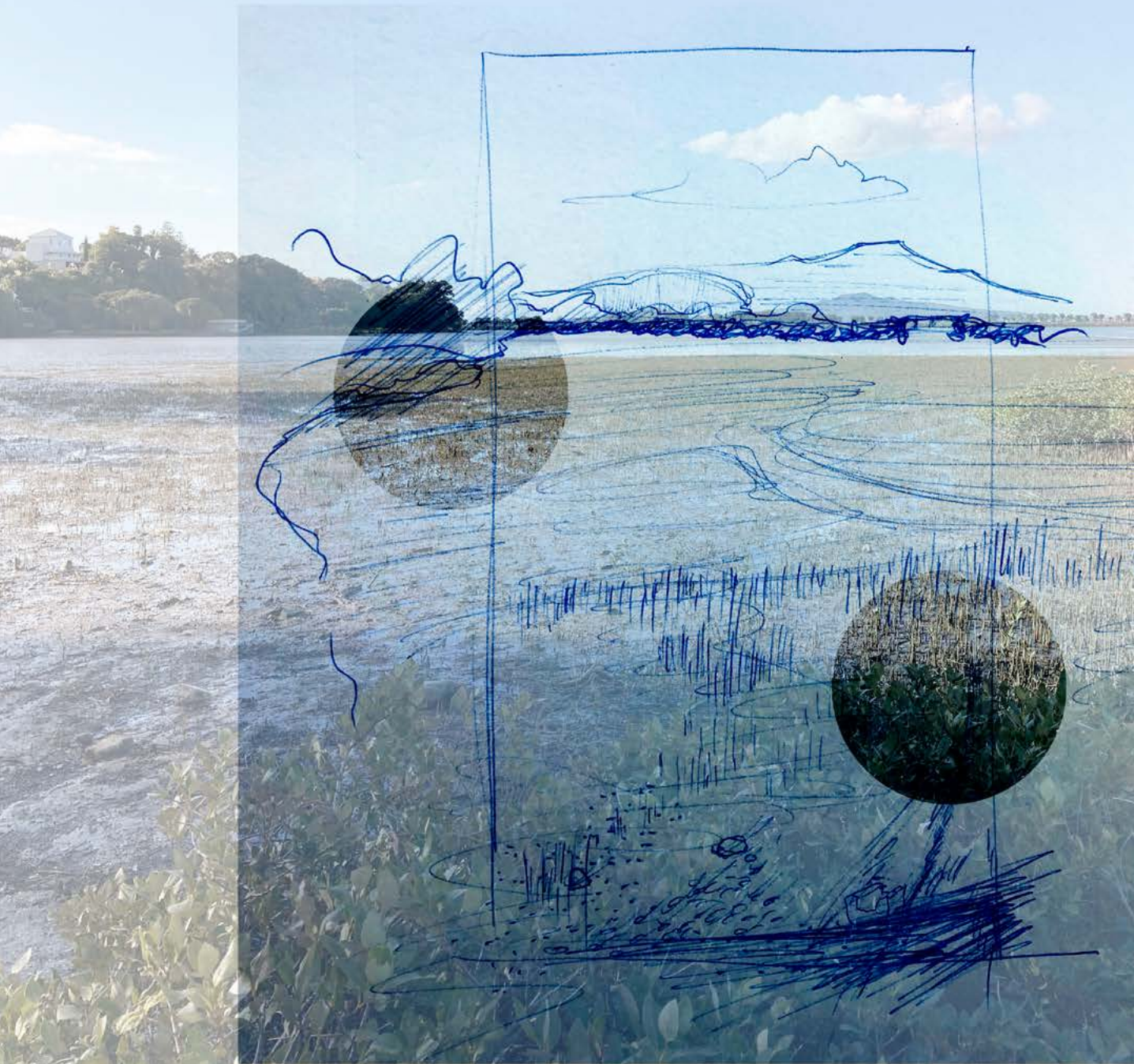
Fieldwork*ing*

Fieldwork in landscape architecture as a diffractive methodology understood through the lens of agential realism.



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Vanessa J Werder
PhD

2025

Fig. 01
Waitaramoa
Hobson Bay.
(Werder, 2024)

Fieldwork*ing*
Fieldwork in landscape architecture as a diffractive methodology understood through the lens of agential realism.

Vanessa J Werder

A thesis submitted to
Auckland University of Technology
in fulfilment of the requirements for the degree of
Doctor of Philosophy (PhD)

2025

Huri Te Ao School of Future Environments

ABSTRACT

1 Our understanding of landscapes and how humans work through and engage with them as physical and cultural entities has changed in recent years. Landscapes such as coastal areas have come to heightened attention due to increased pressures from the climate crisis and ecological emergency. Tāmaki Makaurau Auckland in Aotearoa New Zealand is under coastal influence and will inevitably experience a significant change in the future—through natural events and human development. Concepts such as the Anthropocene and the recent quantum revolution fundamentally changed and disrupted this conceptualisation. However, methods and methodologies in the various domains of landscape architecture (such as research, education, practice, and planning) and related spatial studies have not undergone the same pace of change. This is predominantly noticeable in the methodological approaches, applied methods, techniques, and tools, where the disciplines lack a unique approach.

2 In this thesis, I investigate fieldwork methods (best practice approaches) known in landscape architecture by applying them to a coastal area in Tāmaki Makaurau Auckland. As a result of my probing, as well as through a diffractive reading of the literature and the application of Karen Barad's concept of agential realism, I propose a re-definition of fieldwork as a material-discursive process of iterative intra-action. Fieldwork as a diffractive methodology has the potential to facilitate the observed paradigm shifts in the conception of landscapes and promote a more humble and holistic human engagement with landscapes. This hypothesis critiques the prevalent positivist, solutionist, and predominantly Western framing of spatial studies tasked with decision-making practices (i.e., spatial planning and land use considerations) that determine landscapes' physical and cognitive future, past, and present—to meet landscapes with more humility and care.

Keywords
Landscape studies
Fieldwork
Agential realism
Coastal landscape methodology
Aotearoa New Zealand

ZUSAMMENFASSUNG

1 Unser Verständnis von Landschaften sowie unser Umgang mit jenen als physische und kulturelle Entitäten, hat sich in den letzten Jahren grundlegend verändert. Insbesondere Küstengebiete sind aufgrund erhöhter Belastungen durch die Klimakrise und den ökologischen Notstand verstärkt in den Fokus gerückt. Tāmaki Makaurau Auckland in Aotearoa Neuseeland steht unter prägendem Einfluss der Küste und wird zwangsläufig in Zukunft erhebliche Veränderungen erleben—sowohl durch natürliche Ereignisse wie auch kulturelle, anthropogene Fortschritte. Konzepte wie das Anthropozän und die jüngste Quantenrevolution haben die Konzeptualisierung von Landschaften grundlegend verändert und gestört. Methoden und Methodologien in den verschiedenen Bereichen der Landschaftsarchitektur (Forschung, Ausbildung, Praxis und Planung) sowie verwandter räumlicher Studien haben jedoch nicht das gleiche Tempo an Veränderungen durchlaufen. Dies ist hauptsächlich in den methodischen Ansätzen, angewandten Methoden, Techniken und Werkzeugen spürbar, wo ein einheitlicher Ansatz mangelt.

2 In dieser Dissertation untersuche ich, in der Landschaftsarchitektur bekannte, Feldforschungsmethoden (Best-Practice-Ansätze) anhand einer Anwendung auf ein Küstengebiet in Tāmaki Makaurau Auckland. Als Ergebnis meiner Untersuchungen sowie durch eine diffraktive Lektüre der Literatur und die Anwendung des Konzepts des agentiellen Realismus von Karen Barad schlage ich eine Neudefinition der Feldforschung als materiell-diskursiven Prozess durch iterative Intra-Aktion vor. Feldforschung als diffraktive Methodik hat das Potenzial, die beobachteten Paradigmenwechsel in der Vorstellung von Landschaften zu erleichtern und ein bescheideneres und ganzheitlicheres menschliches Engagement mit Landschaften zu fördern. Diese Hypothese kritisiert die vorherrschende positivistische, solutionistische und überwiegend westliche Perspektive von Raumforschung (*spatial studies*), die mit Entscheidungsaufgaben (z. B. räumliche Planung und Landnutzung) beauftragt sind, welche die physische und kognitive Zukunft, Vergangenheit und Gegenwart unserer Landschaften bestimmen, mit dem Ziel, Landschaften mit mehr Demut und Sorgfalt zu begegnen.

Stichwörter
Landschaftsstudien
Feldarbeit
Agentieller Realismus
Metholodogie von Küsten-Landschaften
Aotearoa Neuseeland

For Mom.
You would have bragged endlessly about this.

ACKNOWLEDGEMENTS

Many thanks to my supervisors, Charles Walker and Ann Morrison, for guiding me through this journey and being patient with my meandering. I greatly appreciate the help and support from all my colleagues at AUT (especially Andrew, Nick, Priscila, Micheal, Champa), and in particular Frances Joseph, Janine Randerson, and Rachel McIntyre, for their valuable (academic and emotional) support in navigating the different stages of this PhD. A grateful thank you to Huri Te Ao School of Future Environments for providing the physical and mental space to conduct my research and the financial support through the Fee Scholarship 2022 and 2023 Doctoral Award. I am much obliged to Prof. Matthew Gandy, University of Cambridge, UK, for pointing me towards Karen Barad's work. And, of course, a massive shoutout to all students I had the pleasure to work with as a lecturer at Huri Te Ao School of Future Environments and School of Art & Design: You have taught me more than you'd know.

Big thanks to all my fellow PhD colleagues at AUT for sharing their experiences and showing I am not alone in this journey. Many thanks to all my work colleagues through the years for (un-)knowingly being patient and either lending an interested ear or providing much-need distraction and balance to PhD life. Thank you to all my friends from afar and close, old and new–you all know who you are.

Infinite gratitude to my father, Hanspeter, for always supporting me and letting me move halfway across the world, and to my mum, Pia, for having passed on the adventurous spirit and the drive to get things done! Much love.

Last but not least, a big thank you for the unconditional companionship of the many more-than-human friends I have made here in Aotearoa: Dr Cookie Mobu (for her excellence in su-purr-vision), Puss "The Dutchess" & Nella, Tiki, Potter, Ruby, Griffin & Tubba, Hecky & Sylvie, Oakley & Lester, Phoebe, Lucy, Coco, Cassie, Ginger & Audrey, Big Momma T, Toast, Cheeka, and Azul.

Kia ora, merci, dankä, gracias & a heartfelt thank you to you all.
—V.

Fig. 02
Waka ama tour on Waitaramoa Hobson Bay. (Werder, 2024)

FOREWORD

1 ***Waka ama.***
We are rowing across the bay. Te Waitaramoa.

It is early spring. The water and air are still cold.
We move our waka across the water, pushing the waves under the hull.

As I am paddling, my body engages, the waves rushing by underneath. With the steady rhythm of the paddles, changing sides, in unison—the repeating of the movements becomes meditative and the connection to Te Waitematā becomes palpable. I gained a new understanding of the connection to the water.

It is the combined efforts of us all that moves our waka. We all become entangled: The paddlers, the waka, the currents, the wind, wai. Reminiscing about the spatial and temporal extent of Te Moana-nui-a-Kiwa we remember pasts and futures yet to be.

2 Immersion into the littoral has revealed various theories of fluidity that are pivotal to the paradigm shifts in landscape conceptualisation. Water, viewed as a topological connector and multi-ontological agent, guides the methodological re-framing of landscapes. The climate emergency and ecological crises highlight the limitations and shortsightedness of anthropogenic actions. The ocean covers more than seventy percent of Earth's surface and an estimated ninety percent of global warming occurs in the water (NASA. The National Aeronautics and Space Administration, 2023).

3 Moreover, we face a communication crisis, struggling to represent natural processes accurately or predict future effects. Western thinking lacks narratives around waterscapes, hindering our ability to form emotional and logical connections to these environments and phenomena. Our collective impacts have accelerated natural phenomena that previously were only perceptual on a geological timescale. Timeframes we, as humans, can only describe as mythological (Magnason, 2021). We are thrown into an uncertainty and a world in constant change that defies the modern paradigm relying on stability and equilibrium.

He waka eke noa.

•

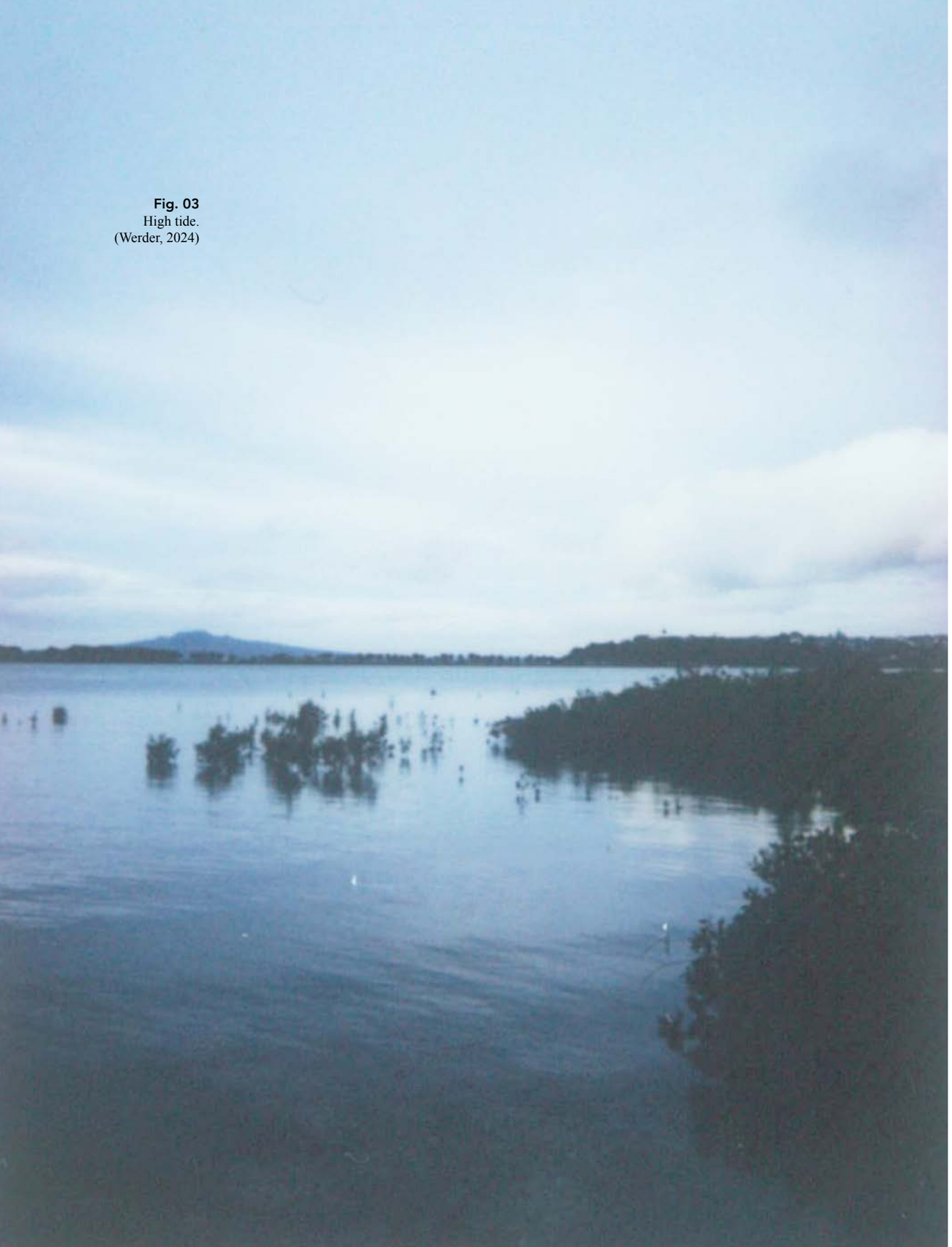


Fig. 03
High tide.
(Werder, 2024)

0 CONTENT

ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced, along with the purpose of use), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

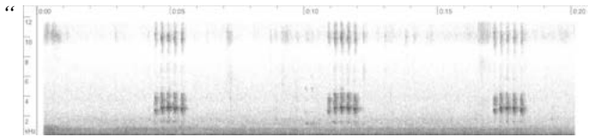
I have utilised artificial intelligence tools, such as ChatGPT 3.5 and Grammarly, only in accordance to the guidelines outlined in the Postgraduate Handbook (V1.1, April 2024): I have used Grammarly for checking spelling and grammar, and ChatGPT solely for additional help with use of language such as rephrasing of my own writing, helping to find synonyms for words, or restructuring my own sentences.

No artificial (generative) intelligence tools have been used for the generation of novel knowledge, synthesis, or dissemination.

Tāmaki Makaurau Auckland, 15 July 2024
(thesis amended 14 February 2025) | Vanessa J Werder

Fig. 04
Harakeke.
(Werder, 2024)

Fig. 05
(Kirker, 2019)

“  ”

—Kōtare (kingfisher) in Tāmaki Makaurau Auckland

1 INTRODUCTION

1.1 Introduction

1 Fieldwork is an established method in landscape research; however, as a borrowed method from other fields, it has eluded a clear definition or critical methodological evaluation. Fieldwork constitutes an empirical observation method grounded in a site-specific context. It situates researchers within a defined place, gaining a multi-sensory understanding and a contextual and relational experience of a particular landscape. This bottom-up approach generates findings (or data sets) traditionally neglected in tools used for analysis or decision-making purposes and enriches and enhances practical inquiries. Through probing landscapes, the investigation focuses on qualitative findings (experiences, phenomena, and data) and recordings of atmospheric and ephemeral characteristics. This provides vital complementary information to otherwise quantitative-heavy sets available on contemporary platforms (e.g., Geographic Information Systems (GIS)) used by designers, practitioners, researchers, and decision-makers. Fieldwork as a process and its outputs are critical practices, and results are used to shape and conceptualise our landscapes’ pasts, presents, and futures.

2 Since its inception as a discipline, spatial planning has predominantly been influenced by politicians, engineers, and the dictates of capitalist, Western, and petrochemical structures and hegemonies. The tools, methods, and approaches selected were tailored to align with the paradigms of these stakeholders, resulting in planning timeframes and scales tied to political terms and reductionistic approaches favouring time-near and simplistic "solutions" to perceived problems. This development has influenced practices, research, and education in landscape research. Moreover, planning was exclusively conducted by a select few in power, with little room for inclusion of diversity in the process. The tools, methods, and techniques embedded in decision-making reflect remnants of the 19th and 20th centuries. Policy-making and policy enabling are performative acts that shape our interactions with the subjects of spatial planning. As a result, the ideologies of past centuries persist through the hierarchies and practitioners engaging with these tools and platforms.

3 Profound conceptual shifts in landscape perception and human interaction with the culturalnatural world have emerged in the 21st century. The increasing rejection of dichotomies and the adoption of a more holistic understanding of entanglement, notably evident in the quantum revolution in physics, has moved the conceptualisation of landscapes as mere objects or entities towards the idea of landscapes as manifestations of intricate, multi-scalar, multi-dimensional, and fluid processes resulting from the complex interplay between human and nonhuman agencies instead. This new perspective is pertinent to reconsider how landscapes are approached methodologically (theoretical and cognitive conceptualisation) and the proposed applications and interactions (including processes and tools or techniques) concerning landscape development, management, and conservation.

4 Landscape researchers and professionals such as architects, landscape architects, and urban planners have shown an increasing interest in challenging this paradigm (Kahn & Diedrich, 2019). They demand responsibility and agency within spatial planning and policy-making processes by embracing more holistic approaches, descriptions, and analyses. These practitioners aim to shift the focus towards the needs of more-than-human and nonhuman aspects. Particularly the dynamic characteristics of landscapes, especially in unique coastal areas, require novel approaches. Waterscapes in these coastal areas exhibit highly local characteristics while simultaneously being influenced by interregional and even global factors. These dynamic site qualities necessitate novel tools capable of holistically capturing and representing the ephemeral and atmospheric aspects (Braae et al., 2013).

5 Through a process of diffractive reading of existing research and literature on fieldwork methods, as well as a practice of *researching through doing*, I re-assess established methods through the lens of Karen Barad's (2007) concept of agential realism. Barad's ethico-onto-epistemological framework is critical to the theoretical framework and hypothesis I propose in this thesis as it affords landscapes and nonhuman entities agency and values their material realities. In this context, I understand fieldwork as an intra-active probing of landscapes that aims to establish a non-solutionist approach countering the previous paradigms of extractive data collection in landscapes. Through this lens, fieldwork constitutes a diffractive, material-discursive methodology aiming to blur boundaries and traditional Western dichotomy such as land versus water, subject versus object, art versus science (Moore, 2019), and us versus them. Crucially, this interpretative and postqualitative stance fosters a more humble approach where humans and nonhumans are collaboratively constituting knowledge production.

6

In this thesis, I argue the need for a re-definition of fieldwork as a methodology to facilitate the observed paradigm shifts in the conceptualisation of landscapes and promote a more humble and holistic human engagement with these. I introduce fieldwork as a diffractive methodology understood through the lens of agential realism (Barad, 2007). This hypothesis critiques the prevalent positivist, predominantly Western framing of spatial studies tasked with decision-making practices (i.e., spatial planning and land use considerations) determining our landscapes' physical and conceptual futures, pasts, and presents.

7 Further, I argue, fieldwork becomes fieldwork*ing*: A process that transcends the mere site visit in the field but is seen as an essential process that ripples through the different phases and aspects of disciplines that concern themselves, with the futures of our landscapes. Fieldwork*ing* is not just the process of probing landscapes. It also looks to the nexus between the recording of findings, their subsequent (visual) representation or documentation, and the researcher's role in this process.

8 As a specific application, I put this theoretical framework in the context of the coastal area of Te Waitaramoa Hobson Bay in Remuera, a neighbourhood in central Tāmaki Makaurau Auckland. While this application provides a real-life context, it also adds additional complexities: On the one hand, coastal areas are complex landscapes that have eluded proper care in spatial planning processes and land use considerations and are further experiencing increasing pressures through the poly-crises of the Anthropocene. Additionally, the coast in Aotearoa New Zealand holds a vital place in Te Ao Māori. The Indigenous population of Aotearoa New Zealand and Te Moana-nui-a-Kiwa (Pacific Ocean) consider the coast vital in their mythology and cultural and spiritual identity. As the gradual intersection of land and water, the coast does not only provide physical nourishment (i.e., as a vital mahinga kai, a food-gathering landscape) but also a spiritual and cultural sustenance. While in settler-colonial understandings, the coast is seen as a threshold—a line demarcating land from water—Māori and other communities across Te Moana-nui-a-Kiwa understand the coast as a place of (ancestorial) connection: Across time (a relationship to previous and future generations) and space (a connection to worldly and mythological relatives across the ocean).

9 Therefore, an ethico-onto-epistemological inquiry into the coastal realm is crucial to address these topics adequately. Understanding and applying fieldwork as a diffractive methodology, particularly in a coastal context, ultimately leads to a more contextually relevant understanding of this landscape and facilitates ethically better-informed outcomes for a better future of our natural and built environments for all living and nonvital beings.

1.2 Scope

1 This thesis is part of achieving a Doctor of Philosophy in Architecture degree, where I engage in research dissemination of contemporary topics in landscape architecture. I locate this thesis in the discipline of landscape research and, more broadly, within spatial studies. Throughout this thesis, I mainly address two subfields within this: Landscape architecture and landscape planning. Both of these fields have landscapes as their primary topics. While the first is mostly a practice of design that looks into the conception of landscape projects, the latter looks at the strategic development, management, and conservation of landscapes. Both fields, however, are concerned with the present and future of landscapes and draw from evidence of their pasts (data and information based on site analyses) as a means for their decision-making processes. This evidence is generally recorded in *data sets*, which, in spatial studies, are often visualised as *mappings*.

2 Therefore, in my research and theorising, I broadly look at landscape studies as a whole, and landscape planning is an example of where I see the need and potential to apply these learnings. Landscape planning is crucial today as humans observe significant declines in our natural environment. Climate change, the ecological crises, and anthropogenic pressures in the form of urban expansion and inadequate management of landscapes have led to systemic issues and a decline in essential landscapes such as wetlands, marshes, coastal areas, or forests, to name a few. Additionally, with planning and decision-making still dominated by a settler state perspective and a lack of inclusion of Indigenous Knowledge(s) in this area, this domain is an important contributor to the project of decolonising landscapes. On the other hand, landscapes hold a vital key in helping us adapt to these issues and mitigate some of the effects of anthropogenic mistreatment.

3 This thesis is transdisciplinary and interdisciplinary—just as landscape studies are interdisciplinary in essence (Prominski, 2019). For the synthesis of my hypothesis, I draw from fields such as cultural geography and social studies like feminist and queer theory. Since much of the discourse around fieldwork is discussed within the context of landscape architecture education, I also draw on literature from pedagogy and education. Additionally, given the context of Aotearoa New Zealand it is essential to address Indigenous already knowing (i.e., mātauranga Māori) and serve in the progress of decolonising landscapes.

1.3 Overview and structure

1 An initial disclaimer is in order: A linear reading may not be the most effective and efficient way to navigate this thesis. However, there is merit in an orderly procession. For the impatient reader, I recommend starting in the **middle** p. 113, where topics are synthesised into a single stream of arguments, and—what may seem an eclectic

*For the paper version please refer to the page numbers in the superscript.

Fig. 06
Thesis overview.
(Werder, 2024)

CHAPTER 1 INTRODUCTION

SECTION I

CHAPTER 2 GENERAL THEORY / ***Context***

2.1	context and research background	Positioning
2.2	. a coastal ontology . the Anthropocene . the coast . Aotearoa New Zealand	Where are we?
INSERT	THE SITE	
2.3	. decolonising landscape . mapping & landscape . solutionism . data & GIS	What is going on?
2.4	the paradigm shifts	Now what?

THE MIDDLE

CHAPTER 3 SPECIFIC THEORY / ***Diffraction***

3.1	. new method(ologie)s . fieldwork as a method . reconciliation with issues	Why is the above relevant?
3.2	. methods in fieldwork . walking methods	
3.3	***fieldwork as a diffractive methodology***	

SECTION II

CHAPTER 4 PRACTICE / ***Iterative intra-action***

4.1	vverview of practical fieldwork	Probing.
4.2	method 1: Travelling Transect	
4.3	method 2: Sketching	
4.4	method 3: Field Exercises	
4.5	comparison	

CHAPTER 5 DISCUSSION

REFERENCES & APPENDICES

amalgamation of thoughts—will be untangled and subsequently re-braided: **Chapter 3.1.3** [p. 117] serves as an entry point to the initiated reader who knows their temporal and spatial context throughout this research journey, and they may use the hyperlinks in bold print* as gateways for further exploration of a non-linear reading.

2 For those who wish to pick their own pathways, I provide a brief overview of the content of this thesis, which I generally structure into two sections: Chapters 1 to 3 and Chapters 4 and 5. **Chapter 1** [p. 19] and **Chapter 5** [p. 219] form the introduction and discussion, respectively. **Chapters 2** [p. 33] and **3** [p. 105] constitute the theoretical background and framework, while **Chapter 4** [p. 149] features the practical inquiry of applied fieldwork methods.

3 In Section I, I discursively explore the theoretical backgrounds that are traditionally considered a literature review. In **Chapter 1** [p. 19], I introduce the core topics of the thesis and address key terms used throughout the research, often defined differently across various disciplines or contexts. Some terms may provide friction or controversy in their colloquial use. In this introductory chapter, I also outline the aim and scope of my thesis, as well as the specific research questions that have guided my inquiry. In **Chapter 2** [p. 33], I address my research's spatial, temporal, and philosophical context and background. This general overview is juxtaposed with the specific context of Aotearoa New Zealand. After a brief stroll across the introduction of **Te Waitaramoa Hobson Bay** [p. 59], I discuss what my literature findings revealed as significant interests of inquiry and disturbance in spatial studies. These systemic issues are called out and addressed in research, planning, pedagogy, and practice. The *wicked problems*, on the one hand, emerge through the altered time we find ourselves in, as well as the shifting paradigms we observe in our thinking and doing, which are further explored in **Chapter 2.4** [p. 87] (a core chapter; one may jump here). I point out the primary paradigm shifts that impact the current theorising and practice in spatial studies, such as landscape architecture, and address how these changes potentially influence or determine methodological approaches. Through diffractive reading and research, I synthesise a proposed approach presented in **Chapter 3** [p. 105]. Here, I introduce fieldwork as a diffractive method and point to the relevance of empirical research in coastal landscape studies, with an overview and critical study of peripatetic methodologies and different fieldwork methods known in landscape research.

4 In Section II and **Chapter 4** [p. 149], I apply my findings to a specific context here in Aotearoa New Zealand, where the previously mentioned Te Waitaramoa Hobson Bay area serves as a case study probed in this practical approach. I chose three existing fieldwork methods that I replicated on this coastal site. The methods were chosen based on their previous suitability of application in landscape studies and landscape architecture and are already sufficiently explored and tested. All methods feature primary and secondary literature helping to analyse and contextualise the methods. The goal of this empiric research is not a comprehensive inventory of the site but an explorative probing of the landscape. It allows me to deeply immerse myself in the context and gain a nuanced understanding of the applied methods and their consequences. This process has been dynamic, and I have developed Sections I and II iteratively and simultaneously.

5 In the discussion in **Chapter 5** [p. 219], I juxtapose the theoretical background and the practical application again and synthesise key findings and a novel **contribution** [p. 241] to the field of spatial studies and landscape architecture in particular. A hypothetical **outlook** [p. 249] gives an overview of potential future applications, further research interests, and consequences that may emerge from this inquiry. In the final **coda** [p. 259], I reflect on my process and provide insight into my personal motivation and biography that have influenced this thesis. True to my surname (we will learn about this at the end) and the topic of this thesis, I will meander and deviate, and I do not treat time as purely linear. However, I aim to contain these as much as possible.

1.4 A note on some terms

1 This thesis is inter- and transdisciplinary. Many concepts or methods introduced throughout this research are borrowed from other disciplines. Additionally, landscape architecture lacks distinct definitions of terms or methods, and some are often only implicitly outlined or ambiguously applied. Other terms, such as climate change, global warming, or the Anthropocene, are discussed critically as they are convoluted with political agendas. Therefore, I outline my understanding of common terms and concepts in this research below. For a more comprehensive overview of terms related to the research around agential realism and the methodologies applied in this thesis, I highly recommend the book "A Glossary for doing Postqualitative, New Materialist and Critical Posthumanist Research across Disciplines" (2021, edited by Karin Murris).

Landscape and nature/Nature

2 *Landscape* is a cultural construct that refers to a culturalnatural environment. Historically and etymologically, landscape is tied to perceptible and aesthetic attributes. In contrast, the German origin of the word ("Landschaft") focuses on the physical enactment of a *landscape*—more on this in **Chapter 2.3.2** [p. 70].

3 While I am trying to avoid using the term n/Nature, it may sneak in as a prosaic word. I understand n/Nature as a colloquial term for what is commonly deemed to be a *natural* setting. The n/Nature of the 21st century is influenced and impacted by anthropogenic enactments (Hunt, 2000). However, I use the capitalised *Nature* to acknowledge the complex entity of Nature (some may refer to as Mother Earth, Mother Nature, Pachamama, or Papatūānuku) in contrast to the Western use of nature as an antonym for culture (Walsh, 2023).

Spatial planning / coastal (spatial) planning / landscape (spatial) planning

4 Coastal spatial planning (or coastal planning) and landscape spatial planning (or landscape planning) are subfields of spatial planning. Spatial planning is concerned with the present and future development, management, or conservation of the natural and built environments and makes decisions around permanent or temporary land use.

5 Spatial planning is generally obliged to national, regional, and local legal frameworks (depending on national policies and state organisations) and is often accompanied by interdisciplinary and supplementary by-laws. In landscape research, landscape

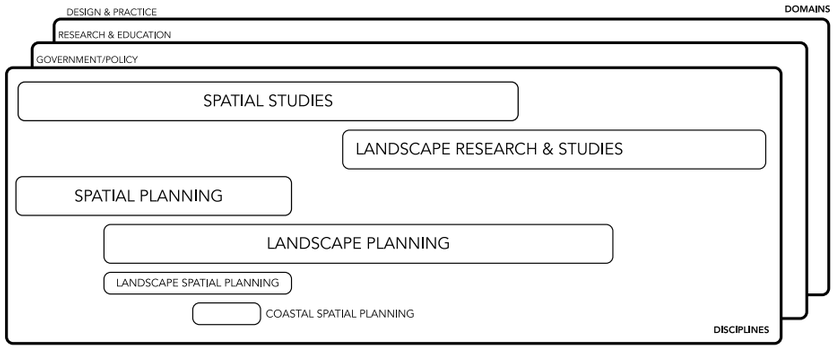


Fig. 07
Relationship and overlap of disciplines. (Werder, 2024)

spatial planning determines locations of interventions (management, development, or conservation). It makes decisions about long-term land use, whereas landscape architecture is primarily tasked with designing or conceptualising a specific place or area, where practitioners engage in short-term planning processes.

6 I understand these different subfields of spatial planning as engagements that concern our future enacting on a place, site, or area and do not necessarily refer to the formalised idea of (governmental) spatial planning (FIGURE 07).

Site / field / space / place

7 Site, field, space, and place are all spatial terms that are often only implicitly defined in landscape architecture and related fields. All terms hold both physical and cultural implications and are theorised at different levels of detail, and in different disciplines. A comprehensive attempt to establish full definitions of these terms would surpass the scope of this thesis. However, the term site is further discussed in **Chapter I.1** p. 58, and I delve into the distinction between site, field, and lab in **Chapter 3.2.1** p. 125.

Climate, climate change, and global warming

8 I understand climate, climate change and global warming according to the definition provided by the Intergovernmental Panel on Climate Change (IPCC), which outlines climate in its broader sense as the "state, including a statistical description, of the *climate system*" (IPCC, 2018, p. n.p., italics in original referring to further definitions). Climate change, therefore, is the "variability of relevant quantities over a period of time ranging from months to thousands or millions of years" (IPCC, 2018, p. n.p.), which is caused by natural as well as "persistent anthropogenic changes in the atmosphere or in land use" (IPCC, 2018, italics in original referring to further definitions). Although global warming is often used interchangeably with climate change, and acknowledging that the two terms underwent political moderation in specific contexts, I understand global warming as one of many (adverse) effects of climate change, which increases global mean surface temperature (GMST). Global warming as a term, therefore, does not explain the underlying effect sufficiently, and I am using the term *climate change* throughout this thesis.

The Anthropocene

9 The Anthropocene defines the current geological epoch as proposed by limnologist Eugene F. Stoermer and atmospheric chemist Paul J. Crutzen (Crutzen & Stoermer, 2013). The Anthropocene is defined by the significant multi-scalar human impact and influence on Earth's geological processes, where natural processes are out-competed. This impact is due to developments of the Industrial Revolution (e.g., burning fossil fuels, deforestation, and many other resulting consequences), invention and use of nuclear weaponry, and widespread agricultural practices (Crutzen, 2006). These behaviours have caused global, complex and *wicked problems* such as the ozone hole, climate change, and biodiversity loss. The official starting date and the general existence or significance of the Anthropocene as a geological epoch are in debate. While others argue for more suitable terms such as the *Capitalocene* (Moore, 2016), the notion of coining a geological epoch defined by significant human impact and influence is relevant in the discussion of landscape studies and has been a significant *motivator* for developments within the field (Prominski, 2019).

Large scale vs small scale

10 Different interpretations exist regarding the delineation between *large scale* and *small scale*, particularly within the context of cartographic representations. I define *large scale* as encompassing large expanses, such as regional or national territories falling within a macroscopic perspective. For me, a map categorised as *large scale* typically operates at a scale of approximately 1:1,000 or greater. Conversely, *small scale* relates to more limited geographical areas. These may manifest at scales such as 1:10 or even entail enlargements of microscopic features (i.e., scales such as 10:1) (FIGURE 08).

Indigenous Knowledge(s)/Indigenous already knowing

11 It is difficult to provide a concise and comprehensive definition of Indigenous Knowledges as these ways of knowing entail processes and relational experiences. Indigenous Knowledges are unbounded concepts that highlight the worldviews, values, and cumulative experiences and histories of, both, individuals and communities at the same time (Brayboy & Maughan, 2009). Indigenous Knowledges are not exclusive to Māori in Aotearoa as the term refers to other Indigenous Knowledges across the

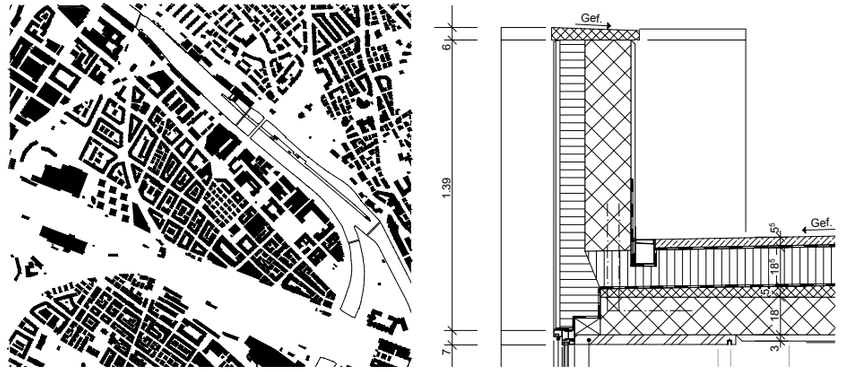


Fig. 08
Large scale (left) vs small scale (rigth). Ironically, these plans are not to scale. (Werder, 2024)

world. The word *Knowledges* is capitalised to address the existing, historical power imbalances (Walsh, 2023).

12 I use the term *Indigenous already knowing* synonymous and the adverbial use signifies the ongoing process (past, future, and present) of knowledge generation.

Knowledge

13 While knowledge can generally be understood as acquired facts, in this thesis, I understand knowledge as a relative concept where the knower and the (to-be-)known are crucial in the definition. (Human) knowledge is bound to the human perspective, perception, and framing of the world (Kuby & Murris, 2021) and how humans come to understand and make sense of the world, and therefore, their limitations and biases. This discussion is both ontological and epistemological. Contrary to conventional definitions, I understand knowledge as a mental and bodily concept or acquisition and support a fluid understanding of knowledge where *facts* must be (re-)assessed in relation to prevalent mindsets and frameworks. In this sense, knowledge is also tied to *unlearning* (Zhao & Murris, 2021). This is particularly important when dealing with unintuitive concepts such as topics connected to quantum physics for example, where the human-bounded thinking patterns and limitations due to anthropologic capabilities of perception and cultural and historical influences are prevalent.

More-than-human, nonhuman, and nonvital

14 The terms *more-than-human*, *nonhuman*, and *nonvital* are used interchangeably. However, commonly in my writing, *more-than-human* refers to vital entities such as the animal, plant, and fungi kingdoms. In contrast, I use *nonhuman* or *nonvital* to address abiotic agents such as water, rivers, or stones, and other phenomena. Therefore, the terms *more-than-human* and *nonhuman* or *nonvital* are often used in conjunction with each other.

Transareality

15 *Transareality* is often associated with Alexander von Humboldt's work and found common application in landscape research. It refers to the transversal, spatial (geographical) extent as well as the "travelling" across different disciplines and domains.

(Visual) Representation

16 Representation refers to the documentation or recording of findings in different media, often as maps or mappings in spatial studies (I use these terms interchangeably in this thesis). While spatial studies prefer visual representations, these are not reduced to ocular-centric media but can include different forms, such as sound recordings, written documentation, and, hypothetically, forms of recording of smell, touch, and taste.

Data and findings

17 Data are generally understood as a set of information collected or extracted manually or with the help of tools and apparatuses. Data are often related to measurable, observable things. What counts as data depends on the discipline and theoretical position (Bozalek & Kuby, 2021a). Findings, however, are what the researcher produces from the data and constitute the whole range of encountered objects, artifacts, phenomena, and experiences, including ephemeral observations or temporal occurrences. From a new-materialist standpoint, matter and meaning are mutually constituted (Bozalek & Kuby, 2021a); therefore, data are relational. Data are not pre-existing but come into being through the investigation.

1.5 Research goals, aims, and objectives

1 Landscape architecture and related disciplines have long called for novel tools, techniques, and methods unique to the discipline rather than borrowed from other fields. However, there is a gap in research and practice to fully address this lack from an ethico-onto-epistemological perspective. An overarching methodological approach that grounds these developments has yet to be theorised. This research is essential as it strengthens common processes in landscape research, particularly landscape architecture, which are often dismissed as subjective.

2 Agential realism was established almost twenty years ago. However, the theoretical concept is still highly relevant and gained significance recently (e.g., Fox & Alldred, 2023). Particularly researchers within pedagogy and education have referenced Barad's work and use their theories as a foundation for novel concepts in these disciplines (e.g., Brown et al., 2020; Murris, 2021). Barad's concept of agential realism understands that the world around us, and therefore, knowledge-production and material practices are intertwined and constituted intra-actively through the mutual agency of humans, more-than-humans or nonvital entities. The framework challenges traditional notions of objectivity, linear causality, and understands the human perspective and perception in its anthropogenic context. Additionally, matter and meaning are inseparable in agential realism. With a relational understanding of reality, agential realism also emphasises that ethical, ontological, and epistemological considerations are interconnected.

3 The theoretical framework and re-framing of fieldwork as a diffractive methodology that I propose in this thesis strengthens embodied and empirical methods and aids decision-making processes. Based on Barad's concept, this hypothesis introduces a postqualitative approach to landscape studies such as landscape architecture. Understanding the human role within the Anthropocene and the observed paradigm shifts in the human understanding of what constitutes the world triggers novel ways of understanding landscapes and our engagement with these. Given the impacts and effects of climate change, humans must fundamentally rethink how we engage with the world. I hope this research provides a basis for advocating the value and importance of postqualitative and empirical methods in landscape studies.

4 Particularly coastal landscapes are in urgent need of ethico-onto-epistemological reframing. Although the complexities of these landscapes are widely researched and the call to action is topical (i.e., due to impacts from relative sea-level rise), there are minimal efforts to demonstrate a change in human behaviour towards these landscapes. The status quo is still prevalent, and proposed solutions repeat the fallacies of the past. Notably, the dichotomy presented in the bifurcations of Western thinking, such

as nature/culture, object/subjects, or us/them, no longer provide sufficient arguments that provide evidence for our decision-making processes. Coastal landscapes sit on the intersection between what is generally considered land and water and, therefore, further amplify this lack.

5 With the rise and growing ubiquity and awareness of spatial tools in our everyday lives (be it from Google Maps to discourses around tracking capabilities or remote-controlled (civil or military) drones) (Kerski, 2015), research around the affordances of mappings and their associated processes has become increasingly relevant. Particularly in landscape planning discourses around environmentalism, holistic planning, or regenerative practices are widely discussed in popular media and respective academic fields. With the emergence of highly capable tools such as artificial (general) intelligence systems (AI or AGI), it is of particular significance to tidy up outdated processes and gaps in research. Without a solid methodological foundation, we risk amplifying and accelerating processes based on outdated assumptions and paradigms and training our future researchers (whether they are human or machine) on outdated processes.

Personal motivation

6 While my formal background lies in architecture, I position this thesis within the realm of landscape architecture. Throughout my professional and academic career, I had many overlaps with landscape architecture. During my studies at ETH Zürich, I studied under Günther Vogt and Christophe Girot. I hope this thesis helps to foster the conversations across spatial disciplines and displays that landscape architecture is not solely concerned with the aesthetics of landscapes or a field of semi-scientific ecological studies.

7 I grew up in a mountainous area in Switzerland with a close connection to water: My family raised me as a sailor on the cold alpine lakes. The seasonal, cyclical rising and falling of the water—either in the lake or the rivers—was a usual observation we would talk about. Politically and historically, the connection to water is of importance across all of Europe, and nowadays, freshwater management is mainly discussed in the context of flood control and mitigation. These topics of fluidity, dynamism, and motion have accompanied me throughout my personal and professional life. As a recent immigrant to Aotearoa New Zealand, this interest has shifted to the realm of coastal landscapes, where I am currently establishing a novel relationship with tidal fluctuations and other hydrological cycles—the observed phenomena, however, seem to mirror my personal and emotional experience from my knowledge of and connection to freshwater bodies.

8 While the state of our planet may currently seem very depressing—countless conflicts, ecological issues, and social uncertainty—I do not subscribe to the *climate anxiety* or what some may call *pre-traumatic stress disorder* (Scott, 2016). I see the Anthropocene and all its symptoms as a chance for humankind to evolve and develop from previous paradigms, practices, and doings: A creative chance to rethink virtually every process ever invented. In my optimistic moments, I am confident we can collectively achieve a better world by applying creativity, compassion, and care to our engagement with the planet.

1.6 Research questions

1 Karen Barad's (2007) theory of agential realism and their notions of intra-activity, diffraction, and entanglement are simultaneously methodologies and subjects of this thesis. To tie this meta-knot even tighter: Subject and object constitute each other intra-actively. For my process, the discovery and deeper understanding of agential realism has served as a revealing diagnosis of my previous research findings. Topics such as the ontological shifts in our understanding of landscapes, the critique of representationalism in landscape studies, and observations such as solutionist planning in the context of the Anthropocene as well as the colonisation of Aotearoa New Zealand, suddenly had a theoretical backdrop where the entanglement of these issues was cohesively theorised. Agential realism helped me to understand my suspicions and frame my research more coherently and concisely within this framework.

2 In an iterative process, I have subsequently applied agential realism to diffractively read and revise my work, which allowed for more precise formulations of my research questions. However, so as not to retroactively censor my own iterative process, I want to present the initial research questions and overlay the revised questions diffractively. The latter would not have been possible without the previous formulation.

3 Two research questions have guided my process in this research. Research question 1 addresses my interest in coastal landscapes and the tools and techniques applied within landscape architecture to engage with these. Eventually, these findings led to the establishment of research question 2: I recognised fieldwork in landscape studies as a cornerstone of empirical knowledge production. However, I also identified gaps in research and literature. This results in my hypothesis, where fieldwork is a methodology that has the potential to facilitate the observed paradigm shifts rather than simply serving as a data collection process, as the method is often portrayed in other disciplines.

Research Question 1

4 What paradigm shifts and challenges are emerging in our understanding of coastal landscapes and the tools, techniques, and methods researchers and practicioners apply to (visually) represent them?

Diffractive revision of Research Question 1:
How can agential realism provide a framework for landscape studies that address the current paradigm shifts in the understanding of coastal landscapes, tools, techniques, and methods applied to these?

Research Question 2

5 How can fieldwork practices facilitate the paradigm shifts mentioned above when dealing with coastal landscapes?

Diffractive revision of Research Question 2:
What is the definition of fieldwork as a diffractive methodology?

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Fig. 09
Ducks among mangroves on Te Ruareoreo. (Werder, 2024)

2 GENERAL THEORY: CONTEXT

1 In Chapter 2, I provide the general context and theoretical background relevant to my research. With these topics, I address the status quo of landscapes as physical and cultural constructs and the current tendencies in spatial studies and landscape research regarding how researchers and practitioners understand, engage with, and work through landscapes as subjects of spatial planning or research concerned with preparing information relating to design and decision-making processes.

2 I outline these topics in the context of the Anthropocene and the increasing pressures landscapes face regarding climate change and intensifying pressures from terrestrial and marine developments. I locate my research on a coastal area in Tāmaki Makaurau Auckland, where I highlight the existing systemic issues observed in Aotearoa New Zealand along these landscapes, as well as the more general conceptualisation and methods and tools that are applied to engage with littoral landscapes.

3 In **Chapter 2.1** p. 35, I give an overview of my methodological perspective as a foundation for this research. In **Chapters 2.2** p. 43 and **2.3** p. 67, I introduce the geographic and conceptual context of this thesis (where are we?) and what general tendencies in research currently exist (what is going on?). In **Chapter 2.4** p. 87, I then transition into my core topic (outlined later in **Chapter 3** p. 105), introduce the paradigm shifts challenging existing and potentially outdated thinking patterns, and highlight the potential for facilitating novel methodologies.

Fig. 10
Waitaramoa coast.
(Werder, 2024)

2.1 CONTEXT AND RESEARCH BACKGROUND

1 In this chapter, I outline the overall methodological background that has informed my research and dissemination of the literature and findings. My research is inter- and transdisciplinary, and while I borrow terms, methods, and ideas, they are tied back to the central discipline of landscape research and landscape architecture.

2 For my overall approach, I assume an interpretive position and draw from post-humanist, feminist, postqualitative, and nonrepresentational theories. As outlined in the main part of this thesis, agential realism (**Chapter 2.4** p. 87) serves as a core theory, and I have applied a diffractive methodology throughout.

3 As I conduct this research within the context of Aotearoa New Zealand, I address the importance of mātauranga Māori and the more comprehensive, global project of decolonising landscape. I aim to provide space for the reader to understand this context and refer to the critical voices in this field of research for more detailed readings. Aotearoa New Zealand further holds a special place in the discussion of the relationship between humans and landscapes as the islands have a unique situation where human occupation and, therefore, direct impact on the local landscapes has happened relatively recently (Holdaway et al., 2019).

2.1.1 General approach and structure

1 This research is inter- and transdisciplinary. I combine different disciplines by drawing from topics from landscape architecture, architecture, and urban planning, cartography, ecological thinking, quantum physics, feminist theory, and cultural geography while metabolising and relating these topics to spatial studies, more precisely to landscape planning along coastal areas, and I apply methods, methodologies and theories transdisciplinary. Settled in Huri Te Ao, School of Future Environments (Department of Architecture), I acknowledge this discipline's interconnectivity to related fields of study and purposely aim to break disciplinary boundaries.

Two-part thesis

2 My goal is to redefine fieldwork as a methodology in landscape architecture. I structure this thesis in two parts: a theoretical inquiry of the current state of the outlined topics—which serves as a literature review in a discursive format—and a practical engagement, an empirical part where I investigate and discuss established fieldwork methods and test my argument or hypothesis.

3 As a synthesis, I derive theory or knowledge from the practical activity in the second part by diffractively applying the hypothesis and learnings from the theoretical background. This approach highlights that knowledge cannot merely be acquired through canonical texts and helps me to emphasise that practice not only contributes valuable insight in the field but also challenges biases and shortcomings in theorising. The practical part is fundamental in forming my arguments and inherently contributes to the methodological re-framing. Furthermore, in this combined approach, I challenge the hardening of the disjunction between theory and practice in landscape architecture and similar fields of study.

Site (case study) and example

4 Te Waitaramoa Hobson Bay serves as a specific context for the theoretical research and a case study for the practical, empirical study of the analysed fieldwork methods. The site was chosen based on convenience of access (I live close by, therefore reducing travel time) and the initial assumption or evaluation of the site providing an adequate amount of opportunities and frictions for interesting site studies. Based on previous knowledge, Te Waitaramoa Hobson Bay has a cultural and historical background that is partly studied and recorded and, unfortunately, has ecological and hydrological issues making it a topic in local, political discussions.

5 I mention spatial (landscape) planning as an example throughout this thesis. While I do not explicitly tie my research to the domain of spatial planning or policy, these fields are the most lacking in their integration of novel paradigm shifts. This omission is primarily due to the notoriously slow processes and the prevailing guarding of an existing paradigm favouring the current political telos. While I see a lot of merit and potential in facilitating paradigm shifts from the bottom-up, such as in education, research, and practice (I am from a country organised by a federal system, after all), it is the "big players" on a national or regional level guided by governmental bodies that eventually can have the most large-scale and wide-spread influence.

6 The notion of *Western thought* is a generalisation and reduction as it neglects nuances and existing, local sensitivities. However, globally, policy and governmental structures are largely guided by Western principles and have undergone many standardisations and flattening of local characteristics. As a process of metaphorical ontological and epistemological osmosis, practices, communication, and protocols trickle down to research, education, and design, where the reverse direction is usually prevented.

2.1.2 Methodology for the theoretical part

1 In this thesis, I acknowledge that the methodologies of the 19th and 20th centuries need an update and resolution to address the problems of the 21st century. Currently humankind is facing challenges of an unprecedented scale and magnitude in relation to human and more-than-human existence. As a species, we must change our approaches to cope with the acceleration of environmental emergency, the climate crisis, and the imminent danger of ecological collapse. The theoretical part, particularly the initial approach to the background of this thesis, is guided by an interpretative understanding of landscape research, specifically of the understanding of space, as well as our working with, thinking through, and engaging with landscapes as subjects for future interactions (i.e., spatial planning).

2 Davoudi (2012) outlines an interpretive approach to spatial planning that has influenced my conceptualisation of these topics. An interpretive perspective critiques the positivistic framing historically employed in spatial planning and still predominantly influencing decision-making processes. In this context, I understand spatial planning as *engagements that concern our future enacting on a place, site, or area*. I do not necessarily refer to the formalised idea of (governmental) spatial planning. Davoudi's methodology acknowledges that spatial planning is not about the organisation of space itself but rather about coordinating the relationships within space. This reinforces the paradigm shifts in the conceptualisation of space, place, and time, as well as the process of visual representation in mappings and map-making (Davoudi, 2012). Interpretive planning comprises the „trialectic of spatiality" of *conceived*, *lived*, and *perceived* spaces as coined by Henri Lefebvre (Davoudi, 2012, p. 434). In contrast to positivism, the interpretive perspective recognises the empirical bottom-up approach and the complexity of the field of study, and acknowledges the dynamism of the built and natural environments, opposed to the idea of spatial equilibrium (Davoudi, 2012).

3 The following points outline my understanding of our engagement with space as a subject of past, present, or future interaction:

1. Space is relative

4 Space can no longer be defined in the Euclidean or Cartesian, purely geometric, and quantifiable way but must address relativity as well as interconnection to time. Space here is understood according to the understanding and theories of Leibniz (i.e., his mathematical and physical expressions of dynamism) and Einstein's theory of general and special relativity (Davoudi, 2012).

5 **2. There is a “will to connect” rather than a “will to order”**
The relativity of space also means that closeness is not necessarily equal to spatial proximity but can be experienced through other connections and is particularly topological. Mapping as a tool to make sense of space and order spatial phenomena means not simply mapping absolute geometry but focusing on showing connections and relationships between things and places. In this sense, Davoudi (2012) points out that interpretive planning is not attempting to tame space (and time) but is looking for a “will to connect” (Hagens, 2010).

6 **3. Interpretive planning accepts multiple timelines**
The multiplicity of timelines emerges with the acknowledgement of the dynamism of our environments: while each thing has its time, the perception and meaning thereof changes with the shift in perspective. Similarly, planners must address cyclical phenomena. Considering that future predictions are more complex, an interpretive approach responds to the prevailing critique of modernist planning, which „is condemned to solve yesterday’s problems“ (Taylor, 2005, p. 157). Interpretive planning is not trying to reduce uncertainty but using this as a constructive quality and opportunity for the changing nature of our reality.

7 **4. Planning is interactive and discursive**
The previous positivist methodology was dominated by an engineering mindset favouring linear and mono-solutionist approaches. The telos of “getting it right” has proven to be myopic and causing systemic issues due to the rigidity of the methodologies and their implications (Holmes, 2020).

8 **5. Visualisation or representation has agency**
Spatial planning, policy-making, and governance are performative tasks, and so are the accompanying (visual) representations. The way practictioners render mappings and make them available to the respective users impacts how they engage with data and interpret it to reach their own conclusions.

9 One of the opportunities that interpretive spatial planning is missing out on is the lack of discourse around the hegemony of a human-centred perspective within this context, leading to the belief that planning for, developing, and managing the natural world is a purely human task. Part of spatial planning nowadays is not simply proactive but also retroactively trying to fix the problems of the past—righting the wrongs. True to the common saying attributed to Einstein, “you cannot solve a problem with the same mind that has created it”, humankind must be critical of their perspective and how problems are framed. While I agree with Davoudi’s understanding of spatial planning from an interpretive standpoint, interpretive research itself is still heavily reliant on positivist research and its methods by including many formulaic and recipe-like approaches (Kuby & Bozalek, 2021; St. Pierre, 2016). In this sense, I advocate to combine and contrast the interpretive understanding of spatial planning with the lens of Karen Barad’s agential realism and their concepts of intra-activity and diffraction (Barad, 2007). These multiplicities in perspective are further enhanced within the context and introduction of mātauranga Māori, which is further addressed in **sub-chapter 2.1.4** p. 39.

10 A non-solutionist standpoint is essential to counter the modernist idea of controlling and rationalising landscape. “[T]he *framing* of a problem must be a conscious activity that precedes *solving*“ (Holmes, 2020, para. 36, italics in original). Holmes quotes Evgeny Morozov (2014), who called processes that define problems „on the basis of one’s capacity for solving them, an intellectual pathology’“ (Holmes, 2020, para. 14).

11 Given the performative nature of landscape research and its wide-ranging impacts—not just on human beings but on more-than-human and nonvital actants—it is crucial to look at these problems from multiple perspectives and disciplines. Complex problems transcend linear causality (or causation). A plurality of methodologies is essential in addressing the iterative thought process in this thesis, and I understand these to support each other constructively and diffractively. *Worldviews* simplify and condense complexities; *orientations*, on the other hand, can overlap and co-exist (Morton, 2018).

2.1.3 Methodology for the practical part

1 The practical part of this thesis features an empirical inquiry into the application of existing fieldwork methods. This constitutes an immersed, bottom-up approach, crucial in my argumentation. While this inquiry has an analytical goal, it is a task of design in its essence—research by *thought and action*. Here, I understand design as the third part of the troika of science, art, and design (Nelson & Stolterman, 2012).

2 I explore three different fieldwork methods, all guided by their underlying approaches and techniques, further outlined in the respective chapters. These methods strengthen a phenomenological methodology that includes qualitative and quantitative methods. Subjective observations in this process are contextualised with the theoretical background and supplemented by an auto-ethnographic report (e.g., Adams et al., 2017; Geertz, 1973) and thick descriptions (e.g., Kostova, 2017; Luhrmann, 2015). As a synthesis, I discuss the findings and outputs through a diffractive analysis of the methods by applying an agential realist perspective to these approaches.

3 These tools and methodologies generally originated in landscape-foreign disciplines but often find application in landscape research and practices (e.g., Van Haeren & Munck Petersen, 2020). The contextual and relational observations in the field will help me use subjectivity constructively by avoiding generating superficial or narrow interpretations and meanings (Kostova, 2017). Through this theorising through making, I also hope to bridge the gap between theory or academic research and practices.

4 I then apply the methods to a specific site in central Tāmaki Makaurau. Te Waitaramoa Hobson Bay is chosen based on ease of access to me as a researcher and fieldworker. Since I already have some knowledge about the site and have experienced it on casual visits, I do not approach the site as a first-time visitor which I am consciously aware of. Although this may introduce some bias in the research, it also emphasises this directly in my engagement. I am aware of these previous encounters and learnings, whereas a *new* location might give the false illusion of an unbiased exploration–are we ever observing a site with new, fresh, and unbiased eyes and minds after all?

2.1.4 Mātauranga Māori and ontological plurality

1 In this thesis, I embrace the paradigm shifts in Western thinking in landscape studies, spatial studies, and associated disciplines and introduce the equivalent current mātauranga (Indigenous Knowledge(s)) and kaupapa Māori (Māori approach, topic, or principle) in my capacity as a reader and student. I hold no claims of a comprehensive understanding of kaupapa Māori, but I hope this research can foster a holistic dialogue. More importantly, I hope other collaborators in this academic endeavour will continue to critique, contrast, cross-pollinate, and collaborate on this matter. I argue for ontological plurality and see multiplicity as a chance to meet an increasingly unpredictable world with more confidence. While I see many overlaps in the tendencies of my research topics and mātauranga in Indigenous-led research, the alignment between Western and Indigenous thinking is critically discussed (Harmsworth & Awatere, 2013; Yates, 2021). However, in many disciplines and domains (such as decision- and policy-making), there is still a hegemony and preference of Western methodologies and tools that favour approaches with reductionistic categories, manageable scales, and quantifiable features. This is further highlighted in Linda Tuhiwai Smith's (1999) account of current and customary research as a Western practice. Not only is my own research presented here subject to this criticism but so are most (if not all) current spatial planning practices.

2 Mātauranga Māori is a combination of Māori worldview and its associated values, cultures, practices, and perspectives (Clapcott et al., 2018) and holds a vital position in Te Ao Māori (the Māori worldview). Mātauranga Māori can be described as a tradition of explicit already knowing within Polynesian ancestries that developed in Aotearoa New Zealand (Clapcott et al., 2018). The Indigenous worldview is integrated into various frameworks, such as Te Aranga Māori Cultural Landscape Strategy (2008), which offers a unique design approach for Aotearoa New Zealand.

3 *As Maori we have a unique sense of our "landscape." It includes past, present and future. It includes both physical and spiritual dimensions. It is how we express ourselves in our environment. It connects whanau and whenua, flora and fauna, through whakapapa. It does not disconnect urban from rural. It transcends the boundaries of "land"scape into other "scapes"; rivers, lakes, ocean and sky. It is enshrined in our whakapapa, pepeha, tauparapara, whaikorero, karakia, waiata, tikanga, nga korero a kui ma, a koroua ma, and our mahi toi. It is not just where we live - it is who we are!*
(Te Aranga Māori Cultural Landscape Strategy, 2008)

4 This relationship and connection to the land has a more holistic meaning in Te Ao Māori—connectivity and sensitivity often lacking in modern Western practices. Although Te Reo Māori has no exact word for *ecosystem*, the notion is conveyed in a full range of concepts and ways of thinking within mātauranga Māori (Harmsworth & Awatere, 2013). The holistic understanding aims to look at (eco-)systems in their entirety rather than dissecting them into decontextualised pieces. This is addressed in whanaungatanga (kinship) and whakapapa (genealogy)—the awareness that everything is in relation to each other, as well as the genealogical tie Māori have to their environment (Wahl & Freeland, 2020). This approach results in an inherent understanding of our responsibility for our impacts on the natural world as human beings. Kaitiakitanga (guardianship) is

central to Te Ao Māori, which has a circular understanding of the world (as opposed to a square or linear worldview currently present in Western thinking) that recognises the temporal recurrence and the dynamism and ephemeral qualities such as mata huna (hidden forces). Freeland (Wahl & Freeland, 2020) argues that current planning and decision-making solely focus on human-centered developments, therefore neglecting the needs and benefits of the more-than-human and nonvital as well as landscapes' capability to play a crucial role in coping with the challenges ahead. Specifically in spatial planning, and even more so along Aotearoa New Zealand's coastal landscapes, where Māori hold mana whenua (territorial rights and authority over land) and depend economically and spiritually on a healthy landscape, this rethinking of colonial planning practices is long overdue.

5 *What makes tangata whenua is an intimate relationship with the natural environment, and this is the wisdom that lies at the heart of our indigeneity. Our humanity is experienced and articulated through our relationship with specific geographies, with our maunga, with our awa.*
(Rauika Māngai, 2020, p. 18)

6 McAllister et al. (2019) also point out that mātauranga Māori provides a supplementary element to neoclassical science, which the authors argue leads to improved results for people and ecology (McAllister et al., 2019, p. 1). This is similar to the concept of "two-eyed seeing" referred to by Bartlett et al. (2012) concerning Canadian First Nation people. The intergenerational and dynamic Indigenous Knowledges in Te Ao Māori (mātauranga-ā-iwi) is also very local and connected to a specific site (Wehi et al., 2019). The environment and its effects are intimately studied through witnessing, experiencing, and conceptualisation, influencing culture and language (Doherty, 2014; cited in Wehi et al., 2019).

7 The different understanding Māori perspectives have on the perception of time and space and the interconnection between the human and natural world is outlined in Tuck and McKenzie (2015). With spatial policy-making dominated by Western thinking, it becomes apparent that an Indigenous approach must be integrated into this methodology. Additionally, there is an increase in research and inquiry into non-Western mapping techniques, which previously dominated and spread the colonialist agenda, e.g., shown by Forren et al.'s example of "racialized landscapes" (2018, p. 307) in Africville, Novia Scotia (CAN). Within the evolving environmental and social contexts, this relatively recent period in human history presents a unique chance to explore Traditional Ecological Knowledge (TEK) (Wehi et al., 2019).

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Fig. 11
Low tide.
(Werder, 2024)

2.2 A COASTAL ONTOLOGY

1 In this chapter, I outline the major issues and formative backgrounds for understanding and working with coastal landscapes. While many of these issues are relevant from a global perspective, Aotearoa New Zealand also displays unique conditions based on its cultural and anthropogenic history (Holdaway et al., 2019), its geography, and geological and biological formation and evolution.

2 Spatial planning, and landscape planning specifically, had remained the same since their wide-scaled introduction to the urban context. The primary dominance of a political telos is largely overruling ecological, cultural, or social considerations (De Block et al., 2019), leading to solutionist approaches causing systemic issues in our built and natural environments. This approach is reflected and reinforced by the disciplines' tools, techniques, and methods. Landscape planning and landscape architecture need more dedicated methods uniquely supporting such environments' needs. This shortcoming is further highlighted by the paradigm shifts landscape scholars observe in the understanding of landscapes and the ecological shifts and challenges experienced due to anthropogenic influences on climate, natural processes, and ephemeral qualities.

3 Coastal landscapes, in particular, suffer from this neglect, and the specific case of Aotearoa New Zealand also underlines this due to its colonial history and the disjunction between Western paradigms and the Indigenous already knowing of Te Ao Māori. These shortcomings must be addressed and made visible to successfully and holistically engage with coastal landscapes. The calls for reframing the problems humankind are dealing with require the rethinking of tools, methods, and techniques and, therefore, the apparent solutions experts, strategists, or practicioners propose. Climate change and its predicted effects put increased pressure on these areas, threatening the wellbeing of life on land, marine habitats, and ecologies.

"And if debates on marking the origins of the Anthropocene suggest anything beyond an exacting reading of the layering of sediments used to justify adding a new segment of time to earth's geological clock, it is perhaps that the structure of temporality that timelines (in their linearity) smuggle into the discussion is inadequate to this moment."
—Karen Barad (2018, p. 57)

2.2.1 Changing times and changing climates

1 Western practices and engagements with landscapes are dominated by economic motivation through capitalist practices. This behaviour enables extraction without replenishment—an inherently un-ecological trait resulting in individualised gains and relative prosperities for few. Historically, in Western societies, the more-than-human and nonvital, such as landscapes, have been regarded as a commodity ready for exploitation and the harnessing of supplies. In research, education, and practices, scholars have long called for the reframing of landscapes as physical and cognitive realities. This call has been amplified by the increasing presence of symptoms of climate change and the amplified awareness of the Anthropocene as an ongoing process.

Our "time"—the Anthropocene

2 Anthropogenic activities outcompete natural processes and are currently the main contributors to geological processes. This awareness resulted in the coining of our current epoch as the **Anthropocene** p. 26 (Crutzen & Stoermer, 2013). The Anthropocene is described as a poly-crisis where ecological degradation is accelerated (Crutzen, 2006), and "newly complex entanglements between the human and nonhuman" as an untenable hybridisation of *nature* and *culture* is formed (Scott, 2016, p. 132). The definition and naming of the current epoch is critically discussed (Chakrabarty, 2018). The Anthropocene can be understood as a synecdoche of the wider effects of anthropogenic behaviour and restructuring of the biosphere (which eventually resulted in the overtaking of anthropomass over biomass (Elhacham et al., 2020))—an overarching cause of the experienced poly-crisis. From ecological collapse to climate change to effects such as relative sea-level rise and ocean acidification, a multitude of (unintended) consequences emerged from unsustainable and unsuitable human behaviour (Williams et al., 2022) such as processes set in motion through technological and social developments like the Industrial Revolution, the Atomic Age, agricultural up-scaling, and global war activities. According to Lorimer, the Anthropocene

3 *represents a very public challenge to the modern understanding of Nature as a pure, singular and stable domain removed from and defined in relation to urban, industrial society (Lorimer, 2012, p. 593)*

4 Climate change operates at multiple spatial and temporal scales and enacts on both aesthetical and cognitive levels (Coen, 2016). Given the complexity and scale of climate change, its convolutedness, and contradictions (Scott, 2016), this phenomenon is understood as a *hyperobject* (Morton, 2013, 2018). In essence, climate change is a time-based issue (van Dooren & Nielsen, 2019) where it also "sits between an unfolding present and imminent and/or imagined futures" (Scott, 2016). This complexity makes it difficult for the human observer to fully relate to these **nestled temporal and spatial scales** figure 33, p. 85 as we struggle to make the invisible visible (Turan, 2016).

