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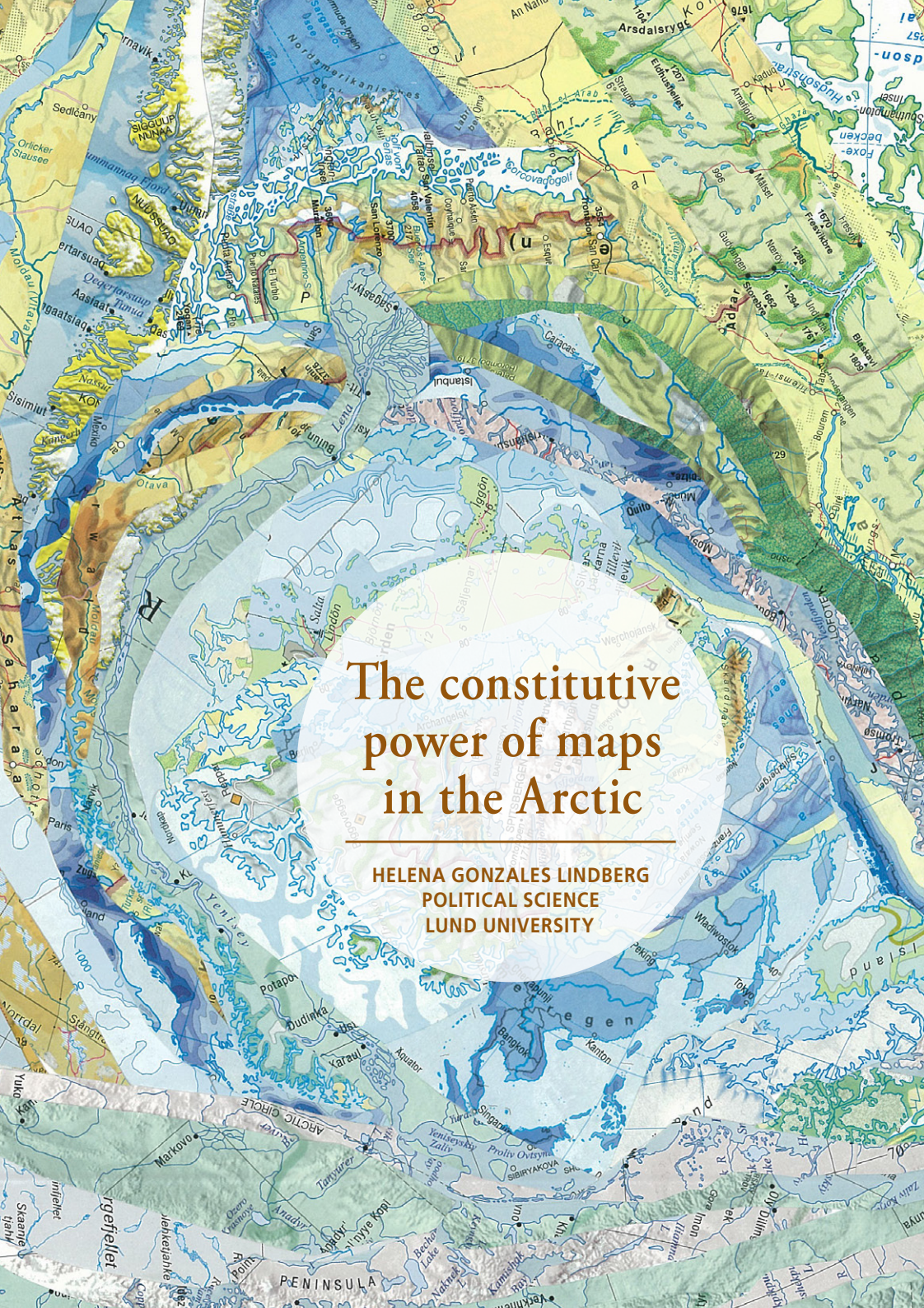
2019

Document Version:
Publisher's PDF, also known as Version of record



The constitutive power of maps in the Arctic

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DOCTORAL DISSERTATION
by due permission of the Faculty Social Science, Lund University, Sweden.
To be defended at the Eden Auditorium, Department of Political Science,
25 October 2019 at 10:15 am

FACULTY OPPONENT
Professor Gunhild Hoogensen Gjørv
University of Tromsø / The Arctic University of Norway

Organization LUND UNIVERSITY	Document name: DOCTORAL DISSERTATION
	Date of disputation: 25 October 2019
Author: Helena Gonzales Lindberg	Sponsoring organization: -

Title: The constitutive power of maps in the Arctic

As maps are widely used, circulated, and recognised, they have consequences for how people view and understand the world. They mediate political meaning-making and frame the conditions for political alternatives to emerge or to be silenced. In contrast to dominant approaches to the study of the power of maps that consider their political influence on the basis of the intentions of the map-maker, this thesis emphasises the constitutive power of maps and the visual representations prevalent within them. Moreover, it attempts to further conversations between the fields of visual politics and critical cartography by investigating the power of maps in international politics. It does so by developing three theoretical assumptions about the constitutive power effects of maps: cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. To illustrate and examine these effects, a two-step analytical framework for interpreting and deconstructing maps is presented and applied to the study of three contemporary maps: a world map using the Web Mercator projection, a map of the changes in Arctic sea ice, and a set of two maps depicting the oil and gas potentials in the Arctic. The analysis focuses on the ways in which maps limit and enable certain conceptualisations of 'the Arctic' and politics within the region. The thesis concludes by contending that maps perform the political by shaping generally held assumptions about the 'reality' of the Arctic, both in terms of its 'challenges' and 'opportunities', and therefore serving particular interests as well as giving rise to ideas and visions about the region's future.

Key words: maps, power, politics, representation, visual politics, critical cartography, the Arctic

Classification system and/or index terms (if any): -

Supplementary bibliographical information: -		Language: English
ISSN and key title: 0460-0037, Lund Political Studies 199		ISBN 978-91-7753-988-9
Recipient's notes: -	Number of pages: 228	Price -
	Security classification: -	

Signature Helena Gonzales Lindberg Date 2019-09-22

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Cover image by Helena Gonzales Lindberg

Lund University
Faculty of Social Science
Department of Political Science

ISBN 978-91-7753-988-9 (print)

ISBN 978-91-7753-989-6 (pdf)

ISSN 0460-0037

Lund Political Studies 199

Printed in Sweden by All-Media Öresund
Malmö 2019

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Acknowledgements

The best thing about writing a PhD has been all the people I have gotten to meet and interact with: at the office, on workshops, courses, conferences, and during summer schools. I have been fortunate enough to have had access to such activities thanks to generous funding from LUCID, the Lund University Centre of Excellence for Integration of Social and Natural Dimensions of Sustainability, a Linnaeus Centre funded by the Swedish Research Council *Formas*.

During this time, I have been based at the Department of Political Science in Lund and I want to start by thanking all my colleagues, including the administrative staff, at Eden. To my supervisor Annika Bergman Rosamond, who has supported me during this professional as well as personal journey: Thank you for always believing in me and supporting my continual criss-crossing between different schools of thought, giving me a hug when I needed it, and sharing with me your academic experiences. Big thanks also to Maria Hedlund, who stepped in as my second supervisor and helped me see this process through. Thank you for your patience, your friendly persuasion, and skilful reading and commenting on my texts. Thanks also to my former supervisor, Annica Kronsell, for introducing me to Eden and to LUCID, and for giving me academic freedom at the commencement of my PhD.

Thank you, Karin Aggestam, Johannes Stripple, Sara Kalm, Jeppe Strandsbjerg, Amanda Cheney, and Elias Isaksson for attending my manuscript conference and taking the time to read my manuscript (some more than once), and for giving me useful and encouraging comments. Moreover, thanks to Catarina Kinnvall for acting as discussant at my midterm seminar. I also want to thank Sandra Engstrand, Niklas Altermark, Catia Gregoratti, Daniel Møller Ølgaard, Mia Orange, Kurtis Boyer, Ulrika Waaranperä, Martin Hall, Ivan Gusic, Jenny Lorentzen, and Þorsteinn Kristinsson, and for commenting on my text at different stages of the writing process. Thank you, Ylva Stubbergaard, Johannes

Lindvall, Douglas Brommesson, Kristina Jönsson, Magnus Jerneck, Åsa Knaggård, Agustín Goenega, Fariborz Zelli, Roger Hildingsson, Stina Melander, Emil Edenborg, and Tobias Dan Nielsen for supportive conversations. I am also grateful to Mikael Kylsäter for being my mentor when I started this PhD. In addition, I have to thank Helen Fogelin for massaging my sore arm during the months of intensive writing. Big thanks go to the PhD community, including PhD candidates from Malmö University. Without friends at work, PhD life would be a sad affair. Special thanks go to Linda Nyberg: thank you for helping me with the text at a point when I became distressingly text-blind. To Klas Nilsson: thanks for keeping it real and sharing my passion for maps. And to Ina Möller – for always having your office door open and for our many conversations during the last year of writing our dissertations – we did it!

The years at Eden would not have been the same without my dear friend and colleague, Elsa Hedling. We have shared so much during this time: office spaces, hotel rooms, conference journeys, engagements, pregnancies, weddings, deliveries – of books and babies! Thank you for being one of the most inclusive and wholehearted people I know. Your professional advices, skilful reading of my texts, and support with writing and text structuring kept me going. Elsa, *du er best*!

Thanks to Hossein Ordoubadian at Accent Sweden for your skilful proof reading – I learned a lot. Any errors remaining in the text are my own mistakes. Also big thanks to Lasse Daleke and Thomas Lagerholm at All-Media Öresund for helping with the thesis design and print.

In addition to the people at Eden, I am grateful to have had a 'second home' at LUCSUS: thank you, David O'Byrne, Ellinor Isgren, Chad Boda, Emma Li Johansson, David Harnesk, Ebba Brink, Stephen Woroniecki, Mine Islar, Henner Busch, Ann Åkerman, Turaj Faran, Anne Jerneck, Cecilia Kardum Smith, Lennart Olsson, and Amanda Elgh. I also want to thank the wider LUCID-community for including

me as part of an interdisciplinary research group. In addition, I am grateful for the opportunity of acting as chairperson of the Social Science Doctoral Student Council (SDR) for two years. Although organizing meetings and keeping up to date on PhD issues was time consuming, it was rewarding to provide important input on matters regarding our education and academic wellbeing. I am also glad for having had Katarina Jacobsson as my mentor, and Tullia Jack, Lisa Flower, and Ida Wingren in my mentor group.

During my travels and course work I have made many PhD friends. A special thanks goes to Orla Ní Cheallacháin, for keeping my spirits high and getting me up that mountain in Snowdonia! I am also grateful to Åsne Kalland Aarstad and Bruno Olivera Martins, for always encouraging me, hosting me several times, reading my texts, and introducing me to Århus. Thanks also to Åse Manengen and Graham Gilbert for hosting me in Longyearbyen and giving me the feeling of being an 'Arctic local' for a couple of days.

Finally, I want to say *salamat po* and *tusen takk* to my parents, Zenaida and Helge, and my siblings David, Katarina, and Daniel, together with their families, for always supporting me in any profession, whether it was selling buttons and beads or driving the Oslo metro. Thanks for not asking too many tricky questions about this PhD – you can now read what it is all about… also *Vielen Dank* to my parents-in-law, Ute and Andreas, for your help and support in many ways during these years. A big hug to Morits – coming home to see your smiling face and little feet running towards me makes it all worth it. I promise to expose you to a wide variety of maps during your childhood! And last, but not least, dear Philipp. A thousand thanks for bearing with my ups and downs, my frustration and crazy time management skills – and for keeping everything running at home. When we met, I had just started this PhD journey. Your decision to come along is the best thing that ever happened to me. Thank you for being patient, caring, loving, and supportive all the way to the end.

I want to dedicate this book to my fellow PhD colleagues – I hope this finished thesis can motivate you in your own research and to keep going.

CHAPTER 1

Introduction

Understanding the power of maps

Maps are central to the mediation of political meaning-making. They have the ability to make abstract information visible and real to their audiences. Maps also provide a way for human beings to conceptualise and understand places and issues such as the Arctic and climate change that otherwise might seem both distant and abstract. A key contention put forth in this thesis is that maps influence what issues are visible and knowable to audiences and what issues are silenced or disregarded. As such, maps set the conditions for what is considered politically possible in terms of identifying solutions to pressing problems such as climate change or pressing ahead with new policy initiatives pertaining to economic development and territorial expansion. Yet, the constitutive role of maps is rarely problematised in the study and practice of international politics or indeed in people's everyday lives. Rather maps tend to be perceived as 'truthful'[1] since they are assumed to function as

[1] The use of inverted commas in this thesis is meant to "denaturalise the terms" (Butler 1992 in Bacchi 1999, p. 8) and to highlight that there is no natural or unproblematic way to identify or represent issues such as 'truth' in the process of naming them (Shapiro 1988, p. 91).

mirrors of reality, resulting from strictly scientific processes and therefore considered to be objective. Hence, as Edoardo Boria (2015, p. 144) argues, a map's ability to seemingly camouflage its political content makes it highly political, conditioning people's thoughts and actions without being questioned. The point of departure of this thesis is that maps are not merely representing neutral facts but that they are always political. They are located and produced within specific power relations in the same way as other representational artefacts such as photographs, films, and cartoons (cf. Bleiker 2018; Shepherd 2016; Hansen 2017). Just like other visual artefacts, maps are often used as sources of knowledge about the world we live in. As sources of knowledge and shapers of assumptions, maps implicate the hierarchical social relations in which human lives are situated. Hence, I argue that maps are central in creating particular points of departure from which the world and issues within it are understood and upon which political choices are made.

Although maps may, at times, appear like mundane visual representations of the world, they signal and naturalise systems of inequality and exclusion. For example, the unquestioned domination of the North being located 'on top' of a map can condition social hierarchies and power relations in the world (Corner 1999). However, map projections can also challenge the unquestioned domination of the North, for example, by placing the South at the top of the map (Corner 1999) (Figure 1). Furthermore, maps can be employed to counterbalance or resist authoritative political claims to nature (Peluso 1995; Harris and Hazen 2006) or help raise political attention regarding urgent environmental issues (McNeil and Culcasi 2015) and the unequal distribution of climate change impacts (Monmonier 2008). Thus, maps have the potential to envision what can be in the (near) future and mobilise alternative imaginations (Cobarrubias and Pickles 2009). These potential abilities are here viewed as key aspects of the power of maps.

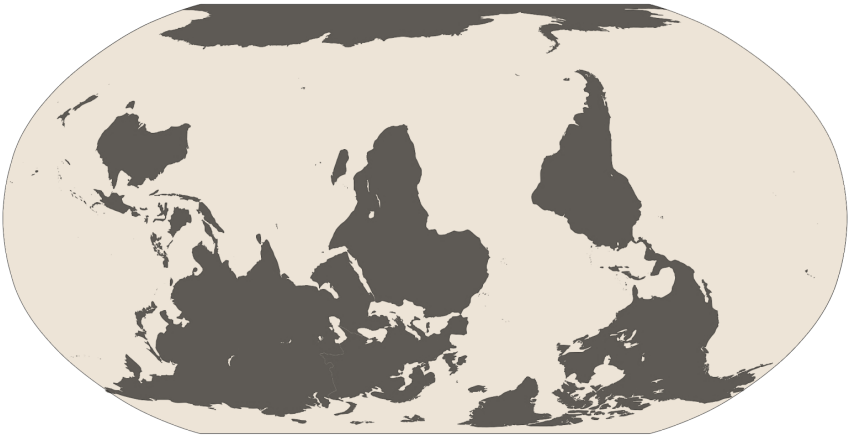

Figure 1. World map[2]

More specifically, this thesis sets out to understand the power of maps in the context of the Arctic region. According to Philip Steinberg, Jeremy Tasch, and Hannes Gerhardt (2015), the Arctic is an area particularly prone to be governed through imaginaries due to its remoteness and distance from the power centres of the eight Arctic states (Denmark/Greenland, Canada, Finland, Norway, Iceland, Russia, Sweden, USA). Moreover, many of the key decisions pertaining to Arctic affairs are made by policy-makers and institutions that have no direct experience with the Arctic (Steinberg et al. 2015, p. 33). Maps then can be seen as central to constituting imaginaries and indirect experiences of the Arctic. Furthermore, as Klaus Dodds (2010, p. 64) argues, maps of environmental changes, new polar shipping routes, and possible natural resource potentials contribute to enhancing a particular understanding of the Arctic as a site of intensifying geopolitical competition. This is also due to the unsettled legal jurisdiction of the Arctic Ocean, which makes maps central to the legal settlement of competing Arctic territorial

[2] Map by Nicoguaro (modified). *Wikicommons*. Retrieved 29 August 2019 from https://commons.wikimedia.org/wiki/File:World_map_upside_down.svg

claims (Dodds 2010a, 2010b; Strandsbjerg 2010). Thus, the Arctic territory, environment, and societies are given meaning and are made understandable via maps to audiences located further afield.

Moreover, by highlighting the role of maps, I consider the political challenges in the Arctic region not simply at the level of resisting or protesting a particular policy initiative, but "at the level of constituting the shape of the issues to be considered" (Bacchi 1999, p. 9, emphasis in original). In line with this position, this thesis provides a detailed investigation of how maps help constitute 'the Arctic' and determine what issues ought to be prioritised, rather than establishing 'who said what, and why'. I suggest that Arctic processes and possibilities are difficult to be mediated to global audiences, let alone imagined, without the use of maps. Furthermore, such visual representation through maps are often employed by actors such as scientists, politicians, and activists to draw attention to how the Arctic is continuously changing, as well as to highlight future prospects in the region. These are tendencies that I will explore further in my empirical analysis in Chapters 4, 5, and 6.

Thus, my general aim is to contribute to further our understanding of how maps perform the political in indirect ways by establishing conditions for possible ideas about the future, rather than seeking to establish direct causal links between maps and political decisions or outcomes. Therefore, a key contention is that maps have the capacity to constitute how a particular geographical region is envisaged and how issues pertaining to that region are seen and approached. Therefore, maps, like images, are "political in the most fundamental sense" as they delineate the boundaries "between what is politically possible and not" (Rancière 2004 in Bleiker 2019, p. 119-120). In other words, maps can enable certain ways of thinking while limiting the scope of possible alternatives to what can be thought, said, and done in politics (Bleiker 2015).

A broad understanding of politics

This thesis employs a broad poststructural approach to the study of power and politics in the Arctic. What defines this approach is a notion of politics that is based on the making of distinct choices and as such privileging certain alternatives over other conflictual ones (Mouffe 2005). At the foundation of politics is the assumption that things always could or can be different. Thus, every order that is established is based on the exclusion of other possibilities and therefore 'political' since it is the expression of a particular set of power relations (Mouffe 2005, p. 18) pertaining to that political order. For example, the ordered representation of clearly separated nation states on a map is an expression of the dominance of this form of political organisation at the expense of others, such as nomadic cultures or non-nation state structures. Moreover, as Michael Shapiro (1989, p. 13) argues, dominant visual and textual representations "give rise to the systems of meaning and value from which action and policies are directed and legitimated". Thus, it becomes important to question privileged forms of representation, such as maps, "whose dominance has led to the unproblematic acceptance of subjects, objects, acts, and themes through which the political world is constructed" (Shapiro 1989, p. 13).

Therefore, I regard maps as representations that shape understandings that serve as a basis upon which the political world and political meaning-making are constructed. More specifically, in this thesis a map is understood as a way of representing an alternative for how to understand Arctic issues chosen and made by the map-maker whether intentionally or unintentionally. Hence, the power of maps lies in their exclusion of other alternative understandings of 'the Arctic' and Arctic issues. This involves making decisions as to what to include and what to exclude in a particular map representation. Such decisions render certain issues and geographical sites visible and others invisible, which relates to the so called "distribution of the sensible" (Rancière 2004 in Bleiker 2018, p. 20), which affects what is politically possible and what is not in

any given situation. Thus, it can be argued that maps limit what Roland Bleiker labels the "thinking space" (2015, p. 258), directing attention and resources to specific political alternatives at the expense of others. Moreover, the framing of a particular set of 'problems' can be beneficial for some, while harmful to others (Bacchi 1999, 2009).

With my thesis being informed by an understanding of politics that centres on the making of choices among conflicting alternatives, I focus less on unpacking map-makers' ability to manipulate maps or a politician's use of maps for propaganda purposes. Rather, I zoom in on uncontested assumptions about 'the Arctic' and Arctic issues in contemporary map representations. My thesis also seeks to bring further clarity to the ways in which maps enjoy the power to set the frame for thinking about and acting on pressing 'problems' in the Arctic, in particular those pertaining to climate change. For example, maps showing the melting of Arctic sea ice can be used to symbolise the urgency of tackling climate change. However, such maps can also signal opportunities for commercial traffic on the formerly ice-covered Arctic Ocean and for accessing previously inaccessible natural resources. Thus, maps can help to establish particular assumptions about the future in the Arctic, although such representations tell many different stories and are, at times, contradictory. Growth and development in a traditional and capital-intensive sense can bring more CO2 emissions as well as intensifying the pressure on local Arctic communities to attract foreign investments and integrating Arctic resources into a globalised economy. Yet, globalisation has been identified by the Arctic Human Development Report as a powerful external force that presents challenges to sustainable development in the Arctic (AHDR-II 2014).

A key ambition of my research project, then, is to examine how the Arctic future is conceived and how it can be thought of differently to deal with the pressing changes – climatic, economic, social, and political – all of which is facing the Arctic. Such a critical approach can enable a

critical analysis of the obstacles to sustainable development and environmental justice in the Arctic more broadly. From this viewpoint of a broad justice perspective maps are central because they have the power to limit as well as inspire different political and ethical alternatives pertaining to sustainable development and local engagement. Arriving at such alternatives require "redescribing a world" which is "the necessary first step towards changing it" (Rushdie 1992 in Boria 2015, p. 143). Hence, new or alternative map representations can facilitate redescribing the Arctic and establishing alternative visions and actions for the its future. In the following section, I disclose my overarching research aim and the research questions underpinning my study.

Overarching aim

As I alluded to above, my overarching research aim is to highlight the role of maps in constituting 'the Arctic' and Arctic issues, and to understand how map representations limit the 'thinking space' about the region's future. I aim to do this by merging the scholarly fields of visual politics[3] and critical cartography. This helps me make the argument that maps have constitutive power. The benefits of merging the two sets of literature will be explained in the next chapter. The decision to combine the two scholarly fields has been motivated by a lack of engagement with maps within visual politics and the limited perspective on power within critical cartography. Thus, I aim to enable a conversation between visual politics and critical cartography to further the understanding of the constitutive power of maps, both as textual representations constituted by political interests (Harley 1989; Wood 2010) and as visual representations possessing the power to constitute political alternatives (Bleiker 2018; Hansen 2011, 2017; Shapiro 1988). Furthermore, I also

[3] This thesis employs a broad definition of a visual politics field which embraces research that address the role of visual representations found in studies of politics, geopolitics, security studies, popular culture, and IR.

develop an analytical framework built on the conversation between visual politics and critical cartography in order to interpret map representations. Within this analytical framework I make use of elements from Carol Bacchi's (1999, 2009, 2018) 'What's the problem represented to be?' approach to not only interpret, but also deconstruct and evaluate the map representation according to their constitutive effects on Arctic issues.

Research questions

This study departs from the epistemological view that maps are socially constructed representations of the world that also contribute to constructing that very world they claim to represent. Therefore, my wish is to push for the inclusion of the study of maps into visual international relations (IR) as I find maps – as artefacts and representations – to be part of key discursive practices that contribute to the constitution of international politics and understanding of that field. Thus, I will closely examine a set of selected maps and the deep-seated assumptions that they carry within them to understand their representation of the Arctic and specific issues relating to the future of the Arctic. The main research question then is: *How does the constitutive power of map operate, and what are the consequences of such power in the context of the Arctic?*

As political scientists Mathias Albert and Andreas Vasilache argue, the Arctic can be conceptualised as "a specific and evolving conglomerate of a relation between power and knowledge that is expressed through and reproduced by a range of discursive strategies" (2018, p. 6). In this regard, the act of mapping the Arctic region in various ways and using maps to explain issues in the Arctic can be regarded as discursive strategies that shape the discourses available for thinking about the Arctic region.

Moreover, since this thesis employs a broad poststructural framework informed by studies in the fields of visual politics (Bleiker 2001, 2018;

Hansen 2011, 2015; Shapiro 1988) and critical cartography (Harley 1989; Wood and Fels 1986; Wood 1992, 2010) for the study of the power of maps, it is also pertinent to ask the following question: *In what ways can contemporary maps be problematised and analysed as visual representations with constitutive power?*

Examples of visual representations are photographs, films, and comics. Here, I am indebted to Lene Hansen's (2017, p. 582) contention that even though such visual artefacts may not come across as explicit inputs to broader political debates, they still rely on and produce particular representations and practices of political significance. To answer these research questions, three contemporary maps will be analysed in Chapters 4, 5, and 6. The maps have been carefully chosen on the basis of their legitimacy and relative frequency within academic scholarship and political debates surrounding Arctic issues. The maps chosen are: Google Maps which is an example of a general reference world map that uses the Web Mercator projection, which shapes the broad political meaning-making about the world and the Arctic (Chapter 4); a U.S. National Snow and Ice Data Center (NSIDC) map, which is an example of a scientific map that shapes political understandings of the impact of climate change in the Arctic (and globally) (Chapter 5); and two maps issued by the United States Geological Survey (USGS), which are examples of geological maps that make possible understandings about undiscovered oil and gas resources in the Arctic.

In what follows, I introduce the conception of maps as social constructions, mainly based on the critical cartography literature. I also provide a brief historical account of how maps came to become important artefacts and discursive representations in society both historically and politically.

Introducing maps

In this thesis, I consider maps as cultural artefacts – that is they are socially constructed. This means that I do not make the conventional distinction between scientific maps as somehow 'good' and propaganda maps as 'bad', but agree with Jordan Branch, who make the following argument that "all maps can be examined in terms of what they include and exclude, what is emphasized or elided, and how social relations or understandings enter into map creation and map reading" (2011, p. 7). To Branch, these social relations entail that distortions often are made unintentionally, shaped by both the mapmaking practices and the unconscious assumptions of the map-makers and their social context. It is these unintended, often unconscious, assumptions that are at the centre of this thesis.

Moreover, my understanding of what makes a map is based on critical cartography scholarship, which in the 1980s started to question modern cartographic practices and scrutinise the profound emphasis on accuracy and a pursuit of mirroring of 'reality' (Caquard 2011; Cosgrove 2005; Harley 1989). Instead, these cartographers started to view maps as social constructions. The critical turn in cartography was a reaction to the mechanical and uncritical approaches that were employed in the 1970s, which emphasised maps as communication, while ignoring their political dimensions (Caquard 2015). The critical cartographers and historians of cartography that sustained this critical turn scrutinised the generalisation and abstraction in map-making, which treats the world as a mathematical object and dehumanises maps by separating them from their makers and users (Woodward, Yee, and Schwartzberg 1994). Furthermore, these scholars reemphasised the role of aesthetics in the science of map-making (Cosgrove 2005; Woodward and Lewis 1998). This emphasis included a consideration of non-Western spatial expressions in historical studies, which formerly had been treated as merely 'traditional art' and not spatial expressions (Harley and Woodward 1987). Thus, the

displacement of traditional map-making by European mathematical cartography was no longer considered 'progress', but as a loss of explicit and prominent human elements in the map and in the art of map-making (Woodward et al. 1994). Accordingly, critical cartographers started to acknowledge the suppressed human and subjective elements in the map. For example, J. Brian Harley, one of the main contributors to the critical turn in cartography, concludes the following:

> Both in the selectivity of their content and in their sign and styles of representation maps are a way of conceiving, articulating, and structuring the human world, which is biased towards, promoted by, and exerts influence upon particular sets of social relations. (1988b, p. 278)

Moreover, Harley (1989) argues that no matter how detailed or accurate, map-makers necessarily will have to make choices about what to show because a map cannot show everything. Since this entails making choices that exclude certain representations, these selections are not innocent. Instead, such selections of what to map and constructions of 'reality' are profoundly engrained within power politics, colonisation, gendering, or other forms of historical subordination. Yet, it is this selection of what to include and what to exclude that legitimates the need for a map (Wood 1992). Through its selection and focus on something at the expense of something else, the map distinguishes itself from the world it represents. Thus, if a map shows everything, we would not have any use for it. Such a pointless endeavour is perfectly illustrated in Lewis Carroll's (1893) tale 'Sylvie and Bruno Concluded'. This story is about a country's obsession with making a map with perfect accuracy and scale. The quest results in a map with the scale of one-to-one, which, if spread out, would cover the whole country. The farmers protested living under the cover of a map since it would shut out the sunlight and lead to bad harvests. The story ends with the country preferring to have the country itself rather than a perfectly accurate map.

Carroll's tale illustrates that it is the necessity of exclusion that makes a map useful as including everything to scale is both impractical and absurd. However, this unavoidable need for selection and therefore exclusion does not mean that a map is always politically manipulated. Map manipulation has and does occur, for example, when drawing nation borders as one pleases, unmarking military bases off maps, or showing disputed areas as non-disputed or vice versa depending on which country makes the map, such as India and Pakistan's representation of the disputed area Kashmir in each state's respective maps. However, my focus is not on such deliberate political interventions in maps, nor on how truthful or factual a map is or how much or little it lies (cf. Monmonier 1996). Instead, my contribution lies in theorising the constitutive power of maps and the unintended effects of their usage and reproduction. While I acknowledge that some maps, such as topographic maps, may be more objective than others (or at least strive to be), this thesis focuses on the deep-seated assumptions that underlie the map selection process. Such assumptions relate to, for example, what to include/exclude in a map representation according to what is found to be relevant/irrelevant or how to represent places and issues in particular colours or symbols according to a hierarchy of assumed significance.

More importantly, I problematise the political effects of these assumptions – how they limit the alternative conceptualisations of the Arctic and its distinct 'problems'/'challenges' and ''opportunities through representations in maps. Through the seemingly neutral and scientifically objective medium of the map such political assumptions may not be noticed and pass unquestioned. In studying political representations, Shapiro (1988) argues that a certain historical distance is useful in order to achieve a politicised reading of representations. Hence, it is not surprising that many of the previous studies considering the power effects of maps have concentrated on historical maps since their effects can be analysed by following the historical accounts of the

map's use. While my focus here is on contemporary maps, I find it necessary to include a short historical account of the upsurge of map-making and map-use. This historical account is necessary because the long history of map use helps to explain the status of maps in today's society as well as the legitimacy of their truth-claims, naturalisation, and materialisation which I will return to in the next chapter.

A short history of maps

Before 1500, only the privileged and wealthy had access to what we consider today to be maps (Wood 2010). These maps were assigned a particular status due to people's generally limited access to them. These early maps were often religious representations of the world commissioned by and/or belonging to religious men or kings. For example, the Christian world was depicted with Jerusalem in the middle and the East, where the Christ would come again, on the top (Turnbull 1989). However, in the 1500s and 1600s, this changed as more and more people began to view the world and politics through maps and people in Europe started to use maps in their everyday lives (Harley 1988a; Wood 2010; Branch 2011)[4]. Branch (2011) argues that concurrently, maps became regarded as rational power tools as many state powers started to centralise their state machinery and maps offered ways of controlling constituents, delimiting borders, and collecting taxes.[5] At the same time, cartographic technological innovations improved maps and the development of the printing press made it possible to widely distribute them. Hence, according to Denis Wood (2010, p. 27), by the

[4] Importantly, this does not mean that maps did not exist or were not being used elsewhere in the world before this time. However, as Wood (2010, p. 24-25) points out, few map artefacts have survived from before the 1500s.

[5] Interestingly, before the centralisation of the modern state, many powers had ruled from a specific centre outward, like ripples on water, recognising that they had less control in the outer rim (Branch 2011). For a critical introduction to the history of maps, see Wood (2010). For more reflection on maps and the emergence of the state, see Branch (2011, 2014, 2018).

1600s maps had become indispensable for many people around the world.[6] It was not only that the quantity of maps exploded with mass printing, but also the way that maps represented the world (Branch 2018). The translation of the classical Greek text *Geography* by Ptolemy introduced the drawing of maps according to a coordinate grid of latitude and longitude. This technique made it possible to mathematically trace any point on earth to a particular point on a flat map, which has dominated map-making ever since (Branch 2018).

This upsurge of map use has also been linked to a broader intellectual anti-authoritarian movement in Europe during the 1500s and 1600s in which science itself, including cartography, began to assume a position of cultural authority in society (Livingstone 1992). Thus, maps represented the ability of scientific knowledge to measure and control land and people in ways that religion could not. As a product of science, maps started to be regarded as a site of 'truth' (Branch 2011). This ability to show the 'truth' and the perceived scientific neutrality of maps can be argued to still provide maps with a particular power which is different from other text-images. Moreover, the popularity of maps was paralleled by an upsurge in the collection of maps among the affluent (Harley 1987). Maps and atlases had become distinct, collectable categories in their own right instead of being linked to the texts or books as mere illustrations. Hence, people wanted to own maps as they started to view maps and atlases as valuable objects in and of themselves as well as beautiful art. This desire for maps as valuable and popular artefacts still persists as many people today also want to own and have atlases and maps in their homes. For example, the world's largest furniture retailer, IKEA, sells world map posters in many shapes and colours.[7] Hence,

[6] Note that Wood mainly addresses the use of European/Western constructed maps, exported to the 'rest of the world' through colonisation.

[7] See IKEA maps: https://www.ikea.com/us/en/catalog/products/S89177873/ (Accessed 26 September 2018)

spread and power of maps in society are an expression of the cultural legitimacy of maps which helps substantiate their truth-claiming, naturalisation, and materialisation.

Maps today

With today's specialised technology it may seem that the 'perfect' map is within reach. 'Real' images taken from satellites in space seem to document any place on earth without bias, continuously recording images "at any time and from anywhere" (Shim 2018, p. 268). According to Denis Cosgrove (2005), aerial photography and satellite images have contributed to reinforcing a trust in the mimesis of maps and the ability of maps to represent the 'truth', which was, as noted above, what the critical turn in cartography set out to challenge. A reinforced trust in technological advances also forgets that science and technological capacity always are interlinked with social relations, and that, for example, a 'fact' is constructed by humans (Jasanoff and Martello 2004, p. 347). Moreover, satellite imagery goes through similar processes of categorisation and sorting like 'traditional' maps in order to make 'reality' mappable. As argued by David Shim, satellite images "only say something after they have been *made* to speak" (2018, p. 270, emphasis in original). An example of this is the process of taking away clouds and other natural disturbances in order to show a 'pure' image of the globe. This makes satellite images simultaneously artificial and authoritative (Shim 2018). Like maps, aerial photos and satellite images distort reality so the observer can 'see it' and by doing so they co-constitute what the world is seen as (Loughlan, Olsson, and Schouten 2015). My point here is not to question the accuracy or usefulness of satellite-generated maps, but rather, as Shim (2018) highlights, to question their inherent politics of imaging and showing. Thus, I regard aerial photos and satellite images as complementary to rather than substitutes for maps.

Together with new technology, the emergence of maps available via the Internet, such as OpenStreetMap, Bing Maps, Google Maps, and

Google Earth, have substantially increased the accessibility of maps and global imagery to more people (Kent and Vujakovic 2018, p. 2). Moreover, the availability of technologically advanced maps that include using global positioning system (GPS) has made map reading and map use easier. For example, one does no longer has to start by locating oneself in the map since a 'You are here' dot often appears by default. Today's new map technology, large data sets, and 'always' available online maps on smartphones can contribute to camouflaging a map's political nature and effects on our understanding of the world. Hence, these new technologies can take us back to an uncritical approach to maps, prior to the critical turn in cartography, when maps were scrutinized on the basis of their accuracy and mimesis of 'reality' rather than by questioning their political dimensions. Therefore, all the maps that I interpret and deconstruct in this thesis are accessible in digital form on the Internet.

Maps compared to other visuals

Similarly to images, photographs, and films, maps can generate emotional responses. This can particularly be the case if a map is perceived to be somehow wrong, directly propagating or silencing issues, or if it shows a surprising projection, counter-mapping or artistic twist. For example, the projection that places the South on the top of the map and North on the bottom is often dubbed an 'inverted map' or 'upside-down' map (see Figure 1, p. 15). Thus, people prefer and are most comfortable with maps they are familiar (Kaiser and Wood 2001). However, a map is different from a photograph or painting because it often represents its subject schematically: an area that is too large to be seen in its entirety is symbolically represented and simplified (Henrikson 1979). Furthermore, a difference between maps and say a photograph, is that the latter represents a specific point of view (Edkins 2013), while maps are constructed to seemingly accommodate any point of view (Wood 1992). Together with maps intertextuality and inter-visuality, i.e.,

the way maps are reproduced through each other, this gives maps authority and legitimacy (Hansen 2017), often by drawing upon scientific knowledge. Thus, they differ from other visuals, including images, films, and comics that are not firmly located within appeals to scientific and/or objective knowledge. Though, in this thesis objectivity is contested, as I will illustrate in Chapters 4, 5, and 6. Moreover, while maps, like documentary photographs and films, are grounded in an illusion of authenticity, enabling them to convey knowledge to distant audiences, maps most often do not invite its audiences to experience an encounter with projections of actual individuals. This is dissimilar to, for example, photographs of people's faces, which seem to connect the audience to directly individuals' lived realities (Edkins 2013; Hansen 2011). Yet, certain maps become dominant representations of an event and/or become focal points that help define the boundaries of political debates, which I have chosen to illustrate in the case of the Arctic.

Why the Arctic?

The Arctic has a long history of being surveyed and mapped as ways to control it from afar. As early as 1595, Gerhard Mercator was among the first Europeans to make a map of the Arctic (Figure 2).[8] His map was a response to pressures from the English and Dutch merchants who were impatient for information about the possibilities of an accessible passage to 'the East' by sailing north of Europe or north of America (Clancy, Manning, and Brolsma 2014). These merchants had strategic interests in accessing the spice and luxury goods markets in South Asia via

[8] Here I want to point out that Arctic inhabitants have for a long made their own maps, although not all such maps are approved as 'maps' according to 'Western' standards (Okladnikova 1998). For example, many of the maps in prehistoric rock art carvings or in early modern artefacts found in the Arctic are cosmographical, connected to the practice of shamanism (see examples of such maps in Okladnikova (1998)).

Figure 2. Mercator's map of the Arctic from 1595[9]

alternative routes to the southern sea routes, which were controlled by Spain and Portugal. Mercator's map of the Arctic shows the Arctic as a central ocean with a mountain rock at the North Pole, surrounded by four mythical islands separated by channels between them, making it possible to sail across the Arctic. Hence, it showed the Arctic as the commissioners of the map may have wanted or expected the northmost

[9] Map by Gerhard Mercator (1595). *Wikicommons*. Retrieved 12 April 2019 from https://commons.wikimedia.org/wiki/File:Mercator_north_pole_1595.jpg

region of the world to look like, according to medieval legends instead of actually visiting the Arctic (Larkins 2010, p. 193). Moreover, Clancy et al. (2014) argue that Mercator's map of the Arctic profoundly influenced the idea of a polar region, which they contend retains its relevance today.

Today, politicians illustrate visions of new railways and shipping ports in the Arctic by using maps. Meanwhile, climatologists present the latest updates about the extent of Arctic sea ice through the use of maps, and geologists represent undiscovered quantities of Arctic petroleum also using maps. While maps are commonly used when defining and conveying issues about Arctic developments, however, less attention is paid to the framing of the Arctic and Arctic issues themselves. When maps are used to examine Arctic issues they are often regarded as tools for settling legal disputes over territory (cf. Strandsbjerg 2012; Steinberg et al. 2015) or used to portray a nation's identity, presence, or claim to the Arctic territory (cf. Bennett, Greaves, Riedelsperger, and Botella 2016). This thesis advances scholarship on the mapping of the Arctic by examining maps' constitutive role in Arctic politics and by highlighting how maps are embedded in Arctic politics.

Maps establish Arctic challenges and opportunities

A region like the Arctic, argues Geir Hønneland (2017, p. 31), is not a predetermined territory, but made in text and speech as it is always possible to find supporting arguments for a geographical area to constitute a 'natural' unit. Thus, maps can be viewed as part of the discursive construction of the Arctic as a region, which Albert and Vasilache (2018) argue is based on a mixture of actors, knowledges and representations that (re)define and (re)constructs the region into what it is understood as. Similarly, Karen Culcasi (2010) considers maps to be central in constructing 'the Middle East' as a particular 'world-region'. Therefore, I find maps to be central knowledges and representations that define and construct the Arctic 'world-region'. Where it is, what it is,

what should happen next: these questions are full of power-knowledge problematisations which are expressed and reproduced in maps. However, to gain access to the underlying assumptions about the Arctic and to understand the kind of place the Arctic has become (and is becoming) requires us to examine how the maps themselves problematise Arctic issues and developments. Contrary to authors who emphasise the ways in which geography influences Arctic politics, for example by exploring how melting sea ice impacts on the prospects of the Arctic coastal states (cf. Wegge and Keil 2018), I argue that such changes and problematisations are not given, but often constructed and mediated in maps. A key contention of this thesis is indeed that maps influence politics by projecting certain assumptions about the geographical areas and issues in question.

To illustrate how particular problematisations about the Arctic are being (re)produced and sustained via the use of maps, I point to two articles by Scott Borgerson (2008, 2013) in the journal *Foreign Affairs*. In "Arctic Meltdown", Borgerson (2008) displays two maps showing the extent of Arctic sea ice. One map depicts ice coverage in September 2001 and the other map depicts the decrease of ice coverage as of September 2007. After establishing the sea ice changes, there is a map showing 'Arctic Energy Resources', and later, also two maps illustrating 'Arctic Shipping Shortcuts'. However, none of these three maps show signs of sea ice in the Arctic Ocean. Moreover, in the largely realist Borgerson's article from 2013, "The Coming Arctic Boom", the first sentence identifies one of the issues: "The ice was never supposed to melt this quickly" (2013, p. 76). Later, there is a map showing 'Economic Opportunity in the Arctic'. This map includes shaded areas marking the probabilities of oil, a line marking the extent of Arctic sea ice extent in September 2012, and an arrow running across the ocean, named the Northern Sea Route

(Borgerson 2013, p. 83).[10] He concludes that it is only a matter of time before the summer sea ice is gone and the Arctic opens up to extensive development, "with enormous benefits for both outsiders and the inhabitants of this prime real estate" (Borgerson 2013, p. 89). This conclusion, I argue, is being substantiated through the use of maps, for example, by not showing any sea ice on the map as a way to reveal economic opportunities. Moreover, the maps displayed in both the articles are familiar to people engaged in Arctic issues and emerge from renowned mapping agencies, such as the National Snow and Ice Data Center (NSIDC) and the United States Geological Survey (USGS) – whose maps that I analyse in Chapters 5 and 6. Due to their circulation and authority, these maps often go unquestioned in Arctic debates, reproducing dominant ideas about there being 'challenges' (ice melting), but also 'opportunities' (undiscovered petroleum) in the area. Hence, I find it important to understand how maps become part of such discourses surrounding 'challenges' and 'opportunities' in the Arctic, but more importantly how they give way to particular visions and certain actors, while silencing others.

In this context, it is interesting to observe that Borgerson (2013) sketches out a kind of 'win-win' scenario for the future of the Arctic and uses many maps to illustrate this point[11]. He uses the maps as a convincing, seemingly neutral background against which his key arguments are articulated. However, I will argue that instead of being neutral background information figuring in a journal article, a scientific study, or a book about the Arctic, these maps in themselves can be the subject of a study about the Arctic. Such maps do not simply mirror reality, but form our conception of what that reality entails. Equally

[10] The National Snow and Ice Data Center (NSIDC), U. S. Geological Survey (USGS) and the North Atlantic Treaty Organization (NATO) are named as the maps' sources (Borgerson 2013, p. 83).

[11] Such a 'win-win result' is also mentioned in China's white paper from 2018, explaining China's Arctic Policy (The State Council Information Office of the People's Republic of China 2018, January 26.)

important is the ability of maps to shape debates and visions about the future of the Arctic. In what follows below I will explain the contributions made in the thesis.

Contributions

This thesis centres on the importance of theorising the constitutive power of maps within International Relations (IR). In conventional IR, the devotion to understanding the relationship between maps and politics has predominantly concerned the connection between maps and territory such as the use of maps to assert claims to territorial sovereignty or to form an idea of a territorial (nation) state (see Black 1997; Branch 2011, 2014; Goettlich 2019; Larkins 2010; Strandsbjerg 2008; Winichakul 1994). One reason for this disregard could be what John Agnew (1994) defines as 'the territorial trap' within geographical assumptions in orthodox IR theory, which sediments the assumption that states are fixed territorialities and that they will remain the predominant actors of power in the international order. While I do not disregard such work, I suggest a different way to approach maps within IR by analysing them as part of a wider selection of visual representations with constitutive power (see Shapiro 1988; Bleiker 2019; Hansen 2011, 2017; Weber 2008; Williams 2018; Rose 2001). Hence, this thesis makes a contribution to IR by including maps as an object of study. While scholars within visual or aesthetic studies of politics (cf. Bleiker 2001, 2018; Dittmer 2010; Edkins 2013; Hansen 2011, 2015, 2017; Shapiro 1988; Weber 2008; Williams 2018) would be sympathetic to attempts to view maps as visual representations and often agree that maps are important artefacts in visual global politics (cf. Bleiker 2018; Rose 2001), fewer (cf. Shapiro 1988) have analysed maps and deconstructed their constitutive power. I do this by bridging the fields of visual politics and critical cartography.

Visuals are indeed important aspects of contemporary global communication and therefore of utmost relevance to the studies of IR (Bleiker 2018; Weber 2008; Williams 2018). As a proponent of "the visual turn in IR", Bleiker argues that images help to constitute and shape politics, as they set the "'conditions of possibility' through which politics takes place" (2015, p. 884). This view resonates with my approach to the study of the constitutive power of maps, in particular since maps too "have the potential to shape what can and cannot be seen, and thus also what can and cannot be thought, said and done in politics" (Bleiker 2015, p. 884). This view is broadly in line with Hansen's inclusion of comics as "text-image constellations that articulate political discourse" (2017, p. 586). By pointing to map-making as a discursive practice and maps as visual representations I bring awareness to the role of maps in constituting politics within IR studies.

My thesis is also an effort to make an input into discursive approaches within the study of environmental politics, in particular those studies that centre on the Arctic, by highlighting the role of maps. In this scholarship, it is common to refer to 'nature' and environmental problems, such as climate change, as being socially constructed (Castree and Braun 1998; Feldt and Oels 2005; Hajer 1995; Hajer and Versteeg 2005; Paterson and Stripple 2007). This social construction can occur via expert language and available technology such as maps. In order to understand the dynamics of environmental politics, Maarten Hajer argues that it is crucial to take apart "the discursive practices that guide our perception of reality" (1995, p. 17). Here I find an avenue to include map representations, both as 'expert language' and as technological knowledge that make truth-claims about 'reality' and in particular environmental issues concerning the Arctic. Moreover, visual representations such as maps, graphs, and tables are common both within the data material and research material pertaining to the study of environmental politics. Topics such as climate change are often illustrated by visuals (cf. Livingston, Lövbrand, and Olsson 2018). One

can also argue that the discourse of science in general is one that is inclined to use visuals, at least as an aid to present research results or in summaries for policy makers. For example, when attending the Arctic Frontiers conference in 2018 I noticed that the power point presentations being used by presenters at the 'science sessions' rested to a great extent on maps. Furthermore, I call attention to the role of maps as constituting background knowledge within political discussions about the future in the Arctic, where sustainability and environmental governance are central.

A third contribution is my effort to advance the deconstruction of maps' power within the critical cartography field, which inspired me to pursue the topic of maps and politics in the first place. Theoretically, this means to rethink the power of maps by introducing the concept of constitutive power as advocated by several authors within the visual representation field. Moreover, I problematise the prevailing state centrism within critical cartography in which maps, for example, have been regarded as a way for states to exert power (cf. Harley 1989). The emphasis given to the power of maps in serving the interests of the state, risks overlook other political effects that are shaped by the constitutive power of maps.[12] Thus, I highlight the constitutive power of maps beyond that of the state and the map-maker. Moreover, I present contributions to critical cartography by empirically addressing contemporary maps instead of historical maps (cf. Harley 1988b, 1989). In this way, I call attention to the power of maps to shape thinking and acting also today. Additionally, I analyse maps that are circulated online which presents a different type of maps compared to paper maps that traditionally have been the ones analysed (see Harley 1989; Wood and Fels 1998; Branch 2011, 2014; Winichakul 1994).

[12] This also relates to my interest in contributing to non-state-centric theories of IR by not reducing the politics of maps to only what goes on within or between states.

Overview of the chapters

Chapter 2 makes intelligible how I theorise the constitutive power of maps and presents my theoretical framework that builds on the conceptualisation of cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation as three main expressions of maps' constitutive power. These concepts help me break down the effects of the constitutive power of maps. In Chapter 3, I explain how I operationalise my theoretical conceptualisations to build an analytical framework for interpreting and deconstructing map representations. The deconstruction is largely inspired by Bacchi's 'What's the problem represented to be?' approach to asking questions to unpack the implicit 'truth' claims, assumptions, and silences in problematisations. I modify this approach with insights emerging from visual communication methods and the use of deconstruction of maps in critical cartography. I also present and justify the maps I have chosen to analyse.

In Chapters 4, 5, and 6, I analyse contemporary maps that represent the Arctic in a range of different ways. In Chapter 4, I analyse Google Maps as an example of a 'world map' that uses the Web Mercator projection and its constitutive power as a seemingly general-purpose map in shaping our understanding of the world and the Arctic specifically. In Chapter 5, I analyse a map that shows the extent of sea ice in the Arctic Ocean in September 2018 which is prepared by the National Snow and Ice Data Center (NSIDC) based in the USA. Such maps have come to symbolise the issue of climate change not only in the Arctic, but also around the world. It also exemplifies a map's ability to show the magnitude of something that is impossible to comprehend with our own eyes as well as contributing to naturalise such a representation. In Chapter 6, I analyse two maps issued by the United States Geological Survey (USGS) that show the estimated quantity of undiscovered oil and gas resources in the Arctic. These maps help to constitute particular

expectations about the future by materialising petroleum estimates. It is an example of the ideational power that maps can have in making 'real' what is not yet discovered oil and gas.

In the concluding chapter, I present and discuss the findings of the thesis through a detailed discussion of the constitutive power of maps in the Arctic and in the wider context of international politics. Moreover, I discuss my methodological choices and contributions, as well as limitations. Finally, I suggest avenues for further research on the power of maps.

CHAPTER 2

Theorising the constitutive power of maps

In this chapter I present my theoretical framework which enables me to trace the constitutive power of maps in the two aforementioned interdisciplinary fields: visual politics and critical cartography. By merging the connections between them I form my theoretical and conceptual guide upon which the thesis rests. This guide gives the means to show how maps constitute 'truth' claims about the Arctic and how they can reinforce dominant discourses in politics as well as help to materialise future expectations. In what follows I present the two fields of studies and the way in which I use them in the thesis. In so doing I employ a broad poststructuralist approach to the study of representations. This approach is based on the assumption that what is a 'real' representation is not simply given, but that representations such as maps are "the practices through which things take on meaning and value; to the extent that a representation is regarded as realistic" (Shapiro 1988, p. xi). Moreover, this does not mean that nothing is real or that reality does not exist, but that reality only becomes meaningful through representations. It allows for studying how that which is taken to be 'real'

has come to be recognised as such, thus interrogating "how it becomes possible that we think what we think" (Shepherd 2013, p. 127).

First, I present the main premises of visual politics and critical cartography, followed by an emphasis on the aspects of each theoretical body that I will specifically build on: a) visual representations as constituting political possibility and being political forces in themselves and b) maps as makers of reality and as having ideational power. I also reflect on my potential contributions to each of the field. Second, I discuss how the two fields enable me to theorize the constitutive power of maps. In this context, I tease out what I consider to be three expressions of how the constitutive power of maps affects politics – cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. These three concepts are central to my analytical framework.

The visual politics field

> Images pervade contemporary politics. Across the globe, people receive more and more of their information and impressions about politics through media outlets saturated with images, while political leaders show increasing skill in melding popular culture and political power. Understanding the aesthetic dimensions of world politics is thus of paramount importance. (Williams 2018, p. 1)

As I have noted in the previous chapter, I draw on the visual politics field in this thesis to explain the constitutive power of maps. Within this field, it is acknowledged that visuals play a central role in contemporary politics, as stressed by Michael Williams (2018) in the quotation above. Moreover, I draw on visual politics because I find the visual elements of a map's representation to be crucial for how maps can represent 'truth'

by reinforcing, legitimating, and naturalising dominant discourses and how maps can shape and materialise expectations about the future. Visual politics as defined in this thesis is a broad, interdisciplinary field that deals with the role of visual representations in politics, geopolitics, security studies, IR, and popular culture[13]. Within this field it is acknowledged that to study visuals can offer possibilities to rethink and review the political world and give insights that otherwise would be missed (Bleiker 2017; Weber 2008). The visual politics field pertains to a wide range of visuals, such as art (Rancière 2010; Danchev and Lisle 2009), photographs (Bleiker 2018; Hansen 2015; Heck and Schlag 2012; Hutchison 2014; Shapiro 1988; Shim and Nabers 2013), media imagery (Campbell 2007; Hutchison 2014), films (Callahan 2015; Neumann and Nexon 2006; Weber 2008, 2014), drone imagery (Grayson and Mawdsley 2018; Wilcox 2018), and cartoons (Agius 2013; Hansen 2011, 2017; Wedderburn 2019). Art, photographs, media imagery, films, drone imagery, and cartoons can be seen as part of facilitating new insights and understandings about politics. Therefore, to focus on visuals can help us to step back, reflect and see political dilemmas in new ways (Bleiker 2009, 2017). In other words, visual politics is about the nature of politics. This idea is expressed by Bleiker, drawing on Rancière's theory on the politics of aesthetics:

> The content and contours of politics are inevitably linked to how we – as political and cultural collectives – speak, hear, visualise and feel about ourselves and others. Because these aesthetic practices frame what is thinkable and doable they are political at their very core. (2017, p. 262)

[13] Popular culture is here placed as part of the visual politics field since many popular culture studies concern an object that is visual (cf. Neumann and Nexon 2006; Weber 2014; van Munster and Sylvest 2015). There are also cases when images become infamous and widely circulated which makes them part of 'popular culture', such as images form Abu Ghraib (Hansen 2015) or images of celebrities (Müller 2018; Bergman-Rosamond 2016).

Instead of seeking to depict politics as realistically as possible, representing world politics 'as-it-really-is', proponents of visual politics accept that there is always a gap between a form of representation and what it represents; one can never perfectly represent 'reality' (Bleiker 2001, 2017, 2018; Heck and Schlag 2012). This gap is not only acknowledged as inevitable but also as politically important because it involves "collective conventions that determine which one of numerous plausible explanations are considered legitimate and which ones are deemed unreasonable or illegitimate" (Bleiker 2017, p. 261). In other words, the gap is due to choices, judgements, and particular perspectives only allowing specific kinds of seeing and therefore is "the very location of politics" (Bleiker 2001, p. 510). Thus, in the field of visual politics, researchers explore visual representations and the insights and understandings they facilitate, reclaiming the political significance of visuals and presenting arguments for how visual representations have come to shape political events (Shapiro 1988; Bleiker 2001, 2017, 2018; Hansen 2011, 2015, 2017; Neumann and Nexon 2006; Rose 2001; Shim and Nabers 2013). This is why this field is interesting to my study as it helps me argue for 1) how maps, as visual representations, can mediate political meaning-making and constitute political possibility and impossibility and 2) how maps shape politics in and of themselves. In what follows, I will present these two perspectives and the arguments within the field of visual politics that I draw on.

Visuals mediate political meaning-making

When humans try to understand the world and politics in that world they depend on and engage in representations:

> Every way of understanding international politics depends upon abstraction, representation and interpretation. That is because 'the world' does not present itself to us in the form of ready-made

> categories of theories. Whenever we write or speak [or map] [...] we are engaging in representation. (Campbell 2013, p. 223)

Thus, much of politics "relies upon, operates through, and produces representations" (Neumann and Nexon 2006, p. 7). This means that political events do not have a naturally given meaning or significance. Instead, for these events to become meaningful they have to be constituted and made meaningful as *particular* events and this "process of constitution is inseparable from their event-ness" (Campbell 2003, p. 72). Thus, in constituting political events, visual representations, such as art, photography, film, and maps, have an important role in meaning-making, as particular ways of apprehending the world. Alex Danchev and Debbie Lisle contend that "[n]ot only does it [visual representation] make us feel, or feel differently, it also makes us think, and think again" (2009, p. 775). Moreover, a visual representation, no matter how detailed and comprehensive, cannot be identical to what it represents because it inevitably is about abstraction and interpretation (Bleiker 2001). Due to the inevitability of abstraction and interpretation, visual representations work by convincing us to see and interpret political events in a particular light. Indeed, most humans harbour an intuitive hope that what is represented is what we 'actually' see and think, and that this, what we see and think, must be real (Bleiker 2001, p. 515). This belief in what is 'real' is, according to Bleiker (2001), part of human's desire to categorise and order the world as a way to make sense of it.

Furthermore, because visual representations frame what is meaningful as well as thinkable and doable, they contribute to constitute a form of common sense of what is accepted as reasonable, thinkable, and doable (Rancière 2010). Hence, widespread visual representations affect politics indirectly through the constitution of what is common sense about 'the world' by narrowing the number of interpretations available to the audience (Hansen 2011). In addition, the notion of common sense "freezes knowledge and imagination" around the profound influence of

a dominant understanding (Bleiker 2001, p. 514-515). In this way, visual representations constitute what is politically possible to know and imagine and what is not (Grayson, Davies, and Philpott 2009, p. 159).

When constituting what is politically possible, fostering political expectations, visual representations also bring about political consequences by shaping particular ways of seeing and therefore by constituting 'reality' (Shim and Nabers 2013, p. 290). For example, in the context of North Korea, David Shim and Dirk Nabers (2013) show how images affect politics by evoking a particular perspective that only allows for specific kinds of seeing and understanding of issues. By projecting reoccurring motifs, such as starving children, massive military parades, and empty streets in Pyongyang, Shim and Nabers argue that particular photographs result in a hegemonic visuality that allows for reading images only in specific ways. Judith Butler makes this claim: "This visuality regulates the (in)visibility of objects, subjects, and circumstances and therefore determines what is existent and what is not" (2009 in Shim and Nabers 2013, p. 297). Accordingly, North Korea is reduced to a place of backwardness, dangerousness, isolation, poverty, scarcity, and weakness – as the very antithesis of modern globalisation – as well as an 'Other' (Shim and Nabers 2013, p. 296-297). Moreover, the photographs do not tell us what actually is going on in North Korea, rather how we should feel about what is going on there.

In a similar study, David Campbell (2007, p. 358) points to how visual imagery is one of the principal ways in which news from distant places is brought to other places. In his study of how photojournalism has represented the conflict in Darfur, Sudan, he argues that these visual enactments do not simply reflect geopolitics, but are in themselves geopolitical. He calls attention to "the role of visuality in the production of geographical imaginations, and how the relations of sight/site establish the conditions of possibility for a political response" (Campbell 2007, p. 361). Campbell also urges analysts to not question photographs

according to their accuracy or appropriateness, but what the photographs do, how they function, and their impact. Moreover, his study of Darfur shows that the conflict and its people are enacted through sight: a complex situation is reduced to opposing photos of refugees versus rebels, 'Arabs' versus 'Africans' (Campbell 2007, p. 377). Thus, photographs taken by journalists do not merely inform geopolitical issues in Sudan, but are themselves geopolitical as they manifest and enable power relations through the constitution and maintenance of spatial (and mental) distances between self/other, North/South, and developed/underdeveloped. Moreover, he urges photojournalists to not reify and replicate particular power relations such as neo-colonial relations of power.

Although Campbell includes a map in his article about Darfur, he does not refer to maps as part of the visuality that produces imaginations. Yet, maps can also be questioned according to what they do, how they function, and their effects on power relations since they, like photographs, regulate the visibility and invisibility of objects, subjects, issues, and circumstances, such as mentioned by Campbell (2007) and Shim and Nabers (2013). Maps also constitute understandings of 'distant places' and establish conditions of future possibility in regard to places such as the Arctic. Without maps, conveying information to people who have not been directly exposed to the object or issue that the map represents would be difficult and time-consuming, if not impossible. Instead, our images of the world and of ourselves are given to us by witnesses such as parents, teachers, scientists, journalists, and map-makers, all of whom we trust, but may never have met (Neumann and Nexon 2006). Although maps rarely are considered within the field of visual politics[14], I think that most proponents within this field would be inclined to study maps as visual representations. For example, Laura

[14] An exception is Shapiro (1988). Also see Shepherd's (2013, p. 123-126) discussion about the Mercator versus Peters map projections as they are discussed in the tv-serie The West Wing.

Shepherd (2013, p. 126) mentions that maps, like news media and art, are representations of the world. In addition, Campbell mentions that "like cartography", images taken by early explorers on their travels have contributed to the development of an "imagined geography" in which several dichotomies such as the West/East (or the West and 'the rest'), North/South, and developed/underdeveloped have been prominent (Campbell 2007, p. 358). Hence, visuals, including maps, can reproduce and manifest existing power relations and ways of thinking, and in this way reproduce and maintain the status quo or limit the scope of thinking space (Campbell 2007). They become naturalised ways of looking at the world (Shapiro 1988). In what follows, I explore how the visual politics field can help us understand the ways in which visual representations can be political forces in themselves. Hence, I deviate from, for example, Hansen's (2011) notion that the visual depends on an actor to 'speak', and instead I view visuals as capable of 'speaking' in and of themselves (Heck and Schlag 2012; Bleiker 2018).

Visual representations as political forces

While some argue that there needs to be an actor who makes the visual 'speak' and in this way shape political events (Hansen 2011), others argue that the visual representation has political significance in itself (Bleiker 2018; Heck and Schlag 2012; Shim and Nabers 2013). Roland Bleiker, who is one of the main proponents of the aesthetic turn in IR and a scholar within the field of visual politics, argues that images and visual artefacts are political forces in and of themselves as they often shape politics as much as they depict it (Bleiker 2018, p. 3). Similarly, W. J. T. Mitchell (2018) argues that visual representations not only reflect the values or motivations consciously intended by their makers, but also radiate new forms of thinking and value to their audience. Hence, to consider visuals is not about understanding the intentions of the one who made the visual representation or unpacking underlying 'truths' or 'facts' that are hidden from view, but to understand how these

representations have political consequences and constitute politics (Bleiker 2001, 2018; Rose 2001; Shim and Nabers 2013; Shapiro 1988).[15] Within this perspective, all visuals are political as they "delineate what we, as collectives, see and what we don't and thus, by extension, how politics is perceived, sensed, framed, articulated, carried out and legitimised" (Rancière 2004 in Bleiker 2018, p. 4). In other words, it becomes less interesting whether a photograph is 'true' or 'false' since it renders subjects and objects meaningful or not meaningful regardless of the intention or motivation of the maker/presenter of the photograph (Campbell 2007; Heck and Schlag 2012; Shapiro 1988). This also becomes my interest when analysing how maps represent 'the Arctic', not to falsify the map or raise doubts about the map-makers intentions, but to unpack the underlying meaning-making.

Moreover, Campbell (2007) argues that there is a need to depart from an understanding of images and photographs as illustrations and information carriers. Instead, he is concerned with "the way in which sites (and people in those sites) are enacted through sight" (Campbell 2007, p. 380). This corresponds with Bleiker's (2001) aesthetic approach to politics in which it is not about uncovering 'truth' or constituting 'better' pictures, but about becoming aware of the taken-for-granted assumptions that surround us in our everyday lives which help constitute meaning in conscious as well as unconscious ways (Weber 2008; Neumann and Nexon 2006). This perspective within the visual politics field helps me to argue for the need to seriously consider visual representations such as maps as mediations of political meaning-making, instead of trying to make 'better' maps by narrowing the gap between the representation and what it represents. While it is not controversial to argue that maps are visual representations (see Shapiro 1988), few have explored maps as examples of visual representation.[16] As noted

[15] This thesis operates with a broad definition of politics, see p. 17-19.

[16] In the edited volume *Visual Global Politics*, one chapter is devoted to "Territory", in which Branch (2018) writes about how territorial boundaries

previously, I seek to contribute to the visual politics field by introducing maps as visual representations. Moreover, I develop the theoretical thesis that visuals can be political forces in and of themselves by adding the concept of constitutive power to the study of maps as visual representations. Having laid out the ways in which the scholarship on visual politics facilitates my study, I shall now turn to the critical cartography field, in particular how it helps me study the constitutive power of maps.

The critical cartography field

The critical cartography literature enables me to explain the socially constructed and political nature of maps. Moreover, critical cartography is here understood as an interdisciplinary field, including studies in and about cartography (e.g., map-making) and its history, as well as IR, critical geopolitics, and geography[17]. Instead of viewing maps as true, unmediated representations of reality, this field scrutinises the unquestioned 'objective' and 'neutral' map and questions the truth-claims in maps. It views maps as social constructions and acknowledges the supressed human and subjective elements within them, emphasising the power dimensions of mapping (cf. Crampton and Krygier 2006;

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are made possible via maps. He calls maps "graphical images" and talks about the "visual language of mapping". However, I contend that this mainly is about mapping as a technology and technique and maps as tools for governing territory rather than understanding the map as a visual representation with constitutive power in itself. Hence, it builds more on the critical cartography field's outlook on maps, with emphasis on its maker, rather than using elements from visual politics to understand maps.

[17] While the 'critical turn' in cartography studies (both map-making and the study of maps) in the 1980s is said to have established 'critical cartography' (Caquard 2011) as opposed to more positivist understandings of cartography, I use the term 'critical cartography' more broadly as a field of studies that deal with maps as social constructs and the power of maps.

Crampton 2001, 2002, 2009; Wood 1992, 2010; Wood and Fels 2008; Woodward et al. 1994; Harley 1989; Casino and Hanna 2006). As concluded by J. Brian Harley, maps show us the world in particular ways:

> Both in the selectivity of their content and in their sign and styles of representation maps are a way of conceiving, articulating, and structuring the human world, which is biased towards, promoted by, and exerts influence upon particular sets of social relations. (1988b, p. 278)

Studies within this field have among other things considered how maps historically have shaped the idea and definition of the territorial sovereign state (Branch 2011, 2014; Larkins 2010; Strandsbjerg 2010; Winichakul 1994) and how maps have impacted the 'discovery' and colonisation of 'new' worlds (Harley 1992). Moreover, studies in the critical cartography field bring to light how maps construct ideas about the nation, national identity, and nationalism (Batuman 2010; Culcasi 2016a; Krishna 1996), how they affect how policy makers think about the world (Henrikson 1980), and how they construct particular environmental issues (McNeil and Culcasi 2015; Harris and Hazen 2006). Examples of maps that have undergone scrutiny are historical maps showing how 'the new world' was represented in Europe (Harley 1992) and those made with satellite data (Shim 2014; Rothe and Shim 2018) as well as those employed in media reports (Culcasi 2006). Other studies have focussed on maps that are being used by particular actors to claim control of land or to symbolise political movements (Bennett et al. 2016; Bier 2017; Cobarrubias and Pickles 2009; Culcasi 2016b). Thus, the effects of maps have been studied in a variety of ways and the types of maps under study have varied a lot.

Within this rich field of studies, I mainly draw on two theoretical perspectives: a) maps are makers of reality (Harley 1989, 1992; Wood 1992, 2010) and b) maps possess an ideational power (Branch 2011, 2014; Winichakul 1994) that represent events and things that are not yet

'real' (Corner 1999; Harris and Hazen 2006). These theoretical perspectives are central to my argument about the constitutive power of maps, in particular when grouped together with theoretical insights into the political power of visual representations as outlined in the previous section. In what follows, I first account for the ways in which maps serve particular power interests. Here I draw on critical perspectives on the role of maps that emerged among cartographers and historical cartographers in the 1980s. Second, I explore the theoretical argument about the 'ideational power' of maps as exemplified by Jordan Branch's studies (2011, 2014) of the historical emergence of the nation state in Europe and Thongchai Winichakul's (1994) study of the making of the Siam nation in the 1800s. Within this line of theoretical argument, I include the notion that maps can represent what is 'not yet' and constitute 'reality', in the words of James Corner (1999, p. 223). My wish is to contribute to the field of critical cartography both by broadening the notion of how maps 'make reality' and by focussing on the constitutive power of maps.[18] In this way I deepen the argument that maps have constitutive power also beyond the idea of the territorial state and that maps enable representations of ideas and issues that are yet to be fulfilled.