5 *Climate change is everything, a story and a calamity bigger than any other. It's the whole planet for the whole foreseeable future, the entire atmosphere, all the oceans, the poles: it's weather and crop failure and famine and tropical diseases heading north and desertification and the uncertain fate of a great majority of species on Earth.*
—Rebecca Solnit (in Scott, 2016)

6 Similarly, the Anthropocene has introduced a layer of uncertainty spilling over into a crisis of representation (Braddock, 2017), where scholars see the arts and humanities as potential guides to "humanise" scientific concepts and findings (Page, 2020). Given our current political structures, primarily based on the scales of the nation-state, these scaffolds "constrain the scalar imagination" (Gerrard in Coen, 2016, p. 34), making it difficult to connect the local with the *global*. Historically, science and the (nation-) state have been tightly intertwined, and therefore, understanding the Anthropocene and climate change have relevant impacts on policy and governmental decisions (Coen, 2016). Predictions for the future are becoming increasingly more difficult as the measuring of the status quo increases in complexity. Rather than dismissing these characteristics as counterproductive and subsequently simplifying them (i.e., categorising them as solvable), frameworks must be adpated: "Indeterminacy is not a state of being but a dynamic through which that which has been constitutively excluded **re-turns** p. 139" (Barad, 2014, p. 178; highlights by author).

The coast and relative sea-level rise

7 Coastal areas exemplify the issues caused by the modern, Western reductionism and dichotomy applied to landscapes: The divide between nature and culture, land and sea, humans and animals, us and them are still ingrained in a colonial-settler mentality for land use and management. Coastal areas are complex and biologically diverse landscapes under increasing physical stress from marine and terrestrial changes and processes, resulting in a *coastal squeeze* (Moomaw et al., 2018) due to global warming, pollution, and human intervention. Habitat loss and fragmentations of ecological spaces are consequences of human expansion, activity, and land use (Gontier, 2007). Global cities are confronted with a vast range of sudden changes and future uncertainty that have intensified due to climate change (United Nations, 2017). The littoral serves as a critical indicator of impending challenges—a canary in a mine. The coast, therefore, is an excellent „playground" to test the hypothesis established in this formal research.

8 More than 40% of the global population lives within one hundred kilometres of the coast, and 10% live in coastal areas that are less than ten metres above sea level (United Nations, 2017), with this number expected to grow further (Dowling & Mcguirk, 2012). Climate change and relative, non-uniform sea-level rise and land subsidisation (Barnett et al., 2020) significantly impact coastal areas, particularly in the case of Aotearoa New Zealand (King et al., 2021).

9 On the other hand, coastal areas harbour the potential to be signifiers of how other urban structures ought to be (re-)organised and present a substantial potential to counter some effects of climate change, either through initiatives like *Blue Urbanism* (Beatley, 2014) or the *Blue Economy*, with methods such as harbouring carbon-storing marine ecosystems (Auckland Council, 2018), or an example for reconceptualisation. Therefore, coastal areas provide a *petri dish* as a prospective zone for adaptation and mitigation efforts. Land allocation and strategic planning are essential to ensure sustainable co-dependency of different habitats, communities, and actors.

10 As subjects of spatial planning, coastal areas are an example of what Rittel and Webber (1973) defined as *wicked problems* that acknowledge that complex processes do not necessarily have one final solution but need constant reframing and resolution. Recent research reveals a gap in addressing the intricacies of coastal planning issues, including social inequality and environmental and ecological challenges (Avni & Teschner, 2019). The implementation of planning strategies for climate change is lagging, and the anticipation of challenges arising from climate change has not yet become the primary catalyst for proactive approaches (Storbjörk & Hjerpe, 2014).

11 News reports on coastal areas are topical in public (media) discourses and have gained significance in recent years. After a rediscovery of coastal areas in urban planning in the early 2000s, research had focused on redevelopments of former port or industrial areas (e.g., Avni & Teschner, 2019; Ferreira & Santos Pereira, 2019 among many). Many studies investigate the development of new housing options, liveability, and their economic advantages. However, these new developments still often maintain an urban-centric viewpoint, sidelining ecological, cultural, and philosophical investigations (Vollmer, 2009). While European research and practices pay a significant focus on flood control along rivers and deltas, other regions of the world are more concerned with marine flood events along coastal areas as well as post-disaster planning with a focus on concepts such as resiliency, regenerative planning, and design (e.g., the New York exhibition and design contest *Rising Currents* (Zeiger, 2010) and the developments around Staten Island, NY after hurricane Sandy (Martin, 2015; Nordenson & Seavitt, 2015; Weisz, 2018)). Although these differ in their geographical or social contexts, these issues all share an equal interest and urgency in flood *control* and primarily address the concept of *control over nature*, or more precisely here, over water.

12 Recent years have seen a shift in attention towards more extensive research on the ecological and geological aspects of landscapes in general (Reed & Lister, 2014) and coastal areas in particular (such as shoreline evolution, sedimentation, and erosion (Milligan, 2015), or wetland conservation (e.g., Sizo et al., 2016)). There is less emphasis on understanding the interplay and mediation between culturally constructed environments and landscapes. Extreme weather events and anticipated relative sea-level rise now shift the focus from either aesthetical development of coastal areas and waterfronts or ad hoc reactions to past natural events to a more proactive approach that looks at mitigation and adaptation strategies to deal with the changing environments anticipated: Measures range from adaptive design proposals imagining (landscape) architecture that allows engagement with the water rather than opposing it (Atelier Descombes Rampini & Superpositions, 2016; Mathur & da Cunha, n.d.) or more large-scale proposals of managed retreat along coastal areas that will see residents gradually moving to different areas. Tāmaki Makaurau Auckland, similar to other cities, currently supports a *managed retreat* as an answer to coastal challenges (Auckland Council, 2018). The strategy is still abstract, and it is challenging to communicate urgency in political discourse. The political and public discussions primarily focus on the economic implications (how much will this cost us?), consumer rights (can I still insure my property?) or social and cultural implications around uprooting and relocating communities from a specific place. Regardless of our response to the issues at hand—whether inhabitants retreat from the coast or find other measures to counteract the adverse effects—the coast must be reconceptualised as a unique environment and landscape. This offers the potential to fundamentally rethink how landscapes are understood and enacted upon. After all, a retreat does not mean the end of the intersection between land and water but only shifts this part further inland. The ontological and epistemological issues remain unresolved.

13 Understanding coastal areas as unique landscapes also strengthens the awareness of a fundamentally different ontology in contrast to current terrestrial planning. Unique frameworks, tools, and methods that understand the fluid dynamism of the interplay of land and water are missing, and terrestrial thinking—in its static understanding (which arguably may be inadequate for dealing with terrestrial issues as well)—is also lacking. These marginalised areas along administrative boundaries and on the threshold of water and land make them of interest to different agencies and communities. Communication through maps, plans, and written policies becomes increasingly crucial in disseminating this (re-)conceptualisation.

14 Coastal management lacks a dedicated “coastal theory” (Marcucci et al., 2012, p. 401) and often relies on borrowing terms and methods from related disciplines (Marcucci et al., 2012; Pittman et al., 2019). Hein (2016) uncovers a lack of research on water as a „connector“ and the interface between urban areas and water. Marcucci et al. (2012) advocate for a more specific planning theory to address the interdisciplinary and expansive nature of coastal management effectively. They critique linear solution processes used in modernist planning approaches, emphasising the temporal nature of these issues and referencing the concept of *wicked problems*. Considering the imminent need for action along coast and waterfronts, Batty and Marshall (2009) argue that climate change effects will inevitably prompt new perspectives. Requiring a re-evaluation and re-invention of planning processes in specific locations can yield valuable insights for other areas. Just as climate change, the Anthropocene, and *wicked problems* are causing us issues in the real world, they also raise questions about their appropriate representation (Scott, 2016).

"What is the outline? […] It is not, believe it or not, that every object has a line around it! There is no such line. It is only in our own psychological makeup that there is a line."
—Richard Feynman (Feynman et al., 1964)

2.2.2 The coast*line*

1 Colloquially, littoral areas are referred to as the coast*line*—a line separating land from water. As anyone who has ever sat on a beach or a shore would know: There is no clear line. The coast*line*, therefore, repeats the inadequacy of the dichotomy of land versus sea. Mathur (2017) questions these "lines of separation", advocating for a more holistic understanding of the organisation of the built and natural environment. She recognises these lines as spatial zones with gradients akin to ecotones and ecoclines observed in natural habitats—gradual transitions in ecological zones (van der Maarel, 1990). The idea of "ecotone thinking" (Kahn, 2021a) addresses the inadequacies of dichotomies and introduce spatial and material qualities—not only for ecological studies but also as analogous application in fields such as postdigital studies (Ryberg et al., 2021).

2 Carter also describes coastal landscapes as a "region, tract or district", acknowledging them as a region with fluid boundaries and a "transitional zone" (Carter, 1999, p. 131). Similarly, fields like wetland management and conservation recognise the conflicts arising from arbitrary administrative boundaries, which frequently separate areas without considering their ecological interconnections (Sizo et al., 2016). The coast, therefore, becomes a human-water landscape—a chimera of natural and cultural phenomena and a multidimensional identity. Approaching the design process involves navigating the complexity inherent in these systems instead of oversimplifying them (Nelson & Stolterman, 2012). A constructive discussion is further delayed by not addressing this issue in the tools and techniques utilised in these spaces (i.e., mapping techniques that engage with coastal landscapes, discursive narratives, or design and planning methodologies). However, the coast is an essential aspect of spatial planning and eludes holistic engagement—this is particularly prevalent in planning practices where the additional effort of communication across the associated authorities generally leads to a neglect of this space (Peart, 2007).

3 Measuring the coast*line* also constitutes a mathematical problem based on Lewis Fry Richardson's paradox (1993). Coastlines cannot be **measured** [p. 91] definitively due to their fractal nature. Richardson describes the measuring output in relation to the measuring device: One's results will differ significantly depending on whether the coast is measured using a meter stick (at the increment of one metre) or a smaller (or larger) instrument. This realisation resists totalising hierarchies by exemplifying the more complex something will become when one looks at it in more detail.

4 The visual misrepresentation of the coast as a line due to 19th-century Western thinking has led to a range of systemic issues ranging from ecological to social and cultural issues. Therefore, the reductionist portrayal of this physical and cultural landscape is widely contested and amplified by the ecological crisis. Notably, in Aotearoa New Zealand, coastal exploration and mapping of this geographical feature were some of the first acts of colonialism. Often the mappings were also approximations of the actual coastal morphologies due to issues with accurate survey and measurement (Carter, 1999). Although, they served as crucial guides for safe marine navigation during early voyages, this practice marked the beginning of colonial hegemony and appropriation of the land through cartography (Nelson, 2017 in Dang, 2021). Carter (1999) argues that the coast*line* represents not just a natural feature but also a cultural concept—

which is often missed in contemporary discussions. Viewing the coast as a linear abstraction, just as spatial zones are demarcated in urban planning, has set a precedent that oversimplifies its complexity, stripping away its expansiveness, dynamic nature, and temporal aspects. Factors like tidal fluctuations, seasonal changes, and long-term climatic shifts blur the presumed boundary between water and land. Using a line as a defining boundary in spatial planning and interdisciplinary policy design not only abstracts the actual landscape but also anthropomorphises the land (or water in this case), breaking the landscape into manageable, human-scale fragments for control—creating "coastal cuts" that are neither naturally occurring nor "environmentally neutral" (Carter, 1999, p. 135).

2.2.3 Multi-dimensionality of landscapes and multiplicity of perspectives. Or: In search of a watery ontology

1 Coastal areas are specific types of landscapes where complexities and multi-dimensional qualities become particularly present due to their interactions between water and land. As outlined above, the conceptualisation of the coast in practice and planning (such as regional spatial planning) is still primarily dominated by land-based thinking. Steinberg and Peters (2015) contrast this framework by introducing a *wet ontology*, which allows the exploration of novel ways to conceptualise coastal landscapes. The authors draw on many scholars and researchers from contemporary (human) geographic theory and reference Doreen Massey (2003) when outlining the main aspects: Verticality understood as volume; processual materiality (in contrast to stratified and formed materials); and temporality. The authors assign the terms volume, matter, and emergence and link these thoughts to the ideas of Bennett's "Vibrant Matter" (2010), Bridge (2013), and chaos-theory-inspired research (e.g., Barad, 2007).

2 This challenges the thinking patterns applied to seascapes as well as landscapes. The reframing also reinforces the systemic, underlying problem humankind are facing: Climate change is not about an issue of temperature itself (hence, the inadequacy of using **global warming** [p. 26] as a synonym) but much rather an issue of the resulting upsetting of water cycles. Droughts, heavy rain events, ocean acidification, and such are all symptoms of the changes in the water metabolism of our planet that constitute the majority of effects of climate change.

3 However, modern Western society has largely forgotten the nuances of water and needs a narrative to frame these phenomena (FIGURE 12, NEXT PAGE). Landscape studies are regarded as an extension of urban studies and adopt the tools, techniques, and methodologies from there. The political telos favours solutionist approaches grounded in (civil) engineering rather than disciplines more suitable for the dynamic characters of landscapes. This is further underlined by the Euclidean understanding of space, which is the dominant principle in organising spatial data. These boundaries, shaped by political regulations governing spatial allocation, land use, and temporal frameworks, delineate habitats and ecosystems. They often overlook the conflicts stemming from arbitrary administrative divisions, neglecting the interconnected ecological networks

within them (Sizo et al., 2016). However, alternative approaches have the potential to be more holistic due to their inherent connection to a particular landscape, topography, or place. This is well-documented in the case of watershed planning in Hawai'i, for instance, where planning borders are organised through the natural pathways water finds within a given topography instead of arbitrary borders and boundaries neglecting the local characteristics (Jensen Carr, 2021).

4 *Geo*graphy and its associated theories, tools and methods, by definition, focus on the geo aspect of their study: *Geo*, here not simply referring to a place or location, but more specifically to *Earth* (Elden, 2013b in Steinberg & Peters, 2015). As terrestrial beings, it is not surprising that humans have evolved their theories and tools adapted to this realm. However, it must be admitted that this does not fully explain what is happening*.

5 Wet ontology provides a reimagination of marine and coastal areas, which is potentially also relevant to terrestrial topics:

Fig. 12
Dump no waste.
Flows to sea.
(Werder, 2024)

*Just thinking of *geo*politics that are much more concerned about what is happening beneath the surface (thinking of water, oil or minerals here) than the land itself.

1. Water as a medium and epistemological experience

6 Water is not simply a material with physical qualities but has agency in its own rights. The reduction of water as a quantifiable good has led to the exploitation of bodies of water—from rivers to lakes to oceans—that are instrumentalised to solving society's problems (e.g., in the form of containers for our wastewater or the seeming abundance of the sea as a provider of food). The ubiquitous "Do not dump waste, flows to sea" (FIGURE 12) that many waste and rainwater openings in the city have embossed is a sad reminder of the *out-of-sight-out-of-mind* mentality often assigned to water as well as the interconnectivity of our doing and other processes.

2. Marine versus terrestrial thinking

7 The dichotomy of land versus water does not sufficiently explain the coastal condition. As observers experience tidal changes, gradual changes in water levels are understood more intuitively. Everything displays a varying level of wetness: The ground is soaked in water, the grass is saturated, and the rain leaves puddles behind. Humans, too, are made of a large portion of water, after all.

3. Water as cultural identity

8 In Te Ao Māori, wai (water) is of vital significance. On the one hand, this is shown in how words are used—different types of water have different names, which goes beyond the simple distinction of saltwater, fresh water, and brackish water. Furthermore, the notion of wai finds itself in many other aspects of Te Reo Māori vocabulary. Makuini Ruth Tai displays this in her book "Te Waihanga. The Creative Waters" (Tai, 1995). Tai explains the origin of words such as waihanga (creativity), wairua (spirituality), or waiora (health), which all relate to the essence and characteristics of wai. Wai is a fundamental part of Māori and Polynesian culture, signifying all living beings' physical and spiritual well-being and where people draw their mauri (life force). Wai holds strong ancestral ties and mythological relevance. Additionally, Māori whakapapa (genealogy) back to ngā maunga (mountains) and bodies of water such as ngā awa (rivers or streams), ngā roto (lakes and wetlands), or moana (the sea). In Te Ao Māori it is understood that these natural features are ancestors and sacred entities. It is therefore not surprising that Aotearoa New Zealand was the first country to award personhood and as such the corresponding legal rights, to a river—Te Awa Tupua (Whanganui River) (Pāremata Aotearoa New Zealand Parliament, 2017).

4. Water as volume and verticality

9 Water further contrasts the horizontality of terrestrial planning. With water, not only surface is associated but also depth. Therefore, an ontology of water is aware of the volume, addressing what is above and beyond the represented surface. With the establishment of the vertical axis, the understanding of space as a three-dimensional phenomenon is reinforced: The coast makes this aspect particularly relevant as vertical fluctuations are observed at different timescales—as tidal fluctuations and long-term changes in the form of relative sea-level rise.

10 *There is no such thing as dry land. Wetness is everywhere to some degree. It is in the seas, clouds, rains, dew, air, soils, minerals, plants, animals. The sea is very wet; the desert less so. So, when we experience 'water' on the other side of*

a line that allegedly separates it from 'land', we know it to be by design, design that articulates a surface for habitation. This surface has served as a ground for experience, understanding and knowledge. Today, however, with rising seas, warming temperatures, and the increasing frequency of floods, this surface along with the edifice of civilization and certainty built upon it is threatened, calling into question the act of separation that brought it into being.
(Mathur & da Cunha, n.d.-a)

11 Steinberg and Peters (2015) contrast, or rather complement, terrestrial thinking with the fluid, dynamic and "chaotic and *rhythmic* turbulences of the material world" (2015, p. 248, italics in original) water presents us with. (Terrestrial) spatial studies dismiss the sea as "without character", as it eludes its definition and meaning of *character* (in the etymological meaning of the word as "to inscribe") as it is without *inscription*. However, in the epoch of the Anthropocene, where the Earth and its inhabitants are dealing with symptoms such as ocean acidification, one may argue that these imprints are present—not in a physical stratification, but a chemical marking instead.

12 On the other hand, littoral spaces constitute a unique, amphibious intersection between marine and terrestrial thinking and, therefore, have the potential to act as a hybrid mediator between traditional thought patterns. Kahn theorises this position as a different way of thinking and a reinforcement of regenerative and ecological practices:

13 *If urban design were to problem-frame and problem-solve according to an ecotonal model, developing tools and techniques to navigate across its traditionally separated but practically intertwined knowledge areas, it could instate a new habit of mind, with the potential to synergize previously isolated resources in truly transformative ways.*
(Kahn, 2021a, p. 202)

14 For Kahn (2021a), ecotone thinking establishes an iterative method for "working in gaps and overlaps" (p. 202) that suits an interstices-rich environment and an interdisciplinary inquiry particularly well.

2.2.4 Aotearoa New Zealand and the coast as a special case

1 Over 90% of Tāmaki Makaurau Auckland's urban expanse is considered *coastal*, which is pivotal in shaping the city's character and cultural identity (Auckland Council, 2018; Auckland Regional Council, 1999; Auckland Regional Council, 2010). Global challenges place increased pressure on coastal areas (Panuku Development Auckland, 2015). The "Auckland Plan 2050" (Auckland Council, 2018) outlines the city's vision for the near future. It highlights the absence of a comprehensive strategy for preserving and developing coastal zones as a critical factor in Tāmaki Makaurau Auckland's progress. Given Aotearoa New Zealand's geographical location, sea-level rise could disproportionally impact the islands. With further developments on land, the coast will experience increased pressure from both land and sea; a proactive approach rather than ad hoc measures needs to be integrated for the city to face future challenges.

2 Additionally, for Māori, the cultural and spiritual values of the coast are expressd in the importance of the coast as, both, a landing point to Te Ika-a-Māui (North Island) and Te Waipounamu (South Island) and the connection to the Pacific ancestry across Te Moana-nui-a-Kiwa as well as the mythological origin and ancient homeland of Hawaiki. Many iwi (Māori tribes) whakapapa to coastal areas where communities connect to the whenua (the land) and their identity.

3 Tāmaki Makaurau Auckland also acknowledges the importance of the city's cultural identity from a non-Māori perspective and states that "Auckland's watery heritage" (Toy, 1977) has not only historical significance but also the potential to rethink future developments (Auckland Regional Council, 1999; Auckland Regional Council, 2010; Bradbury & Bogunovich, 2014).

Policy issues

4 Aotearoa New Zealand's coastal zone is governed and managed by different agencies and councils, each with different values, foci, and philosophies in how they tackle and define the issues of interest (e.g., Auckland Regional Council, 2013; Auckland Regional Council, 1999; New Zealand Government, 2019). While these entities share responsibilities and jurisdictions, effective communication and collaboration have proved challenging, delaying the implementation of integrated spatial planning efforts (Peart, 2007). This complexity is amplified when looking at Tāmaki Makaurau Auckland's legal frameworks: "The Auckland Regional Plan: Coastal" defines the *Mean High Water Spring* (MHWS) as the administrative boundary between terrestrial authorities (district plans) and coastal, marine authorities (Auckland Regional Council, 2013, p. 19 (FIGURE 13)). This demarcation, depicted as a line, holds spatial implications critical to urban planning and ecological studies. However, uncertainty looms regarding how potential changes in sea-level will affect the MHWS definition and policy amendments. The absence of a standardised definition for these landscapes (or landscapes in general, e.g., (Brabyn, 2009)), compounded by the challenges in adapting

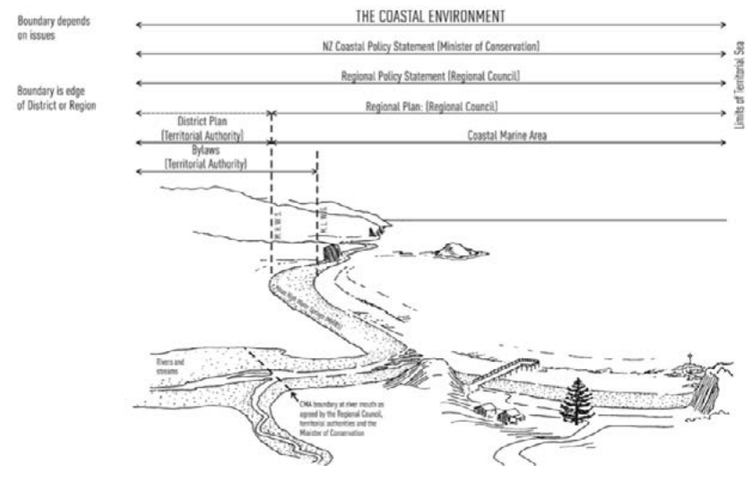


Fig. 13
Administrative jurisdiction along Tāmaki Makaurau Auckland's coast. (Auckland Regional Council, 2013, p. 19)

to dynamic environments (Peart, 2007), is a recognised issue. This predicament is not exclusive to Aotearoa New Zealand; similar complexities in dealing with coastal areas have been observed in the United Kingdom by Allmendinger et al. (2002).

5 In addition to the biophysical challenges, Tāmaki Makaurau Auckland grapples with cultural issues within spatial planning. The impacts of colonialism and the imposition of European worldviews have detrimentally affected Indigenous communities, leading to marginalisation, misappropriation, and disconnection from their ancestral lands (Hikuroa, 2017; Jackson, 1992; Stevenson, 2004 in Clapcott et al., 2018). European economic-driven ideologies, settlers' adherence to property-based systems, and deliberate reorganisation and fragmentation disrupted indigenous means of sustenance, replacing traditional tools, crops, animals, and technologies and altering their relationships with familiar landscapes (Barnett, 2021). This misappropriation of how to responsibly care for and govern the land led to inaccuracies in translating the Treaty of Waitangi into Te Reo Māori, Te Tiriti o Waitangi (Manatū Taonga Ministry for Culture and Heritage, 2021). This pattern of fragmentation and dislocation of Indigenous Land(s) is similarly observed in other parts of the world, such as Hawai'i (Jensen Carr, 2021).

2.2.5 A topological connector

1 The visible presence of water and natural processes and the different cultural and historical connections are associated with coastal areas introduce multidimensionality to a place often neglected in abstracted mappings or plans. Water is not simply a divider of terrestrial thinking and marine philosophy but can act as a *topological connector*.

2 Therefore, the proposed concept of *wet ontology* holds significance, and Aotearoa New Zealand possesses the potential to serve as a conducive environment for facilitating this redefinition. Not only physical and ecological problems can be addressed in this way, but political, social, and cultural concerns also find a joint base for discussion. Opposition (in worldviews) would require a binary system. However, instead, there is a plurality of systems that feature and enforce *different* worldviews: Empowering Indigenous researchers in decision-making processes is facilitated by incorporating diversity and multiplicity into site-specific techniques and tools. This approach differs from a superficial inclusion of Indigenous Knowledges, characterised by the selective adoption of elements that align with researchers' preferences (Todd, 2016). The most challenging task lies in avoiding the fallacy of integrating Indigenous understanding into a solely Western framework, thereby perpetuating a colonisation of thought. Landscapes, after all, exist in a complex and rich physical world that not only has a spatial and material quality but also provides the essential physical, cultural, and spiritual sustenance needed for the pursuit of a better future for all living beings.
•

Fig. 14
Where is the line?
(Werder, 2021)

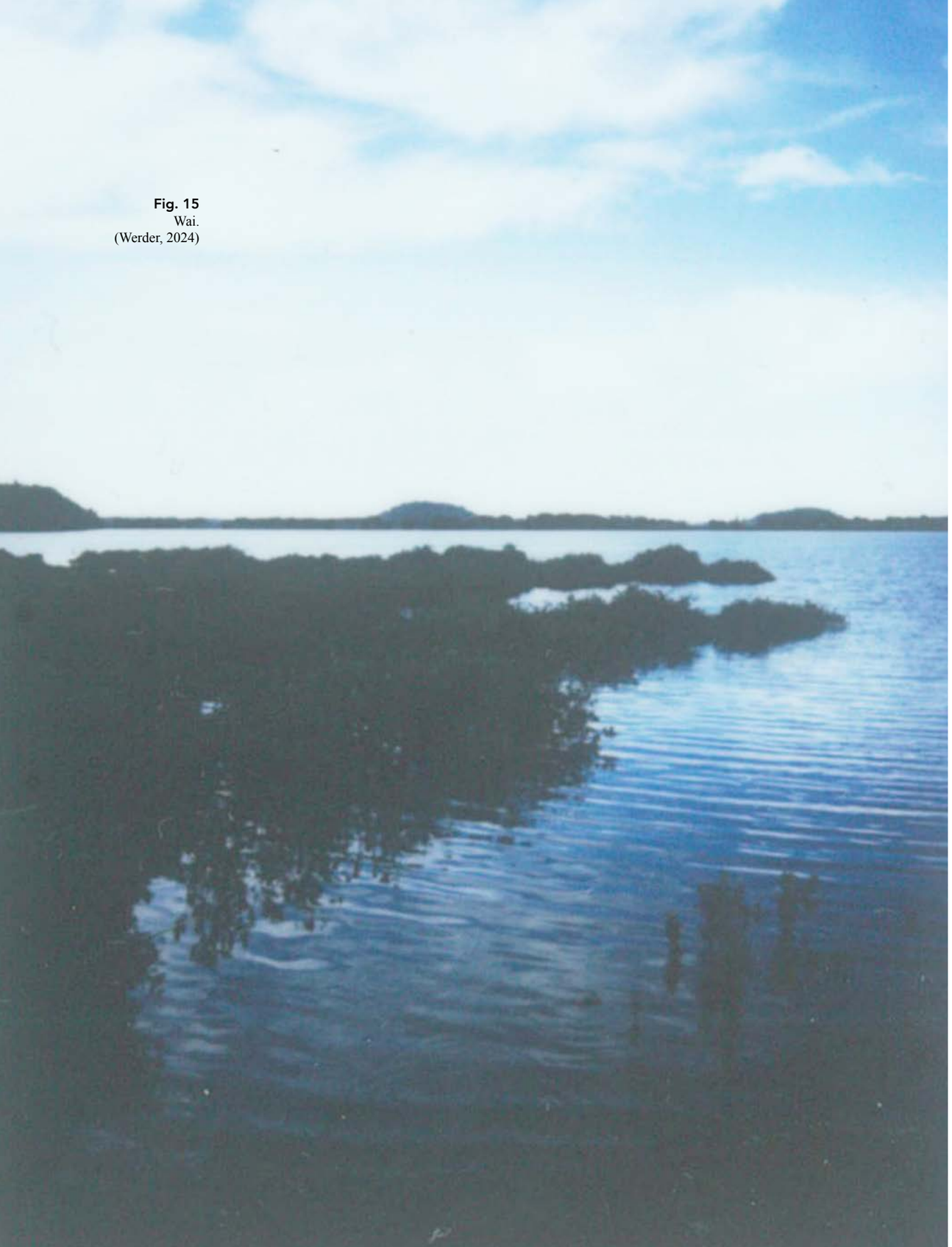


Fig. 15
Wai.
(Werder, 2024)

INSERT

ON SITE/ON-SITE

1 Te Waitaramoa Hobson Bay is located in central Tāmaki Makaurau Auckland. The coastal area serves as a case study site for the practical inquiry of this thesis.

2 The location is a good example of the complexity and amalgamation of different landscapes coming together: water and soil; human-made infrastructure and land, as well as natural features. Te Waitaramoa Hobson Bay showcases a complex cultural heritage within Tāmaki Makaurau Auckland's history. Even short visits reveal that the assessments of such a site cannot simply be conducted by looking at the local features but must include elements that reach far beyond a defined perimeter—both in time and space.

I.1 Site-specificity and site as a missing definition

1 *Site* is paramount in architectural and landscape architectural inquiry for academic research as well as practice-oriented work. Many theories have explored methodological approaches in the analysis and evaluation of site (Braae et al., 2013). Site as a term, however, is implicitly understood in spatial studies but rarely defined or critically discussed.

2 Both landscape architecture and architecture frequently use the term, without initially defining it. Andrea Kahn and Carol J. Burns have therefore collated the voices of a range of scholars to address this neglect and provide an overview of a definition of *site* in their book *Site Matters* (Kahn & Burns, 2021). While landscape architecture traditionally and explicitly understands site as *material terrain* (Kahn & Burns, 2021), it is more generally understood as "a relational construct that acquires definition through circumstances and conditions of interface and interchange" (Kahn, 2021b, p. x). Kahn (2021a) understands site as constituting of overlapping spaces without clear borders or boundaries, heterological in their nature. Many scholars likewise understand site as both physical and mentally constructed (Hogue, 2004; Treib, 1979).

3 Since the first edition of *Site Matters* in 2005, *site* has become increasingly more fluid (Kahn, 2021b), which is reinforced in other spatial disciplines such as archaeology: Joyce (2021) understands site as "autonomous congealments of matter" or as "flows of material" (p. 94). Joyce links this process of congealment to the agential realism of Karen Barad, who understands matter as "*substance in its intra-active becoming—not a thing, but a doing, a congealing of agency*" (Barad, 2003, p. 822; italics in original). This understanding stands in contrast to the notion of *genius loci* (re-introduced in the modern context
by Norberg-Schulz (1979)), which understands site's character or identity as originating from fixed or static qualities belonging inherently to a place (Kahn, 2021a).

4 *Site analysis, at a large scale and recorded through detached rational mappings, has given way to site-**readings*** p. 139 *and interpretations drawn from first-hand experience and from a specific site's social and ecological histories. These site-readings form a strong conceptual beginning for a design response, and are registered in memorable drawings and mappings conveying a site's physical properties, operations, and sensual impressions.*
(Meyer, 2021, p. 38; highlight by author)

5 Place and space, on the other hand, do not fully convey the same specificity. While space constrains locations from their materiality and local particularities (Massey, 2004), place can be seen as a unique expression of space as Eanes et al. (2020) theorise: The authors understand place as an amalgamation of memory, artifact, experience (Bodenhamer et al., 2015) which are both individual and communal (Massey, 1994; Tuan, 1977)—and include the more-than-human. Site, however, is grounded in specificity containing "bodies, doings, and sayings" (Jones et al., 2007, p. 265), which are entangled with each other.

Fig. 16
(next page)
Satellite image of Waitaramoa Hobson Bay.
(Toitū Te Whenua. Land Information New Zealand, 2023)

I.2 Te Waitaramoa Hobson Bay

1 Te Waitaramoa Hobson Bay is located in central Tāmaki Makaurau Auckland. The bay and adjacent reserves, with natural wetlands and recreational areas, are surrounded by the residential neighbourhoods of Parnell, Remuera, and Ōrākei. To the north, Te Waitematā and wider Tīkapa Moana Hauraki Gulf form the marine connection to Te Moana-nui-a-Kiwa, while an extensive network of wetlands, freshwater sources (Te Ruareoreo Newmarket, Hapua, and Portland Streams to the west, and Pourewa and Ōrākei Creek to the east), reclaimed land sites, and reserves (Thomas Bloodworth Park, Shore Reserve, and Waitaramoa Reserve) border south of the bay.

2 Te Waitaramoa Hobson Bay is home to a variety of endemic, native, and introduced fish, birds, insects, and lizard species, as well as plants such as harakeke (New Zealand flax), pōhutakawa, mānuka, tī kōuka (cabbage tree) or oioi (jointed rush). Large parts of the bay are covered by ngā mānawa (mangroves). Generally, the bay is not used for human on-water activities or fishing due to a lack of access and unsatisfying water quality. The adjacent reserves and recreational areas are predominantly used for sports activities such as walking, cricket, or rugby. Shore Road is a local connection between Ōrākei and Remuera to Parnell and Newmarket.

3 The Te Reo Māori name, *Waitaramoa*, probably refers to "the bay of the first rays of sun" (Simmons, 1979), while the English name remembers Captain William Hobson, who was the first Governor of New Zealand from 1841—42. The area is part of Ngāti Whātua Ōrākei hapū's rohe (tribal area).

Marine hydrology and connection to Tīkapa Moana

4 Te Waitematā is a tidal, drowned valley system that has experienced alternating sea level heights (McClure & Te Ara. The Encyclopedia of New Zealand, 2016). The natural harbour protects the coasts from the open sea. Most of the seabed is formed through sedimentation and various stages of volcanic formations—with significant impacts through the eruption of Ngā Rangi-i-totongia-a Tama-te-kapua and the formation of Rangitoto Island (approx. 600 years ago) as well as the extinct and submerged volcano crater forming today's Ōrākei Basin. Early Māori inhabitants used the waters as fisheries. In contrast, today's use is dominated by commercial and recreational boats: Ferry services, commercial boats servicing Auckland Port, recreational traffic from cruise ships and personal yachting.

5 The tidal inlet of Te Waitaramoa Hobson Bay connects to the wider Tīkapa Moana Hauraki Gulf; however, it is mostly cut off from the Waitematā harbour. Due to the built infrastructure to the north, only two small openings provide the tidal flows and hydrological exchange. These developments, the railroad embankment (constructed in 1932) (Auckland Transport, 2014), and Tāmaki Drive (constructed in 1926) have cut through the waterflow between the natural bay and Te Waitematā, leading to significant negative consequences. A former sewer pipe across the bay was dismantled and replaced with an underground tunnel in 2009. These interventions have had profound impacts on the morphology of Te Waitaramoa Hobson Bay, altering the hydrological conditions of the freshwater streams and the saltwater flows. As a result, the water exchange is limited, and sedimentation and erosion processes are disturbed. Moreover,

AUCKLAND PORT

PARNELL

THE DOMAIN

TE TĪ TŪTAHI NEWMARKET

ŌRĀKEI

TE MOANA-NUI-A-KIWA
PACIFIC OCEAN

NGĀ RANGI-I-TOTONGIA-A
TAMA-TE-KAPUA
RANGITOTO ISLAND

TĪKAPA MOANA
HAURAKI GULF

TAURARUA
PT RESOLUTION

JUDGES BAY

WAITEMATĀ

OKAHU BAY

TĀMAKI DRIVE

RAILROAD

WAITARAMOA
HOBSON BAY

WILSON'S
BEACH

ŌRĀKEI
BAY VILLAGE

AYR STREET

1920

1950

SHORE ROAD

ŌRĀKEI
BASIN

HAPUA STREET

PORTLAND ROAD

MAUNGAWHAU
MOUNT EDEN

ŌHINERAU
MOUNT HOBSON

NORTH

0m 500m 1km

REMUERA

MEADOWBANK

1 Te Ruareoreo Newmarket Stream 2 Hapua Stream 3 Portland Stream 4 Pourewa Creek

5 Te Ruareoreo Newmarket Park 6 Thomas Bloodworth Park 7 Shore Road Reserve 8 Waitaramoa Portland Reserve

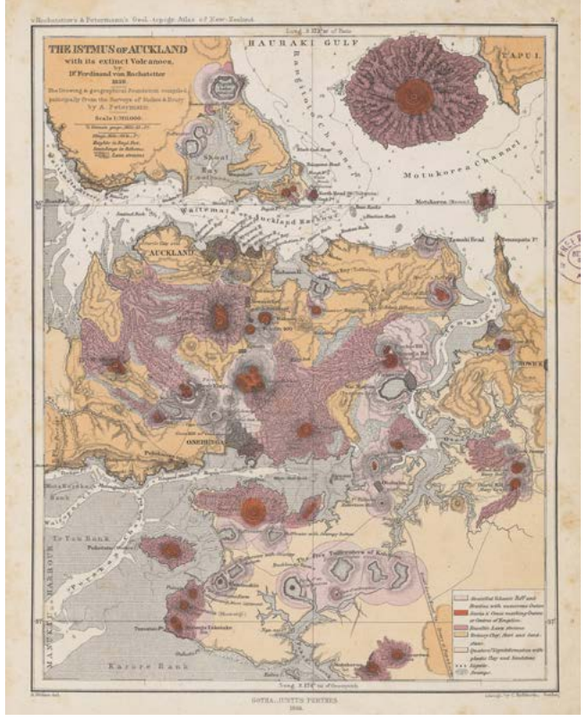
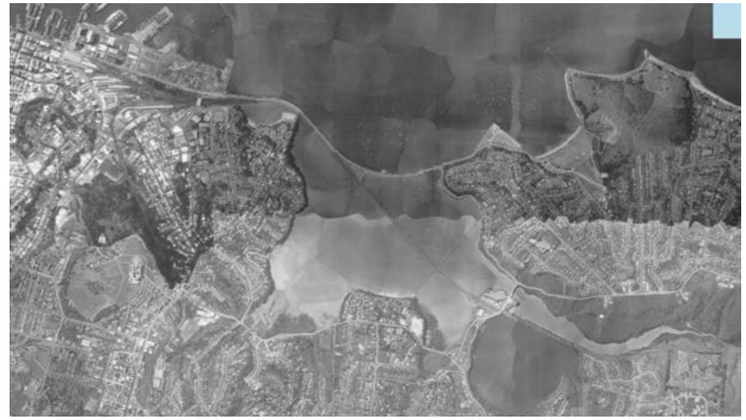


Fig. 17
Geological map of Tāmaki Makaurau Auckland. (Kura Heritage Collections Online, 1865)

(1)

(2)



(3)

(4)

Fig. 18–21
Waitaramoa Hobson Bay through the years.
(1) 1940
(2) 1959
(3) 1996
(4) 2017
(Auckland Council GeoMaps, 2024)

the freshwater streams leading into Te Waitaramoa Hobson Bay, particularly Portland Stream, Te Ruareoreo Newmarket Stream, and Hapua Stream, are heavily polluted due to contaminations and lack of proper water management from terrestrial planning.

Ki uta ki tai terrestrial history and morphology

6 Te Waitaramoa Hobson Bay sits in a horse-shoe-shaped valley formed by volcanic eruptions from the nearby volcanoes Ōhinerau Mount Hobson, Maungawhau Mount Eden, Maungarei Mount Wellington, and Maungarāhiri Little Rangitoto (FIGURE 17). Lava flows, tuff rings and sedimentations have shaped the terrestrial parts around Te Waitaramoa Hobson Bay. The coastal areas are surrounded by tertiary clays, sandstone cliffs on the east and west, and formerly natural wetlands in the southern coastal area. The top of Te Ruareoreo Park (Newmarket Park), along today's Sarawia Street, was the location of a local papa kāinga (home base, village). Around the 1850s, the village was abandoned because of the impacts of the contaminations due to the creation of settlers' slaughterhouses in Newmarket (originally Te Tī Tūtahi), which discharged their affluents into Te Ruareoreo (Newmarket Business Association, 2023). The waterway was colloquially named Slaughterhouse Creek, impacting the bay's health downstream.

7 Te Ruareoreo marked the eastern boundary of the newly acquired lands of Auckland when Ngāti Whātua Rangatīra, Apihai Te Kawau gave 3,000 acres of land to the Crown in 1840 (Manatū Taonga Ministry for Culture and Heritage, 2024): The English settlement was defined as the area between (roughly) Maungawhau Mount Eden, Te Ruareoreo (Newmarket Park), and Opou (Coxs Creek) in the west.

8 Oral traditions and archaeological findings confirm the existence of many pā (fortified village) and campsites (e.g., Mataharehare) at the foot of Ayr Street and around Waitaramoa Hobson Bay. In pre-colonial times, the landscapes surrounding Te Waitaramoa Hobson Bay were said to be covered in natural wetlands and lush coastal forests with trees (such as pōhutakawa or mānuka) and shrublands, providing a habitat

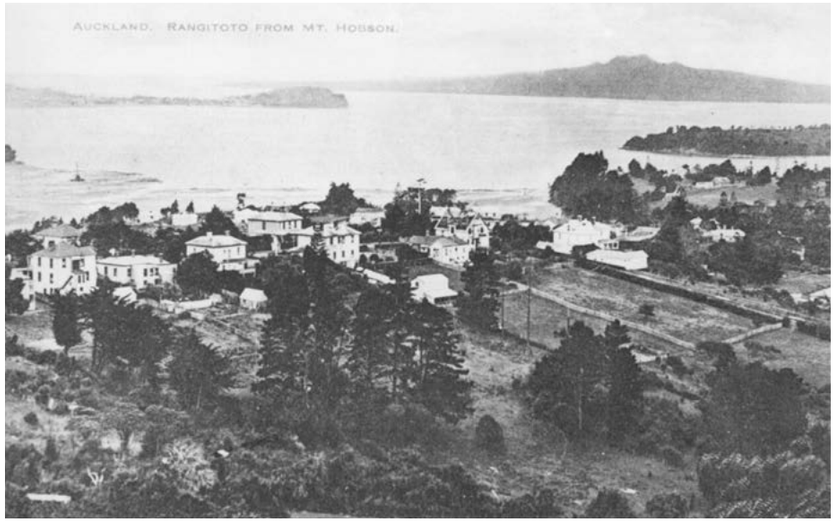


Fig. 22
Waitaramoa Hobson Bay and Rangitoto seen from Ōhinerau Mt Hobson. (Tāmaki Paenga Hira Auckland Museum, n.d.)

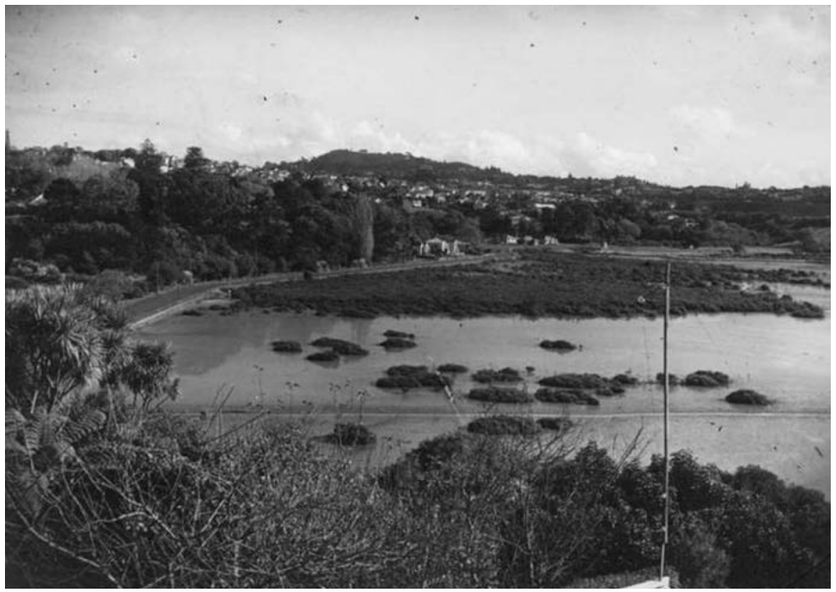


Fig. 23
Waitaramoa Hobson Bay before the land reclamation for Shore Road Reserve. (Tāmaki Paenga Hira Auckland Museum, 1950)

Fig. 24
Low tide at Waitaramoa Hobson Bay. (Tāmaki Paenga Hira Auckland Museum, ~1920)

for native birds and other species. For the local iwi, this landscape was considered a vital and fertile mahinga kai—providing physical sustenance (for both kai moana (seafood, shellfish) and on-land crops such as kūmara (sweet potato)) and spiritual connection to the water.

9 Ōhinerau Mount Hobson and the valleys to the north form a watershed flowing into Te Waitaramoa Hobson Bay. Ōhinerau—named after Hinerau, the Māori goddess of whirlwinds—is an important maunga and location of the pā site *Remuwera* (providing the name for today's neighbourhood). Portland and Hapua Streams are flowing down from this side of the landscape. Much of the current coastal area along the recreational reserves is now dominated by humanmade landscape formations in the form of land reclamations: Thomas Bloodworth Park and Shore Road Reserve were mostly reclaimed in the 1960s.

10 In the case study and practical application of the **fieldwork methods** p. 152 outlined later in this thesis, I understand Te Waitaramoa Hobson Bay in its complexity as a chrono-topography and a hyperobject (as defined by Morton, 2013)—hydrological, geological, cultural, and spiritual values as well as terrestrial and marine histories all merge into each other in the identity of this landscape.

•

Fig. 25
Waitaramoa Hobson Bay boardwalk. (Werder, 2024)

2.3 A COASTAL ONTOLOGY [CONT.]

2.3.1 Decolonising landscape

1 The islands of Aotearoa were the last habitable landmasses humans settled on when Polynesian voyagers first arrived in the late 13th century or early 14th century. With the Dutch discovery of New Zealand by Abel Tasman in 1642 and the eventual conquest of Aotearoa by European colonisers in the late 18th century, the Indigenous people, more-than-human inhabitants, and landscapes were subjected to Western hegemonies and the imposing of foreign political, economic, and social structures.

2 The establishment of European settlements in Aotearoa New Zealand not only displaced and violated the Indigenous populations of Māori but also resulted in deliberate and subconscious restructuring of existing landscapes, habitats, and ecologies based on Western ideals (FIGURE 26). These colonial practices resulted in further material and conceptual consequences that would continue to disrupt and misappropriate the local

Fig. 26
(Sturtevant, 1901 in Barnett, 2021)
Colonising the landscape of Aotearoa: "The true pioneer" or "surveyor" exploring the *wilderness*, re-shaping the land (road-making) as the "first attack", and the eventual "victory" by achieving the Western aesthetic ideal, a "smiling home".
This process is strikingly reminiscent of the evolution of Hunt's (2000) *Three Natures.*

natural and social ecologies. Physical alterations of landscapes (i.e., land reclamations and levelling of hills and mountains) and the introduction of novel crops and agricultural practices in particular would have long-term impacts on the existing landscapes as well as the physical and spiritual well-being of Māori (Barnett, 2021). The fundamentally different understandings of land ownership and the settler state's neglect of place-based relationships* and reciprocity (Barnett, 2021), arguably culminated in many of the systemic wicked problems observed in Aotearoa New Zealand. This commodification of landscape as a resource (either as an object enabling extraction (natural resources) or also as a means for leisure or recreation (e.g., Nadegger, 2023)) results in conceptual appropriation or, at worst, physical harm.

3 Today, Aotearoa New Zealand is constitutionally a bi-governed country, and Māori, in their role as tangata whenua (Indigenous people, and more precisely: "people born of the whenua, i.e. of the placenta and of the land where the people's ancestors have lived and where their placenta are buried" (Te Aka Māori Dictionary, 2024)) hold mana (authority, spiritual power) over the territory. Māori are therefore granted tino rangatiratanga (autonomy, self-government). The crucial mātauranga (knowledge) of these landscapes results from empirical study and the close connection to a very close place-based way of living. Indigenous already knowing holds vital knowledge that contradicts and complements the Western thinking around assessing, managing, and caring for these land- and waterscapes, and therefore, challenges the current frameworks traditionally applied in human engagement with all kinds of landscapes.

4 In Aotearoa New Zealand, mātauranga Māori highly values place-based approaches (Yates, 2021). The coastal realm of Aotearoa New Zealand is not only a place of identity but also vital for "physical and spiritual sustenance" (Barnett, 2021). Te Ao Māori reinforces the entangled concept of ki uta ki tai (from the mountain to the sea), which emphasises the interconnectivity across landscapes—a concept that will emerge again in this thesis as multi-scalarity and transareality.

5 The project of decolonising landscape is ongoing in many corners of the world where settler colonial histories have occurred, with calls getting stronger that decolonisation must start with decolonising landscapes (Dang, 2021). There are multiple attempts to reinforce a paradigm shift in how landscapes are dealt with from various global examples such as North America, Australia, or Canada. However, these aspects are still missing in the tools and techniques applied in the context of Aotearoa New Zealand or barely go beyond the visual application of symbolic decoration. This neglect particularly impacts and inhibits the decision-making processes within spatial planning. Yates emphasises the necessity to discuss spatial governance from a much-needed reframing of an episto-ontological perspective:

6 *In settler-colonial states such as Aotearoa New Zealand, spatial governance and planning occurs within a legislative-institutional framework grounded in another place, with an episto-ontological regime radically other-to-indigenous. Planning—as politics, discourse, process and materialised outcome—is a key site through which such regimes spatialise and bring petrocolonial power structures and ontologies to ground.* (Yates, 2021, p. 7)

*While these values are present in Western thinking in their respective home countries, colonialism as an extractive practice disregarded such considerations.

7 The neglect of methods, tools, and techniques in landscape research that facilitate decolonising practices is apparent and the influence of Western practices and research has long been pointed out by Linda Tuhiwai Smith and her influential work "Decolonizing Methodologies" (1999). In the context of Aotearoa New Zealand, it is important to point out the colonial influence in mapping techniques, tools, and spatial planning approaches. With their affordances, these methods and techniques deliberately or unconsciously continue to reiterate Western paradigms and enactments. Particularly in spatial planning and policy, where normative and standardised tools are common, and little to no room is given to alternative methods or techniques.

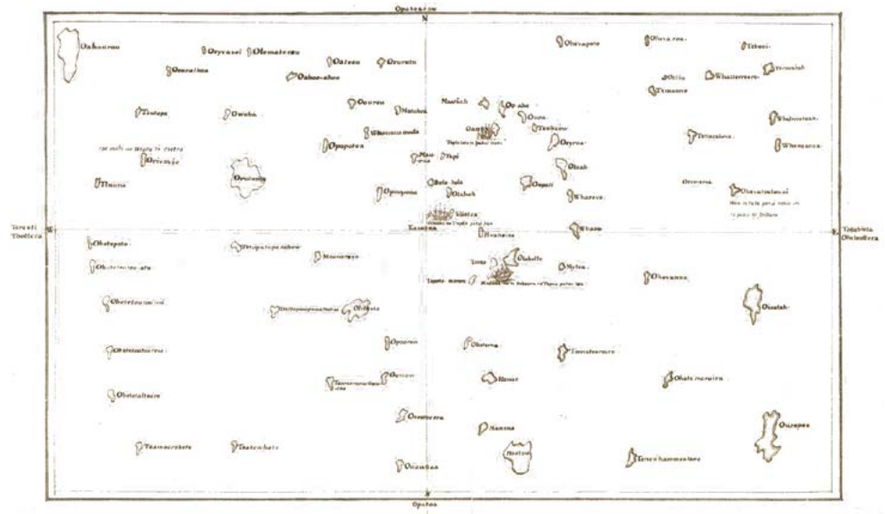


Fig. 27
Copy chart of the Society Islands. (Cook and Tupaia, 1769)

8 An early example of a negotiation between Indigenous mapping techniques and Western practices is demonstrated in Eckstein and Schwarz' (2018, 2023) investigations of Polynesian wayfinding and mappings. The authors unravel the competency of Tupaia, James Cook's trusted Polynesian navigator aboard Endeavour. Tupaia's unique perspective and map-making technique (FIGURE 27), in contrast to the established Western tradition of cartography, give insight into Indigenous approaches' different sensitivities in terms of spatial and temporal awareness, reading of landscape and communicating or documenting these features. However, in his attempt to successfully communicate with the Westerners, Tupaia potentially already adapted his mapping techniques to align with the traditional Western understanding of a map.

2.3.2 The ontological evolution of *landscape*…

1 Landscape colonisation is primarily tied to the philosophical and cultural conceptualisation of landscapes across different worldviews. There is extensive research on the Western ontology of landscape and the philosophical, cultural, and ecological values throughout recent history (e.g., Cosgrove, 1999b; Descola, 2005; Kyvelou & Gourgiotis, 2019). The term *landscape*, as opposed to nature/Nature, is intrinsically linked to the perception and image of our natural world. Corner (1999a) explains this correlation from the word's origin: Derived from the Old English or Dutch *landskip*; the term refers to a landscape picture rather than physical terrain. This evolution has been closely tied to landscape painting and the inception of the discipline of landscape architecture. However, limiting landscapes to their visual qualities or the workable terrain of the preceding German *Landschaft* (Corner, 1999a; Jackson, 1984; Stilgoe, 1982), has led to a simplification and flattening of the physical terrain that surrounds us. The observation from a distance has robbed landscapes of „vital dimensions", and the quantification and measuring of landscapes eventually opened the doors to our exploitation (Picon, 2010). On the other hand, the tracking of landscape, and the planetary movements in general, was a first attempt to predict the natural patterns and, therefore, create order in an otherwise *surprising* environment (Seroussi, 2019). The need to deal with natural occurrences such as floods has led to a hierarchical organisational principle like the example of the Nile floodplains, where the invention of geometry provided the understanding to *make sense* of the „elemental confusions of water and earth" (Cosgrove, 1999b, p. 105).

2 The scientific paradigms of the prevailing *zeitgeist* have influenced the perception of landscape. With Enlightenment thinking and its tendency to preserve knowledge and *freeze-in-time* slowly coming to an end, nature and landscape (among other phenomena) are now recognised to be in constant evolution (Batty & Marshall, 2009) or migration (Milligan, 2015). This neo-Darwinian tendency supports the idea that there is no end-state and, therefore, no *equilibrium* in Nature and acknowledges a successive derivative from deterministic, linear science to a more open and dynamic field of study (Long & Cui, 2020).

3 John Dixon Hunt (2000) proposed the idea of *„three natures"* (wilderness, arable nature (i.e., agriculture), and nature as an aesthetic ideal). While the transitions between these *„three natures"* were motivated by human achievements (e.g., the Enlightenment or the Industrial Revolution (Corner, 2014)), the progress also shows an intellectualisation of the handling and interaction with what is considered to be *natural*. Humankind has potentially entered an era of a *„fourth nature"* now—where *Nature* is understood on a spectrum between nature and culture (Sheppard, 2011) as a hybrid between or amalgamation of the two (Picon, 2010). Nature, as such, does not exist anymore, shifting the discourse to the discussion of the dichotomy between culture and nature and the definition of *landscape*. However, the notion of this dichotomy is a relatively recent introduction to Western thought, which „make[s] no sense to anyone except the Moderns" (Descola, 2005, p. xviii). Landscape architect and researcher Ed Wall supports this notion by quoting the late geographer Neil Smith: „Few ingrained assumptions will look so wrongheaded or as globally destructive as the separation of society and nature" (Smith, 2005 in Wall, 2020a, p. 29). However, recent paradigm shifts show a promising change in our understanding of landscape, which, hopefully, will be translated into less harmful human impacts. Based on Gregory Bateson's theory, Picon concludes that there is a „shift from an aesthetics of contemplation to an aesthetics of active participation" (Picon, 2010, p. 99).

4 Similarly, although relatively new fields, landscape studies such as landscape architecture or planning have undergone similar changes. *Landscape urbanism*, as an emerging discipline from the discourses at the end of the 20th century, has spurred discussions around the relationship between various disciplines such as ecology, spatial studies, cartography and the like, but also highlighted the neglect of cultural, social, or political considerations in studies concerned with landscapes (De Block et al., 2019). Even though this stream of thinking favours bottom-up approaches and challenges the ideas of totalitarian planning, De Block et al. observe favouritism of technical and managerial solutions which avoid the engagement of "radical sociopolitical change or confrontation" (De Block et al., 2019, p. 5).

5 However, landscape history is essentially anthropogenic, narrated from a shared, linear timeline that strips landscapes away from their own temporalities. From this human perspective, landscapes are fragmented and heterogeneous when, in fact, they are ever-evolving. Landscapes as phenomena are continuous—they have no goal or endpoint. Therefore, landscapes rightfully elude stratification in mappings and static (visual) representations.

2.3.3 …and 19th-century tools

1 Maps, mappings, and plans are visual representation tools and contain an interpretation of the world around us: Map-makers translate specific findings of a physical, three-dimensional place into a (mostly) two-dimensional documentation. Maps, therefore, do not show the objective truth of a place or terrain; mappings *represent* reality. Going back to Gregory Bateson's statement that "the map is not the territory" (1987, p. 455)—the translation marks a *difference*, and this difference Bateson understands as *information*.

2 It is broadly acknowledged that our (design) tools are outdated and increasingly unfit to adequately deal with complex dynamic environments and deep structures (Carlisle & Pavzner, 2012; Kahn & Diedrich, 2019). There is a lack of critical discourse around the application of technologies (Mattern, 2015a). This call goes beyond spatial studies and has likewise been acknowledged by artists, media makers, and writers (i.e., Rebecca Solnit, Walter Benjamin, or Alighiero Boetti in Mattern, 2015a). Mappings, as tools in spatial studies, and their process of creation are equally subjective (Cosgrove, 2005; Crampton, 2001, among many), just as the idea of landscape (Bender, 2002).

Maps and power

3 Mappings have a reciprocal relationship with the physical territory they depict. Philosophical, cultural, and technological developments, as well as mapping techniques, influence map-making practices. These mappings shape our understanding

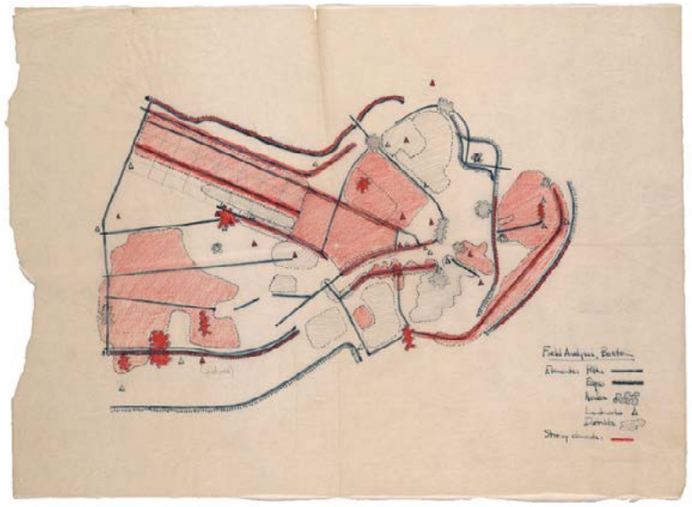
and interaction with the real world, serving as guides for engaging with and preserving spaces. How something is visually represented impacts the understanding of that space and how humans relate to it. As a material practice and form of knowledge generation, mapping is about "making specific worldly configurations" (Barad, 2007, p. 91). However, in the past, this process primarily relied on framing a *tabula rasa* condition and generating knowledge *ex nihilo* (Barad, 2007). The provision of mappings (as well as other depictions such as landscape paintings) results in an expression of landscapes as social, political, and cultural constructs that have (political) will and agency (Nelson, 2017)—with many of these tools having been utilised to naturalise or justify colonial conquests and expansionism. Mappings, map-making, and its tools in (urban) planning are political and never purely objective or innocent (Avermaete, 2019; Hurkxkens, 2015; Lima, 2011; Waldheim, 1999 to name a few).

4 *To read maps and, by extension, landscapes not as authoritative resources that provide objective scientific knowledge but as subjective means of expression is to expose their political, social, and cultural influence.*
(Nelson, 2017, p. 53)

5 Maps serve governments as strategic tools and bases for national territory considerations, where they become political instruments of power. Field (2018) states that creating maps is not simply technical but also a medium carrying political, artistic, and scientific information (Cosgrove, 1999b, 2005). While maps are a form of data visualisation, they are not objective tools but curated views of space influenced by political views, contemporary paradigms, and cultural preferences. As curated data products, maps are never neutral (Picon & Ratti, 2017). Maps exert influence and hold biases (Mattern, 2015b). There is increased interest in cartography and its critical approaches, influencing teaching, education, and society (Pyne et al., 2022). Maps function in three ways: reflecting on the past by analysing historical formation processes, representing the present, and guiding future endeavours.

6 As media, maps are created by different entities (Mattern, 2015b). They are interdisciplinary and collaborative, merging insights from various fields like geography, biology, or sociology. This can sometimes obscure clear authorship and ownership, unlike other forms of data where sources are more clearly citeable, and a meta-analysis of prescribed data (i.e., in the form of GIS data) is vital. Given their characteristics, maps can be considered **boundary objects** p. 76 (as introduced by Susan Leigh Star and James R. Griesemer (1989); more on this further down). Much of the current literature investigates map-making's cultural, historical, and philosophical development. It is understood that political and scientific evolutions have influenced contemporary visual representations in mappings (Brotton, 2012). However, addressing negative externalities or the performativity of mappings in policy-making or spatial planning has not been widely examined. Mapping has been a ubiquitous study in fields such as landscape and ecological urbanism, where the practice has been theorised and applied as a methodology for design research (Turan, 2016). However, Turan (2016) argues that this geographic imagination lacked a true engagement between environment and representation.

Fig. 28
Mental map of Boston by Kevin Lynch. (Lynch, 1960)



7 Policy- or map-makers and practitioners generally need more representational tools for mappings to sufficiently capture the complexity and ephemerality of landscapes (Braae et al., 2013). Integrating the latter into the digital world will be a crucial discussion, and further research and precedents will need to follow this call. Today, technical tools are often described as dangerously seductive in their attempt to establish a new *"digital sublime"* (Weller, 2020), or for instance, their *techno-sublime* power when utilised in satellite imagery (Scott, 2016).

8 Harley (2001) underscores the significance of interpreting and dissecting maps, viewing them as social constructs. Reading *between the lines* becomes pivotal to uncovering hidden motives, focusing on what the map displays and what they deliberately exclude (Harley, 2001). Crampton (2001) supports this perspective by citing Edney's (1993) view on the evolution of maps: Despite cartography's advancements, Edney contends that progress does not inherently yield a *better* product. He advocates for „break[ing] through the shell of objectivity with which our culture has surrounded the map in order to expose and then study the map for what it is: a human practice" (Edney, 1993, p. 188). This concept challenges the presumed scientific nature of maps, embracing the idea of "intersubjectivity" in map-making (Crampton, 2001, p. 242). With the rise of post-modernism, maps have been reevaluated as communication tools. Rather than portraying an objective truth, maps capture diverse human experiences with the (built) environment (Corner, 2014). Theorists, architects, and philosophers like Kevin Lynch (FIGURE 28), Peter Eisenman, and Jacques Derrida have shown interest in the *users* of maps. Maps now function as subjective media, revealing the multiple perspectives through which humans perceive their surroundings. This critical inquiry gained momentum in the 1990s amid the destabilisation of national borders and rapid globalisation (Van-Essen, 2019), leading to the theory of *critical cartography*. Key figures in this critique include J.B. Harley, Jeremy Crampton, Denis Cosgrove, and James Corner (Allen & Queen, 2015).

Fig. 29
The topology of scale. Or: The scalar goldilocks zone in modern, Western planning tools. (In: Werder, 2023)

9 Picon builds upon this concept, highlighting the shift in spatial understanding: Space is no longer seen in the neo-Cartesian and Descartian fashion of *res extensa*, meaning as a „neutral geometrical extent“ (Picon, 2010, p. 98). This understanding of space and representation in maps is further based on the concept of the *rhizome* introduced by Gilles Deleuze and Félix Guattari in „A Thousand Plateaus“ (1980). The rhizome signifies a non-hierarchical, open, and post-structural network that encourages intersections and overlaps, contrasting the traditional hierarchical tree model. Similarly, Guy Debord (cited in Cosgrove, 2005), among others, proposed his concept of *psychogeography* as a response to the functionalist urban planning practices in the 1950s and 1960s.

10 Particularly in the context of Aotearoa New Zealand and other places suffering from colonial oppression, mappings have become a tool for misappropriation and control. Standardisation of techniques and methods led to a mono-culture of visual representation, rejecting alternative ways of documentation and consequentially repeating colonial practices. However, more in-depth appreciation and understanding of non-standard cartographies emerged, presenting themselves in forms other than visual, utilising oral recitals, performances, or songs to depict territory, maps, or cartography. For example, in Australia, this has led to successful cases of Aboriginal communities reclaiming their lands based on records of oral traditions such as song lines (Mattern, 2015b).

Mappings in landscape planning

11 Current discussions revolve around understanding landscape architecture and related fields as independent from architecture. The call for unique tools and techniques in landscape architecture has been raised by many researchers and practitioners, contemplating the lack of (contemporary) research in landscape architecture: „[...] whereas the profession has clearly made significant advancements in recent years, intellectual critical work remains sadly lacking“ (Corner, 2014, p. 7). The research gap is most evident in the absence of dedicated tools within the field, as many techniques are borrowed from architecture or urban planning (van Dooren & Nielsen, 2019).

12 Currently, landscape architecture is closely tied to architecture, which is displayed in shared tools, techniques, jargon and established conventions employed across both fields. Field (2018) created a catalogue of cartography showing the different tools and states that making a good map is more than just following a recipe. Similarly, Wolff (2017) establishes a *landscape vocabulary* that describes and maps the philosophical understanding of nature and landscape, where she sees her contribution as impacting current political agendas. Extensive research focuses on technical solutions like Geographic Information Systems (GIS), unmanned aerial vehicle (UAV) surveillance, and Lidar (light detection and ranging) to map, measure, and monitor landscapes across various scales and timeframes influenced by nonlinear processes. However, the notion of incompleteness of representations (Gandy & Steiner, 2019) and the philosophical and paradigmatic implications of these mappings are frequently overlooked. Globally, current spatial planning favours a scalar *goldilocks zone* where only a minority of scales are represented and explored and others completely ommitted (i.e., the micro- and macroscales) although they have a considerable impact on the world (FIGURE 29). Additionally, the ability to narrate such scalar extremes is lacking (Weller, 2020).