Maps serves particular power interests

The idea that maps simply reflect reality has been challenged since the 1980s when cartographers and others began to recognise that maps are not merely mirrors of reality, but makers of reality. Thus, they make

[18] According to my definition of politics, I am less interested in how maps constitute political boundaries and have direct political effects, for example, by sparking war between two nation states. Instead, I focus on how maps more indirectly shape what is thinkable and unthinkable, possible and impossible, in a particular context or situation.

reality as much as they represent it (Harley 1989).[19] Harley (1989) argues that power is exerted on cartography as well as exercised *with* cartography. Thus, maps are not merely communication tools rather cultural texts inscribed with power that often is hidden behind an illusion of being a product of objective and neutral science. A map is always a commentary on the social structure of a particular place as well as its topography (Harley 1989, p. 6). Moreover, Harley (1988b, 1989, 1992) argues that omissions of, for example, poor people's quarters or indigenous place names are to be understood as quiet processes of domination in and through the map: "Cartography deploys its vocabulary accordingly so that it embodies a systematic social inequality. […] The rule seems to be 'the more powerful, the more prominent'" (Harley 1989, p. 7). This is a point I shall return to in Chapters 4, 5, and 6 when I note that maps often neglect to represent indigenous peoples and other non-state actors in the Arctic.

In turn, Harley (1989) is informed by Denis Wood and John Fels' (1986) analysis of the Official State Highway Map of North Carolina. Their analysis of this inventory map of North Carolina shows that the state not only wants to promote its highway system on its highway map but also wants to promote itself and its sovereignty by, for example, clearly asserting the separation of North Carolina from pale yellow South Carolina with borders and different colours. As Wood and Fels (1986, p. 63-64) argue, the delineation of the state's borders is of importance in the Highway Map as it lays the claims of control and the right to existence – the 'reality' – of North Carolina, although this claim may not necessarily be of great importance for someone driving through south-eastern USA. Moreover, the provision of a Highway Map appears as a natural, unquestioned function of the State of North Carolina. This shows how maps work by serving interests and that these interests often

[19] In particular, the scholarship of J. Brian Harley has been influential in developing the theoretical development within the field of critical cartography (see Dodge and Perkins 2015; Crampton 2010; Rose-Redwood 2015).

are indirect and hidden; in this way, maps become powerful statements about the world (Wood 1992). This is relevant to my study as it points out that the political in a map may not always be obvious and that symbolism, colouring, and place names are central in a maps' truth-claims about 'reality' which is reflected later in step 1 of my analytical framework.

Moreover, Wood and Fels (2008) argue that the collecting, identifying, and mapping of the natural world have contributed to constructing nature into something that can be owned and controlled by humans. In this way, maps have contributed to the strengthening of ideas about human domination over nature (Crampton 1994). For example, in the case of the Arctic, the Arctic coastal states – USA, Russia, Norway, Denmark/Greenland, and Canada – are determined to demarcate their territorial claims on the continental shelfs extending into the Arctic Ocean basin (Dodds 2010a, 2010b). Similarly, maps are central when areas are being considered for protection and conservation (Harris and Hazen 2006). In such events, Western map knowledge is often preferred over so-called 'traditional' and indigenous ways of knowing despite the indigenous people's complex understanding of ecosystems. This preference contributes to reinforcing common socio-political exclusions within conservation planning (Harris and Hazen 2006, p. 106). Therefore, Leila Harris and Helen Hazen argue that maps are necessarily reflective of and productive of power:

> Just as cartographers necessarily privilege compass direction, area, or other aspects in creating maps, those who engage in conservation mapping necessarily privilege certain species or certain understandings of nature over others. (2006, p. 110)

Furthermore, since map-makers have to make choices about what to show in a map, Harley (1989) argues that mapping is profoundly engrained within power politics, ideology, colonisation, gendering, and

other forms of historical subordination. Thus, in this perspective, maps are powerful because they are used by the powerful and are political because they are loaded with subjective interests and intentions (Harley 1989; Wood 1992, 2010; Wood and Fels 1986, 2008). This view of maps serving particular interests can be associated with a realist conception of power where an actor (the map-maker) has power over others (the map readers) (Barnett and Duvall 2005). Thus, power is 'owned' by someone. It is the map-maker who can manipulate, disclaim, and propagate certain issues and interests. Thus, state actors or other groups can communicate their interests through maps. For example, Bennett et al. (2016) study the different ways that the Arctic has been articulated in state and Inuit maps in Canada, showing that such maps have affected Canadian northern policy as well as people's lives. This perspective tells us that the power of the map equals the perceived ability of the map-maker or map-commissioner to exert power through the map. Within this perspective, the purpose of scrutinising maps is to establish how the map deviates from reality (e.g., what is distorted, omitted, or manipulated) and what underlying intentions and interests the map-maker or map-commissioner would have in making such deviations. Hence, Harley (1991) aims to unmask the power in maps in order to make better and more ethical maps, peeling away the political and rise above politics.

However, this thesis departs from this perspective. Although I acknowledge that some maps can be more ethical and objective than others, such as topographical maps, the pursuit of making 'better', 'ethical' maps devoid of politics is not the purpose or interest of my study. That is, rather than questioning the accuracy of the maps being scrutinised, this thesis uses a poststructuralist approach to illustrate what maps as visual representations do and to understand their impact. Moreover, I agree with Bleiker (2018) that a gap between the representation and what it represents is inevitable. For example, in the context of the Arctic, a map showing estimations of undiscovered petroleum resources still becomes part of a perceived 'reality' in the

Arctic. This is also similar to the ideational power of maps which I turn to in the next section to show how the ideas first presented in maps can have material effects.

The ideational power of maps

Harley (1989) and Wood and Fels (1986) argue that maps serve particular interests, often serving the elites and the powerful in society. Other scholars follow suit but also argue that maps have not simply acted as tools serving pre-defined interests of state rules and politicians, but have helped reshape the fundamental goals of political actors (Branch 2014; Winichakul 1994). For example, ideas inscribed onto maps have affected the thinking about territory and the state even before the disclosure of such spaces had become a particular political goal (Branch 2014). In his historical research about the relationship between maps and the state, Branch argues that the changes in ideas about territorial control and a sovereign state were partly developed through the introduction of maps to European political leaders and institutions in the 1500s: "Linear boundaries were firmly entrenched in the visual language of maps more than a century before ideas about political authority, let alone practices, followed suit" (2014, p. 87). Hence, maps slowly (and perhaps unintentionally) contributed to changes in the basic cognitive frameworks of leaders in powerful positions with access to maps, such as kings and priests, and this had ideational effects (Branch 2011, p. 3). Moreover, maps served the centralisation of the state: instead of ruling from a specific centre, accepting less control in the outer rim than areas closer to the core, maps helped claim sovereignty over a specific territory (Branch 2011). According to Branch, it is the ideational effects of cartography that "explains why, in a period with a number of possible political structures, the particular model of the sovereign territorial state was implemented as the only legitimate form of rule" (2011, p. 5-6). This supports the argument that ideational power is embedded in maps and that maps can be ideational sources of political change.

Another example of such ideational impact is shown in a historical study of maps and the making of the Siam nation in the 1800s, today's Thailand (Winichakul 1994). Winichakul (1994, p. 54) found that maps made it possible for Siam to be imagined, an aspiration even prior to being materialised on the ground. With the coordinates on a latitude-longitude grid, maps could predict and communicate the existence of something. Accordingly, Winichakul (1994, p. 56) argues that maps of Siam postulated the existence of boundary lines even though such lines did not exist prior to the map: it was the concept of a nation that required the necessity of demarcated boundary lines. Furthermore, the new geographical knowledge represented by the map displaced the indigenous knowledge of political space that existed in Siam: "the modern discourse of mapping was the ultimate conqueror" (Winichakul 1994, p. 129). Mapping became in effect the framework for thinking, imagining, discussing, and projecting 'Siam', with maps serving as visions of a Siam still to be created: "the limits of Siam were drawn even before an actual survey was carried out" (Winichakul 1994, p. 129). Hence, the idea of 'Siam' in maps later materialised into Siam on the ground.

The examples from Branch and Winichakul show how maps help ideationally and materially establish ideas of a nation. This can be related to map representations of the Arctic where nation state borders and national claims are pointed at or drawn onto the Arctic Ocean floor even prior to such claims being settled through international law (see Bennett et al. 2016; Steinberg 2010). Even though they focus on the idea of the territorially bounded nation state, I find Branch and Winichakul's studies central in building the argument that maps have constitutive power with material effects. Indeed, they show how maps can postulate and constitute ideas that later become materially manifested on the ground – as part of 'reality' and how maps become the framework for thinking of a particular phenomenon, such as territorially bounded places. However, both Branch and Winichakul emphasise the role of the actors making and promoting maps, mainly already powerful state actors.

While they both point to the ability of maps to shape political ideas and visions, it is still the map-makers who inscribe ideas onto maps that intentionally or unintentionally end up affecting rulers' thinking. Instead, this thesis argues that the ideational power also belongs to the map itself irrespective of any political visions or interests of its makers.

Moreover, this can be related to Corner's (1999, p. 223-225) argument that maps do not represent ideas or geographies but affect their actualisation. Thus, 'reality' is not 'given' for our apprehension, but constituted through our participation with things such as images, events, and maps. This is how maps can set the conditions for new images and visions for what can be and what can emerge – an unfolding agency in maps (Corner 1999). While Corner mainly is concerned with urban space and how maps and mapping act as the basis upon which urban projects are imagined, I find this 'unfolding agency' central as I contend that maps have the ability to shape ideas through a capacity to show what can emerge as well as setting the conditions for how to think about particular issues on a map (Corner 1999, p. 214). In this way, maps can become the basis upon which political alternatives and projects are imagined. For example, as I will explore in Chapter 6, maps showing still undiscovered petroleum in the Arctic basin (cf. USGS 2008) nevertheless drive particular visions and expectations for the future in the Arctic. Through such maps' truth and knowledge claims, regimes of 'truth' and 'knowledge' are constituted (Crampton 2002). As Jeremy Crampton (2002) argues, the normalisation and naturalisation of issues in maps are powerful aspects of ontology (i.e., the nature of being) because this stabilises established power-knowledge structures. Thus, maps, in their selection of what to represent, can deny alternative futures to what they project.

Furthermore, this thesis is concerned with map's constitutive power in relation to issues other than the state and within a broader understanding of the projection of power through maps. Unlike Harley (1991), who

aimed to peel away the political such as state power and to rise above politics, this thesis draws attention to the ideational and constitutive power that maps have in mediating political meaning-making. Being informed by poststructuralism, I contend that there always will be selections and choices of what to include/exclude when making a representation and therefore a representation is political (Bleiker 2018). In the remainder of this chapter I will account for the ways in which I combine the insight that visuals are political forces in themselves, informed by the visual politics field, with the perspective that maps have ideational and material effects, drawing on the critical cartography field. The purpose is to add theoretical and analytical rigour to my contention that maps have constitutive power.

The constitutive power of maps

Power is here understood as "the production, in and through social relations, of effects that shape the capacities of actors to determine their circumstances and fate" (Barnett and Duvall 2005, p. 42). This is different from a more realist[20] conception of power being the ability (of states) "to get others to do what they otherwise would not" (Barnett and Duvall 2005, p. 40). Therefore, instead of power being repressive, imposing limits and constraints on how we live our lives, power is constitutive because it can impose limits and constraints as well as enable ideas and thinking about our ways of living and the future. Thus, constitutive power produces understandings as well as the foundations for understandings. Key here is also the argument that power is produced through discursive representations (Foucault 1982; Campbell and Bleiker 2016). Discursive representation is in this thesis understood as a process with which we organise our understanding of reality (Bleiker 2009). Importantly, this recognises that the 'real' is inseparable from how

[20] Realism is here understood as a school of thought where the key to politics is the interaction between social and material power (Wohlforth 2008, p. 32-33).

it resides in our discursive representations (Shapiro 1988, p. 8). Moreover, it is through discursive representations such as texts, images, films, and maps, that meanings, identities, and social relations are constituted, making political ideas, visions, and outcomes more or less possible (Campbell 2013, p. 234-235). Hence, what matters is how a representation limits what can be talked about as "possible or desirable, or as impossible or undesirable" (Bacchi 1999, p. 3).

Moreover, according to Shapiro (1996, p. xvii), discursive representations involve a temporary fix of a meaning at the expense of other possible meanings. Similarly, Bacchi (1999, p. 7) argues that any proposed 'solution' depends on the discursive representation of what the 'problem' is. That is, gaining an understanding of the constitutive power of maps is central to challenging hegemonic understandings of issues and, as such, inspires and promotes alternative map representations on which the future can be envisioned and built. To facilitate my analysis of the constitutive power of maps I have developed the following three broad assumptions about constitutive power 'effects':

1. Maps constitute representations of 'truth' with effects on the understanding of political 'reality' – *cartographic truth-claiming*;
2. Maps reinforce and naturalise dominant discourses in politics – *cartographic naturalisation*; and
3. Maps enable and materialise particular expectations about the future – *cartographic materialisation.*

In what follows, I present these interconnected assumptions through what I define as three constitutive power effects: cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. These effects constitute my main theoretical contributions and serve as my key theoretical concepts upon which I base my analytical framework and empirical analysis.

Cartographic truth-claiming

The concept of cartographic truth-claiming is closely related to the critique presented above about the critical cartography field. Namely, maps not only mirror 'reality' but also represent it in particular ways, producing 'truth effects' (Harley 1988a). According to David Turnbull (1989), maps seemingly become evidence of reality in themselves since they can introduce modes of control and manipulation that might not be possible without the maps; that is, they give us a view of the world that is difficult to achieve in other ways. This is where the visual elements of the map become central: the 'truth' of what is represented in the map is assisted by the map's visual representation in which maps are perceived as mirroring the 'real'. Like photographs, people may be drawn in by the "seductiveness of the real" to the point that it is forgotten that someone made the map from a particular perspective (Perlmutter 1998 in Bleiker 2018, p. 13). This seductiveness helps establish 'truths' about the aspects of the world that a map represents, especially in maps that combine graphics with aerial photographs and satellite imagery. An example of cartographic truth-claiming is how many world maps is unproblematically represent oceans as blue, establishing the 'truth' about the colour of water being blue and that all oceans of the world are identical without any local or regional variabilities. I return to in Chapter 4 when I scrutinise the visual representation in Google Maps.

Furthermore, like other representations, maps can be seen as products of knowledge as well as producing knowledges and 'truths' about the world (Shapiro 1988). These truth-claims refer to "what is 'in the true'-what is accepted as truth" (Bacchi and Goodwin 2016, p. 35). Features such as geological layers, climate systems, or potential new sea routes would all be very difficult to imagine as being 'true' without being creatively mediated through maps. This is part of a map's ability to make meaning and constitute power. Moreover, their visual expression makes maps easily assimilated into discourses of knowledge and truth because

they often are perceived to be what Shapiro calls "an unmediated simulacrum, a copy of what we consider the 'real'" (1988, p. 124). In this way, maps mediate 'reality' not merely as descriptions of a world of facticity, but as ways of making this facticity (Shapiro 1988). For example, maps can make claims about dynamic elements in nature being static and as such make it a 'fact' that something like a measurable 'ice edge' exists, which I will discuss further in Chapter 5 where I look at a map showing a clearly defined mass of Arctic sea ice. In my empirical analysis, the cartographic truth-claiming pertains to how the maps that I analyse make truth-claims about 'the Arctic' and constitute what the main 'problems' or 'issues' in this context are. Furthermore, the truth-claiming lays the foundation of how elements in the map can be naturalised as 'facts', which I address below.

Cartographic naturalisation

Naturalisation is something that "can occur simply through statements of 'fact'", as argued by Roxanne Doty when describing the naturalisation of a 'North' versus a 'South':

> Naturalisation occurs through *presupposition*, which creates background knowledge that is taken to be true. This background knowledge entails an implicit theorization of how the world works and also an elaboration of the nature of its inhabitants. (1996, p. 10, emphasis in original)

Moreover, deciding what 'reality' is and who's 'reality' that ought to be included in a map representation underpins the naturalising process inherent in most forms of map making. Naturalising effects, according to Iver Neumann and Daniel Nexon, are conducted on the basis of selection and omission of certain elements and symbols in a map that make "a particular way of looking at the world appear to be part of the natural order, 'just the way thing are', and hence difficult to argue

against" (2006, p. 19). Hence, maps can keep alternative 'realities' from emerging through a naturalisation of the dominant understanding of 'reality'. Furthermore, the naturalising effects of a map are more explicit the more similar the map is to other political representations such as internationally defined political entities or actors. For example, assuming that the most powerful states are located in the 'North' confirms and reinforces the natural and 'true' position of the 'North' and the 'South'. Moreover, this 'natural' fact becomes difficult to challenge. Thus, a map can help naturalise and depoliticise the political judgements inherent in a map's selected and coded representation (Ferguson 1996), as I will later discuss in my empirical Chapters 4, 5 and 6. Herein lies a map's constitutive power: a map attaches meaningful existence to assumed 'realities', such as a world divided into a North and a South, by employing visual and textual language in particular ways. This is also part of legitimating existing political structures as just, rational, and natural, rather than subject to contestation and reinterpretation.

To the extent that users of a map accept what the map shows and what it fails to reflect in its dominant discourses, users engage in what Shapiro calls "implicit acts of recognition of the existing power and authority configurations" (1988, p. 93). Since maps often are viewed and read as unproblematic descriptions, dominant discourses within their representations are not always easy to discern as map users tend to see and understand them unproblematically. For example, Shapiro refers to the use of maps as an example of unreflective reproduction that shapes international, political speech:

> [I]t is a matter of course that most books which claim to speak about a country begin with a map in the opening pages. This representational practice is so familiar it seems natural (i.e., not a practice), but this representation of bounded areas partakes of a venerable rhetorical gesture: the map is a spatial trope which, far from simply reflecting (natural) boundaries, is an aggressive

> practice, delivering up the discursive territory within which legitimate speech about bounded areas can occur. (1988, p. 93)

For example, the beginning of the book titled *Negotiating the Arctic – The Construction of an International Region* (Keskitalo 2004) includes a map that illustrates different ways of defining where the Arctic is: by temperature, by its marine boundary, by treeline, and by sun height (the Arctic Circle at 66 degrees North). This map is followed by a 'political map' showing the different nation states and several place names (Keskitalo 2004, p. ix-x). Although the book discusses different constructions of 'the Arctic', these maps are not discussed further but taken as a natural basis for the study. This practice is common in other books about the Arctic and Arctic issues (see Steinberg et al., 2015). This illustrates why it is important to highlight what one understands as natural and how naturalisation takes place. Other examples of places naturalised by the map are, for example, the placement by early cartographers of the prime meridian through Greenwich outside London, a geographical feature on maps that helped the British empire claim being at the centre of the world and made places such as the 'Middle East' possible (Dittmer 2010). Without a meridian on a map there would not be anywhere 'East' against which the 'Middle East' can be measured. Moreover, Jason Dittmer argues the following: "[t]his may seem innocent enough, but consider the Iraqi citizen who self-identifies as a Middle Easterner – they have accepted a term that reinforces their own geographical marginality" (2010, p. 11). In a similar manner, Ingrid Medby (2014) has shown how the ideas of 'the North' and 'the Arctic' are becoming elements of self-identity among people living in Norway.

Furthermore, just as any disclosure of the inauthenticity of an image does not necessarily undermine the ability of the image to be included in a wider understanding of what it represents (Hansen 2011, p. 56), so too can a map have naturalising effects regardless of being 'proven' wrong or misleading. For example, even though the Mercator projection

is known to provide a false account of the actual size of land masses, it does not stop it from being a widely used and circulated projection (Kaiser and Wood 2001). That is, the Mercator projection continues to constitute the conditions for how 'The' world map should look like and how people are to think about 'the world', which I will discuss further when I analyse Google Maps in Chapter 4. This is a good example of how naturalisation works to reinforce and legitimate dominant understandings. Moreover, this process directly involves ignoring and/or undermining alternative understandings by not including them. Hence, whenever something is naturalised, something else that is silenced – i.e., one 'reality' is privileged over another (Harley 1988a). Silences can be intentional (e.g., secrecy and censorship) and unintentional (e.g., discursive rules and codes that structure how maps are made) (Harley 1998a, p. 58). An example of the latter, is standardisation in maps which generates "the silences of uniformity" in which much of the character and individuality of local places are absent in the map (Harley 1988a, p. 65). This makes it possible for places that look alike to be treated alike. Another example is how cultures are erased by not mentioning them on maps (which can be highly intentional), thus rejecting 'other' people and ways of life not corresponding to the politically more powerful groups (Harley 1988a, p. 66). In this way, silences help reinforce the dominant discourse in politics and support the political status quo (Harley 1988a; 1989). While Harley (1988a) focussed on revealing hidden agendas in historical maps, I emphasise the impact of silences in contemporary maps. Moreover, as explained by Elspeth Van Veeren about visual representations, invisibility is

> not only disempowerment of certain identities but also to the cultural forces that reproduce these identities and associated inequalities and insecurities, rendering them 'common sensical' and therefore harder to overcome. (2018, p. 199)

Hence, silences are central in the naturalisation and making of the 'common sensical' and cultures of 'how things are done' that often pass unquestioned. Maps can reinforce and legitimate the status quo without people being aware of it (Harley 1989, p. 14). Instead of calling for complete visibility, which would subvert the whole purpose of maps, I call for attention to silences as an important naturalisation effect of constitutive power. To sum-up, the implication for my theorisation about the constitutive power of maps is that the cartographic naturalisation of particular issues becomes the background knowledge that limits and controls who speaks as well as how one speaks, thinks, imagines, and forms expectations about the future. As pointed out by Wood and Fels (2008), the map itself can stay 'natural' and 'neutral', untainted by politics, as it is only the issues represented in the map, such as property rights or voting behaviour, that are considered to be social constructs. In this way, the map itself is not questioned. Thus, the naturalisation of issues in maps are powerful aspects of ontology because they stabilise the established power-knowledge structures (Crampton 2002). In my empirical analysis, focussing on cartographic naturalisation helps me study what and who are silenced and to consider the underlying assumptions in a map's representation of 'the Arctic'. These silences and assumptions, when taken as 'truths' and naturalised can have material 'effects', which I will address next.

Cartographic materialisation

If the power of a map operates successfully by constituting an object or place as a 'true' and 'natural' domain, "as a taken-for-granted ontology" (Butler 1993, p. 10), then it can have material effects because it is taken as a primary given. Thus, Butler argues that materiality "*is* power in its formative or constituting effects" (1993, p. 9, emphasis in original). Moreover, it is precisely when something appears outside power and discourse that its power is most effective (Butler 1993). For example, in a study of how Port-au-Prince, Haiti is represented in maps, Nicolas

Lemay-Hébert's (2018) found that colour zoning on maps of 'safe' and 'unsafe' areas affects not only how United Nation officials regulate their interventions but also how local people themselves talk about, think about, and act in their city. The colours of the zones on the maps – e.g., red, yellow, and green – become part of people's self-identification and help establish an imagined geography of insecurity in Port-au-Prince. This study shows how visual representation in maps are central in these processes of thinking and acting and how maps are effective in 'selling' their particular visions of the world (Dodge et al. 2011 in Lemay-Hébert 2018, p. 96). In this way, maps end up having material effects in ways that, for example, the people in Haiti may not have intended or imagined.

Therefore, I find the concept of cartographic materialisation helpful in explaining the constitutive effects that maps have when they are taken-for-granted and their constitutive power is ignored. Moreover, I use 'cartographic materialisation' to explain how maps not only can constitute 'reality' today, but also can constitute what is not yet materially 'real': maps can contribute to enabling particular expectations about the future, which can later materialise as a map's ideational power. In the context of the Arctic, this is particularly interesting as Steinberg et al. (2015) argue that imaginaries matter more here than elsewhere. Hence, what a map represents as 'real' in the Arctic, such as new shipping routes or the occurrence of natural resources, can build certain expectations that can drive economic investments and become real. Furthermore, maps have the capacity to set the conditions for new images and expectations of what can be and what can emerge; they have an 'unfolding agency' (Corner 1999, p. 214). A similar line of argument emerging from the aesthetics approach is that maps, like other visuals, can set the "conditions of possibility" (Connolly 1991 in Bleiker 2019, p. 119). In other words, maps can set the limits for what is possible to think, write, map, and speak. They can operate in the same way as Carol Bacchi and Susan Goodwin (2016) argue that policies can: as taken-for-

granted background descriptions and, more importantly, as constitutive of the conditions under which perceptions and expectations of the future are being governed.

Thus, particular expectations about the future can be nested in maps. According to James Porter and Samuel Randalls (2014), expectations play a deeply political role in bringing into existence one future over another. Performative practices such as making forecasts, models, or maps can "pre-emptively shape the social, political and economic context for innovations as well as influences people's thinking" (Porter and Randalls 2014, p. 203). The materialisation of particular expectations is made more or less probable depending on the success of the map in naturalising and/or silencing particular representations of the world or issues in the world.[21] By doing this, maps can discern alternative possibilities not only as improbable, but also often as impossible (Ferguson 1996, p. 169). Within this lies also the role that maps can have in decision-making, in particular when maps are seen as forecasts produced by experts (Dunmire 2011) that can contribute to silencing other forecasts or visions coming from 'non-experts' such as local communities. This contributes to limiting the alternatives upon which political decisions can be made.

However, while maps can constrain what is thought of as possible by blocking alternatives, they also have the potential to enable ideas and open up 'thinking space', to use a term from Bleiker (2017). This is in line with my definition of power as not simply restricting, but also constitutive in enabling ways of thinking and living our lives (see p. 57-58). Moreover, the power of maps to affect ideas, as noted by Winichakul (1994) and Branch (2011, 2014), indicates their ability to not

[21] Political actors can also influence people's interpretations and perceptions of facts that would serve the political actor's goal (Edelman 1988). Controlling maps and imaginations about the future can therefore strengthen authorities' political power and reproduce status quo.

only depict the political world, but also to being actively involved in producing this political world. Furthermore, I contend that a map's ability to limit as well as enable ideas about the future is not only something in the past, relating to the emergence of the state system but also something that is happening today, which I will illustrate in in the context of the Arctic by unpacking what particular maps do to the political visions for the future. Eleonora Masini[22] makes a similar claim: "The future must not only be foreseen and dreamt of, but also chosen and built" (2006, p. 1159). Thus, the concept of cartographic materialisation helps me understand how maps can constitute choices and political alternatives for a future that can become materialised.

Concluding this chapter

In this chapter I have accounted for my use of and contribution to the fields of visual politics and critical cartography. Moreover, I have shown how I draw on insights from both of these fields to theorise about a map's discursive representation as well as its constitutive power: 1) that maps as visual representations can, in and of themselves, have political significance and mediate political meaning-making and 2) that maps are social constructions that have ideational power that can become materialised. Furthermore, focussing on the concept of constitutive power, I have identified three expressions of this power in the case of maps, namely: cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. These constitutive power effects also stand for the key concepts that I will centre my analysis on when interpreting and deconstructing three selected maps. In what follows, I shall account for the two-step analysis in this thesis and how I operationalise cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation in my analytical framework.

[22] Masini is a leading scholar within the field of future studies.

CHAPTER 3

Interpreting and deconstructing the map

The analytical task in this thesis is to identify and scrutinise how maps represent 'truths' about the Arctic and how such representations help reinforce and naturalise dominant discourses in Arctic politics. This involves the materialisation of particular expectations about the future of the Arctic. In this chapter, I present my analytical framework, which has been designed to enable the unpacking of the constitutive power of maps. The first step of the analysis, where I interpret the map, draws upon Gillian Rose's (2001)[23] visual methodology and Lene Hansen's analysis of images, icons, and comics within IR studies (Hansen 2011, 2015, 2017). I combine these analytical reflections with key insights from the critical cartography field that analyses maps as representations, in particular Harley's (1988a, 1988b, 1989) approach to deconstructing

[23] Key here is that in the first edition of her book *Visual methodologies*, Rose (2001, p. 205-206) includes maps as one of many visual media which can benefit from an interpretation using visual methodologies. However, she does not present any example of such an analysis of maps (in later editions of her book Rose no longer mention maps).

maps, and the 'decoding' of a map's meanings put forth by Wood and Fels (1986, 2008). In the second step of the analysis, I show how I employ elements from Bacchi's 'What's the problem represented to be?' (WPR) approach in order to deconstruct and make visible the underlying assumptions on which a particular representation is built (see Bacchi 1999, 2009, 2012, 2018; Bacchi and Goodwin 2016). Overall, I employ pluralist methods to analyse maps within visual politics (Bleiker 2018, 2019) with the aim not to test the theory about maps' constitutive power, "but to engage it, both at the level of the soundness of its theoretical assumptions and through further empirical applications" (Hansen 2011, p. 69). Furthermore, instead of viewing methods as neutral tools, I accept that they come with and lead to distinct choices with implications for my research project (Bleiker 2015). I also conceptualise methods as a basis for producing scientific, applicable, and political knowledge, with emphasis on the latter: "knowledge that reiterates, questions or disrupts existing power relations" (Aradau, Huymans, Neal, and Voelkner 2015, p. 16). Hence, my deconstruction of the maps is coloured by my poststructuralist positioning on power and broad understanding of politics, which I explained in Chapter 1. Importantly, the analytical framework is not only about interpreting the maps (step 1) but also about deconstructing them (step 2) according to the motivations underpinning the overall study of the constitutive power of maps.

Moreover, a map is often assumed to depict a snapshot in time as it inevitably stabilises time and space relations in order to represent these realities on a map (Massey 2005). However, I contend along with Wood (1992), that a map more accurately is a snapshot *of* time: of a particular time when a map-maker lived, reflecting the social context of that time in a particular way. Thus, my work distinguishes itself from previous research, such as Harley (1989; 1992) and Bennett et al. (2016) which focuses on the role of the map-maker, by zooming in on the constitutive power of the actual map itself. Moreover, my intention is less to highlight what is wrong or right in the maps that I analyse and more about

understanding how issues, in particular Arctic issues, are constituted in specific ways and the possible effects of this constitution. This relates to the claim by Bacchi (1999) that particular representations shape the ways in which people perceive and think of a particular issue or dilemma which, in turn, affects the possible solutions that they opt for.

To study particular representations, the empirical analysis will consist of a close reading of three selected maps: a 'world map' using the Web Mercator projection represented by Google Maps (Chapter 4); a map showing the extent of Arctic sea ice published by the National Snow and Ice Data Center in the USA (Chapter 5); and two attached maps showing the potential for oil and gas in the Arctic Ocean basin constructed by the United States Geological Survey (Chapter 6). A close reading of these maps allows me to study the specific maps in great detail and theorise its specificity (Rose 2001; Hansen 2011). Such a close reading is common in similar studies that focus on (constitutive) power in visual and/or textual representations.[24] Moreover, this close-reading is structured into an analytical framework built into two steps: 1) a careful interpretation of the map itself and examination of its content in order to say something about the maps' truth-claims and how it tries to naturalise these claims[25] and 2) a deconstruction of the identified truth-claims and naturalisation, inspired by the questions posed to policies in Bacchi's WPR approach. It should be noted that the questions that I will be

[24] For example, Wood and Fels (1986) closely scrutinise the signs and codes in the 1978-79 edition of the "Official State Highway Map of North Carolina"; Hansen (2015) looks at the photograph taken of a hooded prisoner in the Abu Ghraib prison as an example of an international icon; and Bacchi (2016) applies the WPR approach to analyse the World Health Organisation's 2001 "Global Status Report on Alcohol and Health".

[25] When examining the maps, I do not try to unpack the mind of the individual map reader because I am more interested in the constitutive effects of a map when it becomes naturalised and unquestioned by larger groups of people. However, I do recognise that, for example, a politician reads a map in an individual way, which has consequences for that person's world view and possibly political effects through the acts of this person (cf. Henrikson 1980).

posing to each of the maps in Chapters 4, 5, and 6 are not used as strict guidelines, but act as starting points for my analytical discussion. In what follows, I account for the two steps of my analytical framework. An overview of steps 1 and 2 and their respective analytical sub-points is presented in Table 1 below. At the end of this chapter, I present and justify the maps that I have chosen to analyse.

Table 1. Overview of the two-step analysis

1) INTERPRETING THE MAP	**1a) Projection**	Choice of map projection? Focal point(s)? ▪ Cardinal directions? ▪ Geometric grid? Categorisation and naturalisation of hierarchies?
	1b) Symbolism	Map signs: ▪ Map legend? ▪ Signs? Signs not present? ▪ Colours? Social and cultural codes? Static representation? Time?
2) DECONSTRUCTING THE MAP	**2a)** What is 'the Arctic' represented to be in the map? ▪ Cartographic truth-claiming about the Arctic **2b)** What assumptions underlie this representation of the Arctic? ▪ Underlying rationality? **2c)** What is silenced and left unproblematic in the map's problematisation(s) of the Arctic? ▪ Cartographic naturalisation of Arctic issues **2d)** What constitutive effects are produced by the map? ▪ Cartographic materialisation of Arctic issues ▪ Discursive, subjectification, and lived effects ▪ Alternative map representations?	