13 Waterscapes and coastal landscapes are specific cases—dominated by their highly fluid and dynamic processes—and are particularly vulnerable to inadequate application of methods and techniques that do not fully support the inherent nature of the littoral. Scholars and landscape practitioners (e.g., the work of H+N+S Landscape Architects shown in Beenhakker et al., 2022) investigate this lack and propose novel tools and techniques:

14 *Generic solutions are particularly inappropriate to specific and dynamic water landscapes exposed to on-going change, prompting our proposal for a new acknowledgment and representation of site particularities from which the design of water landscapes can shift from an imposition of universal solutions into a transformation of sites through apprehending their existing qualities.*
(Braae et al., 2013)

15 In line with the ontological shifts of landscape conceptualisation, the understanding and agency of mappings have evolved alongside. With an increased appreciation for the fluid and dynamic characteristics of landscapes, a discomfort with the static representation techniques has emerged, resulting in the exploration of novel techniques (how are maps drawn and displayed) to the emergent understanding of mappings as a process or their ontogenesis (e.g., Bryant, 2014; Corner, 1999b). This processual understanding looks at mapping from a technical standpoint and includes social processes that particularly support Indigenous communities (Caquard & Salinas, 2014).

Mappings as boundary objects

16 Mappings are essential tools of communication in spatial studies. From recording findings in fieldwork to governmental or policy maps, these (visual) representations and data sets communicate strategic goals or identify sites of action for development, management or conservation. The decision-making process between general strategic goals (verbally recorded in written policies) is then localised to specific sites on a map based on local data such as physical information, geological, ecological, or hydrological aspects, or social, cultural and economic interests. As boundary objects, mappings serve a variety of uses for different stakeholders and *users*.

17 Given the relatively large scale these mappings operate on, the resolution of conclusions is small and based on a synthesis of abstract and summarised second-hand information rather than concrete and in-depth knowledge of a proposed sites. While this can lead to misappropriation of places, it also means that the act of *choosing a site* is removed from the design process of a specific project.

18 *It is crucial that we understand the technologies by which nature and culture interact.*
(Barad, 2007, p. 42)

19 The concept of *boundary objects* was introduced by Susan Leigh Star and James R. Griesemer (1989). Nowadays, information (collections) such as specimens, maps, or field notes are considered boundary objects, and the authors outline the following definition:

20 *Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use.*
These objects may be abstractor concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation.
(Star & Griesemer, 1989, p. 393)

21 Star (2010) understands this as interpretive flexibility, a common characteristic in constructivist approaches. Mappings are tools of communication and dissemination but also active performance. They allow different users to use maps or mappings in different ways and let groups collaborate without explicit consent (Star, 2010).

2.3.4 Solutionism

1 *"Climate change is not 'a problem' waiting for 'a solution.' It is an environmental, cultural, and political phenomenon that is reshaping the way we think about ourselves, about our societies, and about humanity's place on Earth…"*
—Mike Hulme (in Turan, 2016)

2 The lack of discourse around the performativity of mapping tools and techniques in policy and spatial planning has led to challenging problems due to the simplification of the subject matter—landscapes in this case. Flattening the world's complexity is created through available tools or instruments (Hurkxkens, 2015), which can carry biases. Coupled with the lack of a narrative that understands a **watery ontology** p. 49 and the concepts of the **coast as more than a *line*** p. 48, it led to systemic issues further amplified by the accelerating effects of anthropogenic influence and mismanagement.

3 Spatial planning is the discipline that concerns itself with the future of spaces, such as cities and landscapes. By nature, these studies are less interested in the past yet use findings and recordings as a set of evidence to base their decision-making processes on. In much of spatial planning from the 19th century to now, we observe the proverbial "when all you have is a hammer, everything becomes a nail" fallacy. Arguably, this solutionist thinking may also be a symptom of the lack of a stand-alone agency of landscape architecture since landscape planning is largely guided by concepts developed in engineering. Watery realms such as the coast, rivers, and bodies of water suffer disproportionally from solutionist approaches, which is particularly topical in the context of flood *control* and mitigation and adaptation in politically vulnerable or neglected places and communities (Milligan et al., 2021; Yarina, 2018). Most flood control measures from the past (e.g., developments in former floodplains, construction of dams, river embankments, and such) were based on ecological, ethical, and technical assumptions deemed inappropriate with the current understanding of landscapes, water, and politics (Milligan et al., 2021). Milligan et al. (2021) argue that flooding cannot be fully controlled, but humans can adjust their expectations and tolerance for the risk

willing to take. The argument of *control over nature* is a consequence of the nature-culture dichotomy, where human beings are seen as other than nature, when in fact, a global trend of convergence of the ideas of humans and *Nature* is observed—a change of operation is occurring (FIGURE 30):

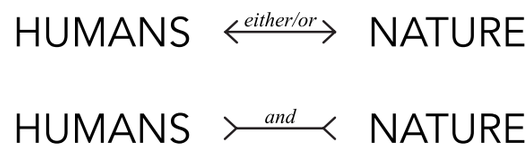


Fig. 30
Humans >< Nature.
(Werder, 2024)

4 Holmes (2020) investigates different examples from the United States where solutionist engineering projects along coasts and bays have led to unintended consequences—externalities such as increased sedimentation, changes of salinity or altered ecologies altogether. The effects of these systemic issues are amplified by the increased capabilities and scalability of our technological tools and the compounding effects of existing damages due to adverse anthropogenic influence.

5 The modernist ideologies in action here favour a rationalisation of landscape (Bélanger, 2016) and an often "social preference […] over ecological health" (O'Neill and Shallat in Holmes, 2020). Holmes draws his definition of solutionism from Evgeny Morozov (2014), who describes it as "*an intellectual pathology* that defines problems on the basis of one's capacity for solving them" (Holmes, 2020). Solutionism, therefore, is not the issue of the solution itself but, more importantly, a misunderstanding of the problem itself—due to an incomplete framing of what is considered a problem from a particular perspective or mindset. Within *landscape solutionism*, Holmes identifies three issues:

6 1. Ignoring the complexities of landscape, and therefore mis-identifying important ecological or social aspects as *problems*.

7 2. The fallacy of reaching for a known solution that may not fit the context of a specific *problem*.

8 3. Avoidance of in-depth engagement with *unsolvable problems*, or mistakenly categorising them as solvable and subsequently producing a trail of unintended consequences.

9 Solutionist thinking results from the mismatch of current tools and methods and the emerging novel conceptualisation within a specific field. While landscape architecture has embraced the fluid, heterogeneous, dynamic, and stochastical nature of landscapes (Kahn & Diedrich, 2019), the applied methods and the predominant political thinking still favour a paradigm of stability and equilibrium. Holmes sees the key to avoiding solutionism in, first, framing a problem that precedes solving it and, second, design that allows for emerging changes to flourish rather than obstruct the solution. He considers the immersive practices of fieldwork as an essential process to counter the prevailing biases.

10 Similarly, Andrea Kahn (2021a) calls for a radical re-constellation of architectural approaches in the Anthropocene. With (urban) planning becoming increasingly inter- and multidisciplinary, she understands that we have lost the security of clearly defining a problem: "Is this a planning problem, a design problem, a political problem, an engineering problem?" (Kahn, 2021a, p. 202). Likewise, Hulme (in Turan, 2016) sees the potential of imagination and representation to facilitate our relation to the issue of climate change.

11 Rittel and Webber (1973) defined these issues when they coined *wicked problems*: Wicked problems have no solution but require constant re-solutions. The solution-finding process itself, therefore, becomes a dynamic process and cannot be achieved with stasis. Further, the authors state that there is a broader tendency to consider the output of policy-making more strongly and question whether the problem definition and the proposed solutions are the *right* things to do.

2.3.5 Big Data 2.0

1 In the early 2000s, planning disciplines embraced *Big Data* as a panacea to solving complex problems by improving predictions and outcomes through increased data. The advent of AI or AGI, and large language models (LLMs), along with the concept of *smart* things (e.g., *Smart Cities*), have revitalised this discourse. However, applying these technologies often needs more critical examination and tends to be viewed from an anthropocentric perspective. Researchers from post-structuralist, feminist, and post-humanist backgrounds question whether cities were not already "smart" before the digital age (Mattern, 2015a). On the one hand, we have ambient intelligence, and arguably also bio-intelligence, which operate under different criteria as to what technologies within the built environment typically measure, track, or sensor (e.g., thinking of the bio-intelligence and efficiency of slime mould recreating complex structure such as the human-made network of Tokyo's railroads (Tero et al., 2010)).

2 The focus on mostly quantifiable data is a crucial feature of the *Information Age* (which, historically, is not the first time in history as we observed equal *hyperabundance* of data in the 18th century in Europe as well (Mattern, 2016). Mattern (2016) discusses historical classification trends during the Romantic era (plants, species, even clouds, everything was neatly defined and classified), inspired by the Linnaean system, and contrasts them with today's conceptual shifts, where the idea of the *Cloud*, capital C, is prevalent. Modern paradigms have moved from clear, tree-like structures to more complex, cloud-like and rhizomatic relationships.

3 *Material practices (ecology and engineering for example)… do not work primarily with images or meaning, or even with objects, but with performance: energy inputs and outputs, the calibration of force and resistance. They are less concerned with what things look like and more concerned with what they can do.*
(Stan Allan in Turan, 2016)

4 (Quantitative) Data are neither purely objective nor is the pursuit of data innocent—with *exploitation* of Big Data being a known risk (Gandy & Steiner, 2019). These approaches often harbour (undetected) biases in their collection methods. Mattern (2016) illustrates this with early ornithologists killing birds to study them, eliminating precisely the life scholars were so interested in to begin with. Data tend to form averages or generalisations, which can obscure local disparities. For instance, Scott (2016) highlights that global temperature rise averages can mask severe local fluctuations.

5 Geospatial technologies like GIS, Remote Sensing (RS), and GPS are crucial in spatial studies. These tools collect, store, visualise, and analyse geographic information, often used in strategic environmental assessments (SEA) to evaluate the environmental impact of landscape policies and planning (Sizo et al., 2016). Kwan (2007) provides a critical overview of the research of these tools, which was mainly conducted in the 1990s, focusing on political issues (power relations and ethics), privacy violations, military use, and questions of epistemology and representation. More recently, in the 2000s, feminist and poststructuralist critiques, inspired by Donna Haraway (1991), Judith Butler (1990, 1993), and Sandra Harding (1991, 1998), have gained prominence (Kwan, 2007). GIS has regained relevance in Big Data discussions (Wilson & Stephens, 2015). These technologies impact spatial humanities and enable radical artistic expressions through maps. In the Big Data era, GIS is a "navigational platform" (Caquard, interviewed by Salinas, (2014)). Wilson and Stephens (2015) explore the implications to spatial humanities, and tendencies such as maps as radical artistic expression.

On Qualitative Data and the more-than-human and nonvital

6 Landscape architecture and related fields heavily rely on qualitative research such as Girot's *Four Trace Concept* (1999) and Braae's "approaching the *as found*" (2017). Likewise, critical geography and feminist studies have also inquired into the inclusion of affect, feelings, and emotions in geospatial technologies (e.g., Kwan, 2007).

7 Understanding landscapes through an eco-ontological viewpoint requires acknowledging various spatial and temporal scales, and qualitative data embedded in more-than-human and nonvital perspectives. These perspectives focus on ephemeral qualities, relational and topological observations, and fluid, dynamic processes. As a form of data visualisation, mapping should connect us with information beyond our anthropocentric view, emphasising collective well-being (Werder, 2023).

8 Today's political climate favours quantitative data over qualitative information, often using them as irrefutable evidence devoid of creative potential (Davis & Oles, 2014). Researchers and practitioners agree that mapping should not solely rely on metrics but must reveal hidden patterns and relationships (Allen & Queen, 2015; Cosgrove, 1999a; Queen et al., 2013). Feminist theory and nonrepresentational thinking challenge the "epistemological priority of representations as the grounds of sense-making" (McCormack, 2003, p. 488 in Kwan, 2007). Kwan (2007) references various scholars investigating the importance of data collection and representation including the un-writeable, nonvisual, and affective and corporeal findings.

9 Kwan (2007) also critiques the absence of bodies in conventional spatial mappings, both as the subjective findings of the researcher and the representation of inhabitants. Conversely, the instrumentalisation of bodies in climate change imagery—such as the visual trope of a polar bear on melting ice or the dying birds used as evidence of the seemingly harmful practice of alternative power production—omits the broader context and bigger picture (Scott, 2016).

10 Particularly the reference to Foucault (1977) highlighting the power dissonance in knowledge production is pertinent to the arguments outlined here. Recognising the elusive nature of environments (Jones, 1991) is central to the evolving understanding of landscapes and their impact on decision and policy-making. This philosophical reassessment of cartography leads to ontological insecurity (Kitchin & Dodge, 2007): How can the paradigm of a constantly changing, unstable, and uncertain environment find representation in a political landscape that favours clear, traceable metrics, data, measurable objectives, and definable goals?

2.3.6 Platforms & navigation

1 Shortcomings around research and application of novel mapping concepts as a process and its tools refer to more than just maps themselves. Digital platforms like GIS and policy documentation have seen little conceptual updates since their inception. These tools follow a static cataloguing system that was revolutionary when McHarg and his team introduced them in 1969 but outdated today. The tools assume an absolute position that reinforce a positivist understanding of space further echoing Haraway's critique of the fallacy of the modern world: A "god-trick of seeing everything from nowhere" (1991, p. 189).

„Design with Nature" and new strategic tools

2 In the 1960s and 1970s, there was a growing awareness of Earth's finite resources, inspiring Ian McHarg's (1969) influental work *Design with Nature*. McHarg's ecological planning and map-overlay method (FIGURES 31 & 32, NEXT PAGE) are a precursor to modern GIS (Herrington, 2010). Rather than a control mechanism, McHarg's method functions as a visualisation tool, heavily reliant on the designer's perception (Carlsson, 2018). Critics, including Herrington (2010), have raised concerns about the inconsistency of McHarg's method in attempting to represent the dynamic features of nature on a static medium. Similarly, Corner (2014) highlights the greater value of McHarg's process over the final results of his methods, emphasising that ecological planning cannot solely depend on factual data and be reduced to mathematical-like formulas.

3 GIS is an inventory of evidence for decision-making processes related to managing, conserving, or developing places. Spatial planning guidelines and policies shape urban and landscape planning, and as regulatory tools, these precede design processes and considerations. While the general content and paradigms that define policies are discussed in research and practice, there is a lack of investigation and critical discourse around the tools, techniques and platforms used to make spatial planning policies and data available to practitioners, experts, and the general public.

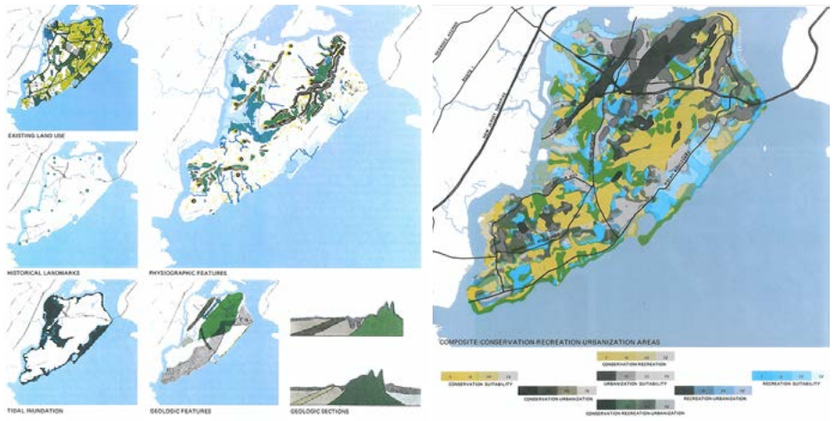


Fig. 31 & 32
(McHarg, 1969, p. 106, p. 114)

4 Centralised planning, rationalised as a remnant of the Industrial Revolution, follows a top-down structure for efficiency (Batty & Marshall, 2009). This approach favours quantitative data and neglects qualitative aspects, leading to incomplete data sets for analysis and decision-making. Landscape architecture recognises that this method is insufficient for 21st-century challenges, just as urban planning tools like master plans have long been criticised for being too formulaic (Descombes, 1999).

GIS now

5 Despite significant technological advancements, particularly in the digital world, platforms hosting mappings and data sets, such as GIS, have not evolved at the same pace. GIS, rooted in McHarg's (1969) *layer-cake* technique combines different observations. However, it inherently assumes an absolute, positivist understanding of space. Additionally, GIS repeats this outdated paper overlay method without fully integrating modern digital capabilities. GIS, recently re-branded as a science (Wilson & Stephens, 2015), and GPS have become part of the (urban) infrastructure, including all their institutions, forms, bylaws, conventions and classifications (Star, 1999). However, Lisa Parks (2011, in Mattern, 2015a) advises a "trust but verify" approach to official GIS data.

6 GIS primarily relates quantitative spatial data, as seen in conservation landscape studies (Eanes et al., 2020), however, the human intersections, such as actors' social and cultural interactions (e.g., networks, power relations, and spiritual and cultural aspects) also rely on qualitative aspects concerning (bio-)physical factors (Eanes et al., 2020). These qualitative aspects are crucial for understanding ecological, cultural, and social aspects. However, they generate (spatial) patterns that operate on different scales (potentially such that are imperceivable by humans) that span across time and space and connect areas that are spatially seemingly unrelated.

7 Satellite imagery has also influenced our perception of the planet, depicting it as a cohesive natural body without geopolitical boundaries (Scott, 2016). However, these visualisations have political agency that is more immediately addressed in mappings

and plans provided on GIS platforms, for example. Novel to a digital society is the ability for almost infinite and seamless zooming on such platforms, with little critical reflection on the implications and affordances of scale or attempts for innovative or novel usage of such capabilities. Standardised spatial planning practices often omit extreme scales or contextualising data beyond spatial proximity (thinking of **topological** p. 100 relationships here), resulting in a mono-scalar view of the world. Although we have the technical capability to visualise extreme scales—the very small and the very large (Big Data has long been lauded for this capability)—embedding this information meaningfully is crucial.

8 Well into the 21st century now, we can transcend the reductionist and antiquated paper-based mentality prevalent in conventional digital planning platforms, which perpetuate outdated anthropocentric, linear, and hierarchical methodologies. Revising this existing framework involves addressing an issue further emphasised by the ecological crisis: our communication challenges, wherein we continue to echo the dominant anthropocentric, linear, and hierarchical approach of top-down methodologies. By visualising the relativity of human scale, interdependence, and reciprocity within mapping navigation methods, we acknowledge the role and responsibilities of policies, planning tools, and mappings in shaping actions and behaviours.

9 An alternative, hypothetical approach (in its early stages) is depicted in (FIGURE 33, PAGE 85), where phenomena are shown in their topological relationship regardless of their scalar extent. This network and establishing of connections highlights that relationality and causality are neither absolute nor linear but topological. Relationality further goes beyond scalar categories, meaning that phenomena evolving or emerging in one scalar realm (e.g., the microscopic) can have impacts on others (e.g., the macroscopic world)– just think of how CO_2 molecules impact global climate patterns. It is therefore vital to address and visualise these disparities (SEE ALSO FIGURE 29, PAGE 75).

10 Similarly, the temporality of GIS is not discussed as it not only flattens spatial dimensions and scales onto a platform but also temporal aspects. Besides the apparent static and stratified visualisation technique, Scott (2016) also asks whether GIS is an *archive*. Does it keep a *record*? Or does it, as the author claims, hold "the present in perpetuity" (Scott, 2016, p. 130)?

11 GIS has faced criticism for its positivist and omniscient view of terrain and landscape (King & Salehian, 2021; Kwan, 2002), especially from feminist scholars within cultural geography who see potential for reimagination through feminist critical theory (Kwan, 2002). Cosgrove notes a modern shift, stating mapping's goal of depicting spatial stability countering the reality of "a world of radically unstable spaces and structures, it is unsurprising that the idea of mapping should require rethinking" (Cosgrove, 1999a, p. 5). Despite this, GIS is interactive, and technically allows for a "plurality of expression and multiple documentations of 'truth'" (Wilson & Stephens, 2015, p. 217), harbouring the potential for multi-ontological mappings.

12 In Aotearoa New Zealand, Mercier and Rata (2017) highlight the benefits of digital mapping for Māori studies, noting its effectiveness as a place-based pedagogy tool

in an Indigenous context. Unlike the ubiquitous, ego-centric GPS systems used by companies like Google Maps, GIS provides a more fixed representation of terrain and is often maintained by public organisations or city councils. Projects like *OpenStreetMap* (2024) offer citizen-driven collective maps that feature astonishingly highly detailed information, or *Ushahidi* (2023), which provides a platform for crisis mapping and real-life data for scenarios such as disaster relief situations during adverse weather events or humanitarian crises. GIS companies such as *Esri* have developed tools like *Story Maps* (Esri, 2024) that integrate multimedia with spatial GIS maps. Eanes et al. (2020) discuss the concept of *Deep Maps*, introduced by Heat-Moon in "PrairyErth" (1991), which counters the idea of *flat* or *thin*, Cartesian maps. Deep Maps offer *Spatial Narratives* that serve as navigational tools and a space for integrating non-visual media (e.g., literary maps), to organise complex information within a spatial framework, helping to prevent cognitive overload.

13 Particularly in the context of **decolonisation** p. 67, alternative mapping techniques and supportive platforms are highly relevant. Indigenous communities worldwide have developed unique mappings, such as Polynesian ocean maps and Aboriginal Australian song lines, which convey as much, if not more, information and meaning as Western cartography.

14 *Such depth is essential because in complex social-ecological systems, the ability to emergently represent and discover such qualitative, experiential essences of place is essential for environmental management and decision making, something that has long been recognized by scholars interested in conservation-oriented topics like traditional ecological knowledge (TEK).*
(Lynam et al., 2007)

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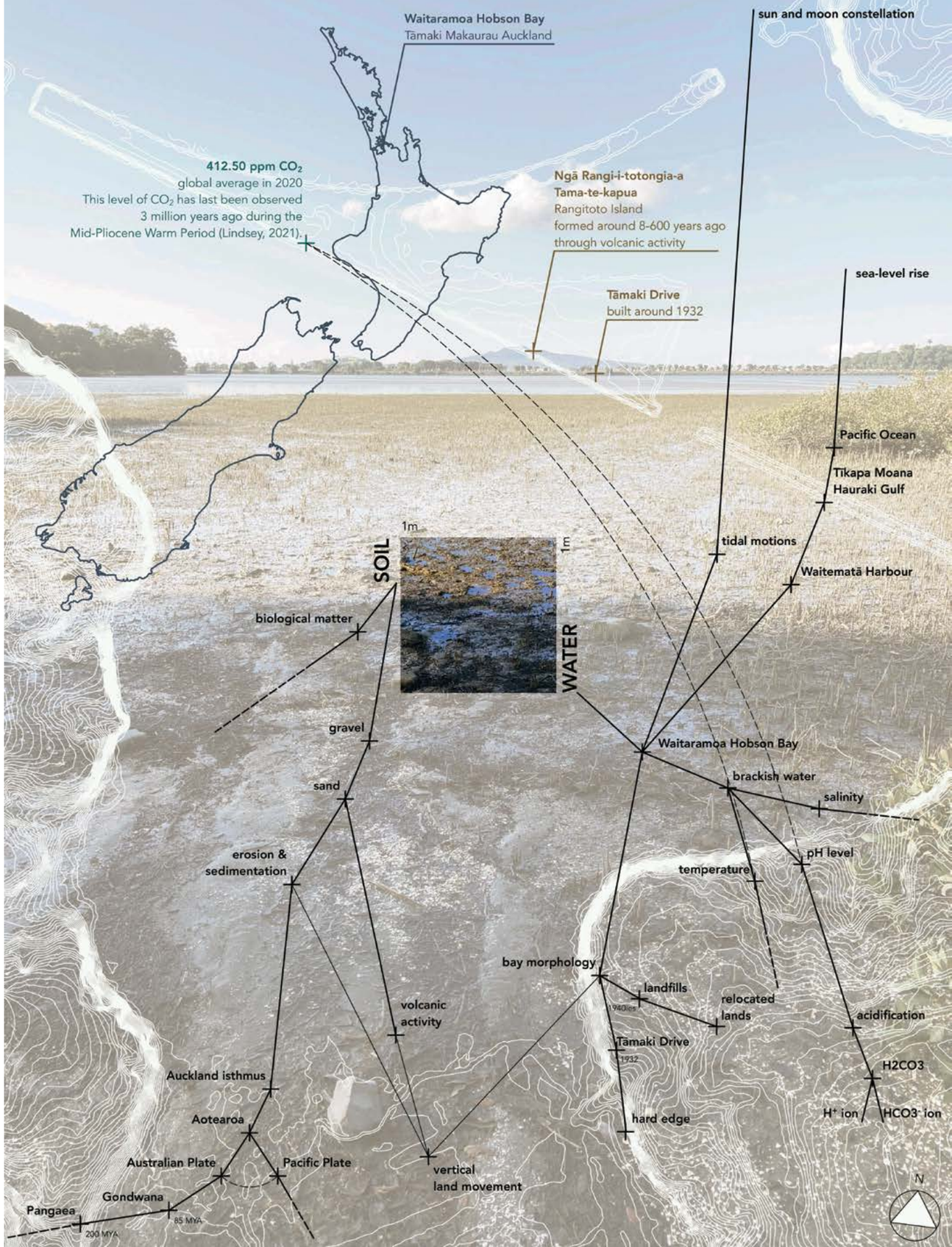


Fig. 33
The whakapapa of things: Findings, elements, and natural features are not simply organised by geographic location. Their relationships are topological and relational, forging connections across various temporal and spatial scales.
(Werder, 2023)

Fig. 34
Spiderwebs.
(Werder, 2024)

2.4 THE PARADIGM SHIFTS

1 The previously mentioned challenges are recognised as systemic issues. Our evolved perspective and the emerging paradigm shifts in Western thinking shine a new light on these issues and the causes that precede them. Accelerated by the awareness of the Anthropocene (Malone & Kuby, 2021), a plethora of movements, novel conceptualisations, technological and philosophical advancements, and shifts in philosophical concepts evolve the current thinking patterns in Western perspectives. A common trajectory that embraces multiplicity, complexity, and contradictions is observed. This thinking is present in various domains and disciplines. It provides an alternative and counterintuitive blueprint to the prevailing modern (Western) worldviews challenging the current political systems based on capitalist structures, petrochemical reliance, monist theologies, and positivist scientific conceptualisations.

2 In this thesis, I utilise Karen Barad's (2007) concept of agential realism as a core theory to support my hypothesis. Among different aspects, in their framework, Barad explores the epistemological and ontological challenges posed by quantum physics on human thinking. The connection between discursive practices and the material world is especially pertinent to my argument. Apart from the philosophical details, agential realism fundamentally allows *thinking to be thought otherwise* (Barad & Gandorfer, 2021) and giving agency to the more-than-human and nonvital. The quantum revolution fundamentally influenced the advancements of such paradigm shifts (even if only indirectly) by introducing concepts such as quantum duality or string theory. This has thrown many disciplines into a (constructive) crisis of (un)certainty, where fundamental concepts are challenged and troubled.

2.4.1 Overview of the emerging paradigm shifts affecting spatial studies

1 "Earthrise" (FIGURE 35)—the unplanned photograph taken by Apollo 8 astronaut William Anders during his orbit around the moon on 24 December 1968—has triggered a novel understanding of Earth as a finite sphere with limited resources. Nature photographer Galen Rowell coined it the "most influential environmental photograph ever taken" (Australian Broadcasting Corporation, 1999). This novel perspective opened up an understanding that the *global* is not equal to the *planetary*, giving rise to an idea of geo-awareness (Kerski, 2015). This mental realisation has resulted in (or coincided with) new ecological movements in society, science, and research. Coupled with publications such as Rachel Carson's *Silent Spring* (1963), novel environmentalism movements emerged. Landscape architecture as a relatively young field shifted from a discipline concerned with aesthetic values and the contemplation of nature to a more ecological, scientific focus. Accelerated with the increased understanding of anthropogenic climate change and the coining of the Anthropocene, these movements significantly impacted how the discipline evolved.

Fig. 35
"Earthrise".
(NASA/Bill Anders, 1968)

2 Many disciplines, particularly in social sciences, have undergone different turns. Novel theories and concepts have troubled scientific studies' normative and positivist understanding. While this ecological awareness is not new, and scholars of Indigenous philosophies similarly present "alternative ways of being with and relating to «nature»" (Malone & Kuby, 2021, p. 98), these historical events have reinforced thinking patterns through its orbital perspective. Together with the emergence of posthumanism, these shifts share a convergent trend and have displaced the belief of an anthropocentric hegemony, strengthening relational ontologies where binaries are broken up. Feminist and queer theory, Indigenous Knowledges, tendencies in art, and advancements in sciences such as physics reinforce this ontological suspicion.

3 Additionally, novel understandings in physics, such as the **quantum revolution** p. 090, have mutually influenced contemporary social theories in feminist and queer studies (e.g., Barad, 2007, 2014, 2018) where particularly the critique of binary systems is very formative and results in theories of multiplicities and uncertainties by often assuming a posthumanist perspective (e.g., Barad, 2003; Haraway, 1991, 1997). Similarly, the notion of objective measuring of phenomena was fundamentally rattled, and observations and measuring tools were understood as influences on the observed world (Barad, 2007)—absolute exteriority was no longer achievable (the **butterfly on a toothpick** p. 070 is no longer a method to study the world).

4 *In the past half century, there has been a paradigm shift in the field of ecology. Where ecologists once saw the world as a collection of self-regulating systems oriented toward "equilibrium and stability," they now see nonequilibrium, heterogeneity, stochasticity, and hierarch[y].*
(Holmes, 2020 citing Wu & Loucks, 1995)

5 Change, flow, and dynamism are now not framed as a process of disruption but as an inherent quality of natural processes. Similarly, this *becoming* is highlighted in the importance of *metabolism over morphology* (e.g., likewise in mapping practices as seen in Bambó & García, 2018)—wherein process is more important than final products. Together with the emergence of post-structuralism and nonrepresentational theory in cultural and human geography as well as phenomenology, this has triggered interest in research methods and social studies within landscape architecture as well as drawing literature from scholars such as Jean Baudrillard, Gilles Deleuze and Félix Guattari (1980), Judith Butler (1990, 1993), or Michel Foucault (Olssen, 2022). Topics such as embodied research methods, immersion (McCormack, 2017), the more-than-human and its agency, and ideas around **topologies** p. 100, networks, relationships, dynamism, and flows have become main foci in research where the ecological is considered in close conjunction with the cultural. These paradigm shifts have impacted spatial studies such as urban planning and design (e.g., Ramalho & Hobbs, 2012) or cartography (Caquard, 2015), as well as the field of landscape studies resulting in trajectories such as Landscape Urbanism (De Block et al., 2019). Within the disciplines of landscape spatial studies topics and limits of representationalism (Braddock, 2017), agency and processes of mapping and map-making (e.g., Corner, 1999; Cosgrove, 1999; Wall, 2020b), mapping as a process (Bryant, 2014; Kitchin & Dodge, 2007), or the critique of tools and techniques utilised in spatial studies (e.g., Descombes, 1999; Mathur & da Cunha, 2001) are discussed critically.

6 On the other hand, countries with colonial histories are still suffering from oppression or appropriation of local Indigenous communities and Knowledges and lack the inclusion of marginalised voices. These effects are countered in global research engaging in decolonising landscapes (e.g., Dang, 2021; Stevenson, 2004). Particularly, scholars engaging with the histories and developments of countries and areas such as Canada, the United States, Australia, and Aotearoa New Zealand provide valuable inputs to this research, with the discourse being led by Indigenous communities in collaboration with researchers from other backgrounds.

2.4.2 Quantum revolution

1 Historically, natural sciences and philosophy hold a strong bond and have always been entangled within Western thought. The Anthropocene has re-established further importance to this relationship (Crutzen & Stoermer, 2013). Notably, recent developments in physics have had a significant impact on cultural frameworks. Advancements in physics are formative in the development of new thinking patterns. As I hold a post-humanist stance—I also think of the Copernican Revolution—I understand physics, *Nature*, and the more-than-human and nonvital as influential participants in cultural discussions. Current developments in mathematics and physics are enhancing our novel understanding of the world and initiating a paradigm shift inspired by the quantum revolution. Concepts such as string theory or supersymmetry in particle physics and discoveries such as dark matter and energy in astrophysics let us understand the value of the indetermined and the unseen or beyond-measurable; introducing us to concepts of uncertainty, complementarity, and unintuitive paradoxes.

2 Talking about quantum physics in a thesis on landscape planning may at first quite literally appear like a quantum leap. I am not a quantum physicist. While having partial understanding of some theories and concepts in particle physics, I aim to avoid romanticising the inclusion of this foreign discipline by falling prey to the seductive resemblance of physical concepts and the subject of landscape studies. Although, many of these morphological and visual similarities lend themselves to efficient metaphors—just thinking how **Te Waitaramoa Hobson Bay** p. 59 and its two artificial openings to the Waitematā resemble a two-slit experiment in physics. Moreso, and I borrow and support this thought from Karen Barad (2007), I am trying to avoid to reason by analogy and instead focus on the summative potential of quantum theory and the essence of its philosophy for a transdisciplinary and diffractive application to other fields.

3 While there is undoubtedly still ongoing research (and dispute) in the field of physics with researchers trying to combine the theories of the macroverse (the Newtonian physics governed by gravity) with the microverse (quantum physics) or vice versa, the most influential and readily applicable theories do not stem from quantum physics directly, but from secondary literature and interpretive studies of the phenomena of quantum physics that aim to make sense of these novel theories and translates their potential to studies in cultural disciplines—philosophy of physics, or: *philosophy-physics*.

4 Karen Barad's theory of agential realism (2007) provides such a framework that lends much insight and benefit to the reframing of our understanding within methods for spatial studies, particularly in the context of complex coastal landscapes. Karen Barad is a physicist, feminist theorist, and philosopher, and the author of the book *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (2007), where they outline the concept of **agential realism** p. 95, which I consider as a core theory for the conception of my research. Barad follows the philosophy-physics of Niels Bohr and refers to the work of other science studies scholars such as Bruno Latour, Donna Haraway, Judith Butler, and Andrew Pickering. They further draw their transdisciplinary approach from postcolonial, poststructuralist, and (post-) Marxist theories.

Paradoxes, entanglement, uncertainty, and complementarity

5 Barad opens the preface to *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* with the following sentence: "This book is about entanglements" (Barad, 2007, p. ix). Barad's understanding of entanglement is based on the quantum phenomenon that describes the mutual dependence of a particle pair. Entanglement is not simply intertwinement but the absence of an "independent, self-contained existence" (Barad, 2007, p. ix).

6 One of the other most prominent and often-cited influential phenomena of quantum physics is the wave-particle duality paradox, which outlines the particle-like behaviour of waves and vice versa. This is further linked to the uncertainty principle, also known as Heisenberg's indeterminacy principle (the position-momentum uncertainty in observations of quantum waves/particles) (Coles et al., 2014). This prompts an ethical re-evaluation because assumptions cannot be made about the intentions of things—a "strange new quantum ethics" (Frayn, 2000) or "quantum weirdness" (Barad, 2007). On the other hand, Bohr understood this indeterminacy as an emergence of complementarity: Indeterminacy is not an issue of our capability of knowing or measuring but rather a characteristic of the world itself, therefore requiring a multiplicity of measuring devices simultaneously. The particle appearing as a wave is simultaneously haunted by the particle's absent presence of its potential as matter (Bozalek & Kuby, 2021b). This is a result of the material-discursive character of measuring devices.

7 *Matter and mattering are agentic, dynamic, in/determinate and temporary. Their endless ability to change and reconfigure is contingent upon conditions of possibility and impossibility.*
(Bozalek & Kuby, 2021b, p. 83)

8 Bohr's framing eventually critiques Western metaphysics and its reliance on individualism (Barad, 2007), which further understands the measuring apparatus as part of the constitution of waves and particle behaviour (Barad, 2014). While these are often unintuitive phenomena only detectable in the microscopic world, they influence our thinking and understanding of the macroscopic world. These concepts have led to a general crisis of (un)certainty in natural sciences and the humanities. Fundamental laws of physics have suddenly been disrupted, and a gap in the understanding and connection between the macroverse and the microverse has erupted. The advancement of these theories, which were primarily introduced in the early 1900s and later advanced through novel technologies and experiment facilities such as the Large Hadron Collider at the European Organization for Nuclear Research (CERN), coupled with the increased experience of uncertainty in our natural world (i.e., the climate crisis) have introduced a more emotional connection to these concepts which subsequently gained traction and relevance beyond their disciplinary fields.

9 The notion of entanglement has been widely mentioned in many disciplines and often supports a post-humanist or anti-capital position. Entanglement counters an individualistic worldview with anthropogenic hegemony and, therefore, counters a capitalist, patriarchal, predominantly Western conceptualisation of politics. Material-discursiveness is a response-ability that is not solely attributed to human beings or

the presence of (what is commonly understood as) consciousness or a central nervous system like a brain. Barad (2007) exemplifies this in examples of nature's ability to respond, where entities like a brittlestar respond to environmental changes by changing its colour or reforming its bodily boundaries—a material enactment.

10 While the chaotic and subjective are not new notions in the sciences or humanities (thinking of Freud and Jung's endeavours in psychoanalysis), the quantum revolution in physics certainly catapulted many disciplines to an era of acknowledgement of uncertainty, multiplicity, and relativity, albeit implicitly acknowledged so. All the above concepts challenge the modern paradigm of a stratified world and practices that methodologies continued to carry over from the 18th century. Shannon Mattern (2016) links this to the literal, metaphorical, and thus contradictory "shooting of birds dead" to study their life. Concepts of paradoxes and uncertainties such as those outlined above fundamentally question the modern Western paradigms and open the doors to more dynamic and complex framings of the world.

11 *Later advancements in math and physics gave rise to mental models that depicted things in the world as part of a dynamic continuum. Today, we make sense of our "topological culture"—with its locative media, volatile financial markets, real-time databases, mobile borders, and so forth—through lists, networks, clouds, fractals, flows, and assemblages.*
(Mattern, 2016)

Intra-action

12 Intra-action is a core concept in Karen Barad's (2007) theory of agential realism and is considered a step further than Bruno Latour's Actor-Network-Theory (Petri, 2022). Intra-activity was first introduced by Donna Haraway (1992) and then further theorised in Karen Barad's posthumanist framework. Intra-action marks an ontological shift of the subject/object divide, signifying a relational ontology where individual existence is not an a priori existence. Instead, through the intra-action of entities, they are becoming, unlike in the case of *interactions*, "which presumes the prior existence of independence entities or relata" (Barad, 2007, p. 139). Intra-action can be summed up as a flow of agency that is not unique to humans. Intra-action as a constituent of agency challenges the notion of human exceptionalism and the Cartesian understanding, as it affords agency to the more-than-human and nonvital (such as landscapes and its constituents) as well, unlike in the work and theories of Foucault and Butler (1993) for example. The world is constantly intra-acting with and across itself—whether humans are present or not. Intra-action, a neologism, "*signifies the mutual constitution of entangled agencies*" (Barad, 2007, p. 33, italics in original).

13 Processes are reciprocal and mutual exchanges between entities and intra-actions are formative for both the inquirer and the examined. In Barad's understanding, entities do not exist independently but constitute each other through their inseparability, suggesting that the boundaries between each are blurred. Intra-actions enact *agential separability*, which is discussed in the context of objectivity and the act of measuring (Einstein, for instance, understands spatial separability as a foundation for objectivity). Intra-action challenges the traditional understanding of causality and forces us to rethink

our epistemological understanding of the world (Murris & Bozalek, 2021). Classical understanding of measuring usually entails a human who does the measuring and a thing that is being measured—a subject *and* object.

14 Niels Bohr explains this break-up of the dichotomy of subject and object with the example of a stick (similar to Merleau-Ponty's example of a blind person's walking stick) where the tool is both a part of the self (a bodily extension) as well as an external instrument (Barad, 2007). "Importantly, the Subject that is positioned as constructor of (universal) knowledge is the thinking subject, divorced from a sensing *body* that is temporal and spatial" (Murris & Zhao, 2021b, p. 18, italics in original), therefore limiting the agency of knowledge generation to the apparent *thinking* human being—the homo *sapiens*—neglects any acknowledgement of bio-intelligence.

Diffraction

15 Barad (2007) summarises and theorises their methodological approach as *diffractive*. Haraway (1997) has previously theorised diffraction based on a reading of Trinh Minh-ha (1988) (Bozalek & Murris, 2021). However, Barad looks at diffraction from a physical standpoint rather than an optical one. In the different realms of physics, diffraction is a phenomenon assigned to the behaviour of waves (FIGURES 36 & 37, NEXT PAGE). In contrast to particles, waves can interfere, overlap, and, more fundamentally, be in the same place at the same time. Particles cannot occupy the same space simultaneously (unless they are in a state of *superposition*). Therefore, wave diffraction is the result of different qualities, or simply *differences*, of waves developing specific diffraction patterns (Barad, 2007, 2018).

16 Diffraction is an epistemological alternative to the inadequate idea of reflection or reflexivity, which operates on an analogical assumption of reflection as a principle of optical physics and its geometrical understanding of the process. As a critical approach, reflection or reflexivity repeats the paradigm of "geometries of sameness" (Barad, 2007, p. 72). Reflection is a paradigm embedded in representationalism, which states that representations such as words, ideas, maps, pictures, or symbols adequately *reflect* what they refer to. This methodology "holds the world at a distance" (Barad, 2007, p. 87) without acknowledging that mutual interactions happen between representation and observation, which is clearly shown in the ontological evolution of landscapes. Empirical studies, on the other hand, utilise this critical approach, especially in their acknowledgment of the triptych of object, representation, and knower, therefore situating the observer *inside* the system. Further, from a diffractive viewpoint, Barad (2014) understands subjectivity not as oppositional to objectivity but the two as superpositional characteristics–an observer can be both the subject and object of study. Diffraction, therefore, is a constructive interference.

17 Furthermore, diffraction, as an analytical tool, is not confined to a single discipline. It is a productive model for contemplating nonrepresentationalist methodological approaches (Barad, 2007, p. 88), embracing a relational ontology. It transcends the nature-culture dichotomy, serving as an effective tool for pondering socialnatural practices in a performative rather than representationalist mode (Barad, 2007, p. 88). The theorisation of diffraction is a unique blend of physics and feminist theory

(Barad, 2014). Similarly, Trinh Minh-ha (1988) perceives the framing of difference as a foundation of binary thinking that has shaped power structures. Diffraction is heterogeneous (as previously theorised by Haraway (1997)) and a material-discursive method practised **intra-actively** [p. 92].

18 *According to agential realism, knowing, thinking, measuring, theorizing, and observing are material practices of intra-acting within and as part of the world. (Barad, 2007, p. 90)*

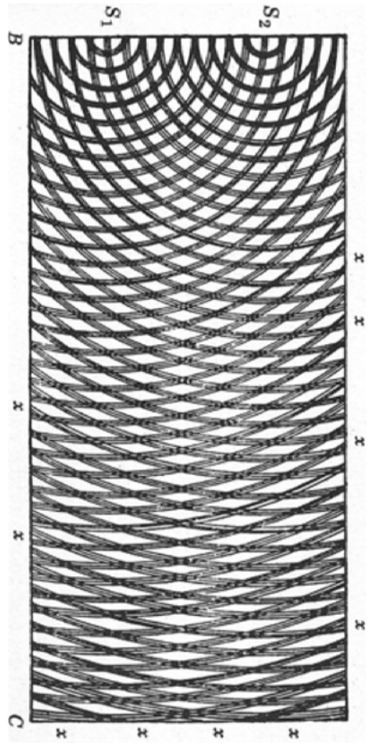


Fig. 36 Diffraction pattern on Waitaramoa Hobson Bay. (Werder, 2024)

Fig. 37 Interference effects of overlapping waves. (Young, 1803)

19 Through this understanding, researchers must address the situatedness of the observer and understand their position within the observed world—a more humble stance than the omniscient yet abstract observer from afar. As outlined in **Chapter 2.3.3 (19th-century tools…)** [p. 71], it is only implicitly addressed that practices of knowledge generation, such as mapping, have *material consequences* that have the potential to *(re) configure the world* (Barad, 2007). Importantly, diffractive methodologies are observant of particularities since their analogous physical phenomena are highly attuned to fine details.

20 A diffractive methodology is constructive and deconstructive rather than destructive (Barad, 2014) and allows the care-ful reading of one theory *through* another instead of *against* it (Bozalek & Murris, 2021). This affirmative stance allows for the formation of new "patterns of understanding-becoming" (Barad, 2014, p. 187). While the optical reflection is looking back at something, diffraction has a projective, lateral perspective, where a constructive looking ahead is promoted (this assumption and conceptualisation is a consequence of understanding the nonlinear nature of time).

2.4.3 Agential realism X spatial studies

1 Terms and concepts such as entanglement, intra-action, and diffraction are philosophical concepts already applied in spatial studies. However, they do not explicitly refer to an agential realist perspective that serves as an overarching methodological approach. *Agential realism* is a theoretical framework established by Karen Barad (2007) that combines the abovementioned concept into a theoretical framework. By applying a diffractive methodology to the reading of different disciplines, Barad introduces a transdisciplinary approach that finds applications in different fields (particularly in pedagogy and education), including ecological education (Brown et al., 2020). Agential realism is an *epistemological-ontological-ethical framework* (Barad, 2007, p. 26) and a "posthumanist performative account of technoscientific and other naturalcultural practices" (Barad, 2007, p. 32) that shifts the focus to "matters of practices, doings, and actions" (Barad, 2007, p. 135). The concepts aim to rethink fundamental notions such as "matter, discourse, causality, agency, power, identity, embodiment, objectivity, space and time" (Barad, 2007, p. 26)—all topics that are essential for spatial studies and particularly in the context of coastal landscapes.

2 Agential realism relies on a contemporary understanding of new materialism, or as Lemke understands Barad's stream as "diffractive materialism" that provides a more immediate approach to describing power dynamics (Lemke, 2021, reviewed by Bean, 2022). This notion can be seen in a tradition of Foucauldian theorising on power and politics, a biopolitics of the more-than-human (Lemke, 2021). Knowledge production is ongoing, dynamic, and entangled in the material presence of the world. Topics such as processes of measurements and representations are also critically discussed. According to Fox and Alldred (2023) a diffractive analysis enables a cross-reading of data and empirical research (findings such as experiences, phenomena, or memories), therefore, providing situated knowledge.

3 These are common aspects in landscape studies:

TABLE 01
Table published in Werder (forthcoming)

Agential realism according to Barad (2007)	X	applying fieldwork practices and spatial planning along Aotearoa New Zealand's coast
Rejection of dichotomies		
4 Agential realism rejects the separation between the human and nonhuman (more-than-human and nonvital), nature and culture, and the subjective and objective, among other concepts proposing a dichotomy or bifurcation.		In spatial studies, particularly landscape studies, this rejection of dichotomies encourages researchers to consider the agency of nonhuman elements, such as ecosystems, in shaping landscapes and the involved processes. The coastal landscapes of Tāmaki Makaurau Auckland require a rethinking of the dichotomies of land and sea or them and us. It is understood that landscapes are not only physical and material phenomena but also cultural and spiritual places. There are already examples of these narratives, like granting legal or spiritual personhood to ngā awa (rivers) and ngā maunga (mountains).
Entanglement and intra-action		
5 Barad's notion of *intra-action* emphasises that entities, including humans and nonhumans, co-constitute each other through their intra-actions. This perspective can be applied to understand how human and nonhuman elements intra-act and influence the development of a place or site. It recognises that decision-making about a site's present or future configuration is not made in isolation but emerges from complex entanglements. From a physics perspective, entanglement is not simply understood as a connectivity between two or more things. It is a quantum phenomenon (seemingly absent in the classical understanding of physics); two entangled particles share a dependence, where one cannot be described or measured without the other.		In the specific context of Aotearoa New Zealand, this interconnectivity is embedded in Te Ao Māori's conception of the world. The understanding of human interactions is interconnected with the natural world through a physical, spiritual, and reciprocal exchange. Knowledge production relies on situated observations and benefits from diverse or intergenerational experiences. Tacit, bottom-up knowledge is crucial for holistic decision-making processes. It highlights the mutuality and interdependence between observer and observed; explicitly understanding that human researchers are never an outside observer but always part of the system that is studied or analysed. Therefore, the hybris of top-down planning and strategising, is not as strong a case as the political telos wants us to believe.

TABLE 01
[cont.]

Material-discursive practices and performativity...	
6 Barad's concept of performativity suggests that the world is brought into being through specific practices and intra-actions. Agential realism emphasises materiality and material-discursive practices.	Discursivity is often linked to visual representations and mappings that document and communicate spatial configurations in spatial studies. Current understanding recognises mappings as ontogenetic processes, highlighting both maps' performative and temporal aspects and their creation. Crampton introduces the concept of an "epistemic break" (2001, p. 235) in our perception and use of maps, viewing them as informational systems and tools for dynamically constructing information. As the understanding of landscapes and mapping practices becomes more intricate, scholars and designers increasingly see mapping as a complex field. It involves visual representation and critical evaluation during the mapping process that Allen and Queen (2015) view as an integral component of inquiry. The emphasis is shifting from map-making's representational and political aspects to a focus on process and creative production, moving from ontology to ontogenesis, from secure representation to unfolding practice (Kitchin & Dodge, 2007). The intra-actions between landscapes and (human) researchers are material-discursive. Particularly in spatial studies, landscape planning, or design: The engagement with landscapes has material consequences and impacts at multiple scales—from footprints on the soil to chemical re-compositions of the water due to pollutants to morphological alterations caused by interventions and (built) projects. In spatial studies, this encourages planners to consider the material aspects of landscapes, including the physical environment, infrastructure, and the material effects of planning decisions. It also emphasises how the connection between discursive practices and the material world is especially pertinent in this context.

...and (non)representationalism

7 Barad reflects on the relationship between representationalism and performativity, where experimenting (in this case, working through the landscape, i.e., conducting fieldwork) and theorising dynamically constitute each other.

In landscape studies, visual representation holds a similar significance as language does in other disciplines, encompassing representational practices that have been theorised and critiqued in various ways (Weller, 2020). Fieldwork research often addresses the ontological disjunction between visual representations and the physical realities they depict. Visual representation provides an alternative to language-based discursive methods but requires detailed local knowledge to understand a place comprehensively. Recognising landscapes (and the non-human in general) as co-constituents of knowledge production implies that discursive tools—words, diagrams, or maps—are insufficient on their own for effective collaboration and exchange and are also culturally biased (e.g., seen in the differences between Western and traditional **Polynesian cartography** p. 69 (Eckstein & Schwarz, 2018, 2023)).

Embodiement and measuring

8 The break-up of the subject versus object dichotomy results in a re-definition of measuring devices and apparatuses and their agency as investigation tools from an anthropogenic perspective. Tools are not innocent and rely on human ableness to perform in their intended/designed way. The observer (researcher, fieldworker, etc.) is part of this apparatus and intra-acts with the observation, process, tool, and observed place. Therefore, the embodied researcher is an embedded observer—part of the environment they are studying.

Empirical, situated, or contextual knowledge relies on a participant—an observer immersed in a specific context (urban or landscape). Practitioners and researchers in the field have raised the claim of the inadequacy of analyses based on remote readings (e.g., satellite images, GIS datasets, etc.). However, the positivist political telos does not value these approaches as constructive and informed perspectives.

Diffraction

9 Barad understands diffraction as a methodology for synthesising knowledge through different lenses iteratively. Their approach to reading one *theory through another* challenges the traditional understanding of reflection or reflexivity. This approach underlines the idea of multiplicity and plurality, particularly from an ethico-onto-epistemological standpoint, and constitutes an affirmative engagement with difference (Bozalek & Murris, 2021).

Diffraction provides a framework for constructive interference and counters the regurgitation of sameness due to *reflective* practices. In a culturally and physically complex field, such as coastal areas in Aotearoa New Zealand, diffraction becomes a vital methodology to engage with the multiplicities of worldviews and ontologies.

Epistemology, ethics, and politics

10 Agential realism highlights the inseparability of epistemology (how we know), ontology (what exists), and ethics. This challenges traditional knowledge systems in spatial studies and calls for a more critical approach to knowledge generation. It prompts planners, practitioners, or conservationists to consider the ethical implications of their knowledge-making processes and the consequences of their interventions on landscapes. (Situated) knowledge production is validated through agential realism, and researchers are given responsibilities for their tasks (Cannon, 2022).

Just as the idea of landscape is highly subjective (Bender, 2002), so is the process of mapping (Cosgrove, 2005; Crampton, 2001, among many). More importantly, the imprint of settler colonial practices has degraded Indigenous Land(s) and altered them in a non-natural way. This behaviour stems from the colonial telos of *controlling* nature and using landscapes as a physical and mental resource (Milligan et al., 2021). Milligan et al. (2021) are calling for more humility. The understanding of landscape forces having agency allows us to rethink the legacy of the extractive planning practices dominated by colonial and capitalist thinking as they fundamentally differ from today's paradigms. Decolonising landscapes is essential for humans' and nonhumans' current and future physical and spiritual wellbeing. In Aotearoa New Zealand this aspect is further defined in Te Tiriti o Waitangi and The Treaty of Waitangi (Te Rua Mahara o te Kāwanatanga Archives of New Zealand, 2024) However, it has not found methodological adaption in landscape research practices.

11 While agential realism is not a direct blueprint for spatial studies, it offers a philosophical lens through which landscape researchers and practitioners can rethink their approaches. Crucially, Barad understands their framework as a chance to *rethink thinking* (Barad, 2018) and a way to "dislodge these unwanted remnants" (Barad, 2007, p. 27). They further emphasise that concepts are not finite: "Concepts are material-discursive and cut together-apart" (Barad & Gandorfer, 2021, p. 30). Agential realism challenges traditional binaries, enacts the uplifting of the Cartesian cut, and encourages a more inclusive view of agency to prompt a deeper reflection on the ethical and material dimensions of spatial studies' impacts on landscapes. Agential realism embedded in methodological approaches fosters phenomenological foci and challenges the reductionist notion of a positivist framework, valuable to inquiries in landscape research and interdisciplinary studies in general. Applying a diffractive approach to reading research and literature in spatial studies reveals excellent potential, and provides a hypothetical *diagnosis* to many of the unresolved confusions. By adopting aspects of agential realism, landscape studies can become more attuned to the complexities and interconnectedness of the landscapes it seeks to shape and reinforce the embodied, material, spatial, and phenomenological experience of landscapes.

2.4.4 Topological understanding of space

1 The relational nature of agential realism complements the interpretative understanding of spatial studies theorised by Davoudi (2012) and outlined in **Chapter 2.1.2** p. 37. This rethinking of space marks a turning away from Euclidean geometry ingrained in cartography and traditional (visual) representations in spatial studies from a Western perspective. Space nowadays is understood as a result of the quality of relationships rather than geometric proximity—space is topological.

2 *Topology* is a concept that has been introduced previously in spatial studies, such as landscape architecture. It is likewise inspired by a mathematical concept going back to mathematicians Leibniz and Euler and eventually coined by Listing in the 19th century. Topology describes the study [λόγος] (logos) of surfaces [τόπος: place or location] (topos) and is interested in the qualities of the latter. Continuity, dimension, compactness, and connectedness are all qualities of topology. In cultural studies, topology is often related to the theories of Giles Deleuze and Felix Guattari's rhizomes and networks (1980).

3 In this thesis, I understand topology from a philosophical and cognitive perspective rather than the application of a metaphor from a mathematical and computational standpoint. In the traditional Euclidean framework, proximity is based on spatial closeness—reinforced by cartographic representations—and, therefore, serves as primary evidence for causality of processes. This assumption repeats a positivist understanding of space, neglecting nonhuman epistemology: As not everyone or everything perceives space in the same way, space does not necessarily have the same density across a place either. Theorised by various scholars and practitioners from different fields (e.g., Girot et al., 2012), topology finds theoretical and philosophical applications in different disciplines.

4 Landscape practitioner and scholar Christophe Girot provides a different reading of topology based on the concept of continuity. He understands that topology creates

5 > *a particular intelligence of terrain by encompassing all of its continuity and complexity; the gnosis of landscape embedded in the intrinsic value of a common place.*
> *(Girot et al., 2012, p. 7)*

6 Girot's understanding of topology introduces an aesthetical aspect, where the topological framing of landscape surpasses a pure geometrical observation and puts qualities and aspects into proximity of a landscape that may not be attributed to spatial *close*-ness. Girot (2012) explains this through the disjunction of understanding landscapes from a scientific ecological perspective and a cultural, cognitive, or even poetical framing. Local particularities are important in this comprehension as a topological understanding helps to interpret varying landscape situations—this is particularly relevant when ready-made solutions or designs are applied across different sites without considering the variables and local particularities, both material and cultural. Topology, as a study of continuity, is understood as a way to make sense of a place in its varying multiplicity and *fine details*: "It is all about how a tree meets the ground and how water sounds as it runs over a stone" (Girot et al., 2012, p. 8). Considering the large-scale alterations of topographies, Girot (Girot et al., 2012) advocates for a topological approach to uncover novel relationships between meaning and matter.

7 Similarly, Lury, Parisi, and Terranova (Dawes et al., 2013) argue that culture is topological, where they observe the multiplicity of relations resulting in the normalisation of change. Change is becoming a constant. As such, the relations between points become more important than their individual positions or the distance between them. In mathematical terms, this refers to the *vectors* between points or what could be called the *forces* and *trajectories* in meta-physical jargon. As such, topology in physics and its relation to thermodynamics and chaos theory becomes significant for social theory for providing mental concepts and vocabulary for analysis. Lury, Parisi, and Terranova argue that cultural topology is highly influenced by technology or technologically mediated processes such as database research (Dawes et al., 2013).

8 > *It is important to offer a possible model of this relationship at a time when the humanities and social sciences are under attack and are being asked to conform somehow to a rather obsolete, but still powerful, model of 'doing science'—what Prigogine and Stengers define as a reductionist, mechanistic, and deterministic science.*
> *(Tiziana Terranova in Dawes et al., 2013)*

9 Topology, therefore, has a similar inter- and transdisciplinary potential and has likewise informed the experienced paradigm shifts. Together with the focus on change and interconnectivity, this highlights the multiscalar and **transareal** p. 28 landscape research affords. As a spatial term, topology directly links spatial studies, mathematical sciences, and physics without falling prey to a purely metaphorical integration of landscape studies and research.

2.4.5 From reductionism to site-specificity

1 Paradigm shifts are inevitable changes in a society's thinking and occur continuously, at different intervals and amplitudes. These changes in public thinking are symptoms of underlying desires intra-acted between humans and nonhumans triggered by the reality of the material world: Both the microscale (quantum physics) and the macroscale (the global climate, and local weather) are influencing our ontological and epistemological understanding and working with and through landscapes.

2 Arguably, the humanities possess a sliver of *physics envy*—as the chaotic and messy, the as-found in landscapes cannot so easily be represented in elegant formulas. Likewise, (quantum) physics cannot be the sole explicator to give a complete account of social and cultural aspects of the world. However, "[q]uantum physics undercuts reductionism as a worldview or universal explanatory framework. Reductionism has a very limited run" (Barad, 2007, p. 24). Its unintuitive theories and novel conceptualisations, quantum (field) theory, and agential realism as a distant relative to this, allow to rethink our 3 & 4 assumptions of the world and troubles the status quo.

As such, agential realism applied to landscape research provides an alternative to create novel stories of the world around us with the call to (re-)define novel or established practices such as fieldwork in landscape studies, and strengthens site-specific experiences.

The question now is: What methods and tools have the potential to facilitate these paradigm shifts and help us become effective and efficient agents, particularly in our relationship with and enactment of coastal landscapes?

Fig. 38 Ducks creating diffractions. (Werder, 2024)

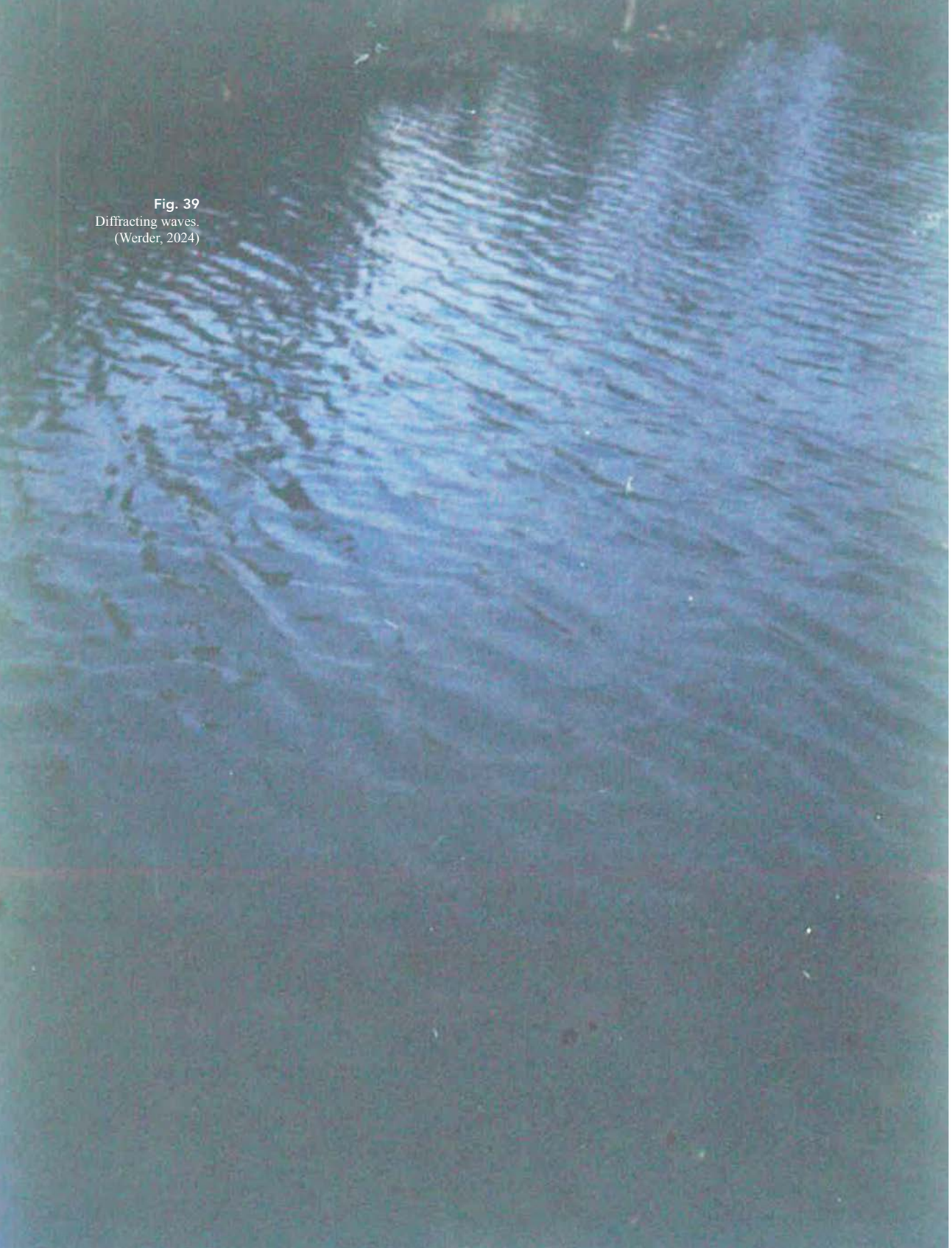


Fig. 39
Diffracting waves.
(Werder, 2024)

THE MIDDLE

SPECIFIC THEORY: DIFFRACTION

1 In **Chapter 2** [p. 33], I have set the scene for this research: The environmental changes, the awareness of anthropogenic influence (as seen in the Anthropocene) and developments in landscape studies and particularly scientific fields such as physics, are opening new paradigms and frameworks in how humankind engages with the present, past, and future of landscapes. Spatial studies, and landscape planning in coastal areas as an example of this, are increasingly complex fields, especially with the heightened challenges posed by ecological crises and global warming.

2 In Chapter 3, I synthesise the inventory of the diffractive reading of the literature around current issues and shortcomings in landscape conceptualisation and human interaction with coastal areas. According to Kahn and Diedrich's (2019) call for investigation of existing methods, I look at fieldwork as an established method in landscape research. The lack of a unique and explicit definition of fieldwork in landscape research emerged through a literature review and an empirical application of known methods. This omission leaves a methodological vacuum. Agential realism has provided a constructive lens to reframe fieldwork in this context and provide a basis for arguments and support of future empirical and (post)qualitative research conducted in this context.

Fig. 40
Climbing wasp.
(Werder, 2024)

3.1 WHAT TO DO NOW

1 Scholars and professionals have long identified deficiencies in the conventional methods, techniques, and tools to assess and evaluate landscapes. This has led to a call for adopting more open-ended, relational, and collaborative approaches. New tools, methods, and techniques are researched and applied in practices, educational settings, and planning approaches. However, this diversity of developments has also led to a fragmentation or isolation of possible re-*solutions*. New methods and methodologies do not necessarily address or resolve the systemic issues holistically, and a temptation for a formulaic application of novel frameworks prevails.

2 In the following chapter, I explore discussions around methods and methodologies in spatial studies and introduce fieldwork as a specific method widely applied in landscape research. Guided by a non-solutionist paradigm, in this inquiry, I address the interconnections and dependencies of fieldwork (as an act of being in the field), data collection, and (visual) representation of findings. These topics are diffractively read through the lens of **agential realism** p. 95 and theories from postqualitative, feminist and queer, and posthumanist inquiries. Considering the urgent need for changes in our thinking through and dealing with the presents, pasts, and futures of landscapes, reinforcing novel methodologies is crucial in facilitating changes in outdated approaches that are no longer fit for the context of the 21st century.

3 This chapter is in a chiasmic relationship with **Chapter 3.2** p. 121, in which I explore existing methods in fieldwork.

3.1.1 New method(ologie)s

1 Considering the pressing issues due to climate change and the ecological crisis results in the imminent necessity for action in coastal regions. Scholars have long claimed that this will inevitably prompt the development of new perspectives (Batty & Marshall, 2009). Juxtaposing the paradigm shifts in landscape conceptualisation with the observed systemic issues due to solutionist thinking in spatial planning, it becomes clear that humankind must rethink the methods and methodologies that aim to facilitate a novel way of thinking, working through, and relating to landscapes—particularly in susceptible and unique spaces such as coastal areas.

Method, method, method

2 Rethinking the role of methods is a crucial start for this investigation. Traditionally, methods are understood as tools often readily available for application. Postqualitative, feminist, new materialist and critical posthumanist theories unsettle this traditional notion of method as an innocent, unproblematic tool that is simply used to obtain information (Taylor & Bozalek, 2021).

3 Springgay and Truman (2018) critically reflect on this need for new spatial study methods by addressing the agitations emerging in qualitative research. With reference to various scholars, the authors highlight the current trends of the dominance of methodocentrism, and methods that pre-suppose a certain outcome or process (i.e., reliance on visibility, the crisis of representation, etc.) (Springgay & Truman, 2018). The plethora of methods already available points to a much-needed shift in perspective: Rather than focus on new methods, the understanding of methods as data collection processes must be moved "towards methods as a becoming entangled in relations" (Springgay & Truman, 2018, p. 84). Springgay and Truman (2018) note that novel methods will not automatically generate new solutions, and the sole engagement with representation and interpretation will not be sufficient. The previous fetishisation of methods resulted in a belief that methods are pre-existing solution-finding apparatuses that can readily be applied (Weaver & Snaza, 2016). Consequently, this conceptualisation assumes that data are "ready to be captured, extracted, and mined" (Springgay & Truman, 2018, p. 84), where a conventional process supposes human superiority (Lather & St. Pierre, 2013). This further resonates with Karen Barad's observation that "relata do not precede relations" (Barad, 2007, p. 334). Elizabeth St. Pierre (2016) claims this issue stems from an ongoing divide between theory and practice, a repetition of data gathering based on conventional empirical methods and a phenomenological understanding.

4 Springgay and Truman (2018) then go on to draw from Deleuze's and Guattari's (1980) theory of the *middle*—a situated approach that triggers responses and activates thoughts, where a priori knowledge is not available. The middle is the realm of the speculative, where thinking about problems becomes more prevalent than searching for solutions (Springgay & Truman, 2018).

5 *Solutions present themselves as stable identities whereas problems (at least the worthwhile ones) present themselves as 'open fields' or 'gaps' or 'ontological folds.' Problems are inexhaustible, while solutions are a particular form of exhaustion.*
(May, 2005, p. 85)

6 Consequently, novel methods or re-interpretation of existing ones must channel us to ask questions critically and differently, to engage with the *problem* rather than the impatient pursuit of unreflected data collection or solution-seeking. Barad similarly concludes that research practices that are "attentive to, and responsive/responsible to, the specificity of material entanglements in their agential becoming" (Barad, 2007, p. 91) must be enabled. Examples of such processes are outlined further down where I address the concept of *probing* landscape in the context of Lutsky and Burkholder's (2017) ***Curious Methods*** p. 113.

7 *Method becomes unruly, rhizomic and nomadic.*
(Taylor & Bozalek, 2021, p. 89)

8 In postqualitative inquiry, method requires a departure from conventional norms, necessitating an embrace of unknowing or even un-learning to confront biases rooted in the researcher's positionality and preconceptions. Taylor (2016) advocates for a radical "letting go" approach to counter normative practices' restrictive nature. Manning (2015) and other scholars underscore the importance of this shift, urging a strengthening of the imperative for empirical work in posthuman research. Manning, in particular, emphasises the concept of "research-creation"* (Manning, 2015, p. 53), highlighting the transformative potential inherent in embracing unconventional methodologies. This perspective aligns with Taylor's notion of research as a "practice of the plunge" (Taylor, 2016, p. 20), where method manifests as a process of relinquishing conventional frameworks and embracing the uncertainty of exploration. Despite its challenges, this approach fosters a sense of adventure and opens avenues for experimentation and speculation, ultimately paving the way for novel modes of inquiry and understanding.

Qualitative research and live methods

9 The prominent call for more qualitative data in landscape architecture may stem from the absence of a guiding methodology. The lack of representation of a site's qualitative and ephemeral qualities has been acknowledged for many years within landscape studies. This omission is partly due to the economic implications of data collection processes (i.e., capturing these volatile and elusive findings takes time, and time is money), and ephemeral qualities are often unquantifiable or uncountable and therefore elude data collection (Bowker, 2013; Weaver & Snaza, 2016). A fallacious remedy to this discomfort is the focus on easily measurable data, often based on remote sensing technologies such as satellite images or tracking devices used for weather forecasts or water quality testing. This neglect is present in normative mappings used for planning

* For a critical reflection on research from an Indigenous perspective, I recommend Eve Tuck and Wayne K. Yang's "Decolonization is not a metaphor" (2012) and Linda Tuhiwai Smith's "Decolonizing methodologies: Research and Indigenous peoples" (1999).

and policy purposes, such as GIS platforms of local councils as well as the gradual decline of the use of qualitative and empirical research and fieldwork in these domains. While this is a foundation in practice and education of landscape studies, unmanicured and raw fieldwork results are rarely considered in publicly available planning tools and regulatory processes. Sampling local data and particularities of a fine-grained location are considered subjective and lack wide-scaled application, relevance, and reproducibility. Nevertheless, there is a growing exploration and appreciation of methods capturing such qualities in both practice and academia. These are recognised for their diverse benefits, serving as valuable complementation to traditional data collection techniques (e.g., Fekete & van den Toorn, 2021).

10 The turning away from the idea of an extractive process of gathering *inert* data that are collated and curated in a secondary, separate step opens up a discourse around simultaneity. As introduced earlier, Springgay and Truman (2018) outline this in their research by addressing the dissolving between experiment and thought, doing and thinking. They argue that research must become a *thinking-making-doing* process. Maybe this simultaneity of doing, knowing, learning, and seeing comes close to Bohr's conundrum of complementarity as analysed in Karen Barad's work:

11 *[…] you can't both think about something and also reflect on your own thinking about the matter. This is because you need to make a choice between two complementary situations: either you think about something, in which case that something is the object of your thoughts, or you examine your process of thinking about something, in which case your thoughts about what you are thinking (about something), and not the something itself, are the object of your thoughts*
(Barad, 2007, p. 21)

12 Sheller likewise calls for practices that "intervene, disturb, intensify or provoke a heightened sense of the potentiality of the present" (Sheller, 2014, p. 134). This engagement with situated and partial knowledge is further an inherent quality of feminist theory that lends itself to application and adaptation to other fields. Springgay and Truman reference Celia Lury's *Live Methods*, which

13 *must be satisfied with an engagement with relations and with parts, with differentiation and be involved in making middles, in dividing without end(s), in mingling, bundling, and coming together. The objects of such methods—being live—are without unity, un-whole-some; put another way, they are partial and undivisible, distributed, and distributing.*
(Lury, 2012, p. 191)

14 Lury situates Live Methods within new materialist methodologies concerned with how agency flows through the networks of relationships across human and nonhuman intra-actions (Springgay & Truman, 2018). Springgay and Truman (2018) acknowledge that there are no "one-size-fits-all" methods and that the existing arsenal must consist of friction, contradiction, and conflict. The methods and approaches I introduce in the following chapters represent a speculative and new materialist approach based on postqualitative research. The latter has traditionally struggled with language and representation (Somerville, 2016) requiring novel "meaning-making practices" or rather an emphasis on doing and experimenting (Springgay & Truman, 2018).

15 In the following (sub-)chapters, I will explore methods already established in landscape research but lacking epistemological precision due to their borrowed nature from other disciplines. Fieldwork is considered a method harbouring much potential for mediating current issues (Holmes, 2020), and has a chance to establish an ethico-onto-epistemological perspective in landscape research acting from the methodological middle. However, this conceptualisation still needs to be articulated in the context of spatial planning, resulting in a methodological vacuum and vulnerability of fieldwork in landscape studies.

3.1.2 Fieldwork as a method

1 Following Stephanie Springgay's and Sarah Truman's (2018) call, I explore existing methods and identify limitations in their theoretical and methodological framing. Rather than inventing new practices, I aim to build on existing ones: Fieldwork methods are widely established in landscape studies; however, they have eluded a precise definition (or re-definition) within spatial studies as fieldwork mostly relies on its inception in social and biological studies.

2 Fieldwork is an active process of empirical inquiry that finds application in various fields of study, practice, and research (Ragsdale, 2018; Wolcott, 2005). Therefore, the traditional understanding frames fieldwork as an *outdoor* data collection process. Outdoors, here, is understood as a place outside a general workplace like an office or studio, or a laboratory. In this thesis, however, I primarily understand fieldwork as a form of direct engagement with a place in the outdoors, in this case, a landscape. This interaction, or intra-action, is multidirectional (for humans and nonhumans). A constructive exchange: A process of becoming and getting to know. Traditionally, this approach is seen as an *extractive process* where information, findings, or data are obtained from a site. However, this form of extraction is not contingent on this method. I also understand fieldwork as a much broader and more complex approach as it constitutes a simultaneous process of doing and thinking and is equally concerned with the subsequent representation of *findings*. Fieldwork does not end after the site visit.

3 Similarly, scholars understand fieldwork as a complex sequence of different methods rather than a single method (Ragsdale, 2018; Wolcott, 2005). While there is extensive research in the field of fieldwork research methods (e.g., Fekete & van den Toorn, 2021; Lickwar et al., 2016), the complex entanglement of fieldwork as an ethico-onto-epistemological methodology and its impact as a practice of dissemination is not explicitly discussed in landscape studies and particularly landscape architecture.

Data and representation

4 Whether quantitative or qualitative, data collection is inherently entangled with (visual) representation of findings. In spatial studies, data are predominantly visualised or organised in mappings, commonly using digital tools. Visual representation, therefore,

must be discussed alongside data-collecting practices. Empiric, phenomenological approaches do not exclude the digital (Crutchlow et al., 2021), and the *abstract* (i.e., in the form of mappings, plans, and diagrams) is not necessarily separate from the *lived*. Crutchlow et al. conclude that a methodological split would also lead to an "ontological separation of thought and action, digital and physical" (2021, p. 264) when researcher must strive for a closer alignment of theory and practice, as well as abstraction and the *real*. There is a risk of losing meaningful contributions if no room is provided to incorporate or accommodate on-site aspects of human experiences in research and representation. These impressions contribute value to a site by displaying aesthetic experiences that collectively contribute to defining a place as more than just a location, map, or locality:

5 *With the lack of qualitative data alternatives, functional geometries of plots, roads and buildings or flashy 2D images tend to prevail. The quality of something as fluffy as a bird song or the coffee enjoyed along a hedge will continue to sit uneasily within these frames of representation.*
(Farsø & Henriksson, 2016, p. 19)

6 This critique addresses the inadequacies of current methods and the technologies that further afford this lack. Providing more diverse options for representation in digital tools—visual, oral, sensorial, or otherwise recorded—must allow a rethinking of the practices on how platforms and tools are used. This omission has ethical consequences—hence the importance of an ethico-onto-epistemological perspective. For example, Caquard, in conversation with Salinas (2014), explores Indigenous mapping projects in North America and concludes that current tools and Western technologies oppress or shroud the Indigenous spatial worldviews:

7 *Indigenous perspectives on places have to "support" several transformations. They have to lose their spiritual dimension to the Euclidean grid. They have to lose their aural structure to become visual. They have to be dehumanized to be coded in computing language.*
(Caquard interviewed by Salinas, 2014)

8 This approach or method results in an ill-imposed twist of Indigenous topologies, which, in this South Pacific context, the reader has similarly encountered in **Tupaia's mappings** p. 69 of the Pacific archipelagos (Eckstein & Schwarz, 2018, 2023).

9 These requirements all link back to overlooking the ontogenetic practice of mapping in relation to fieldwork practices: As Diedrich (2021) points out, *site reading* is interlinked with *site editing*—which is often overlooked. I would argue that *site writing* is also connected to that process (more on this in **Chapter 3.3.2** p. 139). Fieldworkers and landscape scholars researching the methodological application of fieldwork all note the close connection between probing or data collection (the fieldwork) and subsequent representation (Braae et al., 2013; Diedrich et al., 2014; Hemmersam & Morrison, 2016). However, without explicit mention the performative character of this process is not discussed further.

Data collection versus probing

10 My understanding of fieldwork encompasses the notion of **probing a landscape** p. 113, as introduced by Karen Lutsky and Sean Burkholder's *Curious Methods* (2017), where the findings are both cognitive and physical. This opposes the idea of the extractive *collection* of data. Historically, the collection and categorising of findings as data has led to a reinforcement of a positivist approach (Weaver & Snaza, 2016). This process leads to a de-contextualisation, abstraction, and stratification of dynamic and highly context-based or site-related characteristics—thinking of the birds, shot dead by researchers to study them in a laboratory-like setting, far away from the birds' original habitat, their place of life (Mattern, 2016). Many practitioners, however, rely on pre-assembled, prescribed data, which are often presented on platforms such as GIS (Weller, 2020)—a meta-analysis of what is shown and what is *not*, as well as how the data have been collected, becomes vital.

11 This data abstraction has long been criticised as an inadequate remnant of 19th-century paradigms. Lutsky and Burkholder implicitly criticise the practice of fieldwork as a data collection process through their practice of Curious Methods, with which they aim to probe the environment to distil questions rather than find answers or solutions.

12 *probing requires patience, repetition, perhaps a little bit of play.*
(Lutsky & Burkholder, 2017)

13 The authors base their method on a non-solutionist framing of fieldwork methods where they attempt to look for trajectories rather than objective truths or facts. They outline three components of the non-linear approach of Curious Methods: Inquiry, insight, and impression.

14 **Inquiry:** Deriving questions from physical experience in and of a landscape, where they physically ask the question through entangling with a landscape. This leads to a search for a *"lovely"* question, which frees the researcher up from the delusion that stability and correctness are the desired ends of inquiry.

15 **Insight:** Inquiry will lead to insight through the feedback provided by the landscape entanglement process. This feedback is often surprising or serendipitous and challenges expectations.

16 **Impressions:** the recording of impressions (in this thesis called *findings*) using diverse media and representations.

17 Gregory Bateson relates this probing to the sciences themselves: "Science never proves anything ... it probes" (Bateson, 1988, p. 30), again a call to counter solutionism—an essential perspective to facilitate the paradigm shifts and re-solve systemic issues. This argument is also in line with the concept of the speculative *middle*–Fieldwork has the potential to serve as a starting point for an inquiry where multiple, parallel, maybe even straying pathways lead to an outcome (FIGURE 41, NEXT PAGE) rather than a choreographed method resulting from a pre-emptive analysis biasing or inhibiting further investigations.

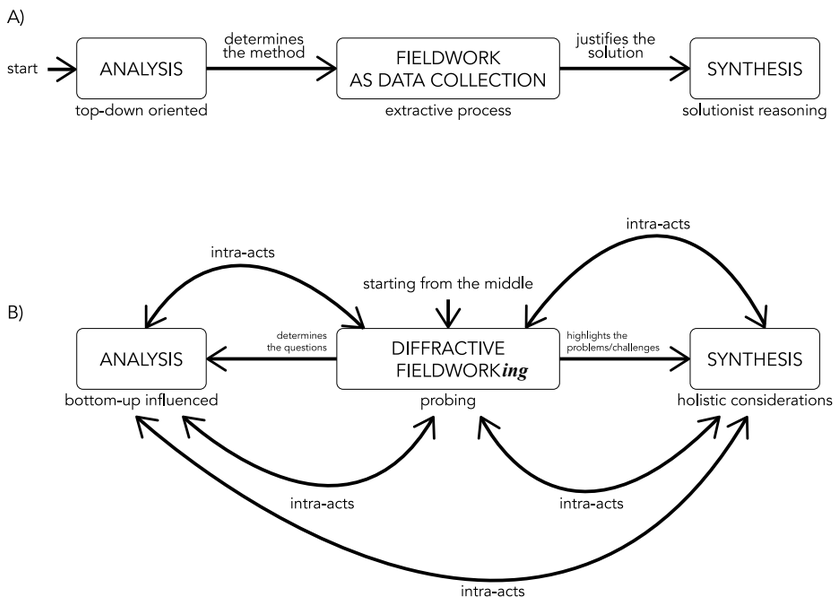


Fig. 41
A) Conventional decision-making process including fieldwork.

B) Including fieldwork as a diffractive methodology in the decision-making process. (Werder, 2024)

Fieldwork X representation(alism)

18 Methodically, fieldwork constitutes an intermediatory process, an intra-action between findings (which I understand as various forms of data, probes, experiences, phenomena, and the like) and the visual representation of such—as well as the perpetual iteration or jumping between these two states, where neither of these pre-exists without the other. Findings and representations simultaneously co-constitute and mutually influence each other through their iterative becoming and uncovering. As a method, fieldwork plays a pivotal role in addressing gaps in previous research and facilitating the observed paradigm shifts by grounding abstract theoretical concepts in practical, experiential, and empirical realities. Landscape scholars, such as Elizabeth Meyer (2008), draw on contemporary social science perspectives to propose that instigating changes in behaviours and policies goes beyond relying solely on data and rational thought. Likewise, Lee and Diedrich (2018) argue that incorporating aesthetic experiences of the landscape can play a crucial role in informing broader public understanding. The emergence of nonrepresentationlism (or neorepresentationalism) further highlights the need to find alternatives in how findings are recorded and documented (Murris & Zhao, 2021a). The hegemony of discursive research in the form of writing or standardised mapping practices leads to a monoculture of visual representation and neglect of novel or alternate ways of communication.

19 Fieldwork as a nonrepresentational research practice assumes an ethico-onto-epistemological perspective (Table adapted from Murris and Zhao (2021a)):

Ontology

20 Fieldwork uncovers, engages, and intra-acts with dynamic networks, phenomena, or relations that are material-discursively emergent. The inquiry is transindividual and transcorporeal, where experience is not only a mental, human task. It is performed iteratively and non-linear. The world is understood and experienced as more than a mere vessel of spacetime.

Epistemology

21 Fieldwork fosters embodied knowledge production, enabling the experience of the in-between and unexpected or pre-cognitive. The diffractive process probes the field and aims to reconfigure, reimagine, or trouble the findings rather than simply (re)present, categorise, or order them. This produces findings from within and acknowledges and situates the fieldworker as part of the world. Fieldwork is inherently transdisciplinary and includes the more-than-human and nonvital. The tools, techniques, and apparatuses are agentic and co-construct findings.

Ethics

22 Response-ability is essential to fieldwork. Fieldwork outputs provide a platform and speculative space for the more-than-human and nonvital to respond and intra-actively engage beyond the *field*. Ethics and care are cornerstones of fieldwork practices.

23 The dissemination of findings is a crucial aspect of fieldwork and needs to be addressed critically and discussed from an epistemological standpoint. Traditionally, the documentation process in fieldwork in landscape studies is conducted in a form of mapping or map-making. Although this is a cartographic term, mappings do not need to be geographic or contain a Cartesian base. Alternative mapping practices such as affective mapping in critical cartography (e.g., Crampton & Krygier, 2006), spatial narratives (e.g., Caquard & Cartwright, 2014; Eanes et al., 2020), or deep and thick mapping (e.g., Bodenhamer et al., 2015; Presner et al., 2014) are well-researched. Incorporating fieldwork into spatial studies enriches and grounds our map-making process by promoting a deeper understanding of the complex interplay between human and more-than-human and nonvital agencies. It allows the researchers to engage in-depth with the observed subject and move beyond abstract theories. Engaging with the messy realities of the landscapes they work with ultimately leads to a more contextually relevant and ethically informed base for decision-making processes and their outcomes.

24 *We have to get at the more experiential, place-based experience of people and speak to that experience for projects to be successful, because imposing values does not get us anywhere. Taking into account multiple different interests to produce multi-benefit outcomes is going to be a basic requirement of adaptation efforts going forward, for it to be successful.*
(Milligan et al., 2021, p. 93)

25 Representational forms such as photographic images, graphs, maps, or theoretical concepts mediate our access to the material world, and representationalism asserts the ontological separation between representations and the entities they aim to represent (Barad, 2007). As such, representationalism is a Cartesian consequence of the internal-external bifurcation and Rouse (1996) addresses the asymmetry between "word over world" (Barad, 2003, p. 806). Barad (2007) further questions the assumption that representations are necessarily more approachable or available than the actual things they represent. They advocate for a performative understanding of naturalcultural practices:

26 > *A performative understanding of scientific practices, for example, takes account of the fact that knowing does not come from standing at a distance and representing but rather from* a direct material engagement with the world. *(Barad, 2007, p. 49 italics in original shown as regular font)*

27 Researchers and scholars engaging in fieldwork in spatial studies address the intersection between the process of on-site fieldwork and the subsequent curation of findings. However, methodologically, they are treated as separate methods stacked on each other. It is essential to acknowledge that fieldwork and mapping are often nonlinear tasks performed simultaneously and iteratively—one influencing the other and vice versa. Science philosopher Ian Hacking retells how seeing is tied to active intervening: ''You learn to see through a microscope by doing, not just looking'' (Hacking, 1983, p. 189).

28 Fieldwork through the lens of agential realism allows us to see this expansion of Hacking's critique of representationalism that experimenting (or, here, **probing** p. 113) and theorising (i.e., making sense of or applying meaning) "*are dynamic practices that play a constitutive role in the production of objects and subjects and matter and meaning*" (Barad, 2007, p. 56, italics in original). Barad understands this relationship as Bohr's proto-performative interpretation of knowledge generation (an observation Bohr has theorised in the context of the socio-natural character of the act of measuring) as an embodied practice, in contrast to the positioning of a detached observer (what they call a *spectator sport*) who pairs dialectal (or pictorial) depictions to antecedents (Barad, 2007).

29 > *To begin with, obtaining a reliable image free of all artifacts entails experimental know-how, intuition, ingenuity (all three of which are acquired through practice), a good deal of tinkering, the honing of tactile techniques in tune with the specificities of the instrumentation (including any of its idiosyncrasies), learning how to discriminate between unwanted noise and desired signal, between fact and artifact, and all kinds of other non-theory-based manipulations. (Barad, 2007, p. 51)*

3.1.3 Reconciliation with issues from the past

1 Untangling the above concepts and theories and reminding the reader of the aforementioned observed systemic issues and paradigm shifts sifts out five key streams that I diffractively combine in the following chapters, as well as introduced in the ones before (past and present are entangled after all):

2 **Fieldwork as a diffractive methodology** p. 137 is based on a reading of Karen Barad's (2007) concept of *agential realism*. I understand fieldwork as a diffractive methodology, which, therefore, goes beyond the traditional idea of work in the field and data collection. Fieldwork extends to the dissemination process and transcends domains as a material-discursive practice. The understanding of landscapes is crossed with the ethico-onto-epistemological process of iterative intra-activity.

3 **(Visual) representation** p. 71 (i.e., mapping, documentation, and recording) are crucial aspects embedded in fieldwork as methods, and techniques stacked on top of each other and iteratively applied, cannot be discussed fragmented or isolated from the process *in the field* but are a part of fieldwork.

4 **Solutionist thinking** p. 77 has led to systemic issues in our built and natural environments and is embedded in practices and methods based on outdated theoretical perspectives applied in landscape research and spatial studies, as well as positivist approaches.

5 Coastal areas in general, and the **coast of Aotearoa New Zealand** p. 52 specifically, are landscapes that urgently need rethinking in terms of our engagement with their current, past, and future state (i.e., through spatial planning, conservation, management, and designing)—including our ethical commitments. Prominent calls for action have been raised for a long time, and the climatic and ecological crises further amplify this need.

6 **Decolonising landscape** p. 67 must be a priority for future engagements with landscapes. Not only a reframing of the ontological conceptualisation of landscapes is needed but also a rethinking of the tools, methods, and techniques applied in this process. Considering their affordances and unintended consequences it is important to halt further repetition of colonial thought patterns.

7 These themes are addressed in their ethico-onto-epistemological entanglement. As human researchers, we are undeniably bounded by our humanness—whether in our perception of digital or abstracted information or our embodied experience as an observer in a particular, physical place. Our interaction influences what we tentatively will focus on and record for future representation. As outlined in Barad's (2007) theory of **intra-activity** p. 92, this process is mutual and reciprocal: We influence what we engage with and vice versa. As outlined earlier, mappings have a crucial impact on how we subsequently see, understand, and work with landscapes. Without a discourse on the performativity of tools, we risk repeating the mistakes of the past—reverting to

solutionist approaches. This call is likewise raised by practitioners and scholars (e.g., Braae et al., 2013; Hemmersam & Morrison, 2016).

8 *This means that 21st century designers have not completely left behind the legacy of the modernistic era of the 20th century, which promoted design from scratch, complete with respective design methods to shape sites seen as tabula rasa—static, empty, bounded, functional units devoid of history or dynamism. Understandably, this legacy has led to a lack of appropriate design methods and work modes able to transform sites through taking on their mutable extant qualities rather than to design them anew according to a universal recipe.*
(Braae et al., 2013)

9 Furthermore, the processes, tools, and approaches utilised to generate such mappings are also performative: it's turtles all the way down. Hemmersam and Morrison raise a call to action to move beyond the reductionist mode of modernist mapping techniques—particularly for places in "urgent need of new conceptual approaches capable of enabling future thinking and strategic action" (Hemmersam & Morrison, 2016, p. 23). Many researchers argue that the practice of reductionist or utopian models and visual representations detached from specific locations may result in disconnection between the inhabitants (human and nonhuman) and their lived environment (Hemmersam & Morrison, 2016). The call for basing urban research on direct interaction rather than abstract observation goes back to the 1990s and beyond (Sennett, 1992).

10 *Why do rivers flood? The simple answer is that they flood because water crosses a line drawn by humans. As such, a flood cannot be a natural event, let alone a natural disaster. Over the years, our interest has turned from a line transgressed to a line invented. It is an act of design.*
(Mathur, 2017, p. 62)
(Mathur also references Harald Fisk's maps as seen in (FIGURE 42))

11 The shift away from solutionism also means embracing wicked problems for what they are. Arguably, (political) consensus is hard to achieve in any country or belief system; therefore, respecting differences must be strived for—among humans and nonhumans—as well as allowing for planning for and with diversity (Milligan et al., 2021). Several agencies have engaged with Māori communities and are incorporating Te Ao Māori approaches into processes and decision-making recently, as exemplified by the Environmental Protection Authority Te Mana Rauhī Taiao (Poa, 2020). Aotearoa New Zealand boasts numerous community-led initiatives dedicated to ocean and waterfront protection and planning. Organisations like Takutai Kāpiti (Kāpiti Coast District Council, 2024) acknowledge the necessity for coastal adaptation and mitigation, integrating local and Indigenous Knowledges in their supportive role for local councils and decision-makers (Ātiawa ki whakarongotai, 2019). Aotearoa New Zealand holds the potential to reconnect with its cultural and natural heritage. This involves adopting a philosophical approach guiding a narrative of paradigm shifts in our comprehension of landscape and mapping. Recognising the rich history, existing Knowledges, and ecological sensitivity within mātauranga Māori offers a vital opportunity to address systemic issues rooted in colonialism and capitalist practices in Western thinking.

12 Considering the particular case of Aotearoa New Zealand, the country's bicultural history—although observed as an, unfortunately, convoluted political discussion in popular media—brings an advantage to re-assessing current planning practices. The confrontation of different worldviews highlights blind spots and biases in the paradigms applied to planning processes, and this must be recognised as a benefit to improving approaches: "Two descriptions are better than one", after all (Bateson, 1988, p. 189).
•

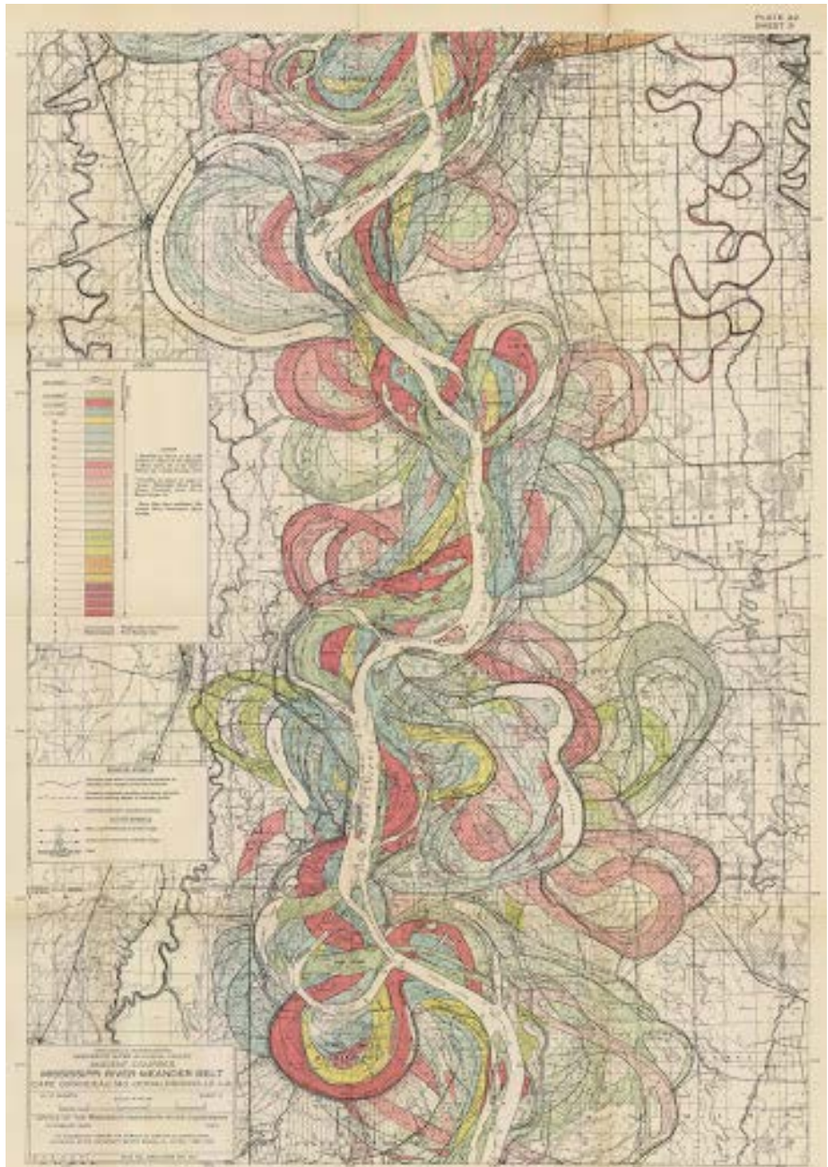


Fig. 42
Historical traces of the Mississippi river.
(Fisk, 1944)

Fig. 43
Growing mangroves. (Werder, 2024)
WATCH ON YOUTUBE.

"It's better to do than to judge, to produce than to evaluate. Or, rather, it's in mining coal that one learns if it is gray or black. It's better to create than to criticize, to invent than to classify copies."
— Michael Serres (Serres & Latour, 1995, p. 136)

3.2 FIELDWORK & WALKING METHODS

1 As outlined before, fieldwork is an entangled process between on-site investigations, or probing, and dissemination of findings. Fieldwork as a method in spatial studies is well-researched, critically applied, and reflected on. However, the general approach and best-practice still refer to an understanding of fieldwork based on other disciplinary studies and include contrary notions to the paradigms in landscape studies. Particularly the discussion around the aim of collecting data and the relationship between the uncovering of findings and subsequent (visual) representation or documentation do not fit the complex processes and understanding of landscape studies. A conservative definition of fieldwork repeats the outdated positivist, extractive paradigm that is no longer fit for dealing with and working through landscapes of the 21st century.

2 The following sub-chapter investigates existing fieldwork methods in landscape studies and the associated research around them. As a vital constituent to fieldwork, I will also address the research and theorising on walking methodologies as there is significant overlap and mutual dependence on these two fields of study. I am introducing *fieldwork as a diffractive methodology* and outline how this theoretical framework aids in remediating the issues presented in this thesis. Fieldwork, here, is understood in a broader way than the traditional definition in landscape studies implies, establishing a novel synthesis of the literature and practices. By applying the concept of Karen Barad's (2007) agential realism and diffractively reading fieldwork research methods through this lens, I establish a theoretical framework that redefines fieldwork within landscape studies. As a counterpoint to landscape solutionism, fieldwork must be strengthened and propositioned more prominently in disciplines and domains concerned with the past, present, and future developments, management, and conservation of landscapes.

3.2.1 Methods in fieldwork

1 Fieldwork is an established method applied in different disciplines, such as geology, biology, anthropology, or ecological sciences (Ragsdale, 2018). Anthropologist Henry F. Wolcott defines fieldwork as "a form of inquiry in which one is immersed personally" (2005, p. 58) and understands this process as an artistic and scientific act. In landscape studies, fieldwork, as the name suggests, is conducted *in the field* and is an immersive act of connecting with a particular site by spending time on an actual location (Holmes, 2020; Ragsdale, 2018). In landscape architecture, fieldwork is often synonymous with site analysis or site inventory*—where observations and experiences produce findings that are synthesised and concluded (Ragsdale, 2018). This synthesis of information is an act of knowledge production through action-oriented methods (Qviström, 2023). Data collection or probing is implied in this process, and recording and documenting specific, primarily visual, features or phenomena of a site is expected. Immersion, observation, and documentation are core activities related to fieldwork processes and techniques and tools are often adapted from disciplines such as ecology or anthropology (Ragsdale, 2018). Fieldwork could be mistaken as *survey*, which, as a term, is often tied to military missions or colonial exploration. Surveys, historically, were conducted to *prove* something, resulting in biasing the method, tools, and findings (Lutsky & Burkholder, 2017).

2 Furthermore, there exists a bias in the current political climate and the rise of ***Big Data*** p. 079 towards favouring quantitative facts over qualitative considerations, often emphasising formulaic methodologies (e.g., the research proposed by Cialdea (2020) defining landscape quality or Cizler and Soriani's (2019) investigation of bottom-up approaches). Consequently, investigations frequently rely on *a priori* knowledge, typically initiated from a distant standpoint and informed by cartographic representations, such as maps or plans. However, fieldworkers intuitively distrust prescribed data as a Cartesian epistemology—a question of the relationality between the object and subject.

3 Diverse methods have been applied and researched in landscape-related fields (e.g., Ragsdale, 2018, as well as the methods further investigated in Chapter 4), and transdisciplinary methods such as sampling methods or autoethnography are adapted for studies in landscape science related fields. Fieldwork as a method for landscape studies are traced back to the work of Kevin Lynch (Lynch & Hack, 1984) or Ian McHarg's (1969) overlay method (Herrington, 2010; Ragsdale, 2018). Transdisciplinary cultural critic Jane Rendell claims fieldwork in design's reliance on social sciences and explores the *ethnographic turn* that has influenced many disciplines (Mattern, 2016; Rendell, 2011).

* Here, I would also like to make a distinction between *fieldwork* and *case study*—where I understand fieldwork as the process of looking at what the sciences would call primary sources, and the latter being concerned with secondary sources; Case studies generally study and analyse design projects that have been realised. However, this does not mean that landscapes are seen as purely natural, as they likewise constitute an altered environment influenced by human actions, and anthropogenic processes and the distinction between culture and nature is uplifted.

4 Fieldwork is often de-glamourised as a messy, subjective, and highly individualised practice—the stereotypical image of a researcher with dirty hands and muddy gum boots prevails. However, fieldwork is a multidimensional approach and is a material-discursive practice challenging representational frameworks. In recent years, research organisations, educational institutions, and practices in landscape studies have been concerned with the role of fieldwork in landscape architecture and planning. In their comprehensive literature review, Fekete and van den Toorn (2021) draw on a range of applications of fieldwork for practice, education, and research in landscape studies, looking at scholars' and practitioners' work such as Christophe Girot (1999), Laurie Olin (2008), or Gareth Doherty (2019) among many. The authors identified fieldwork as a cornerstone in educating future landscape architects (Fekete & van den Toorn, 2021; Ragsdale, 2018), where fieldwork is considered a "rite of passage", a stepping stone to the professions (Mattern, 2016). However, there is a gradual loss of fieldwork as a method, going from education, didactics, and pedagogy to practice, especially policy and planning (FIGURE 44), where the final outputs are valued more than the process of attaining the findings. Therefore, Fekete and van den Toorn (2021) observe a lack of publications and examples and sadly observe fieldwork as *endangered* due to global financial cuts in educational programs because it is *expensive* and time-consuming.

5 Fieldwork—just like landscape (studies) (Ragsdale, 2018)—is multi- and trans-disciplinary in its methods, techniques, and outputs and fosters the creation of connections across different fields of study, such as geology, or water management, and the like. Synergetic information that surpasses disciplinary boundaries can transform spatial planning, particularly in an "interstices-rich" realm confronted with *wicked problems* (Kahn, 2021a, p. 202). It further encourages immersion into the landscape (Ragsdale, 2018). Holmes (2020) points out that "genuine fieldwork requires rigor and openness", allowing for the discovery of the unexpected—the immersion into a

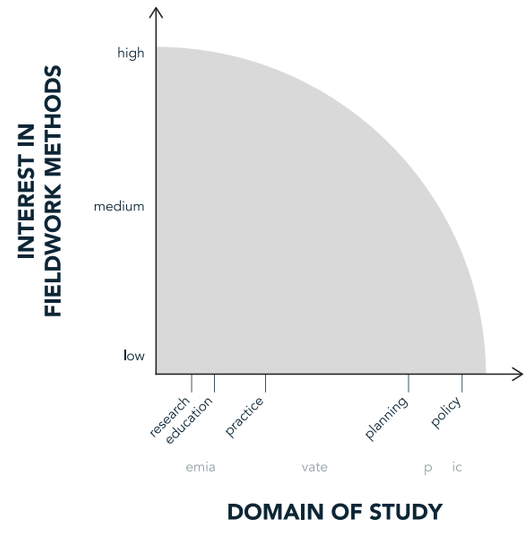


Fig. 44
Interest in fieldwork as a method across domains in spatial studies. (Werder, 2024)

site inevitably undermines pre-existing assumptions and, therefore, the fallacy of a solutionist approach. Holmes points out that not all engagement with site is necessarily fieldwork and understands that certain methods of site analysis differ from fieldwork as they "contribute directly to the ossification of solutionist framings" (Holmes, 2020). This openness is vital for the practice of Vogt Landschaftsarchitekten, for example, as Günther Vogt points out: "Our work begins not with a hypothesis to prove, but with a search for relevant questions" (Vogt in Foxley, 2010).

Field versus site versus lab

6 A definition or theory of fieldwork, or theorising about it, requires a definition of *field*. In landscape architecture, it is implicitly understood that the *field* is the literal field where researchers go and investigate a **site** [p. 58]—often a, more or less, *empty* patch of land (I am challenging this concept in **5.3.7** [p. 253]) that usually has been defined as a place for future intervention (i.e., conservation, management, but mostly: a potential site for an architectural or landscape project).

7 Field and site are both spatial terms that have come to increasing focus in landscape, geography, or architecture disciplines. Like the humanities, they have gone through a *spatial turn* led by researchers and scholars such as Doreen Massey, David Harvey, Saskia Sassen, and Edward Soja, who are also relating to Henri Lefebvre's *The Production of Space* (1991), Michel Foucault, Michel de Certeau, and further scholars such as Marc Augé, Gaston Bachelard, Jean Baudrillard, or Gilles Deleuze to name a few (Mattern, 2015; Rendell, 2011). Field often still has agricultural connotations (deriving from the Old English or German *Feld*) describing a parcel of cultivated land (Jenkins, 2018). In spatial studies, field is a relational term, contrasting the more established and more fixed term of *site*. Related disciplines, such as cultural geography, have explored space as an active factor and place importance to unfixed and relational qualities of space (Rendell, 2011). Jane Rendell dwells on the distinction of *field* and *site* as she discusses the terms with Suzanne Ewing, whose understanding encompasses:

8 *site is a place to practice in/on/with, and field is a place to learn from/in'...*
"To site" implies definitive moves, an author(s) and of course specificity.
"To field" is more contingent, responsive, and depends on flowing, pervasive conditions, clouds, indeterminate edges'.
(Ewing in Rendell, 2011)

9 As fieldwork promotes *real-life* and *real-time* observations, the process involves extensive empirical (outdoor) observations. This method differs significantly from the sciences, where observations are made in laboratories with perfect environments and conditions reduced to fit a standardised model (Fekete & van den Toorn, 2021). Field is not a pre-existing space that is entered or visited: The observer or researcher "brings it into being by conceptually delimiting it, and then "working" it" (Mattern, 2016). From an agential realist perspective, it is important to understand that field (or space and time) are not empty vessels waiting for activation and action but are constantly *spacetimemattering* that is expressed through dynamic, iterative intra-actions (Barad & Gandorfer, 2021). Barad explicitly mentions landscapes' characteristic as layered, vital *time-beings* with *sedimenting historicities* (Barad, 2018, pp. 82—83).

10 The groundedness to a **site** [p. 58] offers researchers a bottom-up perspective providing a vital contrast to our regular exposure to top-down representations and further emphasises the joint process: Places, as Doreen Massey (2003) argues, are continuously emerging in their reciprocal engagement between the site and its visitors and have multiple identities due to their multiplicity of conditions. From an agential realism perspective, site is not a passive location waiting for human categorisation and labelling.

Characteristics and benefits of fieldwork as a method

11 The following aspects are considered essential parts of fieldwork, resulting in inherent benefits and affording specific outputs and findings.

12 **1. Empirical observation:** Fieldwork allows researchers, practitioners, and planners to directly observe and interact with the physical environment and its various elements. This empirical engagement helps them recognise the presence and agency of nonhuman entities, such as ecosystems, natural processes, and ephemeral qualities. By witnessing these agencies in action, researchers gain a deeper understanding of how the material world affects us and vice versa.

13 **2. Contextual understanding:** Fieldwork provides context-specific insights into a particular site's unique dynamics and entanglements. Fieldworkers can see how human and nonhuman entities **intra-act** [p. 92] within a specific landscape, shedding light on the complexity of spatial relationships and contextual and situated knowledge.

14 **3. Probing and data collection:** Fieldwork provides valuable *data* (or rather findings). These data, collected through direct observations and engagements, go beyond static, unidimensional measurements and can be integrated into documentations to create more nuanced and context-sensitive mappings. By adopting a more iterative process, fieldworkers also establish a continuous feedback loop between writing—reading—re-writing—re-reading mappings (see **Chapter 3.3.2** [p. 139]) that allows to diffract, edit, and build upon previous probings and data collections and their visual representation or thematic curation.

15 **4. Multisensory experiences:** Fieldwork engages the researchers' senses, allowing them to perceive landscapes not only visually but also through touch, sound, smell, or even taste. This multisensory experience can foster a more embodied and holistic understanding of a place or site, enabling researchers to appreciate landscape's materiality and agency within a specific context. These observations potentially reveal qualities that are traditionally neglected or underrepresented and foster a material-discursive engagement and dissemination.

16 **5. Synthesis and representation:** Fieldwork practices are concerned with synthesising findings and constantly challenge the conventions of (visual) representation. A diversity of methods how findings are presented and collated also means novel ways to emulate and disseminate this knowledge. However, planar depictions and written text favour an inducted audience and require specific knowledge that potentially excludes certain demographics.

17 **6. Collaborative engagement:** Fieldwork encourages collaboration and co-production of knowledge. It often involves working with diverse stakeholders, including local communities, scientists, and policy-makers. Interactions throughout the process of probing can be used as further evidence of specific qualities and initiate the inclusion of citizen scientists or underrepresented communities. Such collaborative engagement aligns with the idea that knowledge is co-constructed through interactions between human and nonhuman agencies.

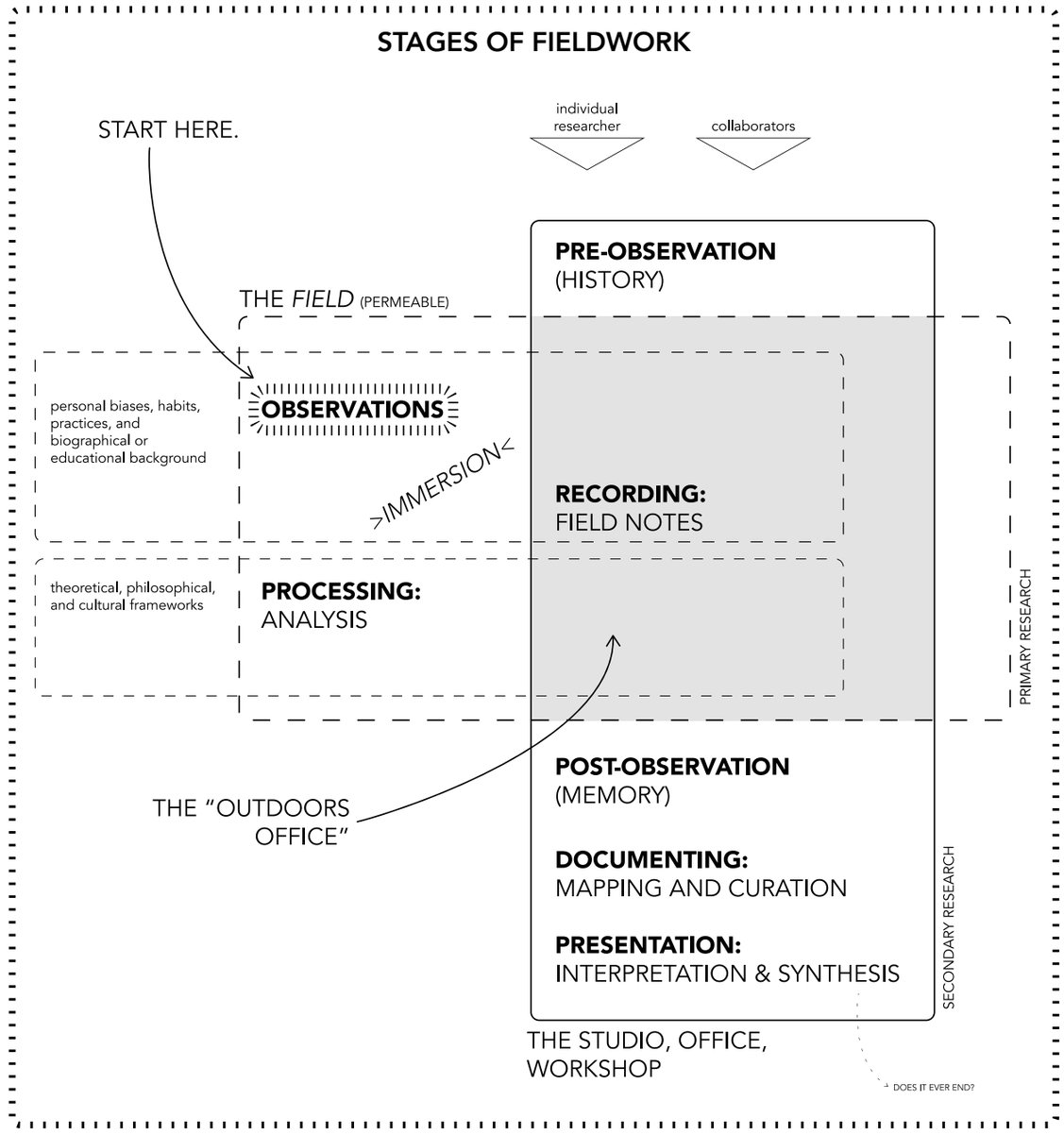
18 **7. ~~Reflective~~ Diffractive practice:** Fieldwork promotes a diffractive approach to engaging with landscapes. Researchers understand their situatedness and perspective as they engage with a landscape. This perspective is consistent with recognising that the observer is not separate from the observed but actively participates in knowledge production.

19 **8. Ethical Considerations:** Fieldwork often involves ethical dilemmas related to the treatment of landscapes and the well-being of communities. Researchers engaged in fieldwork are confronted with ethical questions that emphasise ethical accountability in knowledge production and decision-making.

Process and tools for fieldwork practices

20 During their inquiry, researchers constantly take notes of their findings. These recordings are often multi-media, including videos, photographs, written notes, sketches, sound recordings and other material (Hemmersam & Morrison, 2016). This *live* process is later re-visited in the office or study, where the data and records are sorted, organised, and eventually curated into some form of presentation (FIGURE 45). The process of choosing relevant data and organising them in a meaningful way requires reflection and relies heavily on the tacit knowledge of the researchers or practitioners. Fieldwork inherently focuses on qualitative data collection, concentrating on the ephemeral, atmospheric and particular, as researchers are exposed to and confronted with these characteristics of a site. As humans, we can only directly perceive quantitative data if we use specific devices and tools to measure or track certain features. Fieldwork is sometimes qualitative and messy: "the sticky materiality of practical encounters" (Anna Tsing in Scott, 2016) counter an analytical and systematic methodology. These snapshots, recordings of moments of time, also contrast the abstraction of quantitative data that is presented in averages and medians. Fieldwork addresses spatial exploration but also temporal encounters.

Fig. 45
The different activities and stages of fieldwork. (Werder, 2024)



21 Much research is conducted on visual representations such as mappings. However, the benefits of these methods for planning practices needs more critical discussion. Fieldwork holds the potential to challenge current normative visualisation techniques. Generally, the final output—often in the form of a map or plan—precedes a selection process, implicitly putting a value on the findings. As some may be neglected or chosen not to be shown, other aspects may be magnified in the researcher's visual representation. The final output, therefore, may significantly differ from the *raw* data that have been collected. This is an inherent flaw in our current platforms for spatial planning as they present the information as a *fait accompli*, disguising the data collection process.

22 Fieldwork researchers are consciously aware of this process and are just as interested in translating information into different forms as in the content itself. Therefore, fieldwork provides a counterpoint to Turan's (2016) critique of the disjunction between data and environment (i.e., *reality*). Thanks to site immersion, fieldwork processes can help ground the researcher and narrate the findings more effectively; With localised, sensorial, and tangible results being more physically and emotionally graspable. Findings from fieldwork can potentially form an accumulation of results that can be merged with other data sets. The process involves constant iteration, and fieldwork processes are inherently dynamic, where conversations between collecting data and representing these findings are ongoing and reciprocal. The open-ended and often unforeseen encounters facilitate a creative synthesis of the studied landscape and relate the anthropologic perspective to a site-specific context. In spatial studies, fieldwork can also be considered an intra-action between the researchers and their geospatial technologies (Kwan, 2007), as this process is usually reflected critically. However, Mattern (2016) also points out the fetishisation of fieldwork and the tool kits (think of neatly arranged kits and field guides) used. The narrative of the *hero* in the field, stubbornly defying the elements and venturing into the unknown prevails and still often repeats a male-dominated image (the white-male adventurer trope) enclosed in colonialist and gendered ideologies.

Serendipity: The planned and unplanned

23 Fieldwork enforces an ability to troubleshoot, come up with ideas on the spot and letting go of clear-cut itineraries as out-of-control elements are embraced: Weather or tidal conditions may force us to go different routes, road blockages are re-routing our paths or accidental discoveries are changing our focus. On the one hand, these *accidents* or serendipitous findings may change our itinerary and force the researcher to re-evaluate their plans due to specific encounters. Traditionally, anthropologists conducting fieldwork highly rely on such serendipitous findings, and walking is an effective method to enable these chance encounters (Doherty, 2019). On the other hand, a reflection on the process may also reveal unexpected findings. Planned versus unplanned visits foster the potential to encounter phenomena we otherwise would have missed or not expected. Specifically in coastal areas, where landscapes are in more daily flux, a visit at an unexpected time, such as tidal conditions (or even night-time visits), may uncover new situations. This approach requires the researcher to explore a site when the conditions may not be ideal or favourable for the data collection.

24 *Fieldwork is not well suited for individuals who thrive on authority and expertise and feel they must know everything about whatever subject they touch. Nor is it comforting for anyone obsessed with maintaining control. But fieldwork is wonderfully suited for those who find satisfaction as lifelong learners, ever appreciative of how much others know and have experienced, rather than in need of parading their own knowledge before audiences. (Wolcott, 2005, p. 225).*

25 While fieldwork approaches may appear lacking in rigorous structure, this apparent omission of control is essential to counteract the solutionist approaches prevalent in the 19th and 20th centuries, which have contributed to systemic issues in our built environment—a quality in which control-obsessed politics is not thriving (Ragsdale, 2018). A stance of curiosity is vital (Lutsky & Burkholder, 2017). Unexpected discoveries are not only idea generators (Li, 2021) but also have the potential to shift perspectives or re-evaluate the importance of specific qualities or attributes of a site and to mitigate the selection bias inherent in our expectations based on historical data. Engaging in critical reflection during fieldwork enables detecting and addressing anthropogenic influences on observations. Furthermore, the initial outcomes of fieldwork, assuming it is comprehensive and open-ended, can be considered artifacts that unveil information about a site as well as the thought processes of the researcher (Kahn, 2021a). A meaningful discourse on methodology and frameworks becomes imperative in this process. *Querfeldein*—across the field—provides unexpected observations and creative responses. Collaboration further amplifies this aspect as collecting findings is often done in a group setting. This is already reinforced in educational programs, where fieldwork is often conducted as group work to encourage the students to expose themselves to different perspectives and specific qualities (Fekete & van den Toorn, 2021).

26 Rekittke's (2015) work also discusses the subjectivity of the method. He discusses the importance of discourse between site-specificity, the researcher's biased observations, and the need for abstraction and generalisation when documenting and communicating the findings. Although these methods have led to good (built) examples, and the focus on local phenomena is not new to architecture or landscape architecture (see Kenneth Frampton's (1983) essay on „*Critical Regionalism*"), the approach is subject to criticism as it often lacks reproducibility due to its anecdotal and biased nature. Qualitative research is a common approach in most social sciences. It is argued to be more inclusive and equitable in an ever more globalised and interconnected world, thus providing valuable data for contemporary (city) planning.

"In the nature of things:
Art about mobility, lightness and freedom.
Simple creative acts of walking and marking
about place, locality, time, distance and measurement.
Works using raw materials and my human scale
in the reality of landscapes."
—Richard Long (n.d.)

3.2.2 Walking methods

1 Walking is an integral, although implicit part of fieldwork, and the latter can only be fully understood with a closer look at the agency of walking. Theorised through the concept of the *flâneur* by Charles Baudelaire, Lucius Burckhardt's *Spaziergangswissenschaften* (Strollology) (2006), Guy Debord and the Situationist International's *Dérive* (Debord, 1981), or the field of psychogeography (e.g., Lynch & Hack, 1984), and elaborated on by artists such as Francis Alÿs or Larissa Fassler (Cataldo & Fassler, 2021), walking has a rich history in knowledge generation and reflective theories and fields such as place-making and ethnographic methods. More recently, Stephanie Springgay and Sarah Truman (2018) explored walking as a methodology embedded in a posthumanist, nonrepresentational, and more-than-human framework. Walking is explored as an aesthetic practice for design and pedagogy (e.g., Rae et al., 2017 (FIGURE 46)) but also finds theorising in other fields of study.

2 In recent years, walking and observation as a methodology for site analyses has gained increased interest in landscape architecture. The notion of motion and movement within and through landscape coupled with the effects of visually experiencing landscapes is deeply embedded in the inception of landscape architecture as a discipline (e.g., theorised by John Dixon Hunt (2003) as a contrast to the *primacy of sight*). However, the discipline needs assistance to adequately represent this characteristic in its visual representations. The discourse involving the interconnected processes of walking, field recording, and visualisation is still developing and mainly only addressed implicitly.

3 Springgay and Truman (2018) theorise about walking as a methodology and *research-creation* in their WalkingLabs. The authors understand walking as a method (with different forms, such as a long walk or dérive) that can be merged with other methods, such as drawing, photography, or sensory methods (also see Rae et al., 2017). The authors understand walking not simply as a method instrumentalised to gather data but rather as speculative **probing** p. 113 and a performative experiment (van Dooren et al., 2016, p. 9) where a discourse of intentions occurs. Doherty also refers to the "tactility of landscape" (Doherty, 2019, p. 147) as a valuable characteristic of a physical and sensorial walk (Pink, 2007). Springgay and Truman (2018) summarise their research as a more-than-human methodology as it combines ideas of new materialism, posthumanism, and notions of non-representational and postqualitative methodologies. The authors understand their walking methodologies as an idea of

4 *...thinking-with walking we shift from an individual account of a human walker to consider an ethics and politics of 'walking-with.'*
(Springgay & Truman, 2018, p. 3)

5 Barad seconds this perspective as they understand knowing not as a "bounded or closed practice but an ongoing performance of the world" (Barad, 2007, p. 149). Pink further speaks of "emplacement" that locates the embodied experience of the researcher "within a wider ecology, allowing us to see it as an organism in relation to other organisms and its representations in relation to other representations" (Pink, 2011, p. 354). Similarly, Malone and Bozalek (2021) see the potential of encountering the marginalised, invisible, or even monstrous in the process of *walking-with*. Walking methods share integral aspects and qualities with fieldwork, permeating landscape architecture and related studies (Ingold, 2004, 2021). The following aspects, therefore, are also relevant to fieldwork methods in general.

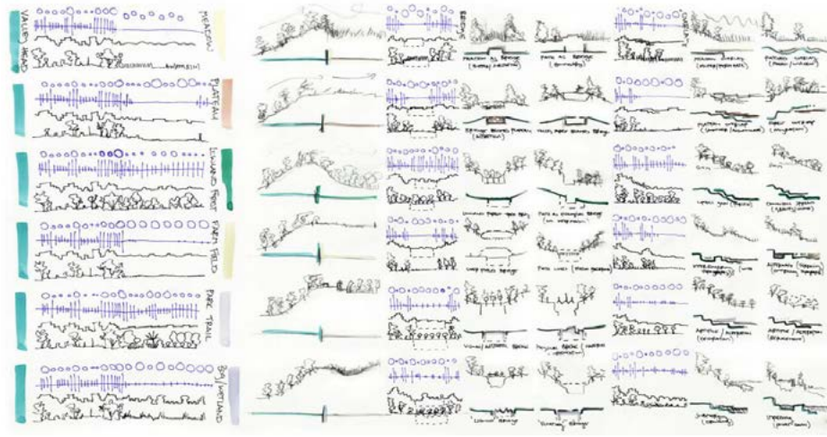


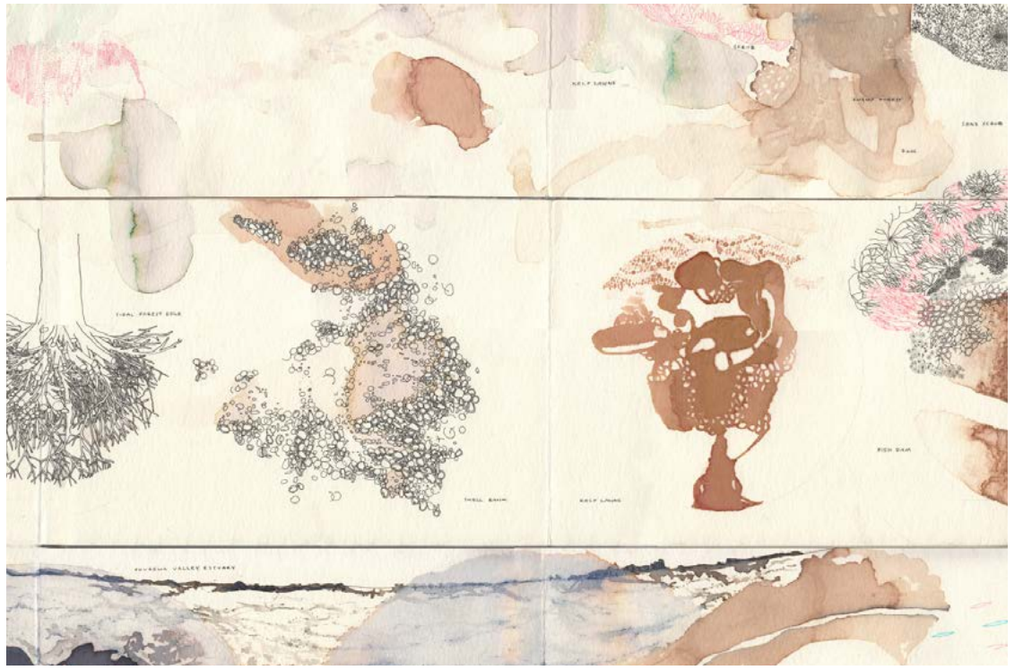
Fig. 46 Walking typologies. (Rae, 2017)

A Peripatetic process and immersion

6 Walking, as a sequence, means movement through space and time. While landscape representations have traditionally favoured a static view (the default for most two-dimensional representations), walking requires a conscious or indeliberate itinerary (Ellah & Douglas, 2020). Ellah and Douglas (2020) consider drawing or recording while on a walk *peripatetic cartographies*. This unfolding and emergence resembles the unstable and shifting characters of landscapes (Ingold, 2021) and puts the walk-er in closer alignment with this dynamism. Therefore, this movement through space and time also results in a reflection of *drawing tenses* (Ellah & Douglas, 2020)—is the past, present, or future recorded, and how is this communicated in the drawing itself?

7 Peripatetic practices further relate to the second compound of the term field*work*, which relates to the activity performed: *work*. Work is mainly understood as an on-site analytical study and collecting and recording of information—it is cognitive and physical work. Usually, a large area is covered on foot, allowing one to explore and experience different areas or aspects of a place and tread lightly in a particular environment. On the other hand, walking allows the researchers to establish a pace of movement that facilitates observations at different scales. The slow-paced walk through a landscape, therefore, opens our view to little details and grand vistas simultaneously.

Fig. 47
Pourewa Valley
Estuary
(Ellah, 2019)



B Pace and pacing

8 The prescribed slower pace of walking allows for contemplation but also requires patience and attention of the observer. The pacing of a walking methodology counters the remote top-down analysis, where zooming and scrolling are performed without much thought and effect. Walking opposes the detached and remote study of a site through plans, satellite images, or another form of data that have become prevalent with the growing capabilities of our digital tools (Jenkins, 2018). While these tools certainly have advantages, they lack a more intimate connection to a subject of study and only ever re-tell findings as a secondary source. The ubiquity of these tools has also led to their loss of efficiency (Desimini & Waldheim, 2016) and clouded the focus on material realities for landscape architecture practitioners (Lutsky & Burkholder, 2017). This detachment and distancing from the actual site of study is against the idea of uncovering local particularities and reinforces the outdated paradigms of landscape as a controllable commodity.

9 Ellah and Douglas (2020) (FIGURE 47) describe this slowing down as lingering and loitering off-balance, and they quote Isabelle Stengers: "The idea is precisely to slow down the construction of this common world, to create a space for hesitation" (Stengers, 2011, p. 995 in Ellah & Douglas (2020))—a concept where new values could emerge. This idea goes hand-in-hand with an appreciation of collaborative and collective processes (collaboration not only between humans but also between humans and nonhuman entities) where thinking is performed in "the presence of others" (Stengers, 2005).

C Embodiment

10 Immersion into a site allows the researcher to have an embodied experience in a specific context. The experiences observed and potentially recorded are guided by our human senses–smell, touch, sight, sound, or even taste. The close connection between researchers and the field fosters accountability and helps to contextualise findings. The simultaneity of observations is an advantage stemming from our humanness. Jenkins (2018) references Henrik Schultz's observation of walking, emphasising sensorial observations by triggering associations, flow states, and creativity. Walking enforces embodied thinking and exploration, where our movement is integral to the process. Petri (2022) investigates the physiological configurations of walking and how our humanness, therefore, constitutes a specific experience and culture of walking which is inherent to the human bipedalism and forward-orientation "one of the body technologies constituting the quality of spatial experience" (Petri, 2022, p. 1). The author links these observations of hidden or unperceived affordances to Karen Barad's theory of **intra-activity** p. 92 (Barad, 2007). The boundaries between the body being an object or subject are blurred based on the performatics of such a material-discursive practice (Barad, 2007). Petri (2022) declares a lack in research on the embodiment and agency of walking as a research method, where the body is understood as a living and sensitive instrument instead of an object. As such, Petri (2022), relating to Böhme (2002, in Petri, 2022), considering walking a *transactional* process, an exchange of information.

11 The embodied experience triggers an alternative method of knowledge generation (Ingold, 2011), countering discursive analyses and allowing exploration beyond material observation (Rae et al., 2017). While cartography has historically struggled to visualise the vertical axes (i.e., topography and the height—or depth—of things), our physical pace will inevitably experience this. Cartographic maps "cannot contain the feel of legs on an incline" (Maher, 2014). Likewise, this adaption is relevant in cultural geography and is gaining attraction as a research method (Carreri, 2018; Doherty, 2019). Our humanness (i.e., our size and scale, as well as the quality of our senses) defines our findings—which we can use to our advantage. In the age of artificial intelligence and large language models taking over many processes, we can harness our physical embodiment as a vital benefit for data collection.

12 Embodiment is vital in landscape probing and physical exploration and as a design technique and response. Schon notes: "A designer's knowing-in-action involves sensory, bodily knowing. The designer designs not only with the mind but with the body and senses" (1992, p. 133). However, the embodied position also raises important topics around inclusivity and ableism. Springgay and Truman (2018) understand walking methods often as a privileged practice as they reflect on experiences of researchers that put themselves into a vulnerable position as a walker (e.g., stories of females wearing hijab report different experiences of walking through a space than researchers clothed differently). However, even without these restrictions, walking methods are inherently fragmented and partial (Shortell & Brown, 2014).

D Experiencing scalar diversity and trans-sectional and transareal discovery

13 As outlined above, our physical abilities guide our multi-sensory perception and our scalar dimensions. As humans, we experience a site in relation to our scale.What is accessible to us also depends on our ability to reach certain places or observe certain artifacts without specific tools (such as a microscope or binoculars). This potential of a multi-scalar process can catalyse knowledge generation and counter blind spots and biases. In spatial planning, for example, the traditional narrow scalar band favouring standardised scales that do not fully convey global climatic and ecological challenges are rarely discussed or critiqued (Gerrard in (Coen, 2016); or illustrated in the example of Dripps (2021) in the case of the urban structure of Manhattan).

14 While walking (or conducting fieldwork), researchers inevitably combine explorations across various neighbourhoods, areas, and terrain (even on the journey to and from a specific location). Horizontal movement is combined with the slight vertical movement of going up and down hills, noticing little thresholds and steps. As researchers move through space, they automatically move across different *zones*, which are (arbitrarily) delineated on mappings and plans. The *gradual* nature of the physical world is perceived and distinguished and enables to critically reflect on the planning systems applied in spatial planning approaches and zoning for land use. Conventional site analyses frequently concentrate on a defined perimeter, often confined to a homogenous and mono-programmatic zone or ecosystem characterised by similarities or adherence to a shared criterion. This approach overlooks the boundaries between distinct zones (FIGURE 48)—whether they are ecological, cultural, or otherwise present. Consequently, contrasts and similarities become more challenging to identify, and intersections and boundaries are not addressed.

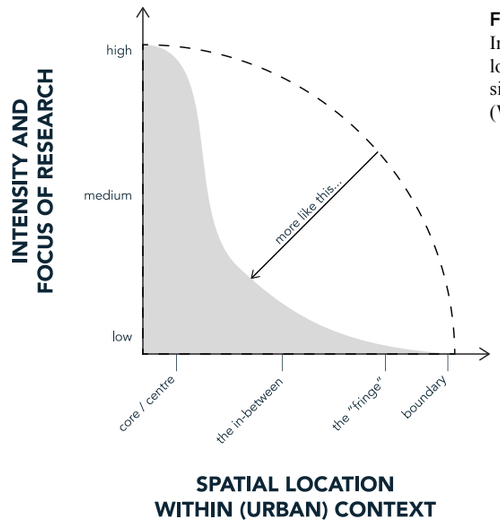


Fig. 48
Intensity of research according to spatial location in the (urban) context. Note the similarity to the graph in (FIG. 44), **3.2.1** p. 123. (Werder, 2024)

15 Walking, combined with the site-specific practice of fieldwork, helps researchers identify network patterns beyond their usual areas of inquiry and nurtures an embodied experience of a place. Additionally, this helps to narrate the multi-scalar experience. It guides them to understand and deal with the scalar disjunction experienced through climate change—this aspect has already been shown by philosophers and scholars such as Spinoza or Deleuze (Richardson, 2020).

E Context, situatedness, and relationality

16 Walking brings along an inherent situatedness and grounding in a specific context or location. Intentionally exploring a site on foot reveals relational knowledge and appreciation for the interconnectivity of the different phenomena. Site and landscape specifically can benefit from the pedestrian agency, with findings allowing for relational encounters (Ellah & Douglas, 2020). Springgay and Truman consider this mode of travelling as "a way of becoming responsive to place; it activates modes of participation that are situated and relational" (Springgay & Truman, 2018, p. 4).

17 Researchers engage with the study context and establish a first-hand connection to a site, becoming participant-observer (Mattern, 2016). The notion of a *bounded observer* is more explicitly addressed in these practices. The researchers operate from the inside, unlike what is usually claimed in an analysis done from afar or in a purely digital context.

•

Fig. 49
View between trees.
(Werder, 2024)

3.3 FIELDWORK AS A DIFFRACTIVE METHODOLOGY

1 The systemic issues and observed paradigm shifts outlined in the previous chapters await re-solution. By applying the lens of agential realism to landscape research in general and (centralised) spatial planning in particular, the entangled relationship between research (site analysis or fieldwork) and (visual) representation (e.g., mappings) stands out. Intuitively, and supported by the literature, these processes are not separated in their spatiotemporal existence as methods and tools. However, they are often studied as individual aspects of landscape research.

2 In this chapter, I explore the performative character of the process of map-making and highlight the interconnected process between *reading* and *writing* landscapes. I conclude that these stages are not only entangled but also extend further. Mappings or maps, as tools of communication, learning, and seeing, challenge the notion of them as final products. As boundary objects, they are vital tools for the researchers themselves as well as for their intended audience. Mappings, therefore, are seen as constantly *in-process*, evolving entities. Fieldwork transcends the work *in the field* and becomes fieldwork*ing*—a transareal methodology that ethico-onto-epistemologically engages with probing, dissemination, and diffractive reading of complex, culturalnatural landscapes.