Interpreting the map (1)

In the first step of the analysis I consider the content of the map itself and what it shows; "what do we actually see?" (Hansen 2015, p. 277). This seemingly banal question helps to illustrate how 'facts' are attributed to images – and maps – by discourses (Hansen 2015, p. 279). In order to immerse myself in the maps' representation of the Arctic, I need to disturb their taken-for-grantedness and the seemingly naturalness of the map (Pinder 2003; Wood and Fels 1986; Harley 1989; Wood 1992). Therefore, I carefully describe the map's content as if it is unfamiliar to me in order to tease out what the map representation do. In Chapters 4, 5, and 6, the maps are not displayed until after the section where I describe their choice of projection and focal point (1a). In this way I hope to disturb the often perceived naturalness of the map – its focal point, signs, and colours – also for my readers.[26]

Projection and focal point (1a)

Maps, like other representations, constantly make intertextual and inter-visual references to other maps and texts (Hansen 2006, 2011). In particular, maps use projections that are most often based on other maps and projections that already exist.[27] However, there are many map projections to choose from according to what the map-maker seeks to depict. All map projections come with particular inclusions and exclusions since they are different ways of representing the three-dimensional earth onto a two-dimensional flat plain. Moreover, it is

[26] However, I do understand that it might be difficult for the reader to understand the interpretation described in point 1a) without having seen the map itself, and therefore, I provide the page number of the map(s) so the reader her/himself can decide when to view the map in question.

[27] For example, when Mercator made his infamous world map projection in 1569, he did not observe 'the world' himself, but compiled already existing maps as well as historical accounts and travel stories to build his projection (Kaiser and Wood 2001).

common to emphasise what is thought of as a most important aspect of a map, most notably by placing it at the centre of the map (Crampton 2001). Hence, the emphasis on a focal point is connected to the making of hierarchies in the map representation. In addition, the choices of projection and emphasis are related to the map's appeal to the rules of cartography as well as cultural legitimacy within the society which its map projection and focal point are accepted (Crampton 2001; Harley 1988b; Wood and Fels 2008). For example, a world map made in Europe would be inclined to place Europe at the centre of the map, while a world map made in China would have China as its focal point.

Moreover, in point 1a) I will be looking for any arrows showing cardinal directions and if the map contains a geometric grid, which gives every point on the earth an exact coordinate of degrees North (latitude) and East (longitude) (Branch 2014). It is commonplace to place the 'North' on top of a map and the 'South' at the bottom on maps. However, this is rarely problematized. I relate this to the tendency of maps to often appropriate the world according to European world views (Harley 1989), making colonial and gendered views and assumptions possible. Therefore, maps be said to have contributed to what Shapiro (1997, p. 26) describe as a "colonial gaze" on the world in which Europeans have viewed themselves as being ordered – for example, due to their ability to map the earth – while indigenous peoples are seen as disordered – because they did not map or have maps according to the European point of view. This was less an observation but more an ontological affirmation for the Europeans who were alarmed by the 'disorder' while at the same time the disorder "confirmed their sense of virtue and their belief in the correctness of their own practices" (Shapiro 1997, p. 26). For example, the 'discovery' of the New World by Spain and Portugal is often taken as self-explanatory successes of European ingenuity in navigation and map-making (Wood 2010). I find this "colonial gaze" particularly relevant in the case of the Arctic due to the region's long history of being colonised (Gad 2014; Shadian 2014). Consequently, to

question what appears to be given and make unfamiliar the seemingly natural and self-evident is part of my analytical point of departure. For example, in the analysis I will ask: what does the enhancement of a place, issue, or community do to the understanding of the issues represented in the map? This relates to how the selected focal point can contribute to naturalise one culture over another (Wood and Fels 1986, 2008) and represent social ordering and/or hierarchies (Harley 1988b).

Symbolism: map legends, signs, and colours (1b)

In point 1b) I make use of Rose's (2001, p. 91-92) analysis of visuals to examine the map's symbolism and to be able to ask: what signs and colours are in the map and what assumptions do they represent? What are the symbolism's connections to wider systems of meaning? For example, a black triangle on a map can symbolise a mountain, yet this meaning is not given but related to wider systems of meaning. Similarly, one can think about how different languages use different words for the same symbol: *mountain* in English, *gáisá* in Saami, *fjäll* in Swedish, and *iggik* or *ingik* in Inupiat. These simple examples illustrate that the relationship between the meaning and the sign is not inherent (Rose 2001). Typically, a person can read the symbolism in a map because she/he grew up within the same culture and language where the map was produced and thus, is educated to know most map symbols beforehand. As expressed by Wood and Fels:

> No matter how many readers are convinced that blue naturally and unambiguously asserts the presence of water […] signs are not signs for, dissolve into makers for, those who don't know the code. (1986, p. 57)

Therefore, in the interpretation of how a map speaks through the use of cartographic conventions and/or social and cultural symbolism (cf. Harley 1986; Wood and Fels 1986; Wood 1992; Rose 2001; Bleiker 2015), I seek to read them as if the map and its symbolism was alien to

me, although I concede that I am positioned within particular forms of knowledge and cannot completely free myself from my context.

Moreover, in point 1b) I start by looking at the map legend, which is an information box often found in maps explaining what the symbols and/or colours mean and illustrating signs with explanatory text. I will scrutinize what is included and explained in the legend and whether or not it is indispensable for understanding the map. This is connected to the categorisation and naturalisation of issues in map representations as well as the ways in which maps can build hierarchies between the elements they represent. The map legend can also be considered a discursive sign it its own right because it indicates what the author deems necessary to explain and what not to explain (Wood and Fels 1986). Beyond the map legend, there may be other signs that also make hierarchies. For example, the symbol for a city can be a red square and a town can be a little, black circle, while smaller villages may not have any symbol attached to it or not even be visible. Since a map often naturalises such rankings and hierarchies (Fyfe and Law 1988 in Rose 2001) I scrutinise the size of symbols, the differences in the use of letters and fonts, and the gradients of colours.

Furthermore, to focus on the seemingly given also includes examining the use of colour signs in the map. In the analysis, I will pose this question when interpreting the map in point 1b): does any colouring appear 'natural' and self-explanatory? This is connected to how the map makes truth-claims and naturalises the issues it represents, thus, 'narrowing down' (Hansen 2011) the number of interpretations available to the map reader. For example, to use the colour white to indicate snow or ice is to make an intertextual reference to historically produced views (e.g., land that cannot be used) and an inter-visual reference to conventional ideas about what maps are supposed to represent (e.g., 'natural' features). It is through these references that a 'new' map will be read. Moreover, the use of colours contributes to make the map

intelligible for its viewers (Guillaume, Andersen, and Vuori 2016). For example, colours can be used to label something, e.g. distinguishing land from ocean; to measure something with colour as a quantity indicator; to imitate reality by using colours to represent particular elements in nature; and to enliven reality using colours to make the map beautiful (Tufte 1990). I especially will consider whether there are colours reoccurring in the representation of the Arctic and what implications the choice of colours has in constituting different Arctic environments.

Deconstructing the map (2)

In the second step of the analysis, I will build on the reasoning developed in step 1, where I interpret the map, in order to further unpack the constitutive power of maps. In the analysis in Chapters 4, 5, and 6 I mainly look for what I have defined as cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. Inspired by the 'What's the problem represented to be?' (WPR) approach, I will be asking questions regarding the assumptions and rationalities on which the (problem) representations are founded (see Bacchi 1999, 2009, 2018; Bacchi and Goodwin 2016). While I draw on the questions from the WPR approach, I have also modified them, withdrawn elements, and added analytical insights from the visual politics and critical cartography fields to specify the analysis of map representations.[28] The main reason for this is that Bacchi primarily analyses political policies and not maps. However, Bacchi (2018, p. 7) herself opens up for using the WPR approach to analyse different materials: as a way of thinking and deconstructing.

[28] The modification entails that I am inspired by the procedure and the analytical questions in the WPR approach. However, my questions differ as I adapt them to an analysis of maps. While I acknowledge the limits of my own interpretations and explanations, I put less explicit emphasis on the question of self-problematization stressed by Bacchi (2009, 2018).

Moreover, the WPR approach is useful for understanding how map representations constitute what is "talked about as possible or desirable, or as impossible or undesirable" (Bacchi 1999, p. 3) in the case of the Arctic. Additionally, it draws attention to the conditions under which things become 'evident' and help identify accepted claims to the 'truth' while at the same time politicising such claims (Bacchi 2018, p. 11). Overall, I will analyse maps as representations containing proposals that can constitute representations of 'truth', reinforce and naturalise dominant discourses, and materialise particular expectations about the future. In what follows, I present the questions designed for this thesis as a guide for the deconstruction of the maps in Chapters 4, 5, and 6. In particular, I show how I aim to operationalise them in my analysis of maps in regard to the Arctic. All the questions are listed in the previously presented Table 1 on page 72.

How the map represents 'the Arctic' (2a)

The first point in step 2 of the analysis is to ask: what is 'the Arctic' represented to be in the specific map? I will identify this by questioning what appears as natural and obvious in the map (Bacchi and Goodwin 2016, p. 20), guided by the findings in step 1 of the analysis. Thus, in Chapters 4, 5, and 6 I look for indications in the specific map of references to the desirability of certain conditions to inquire the map's implicit problematisation(s) (Bacchi and Goodwin 2016, p. 21). Moreover, I ask: how does the map constitute 'truths' about the Arctic? I will consider how the map refers to other dominant discourses and if there are any binaries and categories, such as nature/culture, science/tradition, land/sea, male/female. According to Bacchi (2009), these binaries are not only exclusive categorisations, but also hierarchical relationships where one is considered more important or higher valued than the other. For example, I will look for binaries in the map legend and in the symbolism, building on step 1 of the analysis.

The underlying assumptions in the maps (2b)

This point of the analysis focuses on uncovering the deep-seated assumptions that underpin the map representation (Bacchi 1999, 2009) and here I ask: what is assumed, taken-for-granted, and unquestioned in the map's representation of the Arctic? Identifying and examining these assumptions help to identify the social unconsciousness and worldviews (Bacchi 2009) embedded within and underpinning the cartographic truth-claiming. Bacchi (2009, p. 5) highlights that this is neither about drawing out the assumptions and beliefs held by the maker of the representation nor about identifying their biases. Thus, this corresponds with my intention of looking at the constitutive power of the map itself, as I discussed in Chapter 2. Moreover, this means that I will be looking for the shape of the arguments embedded in the specific map representation and the (assumed) thoughts that are necessary for these arguments to be given intelligibility: "The question is not why something happens but how it is possible for something to happen – what meanings need to be in place for something to happen" (Bacchi 2009, p. 5). Hence, these assumptions are about what can be thought and what is possible and impossible to think (Foucault 1973 in Bacchi 2009, p. 5).

Within map representations there is a common assumption that dynamic political, social, and natural processes can be represented as fixed and static associations (Harris and Hazen 2006). For example, a map may display political boundaries as if they have always existed (Shapiro 1997) or a map can represent nature as static and without dynamics, making it appear controllable and ownable (Wood and Fels 2008). Moreover, since Arctic peoples have a long history of being colonised by others I will consider it there are signs of this colonial legacy at work in the maps. This is related to the creation of categories, which have constitutive effects on how people come to think of themselves and others (Bacchi 2009, p. 9). For example, there may be (racial) stereotypes represented in the maps (Harley 1988b) such as assumptions about 'wild', 'traditional', and 'close to nature' peoples. Furthermore, in the analysis I

will be searching for traces of colonial authority in the map representation by considering the naming of places and the map's focal point. This also relates to what is not on the map: issues that are made difficult or impossible to think about because they are silenced in the map representation, which I discuss below.

Silences in the map (2c)

According to Bacchi (2009), there are certain conditions that allow certain issues to take shape and acquire dominance, while others are silenced. Similarly, Hansen highlights the need to understand how meaning "is produced not only through what *is* put into words and images, but also by what is *not*" (Hansen 2017, p. 589, emphasis in original). In the case of maps, Wood and Fels (1986) argue that by not mapping somewhere or something one denies the existence and territorial expression of somewhere. I contend that a map representation can empower what/who it represents, while disempowering what/who it leaves out, relating this to the constitutive power of maps. Therefore, in this point 2c) of the analysis, I will be asking: what is left unproblematic and silenced in the map representations of the Arctic? This is a clear act of the constitutive power of maps in limiting the conditions of possibility by silencing alternative representations of 'reality'. Instead of focussing on blatant omissions or map manipulations I will draw on the assumptions that I identify in step 1 of the analysis and consider any dichotomies indicating hierarchy and/or a simplification of a complex 'reality' that distorts or misrepresents certain issues (Bacchi 2009, p. 13). Hence, as will emerge in the next three chapters, I will here be looking for silenced processes of domination within the map representation (Harley 1989) such as 'othering' (Said 1978) and 'gendering' (Harley 1988b; Rose 1993). For example, the understandings and (map) representations of 'the Arctic' has been shaped by the pursuit of, at least historically, male explorers entering into an apparently wild and unruly Arctic nature (see Steinberg et al. 2015, p.

6). Even today the notion of the Arctic being a hazardous, peripheral place (Albert and Vasilache 2018) may accentuate a need for management and monitoring from the outside via policies, research, satellites, and map-making. Moreover, such management and monitoring efforts tend to prioritise predominantly male occupations (Litfin 1997).

The map's constitutive effects (2d)

In point 2d) I will build on the previous points explained above in order to continue the deconstruction of the cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation represented in and through the map. In order to uncover these constitutive power effects I will be looking for discursive effects, subjectification effects, and lived effects as presented in the WPR approach (cf. Bacchi 2009; Bacchi and Goodwin 2016). Firstly, the *discursive effects* stem from the limits imposed on what can be thought of and said by the map's representation of 'problems'; their problematisations. I interpret the discursive effects of the map in so far as they relate to how the map is informed by, reproduces, and naturalises assumptions about 'the Arctic'. For example, does the map assist in the maintenance of status quo, naturalising and materialising the Arctic's colonial and gender(ed) underpinnings? I will also emphasise how the map materialises 'the Arctic' as a particular type of region. As Culcasi (2010, p. 582) argues, regions are not 'naturally existing' but socially constructed through representations.

Secondly, I continue by considering the *subjectification effects*, drawing attention to the ways in which 'subjects' are materialised by the map representation and becoming specific kinds of 'subjects' (Bacchi and Goodwin 2016). According to Bacchi (2009, 2018), problem representations create difficulties for some social groups more than for others. For example, as I will discuss further in Chapter 5, a map can promote an understanding of Arctic peoples as victims of climate

change. This happens because the map representation makes available certain subject positions rather than others, through silencing and making of hierarchies of signs, and therefore constitutes subjects and political relations within its representation. In the case of the Arctic, I will also consider subjectification effects to be about how nature is materialised as a distinct subject in the maps, asking: how does the map constitute understandings of 'nature' or 'wilderness' in the Arctic?

Thirdly, and lastly in step 2 of the analysis, I scrutinize the *lived effects* that are being produced by the map representation in question. Bacchi (2009) argues that policies create representations of problems which in turn have effects for the 'real': a material impact on people's lives. However, it is difficult to pinpoint how, for example, a classification of different populations in a map affects an individual family. Therefore, I choose to focus on the self-meaning-making that the maps pertain to people living in the Arctic and ask: how does a map of the Arctic and Arctic issues/problems benefit some people while potentially harm others? As will emerge in Chapters 4, 5, and 6, my aim in point 2d) of the analysis is not to render a map redundant or abolish its use in political discussions about the future of the Arctic. Instead, the analysis aims to unpack the map's constitutive power effects and to make it possible to reflect on the complex implications that maps have in shaping the conditions under which political discussions are held.

Since maps have political significance in shaping what is possible to think of and not to think of, they shape the conditions under which issues are discussed (Crampton 2002). Thus, together with the lived effects, I will scrutinise how the map representation help materialise certain ideas and visions that get to dominate in the context of the Arctic future. Thus, I also look for alternative problematisations and abilities to 'think otherwise' as suggested by Bacchi and Goodwin (2016, p. 22-23). Moreover, I aim to highlight any possibilities for contesting the dominant problem representation in order to destabilise taken-for-

granted 'truths' about the Arctic. Drawing on Bacchi (1999, 2009), I ask: how could visions for the future in the Arctic differ if the issues or problems were constituted in other ways? To disturb the objective position of particular maps that circulate in the context of the Arctic can be seen as part of the rethinking that Annika Bergman-Rosamond and Ben Rosamond (2014) argue is needed in order to imagine alternative futures for the Arctic. For example, maps could be made by Arctic residents themselves, mapping their 'truths' about the Arctic. Such maps would contribute to open up thinking space by highlighting and possibly materialising other issue/problem representations than the dominant ones.

In the following sections I explain why I do a close-reading of a selected few maps in order to understand and say something about the constitutive power of maps in contemporary Arctic politics.

The material: three maps

While the Arctic is chosen to illustrate the theoretical assumptions about the constitutive power of maps, the choice of the specific maps for the analysis is empirically motivated. Drawing on my insights from extensive observations of Arctic politics through conferences, workshops, research, news media, and popular culture representations, I have chosen to analyse three maps based on their relative frequency of being referenced.[29] As I have argued in the introduction chapter, maps are common points of departure in many discussions about the Arctic region and Arctic politics. More specifically, the three maps analysed in

[29] Instead of trying to quantify how many times these specific maps appear, I argue that they are generally known within the field of Arctic studies and politics and that similar maps often refer to these 'original' maps (in particular NSIDC and USGS). Google Maps is used as an example of a general reference map that uses the (Web) Mercator projection and is therefore special since it is widely known also outside the Arctic context.

this thesis have been selected because they build on, naturalise, and reproduce particular assumptions about 'the Arctic': Google Maps' 'world map' articulates where and what the Arctic is/should be; the NSIDC map illustrates the impact of climate change on the Arctic sea ice; and the USGS maps articulate the perceived opportunities coming with an increasingly accessible Arctic ocean floor. An additional justification for this selection is that these are three examples of different types of maps and map-makers: Google Maps is a commercial mapping service; the NSIDC is a provider of satellite data in maps; and the USGS is a compiler of statistical, probability data in maps.

Moreover, I use the three maps to construct an understanding of how the constitutive power of maps mediate political understanding in the Arctic and not to offer generalisations across maps or across issue areas, although I see the possibilities for using a similar framework to analyse other maps elsewhere. Furthermore, contemporary maps are rarely analysed in the critical cartography field where most analyses have focussed on historical maps (see Branch 2011, 2014; Harley 1988a, 1988b, 1989; Wood and Fels 2008). In what follows I explain in detail my justification of choosing each of the three maps.

Google Maps

World maps are central when people form their view of the world (Kaiser and Wood 2001) and therefore, also the construction of places like 'the Arctic'. For example, when justifying China's involvement in the Arctic, the Chinese ambassador to Iceland refers to 'The world map': "If you look at the world map, apart from the eight Arctic countries, China is one of the countries that are closest to the Arctic Circle."[30] Google Maps is an example of a 'world map' that uses the Web Mercator

[30] Olin, Robert (Host). (2019, September 7). *Maktspelet i Arktis* /The power game in the Arctic [Documentary]. In Melén, Johanna (Producer), *Konflikt*. Stockholm: Sverige Radio/Swedish Public Service. Quotation from min. 25:10-25:23. Retrieved from https://sverigesradio.se/avsnitt/1354554

projection.[31] Although it was created in 2005[32], Google Maps chose to employ one of the oldest and most popular map projections that was created by Mercator in 1569 (Kaiser and Wood 2001). I argue that this illustrates the Mercator projection's status as a 'global icon': it is an iconic map of how 'The world' looks like that is globally circulated beyond the local and regional, similar to global iconic images as described by Hansen (2015, p. 272). Since Google Maps became hegemonic among online mapping services (see Boulton 2010; Brotton 2013, June 1; Lee 2010), the use of the Web Mercator projection has become the preferred choice employed by all major web-mapping services (Jenny 2012).[33] I analyse Google Maps as an example of a largely unquestioned 'world map' of today in order to show how it can naturalise a particular view of 'the world' with constitutive consequences for how 'the Arctic' is represented.

The NSIDC map

The U.S. National Snow and Ice Data Centre's (NSIDC) is a leading agency in providing information about polar sea ice to policymakers, the media, and the public (Christensen and Nilsson 2017). For example, the NSIDC communicates with stakeholders such as shipping companies about ice cover predictability in the Arctic (NSDC 2015). One way that

[31] As of August 2. 2018, Google Maps no longer uses the Web Mercator, but displays the world as a spherical globe, '3D Globe Mode', when zooming out on a computer. However, the Web Mercator and 2D world-view is still used in Google Maps when it is accessed on a tablet or smartphone as of August 2019. While this affects the relevance of my analysis, the analysis of the use of colour and graphical symbolism is still applicable since these have not changed. In addition, I find it fascinating how long time it took for Google Maps to replace a soon 500-year-old view of the world, especially since the Mercator projection largely is being phased out as the main projection for printed maps (Battersby et al. 2014).

[32] For the history and creation of Google Maps, see McQuire (2019).

[33] As of August 2019, the Web Mercator projection is still used by online maps such as Bing Maps (https://www.bing.com/maps) and OpenStreetMap (https://www.openstreetmap.org).

the NSIDC provide information about such issues is by producing daily updated maps that show the extent of the Arctic sea ice freely available on their websites. The specific map that I analyse appears on the NSIDC website *Arctic Sea Ice News and Analysis* under the title "Arctic sea ice extent arrives at its minimum" (NSIDC 2018, September 27).[34] It shows that the Arctic sea ice on September 27. 2018, which was the sixth lowest yearly minimum extent in nearly 40 years of the NSIDC's satellite records. According to the NSIDC, the Arctic sea ice news website is the most popular web page at NSIDC (NSIDC 2015, p. 3). In addition, this NSIDC website is the first hit when searching "Arctic sea ice" in several search engines.[35] Being the top-hit when searching the internet says something about the authority and cultural legitimacy enjoyed by the NSIDC and its Arctic sea ice news. Moreover, Arctic sea ice has become somewhat of a bellwether for climate change and sea ice maps, often the ones produced by the NSIDC, have come to represent global climate change (Christensen and Nilsson 2017). I analyse the NSIDC map as an example of how climate change is represented in the Arctic and how maps can represent the scale of something – the melting sea ice in the Arctic Ocean – that is difficult to comprehend with our own eyes. I also scrutinise how this map naturalises a particular view of climate change in the Arctic and the consequences of this particular representation.

The USGS map

Among the many tasks of the United States Geological Survey (USGS) it making estimations about petroleum resources around the world. These estimations are often represented in maps. In 2008, the USGS

[34] On the exact same date, September 27. 2018, NASA and NOAA (U.S. National Oceanic and Atmospheric Administration) also posted similar maps referring to the NSIDC data on their websites. This indicates a strong intertextuality between the map in question and other similar maps in other media.

[35] Example search conducted in the search engines Bing, Aol., Google, and DuckDuckGo on 31 March 2019.

presented a four-page fact sheet which, according to the USGS, was "the first publicly available petroleum resource estimate of the entire area north of the Arctic Circle", accounting for almost 10 percent of the world's known petroleum resources (USGS 2008, July 23, sec. 2, para.1). In this fact sheet there are two maps that show the estimations of undiscovered oil and gas in the Arctic. The maps are based on existing geological knowledge without making any drilling tests in the Artic (Robertson 2008, July 22). Hence, the maps make estimates about a 'reality' of petroleum resources in the Arctic and are good illustrative examples of how maps can make something 'real' that which is actually 'not yet', enabling particular outlooks of the future in the Arctic. There is a long history of surveying and making estimations and maps of what is above as well as underground and the USGS is not alone in this regard. Many nation states have their own geological surveys and are commissioned by their respective states to make geological estimations.[36] However, the USGS, and in particular the fact sheet from 2008 containing the two maps, is commonly referenced when politicians, academics, and others refer to the potentials of finding oil and gas in the Arctic region. Therefore, I analyse the USGS maps as examples of maps that show statistical estimations of petroleum and where they are found, naturalising and materialising the prospects of finding oil and gas which has constitutive consequences for how the future in the Arctic is thought of.

Overall reflection on the map selection

Maps are not entirely reducible to their distinct context as they travel across contexts, and their digitalisation has increased this tendency (Rose 2001). The maps that I have selected cannot be regarded in isolation because their impact is dependent on their intertextual connections and

[36] For example, the Geological Survey of Sweden provides several maps on their website. See *Sveriges geologiska undersökning* – Maps: https://www.sgu.se/en/products/maps/ (Accessed 2 April 2019)

reuse in other settings and works (Rose 2001; Hansen 2006). The map's intertextuality and inter-visuality relate to what context and relation it is situated and accessed through. Attached texts, graphs, tables, flags: such accompanying signs can give insights into what type of society a map helps to constitute (Pinder 2003; Wood and Fels 2008) and work as "visual instructions, which narrow down the range of interpretations that are available to the viewer" (Shim 2018, p. 270). Hence, I will also take account of any visual instructions surrounding the maps. Moreover, I see the maps investigated in Chapters 4, 5, and 6 as meta-discourses about the Arctic, being quoted and reproduced across texts. Table 2 provides an overview of the selected maps, my justification, and their intertextuality and inter-visuality with other maps and documents.

Moreover, all the maps that I analyse in this thesis are accessible via the internet. There are particular challenges when analysing online maps as they are regularly being updated and changed: the NSIDC provides daily updated maps of the Arctic sea ice and changes in Google Maps happen without any explanation. Unannounced updates make it difficult for an analyst to keep track of the changes, in particular when they are not documented by the map provider. For example, the changes in Google Maps from 2D to 3D 'world view' in August 2018 was neither announced on the Google Maps site itself nor on Google's blog, but via a Twitter post from Google Maps (see Twitter @googlemaps from August 2. 2018). The fact that this was not announced at the Google Maps website itself makes it difficult for the map users to be aware of the changes that are being made and why unless they are particularly interested and search for more information. Thus, at stake in the age of digital maps are the possible erasures of the past and/or present information or major changes in the maps themselves without the knowledge of the map user.

Table 2. Overview of the selected maps for the analysis

MAP	JUSTIFICATION	TYPE OF MAP	INTERTEXUALITY AND INTER-VISUALITY
Google Maps	An example of a general-purpose world map that uses the (Web) Mercator projection and the most used cartographic service on the Internet.	Digital, commercial online map service that combines large sets of information and user options. Google Maps is the dominant actor among online map services.	The Mercator has been one of the most common projections for world maps. The use of the Web Mercator projection for online maps increased after the launch of Google Maps in 2005.
The NSIDC map	Often drawn on in order to describe the impact of climate change in the Arctic, but also as a symbol of global climate change.	Map made by satellite generated measurements coming from the U.S. Defence Meteorological Satellite Program.	Others use NSIDC's data to make their own maps; e.g. NASA and Greenpeace.[37] NSIDC's Arctic sea ice maps feature in the National Geographic (2009, May).
The USGS 2008 maps	The fact sheet which contains these maps is commonly referred to in academic and popular literature when describing the petroleum resource potentials in the Arctic.	Maps made by compiling existing statistical data to say something about the probability of finding oil and gas in the Arctic. They are produced by an institution under the U.S. Department of Interior.	A reference to 'USGS 2008' is common in both academic and popular literature.[38] The maps have been reproduced in an article in the journal *Science* (Gautier et al. 2009).

[37] See Borgerson (2013, p. 83) where a map combines the data from the NSIDC with the probability estimations from the USGS maps.

[38] Examples of where I have seen this reference 'USGS 2008' or its equivalent 'Bird et al. 2008' is in: Borgerson 2008, 2013; Christenson and Nilsson 2017; Dittmer et al. 2011; Dodds 2010a; Harsem et al. 2011; Keil 2014; Lindholt and Glomsrød 2012; Nicol and Heininen 2014. In Steinberg et al. (2015, p. 94-95) all the maps in the USGS fact sheet are reproduced in their entirety.

During the empirical analysis, I will keep in mind that particular interpretations of maps are inherently political (Bleiker 2001) taking place in a specific location and in a particular social context (Rose 2001). Therefore, I acknowledge that I cannot escape my own situatedness and that through my work I too contribute to represent certain ways of looking at maps and 'the Arctic'. Moreover, within Arctic research there is a tendency to give precedence to scientific knowledge at the expense of other knowledges often dubbed 'traditional' or 'local' (Desbiens 2010). This contributes to a privileged positioning of the researcher, often originating from outside the region itself (like myself) and may reproduce the colonisation of the region through other means (scientific research) and further marginalise the indigenous as well as non-indigenous peoples who live in the Arctic. While I agree with Christine Sylvester (2016, p. 56) that it is important to not write 'local' people into research as "faceless subalterns of IR", I acknowledge the limitation that underpins my study as I lack first-hand accounts from the perspective of Arctic local inhabitants. While I am knowledgeable about Arctic issues, having my own experiences and opinions, I acknowledge that I am still an 'outsider' to Arctic people and to their everyday realities. Moreover, I am conscious of the fact that I contribute to the legitimation of the maps that I analyse by focussing on them and not on other maps, such as maps made by people living in the Arctic.

Complementary observations

To try to grasp the constitutive power of maps in the context of the Arctic I have found it useful to supplement my desk-top analysis with a few observations during the attendance of Arctic conferences. Since this method is not used exhaustedly in my work they appear more as illustrations and as a way of adding first-hand empirical examples to maps' role in meaning-making. I have attended several Arctic conferences and workshops during the research process, including the Arctic Circle conference in 2014, the Arctic Frontiers conference in 2016

and 2018, and the Calotte Academy travelling symposium in 2018. At the Arctic Frontiers in Tromsø, January 2018, I attended with the specific intension of observing the usage of maps at the conference: in the venues, the printed and visual materials, and in the conference presentations. I was interested in understanding how a presenter self-reflected – or refrained from so doing – on her/his use of maps. This involved posing questions to conference participants seeking to understand how such individuals thought about the use of maps at the conference in question. However, it proved difficult to get people to deeply reflect on maps in the busy in-between conference sessions or in email correspondence. For example, maps had been selected because they were thought to be convenient and informative.[39] Thus, a limitation in my study is that I have not conducted a broad set of interviews in order to, for example, examine the material effects that people perceive that maps may have on their lives. Nevertheless, the reflections generated at the Arctic conferences I have attended enhanced my understanding of the naturalness and unquestioned position of maps at events that concern Arctic issues. Moreover, the material and observations gathered, although limited, help substantiate my analysis. Therefore, I have chosen to include some of these accounts in my empirical analysis when suited.

Concluding this chapter

In this chapter, I have presented my analytical framework and how I combine different analytical elements associated with the fields of visual politics and critical cartography with questions stemming from Bacchi's 'What's the problem represented to be?' approach. Moreover, I have

[39] For example, in an email correspondence with Niklas Nordström, Mayor of Luleå, Sweden, I was told that the map for the cover of their Arctic political platform was chosen in order to describe and emphasise Luleå's attractive and competitive geographical position in the middle of the 'European Arctic'.

provided a justification for my close reading of maps, the choice of the three maps to analyse, and the overall appreciation of my contributions and limitations. My key argument for conducting the analysis in this particular way is that there is a need for teasing out the conceptual premises and assumptions that are prevalent in map representations of 'the Arctic'. More importantly, this entails a reconsideration of how the maps shape what is possible in politics, focussing on cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation.

CHAPTER 4

Google Maps and the making of 'the Arctic'

In this chapter I analyse Google Maps as an example of a commonplace 'world map'. As I noted in the previous chapter, Google Maps has one of the most dominant and influential positions among online map services and as enjoys both recognition and what might be considered icon status. Moreover, it can be defined as a "general reference map" (Wood 1992, p. 11) in 2019; in other words, an 'atlas' of today in wide use. As an 'atlas' provider it has continuously sought to improve its representation, pursuing a never-ending quest for the 'perfect map':

> For the last decade we've obsessed over building great maps for our users - maps that are totally comprehensive (we're shooting for literally the whole world), ever more accurate and incredibly easy to navigate. (McClendon 2012, June 6, sec.1 para.1)

In line with the analytical framework developed in the previous chapter I here provide a two-step analysis. However, before I embark on this analysis I provide a brief background on Google Maps. This is follows

by an analysis of the map's contents and its use of the Web Mercator projection. As a second step in the analytical process I deconstruct Google Maps and discuss its role in making truth-claims about 'the Arctic' and naturalising particular visions for the future.

A brief background to Google Maps

Google Maps was launched in February 2005 to make it easy to find directions from point A to B on the internet enabling the map user to simply "click and drag" around when exploring the map (Taylor 2005, February 8). By the end of 2006 it had become the largest maps service in the world (Gannes 2015, February 8). Employing supplementary aerial and satellite photos, Google Maps has made map-knowledge less abstract than 'traditional' maps. This suits non-expert consumers and making Google Maps useful for businesses and local governments (Parsons 2013). While Google Maps is free for private users, businesses that use its services are charged for their usages (Lee 2010). The authority of Google Maps is supported by the Google brand and its general dominance on the internet. For example, the common verb 'to google (it)' is testimony to the impact and cultural legitimacy of Google in shaping our internet habits and everyday lives.

Moreover, an important element of this digital map services is that Google Maps gives the impression that it is the map user who gets to decide what to focus on and what to view in the maps. This is an illusion that cloaks an important element of digital media: Google uses algorithms to generate personally tailored information to each user, depending on that individual's location, type of device, the browser used, browsing history, and digital footprint (Kaempf 2018). Hence, the map that I examine might be very different from the projections that other map users have encountered. Moreover, as highlighted by Sebastian Kaempf, it is not the user who "decides what is relevant, important, uncomfortable or challenging to his or her worldview", but seemingly

apolitical, computer-generated algorithms that decide individuals' 'worldview' (2018, p. 103). While this is not the focus of my thesis, I wish to highlight this important element in Google Maps as it sets it apart from other, more 'static' world maps.

Interpreting Google Maps

Before proceeding to the analysis of Google Maps' projection, focal point, and symbolism, it should be noted that on my 15-inch laptop, in the zoomed-out view in Google Maps (2D version) the scale bar shows 1000 km (Figure 5, p. 101). Consequently, I need to drag the map around in order to see all its parts and the Arctic specifically. Hence, one limitation of the 2D-view in Google Maps compared to a paper map is that you cannot see the whole world at once.[40]

The Web Mercator projection

While Google Maps in 2D-view is dissimilar to an atlas, paper map, or wall map, it still is an example of a common representation of the world as flat and rectangular, which could be seen as a relic from the time of printed paper maps (Black 1997) and the continued cultural legitimacy of viewing the world in 2D. In the zoomed-out view Google Maps uses the Web Mercator projection, which is visually impossible to distinguish from the 450-year-old Mercator projection and therefore, they can be considered of the same character (Usery 2018). The Mercator projection was introduced by Gerhard Mercator in 1569 for navigation purposes and has been the most popular and familiar world map projection of "general purpose" world maps since the 1700s (Kaiser and Wood 2001). The fact that Google Maps uses this projection in the digital age reinforces its legitimacy and its continued popularity.