3.3.1 Facilitating the paradigm shifts in the context of coastal spatial studies

1 Fieldwork and walking methods are popular subjects of study in landscape architecture and related fields. The processes, methods, and research interests often go beyond working or walking in the field. Besides ecological interests, researchers are likewise interested in this inquiry's ontological, epistemological, and ethical considerations, the process of mapping, dissemination, affordance of tools, and social and ethical aspects. Fieldwork is not left *on the field*, nor does it stop when practitioners transition *off-site*.

2 In addressing potential methods or methodologies that facilitate the current paradigm shifts, researchers must rethink processes constituting fieldwork methods. For instance, empirical research, such as fieldwork, provides an interesting counterpoint to the prevalent top-down approaches in contemporary spatial planning. The formalisation and validation of fieldwork will enable a shift in perspective and subsequent change of thinking patterns, allowing for novel and hopefully more holistic decision-making processes. The plurality of encounters, thanks to contact with the more-than-human and nonhuman, as well as the variability of natural phenomena and ephemeral qualities (i.e., tidal conditions, weather patterns, movements of species, or seasonality), allows for serendipitous findings and challenging preconceived notions based on an anthropogenic framing of the physical world.

3 & 4

Fieldwork in landscape studies must be redefined to be recognised as a methodology to facilitate the observed paradigm shifts in the conception of landscapes and subsequently promote a more humble and holistic human engagement with landscapes. My hypothesis in this thesis critiques the prevalent positivist, predominant Western framing of spatial studies tasked with decision-making practices (i.e., spatial planning and land use considerations) that determine our landscapes' physical and conceptual future, past, and present.

Through the literature research and the practical engagement with existing fieldwork methods, it becomes apparent that fieldwork is a diffractive methodology, and the operations, processes, and outputs must be understood in this context. Fieldwork, further, encompasses more than just the work in the field: As a process that ripples through disciplines and domains (i.e., education, research, practice, or policy), fieldwork as a methodology likewise engages with (visual) representation, documentation, and meta-philosophical paradigms. Fieldwork, therefore, becomes fieldwork*ing*—an open-ended, ethico-onto-epistemological approach guiding current processes in landscape studies both in design and decision-making processes.

3.3.2 The re-turning of fieldwork*ing*

1 Fieldwork entails more than just interactions in a *field*; it is a complex process of pre-travel preparations, on-site investigations and probings, and post-processing in the form of analysing findings and curating and disseminating these. To claim that this process is linear and straightforward would contradict researchers' experiences. As outlined in the reflections around **site** p. 58 and the definition of **field** p. 125, fieldworkers explore a pre-existing world open to various influences from multiple agents such as the more-than-human and nonvital, unlike a contained scientific experiment. Additionally, the different *stages* of fieldwork processes overlap and influence each other, and (cognitive and physical) work is performed simultaneously or in parallel. Lutsky and Burkholder (2017) touch on this aspect in their outline of inquiry, insight, and impression in the context of their ***Curious Methods*** p. 113.

2 Understanding fieldwork as a diffractive methodology by including the entire process in this framework requires a thorough diffraction of the different knowledge generation and dissemination stages. Re-turning is "diffracting diffraction" (Barad, 2014, p. 168); therefore, intra-active engagement with diffraction.

3 *I want to begin by re-turning—not by returning as in reflecting on or going back to a past that was, but re-turning as in turning it over and over again—iteratively intra-acting, re-diffracting, diffracting anew, in the making of new temporalities (spacetimematterings), new diffraction patterns.*
(Barad, 2014, p. 167)

Reading, writing, re-reading, re-writing,…

4 Traditionally, fieldwork is linked with mapping (as a form of curating data into plans). Without explicit theorising on this process and relationship, it is generally assumed that the work process features a discursive characteristic and is bound to a linear progression where information is gradually developed. However, as a diffractive methodology, following an agential realist framework, this progression does not necessarily need to occur linearly. Fieldwork*ing*, therefore, troubles a linear, standardised process of knowledge production and output generation. This notion ties in with the role of time in quantum physics and critiques how time (and space) are conceptualised and subsequently hegemonised in Western cultures (Barad, 2018).

5 I do not use reading, writing, re-reading, and re-writing as metaphors of a book, as is common when discussing the city as a *media* (e.g., in Mattern, 2015a) but as a mimesis of the actual practices, and highlighting the dynamism and iterations taking place in this dynamic process. Diagrammatic phases and protocols need to do justice to the reality of the thinking through and thinking with happening within fieldwork*ing*. Fieldwork*ing* is a process of *spacetimematteringconceiving* (Barad & Gandorfer, 2021, p. 29) which is more successfully depicted in a field of rhizomes and networks. As a material-discursive practice and diffractive methodology, fieldwork*ing* negates the Cartesian cut (Barad & Gandorfer, 2021), and seemingly autonomous parts of processes are not inert stages performed sequentially but iteratively, parallel, and non-linear.

Fig. 50
(next page)
The centrefold:
The re-turning
of diffractive
fieldwork.
(Werder, 2024)

6 Fieldworkers collect data that is later curated and summarised and then visually represented in mappings and plans. These are then interpreted and synthesised by practitioners, planners, experts, other departments, or the general public. As map-making practices and policies (written documents) sometimes use terms that are undefined or implicitly used (such as site, landscape, or nature), these concepts may have different meanings in the various disciplines or stages of this process. This iterative cycle of reading—writing—re-reading—re-writing—editing includes many layers of representation, translation and interpretation that are subject to misinterpretation, neglect of certain information, or a discrepant understanding of terms and meanings. In Barad's words (2014), this process can be seen as a *re-turning*, iterative intra-acting between subject and object. It will lead to the generation and conceptualisation of new diffractive patterns. Although outlined in a linear way below, these are dynamically and topologically entangled. The graphic (FIGURE 50) in the **centrefold** p. 142 will illustrate this complexity more appropriately. However, additional explanations are outlined here:

A Intent

7 Most fieldwork practices (if not all) precede a concrete reason why this specific landscape will be probed. This is usually outlined through a brief or a clear intent of future interaction with this particular site. Based on this task, fieldworkers develop a methodological process outlining goals or research questions intended to be answered through the inquiry—they have a mission.

8 However, a non-solutionist attempt contradicts this approach and requires a more open-ended inquiry: What if the definition of *fieldwork questions* biases the fieldworkers' probings and findings? According to Lutsky and Burkholder's (2017) iterative process of inquiry and insights, these stages dynamically intra-act with each other.

B Reading

9 *Learning to "read" the landscape as object of planning and design is part of the development of vision, of learning to see the relation between form, functioning, and use in its dynamic context.*
(Fekete & van den Toorn, 2021, p. 13)

10 *Reading* a landscape is generally understood as a way of probing or attempting to understand a landscape. It entails and stems from a multidisciplinary cross-pollination. Immersion is fundamental to this process, setting landscape architecture apart from other disciplines (Meyer, 2021). Meyer (2021) notes an increased interest in *site readings* as a form of first-hand observation and highlights their potential for design inspiration. Fieldwork in landscape studies traditionally attempts this. It is a process of *reading* a landscape, where distinguishing between the natural, physical landscape and the *ideal* one becomes crucial. With site-reading, researchers acknowledge that landscapes are not empty canvasses that await meaning and conceptualisations (clearly a core fallacy of colonialism). The agential realist perspective emphasises the pre-existing world and understands landscapes and their various inhabitants and members as co-constituents of meaning-making.

11 Implicitly, this *reading* of landscapes includes a priori knowledge, assumptions, and biases. Reading is not innocent and does not merely start once fieldworkers set foot on a specific site. Pre-conceived notions inform and influence a researchers perception and their reading capabilities. A conscious awareness of this primed state must be critically addressed within this approach.

C Writing

12 The (visual) representation or practice of recording, documenting, or mapping a place can be understood as a *writing* process, and researchers and fieldworkers in landscape studies are very interested in this dissemination process. Particularly the movement of *post-representation cartography* is concerned with the context of the production of maps rather than solely with its visual output (Caquard, interviewed by Salinas, 2014). How such maps and plans are drawn (i.e., what types of lines or other techniques are utilised) has been extensively researched and discussed in the discipline (e.g., Mathur, 2017, among many). Similarly, the notion of borders, zones, and boundaries is critically observed (e.g., Crampton, 2009; Marot, 1999), resulting in unconventional frameworks such as fuzzy borders (addressing inter-regional or supra-national administrative boundaries that also impact hierarchical structures) (Allmendinger & Haughton, 2009) or the introduction of novel vocabularies (Zimmerbauer & Paasi, 2020).

13 *Writing* landscapes, i.e., mapping findings, is a continuous practice, from sketching itineraries to gathering *field notes* to curating and collating findings to (temporarily) finalised mappings published or made available to other researchers and practitioners. This writing process is iterative and highly influenced by the process and the encountered intra-actions. However, standardised or existing mapping conventions often hinder novel or experimental representation techniques, potentially more suitable for recording and narrating findings of a particular site.

14 Outcomes of this *writing* process are often presented as final maps, plans, or diagrams, reducing the complexities of the process to a *fait accompli* devoid of contradictions, gaps, intensities, or repetitions. As landscape researchers increasingly understand this process as **ontogenetic** p. 74, landscape researchers engaged with such writing processes have embraced more fluid and dynamic representation methods.

D Re-reading

15 Fieldwork also includes the study of *secondary sources*, such as analysing existing mappings or data sets. Previous recordings and documentation are metaphorically *traversed* in this off-site or *abstract* fieldwork process. Mattern (2015b) argues that maps and the landscapes they visualise are not only *texts* to be *read*. She consults geographer John Pickles, who argues for "an understanding of mapping that [do] not reduce the work maps do to the repressive exercise of power" (Pickles, 2004, p. 114). This is a critical discourse as the same map can be used in entirely different interpretive processes—the map, therefore, becomes two different things. Fieldwork outputs such as field notes and mappings are **boundary objects** p. 76 in their iterative and diffractive making and their (final) presentation. While different stakeholders may use mappings differently, they retain their coherence and utility, facilitating collaboration and knowledge production.

IN THE OFFICE | IN THE *FIELD* | IN THE OFFICE (OFF-SITE) | IN THE *FIELD*

INTENT | READING / PROBING | WRITING | RE–READING | RE–WRITING | EDITING | CONSTRUCTION | REGENERATION

FIELDWORK AS A DIFFRACTIVE METHODOLOGY
AGENTIAL REALIST GLASSES

ideas
proposals
briefs
tasks

finding "fieldwork questions"
landscape entanglement process / co-creating
establishing "fieldwork questions"
WEATHER & SEASONALITY
SERENDIPITY
collaborations
going down the rabbit-hole

INQUIRY | INSIGHT | IMPRESSION

RECORDING OF FINDINGS
TOOLS OF COMMUNICATION

. MAPS
. DIAGRAMS
. TABLES
. GRAPHS
. VISUALISATIONS
. RECORDINGS (ALL SENSES)
. STORIES & SONGS
. CULTURAL IMPRINTS
. MATERIAL TRACES & MARKERS

diffractive wormhole

DIFFRACTIONS

DIFFRACTIONS

Re-reading of existing probings, maps, data:

DIGITAL FIELDWORK
DISCURSIVE FIELDWORK

epistemological fault line
primary sources
secondary sources

diffractive wormhole

META–IMPRESSIONS
. REVISIONS
. CORRECTIONS
. AMENDMENTS
. ADDITIONS

DESIGNING

SYNTHESISING

REGURGITATION

PHYSICAL ENACTMENT:

CULTURAL CONSEQUENCES
impressions
residues

MATERIAL CONSEQUENCES
vestiges
imprints
traces on site
invisible
visible

SPIRITUAL CONSEQUENCES
traces elsewhere (far) away in space and time
invisible
visible
alterations

THE SPECTRE OF MORE... (UN?)INTENDED CONSEQUENCES

renew

SUSTAINABLE

THE BASE LINE

DESTRUCTION

(UN?)INTENDED CONSEQUENCES

back to square one

* [maybe this should be folded like a Möbius strip...]

16 In agential realism, mappings as boundary objects are entities or concepts at the intersection of different social worlds or perspectives, serving as points of connection or translation between them. These objects facilitate communication and collaboration among diverse actors while retaining their meanings and interpretations within each realm. Star (2010) emphasises the meaning of boundary by understanding this term as an intersection or shared space mitigating between the here and there instead of the common understanding as a delineating threshold. Agential realism supports this uplifting of binaries and the entanglement of inside and outside. It highlights the agency of boundary objects as nonhuman agencies. The associated knowledge production and understanding of reality intra-act and diffract with mappings. In this framework, boundary objects play a crucial role in mediating between different agencies, allowing for the co-construction of reality across various perspectives and worldviews.

E Re-writing

17 Mappings are not created in a vacuum—there is no *tabula rasa* or seemingly white spots on a map awaiting human discovery. This, of course, is a common and relevant critique, particularly in countries with colonial histories or explorations such as **Alexander von Humboldt's work** p. 160 (Kutzinski et al., 2012; Lee & Diedrich, 2018; Moret et al., 2019). Fieldwork is preceded by various existing documentation and mappings. More importantly, empirical inquiry is conducted in an existing physical world with its material-discursive documentation. In an agential realist framework, the ontological shift of the subject/object divide experienced through intra-action challenges the assumption of human exceptionalism (Barad, 2007). This perspective understands landscapes and the more-than-human as *agential* where the world is constantly intra-acting with fieldworkers. Consequently, all *writing* processes are, in essence, practices of *re-writing*.

F Editing: Synthesising & Designing

18 In line with **A Intent** p. 140, most, if not all, fieldwork endeavours to work toward a specific goal, which generally is about maintaining, developing, or conserving a particular landscape—*site editing*. Design practices have displayed an increased interest in research on these topics. There is a growing interest in adopting a comprehensive and inclusive approach across various disciplines in urban design, landscape architecture, and architecture where the outlined processes are considered in their interrelated characteristics. Examples of this can be observed in the works of Kate Orff's office, SCAPE (n.d.), or James Corner's Field Operations (2024). Both practices have been highly influential in their field in researching and applying successful landscape projects. The increasing emphasis on detailed site studies reflects a nuanced application of bottom-up techniques and tactics, often involving multidisciplinary and multi-scalar investigations.

G Building / Constructing

19 Research and inquiry, followed by a design process, may result in some form of material enactment: a built or constructed project realised on a particular site. This material consequence imprints on the site, therefore adding new morphologies and information to the *field* and potentially altering existing material flows. Depending on their *success*, these can be ecologically aware or detrimental to an existing place.

20 Projects such as Atelier Descombes Rampini and Superposition's renaturation of the river Aire in Geneva, Switzerland (2016) or SCAPE's "Oyster-tecture" projects along the coasts of New York and New Jersey (SCAPE, n.d.) are testaments to a novel way of approaching ecological landscape projects. While the renaturation of the Aire gives agency to the river, "Oyster-tecture" understands the more-than-human as a living stakeholder in their strategic planning.

H Regeneration X Sustainability X Destruction

21 The addition or alteration of sites or places in the form of anthropogenic material enactments or as a conceptual consequence can lead—at best—to an improvement (regeneration), maintain the status quo (sustain) or—at worst—cause destruction or obstruction. Regardless of the outcome, each intra-action will leave imprints and consequences of various scales and, consequently, re-turn the process of fieldwork*ing*.

3.3.3 Synthesis and conclusion

1

Fieldwork in landscape research is an intra-active inquiry—an exchange between disciplines, domains, and dimensions. The practice and research are transareal: in their content, processes (meta-level), and structure (organisation). Fieldwork is multi-scalar and topological. Working with and through landscapes intra-acts with content, outputs, processes, and organisational hierarchies. The exchange between domains (i.e., research, education, planning, policy, and design) is vital and must be enabled throughout the process—a diffractive methodology enables this bridging (Barad, 2007). It is an iterative passing on of the batten. Spacetimemateringconceiving in its essence. Fieldwork is the red thread in this inquiry.

FIELDWORKING

2 Agential realism counters a linear, solutionist approach through its ethico-onto-epistemological approach. Problem-probing becomes more important than problem-solving—uncovering questions rather than finding solutions. With agential realism, we understand that these tasks or goals are intra-acting. Neither the problem nor the solution precedes each other, but they are diffractively and iteratively uncovered, hypothesised, designed, and tested. Responsibility is re-turned to the researcher; *getting it right* is not the primary goal (Cannon, 2022).

•

Fig. 51
Waitaramoa Reserve along Portland Road. (Werder, 2024)

4 PRACTICAL PART: ITERATIVE INTRA-ACTION

1 In the opening chapters, I outlined the contextual background of the ongoing research around fieldwork methods in landscape studies and the general tendencies in this field. In Chapter 3, I synthesised my findings of the literature review and the diffractive reading of existing research into a novel theoretical framework where I set up a hypothesis for *fieldwork as a diffractive methodology* to facilitate the observed paradigm shifts.

2 Chapter 4 marks the beginning of Section II, where I investigate specific fieldwork methods and apply them to the site of **Te Waitaramoa Hobson Bay** p. 59. I will now apply the theoretical findings and propositions to three specific fieldwork methods currently used in landscape practices to test my hypothesis. This practical part has iteratively influenced and informed Section I. The explored fieldwork methods are introduced based on the available research and descriptions, further guiding the practical inquiry. The lens of agential realism has provided critical, diffractive reading and triggered novel understandings of these fieldwork practices, supporting the central hypothesis by exemplifying implicit notions in the application and conceptualisation of such methods and practices.

Fig. 52
Tī Kōuka.
(Werder, 2024)

4.1 OVERVIEW OF PRACTICAL FIELDWORK

1 In this chapter, I will give a brief overview of the studied fieldwork methods before delving deeper into the specific learnings in the respective sub-chapters. These established methods serve as a testing ground to validate the hypothesis introduced in the previous chapters. Framed through the lens of agential realism, I will diffractively synthesise critical findings relevant to the context of Aotearoa New Zealand and the studied topics in this thesis.

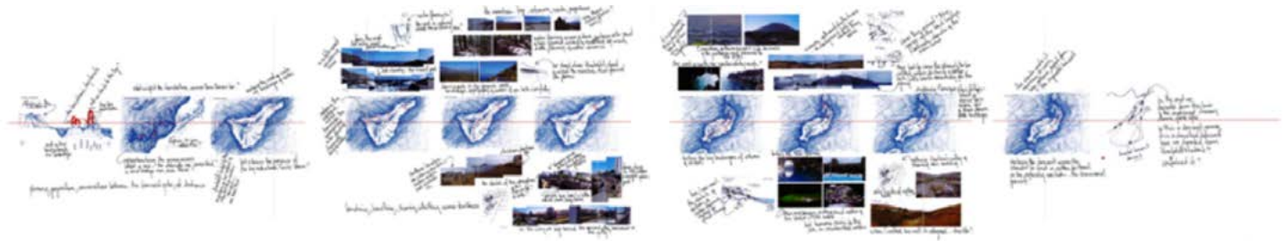
2 While the **Travelling Transect** p. 159 is an overarching, methodological approach, Lavoie's reflections on **Sketching** p. 177 theorise a specific tool and technique that can be used or embedded in other practices. **Field Exercises** p. 195 comprises a looser assemblage of methods combined in a less structured way, such as the Travelling Transect. Through an auto-ethnographic report, I give insight into my process and the findings during the site visits. With the fieldwork, I aim to understand the processes as methods that inform how landscapes are assessed and understood. I then synthesise and collate findings to present these in mappings and sketches. This practical inquiry focuses on the (meta-) investigation of fieldwork as a method and process rather than the claim of collecting a comprehensive set of data or findings in the field. The practical application of the methods to the site of Te Waitaramoa Hobson Bay allows me to gather information and knowledge synthetically and validate the claims of the theoretical enquiry. The diffractive analysis eventually contextualises the methods as part of a methodological approach read through an agential realist perspective.

4.1.1 The three fieldwork methods

1 The three explored approaches or methods are based on findings in recent research and practices and exemplify methods that emerged from different academic contexts. Coincidentally, the methods have extensively been applied to coastal areas or areas dominated by bodies of water, yet this was not a primary selection criterion in the choice of methods. I applied pragmatic selection criteria by looking for methods that are well documented and studied, therefore having primary and secondary literature available that allow for analysis and study as well as replication in the field. Accessibility of the methods was also important, allowing the research to be conducted in a reasonable time frame without the need for highly specialised equipment. I also valued that all methods have significance in (landscape) architecture education, as I think this thesis will be of relevance and interest to this field.

2 The three approaches are:

Fig. 53
Annotated cartographic diary.
(Diedrich et al., 2014, ch. 6)



The Travelling Transect

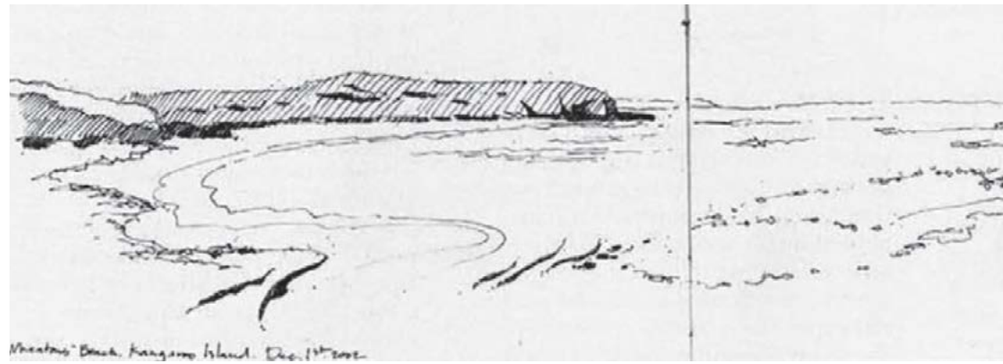
3 The Travelling Transect is a method established by Gini Lee, Ellen Braae, and Lisa Diedrich (Braae et al., 2013; Diedrich et al., 2014) and further explored by other scholars (e.g., Farsø & Henriksson, 2016; Hemmersam & Morrison, 2016; Li, 2021). The method refers to Alexander von Humboldt's exploration of the South American Andes in the early 18th century and his transareal approach of inquiry and subsequent synthesis to sectional mappings.

4 The method is guided by a loosely followed itinerary structured through a linear pathway (the transect) across a landscape, usually at a local to regional scale transcending different areas (i.e., bodies of water, wetlands, grasslands, and mountains) rather than looking at only one homogenous ecological area at once. The itinerary and transareality allow for scalar jumps and the understanding of interconnectedness, symbiosis, and networks across landscapes, supporting a topological and multi-dimensional inquiry. While deviations from the pre-described path are encouraged, the line across a landscape also introduces a moment of arbitrariness, further supporting serendipitous findings due to unusual movements across a landscape.

5 Researchers investigating transects are as interested in presenting their findings visually as they are in the process, with scholars discussing the connection between fieldwork and visualisation. Mappings, referred to as *Tableau Physiques* by Diedrich, Lee, and Braae in homage to von Humboldt, are integral to this method.

6 The method finds interdisciplinary application and is widels studied and applied within landscape research and education with many scholars referring to Diedrich, Lee, and Braae's conceptualisation and study.

Fig. 54
Wheaton's Beach, Kangaroo Island, South Australia.
(Lavoie, 2005, p.23)



Sketching

7 Sketching or drawing is a general technique utilised and embedded in different methods and fieldwork approaches. Caroline Lavoie (2005) outlines the methodological benefits and values of sketching as a method of embodied and immersed observation. The author also understands sketching as more than simply a form of visual communication, where drawings convey underlying information not explicitly depicted.

8 Lavoie advocates for immersed and focused observations that support a more intimate understanding of a landscape through an embodied and grounded approach. The act of seeing and understanding a landscape is then synthesised through focused representations (i.e., drawings) that capture diverse attributes of landscapes, such as geological formations, ephemeral qualities, or temporal conditions, such as weather, light, or water movements.

9 While sketching is a broadly utilised practice across numerous disciplines and domains, it holds particular significance within the context of landscape studies. In this field, sketching conventions, methods, processes, and tools are critically examined, especially regarding their relationship to perception, knowledge production, and their influence on the built environment or its conceptualisation. Additionally, sketching transcends disciplinary boundaries, demonstrating relevance across educational, professional, and academic contexts. It is employed in both deliberate and informal settings, underscoring its versatility and multifaceted role in creative and analytical processes.

Fig. 55
Cornell University students using a weather balloon to capture aerial photos at Seneca Meadows Wetland Preserve.
(Jenkins, 2018, p. 11)

Field Exercises

10 Katherine Jenkins' *Field Exercises* (2018) explores the use of different digital technologies in relation to fieldwork and site visits, with a particular interest in how motion and movement are captured through these instruments. The movement through landscapes is captured with apparatuses or prosthetics and then represented in innovative mappings, resulting in a juxtaposition of experienced time (the researcher's visit) and captured time (i.e., the natural processes that have formed these landscapes). This approach fosters a deeper understanding of *landscapes as a process*.

11 The method is purposely experimental and innovative. The fieldworkers use tools in unexpected ways to further trigger unusual, accidental, or novel ways of seeing and sensing our surroundings (e.g., through a shaky weather balloon). This further highlights the contradictions, multiplicities (of landscapes and experiences), and messiness of such processes.

12 In contrast to the previous two methods, *Field Exercises* is comparatively under-documented and less extensively studied. However, its adaptable approach and considerable overlap in the use of tools and techniques render it highly versatile. Jenkins' critical reflections on this method, along with its testing and application in academic contexts, have yielded relevant case studies. These student projects provide rich material for analysis and offer valuable opportunities for further investigation.

Overview

13 The three methods share common characteristics, such as immersion into a site, the peripatetic approach (walking methods), and the required openness of the researchers to change plans during the process or adapt methods and tools where needed. Each method uses different techniques and tools and embraces their intrinsic qualities. Although a set of tools is mentioned, the *Travelling Transect* does not explicitly prescribe these. The choice is based on best-practice rather than an explicit need for these. *Sketching* embraces an analogue technique by utilising hand drawings. Likewise, to the first, *Field Exercises* does not explicitly specify necessary tools or techniques but uses a variety of novel and creative applications of current and emerging, mostly digital technologies. The encouragement to use ready-made or inventive accessories that record our surroundings generates novel ways of seeing, sensing, and observing landscapes. The techniques and tools are not proprietary to each approach but rather fluidly overlap. They can also be seen as complementing, nested, or integrated within each other.

14 Each method will be applied to the site of **Te Waitaramoa Hobson Bay** p. 59 to reveal a broader and more intimate understanding of this specific landscape. The methods are non-hierarchical and conducted in no specific order. I chose three methods to to test my hypothesis across a range of different methods, formats, and tools. The repetition generated through the application of these methods to the same site will also highlight the multi-ontological reality of the observed landscape. Repetition and the overlap of methods will further emphasise essential findings—fragmentation and gaps in inquiry will equally be of importance in the synthesis.

15 The aim of the exploration of these fieldwork methods is not to rank or label them in any way but rather to explore strengths, challenges and potentials which can help to identify gaps in the research on fieldwork as a method and helpful aid for decision-making processes for the future, present, or past of landscapes. By engaging with these methods in detail and applying them to a specific context, the process allows me to adapt the frameworks and synthesise theory through making. While the methods certainly can be (re-)used for other contexts (in space, domains, and disciplines), they are not supposed to be prescriptive and can be adapted or interpreted. In my own application and practice in this thesis, I deliberately allow myself to alter these approaches, add on (i.e., by combining them with other established methods) or discard ideas to synthesise novel ways of framing, working through, and understanding the landscapes I am engaging with.

4.1.2 Methodological approach

1 I have conducted a variety of fieldwork methods and techniques during multiple visits and in no specific chronological order. Several informal visits proceeded the fieldwork to test tools and techniques and gain an immersed experience of the site. As outlined earlier, the goal of this practical inquiry is not to (re-)create a comprehensive and complete account of the methods or contribute to a re-design of them but to investigate their methodological approach in general. Therefore, visits and recordings were less

continuous than in the described methods and iteration of results was not a primary goal of this research since flawed or fragmented results are considered valuable feedback to the process.

2 The respective research on these methods guides the application of the three methods to Te Waitaramoa Hobson Bay. As the process is deliberately experimental, I will allow for alterations and adaptations. I record my own process through auto-ethnographic descriptions and a reflection on the process. This research through making or design constitutes a way to bridge the gap between practice and theory. The use and application of analogue techniques and tools are crucial as they help to address the abstraction of digital tools that have influenced Western practices and thought traditions (Nelson & Stolterman, 2012).

3 The analysis and synthesis of the explored methods are then guided through a diffractive reading of the literature and an evaluation of the processes through the lens of agential realism—this complements the reflexive part of this inquiry and constitutes a homologous approach to the theoretical framing. Further, I hold a non-solutionist standpoint and understand fieldwork as a way of probing landscapes rather than a data collection process as outlined in Lutsky's and Burkholder's *Curious Methods* (2017). As cornerstones of my hypothesis presented in this thesis, these are additional perspectives I apply to the analysis of the studied methods.

Curious Methods

4 As briefly outlined in **Chapter 3.1.2** p. 113, Karen Lutsky and Sean Burkholder (2017) coin the term *Curious Methods*. The researchers do not propose a specific process or tools and techniques that must be used for this approach but rather theorise a methodological framework of a fieldwork method. Lutsky and Burkholder understand fieldwork and site visits as a process of *probing* landscapes rather than *collecting* data. The latter, they argue, is based on an extractive process reinforcing the idea of landscapes as a commodity or product and, therefore, implicitly also repeating harmful exploitive settler-colonial and capitalist practices.

5 With this methodological approach, Lutsky and Burkholder aim to sequester or discover questions from the observed landscapes rather than forcefully trying to find solutions. With *Curious Methods*, the authors aim to counter solutionist approaches and propose a different motivation and aim than traditionally assigned to fieldwork. Probing is a process of searching for questions, where we understand that the closer we look at something, the more complex it becomes (remember the **coastline paradox** p. 48?).

Thick descriptions and auto-ethnographic summaries

6 Like many methods introduced in this thesis, thick description and auto-ethnography are also methods borrowed from other disciplines. However, they find wide application within landscape research. These domains rely heavily on qualitative research to conduct their studies (e.g. Girot's „Four Trace Concept" (1999) or Braae, 2017). "Autoethnography is a research method that uses personal experience ("auto") to describe and interpret ("graphy") cultural texts, experiences, beliefs, and practices ("ethno")" (Adams et al., 2017, p. 1). This process includes rigorous reflexivity as well.

7 Thick descriptions were termed by ethnographer Clifford Geertz (1973), explicating that descriptions within social studies (e.g., phenomena such as human behaviour) should not solely rely on descriptions of physical displays but also their contextual situation and the researcher's context. Geertz acknowledges in his concept of thick descriptions that data is interpretational and, thus, subjective. In doing so, Geertz has introduced an interpretive turn in his field. As such, thick descriptions are valuable for qualitative research across various disciplines (Kostova, 2017; Luhrmann, 2015). In landscape architecture, this approach has been applied and extended as in Van Haeren and Munck Petersen's (2020) "imagetexts"—a visual recording of a site through sequential photographs, where the authors understand photographs as providing *thickness*. The authors address in their research that landscape depiction must be multi-layered and not necessarily bound to conventional and quantifiable representation.

•

Fig. 56
Self portrait.
(Werder, 2024)

Fig. 57
Walking the line?
(Werder, 2024)

4.2 FIELDWORK: METHOD 1 TRAVELLING TRANSECT

4.2.1 Overview

1 In landscape studies, the *Transect* method is a geographical survey method, initially explored by Alexander von Humboldt during his travels to the Canary Islands and later explorations of the newly discovered (from a European perspective) South American landscapes in the late 18th century. Von Humboldt summarised his transareal explorations in sectional depictions that combine observations of physical attributes with social or ephemeral qualities. This approach later influenced the work of Patrick Geddes (1909) (Duany & Talen, 2002; Han, 2021; Li, 2021) and Ian McHarg's *layer cake* approach (1969), which was formative for the conception of modern-day GIS platforms. Contemporary researchers such as Ellen Braae, Lisa Diedrich, and Gini Lee have rediscovered von Humboldt's approach and extended the method to their *Travelling Transect* (Braae et al., 2013) or *Deviant Transect* (Braae et al., 2013; Diedrich et al., 2014) approach. The renaming and novel conceptualisation highlight the method's process and way of gathering qualitative data; the first iteration of the method emphasises the dynamism of Alexander von Humboldt's approach, and the latter term refers to the *deviant* nature of a meandering itinerary. Similarly, the method is acknowledged for its capacity to represent the multi-faceted qualities in landscapes (Mathur, 2019).

2 In essence, the Travelling Transect constitutes a straight line drawn across a landscape (at a local to regional scale), serving as a guide for a probing itinerary. Many scholars associated with the researchers mentioned above, or likewise coming from a similar geographical area or academic location (in this case, Scandinavia), have picked up on this method and applied it to their case studies (e.g., Farsø & A. Henriksson, 2016; Hemmersam & Morrison, 2016; E. Henriksson, 2019). A transect more generally describes a "geographical cross-section of a region used to reveal a sequence of environments" (Duany & Talen, 2002). While the idea of a *transect* has been adapted from a normative tool in biology and other related disciplines, the term and methodology have autonomous definitions in landscape architecture and related

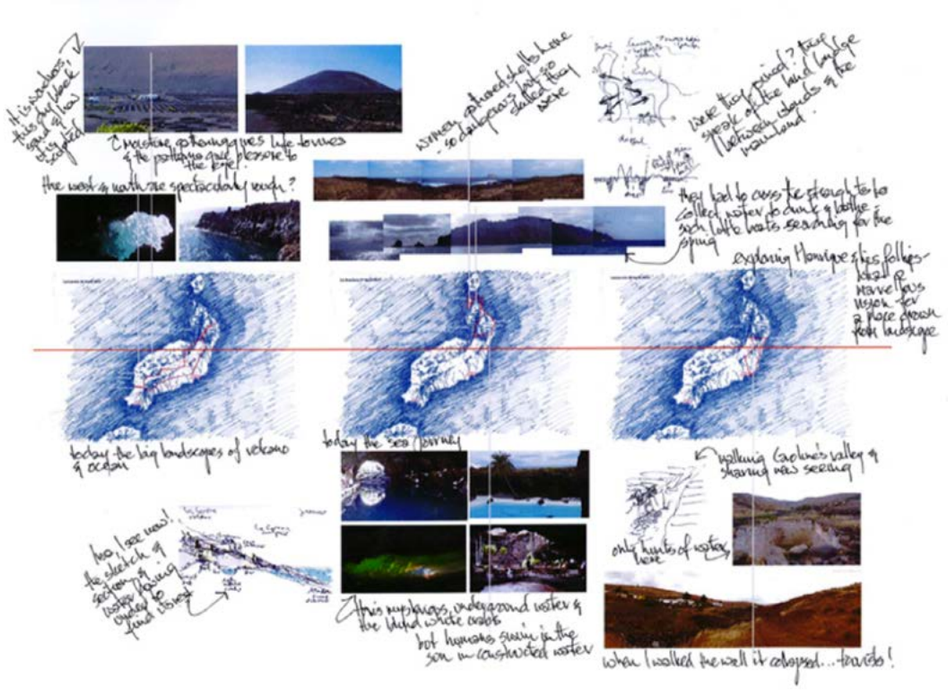


Fig. 58
Cartographic diary of *Canarysect*. (Diedrich et al., 2014, ch. 2)

fieldwork methods. The different, prominent scholars advocating for this method lay different foci on its application. They share the transareal nature of the transect, meaning, the methodological approach supports fieldwork and on-site inquiry spanning across different geographical areas (usually at a local to regional scale) as well as across different disciplines (e.g., geology, soil science, biology and habitat studies, spatial and social analysis). Diedrich et al. (2014) understand the Transect approach as

3 *methods for site exploration to inform site transformation through representing the narrative, ephemeral, and dynamic qualities of places that could contribute to open work design approaches. (Diedrich et al., 2014)*

4 The results of the Transect method can be understood as a "cartographic diary" (Lee & Diedrich, 2018) (FIGURE 58), resulting in a site- and time-specific as well as dynamic mapping. The approach contributes to a method of exploration and analysis as well as novel forms of representation (Farsø & Henriksson, 2016). The scholars' and practitioners' stances on the importance and role of the visual representations resulting from this process differ. However, they all establish a theory around the relationship between *reading* a landscape, *recording* it, and eventually *writing* landscape in the sense of designing for or with this specific landscape.

4.2.2 Context and background of the *Travelling Transect*

1 Von Humboldt regarded scientific studies as cross-disciplinary and moving across geographical and territorial boundaries (Kutzinski et al., 2012). To uncover the newly (re-)discovered landscapes of South America, von Humboldt aimed for a holistic approach to capturing the interrelated nature of the landscapes he observed by scaling up a sampling method established in biology and geology (Han, 2021). Von Humboldt would combine observations of botany and geology with less common and more ephemeral observations, such as the *blueness* of the sky. He recorded his findings in travel diaries and translated them into sectional drawings, so-called *Tableau Physiques* (FIGURE 59) (however, not without fault regarding their scientific accuracy (Moret et al., 2019)). His awareness of the inadequacy or incompleteness of language to fully describe landscapes led von Humboldt to adapt a multi-media approach, combining writing, drawing, and datasets as well as different forms of notations into a cohesive visual representation without physically separating these findings into disjunct categories (DeLue, 2017). He advanced two *epistemological revolutions* that were a sign of the changing paradigms of his time: The methodological approach rejected the purely distant observation of the encyclopaedical tendencies of the late 18th century, and also established empirical, site-specific explorations as "the new authority for reliable knowledge generation" (Lee & Diedrich, 2018, p. 92).

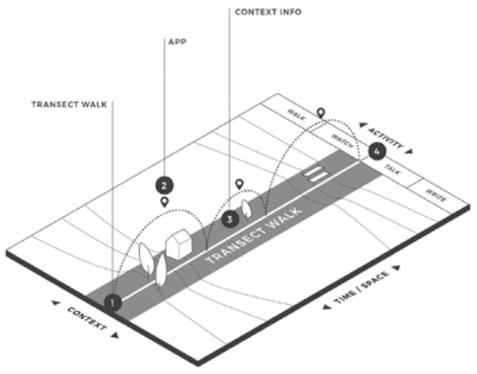
2 While Braae, Diedrich, and Lee inquired into the epistemological foundation and methodological relevance, Farsø and (Alexander) Henriksson (2016) further highlight the connection between the observations, the process, and recording of results. Emma Henriksson (2019) similarly investigates how ephemeral qualities and site-specific characters can be communicated by investigating the Blekinge archipelago in Sweden. On the other hand, Bin Li (2021) uses the method as a reading tool, helping her to understand the touristic characteristics of the Alpine regions of Mount Gongga, part of the Hengduan Mountains in eastern China. The distinction between the process of reading and writing landscape is addressed in Hemmersam and Morrison's study (2016): The researchers investigate five Arctic cities in different countries using the method as a reading aid. Their conclusion focuses on the reproducibility of the *Travelling Transect* as an experience and sharing of findings by further developing a reflexive model allowing the re-reading and re-writing of these landscapes (Hemmersam & Morrison, 2016) (FIGURE 60, NEXT PAGE).

3 In the theory of New Urbanism and Landscape Urbanism, where the concept is applied as a spatial analysis and a methodology for design, transects are often understood as sectional mappings of landscapes. Terms such as "three-dimensional section", "section

Fig. 59
Geographie der Pflanzen in den Tropen. (von Humboldt, 1807)

Fig. 60
(left)
Methodological mapping relations.
(Hemmersam & Morrison, 2016, p. 32)

Fig. 61
(right)
A Line Made By Walking.
(Long, 1967. In: Dapena-Tretter, 2014, p. 104)



perspective", and "section plan" are used interchangeably (Han, 2021). Han (2021) analyses transects as a tool for landscape sustainability and design method. Contrary to the *Travelling Transects*, the sectional depictions in design often cover a smaller spatial extent.

4 *We situate our work between the on-site and the over-site in reference to early land artist Robert Smithson, who aimed at transferring impressions and thoughts from site to elsewhere, producing his non-sites. He was not, however, producing cartographies. To appropriate James Corner, our eidetic operations rather seek a narrative cartography to enable translation from site to non-site—from here to there. This narrative cartography escapes both the raw status of transcriptions and the artful codification of mappings.*
(Diedrich et al., 2014, para. 4)

5 Transects as lines across landscapes have also found application in land art and performances such as Robert Smithson's work (e.g., in Farsø & Henriksson, 2016), Richard Long's "Passage as Line" (Dapena-Tretter, 2014) and "A Line Made By Walking" (FIGURE 61), or in "The Common Line Project" (Crutchlow et al., 2021).

4.2.3 Overview and process of the *Travelling Transect*

1 The process broadly considers three parts: pre-travel preparations, on-site travelling, and post-travel evaluation (Braae et al., 2013), with each part being integral to the methodological and "problem-oriented approach" (Diedrich et al., 2014) (FIGURE 62). The output consists of the (performance of the) transect travel itself—including all deviations—and the multimedia cartographic diary.

Fig. 62
The Travelling Transect's methodological principle.
(Lee & Diedrich, 2018, p. 94)

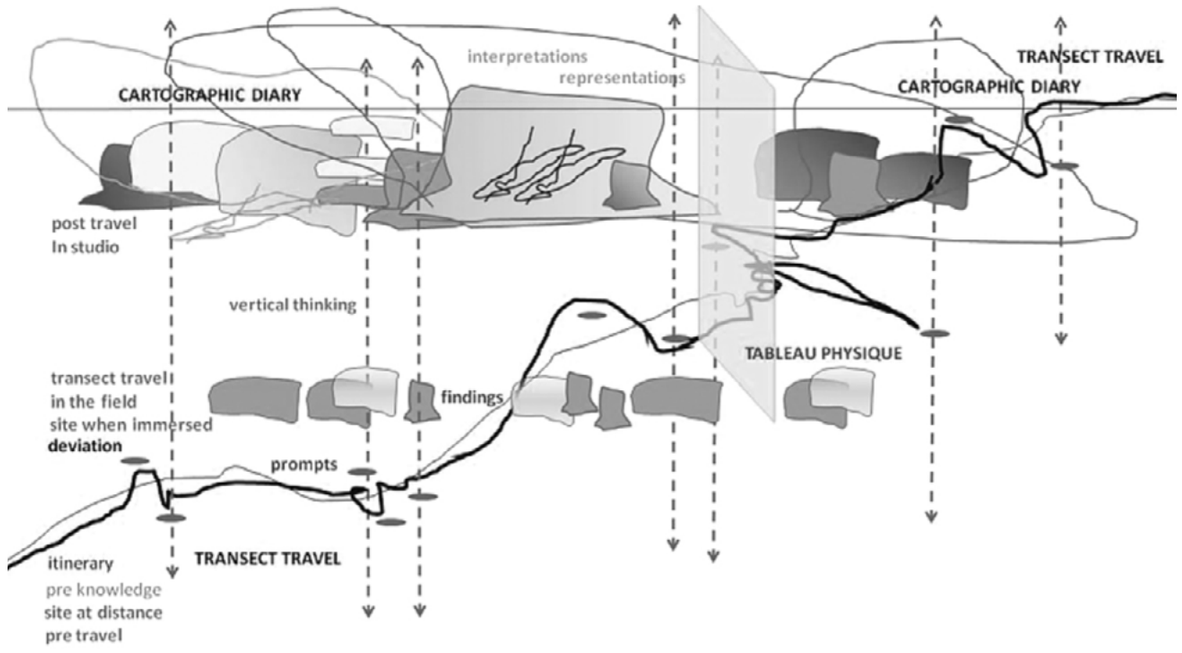
Pre-travel preparations

2 The itinerary consists of a straight line across a map or satellite image, connecting sites of interest in a specific location. This line spans across a local scale, usually including landscape features such as peaks of hills or mountains or areas of shores and coasts. While some existing knowledge is applied in this selection process, there is no need for a comprehensive understanding of the site yet. The abstract line itself is considered a transect, as defined in biological sciences. However, biological studies generally operate at a smaller scale (i.e., roughly 10 meters) than a transect in landscape architecture, where dimensions of two to ten kilometres are not uncommon.

On-site travelling

3 The researchers then travel along the chosen line, mostly on foot, as this allows for a pace or speed adequate for detailed observations. They record characteristic landscape features and empirical findings using various different analogue and digital tools and techniques (e.g., photo, video, sketching, model making with on-site objects, audio, etc.). Braae, Diedrich, and Lee chose the tools based on their capacity to capture and communicate the qualitative aspects of the site:

4 *We adopt and test familiar tools that we assume to have the capacity to capture dynamic, relational and atmospheric site qualities: photographs, videos, sketches, models, writing and annotating, and ourselves as sensing, thinking and communicating subjects engaged in the multiple processes required by travelling - together.*
(Braae et al., 2013, p. 192)



5 This multimedia approach triggers alternative landscape readings (Li, 2021) and contrasts tools used in otherwise normative representations (Farsø & Henriksson, 2016). Given the immersed experience of the researchers, the focus lies on the qualitative aspects and the multisensory, cultural, and material observations. Lee and Diedrich (2018) also adapt Ross Gibson's (2015) methodology of *changescapes* to combine narratives while travelling. The local and phenomenological findings may trigger interesting deviations and meanderings along the itinerary, therefore, *thickening the line*. Farsø and Henriksson (2016) argue that the avoidance of presupposing an exact outcome is precisely what may unfold new knowledge and make the otherwise unobserved visible.

Post-travel evaluation

6 Back in the studio, the findings are sorted, evaluated, and collated to a *cartographic diary*. Diedrich, Lee, and Braae (2014) also complement the on-site findings with data and recordings from statistics, cadastres, topographic maps, and other supporting research. The method, therefore, results in a methodological hybrid using empirical, qualitative, and quantitative data. Hemmersam and Morrison (2016) also investigate ways to make itineraries of transects more publicly available (e.g., through a digital application) to allow for re-visiting these linear inquiries and promote reproducibility and historical continuity.

4.2.4 Relevance: Wider connection of the *Travelling Transect* and benefits

1 The method is concerned with observing a site, recording the findings, and (re-) presenting them visually. Thanks to the immersion, researchers experience a site's transareal scale—evading the general zone-constraint observations in spatial planning—and deviations allowing for serendipitous findings. This benefits the analysis process by potentially highlighting or overcoming biases in the perception or conceptualisation of landscapes. The inter-scalarity allows researchers to expect "discoveries of qualities and conflicts on the level of territorial scales and at the micro-scale" (Lee & Diedrich, 2018, p. 95). Furthermore, this process also highlights the exploration of horizontal and vertical spatial extents, countering the prevalence of two-dimensional mappings and their shortcomings (Han, 2021), and introduces a temporal aspect (Braae et al., 2013). This strengthens the focus on the "relation(s) between phenomena as opposed to a phenomena itself" (Farsø & Henriksson, 2016).

2 Interestingly, the importance of translating findings into a (visual) representation or recording is not explicitly discussed. Von Humboldt already stated the limited capacity of language to capture the complexity of landscapes in his claim of "the imprecision presented by nomenclature, and the problematic divergence of the qualitative and quantitative within scientific methodology" (DeLue, 2017, p. 38). DeLue points out "Humboldt's situatedness in multiple systems of production and multiple geographies" is not only a "representation *of* terrain" (2017, p. 39, italics in original) but also a "terrain or system in its own right" (p. 39). While von Humboldt was still aiming to find *order* in the observed landscapes (DeLue, 2017), today's researchers are highlighting the complexity and interrelatedness of landscapes.

3 Other scholars such as Anuradha Mathur and Dilip da Cunha aestheticise the experiences encountered on-site. Mathur (2019) sees the dominance of the map as a platform for design and analysis an inevitability. As traditional tools regurgitate a solutionist framing, Mathur (2019) concludes her analysis of the transect method with the unresolved potential of its predecessors:

4 *Surely the least we can do in the spirit of McHarg and Geddes is to traverse these places again, to venture a new imagination aimed not necessarily at solving problems, but at keeping the transect alive as an agent of change. (Mathur, 2019, p. 36)*

5 What stands out in the literature review is the case studies' close connection to water. Many scholars have mentioned the suitability for studying fragile landscapes such as coastal areas. Due to the ephemeral features and constitutive character to the local and regional surrounding encountered in these landscapes, the methodology helps to sensitise the researchers to factors often neglected or overlooked in fieldwork processes. Diedrich, Lee, and Braae note that transient sites are particulalry suited, and:

6 *Normative solutions often appear inappropriate to specific water landscapes as situations exposed to on-going change are affected by both nature and culture forces. (Diedrich et al., 2014, para. 1)*

7 Lee and Diedrich mention the negotiation of the "relational margins between land and water" (Lee & Diedrich, 2018, p. 90) as a quality of this method. The investigation of edge conditions, boundaries, interstices, and thresholds is of particular interest, as it reveals the transareal qualities of a site and the method itself—travelling across spatial and programmatic heterogeneity, which is often neglected in spatial site analyses focusing on a mono-programmatic area. This further ties in with the inadequacy of depicting the **coast as a line** p. 48. Doherty (2019) notes the benefits of coupling the aerial view (i.e., satellite images) with the guidance of on-ground intuition, providing a more nuanced and intimate understanding of landscapes:

8 *Combining fieldwork—the vertical—with the aerial image (the horizontal) allows the opportunity for a 'thicker' reading of a landscape, and therefore is positioned to propose 'thicker' solutions that might ultimately be more successful. (Doherty, 2019, p. 152)*

9 The focus on ephemeral and atmospheric conditions is also highly attuned to the fluid dynamism found on such sites—where weathering and erosion are a constant companion to the observations (Lee & Diedrich, 2018). Likewise, for Mathur (2019), the method brought about new appreciation for the ubiquity of water in all its states. This watery focus may be a consequence of the geographical location of researchers (as most of them are located in coastal areas in Scandinavia). However, as Beatley (2018) also states, coastal areas need a more vertical type of thinking to address all present stressors.

4.2.5 Application of the *Travelling Transect*

1 In my application, I follow the approach outlined in Braae, Diedrich, and Lee's reflections and explications. In addition to the (visual) multimedia approach, I am also combining this method with an auto-ethnographic recording and a reflection on my process. This will later give an insight into my decision-making process.

2 On a previous exploration of the Travelling Transect, I adopted a *ki uta ki tai* approach (from the mountain to the sea) in selecting my itinerary (FIGURE 63): The Transect stretched from Ōhinerau Mount Hobson to Taurarua Point Resolution in a north-south orientation. This pathway allowed for an interconnected understanding of the volcanic topology and the resulting watershed in this area. However, as this research was conducted shortly after the Tāmaki Makaurau Auckland weather events in January 2023, these circumstances had shifted my focus to mostly observe the results of the storms and floodings.

3 For this thesis, I opted for a perpendicular route, an east-west oriented transect following along the coast of Te Waitaramoa Hobson Bay. I chose a line from Ōrākei Bay Village to Te Ruareoreo Newmarket Park as my itinerary (FIGURE 64).

Tools & techniques

4 A small digital map (as an image on my smartphone) reminds me of my itinerary. As I know the area quite well, I generally manage to memorise the pathway but occasionally check for the precise location of the transect. The resolution of a phone image is enough to evaluate my position. While *travelling*, I use the Strava app to record my pathway during the fieldwork.

5 I use different digital and analogue techniques to document and record my findings. My smartphone serves as a tracking device and I take photos, videos, and sound recordings with it. I also sketch and take notes on paper. As I am planning to walk along the transect multiple times, I bring different analogue tools with me to focus on different aspects along the way each time. I ended up using paper and charcoal to make frottages of tree barks and timber elements, used watercolour utensils to create water drawings, and paper and coloured pencils for sketches. Combined with the digital recordings, these findings were later collated into a coherent mapping of the *Coastal Waitaramoa Transect*.

Fig. 63 & 64
Ki uta ki tai Transect & Coastal Waitaramoa Transect. (Werder, 2024)

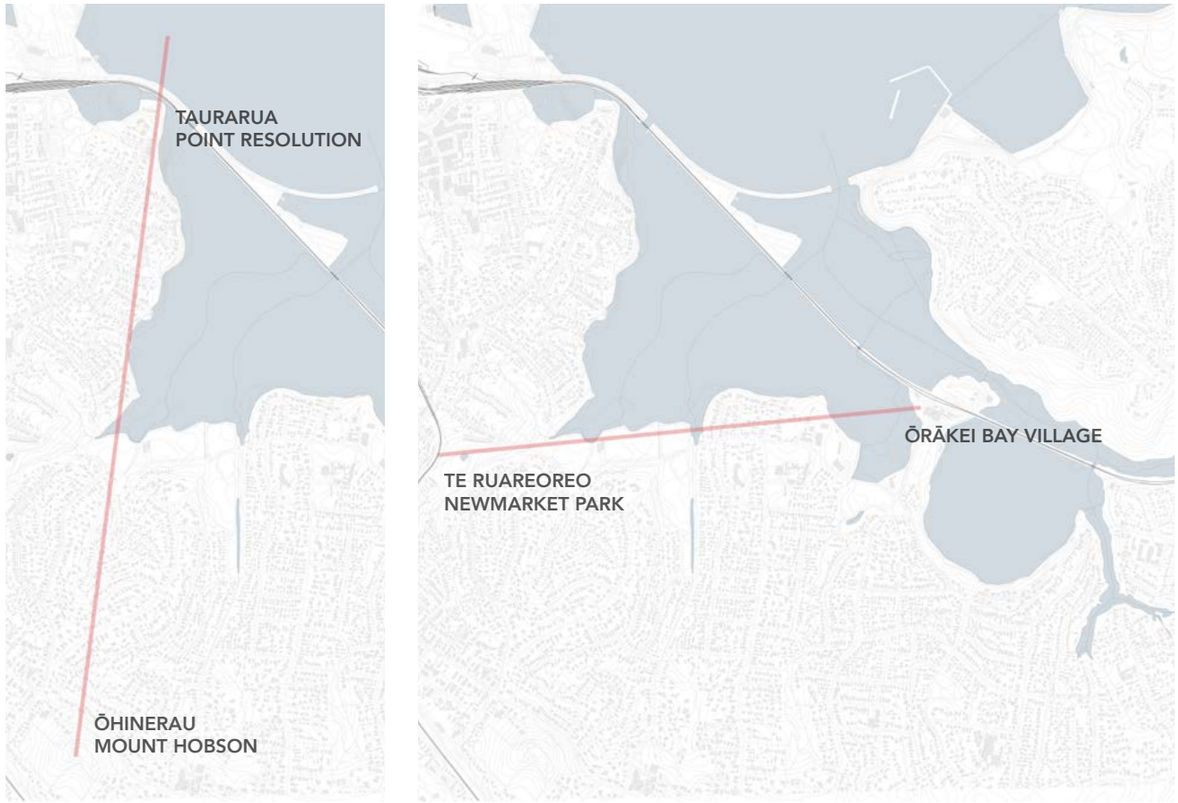
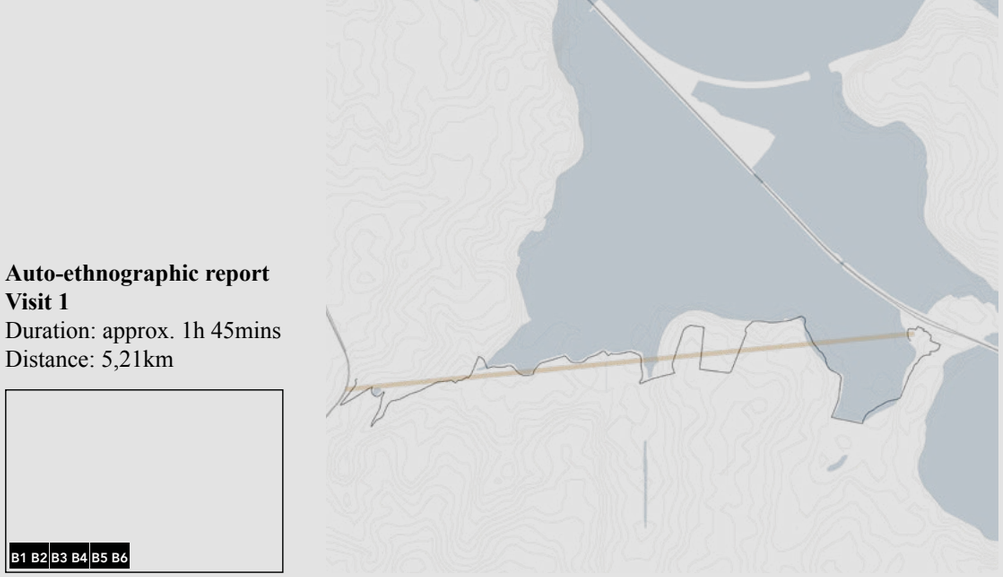


Fig. 65
Route 1.
(Werder, 2024)



Auto-ethnographic report
Visit 1

6 Duration: approx. 1h 45mins
Distance: 5,21km

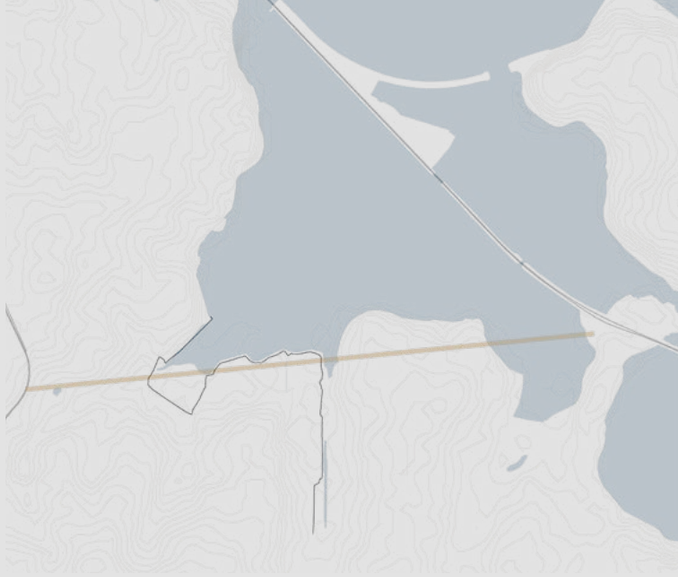
7 The first transect walk is not a novel exploration: I have walked this place many times. However, it astonishes me how many novel findings I have uncovered, nonetheless. I timed the first visit with a morning walk, starting from Ōrākei Bay Village: It is high tide and relatively windy. The waves across the eastern part of the bay wash onto the shore along Ōrākei Bay Village. A little vantage point gives me an overview of the hypothetical line. I cannot walk the eastern part of the line because it traverses the water, but I can observe the location from above. The mangroves are deep in the water and create an exciting assembly, attuning the waves from the breeze across the bay. As I am familiar with this area, I immediately anticipate the western part of Te Waitaramoa. In my mind, I also compare it to its low tide state when little channels and streams become visible—I decide to come back at another time to record this as well.

8 The wind is a serendipitous companion on my excursion. The waves across the bay form interesting patterns and (literal!) **diffractions** p. 93. I stop and contemplate these shapes and patterns and wonder about the mechanics and physical properties of the waves. The movements are simple yet infinitely complex.

9 The topography and urban built environment force me to deviate from my prescribed path. As I intersect with the transect, I plan to observe the trees along the coast: I study their bark and preserve their appearance and touch with a charcoal frottage. While I study the meandering route, I encounter familiar birds: White-faced herons and kōtare cross with my route multiple times. I do not know if it is the same birds (I suspect it is multiple specimens), but the observation highlights their ability to take different paths from what I am forced to follow. Along Shore Road Reserve, I make another frottage (B5 IN FIGURE 68, PAGE 171) as I suddenly notice a community of ants travelling up and down the bark which is slightly peeling off. A reminder of my human scale and that there is more than what we immediately perceive. The ants easily travel vertically—unnoticed to the casual visitor—making the in-between of the tree bark and stem their habitat.

10 Finding my way up to Te Ruareoreo Newmarket Park, I deviate from the transect as I explore the pathway along Newmarket Stream. This is my first time walking this path, so I was curious to explore here. The end of my visit is along the slight bend of Cowie Street. A last glimpse onto the bay, concluded by another kōtare in the treetop.

Fig. 66
Route 2.
(Werder, 2024)



Visit 2

11 Duration: approx. 1h 47mins
Distance: 2,97km

12 After the first visit, I read through the visitor information provided by Ōrākei Local Board and displayed along the pathway. A reminder of the origin of the land I am standing on. Both Ōrākei Bay Village and the reserves along Te Waitaramoa Hobson Bay are largely reclaimed land and constructed landscapes. On the last visit I noticed many water outlets were coming from underground and releasing water into the bay. Te Waitaramoa Hobson Bay is heavily polluted due to adjacent runoffs and water management issues, with the urbanised watershed of Te Ruareoreo Newmarket Stream significantly contributing to this issue. The waterway used to demarcate the border of Tāmaki Makaurau Auckland when English settlers founded the city. The stream historically was heavily polluted as it was used as runoff from local butcheries and industries in Te Tī Tūtahi Newmarket. While these conditions have improved, significant pollution from inappropriate sewage infrastructure is still running into Te Waitaramoa Hobson Bay.

13 During my second visit, I paid more attention to the coastal interstices. I established little *micro-transects* perpendicular to the main transect. These micro-transects provide further findings and a closer inspection of the presence of the water on the site, and the technique seems an interesting approach with potential for further research exploring the values and opportunities of parallel and perpendicular coastal investigations.

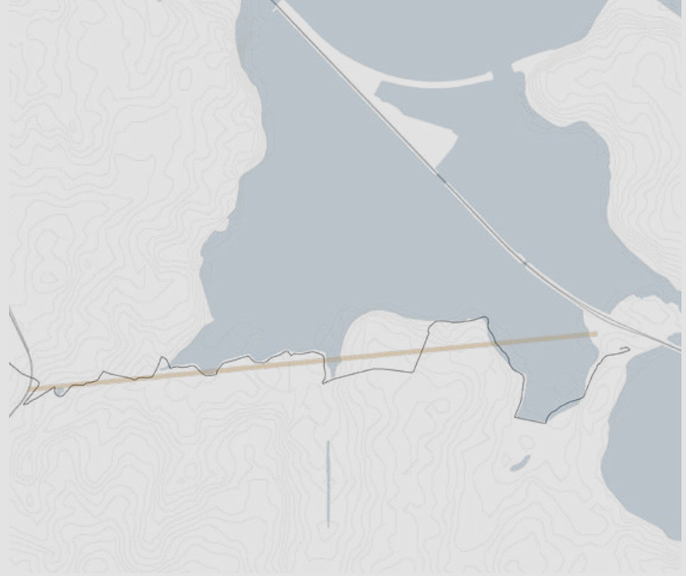
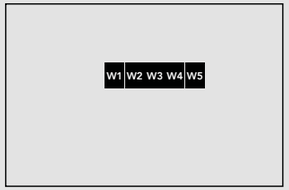


Fig. 67
Route 3.
(Werder, 2024)

Visit 3

14 Duration: approx. 58mins
Distance: 3,07km



15 On my third visit, I revolved my itinerary and started the route from the western end of the transect. As I already know the area well, I cannot fully emulate a *first visit* impression. However, with starting from a more urbanised context (as opposed to the rural part on the eastern end), I am primed to notice more urban and human-made details. The previous visits felt more like a continuous experience of the landscape of Te Waitaramoa Hobson Bay, while this visit appears fragmented and highlights the conflict of nature versus culture in the built urban fabric. The pouring rain of the past few days and the little lake inside Te Ruareoreo Newmarket Park allow me to re-assess my walk since it reminds me of the presence of water. While I walk downhill towards Te Waitaramoa Hobson Bay, I embrace the perspective of a raindrop for the remainder of my walk: What possible pathways could a raindrop take?

16 When I arrive at Te Waitaramoa Hobson Bay, I reconnect with Te Ruareoreo Newmarket Stream where it meets the tidal bay. The stream itself is not safely accessible. Therefore, I am *collecting* some of the imaginary raindrops along the coast of Te Waitaramoa Hobson Bay by making *water*-colours with the *as-found* water from the bay. The approach helped me to understand the presence of water and how all landscapes feature gradients of wetness. I remember the spongy grass and soil of Te Waitaramoa Hobson Bay Reserve on a rainy day (and the audible experience of the soil absorbing the rain) and the many rainwater pipes along the coast releasing water into the bay. Looking at the bay, thinking that my hypothetical raindrop will join the ocean to continue its cycle of evaporation and precipitation is reductionistic. Again, the raindrop has many options on where it may *end up*—seeping through the soil into the groundwater, soaked up by a harakeke plant or a mangrove, or ingested by a thirsty bird seeking water from a puddle.

Fig. 69
(next page)
Coastal Waitaramoa Transect (Tableau Physique).
(Werder, 2024)

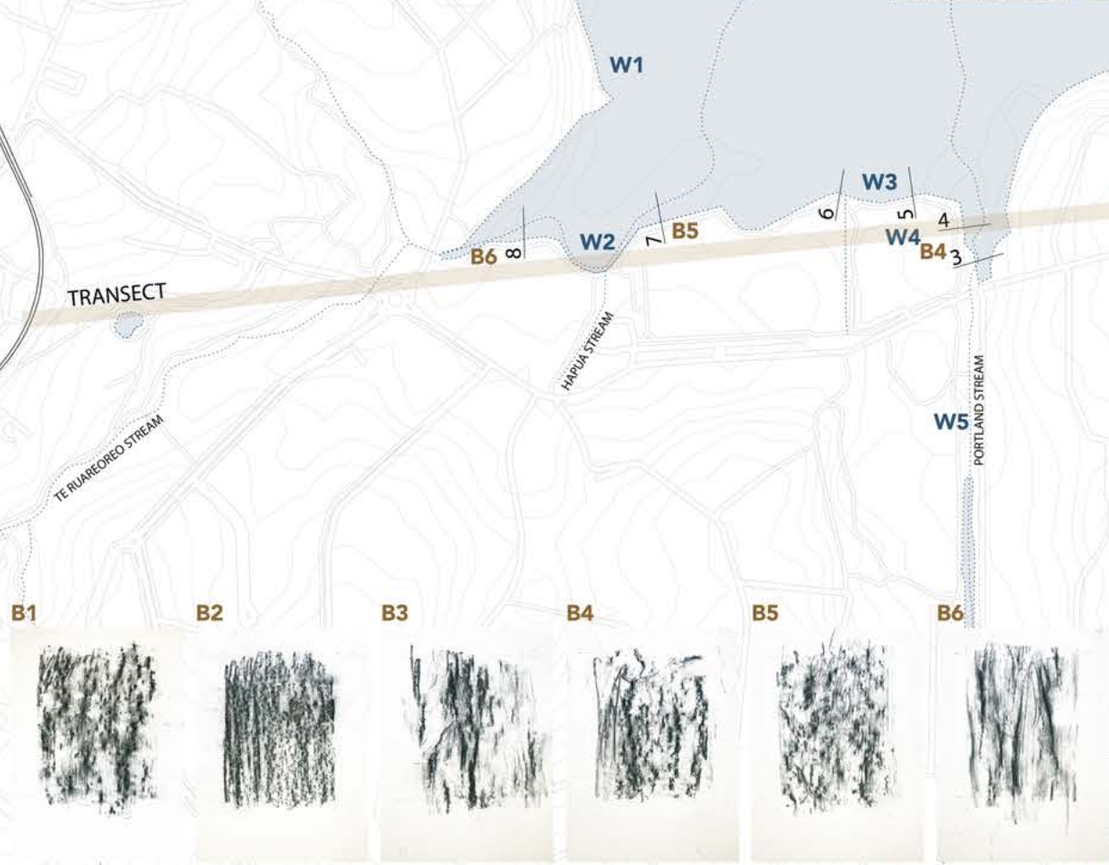
Results: *Coastal Waitaramoa Transect*

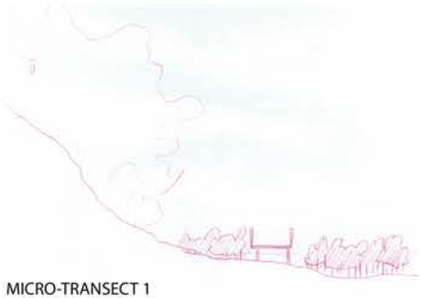
17 I have explored the transect during three independent visits. Experiencing and observing the site in different weather conditions and tidal states. Eventually, I have deviated and meandered away from the initial *line*. The Transect has served as a spine rather than a precise itinerary as novel interests emerged through the explorations. The resulting *Coastal Waitaramoa Transect* (FIGURE 69) is a synthesis of different findings.

18 Assembling the observations provided a chance to analyse the outputs and re-turn to probing the landscape. The most formative experiences are not adequately depicted in the cartographic diary: the wind, the waves, the birds and their movements. I am missing these aspects in particular. This prompts me to ask further questions: What is the topology of the water? Where do the waves come from? What is the quality of the intra-action between me and the birds? What do I not see or experience precisely because of my presence? What do I stir up, scare away, or force into hiding due to my movement? How do I record the wind? The gradients of wetness? Their quality, the tiny turbulences, the movements and motions? These questions reveal the importance of phenomenological inquiry and the reflection on nonrepresentalist perspectives.

19 Studying and reading the *Coastal Waitaramoa Transect* resembles traversing the landscape again. Tracing and exploring the mapping constitutes another kind of fieldwork—or rather a continuation of the fieldwork*ing* preceding the creation of this *Tableau Physique*. As I am creating this map (writing the landscape), I am diffractively and iteratively re-reading the landscape I experienced: Where does (my) fieldwork end?

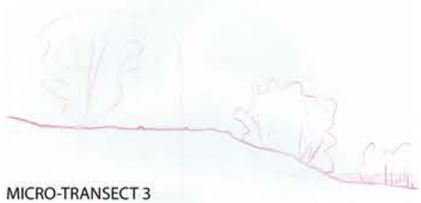
Fig. 68
Ants under the bark.
(Werder, 2024)





MICRO-TRANSECT 1

MICRO-TRANSECT 2

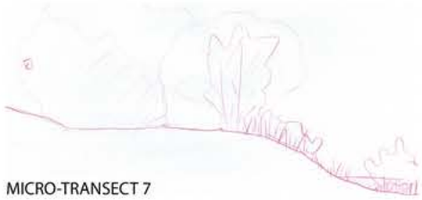


MICRO-TRANSECT 3

MICRO-TRANSECT 4

MICRO-TRANSECT 5

MICRO-TRANSECT 6



MICRO-TRANSECT 7

MICRO-TRANSECT 8

4.2.6 A diffractive understanding of the *Travelling Transect*

1 The Travelling Transect allows for the generation of situated knowledge. The focus on capturing the particular (Farsø & Henriksson, 2016), rather than the general, as well as the diversity of findings rather than the average (Hemmersam & Morrison, 2016). This counters the positivist approaches and the neglect of focus on aspects outside the economic discourse. The abstract itinerary may, at first, look like a rigid framework. However, it reveals its potential for the discovery of novel insights in the process: The semi-structured process, as well as the immersion into the field without a completely presupposed itinerary, allows the researchers to uncover new knowledge and possibly overlooked aspects of the site (Farsø & Henriksson, 2016).

2 *through the medium of the transect the organizing function is the line/itinerary of travel and serendipity is what crosses the line/itinerary and causes us to pause and record or map whatever situation is thrown up at us on site.*
(Braae et al., 2013, p. 194)

3 Additionally, the transect as an itinerary provides an entry point to initiate fieldwork and gain momentum through novel explorations. Allowing fieldworkers to immerse themselves without extensive preparation or previous knowledge, this approach provides a start **in the middle** p. 113, where the intra-action with the landscape is enabled.

4 Serendipitous findings are symptoms of diffractions—moments where unseen or unthought-of phenomena emerge, and differences present themselves intra-actively. The probing (or *measuring* in a Bohrian sense) of the landscape precisely brings about these moments. The transareality, in its spatial understanding, and the scalar jumps inadvertently occur in observations, provide a context for surprising findings that only appear in comparison or contrast to a multitude of situated moments: An ant community inside a peeled-off tree bark is not surprising. An ant community as part of a recreational outdoor playground is assigned a different meaning from a human perspective. This movement across and beyond a site reinforces the topological character of landscapes by supporting relational thinking of local site observations. When boundaries between the macro- and micro-cosmos are blurred, thresholds between water and land are re-negotiated, and culturalnatural relationships are revealed in their holistic and situated entirety, diffraction patterns are enabled. Observations of common denominators (such as the wind, waves, or the continued encounter of specific birds) provide a red thread across a landscape that traditionally is studied in more fragmented ways. The researchers' intra-action with the more-than-human and nonhuman provides a constant across changing topographies.

5 Although not explicitly theorised, most scholars expect to encounter and engage with the *as-found* on the site, where existing phenomena are met with curiosity and humility. From an agential realist perspective, the studied landscape becomes not simply the object of study but an active participant and constituent of the process. Intuitively, researchers and scholars such as Ellen Braae, Gini Lee, and Lisa Diedrich would understand their process as *probing* the landscape, where they focus on synthesising questions that may arise in the process. The strong focus and prominence of the visual outputs highlights this epistemological goal.

6 The representational aspect of the *Travelling Transect* is discussed among different practitioners where Diedrich, Lee, and Braae (2014) also refer to Alexander Chemetoff's approach as consciously refusing any translation of the recordings into another medium or platform. The method contrasts a time-constrained, *Big Data*-based site analysis traditionally conducted using primarily digital tools and embraces the use of different tools, including analogue forms of recording. Farsø and Henriksson (2016) mention the potential of this method in terms of new knowledge production. The authors also conclude with a call for a rethinking of the depiction of these results: Would this also trigger a new form of representation? The iterative process between observation and recording or documenting can be seen as a diffractive practice. Crucially, the resulting outputs, whether as sectional mappings or other forms of representations, constitute an interpretation of the observed landscape rather than claiming to be an accurate representation, or *reflection*, of the observed landscape. This iterative and situated process is also thanks to the embodied experience and the more patient pace of walking that allows for a personal scale and the inclusion of multisensory awareness, displacing the visual hegemony often encountered in such tasks. However, many studied methods still heavily rely on visual media such as sketches, photographs, and videos to document findings.

7 Therefore, the fieldworker's immersion challenges pre-conceptions (Farsø & Henriksson, 2016) as they navigate through a physical space leaving them receptive to intra-actions. Likewise, Hemmersam and Morrison note the importance of the creative potential by addressing the epistemological and synthetic qualities of "writing space before reading it" (Hemmersam & Morrison, 2016, p. 25)—usually a division in tasks in landscape architecture or planning. Mathur (2019) similarly considers the simultaneous emergence of landscape and design within this process. The process of creating a cartographic diary and diffractive reading of the literature (particularly from a phenomenological and nonrepresentationalist perspective) reveal the focus on the *travelling* as opposed to the transect or output themselves: The actual contribution precisely lies in the act of walking and traversing the landscape, the very moments the fieldworker points their attention to a specific phenomenon or finding, and the wandering feet and mind. This process is formative in knowledge production and constitutes an embodied and tacit memory unique to the fieldworker.

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Fig. 70
Drawings on the water.
(Werder, 2024)

4.3 FIELDWORK: METHOD 2 SKETCHING

4.3.1 Overview

1 *Sketching* is inspired by the practice of Caroline Lavoie (2005), a scholar in urban design and theory of design and representation. Sketching and drawing have a long tradition and history in spatial studies and have influenced the early stages of landscape architecture, forming a discipline in the beginning of the 1800s. As outlined previously, many scholars criticise the ocular-centric dominance in landscape research reiterating the outdated paradigm of landscapes as mediums for visual contemplation

2 Lavoie uses drawings and sketches to intimately understand a landscape or built environment and revisits sketching as an academic and pedagogic practice (Alomar, 2016). She emphasises the relationship between the observer (and drawer) and the observed landscape or built environment. Therefore, Lavoie understands drawing as an open-ended process revealing more than a finished drawing. She explicates the multi-dimensionality in her approach, highlighting that the output further reveals implicit information in these drawings. Intangible or ephemeral qualities experienced on a specific site, such as wind, weather, conditions of terrain and the like, imprint cognitively or physically onto the created drawings.

3 Sketching is broadly discussed in landscape architecture and related fields. Most theorising happens in the realm of pedagogy and education. While it is generally not considered a fieldwork method per se, the perceptual approach (Smith et al., 2017) often connected to movement through a landscape (e.g., Alomar, 2016) finds wide application in fieldwork practices and sketching or drawing is considered a vital practice in site analyses and design methods.

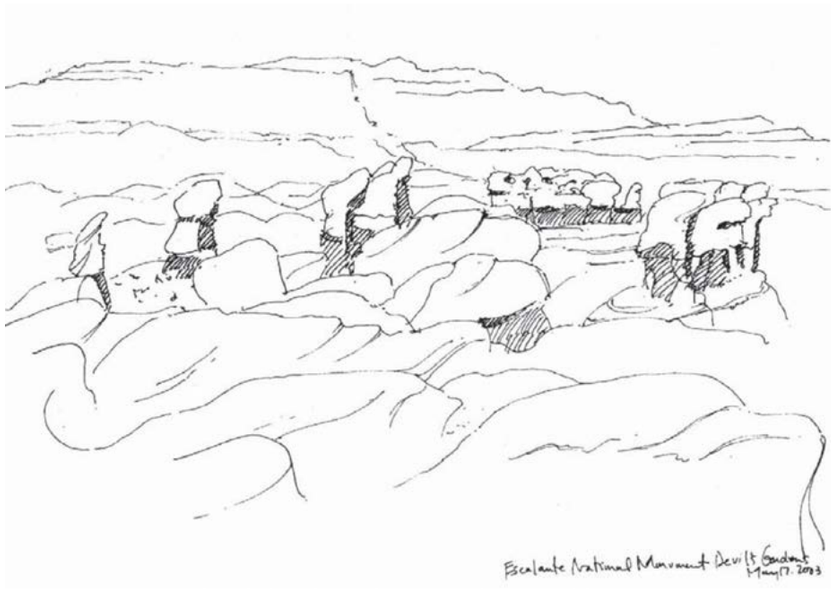


Fig. 71
Devil's Gardens, Escalante National Monument, Utah. (Lavoie, 2005, p. 19)

4.3.2 Context and background of *Sketching*

1 Lavoie understands drawing or sketching (the terms are used interchangeably) in landscapes as creating "an awareness of place that is a distinct form of information gathering and of understanding the landscape setting" (Lavoie, 2005, p. 13). Her method and approach are highly linked to the discussion around the term landscape and our perception of space, and, in essence, aim to *understand* a landscape or built environment while also emphasising the idea of landscape as a "world of relationships" or the "phenomenal world" (Lavoie, 2005, p. 13). Drawing can heighten this understanding through this process and creating a product or output. Without explicitly discussing this, Lavoie applies a naturalistic drawing style, capturing the landscapes as she perceives them without scalar or orthographic abstraction as encountered in mappings or more experimental drawings (FIGURE 71).

2 For Lavoie, drawing highlights crucial elements between the observer or drawer and the subject of these drawings, the landscapes. She claims that a drawing reveals a personal connection to the subject, referencing Catherine Franceschi's claim, "there is a personal involvement (commitment) in all landscape representation" (2000, p. 18; in Lavoie, p. 14; Lavoie's translation). Visual references, prior knowledge, naming choices, and other aspects influence our perception, and drawing further augments the relationship between the landscape and the cultural context. Drawing, therefore, results in a *reflection* of the observed landscape. This relationship between subject and drawer is reciprocal as drawing also heightens the intimacy between the person sketching and the observed landscape (Lavoie, 2005). The time required to sketch allows for a detailed observation of the landscape—Lavoie talks about the understanding of geomorphic transformation through the focus and identification of patterns in landscape—and highlights the ground the drawer is standing on. The awareness of the terrain, risk-taking that may be part of the search to find that perfect vantage point, and soil instability are all aspects revealed in this process.

3 Drawing allows for representing a *sense of place* (Lavoie, 2005), revealing more than just physical features. For Lavoie (2005), the drawings are less about the actual output and more about the learning process while creating these sketches. The author recalls places of rugged terrain and difficult topographies aiding to understand the landscape more sensually, and therefore, amplifying concentration and focus (Lavoie, 2005): The exploration of terrain becoming both a physical and a mental experience. Lavoie puts much thought into the framing of a drawing as well as placement of the horizon—she realises that the sketch or drawing provides a way to understand scale, dimensionality, and discovery of the absence of (visual) boundaries, which is often lacking in the representation in technical mappings. Defining boundaries, however, mirrors the decision-making processes in design and spatial planning.

4 Similarly to the other methods explored in this thesis, Lavoie's approach addresses the aspects of time and movement, which she critically explores: Dynamic entities such as water are challenging to capture in a static medium. The element is de-materialised and reduced to a surface. This stratification in time is relative to the temporal scale of the object: A stone, while not moving from our perspective, has and will still be moving over time (thinking about erosion and sedimentation). However, this process will happen at a much more extensive timeframe. Time and movement, although not actively represented, are always implicitly present in any visual representation (Maldonado, 2022).

5 While Lavoie's sketches reveal a particular skill or confidence in the technique, Smith et al. (2017) explore sketching as a more abstract and affective practice. Their method of *Shaking Hands with the Landscape* introduces undergraduate students in landscape architecture to an immersive and perceptual tool for understanding a landscape. Through an exploration of abstract drawings, the students are asked to layer their knowledge of a site with an emotional response. This approach not only privileges personal experience and presence over craft and skill but also had more favourable responses from the general public in contrast to their reaction to technical drawings and mappings (Smith et al., 2017). The resulting site drawings are abstract and impressionistic and counter a literal or strictly representational depiction. This approach invites the participation of researchers with varying skill levels. It reveals a greater reflection of the observed landscape as a precisely crafted drawing that may mimic a certain aesthetic ideal. Smith et al. (2017) also explore different formats (i.e., paper formats) that the students are tasked to use. One example is using a paper scroll (approx. 61cm x 610cm in dimension), which forces the drawer to sketch *with* the landscape as the logistics of the large paper needs to be negotiated.

6 A further iteration of this method is the *Sketch Walk* (Alomar, 2016). Participants with different backgrounds (not necessarily from a landscape or architectural field) are invited to join a guided walk through an urban or rural place and sketch their experiences. This method is often experienced within a community and aims to discover a place.

4.3.3 Overview and process of *Sketching*

1 Lavoie's sketching process does not require specific preparation or on-site process. Motives and viewpoints are chosen based on on-site observations and experiences and do not necessarily need prior knowledge. Other methods, such as Alomar's *Sketch Walk* (2016), require preparation and reconnaissance to ensure a seamless experience for other participants. However, this preparation would not be needed for researchers already acquainted with these processes.

2 Most sketching methods clearly state the benefits and merits of sketching on-site rather than from memory or copying off photographs, as this approach would precisely lose the valuable qualities of sketching on-site.

4.3.4 Relevance: Wider connection of *Sketching* and benefits

1 Drawing or sketching as a perceptual practice does not necessarily require comprehension or knowledge of a place. Therefore, it invites people of different backgrounds to participate in such an activity and contribute to knowledge generation (Smith et al., 2017). While drawing aims to focus on the *essence* or *character* of its subject, it inadvertently reduces or idealises the observation. Mattern (2016) sees this as a decontextualisation of the subject.

2 Lavoie's multi-dimensional understanding of drawing still amplifies the reductionist nature of current visual representation to the uninitiated reader. Flattening a landscape onto a two-dimensional media neglects many aspects of the characteristics of a site if not explicitly made aware and dilutes multi-scalar relationships. Lavoie and others discuss this aspect critically in relation to photography (Lavoie, 2005; Smith et al., 2017). Lavoie also draws on Carter's description (1996) of how ground is conceptualised: Carter argues that modern planning frequently eliminates any irregularities or roughness to create a smooth, uniform building surface for areas or cities dominated by mechanical traffic. This leveling and standardisation of the ground are expressions of control. On the other hand, Lavoie's sketches are not only representations of ground or other geomorphological processes; as a researcher, she also physically experiences the specific ground conditions by standing, sitting, or even lying on the ground.

3 Choosing a subject for a drawing can be (presumably) arbitrary or based on specific criteria. However, the choice always involves a spatial negotiation: What am I looking at? Where am I looking at it from? Similarly, the drawing process also involves a temporal aspect. Deciding how long the observer is spending on a single drawing or sketch and at what time the drawing is made. Lavoie also suggests drawing the same subject at different times to reveal new insights into a specific place.

4 Fekete and van den Toorn (2021) see drawing as fundamental to learning to see. Translating (messy) field data often leads to sterilisation while visually representing the findings, and the drawings or records mainly focus on the individual or the image itself rather than the relationship to other actants within the field (Mattern, 2016). Smith et al. (2017) counter this assumption by allowing for more abstract drawings:

5 *What was being drawn by our students was so inherently complex and difficult to understand—a landscape formed over eons and an individual's sensorial response to it—that it is fitting that the drawings were usually incomprehensible on first reading, and it is telling that they only became clear once accompanied by a verbal explanation; these are deeply personal drawings; messy, abstract, open-ended, layered.*
(Smith et al., 2017, p. 30)

6 The drawing process revealed a profound connection of the students or researchers to the landscapes and fostered their curiosity and appreciation. Cognitive sciences support this benefit by uncovering how drawing can be used to acquire knowledge (Fekete & van den Toorn, 2021). The observations become part of the drawer's memory and "tacit emotions" (Smith et al., 2017, p. 25). The independence of the method from previous knowledge of a place means technical, cognitive, or detailed understanding is not required, and the approach provides an alternative to the rational approaches of a McHargian model of site analysis.

4.3.5 Application of *Sketching*

1 In my fieldwork, I combine Lavoie's approach with other techniques derived from literature and experiences of my own previous practice. The first iteration includes a method of *storyboarding* (see also Maldonado, 2022), which I had previously applied to a site analysis along the Thames between Kew Gardens and Hampton Courts, UK (Prof. Christophe Girot ETH Chair of Landscape Architecture, 2012) (FIGURE 72, NEXT PAGE). This alteration includes the findings around **walking methods** p. 130 by introducing the benefits of walking to this approach.

2 Storyboarding emphasises the observer's motion and challenges the drawer to act quickly, as many drawings are needed to complete a cohesive storyboard. The sketches focus on the essence of the site and are presented sequentially. Storyboarding traditionally requires a single image for every scene; therefore, a new or altered sketch is needed when the resulting *movie* is supposed to cut, zoom, or pan to another scene. Adapting this technique to a walk in the landscape requires understanding what a (cinematic) *cut* in landscape is, or could be, and, therefore, heightens the senses to perceived boundaries, limits, and thresholds. These moments in time and space are particularly difficult to represent in technical mappings, as landscapes are not made of *lines*. The qualitative and sensorial depiction of these changes of moments will highlight the need to rethink our practices of representing boundary moments in traditional mappings.

3 I opted for eight sketches for each sequence to obtain a reasonable number of sketches for a sequence. The choice of where these sequences would take place was made on-site without any specific agenda—following what captured my eye. Likewise, the timing for capturing these moments was chosen randomly and based on my available time. Lavoie (2005) advocates for boundless drawings not necessarily contained to a specific format or size—the storyboarding method contradicts this approach. However,

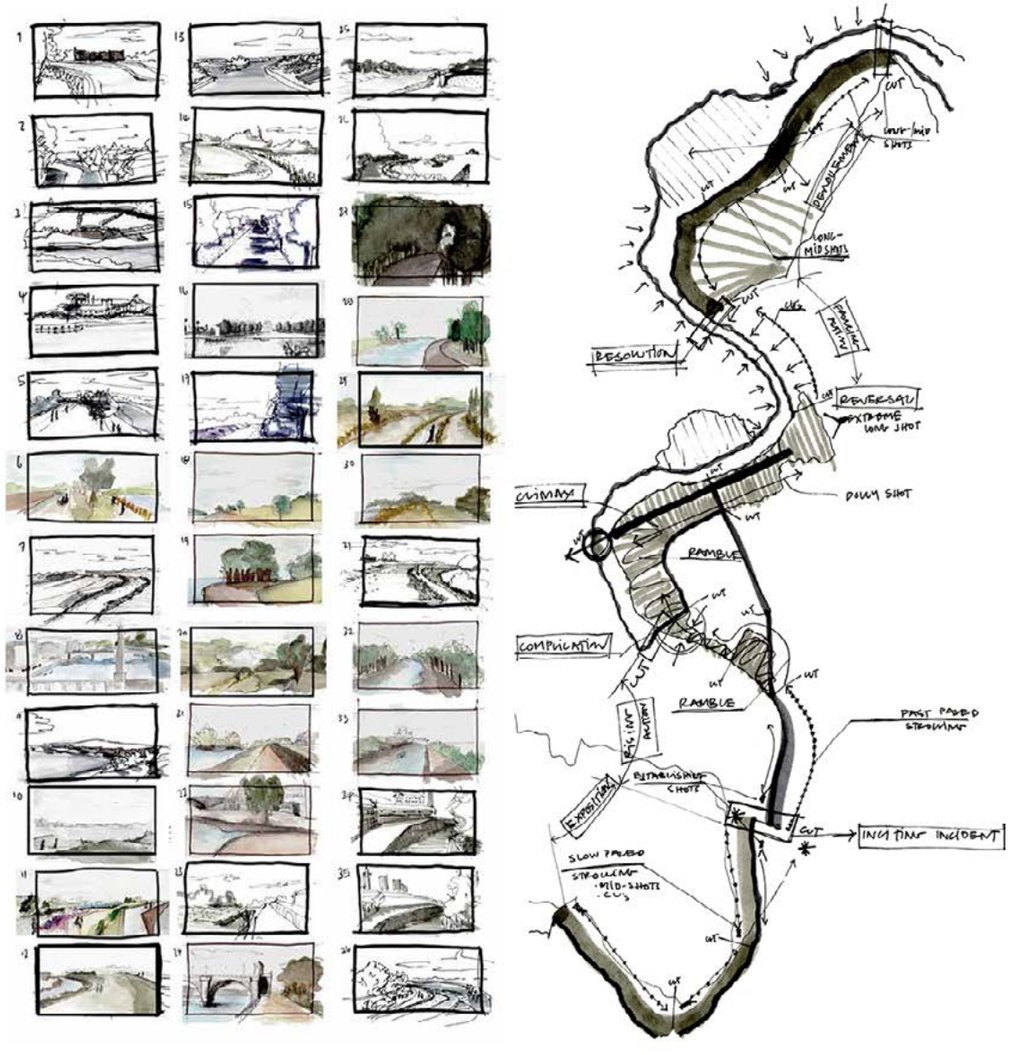


Fig. 72
Thames Walkway storyboard. (Werder, 2012)

Fig. 73
Sketching *on* the land. (Smith et al., 2017, p. 27)

I do not pay particular attention to the frames and aim not to stick to these if needed. Nonetheless, as each drawing represents one moment in time as I experience it, the framing still represents my perception adequately.

4 The second iteration is inspired by Smith et al.'s *Shaking Hands with the Landscape* (2017), which describes a practice using a long paper scroll as a canvas (FIGURE 73). Intrigued by the (almost) boundless opportunity of sketching and the challenge of handling such a large piece of paper on a windy site, I suspect an interesting outcome emphasising crucial observations of Lavoie's theory.

Tools & techniques

5 The drawings are made on white paper using pencils and pens in the first iterations and coloured pencils on slightly tinted paper during the second adoption of the method. The sketching technique focuses on fast drawings, using pen, pencil, or watercolours, and the focus lies on the essence of the landscape by trying to capture lines, textures, light and shadow, or other interesting moments that reveal a site-specific character of the subject. The drawing processes use two different techniques: Linear, sequential drawings and individual moments across different days, times, and weather events.

Linear, sequential drawings: Storyboarding

6 With the storyboarding approach, I use white paper with pre-drawn rectangles or frames. The sizes of the rectangles are all the same and at a similar ratio as a traditional movie screen. This choice frees up the decision-making process to decide about framing, size, or orientation and focuses more on perception and observation of the site. However, as moments emerge on-site, I am allowing myself to deviate from this method and capture other aspects, escaping the predefined size of the storyboard boxes. During the second approach I abandoned this strict convention and adjusted as needed.

Individual moments across time: Scroll-sketching

7 A second drawing technique has gained my interest through repeated exposure to the site: Using a paper scroll is challenging, and the expectation of a crisp paper as a canvas has to be given up. More importantly, the wind, soil, and landscape become participants in the drawing process as they leave marks on the paper and drawings.

Results: “Drawing Waitaramoa”
Auto-ethnographic report

First session

8 The start of winter and the dooming rain further challenged me to take quick sketches and complete my drawings before it rained too heavily. For my first walk, I opted to bring only paper and a black pen and go for simple line drawings. Although I value sketching in my own work, I feel out of practice and struggle to get the results I was hoping for. However, the drawings are neither supposed to be perfect nor aiming for a specific output. The sketching process allows me to look for moments in the landscape that catch my eye and identify interesting phenomena to capture and represent my impression of this moment within my pathway.

9 I felt the need to incorporate annotations of non-visual cues: bird songs, wind, temperature, and quality of light. In these moments, I realised how this process is reverse-engineering a filmmaking process: Rather than designing a sequence for a narrative or storytelling, I am recording what I observe as I create my path. I understand the choice of movement and my focus on specific details as a creative process enhancing my perception of the site. The creation of a sequence gives potential audiences an insight into my way of navigating the site—the movement of my feet as well as the movement of my eyes.

Back in studio

10 Re-reading Lavoie’s thoughts on drawings, I understand the reciprocal relationship between the observer and the subject better. I now understand how the drawings reveal so much more than just the objects they portray. Little raindrops reveal a weather event, and the strength or confidence of the lines gives away a certain discomfort of standing in a specific place for a prolonged time.

11 I also notice the cultural influence of my upbringing in my drawings. Due to familiarity with or exposure to a particular landscape type, as I see preferences in my subjects, Waitaramoa Hobson Bay is not the landscape of my childhood, nor is it the type of landscape my ancestors would have lived in. Coming from a landlocked country, dominated by a topography formed through glacial and fluvial processes, I am looking for features that remind me of these familiar places. I admire Waitaramoa when the tide is low and prefer to sketch this state as the little streams are revealed in the sandbeds—I label it as more enjoyable. I attach value to the meandering waterways that are sometimes unseen, and I notice I am highlighting these in my drawings. I also seem to prefer the foreign view of an almost flat horizon (I grew up in mountainous terrain, on the foot of the Swiss Alps), as I catch myself repeatedly drawing or taking photographs of this scene. These considerations are just as important when it comes to collecting data. However, the researcher’s bias hides behind the seeming objectivity and the discussions are neglected. Decision-makers would feel more open to criticising Lavoie’s approach as anecdotal while not linking this criticism to current ways of *data* collection, which also have their limitations.

Second session

12 During my second walk, I aim to recreate the same pathway to generate a comparison to the first drawings. It is again the beginning of winter, and the soil and pathway are wet and saturated from the rain. I plan to break out of the predefined rectangular shapes of the storyboard and align the individual drawings freely on the pages. One observation leads to the other, and the sketches relate more fluidly to each other. Although I was planning to recreate the same walk as in the first session, the moment drew me closer to the water—probably as I had gained more interest in other subjects by now as well.

13 Again, I use words and annotations to label interesting findings, as I fear I may not adequately capture them otherwise. The sketching is fast again, and I only spend a few minutes per drawing. I continue my walk, experiment with other sketching techniques, and create some individual drawings as well.

Back in studio

14 Compared to the first session, this drawing sequence appears more expressive and personal and highlights the site’s particularities in more detail. The free arrangement of drawing space allowed me to prioritise what I highlight to show or what I would like to stand out more. The standardised storyboard looks, certainly also because of the use of a black pencil, more sterile and generic, lacking some uniqueness and character. These techniques probably influence the audience’s perception.

Fig. 74
Mudflats.
(Werder, 2023)

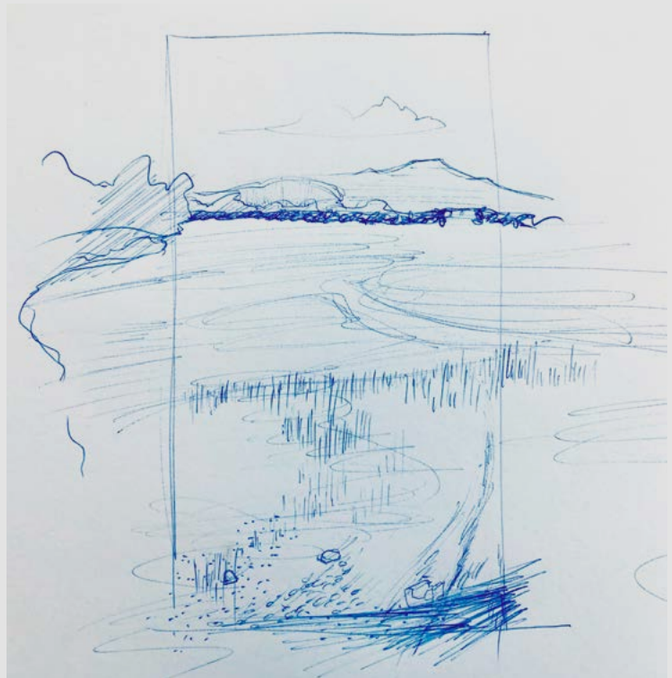
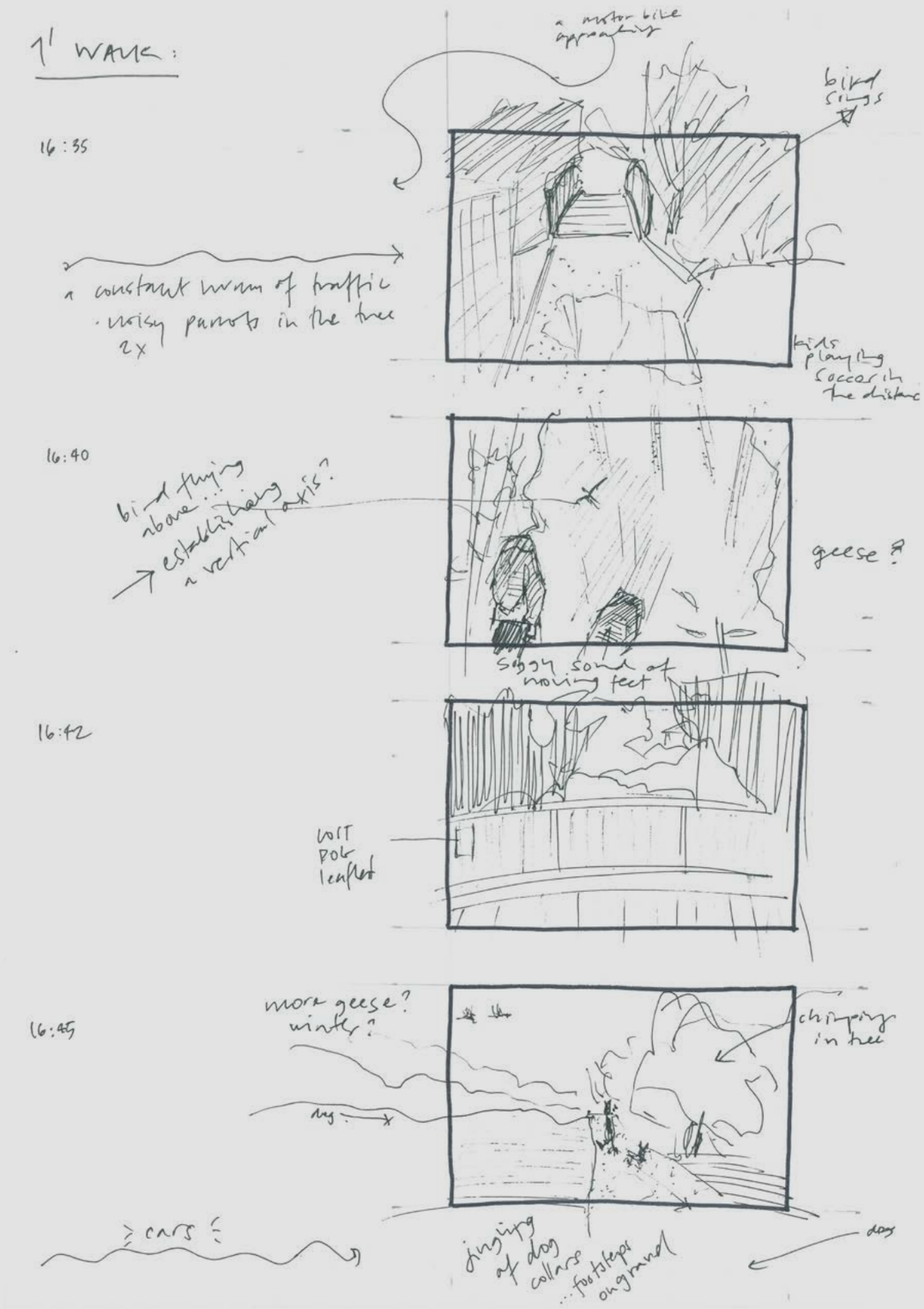


Fig. 75 & 76
Storyboard 1.
(Werder, 2023)



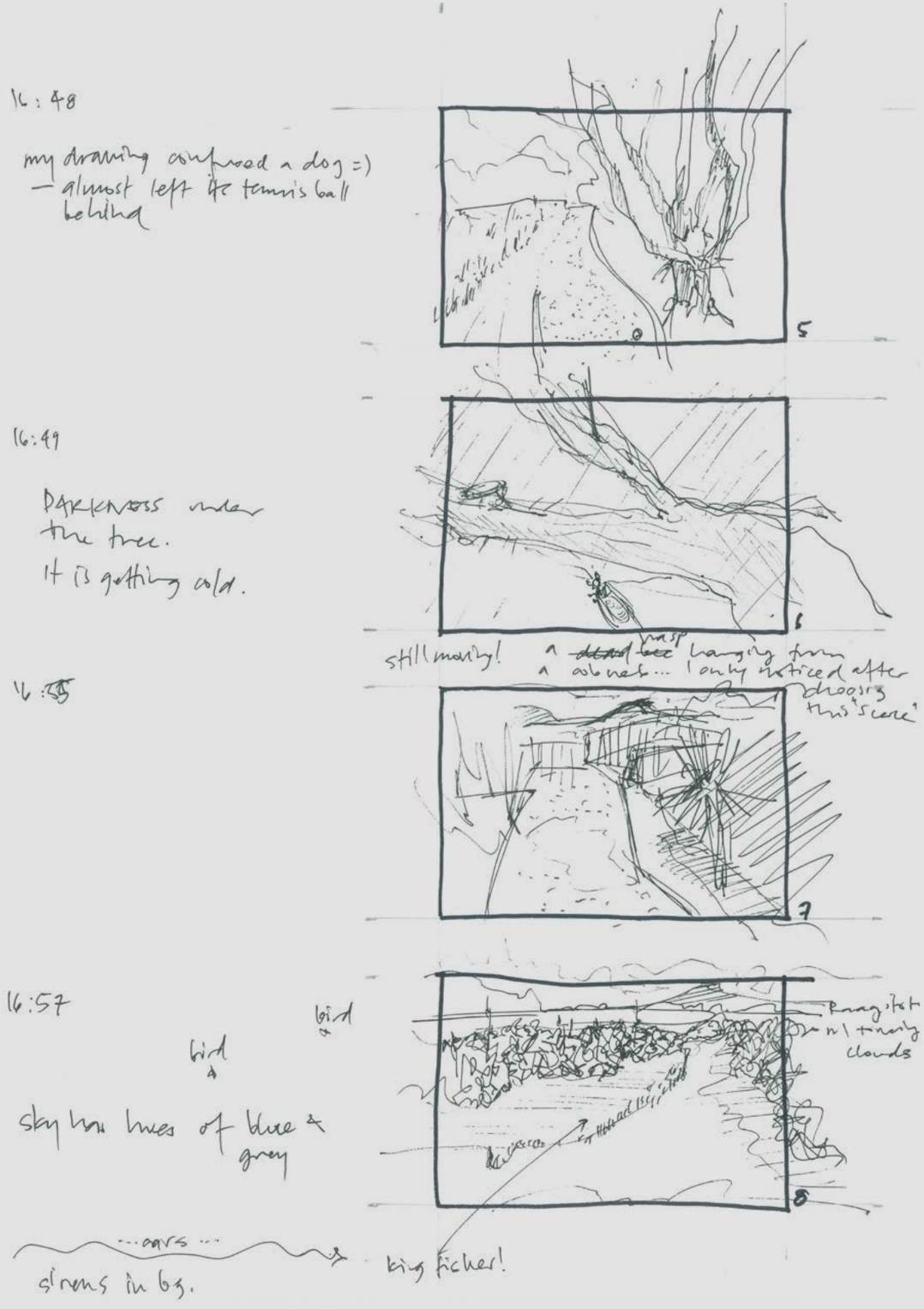


Fig. 77 & 78
Storyboard 2.
(Werder, 2024)

Fig. 79
Scroll drawing.
(Werder, 2024)

Third session

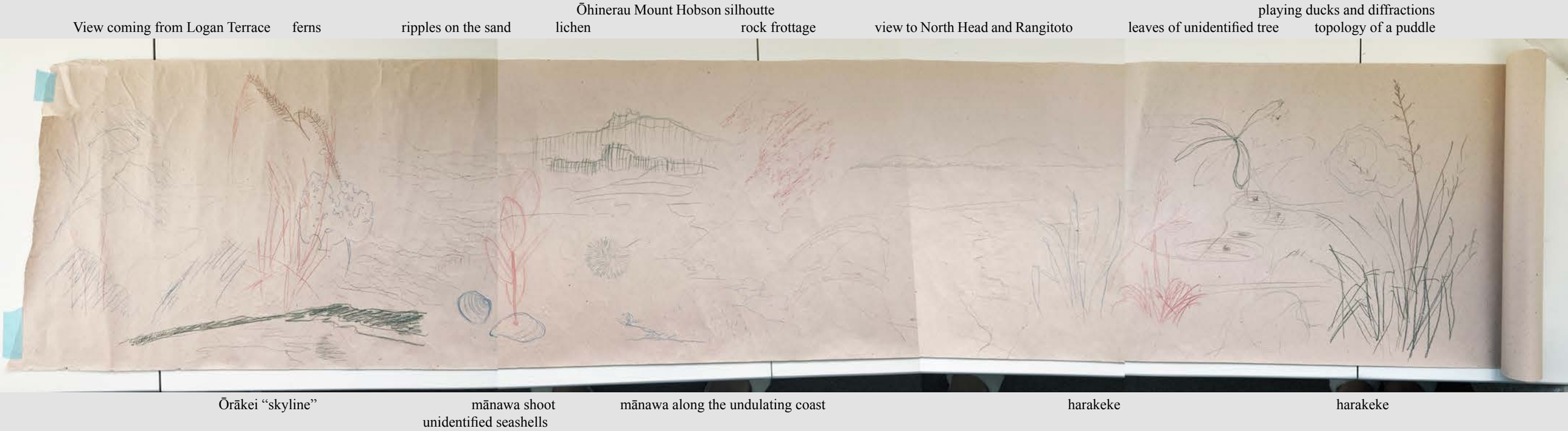
15 Inspired by Smith et al.'s (2017) technique of using a long paper scroll as a medium, I am exploring the site again. I mostly use coloured pencils, which I carry in my back pocket—like a little quiver. A long roll of lightly tinted paper serves as my canvas. I start sketching without specifying what paper length I plan to use. My walk begins on Logan Terraces in Parnell. From here, I can access the tidal Waitaramoa Hobson Bay pathway. It is just reaching low tide, so I expect to be able to follow the path to the boardwalk entering Thomas Bloodworth Park.

16 It is a windy day, and even without unfurling too much of the paper, I have already experienced the struggles of this method. I have to get creative on how to place the scroll (not many stable and flat surfaces are available) and how to hold it in place to sketch. With more and more fast sketches added to the scroll, the paper gets longer and longer. At some point, I have to start rolling it up from the other side and temporarily attach it with a small paper clip. Sometimes, the ground is too rough to draw on—it wears off my pencils, the texture is distracting, and I risk puncturing the paper. Therefore, I occasionally use an A4 cardboard as a drawing surface.

17 It starts to drizzle a bit, and the humidity on the paper adds another challenge, so I protect my rolled-up scroll. I am also beginning to notice that the choice of what I am sketching depends on the available space. I look out for potential sketching surfaces, which determines whether I stop for sketching or not—a reversed motivation. The ground is very muddy and wet as most of the pathway is usually submerged when the tide is in. Once I reach the boardwalk, I continue my walk along the reserve and am grateful for a few benches to sit down and use for more detailed sketching.

Back in studio

18 As I unfurl my scroll again, I notice the marks the terrain and weather have left: Little folds and scrunches have added texture to the paper, rain and mud have lightly stained it, and I have accidentally punctured the paper it at the end of my walk. I have already noticed during my walk that this method biases my choice of drawing subjects. However, as challenging as it was to experiment with such an unusual drawing canvas, I welcomed the *collaboration* with the wind, weather, and ground. I would argue that this has also freed me from the need to create *perfect* sketches.



4.3.6 A diffractive understanding of *Sketching*

1 Lavoie values the idea of impromptu sketches and suggests that these need to be paired with written reflections (Lavoie, 2005, p. 28). The technique of storyboarding, with its usual annotations, serves as an interesting opportunity to enhance the sketches with short descriptions or keys. However, a nonrepresentationalist understanding also acknowledges that not everything needs to be put into words for findings to gain meaning (Barad, 2007).

2 I notice a jump in scales in my observations. Tiny details like a struggling wasp in a spider's net suddenly become present as I search for moments to sketch. A benefit of the storyboarding method is the interactions of different scales found in filmmaking in the form of different shots: Close-ups and long shots are curated to a narrative sequence and allow the drawer and the viewer to jump between different scales. The second session had further emphasised this technique and the resulting sequence appears more fluid. The presence and awareness of the spatial scale are mirrored in a dilation of time—the short distance would typically take only a few minutes to walk. However, with the sketching, it is prolonged to thirty minutes, allowing my gaze to linger longer and observe more details and patterns juxtaposed in the landscape. As an observer, I have become an active participant and part of the "world's becoming" (Barad, 2007, p. 136). In this sense, the experiences of time, motion, and movement are not about these aspects as concepts (nouns) but the act of *becoming* and *moving* (the verb).

3 To counteract the increased speed the storyboarding demands of the sketching process, I chose certain moments as *key moments* and devoted more time to these drawings. This allowed me to delve into the physicality of sketching. As the site does not provide many moments of respite (benches, stones, and the like), and the wet environment discourages sitting on the ground, the process has encouraged the notation and sketching of the essence of a site rather than dwelling on details. The storyboard sequences were ad-hoc and did not include any previous mediation or curation of how the storytelling would unfold. The freer technique of the second session resulted in more expressive drawings, encouraging my field note taking, and resulting in a denser recording of the landscape. The process and choice of media (coloured pencils) have highly influenced the resulting sketches and potentially biases future audiences as well. Each sequence has its values and provides a different set of learnings.

4 Researcher's cultural backgrounds and the capabilities of physical senses dictate many aspects of drawings: how a setting is framed, what can be perceived, and choices of attention and intensity within a drawing. This highlights the subjectivity of data collection—no data are purely objective—reinforcing the need to evaluate the source, intention, and relation of collected data. Our cultural backgrounds may lead us to favour certain aspects of a landscape, giving this more space on a drawing than others. Likewise, absolute perception assumes an able-bodied observer capturing a photograph-like landscape image. However, people perceive differently, and physical senses may have an uneven dominance that leads to different attention when observing a landscape. This method of collecting *evidence* of a site provides valuable, additional data that inform the findings through intangible, qualitative aspects of a site, our relation to it, and how we, as observers or researchers, chose to represent it.

5 Following Smith et al.'s technique (2017), the second method was physically more challenging but eventually supported some of Lavoie's claims more profoundly. The landscape and weather noticeably participate in this process as I draw. The wind directs certain movements or tempos of drawing, and the long paper format inevitably touches the ground or soil, which leaves marks and imprints on the sketches. The paper format and lack of adequate drawing surfaces (unlike in a small notebook that can be held on one's lap) this technique force me to draw on unstable surfaces where timber, rock, or concrete become agents in my process. I, the paper, the landscape, and my process are intra-acting with the landscape and my surrounding. The more affective and emotional drawing process further avoids a purely reflective representation of the observed landscape and supports recording ephemeral or atmospheric qualities. As such, drawing constitutes not only a technical process but becomes material and embodied as I negotiate the challenges of my set-up.

6 Drawing as a method will need to negotiate the relationship between the mental image and the encountered landscape to challenge our biased perception—to counter the fact that "we only see what we know" and allow our senses to let us discover previously unknown qualities. I also noticed that I must unlearn certain habits and ways of drawing based on my architectural training and absorbed conventions. As I am used to orthogonal drawings, I tend to slightly abstract my sketches based on previous knowledge rather than fully embrace the *as-seen*.

7 The reading between lines constitutes an act of diffraction where drawings, again, are not simply reflections of reality but become critical discursions of the observed.

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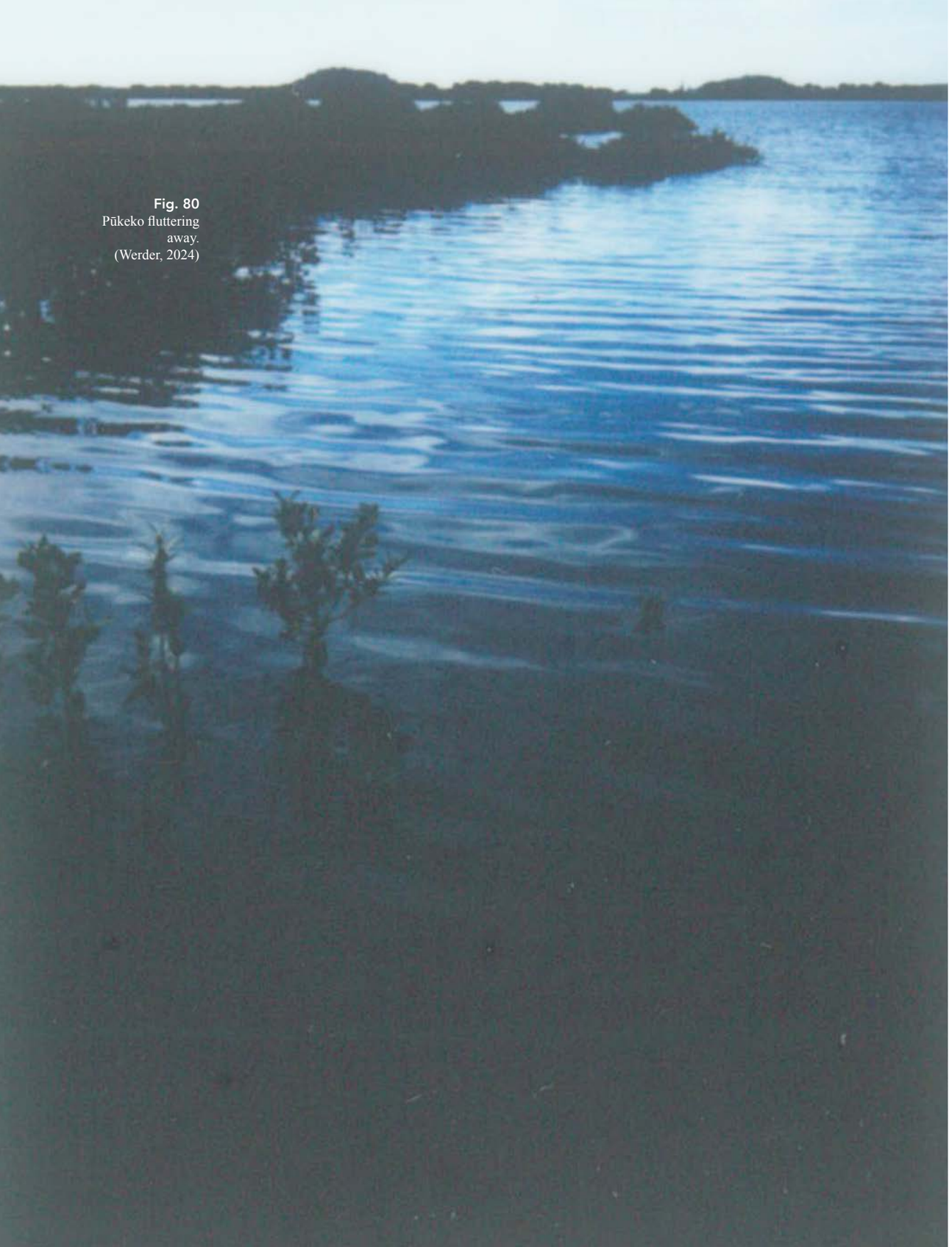


Fig. 80
Pūkeko fluttering away.
(Werder, 2024)

4.4 FIELDWORK: METHOD 3 FIELD EXERCISES

4.4.1 Overview

1 Katherine Jenkins explicitly addresses the lack of outdoor exposure of landscape researchers during design phases and education (Dee, 2010). With her proposed method, *Field Exercises*, Jenkins (2018) counters this deference through the application of empirical tools used on a given site where researchers embark on a site-specific inquiry. The fieldworkers explore the landscapes through walking while simultaneously recording their surroundings with innovative and experimental apparatuses or instruments capturing the landscapes as well as the researcher's movements and ephemeral situations such as wind and weather conditions. This results in spatial and temporal specificity. Therefore, *Field Exercises* critiques static, pre-made imagery and fosters a new way of seeing and experiencing landscapes.

4.4.2 Context and background of *Field Exercises*

1 With *Field Exercises*, Jenkins aims to counter the physical detachment and reliance on pre-existing information to avoid bias through standardised or moderated data. She does not contemplate the lack of data available but instead critiques the plethora of data and data layers that veil the essence of a landscape (Desimini & Waldheim, 2016), making this information inaccessible and unrelatable. The empirical inquiry of *Field Exercises* aims to encounter landscapes in their particularities and over time (multiple visits over weeks, months, or years). Jenkins links this walking itinerary to works such as Richard Long's practice (Dapena-Tretter, 2014). This allows the fieldworkers to experience the "multiplicity of conditions" (Jenkins, 2018, p. 6), which Jenkins relates to Doreen Massey's (2003) conceptualisation of places as moving entities that do not have singular identities fixed in time.

2 As a result, an evolving sitemap is created through the combination of "intuitive wayfinding" and "geomatic data gathering" (Jenkins, 2018, p. 7). Jenkins understands

fieldwork as a repetitive practice, where multiple site visits reveal deeper insights or impacts that can influence the site itself (in a literal way of the word impact) or metaphorically in the form of the researcher's perception and conceptualisation. The resulting sitemap reveals an intimate knowledge of a place. Jenkins stresses that not all recordings may provide the same density—while certain parts may be mapped in more detail, others can also be left slightly unexplored. The reasons for this can be manifold and conscious or unconscious.

3 The published overview of *Field Exercises* features multiple approaches by students conducted in a landscape architecture course. The researchers utilise a contraption of a camera attached to a weather balloon and a GPS-tracker recording the followed pathway. The balloon is guided on a leash, and the attached camera takes photographs at specific, programmed intervals. As the balloon can travel vertically, the distance to the ground will vary depending on wind, precipitation, and air pressure variances. This experimental device allows tension between the travelled path (walkway) and recorded photos (the balloon's perspective) (FIGURE 81).

Fig. 81
Spatial relationship between *balloon keeper*, landscape, and measuring device.
(Jenkins, 2018, p. 16)

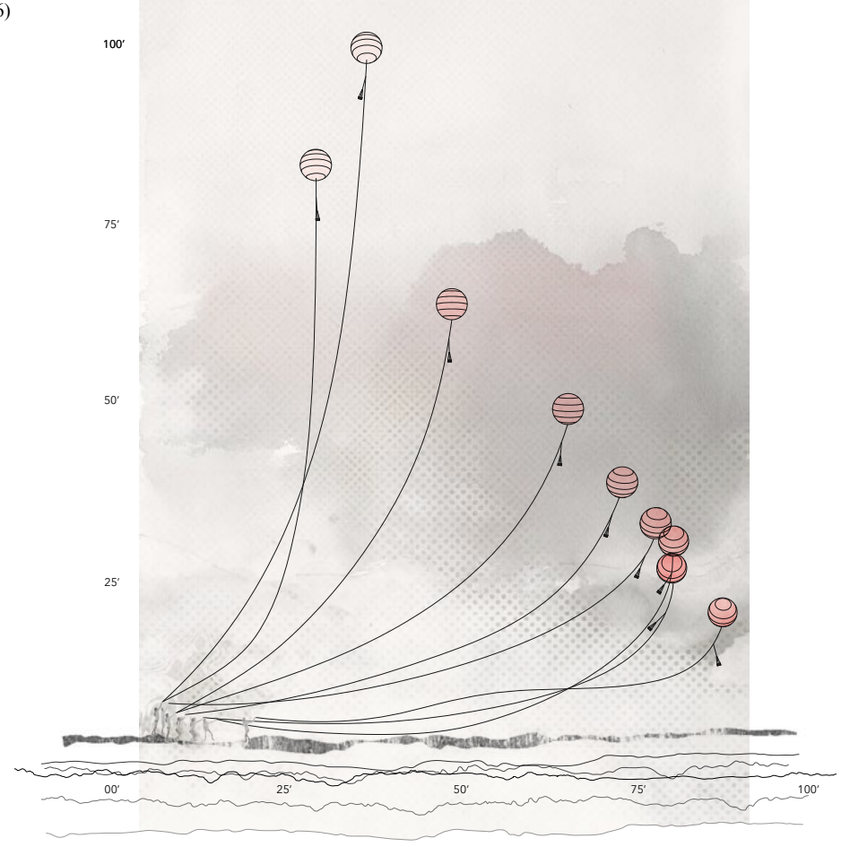
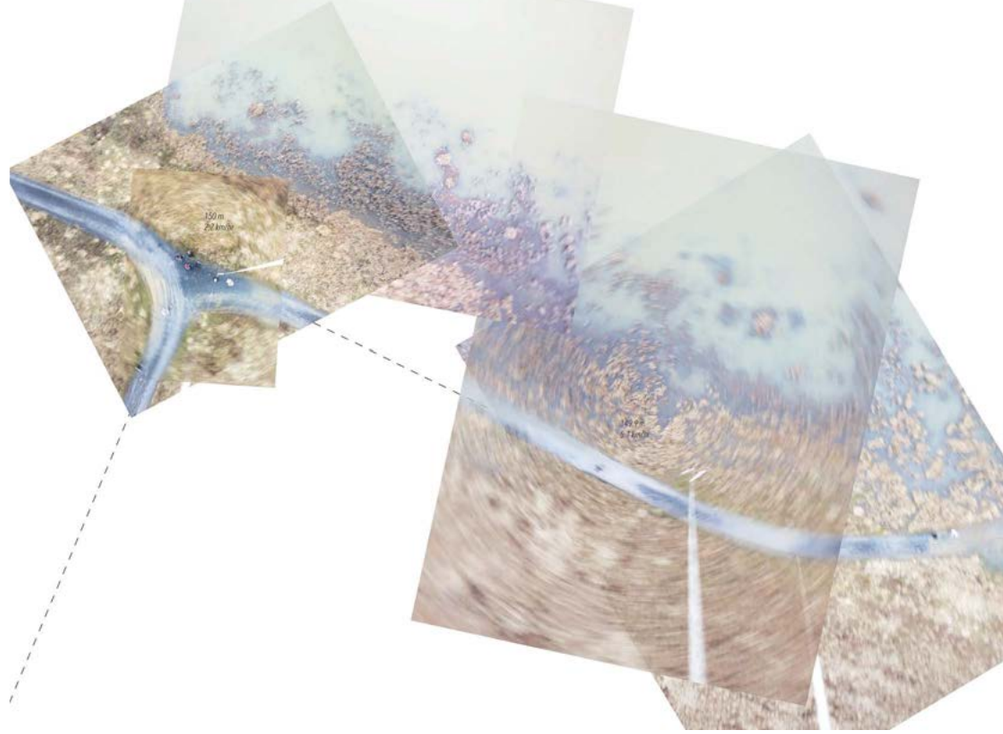


Fig. 82
Collage by Cornell University student Julia Gold.
(Gold, 2018. In: Jenkins, 2018, p. 17)



4.4.3 Overview and process of *Field Exercises*

1 *Field Exercises* aims at an immersed site exploration to capture and record the findings through technical or digital instruments. The recordings and documentation are influenced by the intuitive and spontaneous walking itinerary (the actual pathways) and the number of visits (which can be multiple, repetitive visits). Researchers are encouraged to re-visit previous landscape sections and extend existing recordings by exploring novel territories. Although the publication mentions the use of a weather balloon combined with a camera, these tools are not explicitly prescribed. Jenkins (2018) sums up the process into four stages: itinerary, navigation (on the ground), visualisation (in the air), and invention (the sitemap).

Pre-travel preparations—Itinerary

2 Research and design work may proceed with the choice and functionality of the recording device. The inventive and experimental use of an instrument that combines recording capabilities in a novel way allows for interesting findings that challenge the standardised and abstracted outputs of normative tools such as drone or satellite imagery. Some experimentation is required to generate *new ways of seeing*. This process, therefore, also has the potential to fail in a conventional understanding. However, it provides a new opportunity to reveal unseen or novel aspects of a site.

3 The pathway is not predefined as intuitive walking and wayfinding is encouraged. However, the choice of site and precise area may be proposed due to a specific project or research area. Further, on return visits, a previously mapped pathway may serve as an itinerary that is replicated or expanded on.

On-site travelling—Navigation (on ground) and visualisation (in the air)

4 The recordings usually take place over several site visits (depending on the researcher's availability) or are conducted simultaneously by multiple researchers and devices. While the researchers' walks are guided by their intuition (an act of *discovery*), attention is given to topographical features and elements of landscapes and built environments, such as river edges, surface permeability, or little gullies and channels. Multiple recordings are taken to provide a more holistic overview of the site (i.e., aerial photographs are juxtaposed with eye-level pictures taken by the fieldworkers).

Post-travel results and evaluation—Invention (the sitemap)

5 Back in studio, the captured information is collated into a sitemap. This mapping consists of an overlay of the aerial imagery and recorded pathways using GPS trackers or location data gathered by mobile phones to ground the ephemeral qualities. The collage is chosen as an appropriate medium as it allows for multiple interpretations of the data, reflecting the researcher's experience (FIGURE 82, PREVIOUS PAGE).

4.4.4 Relevance: Wider connection of *Field Exercises* and benefits

1 Many scholars and researchers in landscape studies lament physical detachment to a site. Christophe Girot likewise critiques the use of *ersatz* representations (2006 in Jenkins, 2018, p. 7) that are an insufficient replacement for on-site explorations. Jenkins further notices a detachment to a site in everyday life by referencing cognitive research. Due to the ubiquity of digital tools and apps such as smartphone maps, the reliance on the virtual world takes away from the direct experience in the world.

2 The resulting sitemap of *Field Exercises* reveals intimate knowledge about a site where information is also implicitly conveyed. Little shakes and blurs in representation may reveal weather events (i.e., winds) that constructively disturb the data-gathering. These practices are also adopted in artistic projects such as Lisa Moffitt's *Wind Grid* (2021) and influence techniques and tools reinforcing cross-pollination across disciplines and practices. This multimedia approach is not exlusive to landscape studies. It can also benefit archaeological studies, as various media such as photographs, sketches, or field notes allow archaeologists to translate sensorial experiences (Witmore, 2007).

3 The differences in recording densities reveal a rhythm of notations that hint at the site's qualities or the researcher's (personal) approaches. Fragmentation is purposely allowed, reflecting the need for multiple visits to create a more complete record of the observed site. The portrayed fieldwork methods and outputs still heavily rely on a visual assessment and experience of the observed landscape. Both recording apparatuses and outputs are primarily based on visual media such as photography, mappings, and sketches. Jenkins aims to trigger a *novel way of seeing* landscapes that can be further amplified by applying non-visual tools and techniques. Sound recordings and methods such as *Sound Walks* have gained increasing interest in landscape studies in recent years (e.g., Fowler (2013), or Adams et al. (2008)). The process of Sound Walks, or audio recordings, share a similar take on fieldwork techniques and arguably conclude similar observations as outlined by Jenkins (2018).

4.4.5 Application of *Field Exercises*

1 Jenkins' thorough summarising of the *Field Exercises* process allows me to immerse in the experiences without repeating this process in detail. Instead, I opt for a slightly different approach to reveal or confirm further opportunities and chances of this method.

2 In my personal practice, I perform Jenkins' method through a Sound Walk to complement and contrast the dominance of visual representation and provide a variety to the various sensorial experiences of landscapes (Fowler, 2013). Goh also notes that sound recordings and the associated (situated) knowledge production require "a greater interrogation of the subject-object relation via feminist epistemologies" (Goh, 2017, p. 283). Additionally, with this approach, I also challenge myself to engage with a technology that is less familiar to me. I assembled a sound-capturing instrument to bring along to my site visits. While recording ambient sound along my pathway, I also stop to investigate further into noises and sounds that catch my *ear*.

Application, alterations, and development of the method

3 I have consciously included a non-visual method within the context of *Field Exercises* to provide further diversity in my empirical inquiry. Jenkins (2018) advocates for using digital tools and (technological) media to trigger unexpected and novel ways of *seeing* or rather *understanding* a landscape—to break the ocular-centric dominance and strengthen the idea of multisensory experiences in knowledge generation (Mattern, 2015). *Soundwalking* is a sociological methodology introduced by R. Murray Schafer in the late 1960s/early 1970s (Adams et al., 2008). While initially primarily applied in urban environments (noise pollution has come to increased attention due to the intensification of urban populations and their built environment), this practice has recently found broad interest in landscape architecture, such as the practice and pedagogy of Prof. Christophe Girot at the Department of Architecture, ETH Zürich (e.g., Berger et al., 2018 or (FIGURE 83)).

Fig. 83
"Wondering Around".
(Chair of Christophe Girot, 2020)

4 My *Field Exercises* consists of a Sound Walk along Te Waitaramoa Hobson Bay. There is no predefined itinerary. Intuition, serendipitous findings, and tacit knowledge guide my pathway. As Jenkins' visual recordings reveal deviations from regular paths, I suspect the Sound Walk reveals similar moments. Previous visits served as informal investigations, during which I also conducted technical test runs. I do not repeat this process over a more extended period, although the methodology would also allow for an iterative and repetitive process.

5 Simultaneously, I record my movement while walking by pointing my camera to the floor and feet. This highlights the idea of movement through space and the surface qualities of the ground; mimicking the digital recording and replacing GPS tracking. The video recording serves as a byproduct that may be useful for other investigations, as I do not deem it necessary or relevant for the Sound Walk.

Tools & techniques

6 A repurposed tripod is used as a prosthetic or extension of my arm to hold my smartphone. This allows me to record the pathway and my walk without getting distracted by the visual component of the recording and feeling the urge to control the video material.

7 Attached to my smartphone is a digital microphone I can loosely guide and direct in different directions. Therefore, the sole focus of my inquiry lies in sound recording as the primary tool I have control over and can direct. Through multiple visits, I tested my apparatus and experimented with different gestures (how to hold the microphone) and different setups (using a noise muffler or recording without).

8 While I have my mobile phone to capture the routes I have walked, I rely on my intuitive direction and geographical memory of the site. Instead of using a precise GPS-tracked pathway to record my walking route, I will later create a sonic map of Te Waitaramoa Hobson Bay. This approach complements the sound recording as I attempt to create a *motation* inspired by Lawrence Halprin (FIGURE 84) (Treib, 2012) or a sonic map (Fowler, 2013 (FIGURE 85)) representing my experience of Te Waitaramoa.

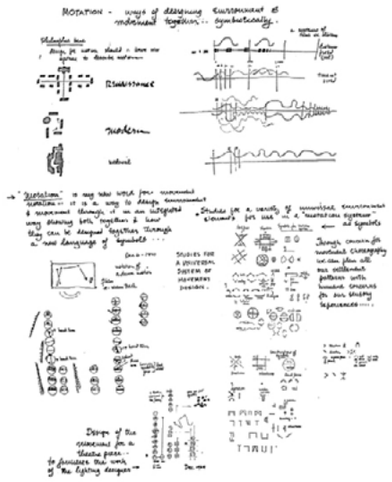
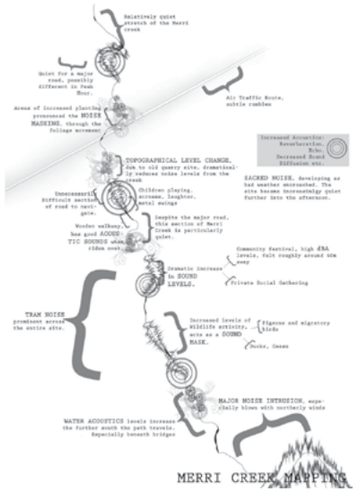


Fig. 84 (left) Motation drawing by Lawrence Halprin. (Dataisnature, 2012)

Fig. 85 (right) Sonic mapping by Jack Tupper. (Tupper, 2010. In: Fowler, 2013, p. 118)



Results: "Sonic Waitaramoa"

9 The resulting Sound Walk is presented as a continuous sound experience accompanied by a video recording of the pathway and my movement. Complementary mappings and documentation reveal my walk's location and provide a structural narrative of "Sonic Waitaramoa"—a visual interpretation of the Sound Walk in an abstract notation. All these documents form the results of my personal approach to *Field Exercises*.

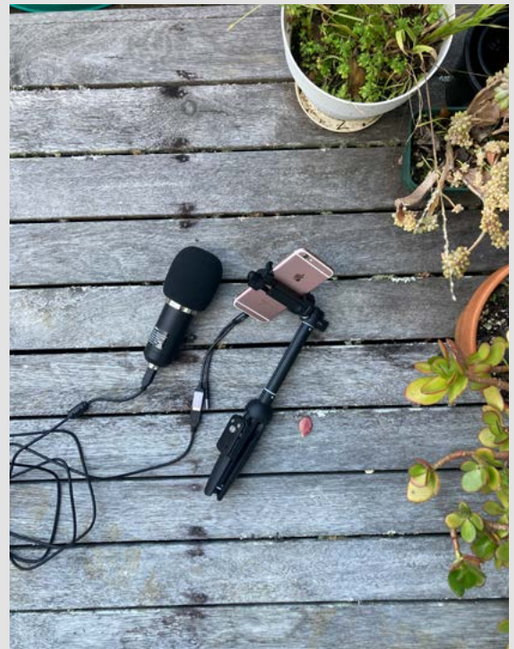
10 To best experience *Sonic Waitaramoa*, I recommend listening to the sonic narrative without watching the accompanying video or further documentation. This allows the listener to experience a personal immersion into the site and accept their own interpretations and understanding of how this landscape is presented. In a second listening or through further investigations, the complementary material can be used to understand *Sonic Waitaramoa* further and confirm or correct assumptions and associations triggered by the sound recording.

Auto-ethnographic report

Visit 1

11 The first site visit was a test run to try different techniques and setups. Since I am not particularly well versed in sound recordings, I had to experiment with this technique and find out what details the microphone could record. These iterations helped me learn the techniques I would later apply to a more comprehensive Sound Walk. I tested different setups and evaluated at what distances the microphone had to be held to capture sounds clearly. Further, I was figuring out how background noises, such as the street or other area visitors, affected the recordings. Since these are part of the experience, I am not consciously trying to avoid them, but I do not proactively seek interactions with other visitors.