[40] Note that my analysis was primarily conducted during the first quarter of 2018.

In the (Web) Mercator projection, a cylinder is wrapped around the globe so that the surface touches the equator (Figure 3). In this way shapes of continents are preserved at the expense of a distortion towards the North and South poles where areas are stretched out to become larger than they are compared to places closer to the equator. For example, Greenland becomes equal in size to the African continent (Figure 4) while in fact Greenland is 14 times smaller in area (Jenny 2012).

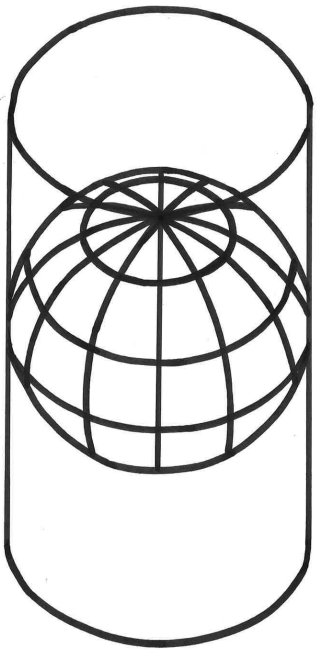

Figure 3. The cylindrical projection in the Mercator projection (Snyder 1987, p. 6). Reproduction by the author.

Figure 4. Africa and Greenland when shown in the same scale in Google Maps[41]

[41] From Google Maps in 2D-view, ©Google 2018. Accessed 2 November 2018

Until August 2018, when Google Maps abandoned the Web Mercator projection for a globe representation of the world, all major web-mapping systems used it despite the Mercator largely being phased out as the main projection for printed maps (Battersby, Finn, Usery, and Yamamoto 2014).[42] The circulation of the Mercator view of the world has thus persisted, appearing in prints and electronically. In this way, it has shaped and still shapes a distinctively public mentality of 'the world'. It activates strong emotional identification and responses and is widely reproduced.

Hence, the decision to use the Web Mercator projection within Google Maps may be explained by its widespread familiarity to a large number of people (Battersby et al. 2014, p. 88). In this way, the visual representation in Google Maps help reproduce and reinforce the dominant representation of the Northern parts of the world as being larger and therefore more prominent and important compared to the projected smaller areas around the equator. The cardinal direction that dominates is of the North sitting 'on top' of the South; this is represented as a 'truth'. However, this representation has historically been different with some people until this day preferring other orientations that does not necessarily correspond to a North-South and East-West axis. For example, Alaskan Yupik are river-oriented, orienting inland/upriver and coast/downriver, while the Greenlandic Inuit are coast-oriented, orienting left or right along the coast when facing out to the sea (Fortescue 1988). Hence, the conventional code of the North – and the Arctic – being 'on top' of the world, is neither conventional nor natural to everyone. While the visual representation employed in Google Maps could be more flexible and accommodate of competing world views, the dominant discourse about cardinal projections prevails. In

[42] As of August 2019, Openstreetmap.org and Bing.com/maps still uses the Web-Mercator projection.

what follows, I discuss the focal point in Google Maps and how the map centres on the location of me, its user.

Focal point: Google Maps centres on its user

Often maps using the Mercator projection tend to be centred on Europe and have therefore been criticised for favouring the significance of European colonial powers of the period when it was made and popularised (Crampton 1994).[43] However, in this context Google Maps differs since it gives its user's location on the map an enhanced position, allowing the map reader to view the map from the point of her/his specific location. To illustrate: When I enter maps.google.com, the map is zoomed in on my own location which happens to be a birds-view of my university department located in the middle of Lund, Sweden. Thus, my computer's specific position is the starting point for exploring the world in Google Maps as the "default centre of the world" with the surroundings emanating from this position (McMullan 2014, December 2, sec.6, para.1). It is necessary to click twelve times on the minus sign to zoom out in order to get to the furthest out view with a scale bar showing 1000 km. Yet, this does not show me the whole world; I am left with Europe in the middle and parts of Northern Africa with the Arctic Ocean being out of sight. While, for example, when my friend in Japan zoom all the way out she barely sees Russia and the continent of Africa. In this way, Google Maps renders certain parts of the world visible to its user while other parts of the world are invisible.

By centring on the map user, with the surroundings emanating from this person's specific location, I argue that Google Maps invites the map reader to a self-centred view of the world. This follows Google's constant tailoring of their services to their users' preferences (see Hunt 2017, November 15). Moreover, the focal point being the individual user

[43] Mercator himself never advocated a fixed middle of the map, but perhaps placed Europe in the top-middle by default as he was living in Europe (Black 1997; Crampton 1994; Kaiser and Wood 2001).

naturalises the individual's familiar outlook on the world, while limiting the incentives for viewing the world in other ways. Hence, Google Maps legitimates a person to stick with their dominant world-view. For example, unless you are located close to the Arctic, this part of the world is invisible and out of your view if you do not deliberately move the map. This becomes one of the major differences between a paper map representation and Google Maps, since the whole world is not visible at once in the latter.[44]

Moreover, Google Maps does not show any sign explaining its choice of cardinal directions which indicates that Google envisages cardinal directions as self-explanatory and, as such, assuming that 'everyone' knows where the North (and the Arctic) is. Yet, there is no 'North' in space. This is merely a choice of projection. That Google Maps finds a sign showing the chosen cardinal directions redundant holds a politically charged truth-claim with colonial undertones: it naturalises and makes inevitable the choice of projection and orientation associated with a pronounced European/Western world view. According to Doty, this is a type of world view where "the encounters between the North and South has been the practice(s) of *representation* by the North of the South" (Doty 1996, p. 2, emphasis in original). Thus, the dominant discourse reinforced by Google Maps is also ethically problematic since it reproduces a claimed natural position, 'the truth', of the North contra the South in international thought and politics (Doty 1996). Below (Figure 5) is the 'world map' view in Google Maps that I analyse in this chapter.[45] What parts of 'reality' that are rendered visible or invisible is also related to the symbolism used in the map, which I examine next.

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[44] This is still the case as Google Maps have abandoned a 2D-view for a 3D-view: the whole world cannot be viewed at once when it appears as a round globe.

[45] Of course, the quality of the map is better online. Figure 5 is a screen-shot from my computer screen when I have zoomed all the way out in Google Maps in 2D-view. Retrieved 19 February 2019 from https://www.google.com/maps/?force=canvas

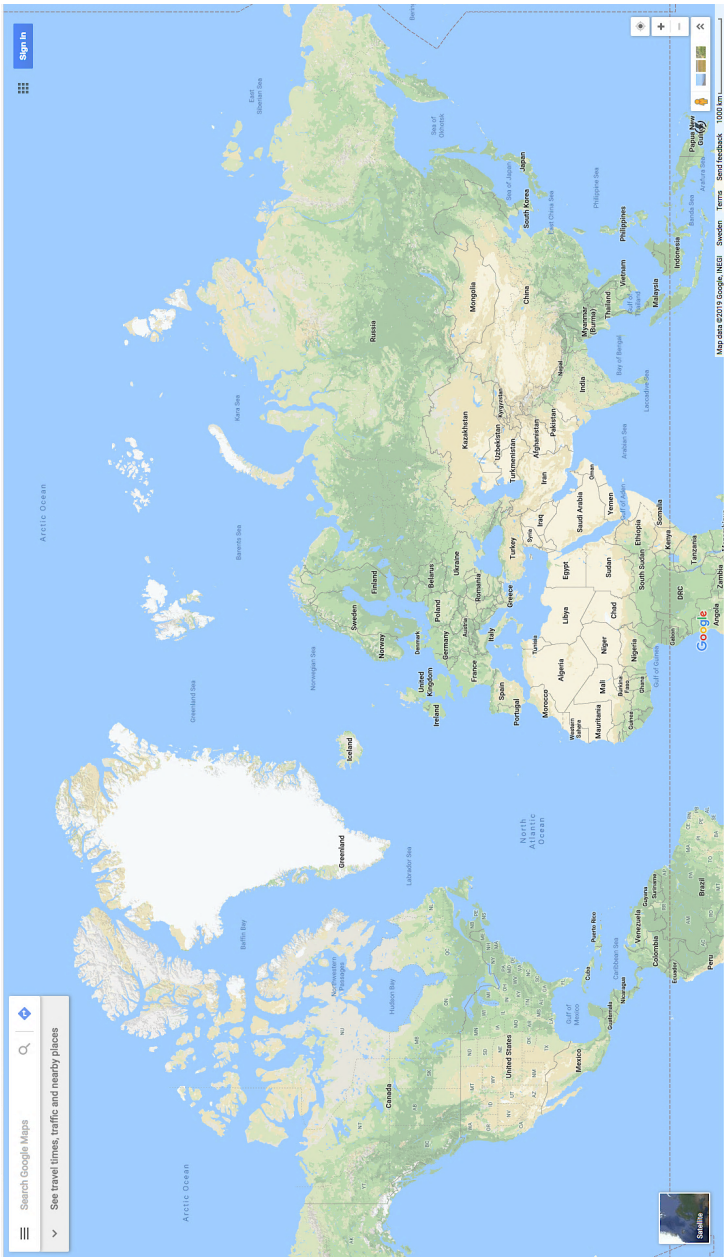

Figure 5. Google Maps, 2D-version ©2019 Google

Symbolism in Google Maps

As I noted in Chapter 3, legends are commonly used in maps to explain the signs, symbols, and colours used in the map. Yet, in Google Maps there is no legend. Neither is there a sign showing cardinal directions[46] nor lines marking a geometric grid. Furthermore, there is no line showing the prime meridian and no names on the dotted lines marking the equator and the international date line running through the Pacific Ocean. One interpretation of this void can be that Google regards its map representation to be self-explanatory and that these signs are elementary when reading maps. Thus, these omissions indicate that the map representation is meant for someone knowing these 'facts' or 'truths' and that they are seen as unnecessary for understanding Google Maps' representation of the world. In other words, such signs are considered to be so dominant and naturalised that they are regarded as dispensable for the meaning-making of the map. For example, by not including a sign for cardinal direction it sustains the 'truth' that the North 'naturally' sits 'on top' of the South. However, the nation states, their names and borders, are considered indispensable. This indicates the constitutive role of Google Maps in naturalising what is important and what is not when viewing and understanding 'the world'.

Furthermore, in the Arctic, few places are named since the name of the (Arctic) nation states are located closer to the capitals of the respective nation states, all located outside the Arctic region.[47] Hence, the view of the world presented in Google Maps is familiar to (American) peoples' general knowledge about nation states in the world, while rendering

[46] Instead, Google Maps gives you the exact coordinates (latitude and longitude) to any point on the map when you click on it. For example, I can find that my university department in Lund, Sweden, lies at 55,707470 degrees North and 13,194302 degrees East.

[47] An interesting observation here is that while non-state or sub-state actors in the Arctic are not named, the island of Greenland is an exception: a space that is intimately linked with key U. S. strategic interests (Bergman-Rosamond 2011).

other areas and actors insignificant. Moreover, Google Maps reproduces the naturalised positions of the prime median and the international date line while simultaneously reproducing the cultural identification that these lines have constituted (see Dittmer 2010).

However, despite the lack of a legend, place names, and other signs on the map, there are many signs surrounding the map on the Google Maps web page.[48] Examples here are the symbol of a circle with a short line attached to it, three lines on top of each other, a blue diamond with an arrow in it, and a blue box in the upper right saying "Sign in". The lack of explanations of what the signs mean indicates that the audience is expected to be aware of particular internet or even a Google jargon (or have a Google account) in order to be able to make full use of Google Maps. Hence, Google Maps does not stand alone, but build on and is intertextually connected to other kinds of maps, codes and representations. Moreover, the implication of my description of signs is that what may appear as straight forward, easy-to-read information in Google Maps is not necessarily accessible to those unfamiliar with its symbols and the codes used in digital media more broadly.

Colours and seasons in Google Maps

The colours used in Google Maps allows a seemingly unmediated 'natural' look of 'reality', which is connected to a map's categorisation of natural features and naturalisation of 'true' colours in nature. It uses the colours that are commonly thought to exist in 'reality' such as light blues, whites, greens, and browns. Such colours are supposed to be pleasing to the human eye and have a certain definitive authority (Tufte 1990). Light blue is dominating as an apparent 'background' colour for Google Maps on which the continents are placed. This homogenous colouring of all

[48] It is important to state that this is how Google Maps looked like as of March 2018. The map is continuously changing with elements added and taken away. In addition, Google Maps changes according to what language it is set in.

oceans and water bodies of the world is common in many world maps.[49] What this colour represents may seem self-explanatory and culturally legitimate: blue means water. However, this is merely the current dominant understanding of what visually represents water. Historically, water has been represented in a wide variety of colours such as brown, green, white, and pink (Wood and Fels 1986). Hence, Google Maps' colour use represents what in a Western culture is unproblematically known as 'blue for water', even though water rarely has this blue colour in 'reality'. Moreover, this visual representation categorises all water as homogenous across the globe: there is no difference between the water in the Arctic and the water in the Mediterranean. This homogenous representation of water in Google Maps has consequences for how the Arctic Ocean is understood, as I will explore further in the deconstruction step of the analysis below.

While 'the Arctic' is not named in Google Maps, the 'Arctic Ocean' is written three times on a large light blue coloured area that stretches along the whole 'top' of the map. This mass of 'light blue' appears as large as the Pacific Ocean.[50] Another reoccurring colour surrounding the 'Arctic Ocean' is white: most of the islands are predominantly white, while the North Russian shores bordering the Arctic Ocean and the tip of Northern Norway are coloured in light pistachio and light grey colours. Without the presence of a legend in the map I do not know exactly what the colours employed convey. However, the spots of white and the larger islands along the Arctic Ocean almost covered in white gives the impression that the Arctic is a place of white which is a naturalised way

[49] The light blue representation of oceans and water bodies coloured is also found in other online maps such as OpenStreetView.com and Bing.com/maps (as of August 2019). This is also common in wall maps and paper maps

[50] In actual numbers, the Pacific Ocean is the largest and deepest of the Earth's oceans with a surface over 165 million km2, while the Arctic Ocean is the smallest and shallowest of the oceans with a surface of only 14 million km2. Source: *Wikipedia*. Accessed 28 August 2019.

of expressing the occurrence of snow or ice, as well as an empty, 'white' place, seemingly devoid of human impacts. This reinforces prevalent understandings of the Arctic as an empty space and a no-man's land: as a "terra nullius" that is claimable (Steinberg et al. 2015, p. 19). Despite the fact that most of the Arctic is already claimed by the Arctic states, the idea and imaginary of *terra nullius* still perpetuates in mass media reports about the Arctic, in particular after the infamous flag planting by a Russian submarine on the North Pole in 2007 (Steinberg et al. 2015; Dodds 2010b), an event that caused a media hype about the coming of a new 'Cold War' and scramble of the Arctic (Dodds 2010a; Albert and Vasilache 2018). Hence, the colouring of the Arctic as empty and undifferentiated contributes to such an imaginary.

Moreover, the colour gradients in Google Maps represent the areas bordering the Arctic Ocean in bleak colours compared to the more compact coloured green and brown parts further down on the map. However, the Sahara Desert, the Arab peninsula, the middle of Australia, and parts of the Gobi Desert are also bleak-light-beige, almost white, indicating that they have something in common with parts of Northern Canada, Russia, and Greenland. An interpretation, from a particular cultural context, can be that the bleak colours refer to bleak and arid realities. Thus, parts of the Arctic are represented in a similar fashion to deserts[51] with the implication that the Arctic may appear as wastelands, similar to a no-man's land imaginary. Furthermore, like many other world maps, Google Maps does not indicate that the Arctic Ocean is a partly ice-covered ocean, but represents it as being identical to all the other oceans; as one light-blue mass of water.[52] When compared to the many colours used on the land areas this demonstrates what Philip Steinberg (2001) considers a constructed absence of complexity in

[51] 'Desert' comes from Latin *desertum* meaning 'something left waste'. *Oxford dictionary*. Retrieved from https://en.oxforddictionaries.com/definition/desert

[52] This is the same when turning on Google Maps' Satellite View: no occurrence of sea ice appears in the Arctic Ocean.

regards to the ocean-space: a blue void. The omission of sea ice also contributes to the construction of the Arctic as an undifferentiated area to be claimed without regard for its fundamental nature (Steinberg et al. 2015). Hence, Google Maps' representation of the Arctic enable particular expectations about Arctic nature being the same as elsewhere and therefore claimable and manageable. The colouring and the highlighting of the borders between nation states fits within a Western world view in which objects should have fixed characteristics and defined boundaries (Turnbull 1989).

Additionally, natural dynamics, many of which are linked to climate change, such as the continuous erosion of shorelines, the melting of permafrost, and the greening of the tundra are ignored, thus limiting the thinking regarding the social consequences of these physical changes. Hence, Google Maps, like other world maps, stabilise time in the 'now' in order to make nature mappable. This is particularly striking because Google Maps is a digital map which could be dynamic and, for example, change with the seasons. By stabilising natural dynamics, or completely ignoring them such as the Arctic sea ice, Google Maps frames a thinking about nature as being static and within reach of human control (see Wood 2010; Castree and Braun 1998). In this point 1b) of the analysis I have shown what the colours employed in Google Maps can do to the viewers' understanding of a separate, but undifferentiated Arctic and undistinguishable Arctic Ocean.

Concluding step 1 of the analysis

Above, I have shown that there are many signs that are taken-for-granted in Google Maps. This shows how Google Maps uses cartographic truth-claiming to reinforce particular 'truths' about the world and cartographic naturalisation to indicate taken-for-granted 'facts' by not even mentioning them on the map, such as a sign showing cardinal directions or naming the equator. Thus, Google Maps expects

and favours certain assumptions in its map users' prior knowledge and contribute to reinforce dominant discourses about the world. Moreover, while there are many options available in the digital and interactive Google Maps, more fundamental alternatives for how to view the world are not provided, including competing projections and the possibility to, for example, view all the parts of the world at once. In what follows I will deconstruct the taken-for-granted assumptions prevalent in Google Maps and examine its ability to shape what is possible, limiting and/or enabling alternative assumptions and ideas about the future in the Arctic. For now I conclude that Google Maps uses a specific projection, particular positionings, signs, and colours to constitute the world and the Arctic in particular ways while excluding alternative aspects such as other ways of orientating and the diversity of and in the world oceans, e.g., depth and occurrence of sea ice.

Deconstructing Google Maps

In this step 2 of the analysis, I explore how Google Maps can, in the case of the Arctic, provide representations of 'truth', reinforce and naturalise dominant discourses in politics, and materialise and enable particular expectations about the future. I commence the analysis by investigating how Google Maps represents 'the Arctic' and its 'problem(s)' and its truth-claiming effects, including its underlying assumptions and rationalities about 'the world' and 'the Arctic'.

Truth-claims about 'the Arctic'

As I have shown in the interpretations in step 1, Google Maps' representation of the Arctic is dominated by a huge, light blue mass of the Arctic Ocean. Google Maps also makes the truth-claim that the Arctic Ocean is identical to other bodies of water on earth as the same light blue colour is repeated in all the oceans, seas and lakes, in the Arctic Ocean, as well as in the South China Sea, and Lake Victoria. Thus, by

representing the Arctic Ocean in the same colour as other oceans, Google Maps makes the truth-claim that it is the same as other oceans and should be dealt with in the same manner as, for example, the South China Sea. This standardisation of the representation of water bodies generate what Harley calls "the silences of uniformity" in which the character of local places are absent in the map and, as such, making it possible for places that look alike to be managed alike (Harley 1988a, p. 65). Such 'truth' claims have been promoted, in particular, by the five Arctic coastal states Denmark/Greenland, USA, Russia, Norway, and Canada that use existing legislation to make territorial claims to the Arctic in the same way as other sub-sea areas (Dodds 2010b; Strandsbjerg 2010). Hence, it is desirable to normalise the Arctic Ocean and claim that it is identical to other oceans, and Google Maps assists in making these desires come 'true'.

Furthermore, the undifferentiated visual representation of the world's oceans reproduces what Steinberg (2001) defines as a historical idealisation of the sea as empty, wild, and unruly by nature, and only meaningful as means for maritime commerce and free flow of capital.[53] Moreover, Shapiro (1997) argues that the (Web) Mercator projection, with the purpose of navigation and use of a grid system, has contributed to an emerging space-time orientation of a commercial society. Thus, Google Maps makes truth-claims about the Arctic Ocean as somewhere that can be used as a transport surface for human maritime traffic and commerce: the Arctic Ocean is represented as an economic zone. Within this truth-claim, any sea ice and seasonal differences in daylight such as mid-night sun contra total darkness become hazards and 'problems' for the free flow of ships and goods. Thus, Google Maps' omission of sea

[53] This idealisation emerged during the industrial capitalist era at the end of the 1800s. Before this, maps had shown the sea with colourful sea monsters, but now the oceans were represented in maps as blue, empty, featureless and formless (Steinberg 2001).

ice can enable expectations about an Arctic devoid of sea ice and seasonal changes. However, this is largely a myth since climate change will not create an ice-free Arctic Ocean all-year-round since sea ice will always reform in winter and there will be large regional differences in ice thickness (World Economic Forum 2014, p. 3). Moreover, as argued by Albert and Vasilache (2018, p. 5), the expectations of the possibilities for Arctic shipping have turned out to be highly exaggerated due to difficulties with ice packs and lack of infrastructure to accommodate any largescale transportation industry. Yet, by viewing the Arctic Ocean in Google Maps one is lead to believe that it has great potentials for hazard-free shipping and that it is a huge ocean that needs to be explored and traversed.

Moreover, Google Maps makes truth-claims about the seemingly forever existence of nation states (Neocleous 2003, p. 418). By visually marking the state borders and symbolising them with place names, Google Maps represent the 'truth' of a world divided into nation states. As such, the position and decision-making power of the nation states becomes a natural 'fact' which makes it more difficult for others to challenge decisions made by the nation states. This is a powerful truth-claim that occur in most world maps. On the other hand, while Google Maps mark out the borders between nation states on the land, no border lines are drawn into the ocean areas to mark sub-sea territories. Thus, while the Arctic Ocean is represented as an economic zone, the lack of state borders in the Arctic Ocean, as well as the other oceans, makes it open to exploitation but also to protection and conservation (Harris and Hazen 2006). Thus, the Arctic Ocean is represented to be 'open to anyone', which enables expectations about possibilities of the Arctic Ocean becoming a global common (Powell 2008) in the same way as Antarctica or, alternatively, the Arctic as an international region to be subject to international maritime law (Albert and Vasilache 2018). To sum-up, the overall truth-claims made by Google Maps is that the Arctic Ocean is a huge ocean where decisions yet are to be made concerning

the status of the Arctic nation states and that there are prospects of the Arctic becoming an economic zone or a global common.

The assumptions underlying Google Maps

One key assumption that underpins Google Maps, like so many other world maps, is a state centric frame of understanding the world (Shapiro 1997, p. 16). This frame is based upon a particular understanding of what is the 'modern' and legitimate organisation of the world and the division of, for example, national versus local space. Within this understanding there is a deep-seated and dominant assumption that the state system has simply emerged as an evolutionary historical 'fact' (Shapiro 1997, p. 15). Shapiro (1997) argues that modern cartography destroys and suppress alternative worlds by its state centric frame of understanding. He criticises the ahistorical assumptions behind such maps and highlight that: "Forgetfulness is thus less a matter of distraction than it is of historically structured angles of vision" (Shapiro 1997, p. 18). Thus, Google Maps ignores the violence and political struggles behind the making and maintaining of sovereign nation states (Shapiro 1997; Neocleous 2003). At the same time, it naturalises status quo and the dominant discourses about a state centric frame for thinking about the world and the Arctic. Within this assumption lies a fixation on the political organisation of the world into nation states at the expense and exclusion of other possible political organisations (Shapiro 1996), such as indigenous nations and nomadic cultures.

Moreover, Google Maps assumes that the Arctic Ocean is devoid of natural dynamics (i.e., sea ice) and that it is identical to other oceans, together with the seemingly 'natural' position of this huge ocean on the top of the world. Yet, Google Maps also naturalises an unquestioned primacy of the land: that the land is more important in the representation of the world than the sea. It is the land that has variations in colour and are categorised into political entities. By omission of any symbolism

showing variations in depts in the Arctic Ocean or the occurrence of sea ice, Google Maps make a particular way of looking at blue coloured oceans that is so familiar that it seems natural. Furthermore, the omission of sea ice build on an assumption about the sea ice as purposeless and primarily as a hazard that prevents easy travelling across the Arctic Ocean, like other oceans. This assumption is part of one of the oldest discourses about the Arctic being a wild, inhospitable, and challenging place (Albert and Vasilache 2018, p. 9). Moreover, the (Web) Mercator projection used by Google Maps constitutes the most successful version of "institutionalised forgetfulness" when it comes to indigenous practices of space (Shapiro 1997, p. 19). For example, Google Maps' 'worldview' fails to acknowledge that people's way of life in the Arctic, both indigenous and non-indigenous, as well as wildlife, are highly dependent on sea ice for travelling and hunting during the wintertime (Huntington, Gearheard, Holm, Noongwook, Opie, and Sanguya 2017). Thus, the visual representation in Google Maps completely ignores this crucial element in many Arctic people's everyday, often cultural, practices. In what follows, I address specifically the silences in Google Maps.

Silences and disempowerment

In Google Maps only the nation states and major oceans and seas are named, reproducing and naturalising their dominant position in the world, while silencing other places and groups.[54] Of course, this is not unique to Google Maps since most world maps emphasise the separation of the world into nation states as an unproblematic feature of the map (Black 1997). However, in Google Maps the name of the nation states to which the Arctic areas 'belong' are placed close to the capitals and thus, removed from the Arctic region, making the Arctic appears

[54] For example, Google Maps has been criticised for being complicit with the Israeli Government by not naming Palestine on its map (Change.org, 2016, March 20).

nameless except 'Arctic Ocean' and 'Greenland'.[55] This visual representation naturalises what is assumed to be the centres of the Arctic nation states: the capital cities of Ottawa, Moskva, Oslo, Stockholm, Helsinki, Washington D.C., and Copenhagen. Thus, other settlements, non-state authorities, regional centres as well as cultures are rejected by silencing them in the map – ignoring 'other' people who do not belong to the more powerful groups (Harley 1988a). For example, the approximately 300 000 indigenous peoples among the total of about four million people who live north of the Arctic Circle (Dodds 2018, p. 95) are being silenced in Google Maps. Among the indigenous are the Inupiat, Yup'ik, Alutiiq, Aleuts, and Athapaskans of Alaska; the Inuit, Inuvialuit, and Dene in northern Canada; the Kalaallit and Inughuit of Greenland; the Saami of Fennoscandia and Russia's Kola peninsula; and the Chukchi, Even, Evenk, Nenets, Nivkhi, and Yukaghor of northern Russia and Siberia (Dodds 2018, p. 95).

By silencing Arctic communities, both indigenous and non-indigenous peoples, Google Maps contributes to naturalising the powerful Arctic nation states and ensuring their status quo, while at the same time disempowering other nations and local communities. This silencing also relates to what Van Veeren (2018, p. 199) notes as the invisibility of the cultural forces that are reproducing particular identifies and their associated inequalities as these forces become 'naturalised' and commonsensical. Thus, the silencing help legitimise a particular construction of 'reality' according to nation state's identities and world views; constituting these identities as more 'natural', powerful, and valuable over others (Harley 1988a). This also makes it harder to overcome state centric thinking and appreciate alternative identities. One possible interpretation can be that, for example, a Russian identity

[55] By zooming in with one click with the mouse, Anchorage, the largest town in Alaska, Resolute (Bay) in Nunavut, Svalbard, and the territories and states of Canada and USA appear with names.

is more valued than a Nenet identity within the Russian nation state. Similarly, the identity of a Canadian in Toronto is valued more than a Canadian in Igloolik, Nunavut. Hence, Google Maps can be said to contribute to an implicit 'othering' of those who do not fit a nation state, 'Western'/'universal' ideal. Furthermore, assumptions about Arctic communities living scattered and isolated like islanders in the Pacific Ocean, far away from the centres of power, undermine and silences how these peoples have traversed vast distances, establishing fishing and hunting grounds and webs of routes between their communities (Craib 2017). This also silences the diversity of identities in the Arctic as well as the interactions that inhabitants have with each other, constituting them as disunited groups of people with limited political power.[56]

In addition to the silencing of humans, Google Maps also silence the environmental complexity and unique ecosystems present in the Arctic, such as the sea ice, animal habitats, and seasonal changes, as well as the impacts of climate change on the Arctic environment. Even if the Google Satellite View adds complexity to the Arctic Ocean – clouds and variations in colours – the sea ice is also here omitted from the map representation.[57] This is consistent with the previous contention put forth above about the 'blue void ideal' (Steinberg 2001) with Google Maps naturalising the Arctic Ocean as a huge, 'open' space, without 'problematic' sea ice or local inhabitants. From this perspective, the Arctic Ocean is constituted as traversable plain, open to commercial trade, tourism, and shipping – as a previously unruly, wild place now being controlled and mastered by humans (Tsing 2005). Thus, Google Maps enable a representation of what is not yet reality in the Arctic, setting the conditions for what can become in terms of thinking about

[56] In addition, I can imagine that if one's home is not named on in map, nor visible in satellite view, it can contribute to a feeling of insignificance and a lack of ontological security (Kinnvall 2007).

[57] Moreover, the nation state borders are still marked by light grey lines in Google Maps' Satellite View as if the nation states' borders are visible from space, having existed before the map itself.

'the Arctic' and one's expectations about its future. In what follows below I will continue scrutinising the cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation to further understand the constitutive power of Google Maps in the Arctic.

The constitutive power of Google Maps

One of the underlying assumptions in Google Maps is that the North is much larger and prominent that the South. The cartographic truth-claim about this differentiation is due to the use of the Web Mercator projection as mentioned above. Thus, Google Maps helps to reinforce and naturalise the position of the North in people's dominant worldviews.[58] In the case of the Arctic, Google Maps naturalises discourses about the Arctic as the 'Far North', 'High North', or 'Arctic Frontier' since its representation make the 'truth' claim that the world 'ends' at the top of the map with the huge, stretched out Arctic Ocean at its fringe. Moreover, due to the rectangular shape of Google Maps and many other world maps, 'the Arctic' becomes materialised as a distant place – a 'frontier' – at 'the edge' of the world. This is nicely illustrated in the opening statement by the Swedish Minister of Enterprise and Innovation at the time, Mikael Damberg, at the Arctic Frontiers conference in Tromsø, January 2018:

> Looking at the world map, Tromsø and the Arctic region is on the edge of the world. Almost invisible, far up by the North Pole. However, this is far from the truth today. Global developments have put the Arctic region at the centre of international attention […]. (Arctic Frontiers 2018, min. 29:16-29:40)

[58] In Norwegian, the preferred term in foreign policy discourse for describing the Arctic has simply been "The North" or "Northern regions". It was not until recently that the term "Arctic" has been employed (Hønneland 2017, p. 1-2).

In the quotation above, Minister Damberg views the Arctic from the 'outside' and describes it as a region that previously has passed unnoticed within international politics due to its assumed location in the 'far north'. While not displaying any map, his describes the Arctic as being located far up, by the North Pole – simultaneously pointing his hand upward in the air – appealing to the naturalised discourse about the North being 'up'. By referencing an assumed generic 'world map', Damberg rationalises the Arctic as peripheral and distant place, while arguing that international attention is a positive development for the Arctic. As such, he draws on a binary assumption about central/peripheral, in which being peripheral is less valued than being central – and as such a 'problem' (Bacchi 1999, 2009). Hence, increasing maritime traffic and international attention for the Arctic region becomes taken-for-granted as something 'positive'.

Moreover, in so doing, Damberg implies that those terms are absolute 'facts' – in a world map – rather than made meaningful and naturalised through cultural practices (Gregory 2004, p. 18), such as referring to or looking at 'the world map'. Hence, Damberg contributes to legitimise 'the world map' as a particular way of looking at the world: it appears as 'the way things are' and therefore, difficult to argue against (Neumann and Nexon 2006). This example, of a seemingly straight forward reference to 'the world map', illustrates how maps like Google Maps help constitute issues such as the future of the Arctic region in particular ways. Hence, Google Maps constitute and naturalises particular 'truths' about the Arctic while this meaning-making often goes unnoticed and unquestioned by audiences and within politics more broadly. As argued by Crampton (2002), the naturalisation of issues in maps are powerful because it stabilises existing power-knowledge structures. Moreover, the assumption about the Arctic as peripheral and distant in the 'far north' easily becomes accompanied by assumptions about the Arctic being 'underdeveloped' and in need of 'assistance' from the international community, as exemplified in the quotation from Minister Damberg.

This can contribute to an 'othering' and victimisation of the Arctic region and its peoples since they are 'outside' and far away from 'the international'.

The ignorance of local 'problems'

As noted above, world maps like Google Maps highlight the Arctic states at the expense of local Arctic inhabitants and non-state groups who are silenced and therefore disempowered. Moreover, since Google Maps ignores the existence of Arctic peoples and their ways of living it also silences their knowledge and problematisations. Together with the omission of any occurrences of sea ice in the Arctic Google Maps makes it possible to ignore any ice-related problems or possibilities such as the importance of sea ice freezing close to seashores in wintertime for many coastal communities. For example, without a protective frozen barrier at its shores the Inupiaq community of Shishmaref, which is an island in Alaska, is exposed to erosion by winter storms where as much as 30 meters of land can be lost during one storm (Røiri and Kjølleberg 2017, October 8). Whole houses have collapsed into the sea, with economic, political, and ontological consequences for Shishmaref's inhabitants. By ignoring such problematisations Google Maps imposes limits on what and who's 'problems' are considered important and what can be thought of and proposed as the solutions (Bacchi 1999, 2009). Thus, Google Maps is an example of what Ó Tuathail (1996, p. 2) describes as "idealized maps from the centre" that "clash with the lived geographies of the margin". The cartographic naturalisation by silencing issues relating to Arctic local peoples and the Arctic sea ice help materialise the subject position of certain peoples, mainly those who do not live and work in the Arctic, while ignoring what local Arctic inhabitants understand as their 'problem(s)'.