Fig. 86 Sonic Waitaramoa recording apparatus. (Werder, 2024)



Visit 2

12 On my second visit I completed a comprehensive Sound Walk along Te Waitaramoa Hobson Bay*. I chose a common route to move across the site. Starting along Shore Road, I follow the pathway along the bay and stop at points of interest to take more in-depth sound samples: the wind rustling through the trees, waves rolling up on the shore, birds rummaging in the bushes and trees, and noises I hear from nearby human activity. My pathway leads me along the gravel paths of the Hobson Bay Walkway, and I occasionally deviate onto the grass or the shore.

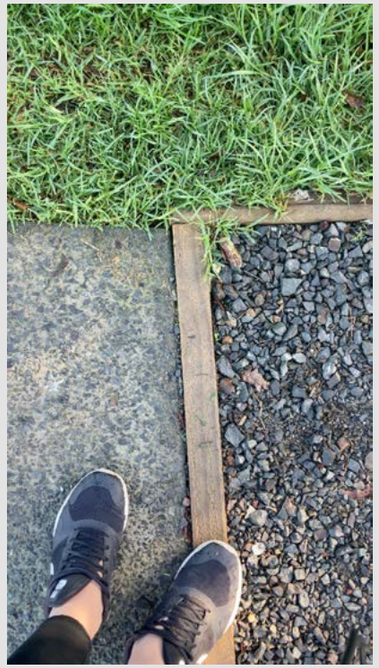
13 Back in my studio, I revisit the recording. *Sonic Waitaramoa* presents a series of monotonous recordings of ground conditions with interludes of moments of ambient noise and sound. What is interesting about this sequence is the novel perspective this setup provides—a new way of *seeing* as Jenkins (2018) theorises. The sounds of my walk (generated through the movement of my feet on the gravel path) are loud and overpowering and interluded by quieter moments where I have to navigate around puddles and mud patches. The Sound Walk was conducted shortly after a rainy day, and the soggy grass and soil were audible. This also contrasts the softer and more gentle recordings of bird movements or songs, as well as the sounds of wind and water. What I found particularly interesting is that the gravel pathway—a humanmade infrastructure—is more prominent than the landscape and its inhabitants itself. While these infrastructures, such as the gravel path or the boardwalks, provide reasonable benefits to a visitor's experience (sensorial experience) and are more beneficial to the ecosystems (less intrusive to local flora and fauna, providing permeable surfaces as opposed to concrete surfaces), they still appear as foreign objects. This separation is even more amplified in the sound recordings. While these elements integrate themselves well visually, they are intrusive in the sound recording. Thoughts about how the pre-historic or pre-human soundscape may have been experienced inevitably emerge.

14 The beginning and end of the Sound Walk are clearly demarcated by the presence of anthropogenic sounds—mostly the traffic of the nearby Shore Road and work noises from a nearby construction site. While some of these sound sources (work noise) are small in spatial extent, they are much larger in sonic dimension.

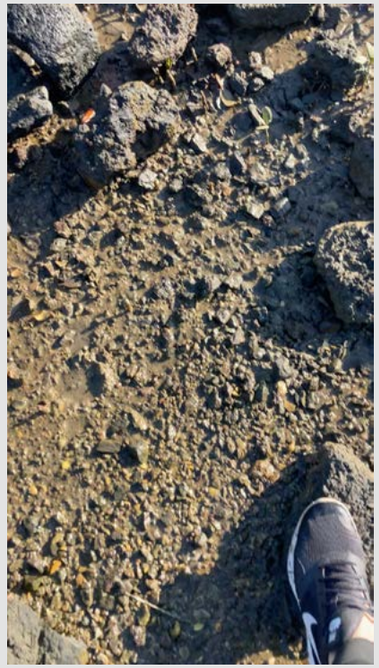
Fig. 87
Visual sound wave of *Sonic Waitaramoa.* (Werder, 2024)

WATCH THE WALK VIDEO ON YOUTUBE.

*The recording has an audible side noise, a little *tingle*, which I suspect resulted from the smartphone holder.



(1) / (2)



(3) / (4)

Fig. 88–91
Stills of *Sonic Waitaramoa* walk video.
(1) 00:00
(2) 02:34
(3) 10:31
(4) 13:54
(Werder, 2024)

Fig. 92
(opposite page)
Sonic map of Sound Walk.
(Werder, 2024)

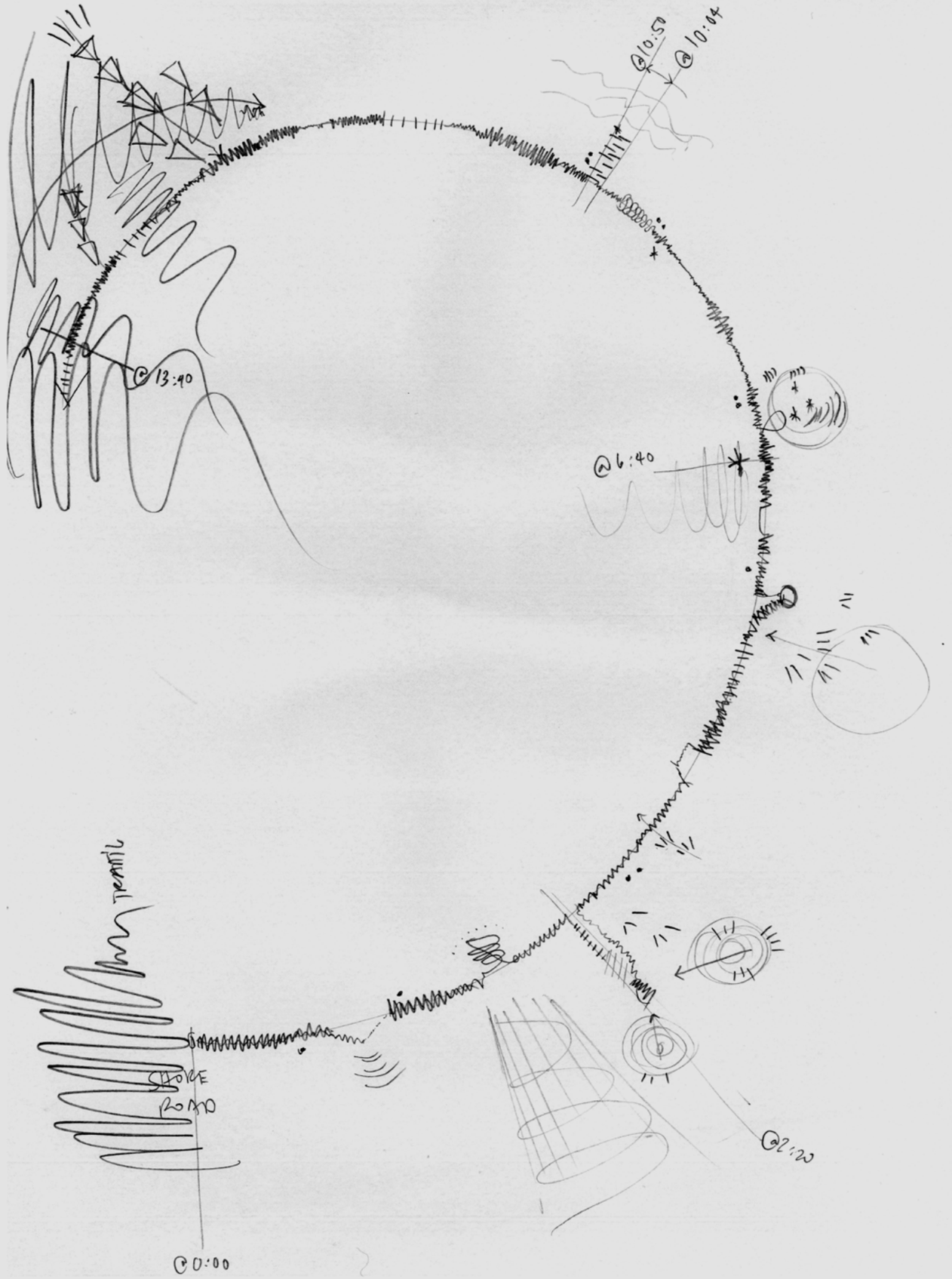


Fig. 93
Still from *Children's Game #10 Papalote*. (Alÿs, 2011)

WATCH ON YOUTUBE.

4.4.6 A diffractive understanding of *Field Exercises*

1 Upon revisiting and reflecting on the audio recordings, the non-visual process has further amplified the situatedness of myself as a researcher and observer within the site. Most of my *results* (i.e., sound recordings) have only emerged precisely because of my presence and doing. However, objects and subjects remain implicit in the final recording (output) (Goh, 2017). Highlighting the postqualitative understanding that data are not pre-existing but come into being through the researcher's investigation (Bozalek & Kuby, 2021a). On the one hand, some of the recordings directly result from my probing; others exist as data because I *measure* them—a similar conundrum as explicated by the Heisenbergian uncertainty principle or Bohr's idea of **complementarity** p. 110. As I intra-act with the site, my presence influences the observations and vice versa. However, as Budel (2023) points out, even an unattended recording technique has qualities of intra-action, and the author points out the reconfigurations and matter*ing* of different aspects: the travel to the site, the pressing of the recording button, the listening, the sampling—all actions that can be further understood from an agential realist perspective.

2 Jenkins addresses this by stating that "a site visit is a meeting of spatial and temporal trajectories in which both site and visitor are active" (Jenkins, 2018, p. 6). Jenkins' outlined process of a tethered balloon to a researcher similarly addresses this aspect as the aerial imagery shows the researcher in the context of the site, and a reflection of oneself in a third-person perspective is triggered. The wrangling of the tethered balloon, the taking the balloon *out for a walk* (p. 15), becomes a physical performance which reminds me of Francis Alÿs' *Children's Game #10 Papalote* (2011) (FIGURE 93). In these cases, the researchers are intra-acting with their surroundings. Weather, landscapes, wind, the balloon—they all have an agency that produces phenomena that entangle us.

3 The measurement instruments and our innovative devices have an ethical component influencing causality. Jenkins understands this quality in the technology that is applied in *Field Exercises*. The instruments are not "neutral probes" (Barad, 2007, p. 142) but active and productive instruments that become part of the phenomenon. The sound recording is a material-discursive practice. This reinforces Bohr's theorising on instrument boundaries: where does an instrument end? My walking, feet, shoes, and the gravel on the floor become part of this measuring device. A posthumanist framing of the relationship between instruments and humans provides a constructive background to this discourse. Similarly, Kwan (2007), based on Gilles Deleuze, points out that the relevance of the portrayal of dynamic interactions between researchers and entities within the field can constitute interesting recordings, reveal emotions, and affective findings.

4 Lastly, a careful listener will notice that I did not manage to be completely silent during my walk (I have managed to avoid greeting the dog that passed by, though). The constant sniffling and clearing of my throat reveal my well-being at that time. I was just recovering from a cold when I conducted this fieldwork. Such aspects reveal insights into a fieldworker's personal state, which can directly or subliminally impact the observation process. As such, this documentation provides implicit information that would otherwise get lost in other forms of representation.

5 Soundwalking repeats findings of other fieldwork methods (e.g., in the **Travelling Transect** p. 159) that made me wonder what I do *not* see. Likewise, I am trying to imagine what I cannot hear on the one hand because of my momentary presence and the prolonged human presence in this place. How would the pre-colonial Waitaramoa Hobson Bay sound like? When the coastal forest was still in place and the bay open to the broader Waitematā? While we may lack direct recordings of this time, the landscape and the names local iwi have given to its features do remind us of this presence: Newmarket Stream is called *Te Ruareoreo*, which loosely translated means "the duplicating of voices, i.e., the echoes" (Simmons, 1979, p. 30), and along the eastern coast of Parnell we find *Taurarua* ("Song of Annoyance" (p. 31)). This knowledge of particular features lives on in the intergenerational knowledge and the oral tradition of tangata whenua.
•

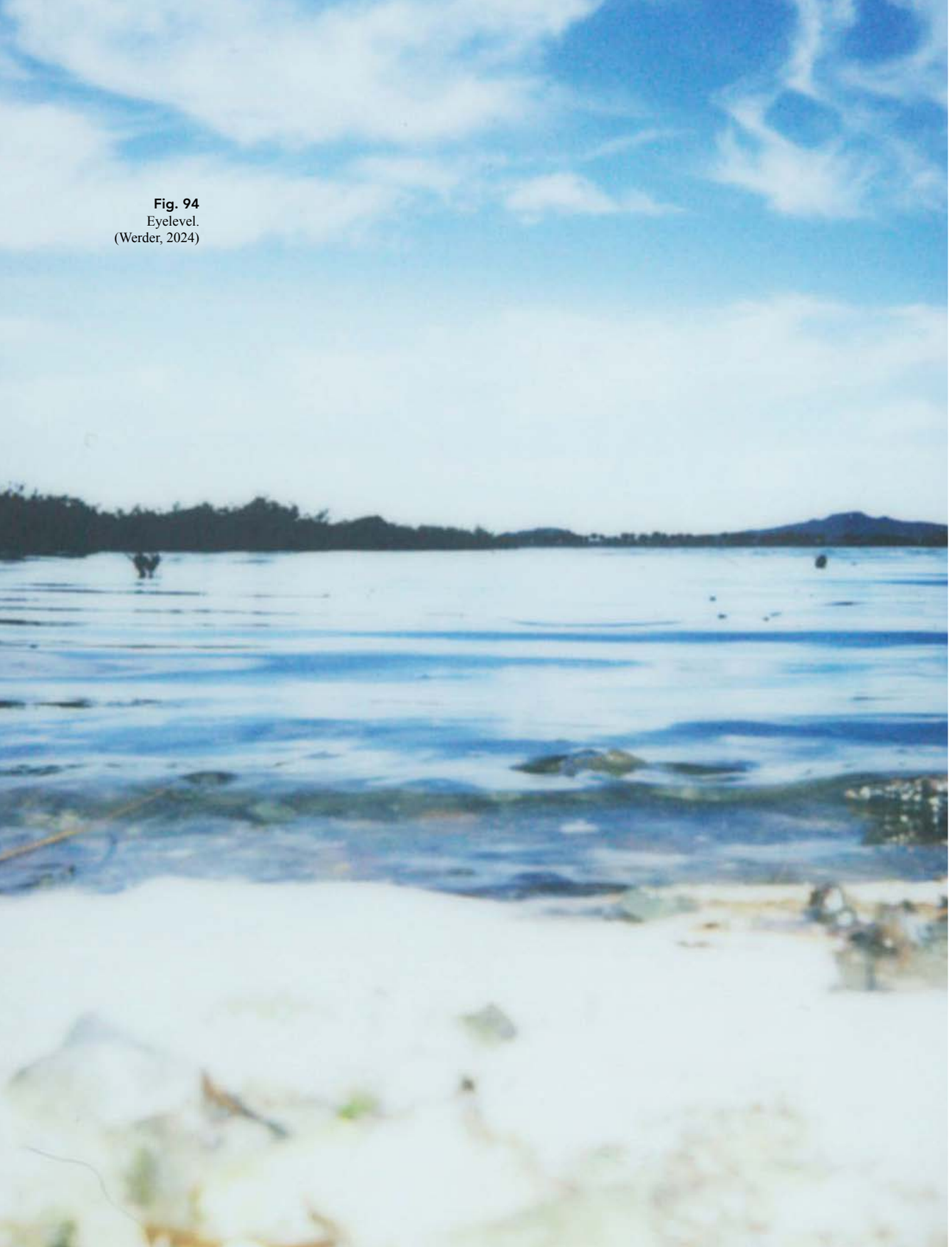


Fig. 94
Eyelevel.
(Werder, 2024)

4.5 INITIAL RESULTS

4.5.1 Diffractive processes and methods

1 Immersion into the site has uncovered site-specific knowledge and provided deeper insights into the strengths and limitations of the applied methods. The physical and cognitive processes overlapped, defying clear distinctions. The practical inquiry affirmed the intuition that fieldwork methods already exhibit characteristics of a diffractive methodology, and framing the findings through an agential realist lens supports this hypothesis. Furthermore, agential realism has intra-acted with the empirical research, functioning both as an active influence (i.e., triggering diversions from the original methods) and as a more passive tool for analysis and reframing.

2 This exploration of fieldwork methods through the lens of agential realism highlights critical aspects often debated in landscape research. In the following sub-sections, I diffractively integrate the literature on fieldwork methods and the practical inquiry with key principles of agential realism: the rejection of dichotomies, entanglement and intra-actions, material-discursive practices (performativity and nonrepresentationalism), embodiment and measurement, diffraction, ethics, and politics

A Rejection of dichotomies

3 The situated experience has challenged dichotomies when looking at a site remotely, such as through satellite imagery or mappings and plans. On-site, it is immediately apparent that the apparent line between land and water is almost impossible to define—yet, an aspect that is confidently depicted on maps. Not only is this *line* in constant movement, whether through movements of waves or tidal and seasonal fluctuations, but upon closer inspection, it is also clear that the water (i.e., the bay or ocean) is vertical in its essence and therefore volumetric. The gradients of wetness are experienced immediately.

4 Similarly, the fieldwork*ing* process is a constant reminder of the subject-object dichotomy. Our body is always experienced as an extension of the tools used—from sound recording to sketching to photographing. The fieldworker's immersion into a site renders the argument of an (omniscient) outside observer irrelevant.

B Entanglement, simultaneity, and intra-action

5 Multi-tasking and completing things simultaneously may be challenging tasks, but the intuition, professional skills, and tacit knowledge of a fieldworker help to navigate this iterative process effectively. Fieldwork*ing* is a direct experience of intra-action and simultaneity. While walking and sensing contribute to a sensorial experience (not only the visual sense is activated here, but all others are part of this experience as well), cognitive observations emerge simultaneously.

6 When observed in detail, human immersion can be understood as trespassing or invasion from a more-than-human or nonvital perspective. Stepping on a mudflat and marsh or disturbing a bird in its foraging may seem like small, quotidian actions, yet humankind are not fully aware of the implications.

7 Fieldwork*ing* is not confined to a physical location. It encompasses the entire process, from travelling to a site, to working on or within a site, to the future assessment of results, and the overall conceptualisation. It's a comprehensive approach that extends beyond the immediate site, as highlighted by Budel (2023).

C Fieldwork as a material-discursive practice

8 It is evident that spatial studies such as landscape architecture have material consequences—they are generally tasked with landscape projects that either develop, manage, or conserve landscapes and impact these environments. It is only logical to enforce a material inquiry, i.e. a physical investigation into the sites researchers and practicioners are analysing and subsequently make decisions or design for.

9 In my observation of fieldwork methods, many qualitative aspects of the site have only been discovered or further appreciated *because* of my physical presence or material interactions with the site. As I noticed in the process, I felt disappointed when reviewing the apparent outputs or mappings from my fieldwork inquiries. My findings' (visual) representations only represent part of my tacit knowledge of the site—and here lie exciting other opportunities for future research, inquiry, and design. Certain qualitative features or aspects characteristic of Te Waitaramoa Hobson Bay elude a recording or traditional translation into representations, as there are diverse ways of knowing. Ephemeral qualities include the feeling of the wind, the movement of my feet on the ground, and the persistent company of local birds I think to know by now. The process of being on site is entangled with knowledge generation. Fieldwork is not a collection per se but a process of immersion and becoming, doing, thinking, and being, a process of ethico-onto-epistemological inquiry—fieldwork*ing*.

D Embodiment and measurement: Tools, techniques, movement, motion, and time

10 The notion of time, motion and movement are persistent topics in landscape-related fields. They are closely related to the inception of the profession of landscape architecture. Fieldwork presumes a walking methodology where the movement across a place is crucial. Similarly, many observations also focus on landscape's fluid and dynamic aspects, even more so in a coastal location. While some of the methods understand the researcher's movement as *motion* (i.e., the act of walking or traversing landscapes), for instance, in the case of *Field Exercises*, others understand this movement as a sequence of moments (e.g., in the *Travelling Transect* or Lavoie's *Sketching* method). Surprisingly, most of these processes rely on static media such as photography, mapping, sketching, or physical evidence, as opposed to moving images in the form of (short)films.

11 Fieldwork methods require the researcher's deep immersion and embeddedness in a specific *field*. This embodied experience is crucial in the physical and cognitive experience of the observed space and is a vital aspect of fieldwork as a method. Contrary to remote-sensing tools such as sensors, point-cloud sensing tools, or remote satellite imagery analysis, the researcher's humanness, their body, is becoming the essential tool for exploration. Lavoie (2005) similarly understands her drawing tools—the pens and paper—as an extension of her bodily experience. More so in Jenkins' (2018) *Field Exercises*, the mostly digital tools become prosthetics of the human body to help capture the environment. This cyborgian notion of the human body is also discussed in feminist and posthumanist theories.

12 Other scholars of fieldwork methods, such as the **Travelling Transect** p. 159 or **Curious Methods** p. 113, reflect less on the tools used. It has become customary to portray the tools and gadgets used in fieldwork methods (for instance, in the form of flat-lay photographs of toolkits). Some researchers criticise this habit and identify a fetishisation of tools (Weaver & Snaza, 2016). Particularly in the *Travelling Transect*, it became apparent that the actual output of the method is not the *Tableau Physique* but the process of the walking (or better, the *travelling*) itself. The embodied experience adds to the tacit knowledge of the researcher and is constituent to their intuition and sensorial experience. This process, therefore, becomes highly individual and challenging to adequately record or document as it is mainly consistent with an implicit, internal experience by a single individual. This observation contradicts the understanding of breaking up the dichotomy between subject and object as the experience is tied to a subject (the researcher) in a particular place (the object). This may not be a shortcoming of the method itself, but it signifies the importance of the awareness of this epistemological condition.

E Diffraction: Reading between the lines

13 Including learnings that implicitly lie *between the lines*—both *Sketching* and *Field Exercises* record findings and phenomena that are not consciously recorded but are results of side effects of the method: Sketching reveals ground and weather conditions through traces on the media used (i.e., the paper and notebook) or the choice of vantage point (e.g., the researchers seeking shelter from the sun or rain or looking for

stable ground). Similarly, the inventive use of digital tools in *Field Exercises* reveals ephemeral site conditions through unstructured approaches—Jenkins (2018) retells cases of weather balloon mock-ups influenced by the wind, impacting the (visual) results of the fieldwork. The multimedial application of tools provides a chance of crosspolination between formats and methods where by-products are of value. There is an added quality to the raw information provided by fieldwork findings, which contradicts the tendency of clean and sterilised quantitative data usually made available on platforms such as GIS for local planning. Over time, a collection of such findings can lead to findings and insights that are otherwise neglected or missed.

14 In my practice, I have noticed changes in my (planned) behaviour based on the probing. While my data collection was short and fragmented, this had raised the question of what someone else might find. How would these experiences compare to each other? There are opportunities to invite citizen scientists to contribute to this process. A diversity and plurality of voices will provide an interesting collection of potentially contradicting and complementary findings that nurture a diffractive reading and analysis.

F Ethics and politics

15 As mentioned earlier, plurality and multiplicity of voices are particularly crucial in determining the future of our (built) environment. As inhabitants of an area, whether human, more-than-human, or nonvital, all actors should have equal rights to be represented in the considerations of future enactments on these sites. However, anthropocentric, positivist spatial planning still dominates decision-making processes. The fieldwork has shown that knowledge production is intra-active, and ethical connotations of this process as well as our intention in the dissemination of these findings must be considered.

4.5.2 Conclusion

1 Fieldwork framed as a diffractive methodology underlines the intra-active, ethico-onto-epistemological process of landscape probing. The immersed practice fosters the understanding that landscapes are experienced, inhabited, and created by different entities in diverse ways—humans are simply one of many. The different processes, methods, and techniques I explored as part of the three introduced methods led to different findings, which nurtured further opportunities for diffractive readings in their combination or contradiction. The translation of the findings into (visual) representations triggered repeated diffraction and awareness of the entangled methods: The fieldwork does not end, and the simultaneous processes highlight the complexity, contradiction, and multiplicity without excluding each other.

2 As a fieldworker, the more intimately I experienced Te Waitaramoa Hobson Bay, the more I felt like a visitor. Closer observations revealed increasing complexities, making the process labour- and time-intensive, with outcomes that are challenging to reproduce. However, this detailed observation provides valuable insights from empirical data. Shifting from viewing space as a quantifiable resource to a relational entity fosters creative thinking grounded in site-specific, cultural, spiritual, and ecological knowledge. This practice enriches human connections to the more-than-human world and enhances the analysis and synthesis of existing information, influencing thought patterns, design, and decision-making processes.

3 Incorporating fieldwork into spatial planning tools is essential to avoid detached and isolated design decisions. This approach is crucial for addressing the challenges posed by our petrochemical economy. In Aotearoa New Zealand, integrating mātauranga and kaupapa Māori and deconstructing colonial frameworks in spatial planning is vital for decolonising landscapes (Werder, n.d.). Diverse planning tools and methods raise questions about equality and equitable data representation, particularly with ephemeral, intangible, and qualitative data currently underrepresented. It is essential to evenly weigh social, cultural, political, economic, and ecological factors.

4 Strengthening qualitative features focused on more-than-human well-being is potentially the equitable solution needed (Werder, n.d.). Spatial planning must embrace the multi-dimensionality of landscapes and acknowledge the limitations of simplified tools. Facing the poly-crisis of the Anthropocene, humankind must rethink the current practices in coastal spatial planning and consider a diversity of tools, techniques, and methods.

5 The concluding **table** p. 214 juxtoposes the findings, analyses and learnings of the three methods and summarises the key findings.

TABLE 02
Comparison and overview of fieldwork methods and evaluation through an agential realist framing.
(Werder, 2024)

		Travelling Transect	Sketching	Field Exercises
1	**Main aim**	Method for empirical site exploration/analysis focusing on the observation and identification of interconnections and networks across a regional or local scale.	An intimate immersion into a landscape through sketching. Uncovering unique characteristics and identities of a place as well as the researchers personal stance to the landscape.	An innovative and explorative mapping of movement across a landscape.
2	**Approach to process / preparation**	A semi-arbitrary line across different parts of a landscape guiding the itinerary.	Not specifically mentioned.	Making of an apparatus to aid the recording of movement across a place. The apparatus is *steered* by the researcher and often subject to the prevailing weather conditions (i.e., the example of the use of a weather balloon).
3	**Scalar range**	Local to regional scale (approx. 2—10km^2)	Points in landscapes spread across wider scales.	Local areas (i.e., 1km^2)
4	**Sites / places of interest**	No clear preference. However, often applied in mountainous and coastal areas where vertical evolution of landscapes is present (i.e., changes in elevation), reminiscing of a *ki uta ki tai* approach.	Equally applied to landscapes as well as urban and built environments.	No clear preference mentioned.
5	**Use of tools**	Multimodal; no clearly prescribed tools. Usually photography, video, sketching, collection of artifacts, or sound recordings are utilised.	Various sketching tools (pen, ink, pencils, etc.) and paper; drawing tools depend on preference of researcher.	Generally use of digital tools and innovative *prosthetics* that are assembled to generate recording apparatuses.
6	**Outputs**	A visual summary or *cartographic diary* in the form of an often sectional mapping (e.g., *Tableau Physiques*). The performance of the process of inquiry can also be seen as an output in itself.	Sketches and drawings using different media.	Multimodal mappings, mostly cartography/plan-based and visual, although no specific output is prescribed.
7	**Relationship to (visual) representation**	Representation and fieldwork process are iteratively conducted and theorised alongside each other.	Resulting sketches/drawings are theorised in relation to their creation process (i.e., the drawers choice of view, physical standpoint, and accidental recording of weather conditions).	The output is considered ontogenetic, where the process of generating the recordings or documentation is revealed in the (visual) representation.
8	**Applied in**	Education and pedagogy (landscape architecture), practice (landscape architecture offices), planning and policy (i.e., McHarg and Geddes)	Education and pedagogy (landscape architecture) and practice (landscape architecture offices) as part of a site analysis.	Mostly in education and pedagogy (landscape architecture students).
9	**Historical reference**	Alexander von Humboldt (as in DeLue, 2017; Kutzinski et al., 2012; Lee & Diedrich, 2018)	Rich history in architecture and landscape architecture, although not specifically mentioned.	Not explicitly mentioned.
10	**Main researchers**	Gini Lee, Ellen Braae, and Lisa Diedrich (Braae et al., 2013; Diedrich et al., 2014; Lee & Diedrich, 2018)	Caroline Lavoie (2005)	Katherine Jenkins (2018)
11	**Further researchers (not exhaustive)**	. Farsø & (Alexander) Henriksson (2016) . Hemmersam & Morrison (2016) . (Emma) Henriksson (2019) . Anu Mathur (2019) . Bin Li (2021)	related approaches: . *Shaking Hands With the Landscape* (Smith et al., 2017) . *The Sketch Walk* (Alomar, 2016)	Not further explored, as deviated from/adapted original method.

TABLE 02
[cont.]

		Travelling Transect	Sketching	Field Exercises
A	**Rejection of dichotomies**	. Transareality fosters critical re-evaluation of conventional boundaries. . Subject-object re-negotiation thanks to prolonged immersion to a site. However, the act of walking along a transect can be solitary and individual and, therefore, difficult to replicate. Current research does mention collaboration and exchange as being vital.	. The definition of subject-object relationship needs to be actively reflected on since the method does not inherently enforce this.	. The definition of subject-object relationship needs to be actively reflected on since the method does not inherently enforce this. . Instrument and tool boundaries are re-negotiated.
B	**Entanglement, simultaneity, and intra-action**	. Simultaneity and iteration are part of the process and the landscape or site become a constituent to the method . Multiple site visits enable the sensibility of noticing intra-actions.	. Although the choice of a vantage point can be biased (e.g., through cultural influences, personal preferences, etc.) the literal *standpoint* (i.e., soil or ground) intra-acts with the person drawing as well as intra-action with atmospheric qualities occur.	. Intra-actions with atmospheric qualities or site-specific characteristics are inherent to the method. . Emphasises that data are not pre-existing but come into being.
C	**Fieldwork as a material-discursive practice**	. Material inquiries are encouraged but aim to keep physical impacts low . Different techniques such as ready-made assemblages or collages can be part of the process . Documenting ephemeral qualities is not always successful or satisfactory	. Sketching or drawing is less "invasive" and display a disjunction to the physicality of a site. However, ephemeral impacts such as raindrops on a drawing or crinkled paper from the wind reveal unseen forces.	. Physical interaction depends on the choice of technique or tools. Encouragement of making ephemeral qualities visible is an essential part of the method (i.e., wind that directs the pathway of a weather balloon)
D	**Embodiment and measurement: Tools, techniques, movement, motion, and time**	. Multimodal and multi-sensory experience . Walking and movement are essential parts of the method and are the main contribution. However, mostly performed along a linear pathway.	. Motion and movement are generally limited and time is stratified in a drawing capturing a *moment in time*. However, the recording and capturing characteristics such as geological formations allow documentation of deep time.	. Tools are seen as extensions to the body and critical reflection between these is encouraged
E	**Diffraction: Reading between the lines**	. Deviations and serendipitous findings are symptoms of diffractions. . Re-turning to and of probings (creating the *Tableau Physiques*) allows for further diffractive processes	. Side-effect of the methods are almost more valuable than the intended output.	. Side-effect of the methods are almost more valuable than the intended output.
F	**Ethics and politics**	. Deviations allow to reflect on biases critically . Great opportunities and potential to strengthen as a collaborative method	. Collaboration, exchange, or reflection must actively be encouraged to highlight individual biases due to personal preferences or cultural apriori knowledge.	. Favours a collaborative process due to the use of techniques and tools that may be difficult to use by oneself. . Tools may influence causality.

Fig. 95
Sea—grass.
(Werder, 2024)

5 DISCUSSION

1 The following chapter summarises and concludes the findings of Sections I and II. **Chapter 5.1** [p. 221] combines the theoretical hypothesis with the findings and reflections of the practical inquiry and my synthesis from this physical engagement. I outline the opportunities and benefits of framing fieldwork as a diffractive methodology and its potential for facilitating the current paradigm shift.

2 The findings support the assumption that fieldwork methods do contain diffractive qualities and confirm the hypothesis established in this thesis. A critical reflection points out the shortcomings and challenges encountered in the research. In **Chapters 5.2** [p. 241] and **5.3** [p. 249], I emphasise the intended contribution of this research and underline potential impacts of a consequent adaption and integration of the proposed hypothesis and framework and outline further interests of research. In the **Final Reflections (5.4** [p. 259]**)** and the **Coda (5.5** [p. 263]**)**, I close the circle by giving insight into my personal motivation and biography that have influenced and intra-acted with this research across geographical location and time.

Fig. 96
Gradients of wai.
(Werder, 2024)

Our main problem is a lack of understanding of what it means to be human and that we are not separate from nature.
—Jacque Fresco

5.1 DISCUSSION

1 In this thesis, I have applied a diffractive reading of the presented literature and synthesised the learnings into a conceptual and philosophical framework providing a novel perspective to frame fieldwork as diffractive methods. This has been complemented and tested through theorising through making, where I applied, tested, and iterated different established fieldwork methods. The practical part (Section II) tests the theoretical background and framework of Section I. Furthermore, the particularities of the coastal site of Te Waitaramoa Hobson Bay, its broader geographical, cultural, and ecological context, and the unique case of Aotearoa New Zealand have revealed a rich and complex *ground* for further inquiry.

2 Karen Barad (2007) theorises diffraction as a methodology and applies this concept to their theory of **agential realism** p. 95. Juxtaposing diffraction with fieldwork reveals striking similarities that have previously only implicitly been theorised in the respective research in spatial studies. Therefore, agential realism offers a framework through which to critically put the benefits of fieldwork as a method in a compelling and convincing narrative that supports the current reframing of landscapes in the context of the Anthropocene and further the specific case of Te Waitaramoa Hobson Bay.

3 In this context, fieldwork is understood as a *diffractive methodology*—an ongoing process rippling through spatial studies concerned with the future of landscapes. Like a gravitational wave, fieldwork intra-acts with different stages, methods, methodologies, and techniques. As an open-ended process, fieldwork requires an understanding as fieldwork*ing*—a diffractive, transareal, multi-dimensional, and collaborative act of exploring, understanding, and disseminating the context of a specific landscape and the concern for its past, current and future wellbeing.

5.1.1 Fieldwork as a diffractive methodology

1 With the lack of a unique definition of fieldwork in landscape studies, particularly landscape architecture, the discipline borrows terminologies, tools, methods, and onto-epistemological methodologies from other fields of studies. While there is much research and innovation of different tools and techniques applied in fieldwork and explorations for fieldwork methods as pedagogical models or tools for design research, there must be more inquiry into fieldwork as a methodology. Fieldwork as an empirical method for data collection is well established in the educational context of landscape architecture and related spatial studies and still finds relevant prominence in practice. However, it dissipates as we move to planning, policy, and more strategic domains of landscape studies. This gap in research results in many aspects that are only implicitly addressed. Topics such as the relationship between the observer and landscapes (the object-subject dichotomy), aspects around data collection process or probing and dissemination of findings, as well as onto-epistemological concerns remain largely unexplored. *Fieldwork* is often defined as the act or process of collecting various forms of data *in the field*. However, research has shown that fieldworkers continue their work when they leave a site and commence their research long before being on-site. Fieldwork*ing*, as an ongoing process, therefore, needs a re-definition to do justice to its all-encompassing capabilities—the boundaries between research, data collection, site analysis, synthesis, and visualisation must be blurred diffractively and facilitating a more holistic understanding of this method.

2 The novel (re-)definition of fieldwork based on a reading through agential realism provides a helpful lens to re-evaluate these topics, further amplified through the paradigm shifts experienced in humankinds understanding of landscapes and the wider more-than-human and nonvital world. The borrowing of *physics-philosophy* of quantum physics as guidance for diffractive fieldwork does not claim that humans necessarily must understand the complete and implicate order of reality or the current state of physics but acknowledge a potential divergence between human perception and how things are or come into being. Additionally, the analysis and engagement with existing fieldwork methods has highlighted strengths and weaknesses and exciting contrasts and complementations to the theoretical framework I have established in this thesis.

3 A conundrum often cited as a limitation of fieldwork methods is the apparent proprietary to a specific fieldworker, researcher, or practice: While the probing, exploration, and findings are based on an individual experience, researchers deduce problem-framings or solutions that are supposed to be collaborative, serve a communal need, or address global issues. However, this argument assumes a "humanist flattening" (Barad & Gandorfer, 2021, p. 30). It presumes an incomplete assumption by framing the critique from an incomplete perspective altogether: Barad (2021) understands the *I* as a constant intra-action between *I* and the world. Therefore, in an agential realist framework, the *I*, or here, the individual fieldworker, is never seen in their individual, lone presence shrouded in their human exceptionalism. Fieldworkers are entangled with the *field* and the reframing of time, space, and mattering—just as global phenomena (i.e., climate change) are entailed in the details of local, ephemeral, and particular qualities. Scalar extremes are not as distant to each other as representations and data thereof assume.

4 Agential realism and a diffractive methodology actively invite the integration of diverse frameworks, theories, and methodologies into the knowledge production process, emphasising an awareness of biases and the importance of a more humble, non-solutionist approach. The primary goal is not to assert the correctness of a theory or to defend it against criticism by all means but to foster constructive discourse.

5 Karen Barad's (2007) concept of agential realism is based on a diffractive methodology that intra-acts with the philosophical framework they propose. Juxtaposing results from the fieldwork practices and the studied literature with Karen Barad's table outlining the qualities and criteria of diffraction as a material-discursive phenomenon (2007, pp. 89—90) highlights methodological parallels and the potential for amalgamation into a holistic methodology. Expanding the table by adding the characteristics of fieldwork methods (TABLE 03, NEXT PAGE) shows that there are clearly diffractive characteristics. Yet these have not been formalised or articulated through an agential realist framework.

6 Diffraction is a methodology ***engaging constructively with difference*** (Barad, 2007; Bozalek & Murris, 2021), which can be a valuable approach in landscapes like coastal areas where marine thinking meets terrestrial concepts and multiple ontologies and diverse agents intra-act.

7 *Response-ability is about attending to, tracing, and taking account of entanglements, about being in touch with world's practices of materializing/making-sense, including its material-discursive "concepting."*
(Barad & Gandorfer, 2021, p. 31)

8 Understanding the complex and intertwined process of fieldwork*ing* as a material-discursive practice engaging with its topic iteratively, simultaneously, and in parallel also means a need for different work or protocol structures. The complex entanglement of doing, thinking, making, mapping, and planning becomes part of *spacetimematteringconceiving* (Barad & Gandorfer, 2021, p. 29), where the Cartesian cut is uplifted. The encounter of the real world with its entangled "sedimented/sedimenting historicities of matter/ing" (Barad & Gandorfer, 2021, p. 28) necessitates collaborations across humans, more-than-humans, and nonvital entities. Barad's understanding of open concepts questions the idea of "rational thought as a particular modality of having well-defined concepts, where one foot is put after the next, in order to "think correctly" " (Barad & Gandorfer, 2021, p. 32). Applied to current spatial planning agendas, this implicitly counters solutionist practices.

9 Fieldwork fosters an ethico-onto-epistemological position—as fieldworkers are met with reflections on their role, their responsibility (or response-ability), authority, accountability, interest, and contribution transcend both disciplinary realms (such as spatial studies, ecology, biology, or sociology) and domains (i.e., education, research, planning, practice). Particularly in policy or spatial planning, fieldwork as a diffractive methodology becomes beneficial. As a critical practice, this method highlights the discussion of objectivity–which is just as important in the humanities as it is in the fields of science:

[cont. on page 224]

TABLE 03
Diffraction X Fieldwork. (Werder, 2024) left column adapted from Barad (2007, p. 89–90)

FIELDWORK READ THROUGH A DIFFRACTIVE LENSE OF AGENTIAL REALISM

	DIFFRACTION	FIELDWORK
	Diffraction pattern	
1	marking differences from within and as part of an entangled state	situates observer *in the field*; on the ground/water/air/...
	Differences, relationalities	
2	objectivity is about taking account of marks on bodies, that is, the differences materialised, the differences that matter	*serendipity*; unexpected findings are often in the difference; the unseen or unthought-of; unlearning may be required
	Diffractive methodology	
3		Diffractive methodology transcends disciplines, domains, areas
	Performativity	
4	subject and object do not preexist as such, but emerge through intra-actions	the observer, the observed, and the representation thereof become a mutual, reciprocal, and dynamic process
	Entangled ontology	
5	material-discursive phenomena	working in the field means encountering a multiplicity of ontologies—the more-than-human, the nonvital, different worldviews. Findings are not singularly bound to language or representations
	Onto-epistem-ology	
6	knowing is a material practice of engagement as part of the world in its differential becoming	knowing through making; theorising through making—ontology and epistmology are not separate, and fieldworkers are accutely aware of this in their process.
	Intra-acting within and as part of	
7		the fieldworker as a bounded and immersed entity
	Differences emerge within phenomena	
8	agential separability, real material differences but without absolute separation	the boundaries of inside and outside are blurred; the observer is part of the observed world

TABLE 03
[cont.]

	DIFFRACTION	FIELDWORK
	Diffraction/difference pattern	
9	intra-acting entangled states of nature cultures	the dichotomies are lifted—us vs them, nature vs culture, etc. does not provide a constructive framework
	about taking responsibility for the fact that our practices matter; the world is materialised differently through different practices (contingent ontology)	the representation is a translation and interpretation of the as-found; the atmospherical, ephemeral, particular, and personal is of value; others can add to this collection—it is open-ended
	Phenomena are objective referents	
10	accountability to marks on bodies, accountability and responsibility taking account of differences that matter	The thing we observe is not outside of us—we understand it and make sense of it from our standpoint
	Ethico-onto-epistem-ology	
11	ethics, ontology, epistemology are not separable	they are intertwined
	Reading through (the diffraction grating)	
12	transdisciplinary engagement attend to the fact that boundary production between disciplines is itself a material-discursive practice; how do these practices matter?	fieldwork is inter-, multi-, and transdisciplinary by nature; political boundaries are irrelevant—same applies to landscapes
	subject, object contingent, not fixed	There is no clear distinction between subject and object. As a subject of exploration, our body likewise becomes an object in the world. The way the fieldworker positions themself in the landscape (sketching, walking) *matters*
	respectful engagement that attends to detailed patterns of thinking of each; fine-grained details matter	Fieldwork records hyperobjects—the whole is not more than its pieces. The particularities matter. The fine details are of importance.
	Summary	
13	accounting for how practices matter	Fieldwork gravitates across the whole process. It has no clear end, no clear beginning. Fieldwork*ing* is an on-going, collaborative process.

10 *Objectivity cannot be about producing undistorted representations from afar; rather, objectivity is about being accountable to the specific materialization of which we are a part. (Barad, 2007, p. 91).*

11 On regulatory and normative levels in particular, the integration of novel methods is slow. Often dismissed as irreproducible or too *fluffy*, qualitative, empirical research is underrepresented on current landscape planning platforms. In policy and planning practices, fieldwork may precede and guide or influence the design or decision-making process. But, as a process, it is not visualised or made publicly available. Outside research and education, fieldwork is still considered an unreliable method as it lacks reproducibility, standardisation, and formal consistency. It is seen as subjective, countering the reliance on objective data in normative governmental platforms or mappings. This argument supports an understanding where statistical or predictive power (decisions based on quantitative metrics) are favoured—notions of fairness, equity, or equality may operate under different assumptions. Therefore, a (re-)calibration of premises and acknowledgment of this ambiguity (Moore, 2019) precisely provides the change and benefits omitted in previous solutionist approaches. More importantly, a diffractive discourse shifts the discussion from a subjective versus objective standpoint to a discussion where these boundaries are lifted. Barad's (2007) concept of agential realism and intra-activity further highlights mutuality and reciprocity. In an entangled world, object and subject arise through intra-actions. A critical discourse between the researcher and the researched is established with the understanding of the researcher as an embedded entity within a specific context. This entails that the subject-object boundary is lifted or, at least, re-negotiated, and the notion of a top-down, god-like, detached observer is challenged. Fieldworkers step into an intra-active process between the landscapes they observe, the resulting representations, and themselves in their capacities as observers situated in this context.

12 Fieldwork as a diffractive method operates on spatial and organisational transareality (across geometrical space and boundaries between disciplines and domains) and supports multiscalarity—both during its process in the field and in the (remote) analysis and synthesis of its findings. Fieldwork provides intimate knowledge of a site and establishes a deep connection of the researcher to a certain landscape. It reveals potencies and characteristics that usually stay hidden in conventional mappings. The scalar oscillation experienced in this inquiry and the multi-sensory observations introduce a more synthetic exploration of a site, resulting in a more holistic basis for design decisions, planning approaches, or management considerations. There is no clear definition of where fieldwork begins and where it ends. Through the highly immersive and intra-active practice, researchers, or better fieldworkers, are embedded in the field and implicitly assume a clear epistemological stance of being *within-the-world* or *of-the-world*. Due to its potential for an open-ended, collaborative, and inclusive process, fieldwork aids the discussion and awareness of cognitive cartography and cultural geography. It introduces these fields into the design branches of spatial studies.

13 Fieldwork's close tie to mapping also reveals the practice as a material-discursive method discussed critically within research, education, and practice. Implicitly, mapping

as a form of record-keeping for fieldwork findings is concerned with epistemological questions and understanding the world from a contingent ontological perspective as well—the practice of mapping materialises the world in a certain way that fieldworkers critically reflect on. Mapping is not simply a reflection (from the understanding of an optical metaphor) that attempts to re-produce the same but a diffraction: Mapping is the visualisation of what Barad (2014) would call *interference* and the making visible of the effects of differences. Fieldwork findings often focus on particularities of a site and the fine details—recordings are topological as they look at the contextual and relational qualities and differences of phenomena. Similarly, the transdisciplinary quality of fieldwork is shown in the findings of the researchers' work and their embeddedness and interconnections in social and professional structures.

14 Furthermore, a diffractive methodology also has the potential to support the dialogue between kaupapa Māori and Western thinking. Fieldwork as a diffractive methodology challenges the general definition of research within landscape studies. As a postqualitative approach, this opens up learnings and techniques to address questions of power (im)balances and privileges and actively invites decolonising methodologies (Bozalek in Kuby & Bozalek, 2021). It is neither in my capacity nor in the scope of this thesis to resolve the question around the future relationship of Te Ao Māori and Western thinking (whether this lies in re-alignment or not), I can only advocate for a respectful, *care*ful, and inspiring conversation. It is important to note that the understanding of a connection between a theory derived from quantum physics within the context of a subject that is highly related to discussions of decolonising landscape and mātauranga Māori can also mean that this diffractive methodology is a tool stemming from Western thinking and is, therefore, potentially misappropriating the context (again). Just as any Western research potentially colonises Indigenous Knowledges (Smith, 1999) or renders these worldviews as involuntary collaborators.

15 Likewise, the grounding of analogies for methodological approaches stemming back to Ancient Greek traditions can potentially be seen as a continuation of Western thought. However, as other philosophers, thinkers, and polymaths have shown (e.g., the work of Spinoza) reducing Western thinking to homogeneous, predominant settler-colonial, extractive, patriarchal, and industrialised tradition is also insufficient. I do not want to partake in the fallacy of inappropriately framing the learnings of quantum physics as an exotic, spiritual, somewhat Eastern/Buddhist/Zen-inspired theory (Barad, 2007) that appropriates other belief systems or inadequately claims that analogies are sufficient conditions for logical proof. However, from my understanding, fieldwork as a diffractive methodology has many common themes and advantages, themes, and topics that are beneficial for nurturing the cause of creating a better world for all living beings. The acknowledgement of the physics-philosophy of quantum physics enables the humble perspective of welcoming multiplicity, difference, diversity, and uncertainty—providing complementarity of explanations.

5.1.2 Facilitating current paradigm shifts

1 Novel methods and methodologies stem from a frustration with the disjunction between the experienced paradigm shifts; a mismatch of our changes in thinking and the prevailing status quo. As such, we must ask how we can facilitate these paradigm shifts, particularly into policy, planning, and other normative practices, where they can take hold and nurture a much-needed change in *how things are done*. Fieldwork*ing* as a transareal, collaborative, and multidimensional method has the potential to bridge gaps between current, established, and more conventional approaches. Many of the outlined systemic issues and inadequate remnants of outdated practices, mostly rooted in solutionist approaches are addressed in an ethico-onto-epistemological (knowing-being-doing are inseperable) (FIGURE 97) understanding of fieldwork as a practice from a perspective of agential realism:

ONTOLOGY **Fieldwork*ing* fosters a more holistic response to decision-making processes in coastal landscapes in the age of the Anthropocene**

1. Data versus representation. Or: Of products and processes

2. Highlighting the qualitative

3. Embracing multiplicities, contradictions, complexities, and uncertainties

4. Transdisciplinary methodologies and collaborations

EPISTEMOLOGY **Fieldwork*ing* unravels a more humble perspective for decision-making process**

5. Countering solutionism

6. Bottom-up approaches

7. Serendipitous findings

8. Embodied research as humankind's advantage

ETHICS **Fieldwork*ing* troubles organisational structures and addresses power imbalances**

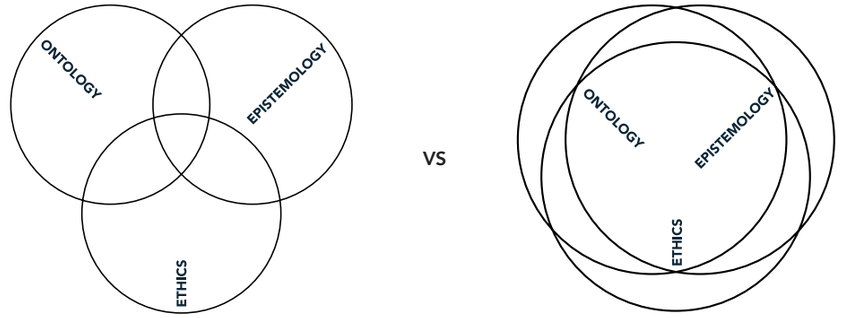
9. Collaboration, co-creation, inclusion, and diversity

10. Topological navigation tools and organisational hierarchy

11. Agency and accountability

12. Response-ability and care

Fig. 97
A conventional and an intra-acting Venn diagram: Everything all at once. (Werder, 2024)



ONTOLOGY **Fieldwork*ing* fosters a more holistic response to decision-making processes in coastal landscapes in the age of the Anthropocene**

1. Data versus representation. Or: Of products and processes
(more on this in **Chapter 3.3** p. 137 and **Chapter 4.5** p. 209)

2 Many researchers in landscape studies investigating fieldwork are equally invested in a critical reflection of the (visual) representation of their findings (e.g., Diedrich et al., 2014; Hemmersam & Morrison, 2016; Li, 2021). The mapping process is often seen as ontogenetic (Kitchin & Dodge, 2007) and performed iteratively with the data collection of fieldwork methods. Visual representations must be considered emergent—artifacts of becoming—rather than finished products. Unfinished data sets and representations do not lack information but communicate essential information in their omission. Making gaps visible counters solutionist, potentially myopic approaches. The need to visualise findings triggers creative responses (Ragsdale, 2018), adding to the generation of knowledge. Kuby and Zhao (2021) highlight the importance of this broader focus in literary education, where there are more viable options than pen on paper.

3 Through closer inspection of the methods in this thesis, we realise that the resulting mappings contain more information than the mere representation of data. For example, Lavoie's drawings (2005) reveal part of her cultural background, and sketching can give insight into a researcher's bodily ableism. Jenkins' *Field Exercises* (2018) establish relationships between the technology used and its shortcomings (e.g., vulnerability towards weather conditions), eventually providing implicit evidence of a site's otherwise unnoticed and ephemeral qualities. The *reading between the lines* can reveal essential information that is not consciously recorded. Therefore, the methods and tools utilised have unexpected, vital consequences that derive from the process. Similar to Bohr's understanding of complementarity, the measuring apparatus is part of the findings (Barad, 2014).

4 Likewise, the open-ended process of fieldwork*ing* spills over to other domains. Fieldwork does not simply stop at the doorstep of an office.

2. Highlighting the qualitative

(more on this in **Chapter 3.2.1** p. 122)

5 Immersion into the field, the material world, similarly, constitutes reading a landscape as a primary text (to use a discursive metaphor). Situated and contextualised inquiry inevitably reveals qualitative data: atmospheric, ephemeral, aesthetic values, cultural characteristics, and particularities are unavoidable. While some of these findings are consciously recorded, others may lie *between the lines*, as explained in **(1.)** p. 227.

6 The integration of qualitative findings with quantitative data is not just a process, but a journey of discovery. It provides a layering of data, as outlined in Girot's concept of topology as an aesthetic quality (Girot et al., 2012), revealing the multi-dimensional reality of landscapes. This approach holds the promise of unveiling new insights and perspectives.

3. Embracing multiplicities, contradictions, complexities, and uncertainties

(more on this in **Chapter 3.2.1** p. 122)

7 Through a diffractive reading of Steinberg and Peters' (2015) wet ontology, one must acknowledge that water acts as an entity in superposition–water is everywhere simultaneously, and its beginning or end cannot be delineated. Coastal areas, therefore, require this ethico-onto-epistemological reframing and have the potential to serve as *testing grounds* for the wider discipline of spatial planning.

8 Coupled with the specific case of Aotearoa New Zealand, and the already knowing of tangata whenua, this encountering of worldviews provides a chance to challenge the hegemony of Western thinking patterns. Although the realignment between Western worldviews and Indigenous Knowledges is critically discussed among researchers, the presence of different philosophies and belief systems can only be an advantage in the increasing uncertainty of the Anthropocene where contingencies will become relevant.

4. Transdisciplinary methodologies and collaborations

(more on this in **Chapter 3.2.1** p. 122)

9 Fieldwork is inter-, multi-, and transdisciplinary. Since it is often conducted in teams, it nurtures vital collaborative practices and communication (before, during, and after fieldwork), inviting diverse researchers with different backgrounds to participate. During site investigations, the focus of interest can switch to the requirements of the *as-found*. Ecological, social, cultural, or geological findings can be explored or found almost simultaneously. Inherently, hierarchical ranking or classification is not made on the site. However, this process could be added later when curating the findings.

10 The current poly-crisis and the wicked problems identified in this thesis require comprehensive, collaborative, creative, and compassionate problem-framing and re-solving. A transdisciplinary approach requires mediation through tools, techniques, and methodologies as well as researchers and practitioners attuned to transdisciplinary thinking.

5. Countering solutionism

(more on this in **Chapter 2.3.4** p. 77)

11 As a bottom-up and synthetic process, fieldwork counters an omniscient top-down view, favouring a generalised and standardised view of the world. Without a predetermined fixed assumption, fieldwork can focus on the *problem* first rather than superimposing a (potentially inadequate) solution, advancing the fallacy of solutionism. So-called *moonshots*, where the focus on the problem precedes the finding of a solution, can lead to unexpected, innovative, and surprising outcomes.

12 Fieldwork further promotes this second-order thinking through its iterative process and allows ambiguity as an advantage. The process of collecting data, visualisation, and synthesis is dynamic, iterative and overlapping—fieldwork*ing* is not performed linearly or chronologically. Recording findings that may contradict an assumption, different data sets, or parameters triggers interest and feeds hypothetical planning and exploratory scenario planning, which is unusual in landscape architecture (Holmes, 2020). Dealing with uncertainty is inevitable in the age of the Anthropocene and does not have to be a disadvantage. Scenario-thinking and inclusion of contingencies will be critical.

13 The political telos favours solutionist approaches classifying information and data as *correct* or *wrong*. Landscapes have multiple aggregate conditions and can assume different or ambiguous forms and shapes. In fieldwork, researchers are immersed in these contradictions as they navigate complexity and intertwined realities. Fieldwork, like the state of landscape, is iterative and open-ended, and knowledge generation is an ongoing process (Ragsdale, 2018).

6. Bottom-up approaches

(more on this in **Chapter 3.2.1** 122)

14 Immersion into an ultra-local, site-based location inevitably nurtures a change of perspective. It highlights details, inhabitants, and phenomena of a site (the more-than-human and nonvital) often neglected or underrepresented in normative governmental data sets such as council maps and plans. This valuing of the particular provides a counterpoint to the current favouring of generalising, abstracting, and condensing information. Bottom-up approaches are based on posthumanist theory and are simultaneously inherently anthropogenic: They increase attention on the nonhuman world. At the same time, these processes are highly informed by the researcher's humanness.

7. Serendipitous findings

(more on this in **Chapter 3.2.1** p. 122)

15 As outlined through the researched methods, the semi-arbitrary and open-ended explorations trigger unexpected findings and lead researchers into terrain that may have otherwise been overlooked or neglected. Fieldwork*ing* requires an openness to flexibility and dynamism, deviations and meandering to counter *a priori* assumptions, biases, and expectations. The synthesis and adoption of these findings leads to the integration of underrepresented qualities and aspects in the form of (visual) representations.

8. Embodied research as humankind's advantage

(more on this in **Chapter 3.2.1** p. 122)

16 Site immersion is linked to the embodied experience of fieldworkers. Our *stand*point *matters*—literally and metaphorically. Our perception is influenced by our humanness—digital or mechanical tools and technologies become prosthetic devices enhancing our sensorial experiences. Fieldwork*ing* understands humanness as a quality embedded and enmeshed into the natural world without labelling it as superior or dominant.

17 Unlike many technical tools that are generally highly specialised and operate in sequential processes, the human researcher can perceive and distinguish asynchronous, simultaneous, and parallel phenomena. Embodiment, here, is an essential advantage that further counters the prevailing angst of digital hegemony. The recent discussion around A(G)I and LLM highlights the benefits of embodied research and provides a critical argument for hybrid work processes. Our humanness must be cause for nurturing more meaningful work approaches. Outsourcing work to nonhumans is not seen as a threatening development but as a chance to focus on our human strengths instead. This paradigm shift provides human researchers with a more enriched and fulfilled work process innately tied to our embodied experience by moving through and engaging with landscapes.

ETHICS **Fieldwork*ing* troubles organisational structures and addresses power imbalances**

9. Collaboration, co-creation, inclusion, and diversity

(more on this in **Chapter 3.2.2** p. 130)

18 Fieldwork*ing* is collaborative and must facilitate diversity across its process and outcomes (see also (4.)). Different perspectives enhance the process and diverse approaches, either from the input of different collaborators or the application of various methods. The current political context in Western societies often still frames diversity as an inclusion of *others;* requiring compromises of some sort. However, fieldwork*ing* understands perspectives that differ from the normative (governmental) framework not as a compromise but as complementary.

19 Fieldwork*ing* has the potential to further integrate postcolonial, feminist, and queer theory into spatial studies. The diffractive method shares a core belief with social theories where difference is not derived from binary thinking, as seen in Trinh Minh-ha's work (1988) that influenced Barad's theories (2007, 2014).

20 Furthermore, fieldwork*ing* has the potential to advance the more holistic integration and highlighting of Indigenous already knowing and representation of the interests of more-than-human stakeholders. This methodological approach fosters unheard or un(der)represented voices. It presents an opportunity for community-based research. In the specific case of Aotearoa New Zealand, these methods can further the project of decolonising landscape.

10. Topological navigation tools and organisational hierarchy

(more on this in **Chapter 2.4.4** p. 100)

21 Fieldwork*ing* as a relational methodology supports a topological understanding of space. Navigation is not simply navigation across space according to geometrical Euclidean coordinates but is guided by pathways of relations and interconnections. Navigation is relevant for on-site exploration and the (re-)reading of visual representations.

22 The affordance of the tools utilised to visualise and present the artifacts of fieldwork*ing* must facilitate this need: Rather than rethinking how such platforms look or how they represent visual data; we must rethink how these data are navigated—the relationship between data sets and various recordings. This will influence the synthesis and (re-)reading of information and transport core values across domains and disciplines.

23 The process of fieldwork*ing* can imprint on organisational hierarchies, where the rethinking of structures such as centralised planning authorities (e.g., city councils) will mimic the methodology. Although hypothetical, a fracturing (in a constructive way) of council structures can lead to more localised and contextualised organisations or teams through a closer connection to the locations with which they work.

11. Agency and accountability

(more on this in **Chapter 2.4.3** p. 95)

24 Fieldwork*ing* as a diffractive method distributes agency more holistically–blurring boundaries between object and subject understands knowledge generation as co-constituting. While this may seem like a de-strengthening of the human researcher, it does encourage agency and accountability through personal involvement and immersion in the process.

25 Dealing with the problems of the 21st century requires a discourse of responsibility and response-ability as we navigate the current understanding of power imbalances at different scales. Knowledge producing practices matter and responsibility is placed onto (or given back to) the researchers (Cannon, 2022).

12. Response-ability and care

(more on this in **Chapter 5.1.1** p. 222)

26 Fieldwork*ing* as a methodology fostering perceptual and immersive methods has shown to be a valuable tool for inspiration, heightened appreciation and understanding, and, therefore, greater care for the studied landscapes. Mainly seen in the pedagogical context, such as Smith et al.'s (2017) approach, students' emotional responses were able to meet their environment with more openness, strengthening their receptiveness rather than aiming to skew their methods to suit a grading process.

27 Immersion into the outdoors is also beneficial for the quite simple experience of, dare I say it, enjoyment.

5.1.3 Limitations and challenges

1 A common critique in transdisciplinary research is questioning the adequacy of one theory applied to another: Are learnings from quantum (meta-)physics the appropriate tools to apply to landscape research or planning? This hypothesis presumes that landscape research and, therefore, planning or policy are interested in understanding the reality of *Nature* and how the world works. While quantum physics does not (yet) sufficiently describe how reality is constituted (physicists are still trying to figure out how to quantumise the macroverse or gravitise the microverse—or which way is the right one), the knowledge of quantum physics provides the humble perspective of understanding that not everything we see may exist or behave in the way we (classically) make sense of. Quantum physics is unintuitive as its asynchronous and parallel processes contradict our human, sequential processing capabilities. Considering the computational and material sophistication and the intricate communication of the world around us, there are processes that work and translate operations differently than us—this is a humbling realisation, opening our minds to biases and blind spots.

2 This criticism raises the issue of the relationship between subjectivity and objectivity, as well as the previously mentioned concept of *physics envy* in the humanities and related fields. While the hard sciences are often praised for their objectivity, making them easier to quantify and verify, qualitative research is inherently interpretative. However, as the evolution of quantum physics has shown, science itself contains ambiguities and limitations in verification, which are shaped by human-approved methods and tools. This realisation highlights the importance of a well-defined problem framing, which is subject to critique in any field of study. Furthermore, agreement with research results and outcomes does not necessarily imply agreement with the established framework—and vice versa. One can accept or challenge either independently.

3 Fieldwork is often considered a messy process. It is open-ended, fragmented, ambiguous, and patchy. The personal involvement of researchers make the findings appear anecdotal, irreproducible or avoidant of standardisation. These qualities are particularly uncomfortable in a policy setting. However, these aspects are vital in the discourse of what landscape planning must entail to enforce the paradigm shifts we observe and the era of poly-crisis we find ourselves in. The efficiency and effectiveness of tools are redefined in this context. The highlighting of serendipitous findings is considered *lucky accidents*, signifying a lack of rigorous methodologies. However, serendipity and contingencies are not excluded from natural sciences: I am thinking of the Stern-Gerlach experiment, where Otto Stern's excessive smoking habit generated a successful outcome of an apparently inconclusive experiment (as outlined in Barad, 2007). Here, the fact that the cigar smoke revealed findings that would have otherwise been missed is also linked to ethical and contextual factors. Stern, a white male of his class and nationality, was more likely to smoke cheap cigars than another person. If dichotomies are reinforced, culture and nature, subject and object, art and science (Moore, 2019), gender and science, and these notions were truly separated, this discovery would be less meaningful—serendipity diminishing the efforts. However, from an agential realist perspective, serendipity can be seen as a (spontaneous) emergence or a becoming visible of intra-action.

4 Within social studies (namely including areas such as environmental sustainability), diffractive processes are critiqued due to concerns around their applicability to policies and practices (Fox & Alldred, 2023).

5 > *Despite this assertion, the potential for [diffractive methodologies] to generate a near-infinite multiplicity of contingent—and different—conclusions from research data poses a challenge for its users to produce the kind of 'evidence' conventionally sought by policy-makers and practitioners.*
> *(Fox & Alldred, 2023, p. 95)*

6 Fox and Alldred (2023) criticise the suitability of diffractive methodologies to produce *useable* outputs and question the truth and relevance of Barad's particular understanding of quantum physics given that the macroworld can be sufficiently explained through Newtonian/Euclidian physics. However, I would argue that this assumption precisely negates the goal of Barad's agential realism and their underlying argument: It is not primarily about finding the *one* truth but the acknowledgement that processes may work differently than what we immediately perceive. The observed paradigm shifts within landscape studies, and sociology, point at a gradual switch of such mindsets and worldviews which will soon be receptive of novel methodologies such as fieldwork*ing*.

7 Similarly, Everth and Gurney (2022) criticise the uncritical application of learnings from quantum physics to a field of study that is not immediately affected by these processes (although most quantum physicists would probably disagree with this statement as it simply puts Ockham's Razor too close to an object of study). The authors state the discrepancies between the scalar extents of the quantum world and the human macroworld as an unsuitable ground for analogous application. However, Barad is precisely mindful about metaphorical applications and theorising through analogies—and they understand the concept of agential realism as a framework to *rethink thinking*. The troubling of established (scientific) worldviews provides a valid perspective even though quantum physics is not yet fully discovered and unravelled. The very prospect of an alternative (cognitive) world model (i.e., contrasting the arguing from a purely Newtonian perspective) provides the opportunity to question assumptions in natural and social sciences.

8 A persistent claim of the shortcomings of current data sets and information available through platforms like GIS is the overabundance of data (Desimini & Waldheim, 2016; Jenkins, 2018) that shroud a site's or landscape's essential characteristics. Many scholars and researchers (e.g., Jenkins, 2018) advocate for first-hand experiences and understand fieldwork as a vital contributor to knowledge generation. While they advocate for appropriate recordings of findings other researchers and practitioners can use, it does raise the question of practical utility of these findings and whether this claim counters the need for immersion into a site. Can fieldwork recordings replace actual fieldwork: A practice we condemn when done with the mere consultation of satellite images? The call for more empirical, qualitative data may repeat the persistent claim of the panacea of Big Data as a solution to design problems in spatial disciplines.

9 Given that the previously mentioned mapping techniques and tools mostly favour an open-ended, sometimes even objective inquiry, this raises the matter of planning dependability and how these new insights can be implemented sustainably in a policy-making context. Although current policy tools such as GIS stem from intensive fieldwork, the initial process is detached from the data we are presented today. What is missing in the discourse of landscape planning and spatial policy is the lack of explicit mention of the relationships between site reading and site writing: The discussion of who writes site-specific data (i.e., who provides the mappings and what is included) and who reads the data (i.e., the person analysing the data and using it to rationalise decision-making) is lacking in spatial planning. The platforms that display site data are static and portray data as finished or complete, with no insecurities in what is presented. Diedrich (2021) analyses the current understanding of the distinction between **site reading** [p. 140] and **site editing** [p. 146]. She concludes that site reading is often considered purely rational, analytical, and scientific-like. Therefore, the author relates this to an uncreative and non-productive act separate from the design process (Diedrich, 2021). The personal inquiry based on phenomenological and empirical findings is highly related to the individual researcher and, therefore, constitutes a problematic process to scale up (considering the time and energy commitments associated with this).

10 Collecting data, representing data, site reading, and site editing are all intertwined. However, this needs to be addressed in the preparation of *data* and its interpretation in the form of site reading. The required site sensitivity we aim for to counter the poly-crisis of the Anthropocene requires rethinking its methodological perspective. Site reading is performative and subject to a paradigm that is neither neutral nor purely rational. As site reading relies on data, the way it is represented, and the analysis of existing features, the techniques and tools we apply to this become increasingly more important to study critically.