Moreover, as I discussed above, Google Maps proposes an outlook on the world where the nation states are the primary subjects, with regions, cities, towns, villages following hierarchically thereafter. This is being

strengthened and naturalised by not mentioning any indigenous place names. For example, 'Nunavut' in Northern Quebec, in Inuktitut ᓄᓇᕗᑦ, is not mentioned. This omission can also be related to the nomadic culture of many indigenous peoples which are seen as 'problematic' in mapping efforts where the aim is to locate peoples in fixed places (Neocleous 2003, p. 419). Thus, Google Maps prioritise names and alphabets belonging to central governments in nation states, naturalising dominant power-knowledge structures (Crampton 2002) while ignoring other peoples and languages. This exemplifies how names in maps often follow the legacies of conquest (Monmonier 2006): the place names reflect who seemingly first 'discovered' a place or an outsider's preference regardless of the people already living in that place. Hence, the nation states' primacy is constituted both by the emphasis on national borders and place names along with the exclusion of non-nation states' existence, names and alphabets. This reinforces dominant discourses about the Arctic and help materialise certain actor's expectations about the future other others.

The political visions of the nation states

According to what I have discussed above, the political visions coming from nation states are taken as primary given in Google Maps despite often being unrelated to the lived realities of Arctic communities. Moreover, ignoring local realities and local peoples as well as enabling visions about an ice-free Arctic Ocean can help materialise an Arctic future in which a particular type of capital intensive, economic 'development' is a predestined path for Arctic communities. Hence, Google Maps can pre-emptively shape the "conditions of possibility" (Connolly 1991 in Bleiker 2019, p. 119) setting the limits of what can be imagined for the future in the Arctic. Furthermore, the visual representation of the Arctic Ocean as a huge ocean, as large as the Pacific Ocean, can enable visions of a 'new' ocean in the making as sea ice is melting (or already depicted as being gone). For example, this type of envisioning is found in the headline in Bloomberg's business news: "The

World Has Discovered a $1 Trillion Ocean. Now what to do with it. The Arctic is open for business, and everyone wants a piece." (Roston 2016, January 21, title and para.1). The materialisation of such visions builds on the cartographic truth-claims and the cartographic naturalisation of these in maps such as Google Maps.

However, instead of naturalising dominant discourses about the Arctic as 'far away', 'distant', and preferably ice-free, circumpolar maps takes into account the interconnections and short distances in the Arctic region and across the significantly smaller Arctic Ocean compared to the Pacific, for example, between Russia and Canada. This could also limit thinking about the Arctic being somehow at 'the edge' of the world and reduce its peripheral positions in international politics. For example, the circumpolar map of the indigenous peoples of the Arctic from the Norwegian Polar Institute (Figure 6) highlights the diverse populations living along the shores of the Arctic Ocean. Commissioned by the Arctic Council, the map represents the indigenous peoples of the Arctic according to language families, even though they are still being categorised on the basis of which nation states they 'belong to'. While this maps also ignores the occurrence of Arctic sea ice, it does highlight the indigenous peoples and the variety among these populations living in the Arctic.

The map represents the indigenous language families grouped into Na'Dene in lilacs (Native American languages); Macro-Algonkian and Macro-Sioux in turquoises and grey-pinkish (North American Indian languages); Eskimo-Aleut in blues (Inuit, Yupik, and Aleut languages in Canada, Alaska, and Greenland); Uralic-Yukaghiran in yellows (including the Saami in Scandinavia, Nenets, and Yukagir in northern Russia); Altaic in browns (Siberian languages); and Chukotko-Kamchatkan in green (Kamchatka languages). What I find particularly interesting about this map is how it calls attention to the connections between indigenous languages and peoples across national borders, and

how it highlights the diverse group of indigenous peoples in northern Russia and Siberia. Hence, this map helps to materialise the existence and 'reality' of Arctic peoples and can enable alternative ideas about the future which go beyond the restrictions made by national borders.

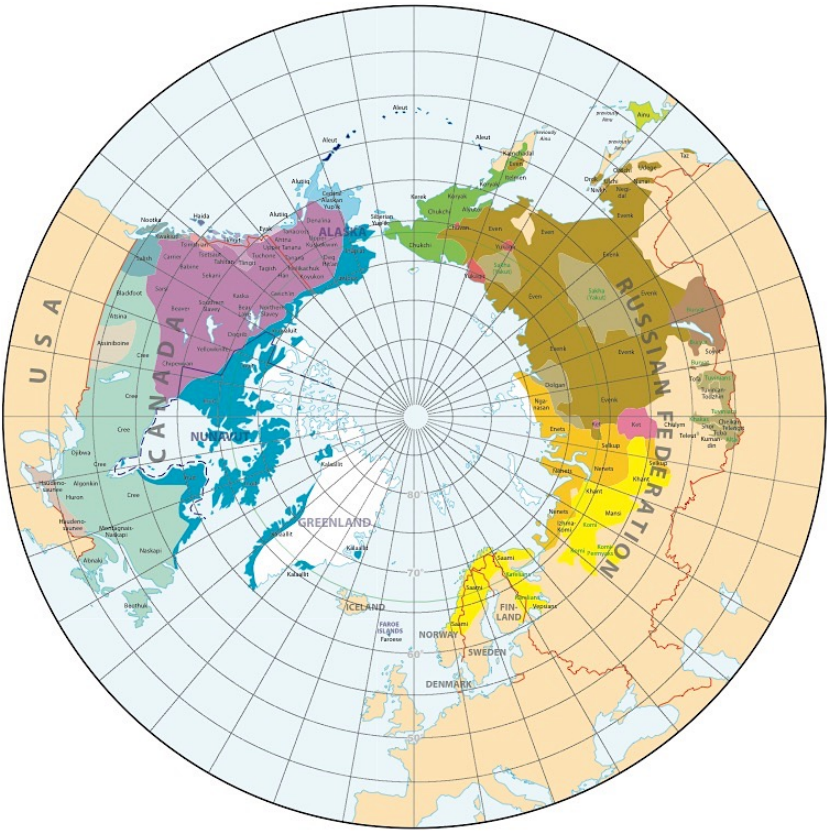

Figure 6. Map of the indigenous peoples of the Arctic ©Norwegian Polar Institute [59]

[59] Arctic Council Maps. Compiled by Winfried K. Dallmann ©Norwegian Polar Institute. Available at https://arctic-council.org/index.php/en/learn-more/maps (Accessed 5 March 2019)

Concluding this chapter

The lengthy use by Google Maps, from 2005 until 2018, and its continued presence in tablets and smartphones as well as in other online map services, pertains to the long-lived success of the (Web) Mercator rectangular worldview and the strength in the cartographic truth-claiming when using this projection. Thus, the constitutive power of Google Maps lies in naturalising the understandings of the 'North' and 'the Arctic' as necessarily being located 'on top' of 'the South' and that the Arctic is a huge, stretched out region 'far away'. Moreover, it has the effects of materialising and enabling particular understandings and visions for the future in the Arctic, mainly stemming from voices outside the region itself.

While Google Maps is an innovative and useful service in many ways it remains a for-profit corporate commissioned map that dominates the privatisation of the digital world (Zook and Graham 2007, p. 1334). Google Maps may be great for shopping and advertising, but Brotton (2013, June 1, sec.4, para.3) warns that it may not be so helpful in engaging with the world 'out there'. What has become clear in my deconstruction above is that Google Maps fails to engage with dynamics occurring in nature and to include the lived realities of Arctic peoples. Moreover, Google Maps' constitutive power effects lie in the cartographic materialisation of the nation states, industry, and businesses as the main political actors that get to shape the conditions under which the future in the Arctic is thought of and imagined. My analysis shows that maps are effective in naturalising particular power-knowledge structures and political organisations of the world as unquestioned 'facts'. Furthermore, due to its hegemonic position I argue that Google Maps have constitutive power effects in naturalising many people's 'world view'. Thus, I call for the need of a more diverse array of maps and map-makers that can inspire alternative 'truths' and visions beyond the for-profit perspective.

CHAPTER 5

The NSIDC map and the making of Arctic sea ice

This chapter follows the same structure as the previous one in examining a specific map from the United States' National Snow and Ice Data Center (NSIDC). Contrary to Google Maps, this particular map highlights the occurrence of sea ice in the Arctic Ocean – an area of political and environmental significance worldwide. The NSIDC map is made as part of monitoring and making forecasts about sea ice conditions in order to provide predictions about the rate of diminishing Arctic sea ice and its consequences for shipping and other activities. Such sea ice maps are widely cited by researchers and others who argue that climate change is faster in the Arctic than elsewhere on earth (cf. Sörlin and Lajus 2013; Christensen and Nilsson 2017). Due to the attention given to the Arctic sea ice as a measure of climate change many politicians and celebrities venture to the Arctic in order to "see" climate change. In July 2015, the then General Secretary of the United Nations, Ban Ki-Moon, visited Svalbard in preparation for the UN's climate convention in Paris. In a video from the UN Web-TV, Ban Ki-Moon

sits in an open rib boat close to a glacier front, while it calves into the sea. He finds the sight alarming:

> It looks magnificent, but at the same time I am alarmed that there are so many cracks that will soon break. They are melting very rapidly and I fully agree with what scientists have been projecting, that unless we take action now we will have to regret. (UN Web-TV 2015, July 8, min. 0:24-0:47)

Hence, the Arctic sea ice can be said to have become what Kate Manzo (2018) calls a climate iconography that visualises global climate politics. The NSIDC map(s) helps politicians and the public to acquire a deeper understanding of the magnitude of diminishing Arctic sea ice. Even activists use such visual tools: Greenpeace visualises the melting Arctic sea ice as part of their "Save the Arctic"-campaign (Greenpeace n.d.). In the same way as I proceeded in the Chapter 4, I start by providing a brief background to the NSIDC map. This is followed by an analysis of its contents and finally, I deconstruct the map and discuss the role of big data and science in the representation of current changes in the Arctic.

A brief background to the NSIDC

The National Snow and Ice Data Center is based at the University of Colorado at Boulder in the USA and researches the world's frozen realms – more specifically where water is found in solid forms as snow, ice, glaciers, and permafrost (NSIDC 2015). While the intended audience are scientists around the world (NSIDC 2015, p. 2) the maps and information provided by the NSIDC are also made available and understandable for the benefit of a wider audience. Moreover, the specific NSIDC map that I analyse in this chapter is constructed by the use of Sea Ice Index data derived from satellites within the U.S. Defence

Meteorological Satellite Program.[60] It appears in a NSIDC's Arctic sea ice news post, under the headline "Overview of conditions" (NSIDC 2018, September 27). The news post also contains other visual representations such as another map and a graph, and contains boxes of more facts and information located on its right side. The accompanied materials help underscore the map's authority and scientific trustworthiness.[61] Moreover, the NSIDC map is surrounded by a wide range of institutions and practices within which it is made and used. First, it is comprised of microwave-gathered data from satellites in space, belonging to the U.S. defence program. Second, this data is being analysed and represented in a map by scientists at a centre sponsored by a U.S. state department. Third, the map is part of a series of maps that are presented on the website *Arctic Sea Ice News and Analysis*. And lastly, the maps are being reproduced by other actors such as the U.S. National Aeronautics and Space Administration (NASA).

However, while the author of the news post is stated at the bottom of the news entry the scientists and others who actually made the map are not. I argue that this disembodiment encourages a definition of NSIDC scientists as non-individuals and an indefinite group of scientists. However, the map-makers in NSIDC are not simply transferring remote sensing and satellite data into pixels and different colours, but making conscious/unconscious choices about pixels and colours to achieve a particular map representation of the Arctic sea ice extent. As argued by Shim, remote sensing is "not an objective instrument of sight, but a subjective point of view concerning what deserves distant observation – and what does not" (2018, p. 270). It is the people – the NSIDC scientists – who make subjective decisions in the interpretation of

[60] The information about how the data is obtained and analysed is available via a link "About the data" in the text below the map on the website (NSIDC 2018, September 27).

[61] For example, the NSIDC also point out that its data is preliminary and may change with winds or late-season melting and therefore will be updated (NSIDC 2018, September 27).

satellite data. They decide what is an area of interest and what is not. I shall return to this contention in step 2 of the analysis.

Interpreting the NSIDC map

In this step 1 of the analysis, I interpret the contents in the map so as to unpack its visual representation of 'the Arctic', which is connected to its cartographic truth-claiming. Since the NSIDC map (Figure 8, p. 127) is made from using remote sensing via satellites in space that detect electromagnetic radiation from features on earth, such as sea ice (NSIDC 2019a), it is central to scrutinise the selection of what is represented in the map (Shim 2018). I start by examining the choice of map projection and how the NSIDC map privileges the position of certain elements over others. Second, I consider what the map's use of symbolism such as colours and place naming, and their significance for the understanding and construction of 'the Arctic'.

Polar projection and focal point

The NSIDC map uses a projection centred on the Arctic Ocean and the North Pole as apparently seen 'from above' without mentioning 'the Arctic' or 'Arctic Ocean' by name. In this way, the map naturalises such a birds-eye view of the Arctic region. This exact projection is developed by NSIDC and NASA, and is based on the polar stereographic projection (NSIDC 2019b). It is made by projecting a flat plane onto the earth's surface centred, in this case, on the North Pole, similar to the plane projected in Figure 7 below. The polar stereographic projection's view of the world is significantly different from the Mercator projection as it puts the North (or the South) pole at the centre with the continents circling around this point outwards. It is the projection of choice for topographic maps of the world's polar regions (Usery 2018). During the 1930s to 1950s, maps using polar projections became popular as the

world was on the dawn of air-age globalism (Barney 2018), reflecting the merging (American) "airman's view" of the world (Henrikson 1979, p. 174). For American audiences such map projections emphasised USA's proximity to Europe and the strategic position of the Arctic region and later, during the Cold War, also the closeness to the Soviet Union. Thus, Boria (2015) argues that the use of polar projections contributed to a new planetary consciousness about cartography both among scholars and the general public in America.

Moreover, in polar projections the Arctic appears as a region surrounding the north pole instead of a long-stretched ocean on top of the world as in the Mercator projection. Thus, 'the Arctic' is represented more as a connected region, which I will discuss further in the step 2 of the analysis.

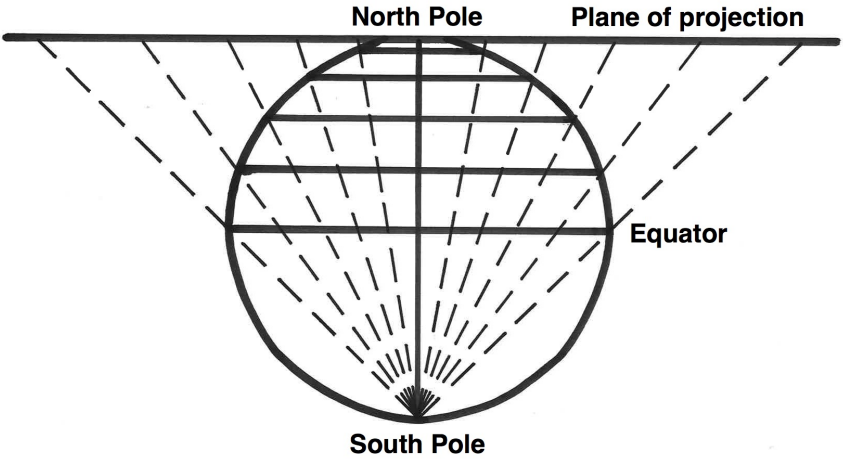

Figure 7. Geometric projection of the polar stereographic projection (Snyder 1987, p. 155). Reproduction by the author.

The NSIDC map is a rectangular cut out from the polar stereographic projection, possibly centred at the North Pole even though this is not stated. The spatial resolution in the map is pixel cell size of 25 x 25 km (NSIDC 2019b). While the map is made in the USA, few parts of the USA are represented (the name 'USA' does not appear at all) except 'Alaska'. Instead, the NSIDC map puts the Arctic Ocean at the centre. This may contribute to achieving a notion of the map as objective and neutral rather than subjectively constructed and as such contributes to a particular vision of Arctic politics.[62] The map probably comes across as unfamiliar to some onlookers due to its lack of standard North-South-East-West orientations. Moreover, there are no signs showing cardinal directions only three, thin, white lines that cross one point at the middle of the map with three circles ascending from this point. In what follows, I will continue discussing the symbolism and unfamiliar view of the Arctic in the NSIDC map, which is displayed below (Figure 8).

[62] Yet, the rectangular shape of the map is set vertically, which includes larger parts of the Northern Pacific and Northern Atlantic, which are part of the USA's national interest domain.

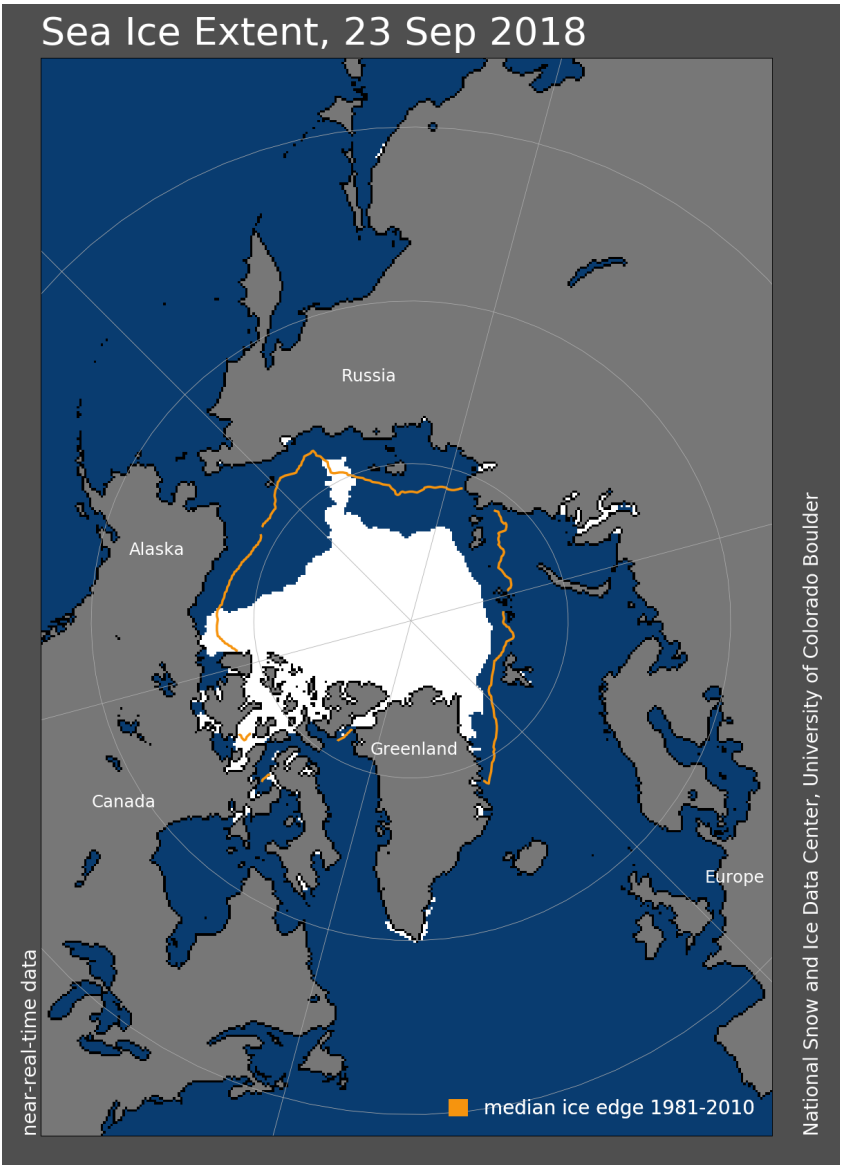

Figure 8. The NSIDC map of the sea ice on 23 September 2018 (NSIDC 2018, September 27). Image courtesy of the National Snow and Ice Data Center, University of Colorado, Boulder

Symbolism in the NSIDC map

In order to unpack the ways in which cartographic truth-claiming is employed in the map and what categorisations and naturalisations traits it harbours, I carefully describe the symbolism used in the map. Instead of a legend that explains the symbols and colours used in the NSIDC map there is only one orange square explaining that this colour indicates the "median ice edge 1981-2010" at the bottom of the map (NSIDC 2018, September 27). Thus, the map reader is expected to have an a priori understanding of what the other three main colours in the map mean. This may be an expression of hierarchy between the colours, with orange being one of the important ones. Only five place names appear on the map itself, in white, capital letters on top of grey areas: Alaska, Russia, Canada, Greenland, and Europe. There are no indications of borderlines between these entities which makes it unclear what areas the names symbolise. For example, the names 'Russia' and 'Europe' are placed on top of the same large grey area that dominates the right part of the map, which makes it possible to view the landmasses as being connected rather than separated into different nation states and regions.

While the NSIDC map does not represent national borders, the five place names in the map can be said to build a hierarchy among political actors. For example, 'Russia' and 'Canada' are named, while all the nation states in Scandinavia are not. 'Greenland' is also named while, for example, Iceland, Ellesmere Island, and parts of China and North Korea are not. Together with 'Alaska', if viewed as a representative of the USA, the map reaffirms the geopolitical status of the five Arctic coastal states: Canada, USA/Alaska, Denmark/Greenland, and Russia even though Norway is counted under the label 'Europe'. Consequently, it naturalises the political status quo where the Arctic 5 (the coastal states) are eager to dominate the Arctic 8, which includes Sweden, Finland and Iceland as permanent members in the Arctic Council (Bergman-Rosamond 2011; Steinberg et al. 2015). Nevertheless, the map does acknowledge

Alaska and Greenland over the nation states they (still) 'belong' to, probably due to their strategic significance nationally.

When it comes to the colours used in the map it is grey and dark blue that dominates, continuing 'beyond' the map's frame, while a smaller white area is the focal point, being placed at the centre of the map. Similar to Google Maps, the oceans and lakes are all represented in the same blue colour indicating that they are identical in function. The grey areas are lined with black colour showing the border between land and sea. There is no indication of variation in, for example, sea ice thickness, depth of the sea, vegetation on land, or the existence of glaciers and mountains. Moreover, this gives the impression that the Arctic sea ice is a huge thick, white mass of ice. The limited use of colours demonstrates that the NSIDC map is not intended to be decorative but informative regarding representation of satellite derived data. It appeals to what its audience, predominantly other scientists, expect the map to be about, namely to stick with the 'facts' about the sea ice.[63] While the white and orange colours have an enhanced position in the map the landmasses surrounding it are represented in monotone grey suggesting that they are unimportant to the map's issue representation. They appear lifeless without flora or fauna, or any human as well as non-human infrastructures. Hence, this shows what Harley (1988b) describes as a map's tendency to desocialise the issues they represent. I will return to the lack of humans and human agency in step 2 of the analysis below. Moreover, the homogenous grey colour symbolising land gives an impression of all land areas being identical and the Arctic being no different from other places. Hence, the Arctic becomes a place that can be made legible by nation states in the same manner as anywhere else on earth. For example, Arctic coastal states continuously work to delimit their outer continental shelfs by claiming territorial control of the Arctic

[63] NASA makes more 'nature like' and animated maps, which imitate and enlivens reality with more shades of colours, which the NSIDC refers to in their own Sea Ice News (NSIDC 2018, September 27).

Ocean sea bed within the framework of the UN Law of the Sea (see UNCLOS 1982) (Dodds 2010a).

Moreover, the NSIDC map represents the Arctic sea ice on one particular day, 23 September 2018. Thus, it represents a clearly chosen time and season. As one map in a series of maps it also appears to be a clearly limited snapshot in time and duration with the orange median lines offering historical comparison. Looking at other NSIDC news posts about the Arctic sea ice I notice that the colouring does not vary according to time of the day or season: no clouds, snow, or waves in the ocean are represented in the map itself. This is partly a result from how satellite sensing works and that the radiation waves penetrates clouds (NSIDC 2019a). The implication is that the Arctic (and other places as well) appears as a place without seasons or climatic variations. Nevertheless, the orange lines showing the median sea ice extent indicate that the map partly represents natural dynamics over time. Hence, the NSIDC map gains a more profound meaning when seen as one among many maps, visible when, for example, using NSIDC's animation tool which shows the maps in chronological order like motion pictures.[64] By describing the symbolism and lack thereof in the NSIDC map I have pointed to elements in the map representation that often pass unquestioned. Moreover, I have shown that the selection of what to show and highlight matters since it ignores something else. This becomes central in my deconstruction of the map which follows this step of the analysis.

Concluding step 1 of the analysis

Like Google Maps, the NSIDC map lacks common cartographic symbols such as a symbol for cardinal directions and a comprehensive map legend. It assumes that its viewers already know the Arctic Ocean

[64] NSIDC: Sea Ice Index Animation Tool [*Website*]. Retrieved from https://nsidc.org/data/seaice_index/archives/image_select

to be 'on top of the world' and being 'north' without, for example, symbolising that everything 'outside' the map's frame is 'south'. Moreover, it is the block colours that get to dominate the map representation. Overall, the NSIDC map may appear objective and simply informative, but it is also deeply political, ignoring many natural, social, and political features of the Arctic while enhancing others. I have shown how the map emphasises one part of the cryosphere, the Arctic sea ice. While the NSIDC map constitutes contrasts between land, ocean, and sea ice, it disregards the distinctions between different types of vegetation, land features (e.g., glaciers, mountains) and human infrastructures (e.g., few state names, no indication of settlements) which is common in other maps such as Google Maps. Hence, the NSIDC map fails to acknowledge the varieties in natural vegetations, landscapes, and the Arctic environment in particular, as well as human and non-human Arctic inhabitants. Thus, it can contribute to reproduce ideas about 'the Arctic' as an untouched wilderness. In what follows, I turn to the deconstruction of the map itself to unpack its political relevance in relations to its representation of 'nature'.

Deconstructing the NSIDC map

Above, I have begun to visualise and denaturalise the embedded politics within the seemingly neutral NSIDC map. In this step 2 of the analysis, I deconstruct the map building on what I have found in step 1 and employ questions to examine the underlying assumptions on which the map is founded (see Table 2, p. 89). By deconstructing the NSIDC map, I explore how it sets the conditions for what can be thought about in terms of 'the Arctic' and environmental and climatic changes. This helps me unpack the constitutive power effects of the NSIDC map in enabling particular thinking and political visions about the future of the Arctic.

Truth-claiming via science

As I have highlighted in the previous step 1 of the analysis, the NSIDC map mainly represent the Arctic as a place of sea ice despite the omission of the name 'Arctic' or 'Arctic Ocean'. There is nothing else very unique about the Arctic compared to other grey parts of the world. Moreover, with the highlighted median ice edge (i.e., the orange lines) the map constitute the 'truth' about the occurrence of an 'ice edge' that can be measured and monitored over time. This truth-claim is further strengthened by the construction of a white category of ice-covered areas clearly separated from a dark blue category of open water, although no map legend explains these colours. Hence, the NSIDC map helps to materialise an element in nature in a map: the occurrence of an 'ice edge'. However, the very definition of an 'ice edge' is a politically constructed definition: no clear-cut lines exist between these elements in nature (Steinberg and Kristoffersen 2017), not even between the ocean and the land, as I described in the previous chapter. The NSIDC map constructs its truth-claims via a sober visual representation with few colours, few place names, and no national borders with the 'ice edge' constructors – the map-makers – appearing as merely modest witnesses of nature, as suggested by Noel Castree and Bruce Braun (1998). By making an 'ice edge' 'real' on the map it also becomes naturalised into a fact and something/somewhere available to be monitored and mapped by the NSIDC as well as politically displaced by governments (see Steinberg and Kristoffersen 2017).

All the additional information; other maps, graphs, and tables, which are accessible at the same web page where the map appears, help to reinforce and naturalise the scientific foundation of the NSIDC map's truth-claims. Furthermore, with references given to other scientific authorities

such as NASA and NOAA[65], the map's audience are assured of the objectivity, accuracy, and neutrality at the base of the satellite data analysis. Thus, to the sea ice map, as to any map, a belief in 'truth of appearance' is fundamental to its function (Wood and Fels 2008). Moreover, the NSIDC map builds on and reinforces an understanding of the Arctic environment as somewhere that can and should be managed through continuous monitoring via satellites by scientists. In this way, it makes truth-claims about how environmental changes should be understood and governed, rendering this as a largely technical task. Thus, this cartographic truth-claiming also suggests that there is a technological-institutional fix for environmental problems (cf. Hajer 1995). Simultaneously, this contributes to legitimise the position and knowledge coming from the NSIDC's satellite derived maps and the NSIDC itself. Any disruptions in the sea ice monitoring or disbeliefs in the certainty of the satellite data or the NSIDC's analytical abilities would appear problematic in this regard. In the next step I consider the assumptions that underlie these problematisations.

Underlying assumptions within the NSIDC map

The NSIDC map is supposed to inform its audience about the deviations between the historical median sea ice extent and the current sea ice changes. As I have noted, there is an expectation on the part of the map-makers that the audience has prior knowledge about maps as well as the Arctic to understand where and what the map represents. Even though the orange median lines hints to dynamics over time the map itself shows no variations in the sea ice or the Arctic environment. For example, there is no variation shown in the thickness of the sea ice, in the dept of the ocean, or in the vegetation on land. In addition, no human infrastructure or animal habitats are represented. The underlying

[65] NASA and NOAA also use NSIDC data to make their own maps, adding complexity and credibility to the map in question (NSIDC 2018, September 27). See NOAA (2018, September 27)

assumption is that these elements are unnecessary and that a static construction of the Arctic sea ice and the Arctic unique environment is unproblematic. Thus, it is taken-for-granted that Arctic sea ice is monitorable and mappable and therefore seemingly controllable by humans (Harris and Hazen 2006; Wood and Fels 2008). This underpins the cartographic truth-claiming in the NSIDC map.

Moreover, the NSIDC map assumes that knowledge derived from data remotely acquired via satellites, what Karen Litfin (1997, p. 31) calls "abstract science", is to be privileged over knowledge derived from, for example, people living with the actual dynamics and changes in nature. This assumption has colonial undertones, emphasising an understanding of the Arctic that is abstract and detached from the unique, lived experiences of Arctic peoples. Moreover, the particular assumption of 'superior knowledge' is identified by Litfin as central in the field of satellite monitoring as she argues:

> Whenever quantifiability monopolizes the mantle of legitimacy, qualitative values are given short shrift, so that even if satellite data are supplemented with 'ground truth', the privileging of abstract decontextualized data is likely to devalue other approaches to knowledge. (1997, p. 31)

This suggests that the map represents the NSIDC scientists' knowledge (in Colorado) as being more valuable than local knowledge emerging from peoples living in the Arctic. This also assumes a privileged status of a science that builds on spacecraft, engineering, and data processing, which are elements that privilege an expert structure often dominated by white men in affluent societies (Litfin 1997, p. 31). Thus, within the NSIDC map's assumption about 'science' lies an unquestioned position of particular men outside the Arctic region, of which many are the NSIDC scientists themselves. The map, therefore, contribute to naturalise this position of white men and scientists.

Moreover, the NSIDC map builds on the dominant assumptions that many people south of the Arctic have about sea ice: that it mainly is a hazard, causing 'problems' to the ideal condition of open and traversable oceans. I discussed this in the previous chapter as the 'blue void' ideal (Steinberg 2001). Michael Bravo (2010) argues that even prior to the tragedy of the Titanic, the ship that crashed into an ice berg and sank in 1912, sea ice has been counted as a risk and financial liability for Arctic activities from the perspective of Europeans and North Americans. It has for a long time been considered a hindrance to fishing and navigation, thus as "a natural restraint on the growth of commerce" (Bravo 2010, p. 448). The NSIDC's everyday monitoring of Arctic sea ice is aimed at contributing with information, predictions, and preparedness to handle sea ice changes, serving stakeholders such as shipping companies (NSIDC 2015). Here I identify an underlying assumption about scientific knowledge and NSIDC's monitoring of sea ice which is a belief that this work will deepen the understanding of Arctic changes and help decision-makers make rational decisions. Hence, there is an underlying trust in science to lead the way to rational action (Litfin 1997). However, according to Litfin (1997, p. 37), this ignores how knowledge becomes power exactly through the prediction of future changes with the use of remote sensing satellites, which are not available to everyone. Therefore, I contend that the NSIDC map, as part of a series of maps, builds on a rationality in which 'Western' science is the main knowledge that will enable policy-makers to predict and 'manage' changes in the Arctic environment.

Overall, the truth-claim about 'scientific' knowledge and the naturalisation of sea ice as a hazard ignore other types of knowledge and lived realities in the Arctic. For example, Laidler, Elee, Ikummaq, Joamie, and Aporta (2010) explain how the Inuit people, indigenous to Greenland and northern Canada, always have adapted and continue to adapt to their changing environment. Over the centuries, indigenous experts have developed sophisticated knowledge about the complexity

and dynamics of both the local and regional marine environment (Laidler et al. 2010). Moreover, viewing Arctic sea ice loss as a bellwether for global climate change (Christensen and Nilsson 2017) may contribute to victimise local Arctic peoples and further subvert indigenous expert knowledge. In addition, a climate change crisis discourse helps construct local Arctic peoples as exposed victims to climate change (Tejsner 2013, p. 47). According to anthropologist Pelle Tejsner (2013), such victimisation is accompanied with an 'othering' of Inuit people that deprive them of agency to deal with pressing changes in their vicinity. Similarly, it strengthens a "metropolitan bias" of viewing peripheral places as 'hopeless' and deprived of creative capital regardless of the opposite being true in many northern communities (Petrov 2014, p. 13). Such bias is also indicative of downplaying local communities' capabilities in line with a postcolonial as well as gendered view of 'the other' as backward and vulnerable (Said 1978; Tsing 2005). In what follows I continue to deconstruct the inherent political assumptions and cartographic naturalisation in the NSIDC map by pointing out who and what is silenced in the map representation.

Silencing people and the causes climate change

The NSIDC map allows particular issues related to the Arctic sea ice to take shape and become dominant such as the global impacts of climate change in the perspective of seemingly neutral, American-based scientists. At the same time, the map silences local variabilities, cultural meanings attached to the sea ice, and the adaptive capacities of local people. Moreover, by denying the territorial expression of the Arctic and thus, its existence, Arctic peoples and other animals, their communities and the interconnections between them across the Arctic, are ignored and alternative understandings of 'reality' silenced. Thus, the NSIDC map silences other problematisations that do not relate to the large mass of sea ice, such as lack of healthcare, unemployment, or the problems related to the melting of permafrost which causes damages to houses

and infrastructure. In addition, by divorcing the Arctic from its people and assuming that it is an empty land mass without unique properties, the NSIDC map disempower local problematisations. It also visually removes prospects of building a political community across the Arctic (Bergman-Rosamond 2011; Bergman-Rosamond and Rosamond 2014).