11 This bias or assumption of research or methodology as ethical and morally *good* must be critically discussed in the context of places with colonial histories (e.g., Smith, 1999). Avoiding further appropriation or mistreatment of Indigenous Knowledges in Aotearoa New Zealand must be prioritised. Communication, transparency, and care are vital in this discourse to foster mutual understanding.

12 Further, the notion of embodiment also addresses human-ableism (Barad, 2007). This can either attract criticism due to a lack of research and representation of differently-abled people in this field or provide a chance to include more diverse participation in the probing process.

13 Additionally, the spatial and temporal scale of landscape and its area of influence usually surpasses an individual researcher's capability of observation (Corner, 2014). However, this understanding of fieldwork as transareal fieldwork*ing* implies an application of the methodology to larger, hypothetical scales as well. As with most research, we are interested in when an experiment *works*. When is the theory *successful?* (Barad, 2007) Similar to measuring outputs, there is no clear answer to when fieldwork *works*. However, it is precisely the fact that it is working that makes the inquiry successful.

5.1.4 Conclusion

1 Fieldwork, as discussed in ethnography, has a strange suspicion of its outdatedness—the repeating of extractive practices reinforces colonial paradigms. This could equally be applied to fieldwork in and on landscapes. Are we as humans superimposing our interests (as humble as they may seem), our doings and understandings, or are we genuinely allowing landscapes to be co-constituent of this work? The philosophical amalgamation of fieldwork as an ethico-onto-epistemological process rightfully addresses aspects previously criticised in this inquiry. I am not trying to frame fieldwork as a prescribed, overarching method or umbrella term that summarises and, yet again, abstracts reality into theories, but more about embracing the presence and possibility of multiple onto- and epistemologies to co-exist alongside each other. It is not about the definite and only way of understanding reality as a truth-seeking process but a humbling understanding of our anthropogenic position in this context. The engagement with uncertainty and the current age of the Anthropocene must be regarded as a chance to rethink processes and business-as-usual approaches:

2 *Uncertain situations create genuine opportunities for bi-directional dialogue, learning and knowledge transfer between practitioners and researchers.*
(Kahn & Diedrich, 2019, p. 15)

3 The relationality of this logic highlights that multiple and novel modes of knowledge generation and dissemination are possible. With its multimodal outputs, fieldwork provides alternatives and space for innovation and critique.

4 By adopting aspects of agential realism to landscape studies, the discipline can become more attuned to the complexities and interconnectedness of the landscapes it seeks to shape. It reinforces the embodied, material, spatial, and phenomenological experience of landscapes as a whole. Karen Barad's question, "How did language become more trustworthy than matter?" (Barad, 2007, p. 132), repeats the call raised many times in landscape studies. The discipline seeks to develop and utilise tools, techniques, methods, and methodologies more attuned to the very *nature* of landscapes. Hopefully, the argument in this thesis strengthens iterative fieldwork methods through diffractive intra-action and highlights the benefits of fieldwork*ing* to the discipline of landscape studies and similar fields. Fieldwork*ing* acknowledges processes that are material-discursive, that understand the subject/object entity as co-constituting and, therefore, embrace the existence of a bio-intelligence where the intelligible and material are not separate (Bozalek & Kuby, 2021b). It allows adopting spatial, material, and phenomenological methods in landscape architecture without defending these normative, positivist methods derived from other fields of study.

5 As a contextual, relational, and open-ended process, fieldwork*ing* facilitates the observed paradigm shifts on many levels, informing both our ontological understanding of the subject matter (the explored landscapes) and the material-discursive process around the epistemological framing of how findings and recordings (data sets) are visualised, represented and made accessible. Furthermore, fieldwork*ing* intra-acts across different domains and disciplines (organisational transareality) and encourages discussions around ethics, agency and accountability. Fieldwork*ing* is "iterative intra-activity"

(Barad, 2007, p. 184) and challenges the static nature of prescribed data. Bozalek and Kuby understand matter and, therefore, mattering as "agentic, dynamic, in/determinate and temporary" (Bozalek & Kuby, 2021b, p. 83), with a ceaseless ability to transform and reconfigure. Similar qualities can be ascribed to the researchers and their tools, methods, and techniques:

6 *[… a]pparatuses are constituted through particular practices that are perpetually open to rearrangements, rearticulations, and other reworkings.*
(Barad, 2007, p. 170)

7 Arguably, most normative sciences, including spatial planning, aim to create a cohesive world model that the disciplines can use as a basis for analysis and communication. Agential realism provides a different framework to navigate such a world model and troubles assumptions by utilising the concepts of potentialities, possibilities, and probabilities. Diffraction, understood from a quantum physics perspective, challenges the Western, capitalist, Newtonian-deterministic notion of time (and, therefore, history) and (Euclidian) space—although there still is an irony in how the avoidance of any dichotomies establishes a new one between Newtonian physics and quantum (field) theory (potentially a synecdoche of the quest for a Grand Unified Theory). As Barad (2018) states, such understanding results in ontological indeterminacy—not to be mistaken with epistemological uncertainty. We think we are so sure about everything and take these philosophical bases for granted when, in fact, the world (and particularly the quantum realm) is humbling us in this regard.

8 Therefore, fieldwork as a diffractive methodology promotes a more humble stance of human knowledge production and understanding of the world around us. It provides redundancy and contingency to our current systems in place for spatial studies and particularly spatial landscape planning (another thing we can learn from the quantum world). The associated reconceptualisation of time and space highlights that the *field* is not an empty vessel or vacuum waiting for human activity or interference. Furthermore, landscapes as agential entities contain *yearnings*:

9 *Yearning is not anticipatory in the sense of not yet arrived, not yet mattering, but is always already active in the Thick Now of the present; possibilities and potential are not about what might yet be, so much as what is already active, in motion, in this Thick Now.*
(Barad & Gandorfer, 2021, pp. 44–45)

10 This presents (planning) processes and outcomes that counter a solutionist approach historically cascading into sequences of unintended consequences. It will be part of further research to look into the specific and practical implementation of fieldwork as a diffractive methodology and how this potentially impacts our organisational structures. As a material-discursive method, at its core, fieldwork as a diffractive method shares the goal with many ecological endeavours: How can we facilitate a better world for all living beings in the age of the Anthropocene?

11 *In a diffractive methodology, the details of one theory or philosophical position are read attentively and with care* through *rather than* against *one another to come to more creative insights.*
12 & 13 *(Bozalek & Murris, 2021a, p. 54, italics in original shown as regular font)*

Moreover, this compassionate, care-ful, and creative process is exactly what we need to create a better world for all (living) beings and entities. Fieldwork as a diffractive method or fieldworking addresses implicit understandings in the current definition of fieldwork in spatial studies, particularly landscape studies. This methodology counters the current understanding of fieldwork as an inventory-producing technique—embracing knowledge-sharing rather than primary problem solving (Kahn & Diedrich, 2019). It has more than just the goal of one-directional data extraction in mind, which generally aims to provide evidence for design or decision-making processes. Un-learning may become part of the process (Taylor & Bozalek, 2021).

Fieldwork as a diffractive methodology becomes a remediating tool to address human influence in the field. A stocktake of where we are as a human species, what we have done, and where we plan to go next. With a more holistic approach that determines the priorities for current or future action (or conscious in-action), the optimism for a more humble perspective supporting the prosperous wellbeing of all living beings prevails.

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Fig. 98
Interstices.
(Werder, 2024)

5.2 CONTRIBUTION

1 This thesis is both inter- and transdisciplinary. It deviates into disciplines outside of architecture or landscape architecture. The diffractive reading of the literature and the synthesis of findings have led to a fluid and dynamic process supporting and demonstrating the main argument of this thesis.

2 In the process of writing this thesis, I have established a meta-layer: What I studied and found is reflected in the process and structural approach in the writing. The hermeneutic, dialectic, and non-linear process reflected a non-solutionist paradigm that attempts to frame a problem before attempting to solve it. This is reflected in the two-part structure of this thesis, with two temporally disjoint, yet intra-acting **research questions** p. 31 (Research Question 2 cannot be deduced before Question 1 is partly established). However, both questions exist simultaneously, are entangled, and they intra-act with each other, like two atoms approaching a two-slit experiment, where the pointing of a measuring device must be critically discussed, as it may alter the outcome. This thesis is a measuring device.

3 The contribution of my findings will be of interest to spatial studies such as landscape architecture and in the wider field of urban spatial studies (i.e., urban planning). I am advocating for these methodological approaches and theoretical frameworks to gain prominence in normative governmental planning practices—for them to find their way into the thinking processes, guidance, and conception of policy documents.

5.2.1 Addressing the research questions

1 I have developed, amended, and refined the **research questions** [p. 31] iteratively. With the help of Research Question 1, I have investigated the relevant literature and synthesised the conceptual and philosophical framework and basis for this thesis. A synthesis of the findings relevant to Question 1 precedes the formulation of Research Question 2, which guides the second part of this thesis. I have translated the findings into a practical application of an explorative and empirical study.

Research Question 1

2 What paradigm shifts and challenges are emerging in our understanding of coastal landscapes and the tools, techniques, and methods researchers and practicioners apply to (visually) represent them?

How can agential realism provide a framework for landscape studies that address the current paradigm shifts in the understanding of coastal landscapes, tools, techniques, and methods applied to these?

Research Question 2

3 How can fieldwork practices facilitate the paradigm shifts mentioned above when dealing with coastal landscapes?

What is the definition of fieldwork as a diffractive methodology?

Results and significance of Research Question 1

4 Research Question 1 displays a broad disciplinary scope supporting my interest in this research journey. This was vital in my process as it let me explore related topics more openly and allow for unexpected findings. A too narrow formulation could have channelled this thesis' outcome towards a pre-determined result that had yet to be discovered. A solutionist framing would directly contradicted my key findings and arguments—a site-based, immersed, and embodied process allows for these excursions to happen, and serendipitous findings provide valuable contributions to knowledge generation.

5 Consequently, the transdisciplinary approach and diffractive methodology led to many deviations and meanderings that highlight the entanglement and complexity of coastal landscapes. Understanding a fluid, watery ontology and epistemology is vital for determining the future of the coast and was essential for formulating the argument in this thesis. The synthesis of findings of Research Question 1 led to a more precise formulation of Research Question 2. Although this was not a linear process, causality has been reciprocal. The content and formulation of Research Question 2 was initially surprising and counterintuitive for my own background as a researcher and practitioner—a focus on fieldwork would not have been my first choice and natural direction when I started this journey of a PhD, and yet—in an entangled manner—it *will have had been* part of my professional biography all along.

6 The resulting argument of ***benefits of fieldwork as a diffractive methodology to facilitate paradigm shifts in our understanding and working with coastal landscapes*** was not initially anticipated. This shows that the open-ended inquiry has nurtured an unbiased approach, and the methodological outset has produced the desired result.

Results and significance of Research Question 2

7 Although the two research questions are listed sequentially—they are in close spatial proximity—they are temporally separated yet conceptually entangled. In Research Question 2, I presume an outcome or key learning from Research Question 1—in a non-solutionist manner, I have attempted to *frame the problem before I solve it* (Holmes, 2020). This set-up mimics the structure of a two-part thesis, where Section II is focussed on a more practical inquiry.

8 The findings through practical activity of working with established fieldwork methods as well as the exploration of themes in different contexts (e.g., teaching activities as part of my appointment as a lecturer at Auckland University of Technology, Huri Te Ao School of Future Environments and School of Art & Design between 2020 and 2023) revealed novel insights into the benefits, potential, and challenges of fieldwork as a method. I have further identified ontological and epistemological gaps through a diffractive reading, an iterative re-evaluation of the theoretical framework, and a re-turning to Section I. This resulted in a novel (re-)definition of fieldwork as a methodology in landscape architecture. Understanding the process as a diffractive methodology results in a critical and co- and de-constructive contribution to the ongoing research.

Limitations and reflection

9 The practical inquiry was primarily conducted to test my hypothesis. The practical fieldwork process was deliberately unstructured and holds no claim to be exhaustive. Additionally, I had given myself the freedom to alter and adapt the applied methods. This makes the process vulnerable to critique, whereas others would have suggested a more rigorous and comprehensive approach. However, the focus was not on testing the methods themselves but their potential and opportunity to exhibit and demonstrate diffractive qualities. I have not conducted the literature research and fieldwork strictly linear or chronological. The focus was on the inquiry as a method (from an ethico-onto-epistemological perspective) rather than the need for a comprehensive collection of on-site data.

10 While I am advocating for a bottom-up methodology and location-based and site-responsive methods, the concept of an overarching methodology in the form of fieldwork as a diffractive methodology can be regarded as a top-down concept. However, when studying the arguments and assumptions more closely, the methodology reveals the required contextuality, relationality, and fluidity that I initially stated as critical characteristics of landscapes in general and coastal areas in particular. While I have only applied my findings to one site, Te Waitaramoa Hobson Bay, within one country, Aotearoa New Zealand, I see potential applications across different geographical and cultural sites and urban(ised) conditions.

11 While the scale of the theoretical investigation is all-encompassing—spanning from the microscopic to the macroscopic—the scale of the practical application has a human-sized dimension, allowing for an efficient and effective fieldwork process on-site. The location can be walked within a reasonable time, and a sense of overview and (alas!) control is attained. It would be interesting to research the spatial and temporal scalability of fieldwork as a diffractive methodology. Can it be applied to a national

scale? A global scale even? Does it contradict the initial premise of the importance of a site-based response? Will it repeat previous shortcomings of scaled-up methods or provide novelty to a space with a dimension that can only be managed through a top-down perspective?

12 Furthermore, it is important to stress that this research has been conducted solitary. Many of the methods either mention collaborative processes or have been conducted in teams and the theoretical framing emphasises the benefits and opportunities emerging from collaboration, exchange, and friction. It is subject to further study and future research to explore this aspect in more detail.

5.2.2 Contribution

1 The conclusion of this thesis challenges the current state of how engagement with and representation of landscapes for design and decision-making processes occurs. My proposition will first interest educators and practitioners in spatial studies, particularly in landscape architecture and landscape planning, urban planning, and architecture. However, I hope to contribute to rethinking planning and policy structures and approaches on different governmental levels. Planning and policy practices are notoriously slow in adapting new paradigms and historically favour a conservative (that is, a politically *easy-to-sell*) agenda. There have been calls for more landscape architects (or designers in general) in decision-making roles.

2 Suppose landscapes were to be seen as a *product*; its different stakeholders are manifold and range from natural individual persons (inhabitants and users or visitors of the landscape) or groups thereof (iwi, communities) to juridical persons such as companies that *use* the landscape for their production (e.g., fishing, extracting of non-living resources) or property (land ownership, semi-private parks) as well as councils that manage and plan for these landscapes. Additionally, some temporary stakeholders are interested in these spaces as they may be tasked to perform specific duties on these landscapes and are paid to plan for, develop, maintain, or conserve them. More importantly, though, the most important and arguably also most numerous stakeholders are the more-than-human and nonvital entities: Landscapes are the home for the mammals, the fish, and birds, the various slugs, and algae, and plants, the water, the sand, and the stones.

3 The findings of my thesis potentially influence the human world and, more importantly, the nonhuman. In a traditional study of stakeholder relationships, humankind favours an anthropogenic focus. A stakeholder map (FIGURE 99, NEXT PAGE) defines the stakeholders based on their power relations and interests in a particular product or project. Such a strategy may be implicitly or explicitly used as a foundation for political and public decision-making processes. By acknowledging that mutual agency is paramount, it is clear that a conservative assignment is not representative of a contemporary understanding of landscapes—the stakeholders with the most power and most interest should not necessarily have hegemonic agency in determining the future of these landscapes.

4 Since landscape planning is still predominantly of political interest from a capitalist's economic understanding of landscapes as a resource, this allocation of power and resulting imbalance must be addressed as a prerequisite in decision-making processes. Holistic methods, tools, and techniques must include approaches allowing for gaps to become visible, un(der)represented voices to be heard, and nonhuman actants to be included. Politics influenced by modern capitalist thought often supports a traditional analysis of a stakeholder map—where the powerful are heard and represented, and the seemingly weak are kept quiet and at bay. It is important to rethink a traditional stakeholder map and analyse the interests and power relationships from a more-than-human perspective.

5 In the case of coastal planning, it is not the politicians, land owners, or human inhabitants, and certainly not the banks and insurance companies, who should have the highest interest in a flourishing coastal area. However, the ecosystems and species that inhabit these spaces must be the primary beneficiaries of any anthropogenic influences or intervention. However, the latter usually has the least say in decision-making processes. Concepts such as Karen Barad's (2007) agential realism undermine these paradigm shifts as they understand that individualism and separateness are not the original states in nature.

6 Landscape architects and architects are highly skilled in understanding complex and interrelated problems and are attuned to synthesising and communicating findings in non-verbal ways. These skills can be highly beneficial when further developing and applying the presented theory to a practical outcome. Furthermore, different societal groups show increased interest in these topics, and a trend of inclusion, plurality, and diversity can be observed. This is also evident in the increased audience topics such as cartography received outside their academic field (Pyne et al., 2022).

Fig. 99
A traditional stakeholder maps organises participants and actors within a power X interest matrix. High power groups or individuals, therefore, are managed more closely and given a more prominent voices. However, in the context of landscapes and their inhabitants, the more-than-human and nonvital interests outweigh everyone else's interests and should be granted priority regardless of their respective power. Traditional Western politics and economics still favours this approach and bases decision-making processes on such evaluations. (Werder, 2024)

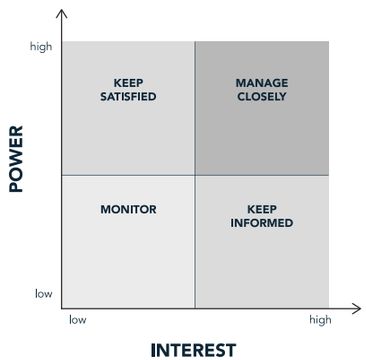

Fig. 100
(next page)
Ripples in the sand.
(Werder, 2023)

5.2.3 Conclusion

1 While the *wicked problems* of the Anthropocene certainly require inter-, multi-, and trans-disciplinary approaches, I do not claim that architects or landscape architects will be the sole mediators to resolve these issues. More so, I find solace in the often-cited quality of (landscape) architects as generalists. A degree and experience in either (or often both) fields—architecture and landscape architecture—prepares researchers, educators, and practitioners to work within a network of disciplines. They are highly attuned to negotiating different priorities, scales, and requirements and are trained to see relationalities. As a highly visual practice, the disciplines must address this primacy of sight and use it constructively, as it provides a valuable counterpoint to discursive
2 practices mainly relying on language.

My hypothesis of *fieldwork* as a *diffractive methodology* does not propose an immediate practical application that is novel to the field, but instead builds up on existing tools, techniques, and methods. The concept and explicit formulation of fieldwork*ing* provides a conceptual framework for other researchers to use as a stepping stone to frame through and validate their fieldwork practices with.

3 Understanding fieldwork as a potential methodology to facilitate the current paradigm shifts **allows the practice to form a discipline of itself**. Fieldwork becomes fieldwork*ing*, transcending disciplines and spanning across research, education, practice, and policy. Therefore, it blurs boundaries and bridges organisational gaps. The role of the fieldworker will be strengthened and potentially redefined as well.

•

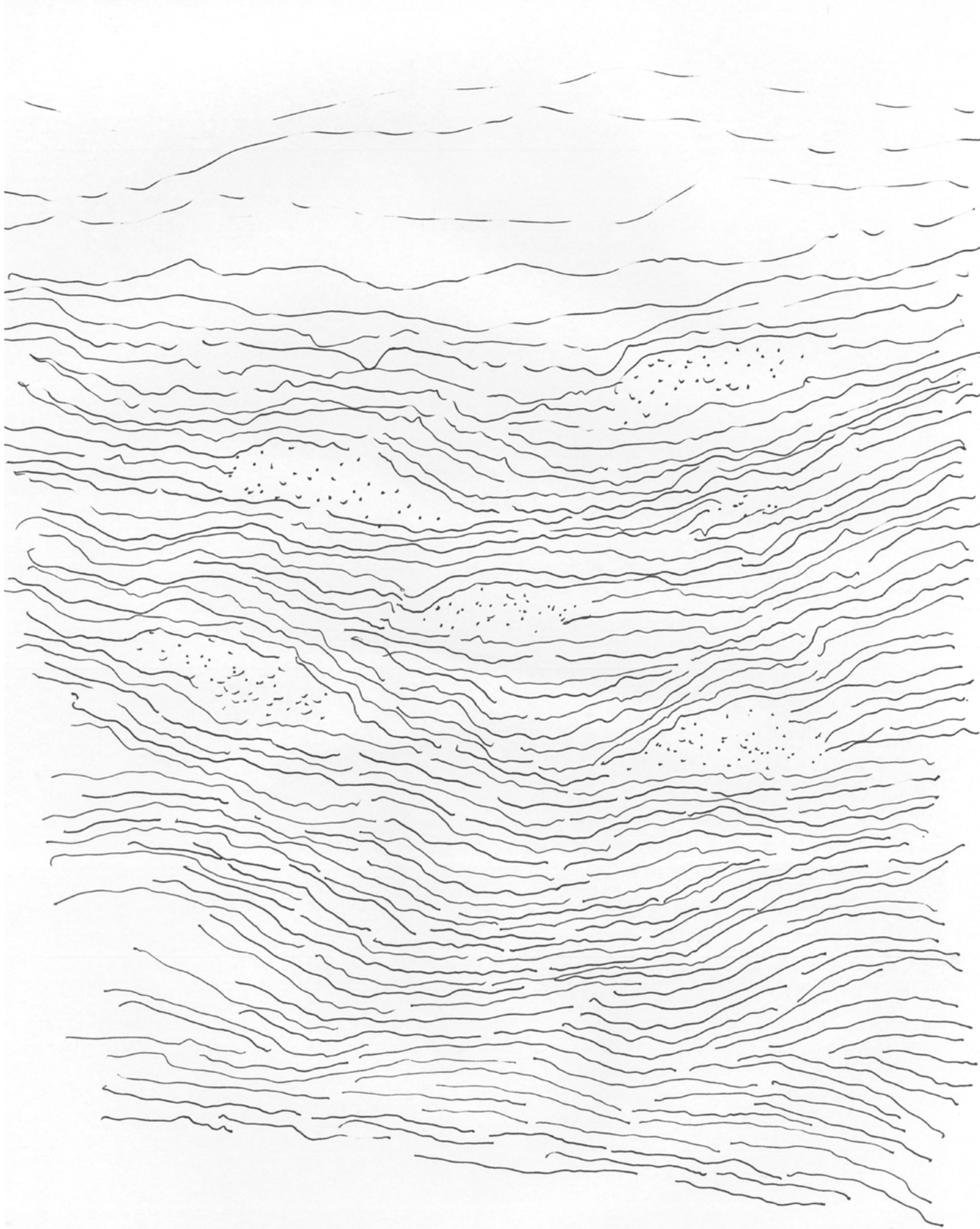

Fig. 101
Maramataka:
Ōhua.
(Werder, 2024)

5.3 HOW TO GO FORWARD

1 My research does not propose a blueprint of a specific fieldwork method. However, as a conceptual framework, agential realism guides, frames, and influences the methods, tools, and techniques utilised in fieldwork as a diffractive methodology. I present a hypothesis that suggests new ways of thinking and engaging with these subjects. Fieldwork*ing*, as a novel approach to cognitive agency, has the potential to gradually reshape processes, expectations, and assumptions in the context of coastal landscapes and spatial planning. If agential realism is consistently applied to spatial studies and landscape planning, it potentially leads to significant changes in the disciplines' methods, techniques, and tools.

2 This chapter provides a hypothetical outlook of how current methods, best-practice approaches, and tools are potentially influenced and highlights interesting areas of further study and research.

5.3.1 Formalising fieldwork

1 The ontogenetic inquiry of mapping practices and the discussions around relationships between (visual) representations of fieldwork findings and their affordances and performativity reveal the crucial importance of these tools in acting as metaphorical gravitational waves. Therefore, a conscious effort must be made to make fieldwork processes and outputs more visible and accessible. Much of these findings stay hidden in the practices of offices and councils, where fieldwork is performed as a primary analysis that is later deemed irrelevant once the results are synthesised and summarised.

2 Diffractive fieldwork rippling across domains and disciplines raises the question of who or what has the agency to act in the capacity of continuity of knowledge flow or retaining methodological rigour within this practice. Is it a personified entity transporting these ideas or the tools and techniques (i.e., the mappings and recordings) that allegorically pass on the batten?

3 Consequently, this requires a formalisation of fieldwork. Publishing fieldwork more explicitly gives access to further study of the findings and critical discourse through constructive questioning or potential editing, extending, amending, and critiquing findings. Establishing a peer-review process for fieldwork methods (Eanes et al., 2020) and findings can strengthen the discourse and provide valuable contributions. While this may render fieldwork as a vulnerable methodology open to further critique and questioning, this openness is the method's leading strength and quality by avoiding the hybris of omniscient planning practices presented as finished products. Opening fieldwork outputs to a broader and more general audience also allows for the reproducibility of the applied methods and a potential for explicit outlining of specific approaches. The outlined research in this thesis will not only be relevant in the context of landscapes but also of significance for urban studies, as many researchers referenced in this work have equally applied their interests to urban context (e.g., as evident in Diedrich's role in the development of a "Beyond Best Practice" theory in collaboration with Janches et al., 2022).

4 However, the formalisation of fieldwork may lead to an unfavourable standardisation or stratification of approaches, leading to the creation of formalistic methods. This counters the open-ended, explorative, and playful character of fieldwork. The often-valued *childlike curiosity* cannot be contained in clearly defined protocols and itineraries and precisely provides critical qualities to the inquiry. Practitioners in landscape studies and architectural fields are attuned to methods that share these qualities and possess the skillsets and intuition to engage with fieldwork as a diffractive method. I second the call to have more landscape architects and architects present in decision-makers' roles in spatial planning processes. This position grants these practitioners new roles where transdisciplinary skills are valued.

5.3.2 Navigation in and of mappings

1 Similarly to the abovementioned arguments, integrating of fieldwork as a diffractive methodology requires a rethinking of current mapping platforms and visual representations. While the drawing and displaying techniques may alter and develop, the main focus must be on the relational representation of data—that is, how are data (in the form of mapping information) curated and collated, and how is navigation of this information mediated?

2 GIS still predominantly repeats a paper-mentality with linear layering of information (i.e., the ***layer-cake* method** p. 81). Contemporary digital tools have astonishing capabilities of arranging data in dynamic and interlinked ways. Topological configurations of findings that present data with hyperlinks and complex spatial visualisations. Such approaches are applied in many fields outside spatial studies (e.g., computer sciences or biological visualisations). Data visualisation has emerged as a relevant field that is gaining importance, and with the advancement of technological tools, there are hardly any limitations of what is feasible. However, few constructive criticisms of spatial studies' conservative data visualisation have been raised. Finding alternatives to the outdated layer hierarchy in traditional platforms like GIS is an effort to move away from the increasingly unfit 19th- and 20th-century techniques and tools. The linear and

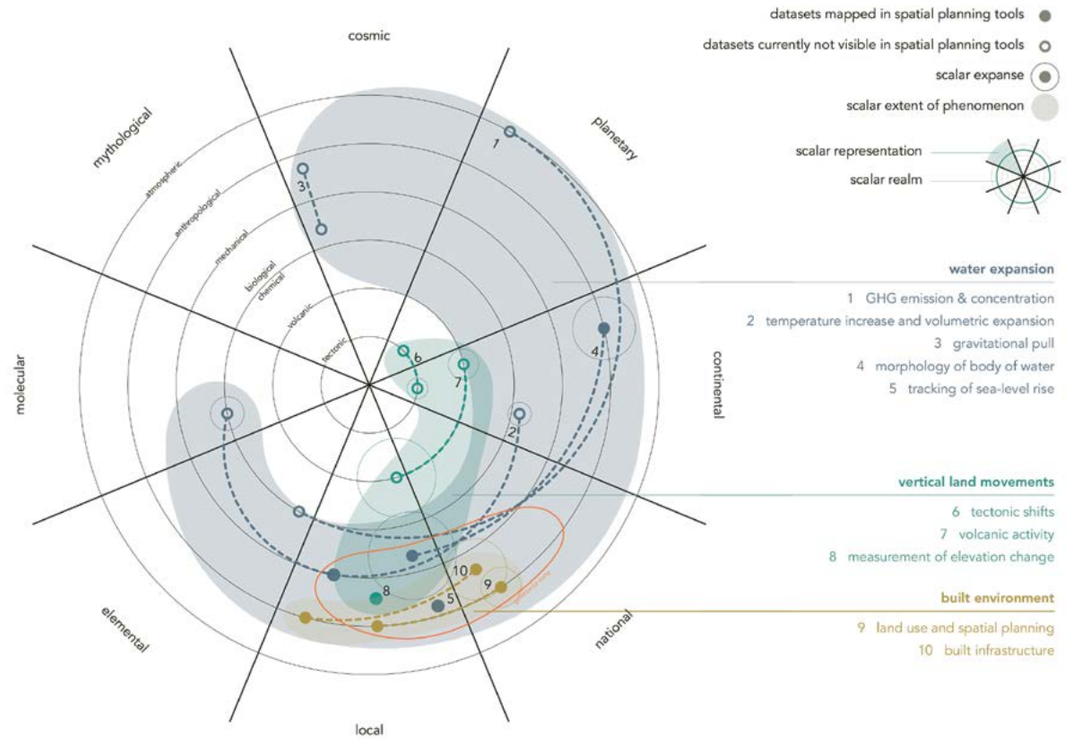

Fig. 102 Concept of a *scalar navigator* for GIS platforms. (In: Werder, 2023)

static application and overlay of planning tools today cater to mechanistic navigation of mappings, affording a solutionist reading and human-centred framing of the *problem*. Traditional GIS platforms and governmental mappings suggest that all information is available and complete, promising a finite solution or conclusive endpoint to our investigation. Shifting towards a more eco-ontological representation of the world supports the ongoing paradigm shifts in landscape thinking and planning. This shift aims to encourage more diverse and inclusive perspectives in landscape planning, embracing change, uncertainty, and dynamism as inherent qualities and fostering the pursuit of shaping a better future for all living beings.

3 The *scalar navigator* (FIGURE 102, PREVIOUS PAGE) presents a hypothetical design imagining a novel navigation tool. The navigator highlights the dimensionality and multiplicity of scalar representations applicable to specific sets of mappings (Werder, 2023). Datasets are categorised and contextualised to allow for transparency of the data collection (or better: probing) processes. Putting data in relation to their scales, dimensionality, and realms allows for a more nuanced representation of data where potentially not everything is weighted the same. This provides transparency but also further argumentation to hopefully advocate for more holistic planning approaches or analyses. Further, the scalar navigator also provides a chance to highlight incomplete or missing data, indicating gradients and concentrations. These arrangments illustrate the multi-layered nature of probings and findings. Although data may originate from the same spatial location or configuration, its emergence from different scales or dimensions reveals the interconnectivity and entanglements of phenomena that are not only bound by spatial proximity but also other criteria or topological proximity.

4 Comprehending our environment's intricate and interconnected nature provides an opportunity to reconsider the approach to identifying problem-*seeking* processes in landscape planning. Establishing a navigation tool enables the user to move beyond solely human-centred perspectives, accommodating diversity and multiplicity in the scalar representation. Acknowledging the complexity and variety inherent in landscape planning is crucial, viewing it as an asset and opportunity rather than a hurdle. By visualising the diverse scales involved, the possibility of scale fluctuations is embraced and our human influence is positioned within this web of interconnection. Ultimately, scale is subjective and context dependent. Ironically, the ubiquitous and flexible zooming capabilities on digital platforms have rendered scale obsolete in digital media—as both a parameter and a measure of dimension. However, in this context, the definition of level of detail and resolution gains significance, opening opportunities currently overlooked in digital tools. The hypothetical scalar navigator is a tool facilitating a distinct form of navigation within multi-layered mappings. It can be combined with other technical and ontological advancements in planning approaches.

5.3.3 Ultralocal and transareal platforms

1 The performativity of the tools highlights the need to critically discuss the platforms, tools, and methods applied in spatial planning. GIS, although not inherent to the technology itself, repeats a top-down methodology often omitting site specificity and levels of detail beyond a politically favoured discussion. Establishing an ultra-local GIS platform will give access to more relevant data and must allow for more diverse contributions, therefore amplifying the voices of marginalised groups and nonhuman actors alike.

2 The potential of (regular) GIS and **altGIS** p. 82 (alternative GIS platforms and practices) is not fully utilised due to its current separation. Fieldwork as a diffractive methodology emphasises a focus on non-biased pattern networks intrinsic to the complexity of coastal landscapes. It acknowledges that spatial planning is not primarily about organising space itself but rather about coordinating the relationships within space.

3 This ties in with the argument of the inadequacy of spatial and temporal scales utilised in these tools and the lack of critical reflection on spatial boundaries such as administrative borders. Most GIS platforms for spatial planning provided by councils repeat political districts' administrative borders (i.e., city borders, council delineations, and the like). These borders are ecologically arbitrary and need to highlight the need for conversation across borders. There is generally a complete omission of any data beyond these arbitrary lines. The presented data must be transareal—transcending spatial distinctions (such as water and land), disciplinary fields, and jurisdictional borders. This leads to an assemblage of information that is not tied to the political expanse and fostering communication and accountability for the provided data sets and the adoption of a framework of ecotone-thinking (Kahn, 2021a), where fragmentation, patchiness, change, diversity and heterogeneity are seen as a chance and defining quality of a place. Novel approaches that have previously been studied (e.g., concepts such as fuzzy borders (Allmendinger & Haughton, 2009)), potentially find new breeding grounds within this context.

4 Such an approach will raise questions about authorship and the financial consequences (who is paying for the probing (data collection) of a specific area and who is responsible for their maintenance and archiving?). However, these questions must be addressed regardless of national, local, and district borders.

5.3.4 Decolonising and decentralising councils

1 The organisation and coordination of ultra-local methods may result in a splitting up of city council structures and force them to operate in a more decentralised manner. Coming from a country with a federal organisation system, the ultra-local fragmentation of regulatory processes and structures is not unheard of. Although it may result in, superficially, more work (e.g., more satellite offices doing the *same* work), the research is conducted in more detail and a closer connection to specific sites, with workers usually having a closer connection, emotionally and physically, to the sites they look after. Considering the technological advancements, the *extra* work will balance out

with more efficient tools and counter the fear of losing jobs due to technological developments. A closer connection to the site will also establish more responsibility for probing through personal and intimate immersion in a specific area. Fieldwork*ing* encourages exploration rather than the formulaic following of methods and tools, therefore supporting the agency and responsibility of the planner or practitioner.

2 This restructuring of stratified council structures and other provides an opportunity to align with decolonising governmental bodies and processes. The inclusion of multiplicity and diversity, and the acknowledgement of complementarity of worldviews hopefully provides a chance of questioning bipartisan practices dictating the structures of governmental bodies, their influences, and impacts. De-coupling of prevailing political power (party maxims) allows for more consistency in the use of methodological approaches.

3 Transareal departments and ultra-local platforms must connect within this structure to foster exchange, overlap, and communication. Given the various communication tools and platforms available, rethinking an efficient, effective, and innovative use is imaginable. This further invites actors and stakeholders into the process previously neglected or un(der)represented (similarly to Bruno Latour's ideas of a novel proposition for an innovative parliamentary governance framework that extends invitations to both nonhuman and human entities (e.g., in Barad, 2007)).

4 Given the bottom-up characteristics of fieldwork an opportunity for inclusion of citizen-science emerges. Similarly, Kahn and Diedrich (2019) notice a chance to "de-professionalise" and "un-discipline" (p. 14) practice and research—in a constructive form of reflection on business-as-usual approaches.

5.3.5 Hybrid work practices and methods

1 The recent discussions around application of artificial (general) intelligence and LLM in various fields raised excitement and fear in public and professional discourses. With the increasing capabilities of A(G)I, people fear losing their jobs to more efficient and capable entities. However, fieldwork*ing* shows that our humanness is precisely a quality of this method which is difficult to outsource. Many researchers in this field agree that human perception and multisensorial synthesis are still incredibly complicated to recreate or even simulate. The software requirements are complex to solve, but the hardware issues around energy consumption seem insurmountable. The human brain performs complex computational tasks at a fraction of energy costs required of silicon-based intelligence. In a best-case scenario, humankind can outsource tedious and repetitive data collection or analysis to A(G)I systems, allowing human researcher more time to engage with the content they are more attuned for: The creative syntheses will become ever more important. Empathetic constructiveness inspired by the curiosity of inquiry and the drive to ask the right questions are key in this pursuit.

2 The **Big Data** p. 79 discussion of the early 2000s is currently repeated with the emergence of *Deep Data*. The previous discussion showed that it is not merely about the quantity of information gathered but rather about collecting the relevant and meaningful data (which may not necessarily be the most evident choices). The synthetic process of how these data are put in relationships with the context and other findings is an essential and creative process requiring intuition and tacit knowledge. When A(G)I finds widespread application, whether this capability is utilised in its novel conception or an anthropomorphised application (as is the case currently), it is crucial to train these systems under relevant methodological assumptions.

5.3.6 Digital fieldwork

1 While fieldwork theorised in this thesis relates to work in the *physical* field, field can also have a broader definition. In the true sense of *field* being a mathematical or physics term, the field can also be understood as an abstract or digital realm. With the continuous increase of digital data (collections) and information available across various platforms, arguably, researchers already engage in a significant amount of digital or virtual fieldwork—this potentially will increase given the current trends.

2 On the one hand, this development may result in fieldwork*ing* exclusively conducted in the digital realm or, in a more prosperous way, counterintuitively strengthening the in-person experiences as Schon (1992) already theorised when addressing computer and AI's sensorially deprivation and lack of embodiment (at least as of now). With the advent of *digital twins*, it is only a matter of time until fieldworkers will *canvas* the digital fields of landscapes. It will become increasingly important to theorise and strengthen physical fieldwork on-site and establish an effective and relevant relationship between the digital realm and physical *Nature*. It will be interesting to see in what ways digital fieldwork and physical fieldwork will differ, complement each other, and what each practice's capacity will consist of. Inevitably, this will trigger further re-definitions of the process and meaning of fieldwork.

5.3.7 Aquatic and amphibious fieldwork

1 I have reflected on the term *field* in **Chapter 3.2.1** p. 125, where I define it as a spatial term. However, I have not implicitly labelled field as a terrestrial term, although conventional understanding would signify this. In the context of coastal and marine (spatial) planning and particularly the idea of fieldwork as a vital methodology for coastal landscapes, I consequently must consider the idea of *aquatic* or *amphibious* fieldwork. As human beings, bipedal and land-bound, we are not used to spending prolonged time in or on water and, therefore, have adapted our behaviours, tools, and methods to terrestrial practices. It is an exciting concept to hypothetically and practically explore in further research: What would aquatic or amphibious fieldwork look like? Would it necessarily differ from terrestrial fieldwork? Are there novel insights that are beneficial to other fieldwork practices? Is there a unique, element-bound methodology, or is there an overarching methodological approach. Thinking of the concept of **wet ontology** p. 49 and the challenges the ocean—or water in general—has caused to archaeological and historical narratives further highlights the notion of

time: Movement, change, and dynamisms are essential characteristics of water that the Western perspective traditionally struggles to frame constructively. Cultures that have developed closely to water, such as most Polynesian communities, are more attuned to *reading* water. Skilled navigators can detect nuances of currents and movements imperceptible to the untrained eye.

2 I argue that the term *field* should still be used in aquatic or amphibious *field*work, as the term does not necessarily need to be understood from a terrestrial perspective (as seen in applying the term *field* in mathematics or physics). However, a rigorous application to these realms would potentially reveal and significantly alter the methodologies, methods, and knowledge generation processes, where the arguments around shortcomings of current fieldwork practices presented in this thesis are becoming even more apparent.

3 In this context, it is also critical to note that bodies of water not merely consist of the surface or volume of water but that the *ground* is of equal importance. The ground is an essential habitat for marine flora and fauna, from algae to different crustaceans to corals—all these beings rely on a healthy sea-, lake-, or riverbed. Unfortunately, this *land* is equally mistreated through adverse practices such as seabed mining or trawling through industrial fishing practices.

5.3.8 Conclusion

1 The formalisation and reconceptualisation of fieldwork and related tools such as GIS platforms, underlying organisational structures, hierarchies, and work practices will enhance the critical discourse, allowing for extended, amended, and critiqued methods. This openness, while rendering the methodology vulnerable to critique, is a strength that avoids presenting planning practices as finished products. The integration of mātauranga and kaupapa Māori as well as decolonising frameworks, combined with diverse planning tools and techniques, can address the systemic challenges observed in spatial planning. Qualitative features focusing on more-than-human well-being are crucial for equitable solutions, demanding a shift from simplified tools to a multi-dimensional understanding of landscapes and our physical and cognitive engagements with these areas.

2 Considering their affordances and performativity, rethinking current mapping platforms and visual representations is essential for integrating fieldwork as a diffractive method. Traditional GIS platforms, with their linear layer-cake methods, are increasingly inadequate. Modern digital tools have the potential to offer dynamic, topological configurations that transcend outdated techniques. Moving towards eco-ontological representations supports ongoing paradigm shifts in landscape planning, fostering diverse perspectives and embracing change and uncertainty. Additionally, establishing ultra-local GIS platforms can provide access to more relevant data and amplify marginalised voices. Hybrid work practices, combining human multisensorial synthesis with A(G)I's efficiency, highlight the irreplaceable value of human perception in creative processes. As digital fieldwork becomes more prevalent, the relationship between digital and physical realms will further redefine the meaning and process of fieldwork in the disciplines of landscape studies.

3 I do not anticipate such changes to occur rapidly or through top-down implementation. Instead, these transformations are more likely to emerge gradually, driven by the evolving nature of planning and paradigm shifts in underlying conceptual and philosophical frameworks. This slower, organic process may prove advantageous, allowing for the adaptation and refinement of approaches within diverse contexts. While spatial planning holds potential to facilitate and institutionalise these future applications, the implementation is more realistically rooted in a bottom-up approach. This perspective recognises the critical role of education and professional practice as catalysts for innovation, wherein evolving methodologies and practices can reshape prevailing norms. Over time, these grassroots changes can exert a transformative impact on policy and planning frameworks and ground, integrate, and contextualise future applications more effectively.

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Fig. 103
Harakeke raranga.
(Werder, 2021)

Fig. 104
Reflection.
(Werder, 2024)

5.4 FINAL REFLECTIONS

Reflecting on the process and methodology

1 Navigating the transdisciplinarity of this thesis was challenging. My analyses of systemic issues, the recognition of paradigm shifts, and particularly my novice understanding of quantum physics have revealed an intuition that I initially could not cohesively and definitively summarise. Agential realism, particularly the notion of diffraction, eventually provided a compelling framework. The hypothesis of *fieldwork as a diffractive methodology* and the framing of the methodological approach from a fluid, watery perspective has revealed a meta layer to the dissemination of this research. Barad's preface to *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Barad, 2007) resonated strongly with me, and I sympathise with their account of intra-active authorship in their book. Influenced by a diffracting methodology, I have likewise intra-acted with my thesis, and the processes of writing, illustrating, summarising, and synthesising these strains of arguments have become a way of fieldwork*ing* in themselves.

2 The boundary between casual site visits and conscious on-site fieldwork has been blurred. I am part of Te Waitaramoa Hobson Bay as it has become part of me. My initial distant and more abstract positioning of clarifying my process and methodology has given room to a more situated and embodied approach: To borrow Goethe's Faustian exclamation—*"zwei Seelen wohnen, ach, in meiner Brust"*, two souls living in me—I have found a new admiration for both the digital and the analogue, the theoretical and practical. They are not binaries contrasting but intra-actively constituting each other.

Connection to *my* landscape

3 As a relatively recent immigrant to Aotearoa New Zealand and identifying as neither Māori nor born in Aotearoa New Zealand, it is not my lead in the discussions around decolonising landscape in the context of Aotearoa New Zealand or the principal question of re-alignment of Te Ao Māori and Western thinking. However, coming from a different culture—a country with different languages, different social, economic, and religious histories, different topographies and geographies, and most formatively, a historic absence of monarchic structures—equips me with an outside view on the nuances of implicit characteristics of Anglo-Saxon cultures and societies. My thought processes, methods and philosophical background are undoubtedly influenced and biased by this context of upbringing.

4 I grew up in a rural, mountainous, and, arguably, stubborn part of Switzerland, where the historical resistance to any outside hegemony or usurpers—being it the Austrian *Vögte* (the advocates), Napoleon, or more contemporary, the avoidance of joining the European Union—is celebrated and deeply embedded in our identity. Historically and culturally, the *Willensnation Schweiz* (Switzerland a nation by will)—being made up of different languages, cultures, religions, and environments while lacking natural borders—has found its common denominator in the local and place-based landscapes and cultural practices associated with the natural environment, such as the seasonal migration and herding practices of cattle (*Alpabzug und -aufzug*). We deal with the water in the form of Alpine rivers—which swell up with the seasons. We keep a close eye on them when the Alpine snow and ice melts in springtime, regulating the lakes by letting off more water into the main rivers such as the Rhine. My personal experience has taught me that floods are generally not *bad* (FIGURE 105). However, the way we have organised our settlements, disregarding flood plains, has proven to be incapable to *dealing* with natural processes, therefore *creating problems*.

5 The volcanic and coastal landscapes of Aotearoa New Zealand could not be any more different to the landscapes I come from: a landlocked *Landschaft* shaped by fluvial and glacial processes. In my new home, I navigate the hills differently, maybe because my body senses the different geological formations or simply because Tāmaki Makaurau Auckland's urban planning has not responded particularly well to this topography. Yet, the appreciation and physical and emotional connection remain akin.

6 I was born in the *Flachland* (the flat lands) but eventually grew up *am Bärg* (on the mountain), on the foot of Bürgenstock. *Ennetbürgen* literally means "behind the *Bürgen*; the mountain"—a place between the lake and the mountains. In the tiny state, I associate my cultural heritage with, we often refer to the geographical and topographical features to explain our heritage. Although my last name is unusual for this area, it is a toponym. *Werder* means *ait* in English: A small river island, formed by deposits of sediments that may accumulate further or move to a different place altogether. It is about water, and land, and time, and change, and movement. The idea of a *pepeha* is not so foreign to me after all.

7 *Zwische See und hechä Bärge liid, vom Herrgott anegleid,*
ganz versteckt e Fläcke Ärde,
gfindsch kei schenre wiit und breit.
— Heinrich Leuthold
(first verse of the anthem of the Canton of Nidwalden).

8 Between the lake and the high mountains, is placed by God,
a hidden piece of earth (land),
you will not be able to find a more beautiful one.
(translation by author)

Fig. 105
A *picture* of the 2005 floods in Nidwalden, Switzerland. (Werder, 2005)

Pepeha
(English translation)

9 Tēnā koutou katoa
Greetings to you all
Ko Huiterangi te whakapaparanga mai
Switzerland/Swiss is my ancestry
Ko Nidwalden te whenua tupu
Nidwalden is where I grew up
engari
but, however
Kei Tāmaki Makaurau au e noho ana
I am living in Auckland
Ko Vanessa taku ingoa
My name is Vanessa
Tēnā tātou katoa
Greetings to one and all
(template from E-Tangata & Opai, 2022)
•

Fig. 106
Rangi-nui.
(Werder, 2024)

Now you could say the paradigm has shifted. What needs to be done is obviously in front of us, and it's not essentially negative to be a generation that has to rethink and reinvent and redesign almost everything.
—Andri Snær Magnason (2019)

5.5 CODA

1 I started this thesis at the outset of 2020 when whispers of a novel respiratory virus were circulating global media. The attention to COVID-19 has silenced novel publications, such as the calculations showing how the anthropogenic mass has surpassed the biomass on our planet (Elhacham et al., 2020). Then 2022 marked the fiftieth anniversary of *The Limits to Growth* (Meadows et al., 1972). Updated simulations and estimates were published–humankind are not doing much better than predicted in the, although computationally limited, calculations of 1972. In addition, 2023 was the first year to record a global temperature rise of an average of +1.5°C (Copernicus Climate Change Service (C3S), 2024).

2 Now, four years later, we live in a different world where new and old conflicts, wars, and humanitarian crises are mounting, and the accelerated developments of machine intelligence are discussed as an apocalyptic threat. However, I continue to believe in humankind's creative, careful, and compassionate capabilities to reimagine processes, methods, and structures to create and envision a better future for all living and nonvital entities.

3 It is June 2024: Mānawatia a Matariki.

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A APPENDIX A: TE REO MĀORI GLOSSARY

A	Ao Māori, Te	worldview of Māori
	atua	ancestor with continuing influence, god, demon, supernatural being
	awa, ngā awa	river, rivers
H	hapū	kinship group, clan, tribe, subtribe; to be pregnant
	hapū rohe	tribal area
	harakeke	New Zealand flax (*Phormium tenax)*
I	iwi	Māori tribes
K	kai moana	seafood, shellfish
	kaitiakitanga	guardianship, stewardship, trusteeship, trustee
	karakia	prayer, grace, blessing
	kaupapa	topic, policy, matter for discussion, plan, purpose, scheme, proposal, agenda, subject, programme, theme, issue, initiative
	kōtare	sacred kingfisher (*Todiramphus sanctus*)
	kūmara	sweet potato
M	mahinga kai	garden, food-gathering place
	mahi toi	art, craft
	mānawa	mangrove (*Avicennia marina)*
	Mānawatia a Matariki	Happy Māori New Year
	mānuka	mānuka, tea-tree *(Leptospermum scoparium)*
	maramataka	Māori lunar calendar
	mata huna	hidden forces
	Matariki	Pleiades, Messier 45—a cluster of stars in Te Kāhui o Matariki.
	mātauranga	knowledge, wisdom, understanding, skill; in Aotearoa often used in the context of Indigenous Knowledge(s)
	maunga, ngā maunga	mountain, mountains
	mauri	life force
	moana	ocean
O, Ō	Ōhua	moon on the 14th (or 12th, 13th or 15th) night of the lunar month. For some tribes (e.g. Te Whānau-ā-Apanui) this is the twenty-ninth night of the lunar month. A good day for planting crops
	oioi	jointed rush *(Apodasmia similes)*

P	pā	fortified village
	pākehā	english, foreign, European, exotic
	papa kāinga	home base, village
	Papatūānuku	Earth, Earth mother and wife of Rangi-nui—all living things originate from them
	pepeha	tribal motto, proverb. "The pepeha is a familiar template of phrases that define and describe iwi, hapū and whānau connections for Māori." (E-Tangata & Opai, 2022)
	pōhutakawa	"Christmas tree of Aotearoa" *(Metrosideros excelsa)*
	pūkeko	purple swamp hen (*Porphyrio porphyrio)*
R	Rangatira	to be of high rank chief,
	Rangi-nui	Atua of the sky and husband of Papatūānuku, from which union originate all living things
	reo Māori, Te	Māori language
	roto, ngā roto	lake, lakes
T	tangaroa	Atua of the sea and fish, he was one of the offspring of Rangi-nui and Papatūānuku and fled to the sea when his parents were separated
	tauparapara	to play together, incantation to begin a speech
	tikanga	correct procedure, custom, habit
	tī kōuka	Cabbage tree (*Cordyline australis*)
	Tiriti o Waitangi, Te	translation of the Treaty of Waitangi in Te Reo Māori
W	wai	water
	waiata	to sing, song
	waihanga	creativity
	waiora	health, soundness
	wairua	spirit, soul, spirituality
	whaikōrero	to make a formal speech
	whakapapa	to give history; to recite genealogies (in proper order)
	whānau	extended family, family group
	whanaungatanga	relationship, kinship, sense of family connection
	whenua	land; also placenta
	—mana whenua	—territorial rights: power from the land
	—tangata whenua	—local people, hosts, Indigenous people

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All translations from Te Aka Māori Dictionary (2024).

Placenames and Toponyms

A	Awa Tupua, Te	Whanganui River
	Aotearoa	"The land of the long white cloud" New Zealand
H	Hawaiki	ancient homeland
I	Ika-a-Māui, Te	North Island
M	Maungarāhiri	Little Rangitoto (volcano)
	Maungarei	Mount Wellington (volcano)
	Maungawhau	Mount Eden (volcano)
	Moana-nui-a-Kiwa, Te	Pacific Ocean
O, Ō	Ōhinerau	Mount Hobson (volcano)
	Opou	Coxs Creek
R	Rangi-i-totongia-a Tama-te-kapua, Ngā	Rangitoto
	Ruareoreo, Te	Newmarket Stream, "the duplicating of voices, i.e., the echoes" (Simmons, 1979, p. 30)
T	Tāmaki Makaurau	Auckland
	Taurarua	Pt. Resolution and site of Parnell Baths, "Song of Annoyance" (Simmons, 1979, p. 31)
	Tīkapa Moana	Hauraki Gulf
	Tī Tūtahi, Te	Newmarket
W	Waipounamu, Te	South Island
	Waitaramoa, Te	Hobson Bay, "the bay of the first rays of sun"
	Waitematā, Te	Tāmaki Makaurau Auckland's natural harbour

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B APPENDIX B: LIST OF RESEARCH OUTPUTS

Publications

Werder, V. J. (2023). Scalar oscillation in the visual representation of coastal landscapes. *Testing Ground*, *1*(4).

Werder, V. J. (*forthcoming*). From reductionism to site-specificity: Fieldwork as a diffractive methodology in the context of coastal landscapes in Tāmaki Makaurau Auckland. *Landscape Research*.

Werder, V. J. (2023). *Waitaramoa transect. Exploring urban and ecological spatial qualities through the deviant transect method*. [Unpublished research project]. AUT Auckland University of Technology Huri Te Ao School of Future Environments Faculty of Design and Creative Technologies.

Workshops

Field Office workshop 01. 13–14 October 2023. *https://fieldofficeworkshops.org* [Participant]

Presentations

AUT Huri Te Ao School of Future Environments Research Symposium. September 2023. [Presenter]
AUT Postgraduate Research Symposium. September 2023. [Presenter]

Relevant teaching

2022 & 2023: ARDN608. *Design & Ecology*. School of Art and Design. [Co-Lecturer]
2023: CTEC702. *Transmedia Narratives*. Huri Te Ao School of Future Environments. [Co-Lecturer]

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C APPENDIX C: PHOTO SELECTION

All photos by author unless otherwise stated.

2020

01

Judges Bay with Auckland Port in the background.
10 January 2020, 8.15pm

02

View from Ōhinerau Mount Hobson.
30 March 2020, 5.45pm

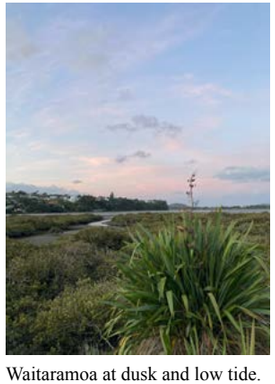
03

Full moon over Waitaramoa, view from Wilson's Beach.
03 April 2020, 7.18pm

04

Blooming pōhutakawa.
22 November 2020, 8.14pm

05



Waitaramoa at dusk and low tide.
22 November 2020, 8.21pm

06

Deceased pūkeko.
22 November 2020, 8.23pm

2021

07

Waitaramoa Hobson Bay boardwalk along Parnell cliffs.
07 February 2021, 4.08pm

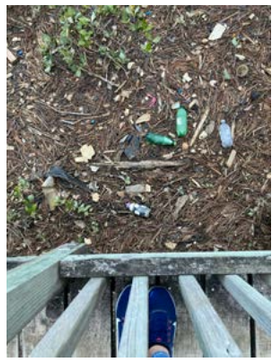
08

Stop sign and algae.
09 February 2021, 8.04pm

09

End of Waitaramoa Hobson Bay boardwalk.
09 February 2021, 8.13pm

10

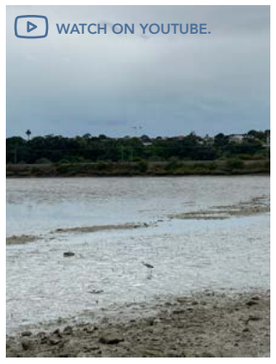


Low tide among mangroves: Litter.
09 February 2021, 8.15pm

11

Textures and colours of low tide.
16 February 2021, 4.24pm

12

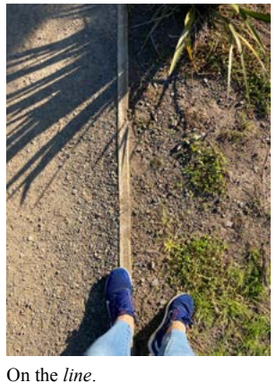


White-faced heron.
16 February 2021, 4.26pm

13

Harakeke raranga.
16 February 2021, 4.31pm

14



On the *line*.
03 May 2021, 3.05pm

15

Public health warning.
03 May 2021, 3.10pm

16

Kōtare on a branch.
03 May 2021, 3.15pm

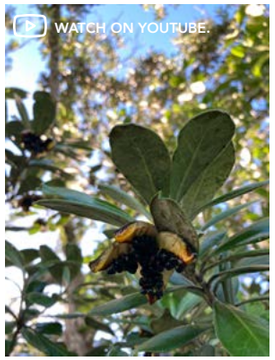
17

Steps and mud.
03 May 2021, 3.18pm

18

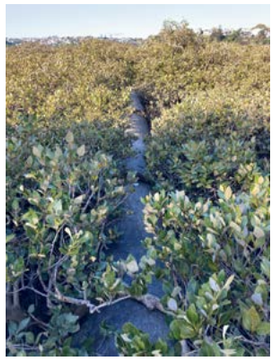
River between mangroves.
03 May 2021, 3.20pm

19



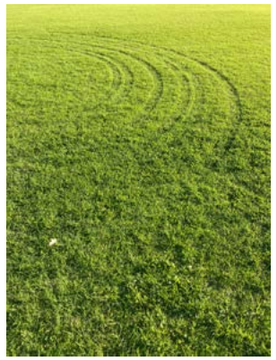
Plant details.
03 May 2021, 3.24pm

20



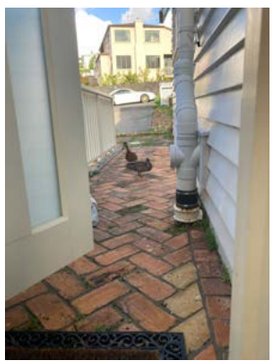
Supra-structure / infra-structure.
03 May 2021, 3.32pm

21



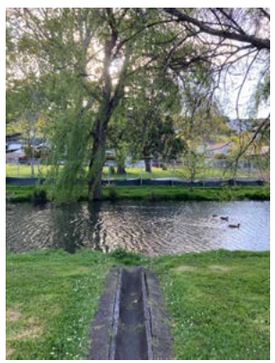
Traces on grass.
03 May 2021, 3.56pm

22



Ducks escaping the construction at Portland Reserve.
05 October 2021, 5.40pm

23



Construction at Portland Reserve.
20 October 2021, 6.01pm

24

Swampy land reclamation.
20 October 2021, 6.10pm

25

Low tide on Waitaramoa.
20 October 2021, 6.27pm

26

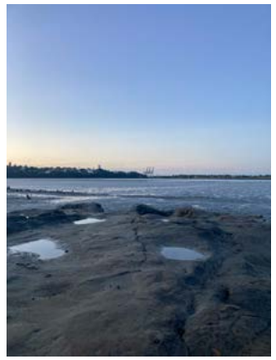
Stabilising the cliffs.
20 October 2021, 6.38am

27

On-going construction at Portland Reserve.
05 November 2021, 4.15pm

2022

28



Dusk at Wilson's Beach with tidal pools.
09 November 2021, 8.08pm

29

High tide.
14 November 2021, 4.44pm

30

Azul the kōtare.
15 April 2022, 9.32am

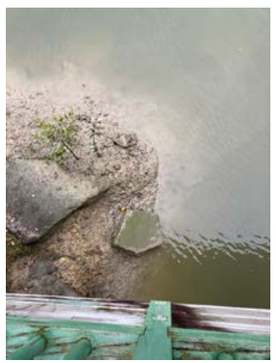
31

A pīwakawa (fantail) jumping on branches.
24 May 2022, 3.09pm

32

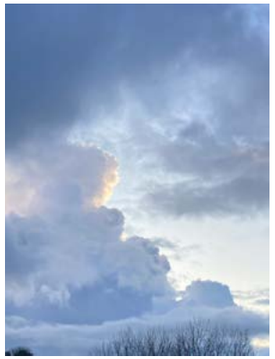
Water clarity testing.
17 August 2022, 1.44pm

33



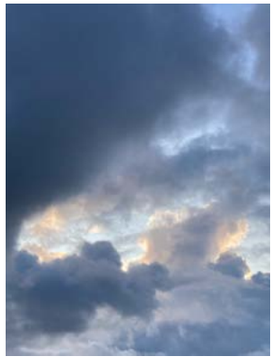
Clearly not so clear.
17 August 2022, 1.49pm

34



Cloud formations.
23 September 2022, 5.58pm

35



Cloud formations.
23 September 2022, 6.00pm

36

Tī kōuka silhoutte and rainbow.
20 December 2022, 8.18pm

37

Low tide on the foot of Parnell cliffs.
25 December 2022, 5.15pm

38

Panorama.
03 January 2023, 6.31pm

39

Post-flood rubble.
07 February 2023, 12.31pm

40

Post-flood landslide on Shore Road.
07 February 2023, 12.42pm

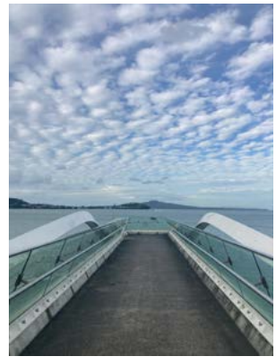
41

Shades of grass.
09 February 2023, 8.02pm

42

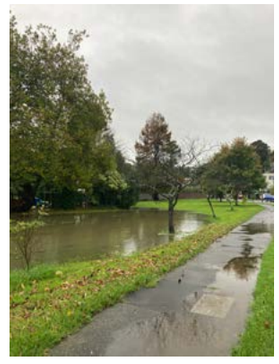
Ōhinerau landslide.
11 February 2023, 9.08am

43



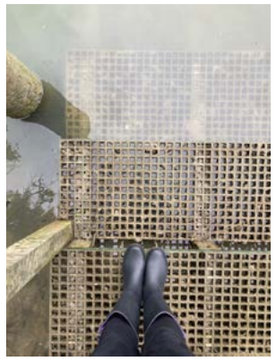
Taurarua Point Resolution bridge.
15 February 2023, 6.25pm

44



Hapua Reserve flooding.
09 May 2023, 2.53pm

45



Muddy steps.
18 May 2023, 3.58pm

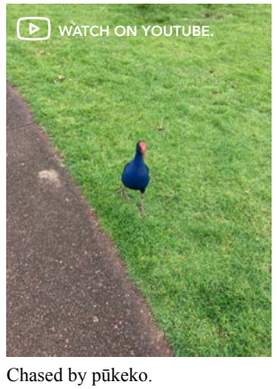
46

Cruise ship.
18 May 2023, 4.42pm

47

Muddy face mask.
02 August 2023, 2.36pm

48



Chased by pūkeko.
19 August 2023, 12.09pm

49

Waka ama trip across Waitaramoa.
09 September 2023, 11.02am

50

Waka ama trip across Waitaramoa.
09 September 2023, 11.02am

51

Waka ama trip across Waitaramoa.
09 September 2023, 11.14am

52

Wilson's Beach at low tide.
10 September 2023, 7.45am

53

Grass and shrubs.
27 September 2023, 3.39pm

54

Low tide.
27 September 2023, 3.45pm

55

Harakeke in the wind.
27 September 2023, 3.56pm

56

Change of weather: Mist and rain.
28 September 2023, 2.49pm

57

Tūī.
16 October 2023, 1.34pm

2024

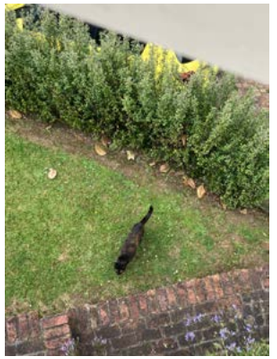
58

Freshly hatched and unfurling butterfly.
22 November 2023, 4.39pm

59

White-faced heron on eastern Waitaramoa boardwalk.
17 December 2023, 1.53pm

60



A Cookie in the wild.
22 December 2023, 1.53pm

61

Islands of mangroves tops.
15 January 2024, 11.21am

62

Waitaramoa east.
10 February 2024, 11.19am

63

Ripples on the water.
11 February 2024, 10.17am

64

New Zealand pied shag *(Phalacrocorax varius varius)*.
18 February 2024, 6.59pm

65

Waitaramoa from the train tracks.
22 February 2024, 4.51pm

66

When the water is out...
10 March 2024, 5.34pm

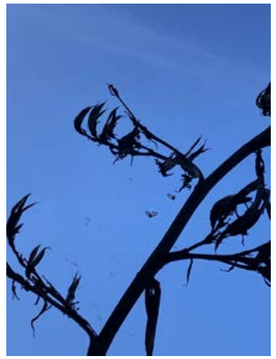
67

Traces in the soil.
10 March 2024, 5.47pm

68

Young harakeke stem.
10 March 2024, 5.48pm

69



Harakeke silhouette.
10 March 2024, 5.53pm

70

Cheeka the magpie.
14 March 2024, 6.20pm

71

Low tide rivers.
14 March 2024, 6.43pm

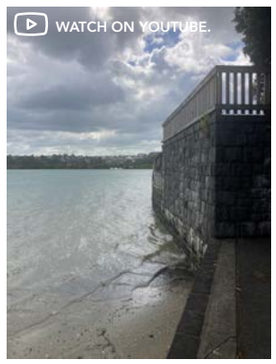
72

Sediment.
27 March 2024, 11.19am

73

First come...
27 March 2024, 11.29am

74



Diffractions.
27 March 2024, 11.30am

75

A lost feather.
27 March 2024, 11.32am

76

Nestled finds.
27 March 2024, 11.49am

77

Ants under the bark.
27 March 2024, 12.04pm

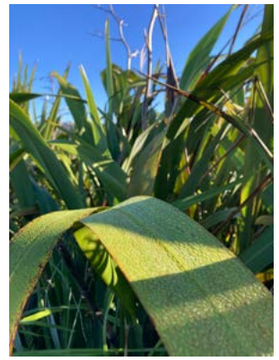
78

Te Ruareoreo pond.
27 March 2024, 12.21pm

79

Waitaramoa in pristine sunshine.
12 May 2024, 9.45am

80



Dew: Wai in all its forms.
12 May 2024, 9.46am

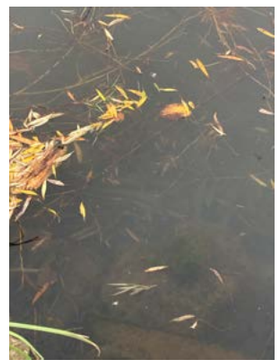
81

Layers on water.
12 May 2024, 10.00am

82

Overlooking Waitaramoa. Credit to Cat Morton-Burns.
12 May 2024, 10.02am

83



Disguised tuna (eel) in Portland Stream.
03 June 2024, 4.09pm

84

Folded harakeke.
3 June 2024, 4.45pm

85

Tiny grass is dreaming.
18 June 2024, 10.03am

86

Tide pushing up water through the grid.
18 June 2024, 4.05pm

87

Are ghosts considered more-than-human?
18 June 2024, 4.13pm

88

Low tide seen from Logan Terrace.
20 June 2024, 11.38am

89

Lichen.
20 June 2024, 11.51am

90

Ripples in the sediments.
20 June 2024, 12.06pm

91

Tyres on the coast.
20 June 2024, 12.10pm

92

Tidal pathway.
20 June 2024, 12.10pm

93

Ducks creating diffractions.
20 June 2024, 12.18pm

Fig. 107
(back)
Rangitoto.
(Werder, 2024)

KĀTI I KONEI.
THIS ENDS HERE