In addition to silencing all local communities and non-state actors in the Arctic, the NSIDC map dissocialises the territory, i.e., no roads, no ports, no communities, and silences large parts of the world: half of North America, South America, Africa, most of Europe and Asia are outside the margins of the map. Hence the map highlights and naturalises one of the consequences of climate change in the Arctic – the loss of sea ice – while ignoring the sources of climate change: the carbon dioxide emissions mainly emerging in locations beyond the Arctic that contributes to global warming which melts the Arctic sea ice.[66] Overall, the NSIDC map naturalises what Marybeth Martello (2008) calls a climate change science without a human component, including the humans who made the map. The map is embedded in a context that values seemingly neutral science and remote sensing data over local humans' direct experiences. This valuation is central in the map's cartographic naturalisation which is further strengthened as the proponents of international climate change policy tend to emphasise the role of scientific evidence and computerised understanding of change (Dittmer et al. 2011). By silencing other knowledges and experiences of change in the Arctic, the NSIDC map reduces the changes in the Arctic sea ice cover to physical processes alone. In what follows I will discuss the constitutive power of the NSIDC map.

[66] Although, many of the Arctic states are economically dependent on the extraction of non-renewable energy resources often located within the Arctic region (Gjørv 2017). However, the emissions coming from the usage and burning of these non-renewables such as oil and gas, largely happen outside the Arctic region as these resources are exported elsewhere.

The constitutive power of the NSIDC map

The melting of Arctic sea ice is by many scientists, journalists, and climate activists seen as a momentous image of global climate change (Christensen and Nilsson 2017; Sörlin and Lajus 2013). Hence, the maps released by the NSIDC are often called upon for motivating and mobilising people to act on climate change. One reason, for example, may be that it is easier for the general public to comprehend warming in the context of melting of ice, especially compared to say, the slow intrusion of sea water into drinking water wells on islands in the Pacific Ocean. However, the NSIDC map also represent the 'truth' about the melting of Arctic sea ice which can bring business opportunities to the region, in the form of, for example, the opening of previously frozen sea routes, both for shipping and tourism, and an increased accessibility of previously inaccessible natural resources (see Dodds 2010a; Gjørv 2017; Borgerson 2008, 2013). This resonates with what Maarten Hajer and Wytske Versteeg (2005) argue, namely that it is not the environmental phenomenon in itself, e.g. climate change, but how society makes sense of this phenomenon that matters. In other words, linking sea ice loss to climate change can be seen as bringing major challenges, while also great, often economic, opportunities. In what follows I examine the discursive, subjectification, and lived effects, building on the previous steps above, in order to further unpack the cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation in the NSIDC map.

When it comes to the political authority, the NSIDC map contains place names of two nation states (Russia, Canada), one region (Europe), one federal state (Alaska), and one self-governed areas (Greenland). Despite a muddled mix, the NSIDC map can be said to reproduce the political authority of nation states. Hence, the NSIDC map naturalises the status-quo power-knowledge structures in the Arctic, naturalising its colonial underpinnings and the nation states' unquestioned dominance. Furthermore, this reinforces the dominant discourses about 'problems'

and political 'issues' in the Arctic according to the perspective of the nation states. In addition, as mentioned above, the map naturalises the dominance of knowledge coming from the 'centre' rather than the 'periphery'. In the case of the NSIDC map, this also means science sponsored by the U.S. state.

As I have noted above, the map does not address climate change directly, but prioritises monitoring the specificities of the Arctic sea ice changes in order to make future predictions about sea ice changes. Hence, it naturalises the assumptions about Arctic sea ice as a measure of global warming while limiting its consequences to that pertaining to the sea ice instead of other environmental and social consequences. While the loss in Arctic sea ice can be understood as a global indicator of the impact of climate change it simultaneously opens up a 'truth' about new economic opportunities that climate change may bring to the Arctic region (Sörlin and Lajus 2013, p. 83). I connect this to the meaning-making in regard to environmental phenomenon (Hajer and Versteeg 2005) and how the map materialises an Arctic Ocean in a process of becoming ice free, at least parts of the year. Thus, the NSIDC map not only 'speaks' the sea ice and an 'ice edge' into existence, but also anticipates its disappearance. This is connected to the cartographic materialisation in representing what is not yet, as I discussed in Chapter 2, and illustrates how the NSIDC can build particular expectations about a 'soon-to-be' ice-free Arctic Ocean. Overall the discursive effects of the NSIDC map is that it naturalises the Arctic region into a climate change 'impacted' region. It also naturalises the current political order where Arctic communities remain under the jurisdiction of nation states. Furthermore, the map stabilises established power-knowledge structures where Western scientific knowledge is thought of as being superior and where scientific centres like the NSIDC continues to have a strong position. In the next section I will explore the subjectification effects of the NSIDC map's representation of the Arctic region, in particular the making of an 'ice edge'.

The subjectification of an 'ice edge'

While the Arctic sea ice is represented as the main subject in the NSIDC map, a specific part of it becomes a more particular subject: the 'ice edge'. By defining an 'ice edge' as a measurable location in space both visually and textually the map manifests an understanding of nature as possible (for humans) to categorise into specific spaces (Harris and Hazen 2006; Steinberg and Kristoffersen 2017). Sea ice occurs in a mix with liquid sea water, fresh water, land, air and other objects, making it unfeasible and impractical to try to define a distinct 'ice edge' (Steinberg and Kristoffersen 2017). Still, through the process of mapping, the 'ice edge' has become an object of political discussions despite the absence of a standard for defining it. For example, in the maps that they study, Philip Steinberg and Berit Kristoffersen (2017) identify different sea ice concentration thresholds in Canadian versus Norwegian state maps. Similarly, I find the NSIDC map to contribute to a subjectification and materialisation of an 'ice edge' as a static representation of the division between sea ice and open sea. Moreover, I find the NSIDC map illustrating maps' general ability to represent something that does not exist, which still can become politically significant.

While I do not contest the visual habits of the NSIDC and the necessity of static representations in order to make useful maps, I here point to the effects of such a representation. The NSIDC map's proposal of the 'ice edge' as a significant subject gives the impression that nature is easily delimited and categorised and therefore, monitorable and controllable by humans. Following Bacchi's (1999, 2009) deconstruction of the definitions of policy areas, I ask: who benefits from this particular definition of a static 'ice edge' and a measurable sea ice extent? Certainly, this benefits the NSIDC. Their work depends on the monitoring of somewhere (i.e., the Arctic Ocean) and something (i.e., the ice edge) to provide concrete predictions and planning information to governments, businesses, and others. For example, such prediction services can be

about how early in the season a sea route will be open to traffic or how far north ships can explore the Arctic sea bed.

Moreover, the NSIDC map focuses our attention onto the large sheet of Arctic sea ice and permits an understanding of an 'ice edge' as a particular subject in need of monitoring. However, for local Arctic residents it is the sea ice forming closer to land, frozen to the shores or covering the fjords, that matters. For example, an important concern for Inuit people in Nunavut (northern Canada) is the "floe edge" where land-fast ice meets the open sea (Laidler et al. 2010). A floe edge is important for subsistence and commercial hunting, but also for travelling to meet family and friends, getting the latest news, and enjoying leisure time (Laidler et al. 2010). Thus, the sea ice connects people to each other and to their identity, as highlighted by Huntington et al.:

> Sea ice does indeed provide a surface for travelling, for visiting others, for being part of the land and sea, for breathing fresh air, for feeling free and whole. For Arctic peoples, sea ice is more than an object, it is part of a way of life, part of living a full life, part of what it means to be human. (2017, p. 594)

The quotation illustrates that it is not the Arctic sea ice at the focal point in the NSIDC map, but the sea ice lying closer to land that is important, useful, and valuable for local people's lives. Thus, the NSIDC map's ignorance of this may have consequences on their lives, with lived and materialised effects. As I have explained in the introduction to this chapter, this specific NSIDC map was published on 23 September 2018. Thus, it draws attention to the lowest yearly sea ice extent and emphasises the Arctic sea ice in the summer. However, it is in the winter that the sea ice is of most importance and significance for Arctic inhabitants (as well as the animals they hunt) (Huntington 2013). For Arctic residents, as argued by Henry Huntington, changes in sea ice are measured according to warmer winters rather than unusually hot

summers and thus, "[t]o focus on sea ice in summer is to miss the point" (2013, p. 119). Hence, the NSIDC map from 23 September 2018 misses the point: it shows the lowest sea ice extents during the year at a time when the sea ice matters less to local people. Although it is the NSIDC maps that show the minimum Arctic sea ice extension (commonly from the month of September) that get wide media attention, this yearly minimum does not give account for the seasonal lives of Arctic peoples. While people from outside the Arctic may make headlines about the low summer sea ice minimum, this minimum is of less relevance to local peoples and other animals, for whom it is the maximum extent in wintertime, January/February, that is crucial for hunting and travelling (Huntington 2013). This lack of connection to local lived realities and the aforementioned emphasis on nation states may undermine a local person's own view of her/his own position in Arctic affairs as well as further marginalise her/his voice in Arctic politics.

Moreover, as Caroline Desbiens (2010, p. 412) argues, it is the fluctuations in sea ice and weather patterns that often attract research funding in the case of the Arctic. When local peoples' knowledge is being consulted in research about the effects of climate change this mainly includes people in the traditionally male occupations, such as hunting and fishing, due to their broad geographical knowledge (Desbiens 2010, p. 412). Since, at least traditionally, women's environmental knowledge often is related to smaller geographic areas such as the household, their ways of knowing and connecting with the land is often undermined within research projects (Desbiens 2010). Hence, the NSIDC map and sea ice monitoring provide us with information about the prevalent physical conditions in the Arctic Ocean, but falls short of producing new understandings of local lived realities. Moreover, as argued by Dodds (2018, p. 107), the reflections on sea ice loss in the Arctic may not be sufficient to disrupt the continuation of fossil-fuels-based economies and the demands from global capitalism that drives climate change. In the next analytical step, I continue to discuss how the NSIDC map

materialise particular political expectations and visions for the future in the Arctic.

Political expectations: an economic zone

The NSIDC map constitutes both the Arctic region's 'fragility' as well as possibility of becoming ice free in summertime (Dittmer, Moisio, Ingram, and Dodds 2011). Dittmer et al. (2011) argue that such mapping and surveying are central to a geopolitical constitution of the Arctic space, feeding several future expectations which can be opportunistic and/or dystopian. For example, the inevitability of the melting away of sea ice in the Arctic Ocean can lead to a scramble for resources in the middle of an ecological disaster (Bergman-Rosamond and Rosamond 2014). Moreover, Dittmer et al. contend that constructions of the Arctic as an emerging economic zone "highlights the dominance of future over present in contemporary geopolitical discourses" (2011, p. 4). Similarly, Albert and Vasilache (2018, p. 14) find the 'economic zone' discourse as the one that most directly draws on the observation of regional effects of climate change, in particular the reduction of sea ice in the Arctic Ocean. This is well illustrated in a quotation from the opening speech by the then Greenlandic Minister of Finance, Mineral Resources and Foreign Affairs, Vittus Qujaukitsoq, at the Arctic Frontiers in 2016:

> While climate change poses a serious challenge to our way of life, it is also resulting in increased accessibility to our natural resources, bringing about new opportunities for development in the Arctic. (Arctic Frontiers 2016)[67]

Qujaukitsoq speaks about the challenges of climate change as an acknowledged 'fact' while explaining its consequences within an already existing discursive framework about the Arctic as a place of emerging opportunities. Thus, the NSIDC map can substantiate such discourses

[67] See Arctic Frontiers 2016, minutes 0:19:30 when Qujaukitsoq's speech begins

by constituting the Arctic as an emerging economic zone and materialising the possibility and probability of an ice-free Arctic Ocean in summertime. For example, an ice-free Arctic Ocean means that ships can travel from Asia across the northern coast of Russia to reach markets in Europe. This travel route is often represented in maps: Figure 9 shows two shipping routes from Asia to Europe: one across the Malacca strait and through the Suez Canal – the Southern sea route – the other along Japan and the northern shores of Russia – the Northern sea route. The blue line is represented as being shorter than the red line, indicating that the existing international shipping routes is in need of change and represents concerns (note the use of red colour) about the time and money spent on using long shipping routes.

This map representation is not just an impression of commercial concerns, but it also becomes part of how governing takes place because the related concerns are accepted as being 'real'. For example, in China's white paper released in January 2018, Arctic shipping routes are mentioned as likely to become important routes for international trade as a result of global warming (The State Council Information Office of the People's Republic of China 2018, January 26., sec.3, para.1). Hence, the shipping routes across the Arctic Ocean becomes what Bacchi and Goodwin (2016) describe as a desirable situation, which is also being promoted by political actors. This illustrates the constitutive power of maps in setting the conditions of possibility and enabling and materialising ideas about the future. Thus, the NSIDC map of a changing sea ice cover can help materialise visions about 'the Arctic' as a zone of economic opportunities in the making. At least theoretically, the melting of Arctic sea ice can increase the access to oil and gas resources, representing an 'opportunity' rather than a 'threat' to human societies (Gjørv 2017). Therefore, instead of being a warning to persuade a shift away from heavy industry and extraction, Mia Bennett (2016, p. 265) argues that the melting of Arctic sea ice is by many states and

corporations being perceived as an opportunity to extract even more resources from the Arctic.

Figure 9. Map of Northern Sea Route (blue) vs Southern Sea Route (red)[68]

[68] Map by Collin Knopp-Schwyn and Turkish Flame. CC-BY-4.0. *Wikicommons*. Retrieved from https://commons.wikimedia.org/w/index.php?curid=7865628https://commons.wikimedia.org/wiki/File:Northern_Sea_Route_vs_Southern_Sea_Route.svg

In other words, the NSIDC map mediates and constitutes the Arctic as a future supplier of resources and travel opportunities to the world, rather than providing for the needs of the Arctic region and its peoples. This is in line with prophesies associated with neo-realists like Borgerson, who I mentioned earlier is writing about an "Arctic Meltdown" (2008) and "The Coming Arctic Boom" (2013) (see p. 31-33). Moreover, instead of driving efforts to mitigate the emissions that cause the melting of Arctic sea ice, the NSIDC map materialises what Berit Kristoffersen (2015) calls an 'opportunistic adaptation' to climate change in the Arctic. This includes the possibilities of, for example, new shipping routes, fishing areas, and tourism opportunities, as well as the possibility of extracting petroleum, which I will deal with in the next chapter.

When considering the main omissions in the NSIDC map, many physical and social elements could be added to make a more inclusive and complex map. Through my deconstruction of the underlying assumptions regarding what is included/excluded in the map representation I find that the NSIDC could become more reflexive in their role as (political) knowledge-makers when making maps. As Sheila Jasanoff and Marybeth Martello argue, scientific and expert bodies, such as the NSIDC, should become more self-reflective and "more sensitive to possible blind spots and constraints of imagination underlying their global and universal orientations" (2004, p. 348). Moreover, there seem to have been little reflection on how the map is indicative both of the impact of climate change on Arctic sea ice as well as simultaneously becoming a "visible and tangible proof of the prospect of new economic order in the far north" (Sörlin and Lajus 2013, p. 83). One possibility for challenging this assumption could be to place less emphasis and sensationalism onto the minimum extents of the Arctic sea ice in summertime. Visions for the future in the Arctic could be different if the NSIDC and their maps instead highlight the sea ice maximum in wintertime and how this affects coastal inhabitants' ways of life. This

could entail, for example, acknowledging indigenous peoples' expertise, including women's, about changes in the weather and sea ice cover and represent these in maps that would be more useful for local peoples' thinking about the future. Moreover, this could also contribute to raise the awareness of the local and regional variabilities and unique properties in the Arctic among people living outside the region.

Concluding this chapter

In this chapter I have sought to disturb prevalent assumptions about neutrality and naturalisations present in a specific NSIDC map. My close analysis of the NSIDC map shows that it represents nature as being a place of static relationships between land, ocean, and sea ice and that it, intentionally or unintentionally, silences and further marginalises local Arctic populations and their expert knowledges. The NSIDC map also proposes a strict separation in our understanding of nature and culture, and knowledge and politics, making cartographic truth-claims about what is happening in nature. Moreover, I have scrutinized the seemingly non-political objective map to show how environmental matters in the Arctic, predominantly climate change, have been defined, measured, and made sense of through mapping and making maps. The NSIDC map makes the sea ice extent into something 'real' and mappable: it manifests an appearance of order in nature that becomes knowledgeable and manageable for humans, mainly on behalf of those who live outside the Arctic itself. In addition, the map naturalises the existence of an 'ice edge', which touches upon practical and philosophical issues within map-making regarding how to map the dynamics in nature. This brings insight into the issue of how to include nature as a factor in political understandings of places and issues. My deconstruction of the NSIDC map has shown that it is imbued with cultural and political meaning about what sea ice is, what Arctic 'problems' are being discussed, and what future visions and expectations are materialised.

CHAPTER 6

The USGS maps and the making of Arctic resources

> Before we can make decisions about our future use of oil and gas and related decisions about protecting endangered species, native communities and the health of our planet, we need to know what's out there […] (USGS 2008, July 23, sec. 4, para.1)

In the extract above, the then director of the United States Geological Survey (USGS), Mark Myers, articulated a dilemma regarding the use of oil and gas and the wellbeing of people and the planet. This chapter sheds light on this dilemma by exploring two maps that have emerged out of the USGS' estimations of undiscovered oil and gas in the Arctic. The maps represent the estimated location and quantity of undiscovered oil and gas in the Arctic Ocean, a site believed to be the largest unexplored area of petroleum on earth (USGS 2008). The USGS fact sheet and its associated maps are central in creating such prospects, in particular by representing the potential energy security stakes in the Arctic (Nicol and Heininen 2014). Such representations in turn give rise to expectations about future oil and gas finds in the Arctic and the

economic wealth that they might bring to states, private businesses, and local inhabitants.

This chapter follows the same structure as the previous chapters. Thus, I start by presenting a brief background to the USGS. I employ the approach based on my analytical framework presented in Chapter 3. First, I provide an interpretation of the maps' contents and secondly, a deconstruction of the USGS maps whereby I unpack their assumptions and discuss their cartographic truth-claiming, naturalisation, and materialisation about petroleum resources in the Arctic.

A brief background to the USGS

The creation of the USGS in 1879 marked a change in the surveying and use of geological information in the USA. Instead of only surveying what was found above the ground, the USGS was awarded the responsibility to prepare a topographic *and* geological map of the whole of the USA including what could be found below the ground (Rabbitt 1989). This included the occurrences of minerals, gold, and coal as well as water sources, forests, and arid areas. Eventually, oil also became a major interest after a successful drilling of an oil well in Texas in 1901 (Rabbitt 1989[69]). Almost 140 years since its creation, the USGS is the largest civilian mapping agency in the USA (USGS n.d.1). Its headquarters is located in Reston, Virginia, with local USGS offices located in every US State. As a US federal agency, the USGS only hires US citizens (USGS n.d.2). It produces a wide range of geological, topographical, and geospatial maps and has become an international cartographic authority, mapping the whole earth system as well as other planets and the moon.[70] Therefore, it is not surprising that the USGS' maps and information

[69] The fact that the USGS provides a historical account of how it was established on their website, with old photographs and documents, contributes to the construction of their authority and legitimacy (see Rabbitt 1989).

[70] See USGS maps overview: https://www.usgs.gov/products/maps/overview

about oil and gas in the Arctic largely go unquestioned among scientists, politicians, and the media beyond the USGS sphere (see Table 2, p. 89).

Interpreting the USGS maps

The USGS fact sheet that contains the two maps that I analyse (Figures 12 and 13, p. 155-156) is intertextually and inter-visually connected to other USGS fact sheets that contain maps illustrating the undiscovered petroleum in other parts of the world.[71] Thus, the maps in question are part of a wider context whereby they are seen as important and *natural* for conveying information about assessments of yet to be discovered natural resources. In the step 1 of the analysis which follows, I describe and interpret the USGS maps' contents in order to unpack how they represent undiscovered Arctic oil and gas by using a particular form of map projection, focal point, symbolism, and categorisation.

Polar projection and focal point

Similar to the NSIDC map's projection analysed in the previous chapter, the USGS maps also use a projection centred on the Arctic. Compared to the Mercator projection used in Google Maps, maps with projections centred on the Arctic region shows the proximity between Europe, Russia, Canada, and the USA across the North Pole. Instead of being projected as a spread out 'ocean' region on top of the world the Arctic appears as a connected region. The maps in question use a polar azimuthal projection which centres on the Arctic Ocean (Figure 10). They are round maps centred on a stabilised point most likely located at the North Pole (Alpha and Snyder 1982), even though this passes unmentioned. The Arctic Circle is named with capital letters and this circle is thicker compared to the other parallel latitude circles ascending

[71] See USGS Energy Resource Program > Publications: https://www.usgs.gov/energy-and-minerals/energy-resources-program

from the maps' centre points. This both enhances the position of the area within the Arctic Circle while simultaneously naturalising the Arctic as an area being located within the Arctic Circle. However, no other places, on land or at sea, are named in the map except initials indicating the names of the assessment areas. This lack of place names indicates an expected a priori knowledge on behalf of the map reader, in particular, a familiarity with maps centring on the North Pole enabling that reader to locate and envisage the different assessment areas.

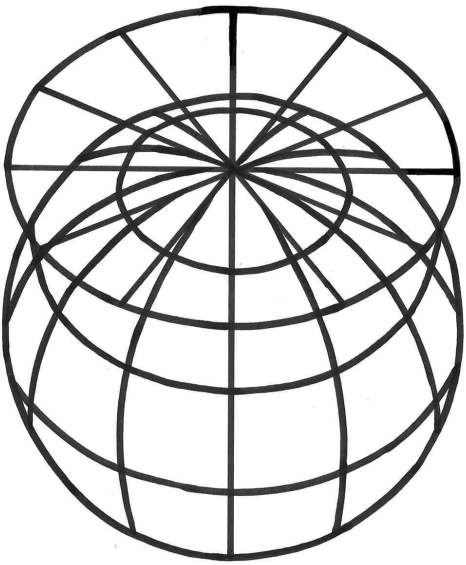

Figure 10. Polar Azimuthal projection (Snyder 1987, p. 6). Reproduction by the author.

Despite the USGS being located the USA and being a prominent U.S. agency, the USGS maps' focal point is not on the USA. Moreover, it is interesting to note that Alaska is barely visible at the bottom of the maps, which indicates a downplaying of the national character of the USGS maps' origins. This may enhance the neutral position and scientific authority of the USGS maps and their makers. Another interpretation could be, drawing upon to Kathrin Keil's (2014) empirical studies of the five Arctic coastal states, that the USA dedicates rather little importance to the Arctic in general and its potential petroleum resources in particular, compared to, for example, Russia.[72]

Moreover, compared to the previous maps that I analysed in Chapters 4 and 5, the USGS maps do have indications of cardinal directions. They are pointed out on each side of the map: "0º" on top; "180º" at the bottom; "90º E" on the left side; and "90º W" on the right side. Furthermore, there is a grid laid out on top of the maps, whose lines are drawn to correspond to the cardinal directions. This makes it possible to locate the assessment areas using latitudinal and longitudinal descriptions. The use of cardinal directions and a mathematical grid make the assessment areas of oil and gas identifiable and controllable within a cartographic way of describing places according to coordinates.

Below (Figure 11), I present the two pages from the USGS fact sheet (USGS 2008, p. 2-3) in which the two maps in question appear in the centre (red) and to the right (green), together with a map showing the assessment units with their probability (blue). What follows is a zoomed-in, modified view of the specific maps that I analyse in this chapter representing undiscovered oil (Figure 12, p. 155) and undiscovered gas (Figure 13, p. 156). I will then continue by turning to the maps use of symbolism.

[72] This may be changing with the provocative statements by the USA at the latest ministeral meeting in the Arctic Council, May 2019.

Figure 11. The USGS maps, as they appear in the fact sheet (USGS 2008, p. 2-3)

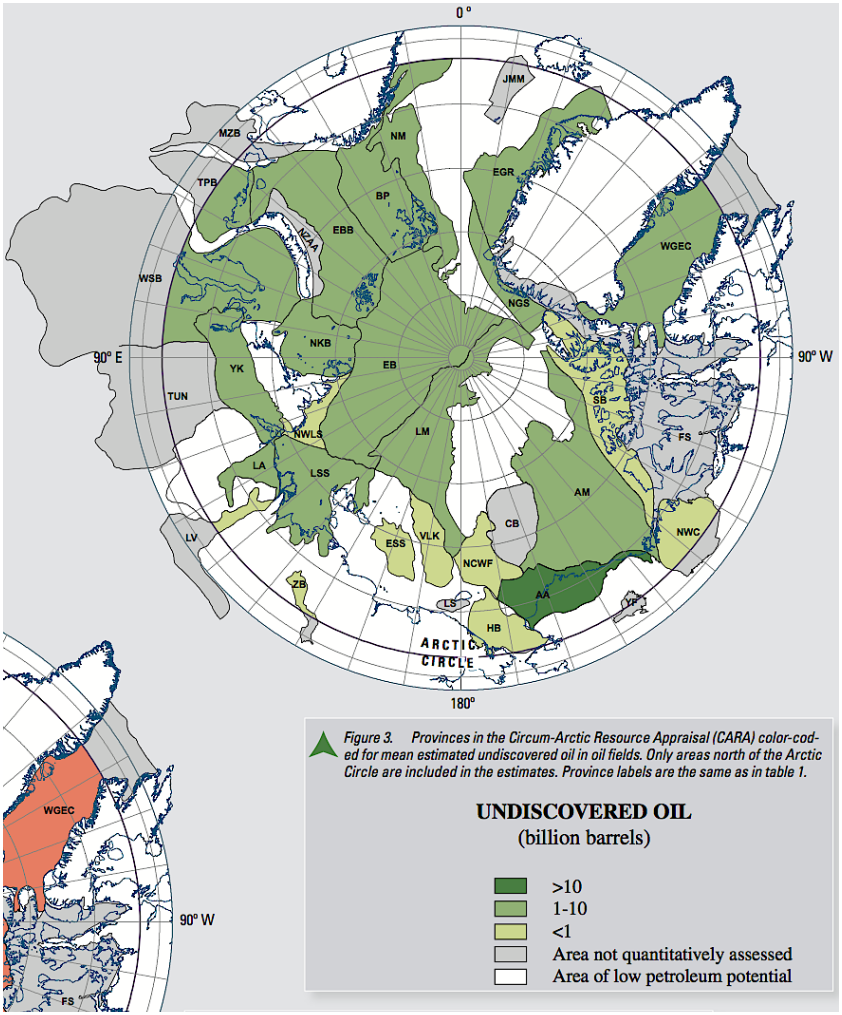

Figure 12. The USGS map of undiscovered oil (USGS 2008a, p. 3)

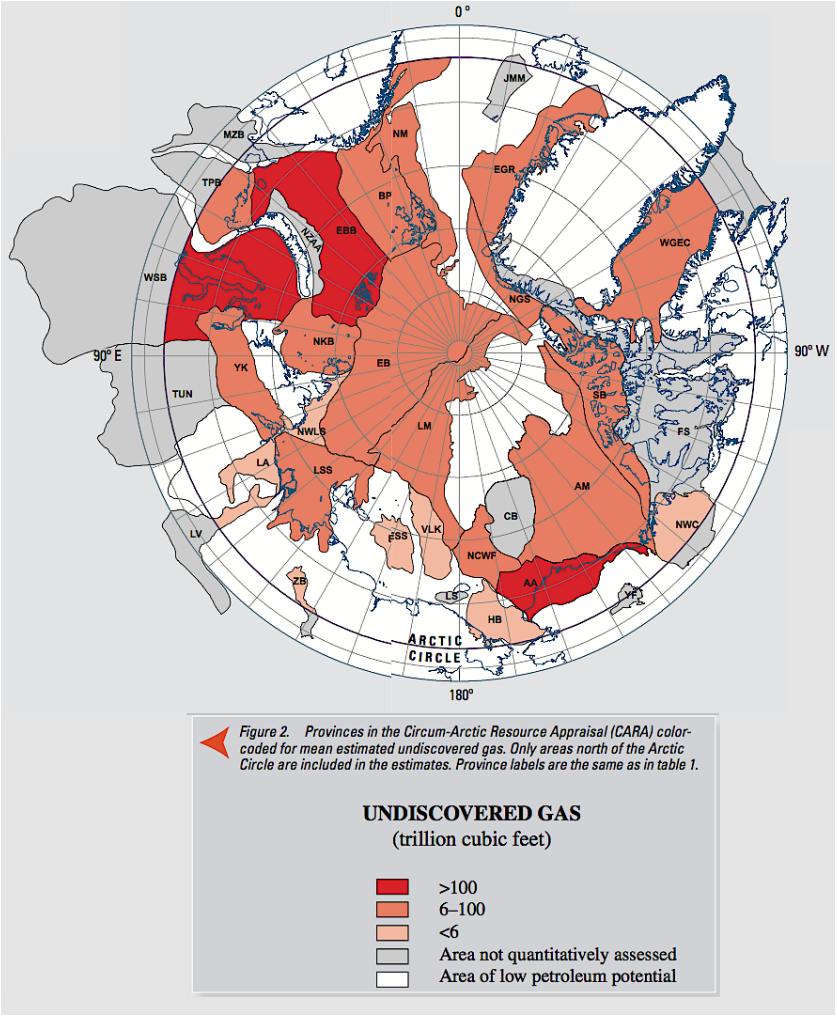

Figure 13. The USGS map of undiscovered gas (USGS 2008, p. 2-3). Modified by the author.

Symbolism: legends and colour hierarchies

At a first glace it is possible to observe that some places are marked out on the maps in darker colours than others, while some areas are merely white. The colours are explained in a map legend attached to each of the maps. Within each map legend there are six boxes: the first three show shades of red or green, from full colour to light colour, the fourth box is grey, and the last box is white. This can be interpreted as representing a hierarchy of interests in the map legend of what is important to represent: from top to bottom and from full to faded and non-coloured boxes. Therefore, the title above the legends, in bold capital letters, is what is sufficient for the map reader to get a quick understanding of what the maps represent. For example, to find out where the most probable areas for discovering oil in the Arctic are located, she/he simply needs to read the title of the map legend, "Undiscovered oil", and look for the darkest green areas (Figure 12, p. 155). Hence, the categorisation and naturalisation of colours in the USGS maps are symbols for measurements (Tufte 1990). Moreover, the difference between the gas, measured in trillion cubic feet, compared to the oil, measured in billion barrels, is not explained.[73]

When it comes to the representation of the assessment results in the maps, the USGS also relies on colours to:

- differentiate the assessment areas,
- show the quantity of undiscovered oil and gas in each assessment area,
- represent oil and gas as something 'real', and,
- to enliven the maps by using different variations of the same colour.

[73] Without this knowledge it is difficult to know if the dark red colour in the gas map at ">100" means a much larger quantity than the dark green in the oil map at ">10". This indicates that the map reader is expected to know the differences among mathematical measurements and what the symbols like < and > mean.

The oil map is represented in different shades of green, while the gas map in different shades of red. The USGS maps follow an oil=green convention.[74] Yet, this does not account for how oil and gas look like in nature where oil is blackish and gas is colourless. In this way, the maps mediate the undiscovered oil and gas as something visible and thus, 'true' and intelligible for the map readers. Moreover, the green and red colours only appear within the line marking the "ARCTIC CIRCLE", even though some assessment areas stretch beyond the Arctic circle. Outside the circle the areas are simply grey. For example, the map in Figure 12 (p. 155) represents the green areas to the left and right of the island of Greenland with the initials "EGR" and "WGEC". Here the green area seems to continue beyond the Arctic Circle (southwards), but when they appear outside the Arctic Circle the colour is no longer green but grey. In this way, the USGS maps make truth-claims about how to define 'the Arctic' as an area within the Arctic Circle and that this is a unique area of petroleum resources.

Moreover, both the USGS maps have initial letters placed on top of each coloured area, including the grey ones. These do not refer to socially defined areas such as regions or places where people live, rather to physically defined ocean basins represented in the maps. While the capital lettered initials are explained in a table on the last page of the USGS fact sheet (USGS 2008, p. 4) they are given less prominence in the map representations. Thus, the focus is on the green and red colours, their occurrence and quantity, rather than the geographical names of the places where petroleum can be found. Since it is only the Arctic Circle

[74] In the so-called 'Shell Standard Legend' for cartographic use there is one convention for representing oil in green, while another for representing oil in red (International Association of Oil and Gas Producers 2017, March 15). These are the two mapping conventions used worldwide by different governments and industries. When oil fields are green, the gas fields are red, and vice versa in the other convention. The USGS use their own digital cartographic standards for geologic map symbolisation (see USGS 2006).

that is named, this contributes to constituting 'the Arctic' as a region of oil and gas. Moreover, this standardisation and uniformity (Harley 1988a, p. 65) i.e., sole focus on oil in one map and gas in the other, limiting the attention to the specific character and individuality of local places and populations in the wider Arctic region. I will return to this silencing in step 2 of the analysis.

The lack of time and natural dynamics

The USGS maps show the probability and quantity of undiscovered petroleum that is believed to be recoverable by using the existing technology available as of 2008 (USGS 2008, p. 1). However, in the maps themselves and in their map legends there is nothing indicating that they represent assessment data for a particular year. Hence, in themselves the USGS makes truth-claims about the availability of the petroleum in general. Moreover, the maps do not represent the occurrence of sea ice or different depths in the Arctic Ocean which contributes to enhance the perceived availability of oil and gas. Similarly, any seasonal or environmental uniqueness of the Arctic is downplayed both visually and textually. In this way, the USGS maps constitute the assumed undiscovered oil and gas resources as meaningful in the effect of being available. This naturalisation of petroleum as merely 'physically occurring' in the Arctic depolitises petroleum resources by constituting them as 'natural', which is something that I will discuss further when I deconstruct the map below. Furthermore, the USGS maps, like the ones previously analysed in Chapter 4 and 5, naturalise a static division between the land and the sea. For example, the petroleum assessment areas are clearly demarcated by black lines; they do not gradually fade into one another, but are strictly defined areas. Therefore, similar to the NSIDC map, the USGS maps make truth-claims about geological occurrences in nature as being definable and containable. Thus, the petroleum resources are materialised as being discoverable and ownable.

Concluding step 1 of the analysis

The choice of letting maps dominate two of the four pages in the USGS fact sheet says something about the position and perhaps the prestige given to the making of these maps both by the USGS itself and its audience. Moreover, through a careful interpretation I have established that the colours employed in the oil and gas maps make truth claims about the Arctic as a place of undiscovered petroleum. Thus, the USGS maps make 'real' Arctic petroleum which can contribute to materialise these resources ahead of their actual discovery. This is similar to the ways in which land historically has been claimed ahead of actual conquest through the medium of the map (Branch 2014; Winichakul 1994). Moreover, the USGS maps assume a particular understanding about the purpose of such scientific assessments, namely to provide concrete results in order to inform rational political decision-making, as noted in the introduction to this chapter. The concrete results are made available through the colouring in the maps that make truth-claims about the occurrences and likelihoods of discovering oil and gas. As such, the USGS maps become background knowledge that limit as well as enable ways of thinking, talking, and imagining petroleum in the Arctic.

Furthermore, the USGS maps ignore the geographical, topographical, social, political, and environmental variations prevalent in the Arctic with no nation states, place names, humans, animals, vegetation, weather, or seasonal dynamics being visible. This, in turn, naturalises assumptions about the Arctic as a region not being all that distinct from other parts of the world except when it comes to the occurrence of potential petroleum. Other non-renewable resources in the Arctic such as minerals and rocks as well as renewable resources such as fish and wood are disregarded. Also ignored are any social or creative resources to be found in the Arctic such as human communities and infrastructure. Thus, the Arctic appears without people or societies: as an empty and unknown place, waiting to be 'discovered' (Bennett 2016). This

reinforces historical imaginings and assumptions about unprecedented opportunities to be found in the Arctic (Steinberg et al. 2015) whether in the shape of whale oil, seals, furs, gold, uranium, or petroleum (Hacquebord and Avango 2009). Thus, the USGS maps work as a background which enable visions pertaining to the 'opening up' of the Arctic for further exploration and exploitation (see Borgerson 2008, 2013). In the deconstruction step of the analysis that follows below, I will continue problematising the truth-claims, naturalisation, and materialisation about Arctic petroleum in the USGS maps.

Deconstructing the USGS maps

According to Bennett (2016, p. 266), the USGS' appraisal of Arctic petroleum follows a proliferation of geological surveys in the Arctic which can be interpreted as a return to a "mapping mania" expressed in actors' the pursuit of natural resources. Moreover, Wood and Fels (2008, p. 218) argue that USGS inventories frequently centre on the potential availability of natural resources, mainly regarding nature as a site which may be dug up, gathered, or harvested. This relates to my contentions presented in Chapter 2 about maps' ideational power. Here in step 2 of the analysis I will examine the truth-claims embedded in the USGS maps and the underlying assumptions and rationalities upon which these truth-claims are founded. Furthermore, I identify how the visual representation in the maps silence particular assumptions while simultaneously help naturalise these omissions. Overall, I discuss how the USGS maps employ cartographic truth-claiming, naturalisation, and materialisation and their consequences for limiting and enabling various ways of thinking and acting in regard to the future of the Arctic.

Truth-claims about 'the Arctic' and petroleum

The USGS maps make truth-claims about undiscovered Arctic oil and gas potentials and in so doing contributing to making such claims 'real'

and possible to quantify and map. They represent materialities that do not yet exist (Corner 1999). Hence, the USGS maps make possible the thinking and imagining of 'the Arctic' as a place of oil and gas resources. As expert knowledge, they reshape the Arctic from an unexpected place to a calculable place (Albert and Vasilache 2018, p. 13). This constitutes Arctic petroleum as 'real', discoverable, and ownable (Harley 1988b). Nowhere in the maps is it noted that they actually represent relative potentials, emerging from the Arctic sea basin, rather than absolute potentials (USGS 2008). What is more, the maps both visually and textually naturalise the Arctic region, e.g. within the Arctic Circle as a site of future oil and gas resources. The use of green and red colours in the maps as well as their usage in the map legends represent clear binaries between areas potentially containing petroleum compared to the grey or white areas not quantitatively assessed or with little potential for extraction. Hence, the USGS maps contributes to the narrowing down the number of interpretations and understandings available to the map user. Thus, one interpretation is that the discovery of the undiscovered oil and gas is a desirable outcome. This is also implicit in the naming of the legends as "Undiscovered oil" and "Undiscovered gas". Thus, the USGS maps constitute the knowability and 'reality' of the undiscovered oil and gas in the Arctic. The discoverability of the petroleum is made easier to imagine and think about through the employment of creative categorisations and naturalisations of their quantity and boundaries embedded in the maps.

Moreover, as I noted when examining the colours used in the maps above, the green and red colours only appear within the Arctic Circle, while the areas that stretch beyond the circle become grey or white. This change of colour makes a truth-claim about the locations outside the Arctic Circle as uninteresting and 'empty'. Thus, by making oil and gas 'exclusive' to the Arctic within the Arctic Circle, the USGS maps naturalise assumptions about the Arctic as a 'resource frontier' (see Steinberg et al. 2015). For example, Steinberg et al. (2015, p. 93) found

in their many interviews with Arctic government officials, NGO leaders, and industry representatives that the most common description of the Arctic is "vast natural resources".[75] Hence, the USGS maps reinforce such common assumptions by materialising the location of yet undiscovered petroleum resources within the Arctic Circle. Furthermore, without place names and graphic lines indicating social or political boundaries, the Arctic is represented as a socially empty space (Bergman-Rosamond 2011), while the green and red colours merely represent natural 'facts'. In what follows, I unpack the assumptions that underly this truth-claim about the Arctic and the probability of petroleum resources.

Underlying assumptions within the USGS maps

The USGS maps are founded on the assumption that scientific data analysis has the ability and legitimacy to make forecasts about the quantity of undiscovered petroleum in the Arctic. This in turn is rooted in certain assumptions being made about human beings, particularly scientists, as entitled and capable of categorising, mapping, controlling, and owning 'natural' resources, including those that have not been found. This is also an argument that I made in Chapter 2 when discussing the constitutive power of maps to materialise what is possible and what is not. Similar to the NSIDC map, the USGS maps assume that a static representation of natural elements is unproblematic and it is taken-for-granted that yet undiscovered resources in nature are mappable and controllable by humans (Wood and Fels 2008). Hence, the USGS maps reinforce assumptions about human's domination of

[75] In their study, Steinberg et al. (2015, p. 93) note that industry representatives would offer statistics and maps to support this description when interviewed. However, Steinberg et al. do not discuss further the constitutive role of maps, even though they actually display the complete double page from the USGS (2008) fact sheet where the two maps in question appear (see Steinberg et al. 2015, p. 94-95). No comment is made on the reproduction of these maps in the book.

nature through exact measurements (Crampton 1994) where nature is assigned meaningfulness when serving human interests. Alternative ways of understanding nature/human relations are disregarded as the USGS maps successfully silence other elements in nature such as vegetation and animals.

Underpinning the making of the truth-claims in the USGS maps is also an assumption that natural resources can be 'discovered' in advance through scientific calculation and data analysis. Thus, the USGS maps privilege abstract science (Litfin 1997) over actual experience or direct knowledge about petroleum resources in the Arctic. Moreover, this means that the USGS maps rest on an assumption that maps simply show natural 'facts' rather than helping constitute those 'facts' (see Shapiro 1988). The political judgements inherent in the maps' selection and coding are, in other words, naturalised and depoliticised (Ferguson 1996) sustaining the assumed absence of humans and other natural resources in the area projected. As I have shown above, the USGS maps do not simply mirror a presumed future 'reality' but help naturalise the availability of undiscovered oil (shades of green) and gas (shades of red) within the Arctic Circle. Within this naturalisation process also lies assumptions about the inevitable growing global need of these petroleum resources and, given that, the USGS maps providing important information for the future.

Furthermore, the assumptions in the USGS maps regarding ideas about the discovery of 'hidden' resources follow a long history of imagining the Arctic as a place of adventure and natural resource exploitation – the home of Western scientific exploration with clear colonial undertones that continue to persist today (Hanrahan 2017; Avango, Nilsson, and Roberts 2013). Similar to the NSIDC map analysed in the previous chapter, the USGS maps depict what is 'naturally' occurring in nature (Castree and Braun 1998) and the material and discursive representations and constructions of 'natural resources' are silenced in the process.

Moreover, as mentioned above, there are no indication of place names nor state borders in the USGS maps. Thus, the undiscovered petroleum resources are represented as occurring in a non-political space, as though they could be claimed by any state, business, or individual. These silences in the maps naturalise assumptions about the Arctic as a place where 'the international' has not yet caught up and reinforce the idea that resources and land still can be discovered and claimed.

Silences in the USGS maps

Through the making of truth-claims about undiscovered oil and undiscovered gas, the USGS maps enable and materialise expectations about the availability of petroleum resources in the Arctic. Meanwhile, as noted previously, other types of resources such as minerals, rare earths, stones, fish as well as human resources are silenced in the USGS maps. This silencing sets the conditions of possibility in thinking about what the main (economic) opportunities in the Arctic are. Moreover, since the USGS maps represent no variations between land and sea, or in the sea and seabed, they silence any obstacles to the possible discovery of the oil and gas. Hence, the discoverability and exploitability of the oil and gas become unproblematic as the Arctic is naturalised as having no other unique characteristics. Similar to Google Maps and the NSIDC map analysed in Chapters 4 and 5, the USGS maps lack most place names, ignoring the existence of settlements and infrastructures such as roads or shipping ports, although such infrastructures could potentially be crucial for exploration and exploitation of petroleum.

Furthermore, in the silencing of the peoples of the Arctic, the USGS maps enable ideas about the future discovery and exploitation of oil and gas that disregard any political issues relating to large-scale oil and gas extraction or environmental concerns as well as local peoples' rights to resources. Similarly, Bennett (2016, p. 262) notes that when places are made to appear as uninhabited, untouched and yet-to-be discovered, the extraction of resources appears more justifiable since the resources are

not "stolen" from anybody, nor are they owned by anyone. By silencing nation states as well as local peoples and their concerns about resource exploration and exploitation, the USGS maps displace any Arctic political authorities such governments, both national and local as well as any conflict over the natural resources. Moreover, the silencing naturalises and depoliticises the inherent political judgements within the maps' selected and coded representation (Ferguson 1996) by focussing on 'natural' and 'neutral' elements, i.e., petroleum and the Arctic Circle, and not highlighting any social or political elements in the maps. This also makes it possible for the USGS maps to enable thinking about the coloured areas as being 'up for grabs', simply waiting to be discovered by aspirational actors. Furthermore, since oil and gas are non-renewable resources their continued extraction and usage depend on the availability of more geographical areas to extract from. Hence, the USGS maps play a part in raising expectations among states, investors, and energy companies with the view of exploring the presumed discoverable oil and gas resources within the Arctic Circle. In what follows I will further examine the constitutive power of the USGS maps in representing 'the Arctic'.

The constitutive power of the USGS maps

As I have noted about, the silencing of both state actors and local political authorities and organisations in the Arctic in the USGS maps naturalise assumptions about 'the Arctic' as somewhere with oil and gas potentials that are neither discovered nor apparently claimed by anyone. This can in turn contribute to the legitimation of claiming Arctic petroleum resources and their later (self-fulfilling) discovery. Thus, one of the constitutive power effects in the USGS maps is the cartographic materialisation of 'freely available' Arctic frontier land and sea. As argued by Keith Barney (2009, p. 146), 'frontiers' must be created and this discursive construction is central in neoliberal forms of development: understanding somewhere as a 'resource frontier' serves ideological

functions for 'resource capital' and a commodification of nature. The materialisation of an Arctic 'frontier' in the USGS maps can become a legitimising rhetoric used by state agencies, companies, and investors in the promotion of the Arctic as, what Barney (2009, p. 147) calls, a "new frontier for corporate investment". This materialisation of a 'frontier' can also contribute to reevoking colonial ideas of the Arctic as an "underpopulated frontier zone" (Barney 2009, p. 149). This builds on assumptions about the Arctic territorial and oceanic floor as an available, untapped space, which for long has remained out of reach of international capital due to the Cold War and the Arctic sea ice blocking 'everything' (see Borgerson 2013). Climate change is now changing this and the melting of ice makes the petroleum accessible (Borgerson 2013).

Moreover, the dissocialised and static representation of the undiscovered oil and gas resources in the USGS maps are in line with Harley's (1992) argument surrounding the anticipatory use of maps. According to Harley (1992, p. 532), making maps that project an anticipatory territory was the first step in appropriating space from the distance and, in so doing also, choreographing colonial expansions. In the same way as the Americas had to be invented and integrated into the European consciousness through maps before they could be colonized, the Arctic oil and gas are being creatively mediated as discoverable through the USGS maps, even before they are discovered. In this way the USGS maps contribute to making the Arctic meaningful only in regard to petroleum potentials, thus, sustaining and limiting ideas about the Arctic as mainly being a place of resources and little else. Hence, the USGS maps limit the space available to for thinking about the future in the Arctic and in so doing limiting alternative future scenarios.

Materialising petroleum expectations

According to Gisa Weszkalnys (2015, p. 613), pinning down the precise location, quantity and quality of oil (and gas) is both difficult and costly. However, the USGS maps do exactly this. As noted above, constructing space as a 'frontier' can legitimize large-scale resource development and

attract corporate investments (Barney 2009, p. 147). Hence, the USGS maps can contribute to raising expectations about a profitable economic development that might arise from extraction of oil and gas. These petroleum expectations can have material effects as well. For example, expectations can rise regarding foreign investments and potential workplaces when estimations are made about the potentials for extracting petroleum (Weszkalnys 2015). The significance given to the estimation of potential oil and gas findings can drive expectations about a future in which Arctic communities embark on capital-intensive petroleum developments as the preferred development path. This also raises expectations in some of the Arctic states, such as Canada and Norway, to continue the production, sale and/or consumption of oil and gas energy resources despite the dangers of climate change to human wellbeing in the region (Gjørv 2017). Thus, disputes already exist, for example, between the Arctic coastal states regarding exclusive economic zones and boundaries of the continental shelfs (Dodds 2010a, 2010b; Keil 2014). In addition, nation states beyond the Arctic, such as China and the UK, show a good deal of interest in the Arctic, viewing the Arctic as a 'commons' in which they too have important energy security stakes (Nicol and Heininen 2014). Yet, others question the profitability of Arctic petroleum extraction and call off any 'oil bonanza' (Lindholt and Glomsrød 2012), amongst other things due to high production costs in an unpredictable Arctic environment (Harsem, Eide, and Heen 2011). However, these projected interests and disinterests are present in the naturalised view of the Arctic as having large quantities of unexploited petroleum. Thus, this understanding frame the thinking space (Bleiker 2017) available to the users of the maps.

Moreover, even though USGS scientists have not gone 'out there' and actually drilled in the different assessment areas their maps have the ability to make their estimations appear 'real' and as such, disable alternative ways of thinking about the future of the Arctic. Moreover, by simply naming and mapping potential 'Undiscovered oil' and

'Undiscovered gas', these resources become extracted from their natural subsoil texture and fed into human dreams about wealth and power, with little connection to the immediate natural reality of these resources (Žižek 2008 in Jönsson 2014). Thus, Erik Jönsson (2014) argues that in the context of the politics of expectations and the role of experts and expert knowledge (such as maps) any prospects and promises of future resource discoveries affect future visions and ambitions. For example, Weszkalnys' (2015) empirical study of Sao Tomé and Príncipe, an island country in the Gulf of Guinea, shows that entire populations may be left in a state of expectation while oil is being explored at massive expenses and with uncertain results. This state of expectation may last for a long time as the extraction of petroleum depends both on the geological conditions and the price on the market. Hence, the USGS maps may materialise petroleum expectations and draw investments and resources into fulfilling this expectation, while it may never actually materialise.

Furthermore, the USGS maps can drive expectations about petroleum discoveries that get to dominate contemporary thinking about the future of the Arctic, without taking account of the lived experiences and material effects that such representations might have on Arctic peoples. For example, Mark Nuttall (2015, p. 125) notes that the anticipation of oil exploration opportunities in offshore waters and other extractive industries have become the only basis upon which Greenland's economic future has been envisaged. This is also the only future vision that the Greenlandic government is willing to consider as that government is looking to exploit the economic benefits that climate change might bring to the local economy and future notions of a sovereign Greenlandic state (Dingman 2014; Bergman-Rosamond 2015). Indeed, there are assumptions that new oil fields and mines could ensure the necessary revenues needed to replace the current grants provided by Denmark and as such pave the way for sovereignty. According to Erica Dingman (2014), this appears to be a seductive proposal that has attracted the political elite and a good number of

people's wish to separate from the former coloniser once and for all. However, the political implication is that alternative voices, experiences, and perspectives on the future of Greenland are being disregarded (Dingman 2014).

Moreover, such an extraction-based development path, based on large-scale commercial production, is often dependent on Arctic 'outsiders' both as investors and potentially as migrant workers and scientific personnel (Nuttall 2015). Such development might then put pressure on the Greenlandic economy. In such a scenario, most of the revenues emerging from Arctic oil and gas resources would not stay in the Arctic but be transferred to other parts of the world. Thus, a key constitutive power effects harboured by the USGS maps is that they help naturalise and materialise a short-term thinking on petroleum extractions in Greenland and in other parts of the Arctic, at the expense of a long-term commitment to an economic development that could benefit Arctic communities. In what follows I discuss alternative visions for the Arctic future.

Alternative visions for the Arctic future

My deconstruction above, amongst other things, has centred on the ways in which the USGS maps, through cartographic naturalisation and cartographic materialisation, give rise to certain ideas about the future economy of the Arctic. Mainly, the USGS maps limit visions to the discovery of oil and gas in order to attract investments, jobs, and economic capital to the region. However, alternative visions of the Arctic future ought to be seriously considered. Discourses that are engaged in the balancing out of the extractive industries' dominance centre on ideas about advancing the local synergies between social and creative capital among peoples living in the Arctic peripheries (Petrov 2014). Instead of viewing Northern communities as 'hopeless places', Andrey Petrov (2014, p. 13-14) emphasises the need to enable thinking about the existing and potential creative "hot spots" in the Arctic that

could become centres of regional reinvention. He argues that remote places may have a higher level of creative potential, independence, and self-reliance compared to less remote peripheries. Moreover, remote settings may also be more attractive to creative individuals and provide better conditions for retaining local creativity (Petrov 2014), such as indigenous cultural economies.

Such notions of unique creativity were confirmed to me in conversations with peoples living in Longyearbyen on Svalbard where I did fieldwork in January 2016. Here there are many *ildsjeler*, 'fire spirited enthusiasts', who contribute to obtaining various services in the local community. For example, one person might simultaneously work as a teacher at the local school, hold a political post in the Community Council, and volunteer as a football coach and a local choir conductor. Moreover, this outlook on the social and creative capital in remote places differs from that of the Government of Greenland's one-tracked development path, which is dependent on extractive industries, as noted above. However, there are also those in Greenland who envisage the island as a key part of the Kingdom of Denmark (Rosing, Knudsen, Heinrich, and Rasmussen 2014). This involves diversifying the Greenlandic economy beyond fisheries, mining and tourism (Hauptmann 2016, February 1). Instead of only focussing on what the USGS maps represent, they can be contrasted with maps that enable other visions as well. First of all, other maps could point out the existence of local Arctic populations, for example, by including travel connections and language varieties (Figure 6, p. 119). In addition, making maps of Arctic environments by employing local experts would reduce the domination of USGS scientists and data analysts, mainly Arctic 'outsiders', in representing the Arctic region. This approach to mapping has the potential to expand upon existing Arctic knowledge and enabling Arctic and non-Arctic people alike to gain insight into the experiences and knowledge of local

communities and as such contribute to the preservation of their knowledge.[76]

Concluding this chapter

Through my interpretation and deconstruction of the USGS maps I have suggested that the USGS maps materialise the construction of the Arctic as a place harbouring undiscovered oil and gas resources: the two maps highlight the availability of undiscovered oil and gas as the main features within the Arctic Circle. Supported by a well-established US scientific geological surveying agency, the USGS maps make truth-claims about estimations of the potential quantities and geographical locations of 'yet-to-be' discovered oil and gas resources, while at the same time encouraging the pursuit of these petroleum resources. Thus, the maps in question are good examples of how seemingly unbiased, neutral expert knowledge mediated in maps can raise expectations about the future of a particular region and limit the range of ideas and future visions of that space. Such mapping practices can impede upon alternative visions of the Arctic future by focussing mainly on the exploitation of natural resources, rather than investing in existing or emerging social and creative resources.

In addition, by silencing local Arctic peoples the USGS maps represent the exploration and extraction of oil and gas in the Arctic as being unproblematic rather than disputed. This downplays the political decision-making in the Arctic at the local and national levels. In this way, the Arctic and any possible oil and gas discoverable are represented in the USGS maps as seemingly 'up for grabs' by interested parties, including non-Arctic states and businesses. Therefore, the main constitutive power of the USGS maps lies in its cartographic

[76] For an example of using maps in order to bridge cultures of knowledge on Greenland see Ann E. Lennert (2017).

materialisation of undiscovered petroleum together with their disregard for the politics surrounding any petroleum exploration and exploitation. Building on assumptions about the ability and legitimacy of scientific methods in forecasting oil and gas potentials, the USGS maps limit the understanding of the Arctic as primarily a resource 'frontier' awaiting both more scientific inquiry (by the USGS) as well as further industrial investments and commercial activities. In this way, the USGS maps help naturalise the need for particular types of knowledge and economic development.

CHAPTER 7

Conclusion

The aim of this thesis has been to understand the constitutive power of maps – how maps mediate political meaning-making and frame the conditions for possible political alternatives to emerge or to be silenced. In order to unpack the constitutive power of maps, this thesis has merged the interdisciplinary scholarly fields, those of visual politics and critical cartography. Three expressions of maps' constitutive power have been at the centre of the analysis: cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. Moreover, the constitutive power of maps and its effects have been examined through an analysis of three contemporary maps that represent different ways of understanding the Arctic and Arctic issues. In this concluding chapter, I discuss the main theoretical findings and contributions of the thesis, centring the discussion on why maps are central to the mediation of political meaning-making and what the empirical analysis of the Arctic has taught us about the constitutive power of maps. I also account for what we can learn about the Arctic through the study of the constitutive power of maps. Moreover, I discuss the thesis' methodological contribution as well as its strengths and limitations in unpacking maps' constitutive power. Finally, I suggest avenues for further research on the power of maps.

Maps mediate political meaning-making

One of the main arguments in this thesis is about the central role of maps in mediating political meaning-making and in turn how these mediations affect politics. My argument is based on a broad understanding of politics involving making choices among often conflicting political alternatives where the power lies in determining which of these to pursue. My study of politics does not centre on the material power of a specific actor, such as a map-maker or a state, to manipulate or propagate various political alternatives through the use of maps. Rather, the study centres on the map itself and its potential to constitute assumptions and alternative approaches to political dilemmas pertaining to the Arctic and its future. By theoretically examining the constitutive power of maps, I have substantiated my argument by showing that the power of maps does not solely rest on the interests of the map-maker, but also depends on the ways in which maps themselves play a key part in forming alternative conceptions of places and the resources and other potentials they might harbour. Hence, this thesis has sought to further an understanding of how maps perform the political by showing how they shape generally held assumptions about the 'reality' of the Arctic. Furthermore, I suggest that such cartographic assumptions can influence policy-makers and other actors' general understanding of the Arctic as well as influencing their prioritisation of pressing issues and dilemmas such as climate change and natural resource exploitation. The power of maps to shape Arctic politics is not always obvious and often requires an unpacking of the map's discursive representation, one of the aims of this thesis.

This thesis, moreover, combines the theoretical insights of visual politics and critical cartography to unpack the map's discursive representation as well as its constitutive power. By drawing on these bodies of literature, I have demonstrated 1) how visual representations, such as maps, mediate political meaning-making, and, as such, are politically significant

in and of themselves as well as 2) how maps might serve particular interests and influence ideas and visions about the future. By merging of visual politics and critical cartography, I was able to identify three constitutive effects of maps' constitutive power: cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. Although the thesis centres on 'cartographic' representations, I suggest that these three key concepts can also be applicable to other studies of visual representations more broadly (Shepherd 2016). Moreover, I argue that it is through cartographic truth-claiming, naturalisation, and materialisation that the constitutive power of maps operates and performs the political. In what follows, I unpack the three constitutive effects and how the empirical analysis has demonstrated their applicability and relevance.

Unpacking cartographic truth-claiming

By making cartographic truth-claims through visual representation, maps affect how the political 'reality' of a place or an issue is understood and dealt with. They provide us with insights that might be hard to come by without actually visiting a particular region such as the Arctic. Maps then are key to the mediation of commonplace understandings of political realities. Such truth-claims are based on the map's visual seductiveness, where the subjective choices and decisions that went into making of the map remain hidden, so the map 'mirrors' the world by appealing to singular notions of obstructing alternative visions. In this way, their visual representation helps constitute 'truths' upon which political routes are formed and alternatives are disregarded. This particular theoretical argument has been thoroughly substantiated in the empirical analyses in Chapters 4, 5, and 6.

In Chapter 4 I demonstrated how Google Maps makes cartographic truth-claims about the Arctic as a peripheral, blue void by representing the Arctic and the Arctic Ocean as a stretched-out region at 'the edge' of the world. This 'fact' substantiates a desirability of making the Arctic

less peripheral and more incorporated into 'the rest of the world' (see quotation by Damberg, p. 114). In addition, the distinct colouring of the Arctic Ocean used in the map creates the illusion that it is identical to all other oceans and water bodies on earth. The political meaning-making in Google Maps thus entails a normalisation of the Arctic Ocean as just another ocean, giving rise to ideas about new sea routes and profitable economic activities. Moreover, Google Maps, like other 'world maps', tends to geographically depict the world as a place divided into nation states, leaving out alternative ways of organising political and social life. This follows what Harley (1989) calls the systematic social inequality in maps as the more powerful within a society are depicted as the most important and prominent in the map. Indeed, Google Maps completely disregards the existence of local Arctic communities and it disempowers their voice on such things as climate change, new sea routes, and resource extraction, which I will return to when I unpack the cartographic naturalisation.

In Chapter 5, I discuss the ways that the National Snow and Ice Data Center (NSIDC) uses a map that visually establishes the Arctic as a place where sea ice is melting. Its visual representation focusses on a white mass in the middle of the map, suggesting that this mass is the most important cartographic element in the Arctic. It makes a strong cartographic truth-claim about the occurrence of an 'ice edge' between the white mass and the dark blue mass (the ocean). This also makes truth-claims about this edge being measurable and monitorable via satellites. Thus, the NSIDC map makes the truth-claim that science and technology can project and forecast knowledge on which political decisions can and should be grounded. However, the emphasis on science and technology leads to the privileging of particular types of knowledge, often derived from outside the Arctic, over other knowledges, for example, those rooted in local people's everyday interaction with sea ice.

Lastly, the USGS maps analysed in Chapter 6 make cartographic truth-claims about the quantity and location of yet-to-be discovered oil and gas resources in the Arctic. In particular, the use of a specific polar projection and colours to mark out the estimated oil (shades of green) and gas (shades of red) mediates the facticity of these resources' existence (see Figures 12 and 13, p. 155-156). Moreover, the USGS maps establish the Arctic as a place of petroleum and make truth-claims about its discoverability by categorising quantities into clearly separated assessment areas. Although the maps are made only by compiling existing statistical geological data and not by conducting any drilling tests in the actual assessment areas, the perceived 'reality' of these petroleum resources is still mediated through the maps. Hence, the USGS maps make possible political alternatives that concern the extraction of oil and gas in the Arctic. In the next section I discuss the different maps' naturalisation of the issues they represent.

Unpacking cartographic naturalisation

Cartographic naturalisation occurs when certain map elements are selected while others are omitted in the map's visual representation. Moreover, it engages in the depoliticisation of the world and issues within it by prioritising a particular view of the former as 'natural' and 'inevitable' and therefore difficult to contest (Neumann and Nexon 2006). Thus, cartographic naturalisation is about reinforcing and legitimating particular dominant discourses on which various political alternatives are based. In the empirical analysis this theoretical argument has been substantiated through a careful deconstruction of the underlying assumptions and silencing found in the maps under scrutiny.

Like many other world maps, Google Maps (Chapter 4) naturalises the dominant position of the North in people's worldviews and, as such, makes possible discursive constructions of the Arctic as a peripheral region located 'far north'. Moreover, it naturalises a view of the world as being divided into nation states. Within this naturalisation lies a

legitimation of the status quo and the prominence given to political alternatives voiced by the Arctic states, in particular the Arctic coastal states, while suppressing other alternatives, for example, voiced by non-state groups or indigenous peoples. Hence, Google Maps also naturalises and depoliticises the discourses that contribute to reproducing particular cultural identities and their accompanied inequalities (Van Veeren 2018), ignoring local Arctic people's problems and voices.

Within the NSIDC map (Chapter 5) lies a cartographic naturalisation of human's controllability of nature by visually representing a clearly definable 'ice edge'. However, this controllability naturalises the unquestioned position of more often than not white, male scientists outside the Arctic region whose knowledge through the possession of advanced satellite technology is prioritised over the knowledge of local experts (Litfin 1997). Moreover, the NSIDC map naturalises a dominant focus on the lowest yearly extent of the Arctic sea ice in summertime, while ignoring the sources of emissions that cause these changes as well as local inhabitants' concerns with the sea ice extent during wintertime, which can be such that it makes it difficult for them to travel and hunt. Hence, the NSIDC map gives substance to political alternatives that are based on dominant discourses about climate change and melting Arctic sea ice in the summer. However, this renders other climate change issues in the Arctic less visible, such as the collapse of seashores and melting of permafrost as well as silences other social and economic pressing issues concerning local communities such as health and education.

Furthermore, in the USGS maps (Chapter 6), cartographic naturalisation is visually noticeable in the colouring of oil and gas, while leaving out the extent of the Arctic sea ice cover and/or other local environmental variabilities. In the same way, these maps do not provide insight into the ways in which local communities are ordered or politically conducted. That is, the USGS maps naturalise the availability of petroleum within a seemingly non-political space to be claimable by any state, business, or

individual.[77] Thus, they reinforce and legitimise discourses about the Arctic as a 'resource frontier' offering endless economic prosperity and therefore narrow the alternative conceptualisations of the region. In what follows, I will unpack the ways in which maps can give rise to cartographic materialisation by visually representing not-yet-existing elements as both real and probable.

Unpacking cartographic materialisation

If maps are successful in making truth-claims and naturalise the issues they represent, they can have material effects, since they give rise to knowledge that is taken-for-granted. Thus, they can frame what is thinkable and doable and therefore they are political at their very core (Bleiker 2017). However, this cartographic materialisation can occur irrespective of the map-maker's intentions. Moreover, by studying the maps' cartographic materialisation we can begin to explain how maps can constitute the conditions of what is thought of as possible/impossible in a particular region. This in turn might shape particular expectations about the future, with the Arctic being particularly entangled within such expectations. Still, such representations can obscure other ways of thinking of Arctic politics, both in terms of challenges and opportunities pertaining to climate change and economic development. Thus, cartographic materialisation, as a visual process, has the potential to limit the range of political alternatives from which to choose from. Through a deconstruction of the discourses implicated in the maps, although not always spelled out, the subjectification inherent in the maps and the possible lived effects in the selected map representations, the empirical analysis has helped to substantiate the cartographic materialisation effects present in maps of the Arctic.

[77] Moreover, like the NSIDC map, the USGS maps also legitimate the necessity of scientists to make forecasts about the future, silencing other knowledges and ways of thinking about the future of the Arctic.

By bringing the Mercator projection into the digital age, Google Maps (Chapter 4) has contributed to reinforcing the position of 'the Arctic' as being in the 'Far/High North' and at 'the edge', as a 'frontier' of the world. Such dominant discourses are common in political rhetoric about the Arctic. Moreover, Google Maps' visual representation of the Arctic as a huge blue void without any sea ice helps to materialise the likelihood of a prosperous Arctic future where the melting of the circumpolar sea ice has paved the way for global commerce as well as natural resources explorations. By excluding local inhabitants or even a state's territorial power in the Arctic ocean, Google Maps constitutes this vision as being without political 'disturbances' and therefore up for grabs for private businesses and commercial actors.

In the case of the NSIDC map (Chapter 5), the visual representation of the melting Arctic sea ice helps materialise the Arctic as an emerging economic zone in the wake of climate change. Moreover, the polar projection chosen for this map cartographically materialises the short distances between, for example, Greenland and Alaska across the Arctic Ocean. Thus, it decreases the length of shipping routes in the Arctic and, in so doing, shapes expectations of new business opportunities as both probable and desirable alternatives for the future. Together with the silencing of what causes the Arctic sea ice to melt, such materialised opportunities make it hard to propose political alternatives that mitigate climate change and reduce the demand for material goods.

Lastly, the USGS maps (Chapter 6) are perhaps the best examples of cartographic materialisation effects. These maps contribute to materialising the existence of oil and gas without providing material evidence that they really exist. Thus, they clearly raise expectations about petroleum resources that might be discovered in the Arctic. Moreover, by silencing political boundaries as well as indigenous settlements, the USGS maps feed dominant understandings about an underpopulated and untapped Arctic 'frontier', which is central in neoliberal forms of

development and the commodification of nature. Thus, the USGS maps materialise political alternatives about a future based on the discovery and exploitation of oil and gas. This seductive proposal makes such a future both a probable and desirable alternative both for actors within the Arctic region and beyond. However, it limits the political alternatives to capital-intensive economic development based on non-renewable resources while ignoring both the problems related to such short-term development as well as other renewable and human creative resources in the Arctic.

Concluding remarks on the theoretical findings

The present study of the Arctic has provided new insights into the ways in which the constitutive power of maps operates through cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation. The empirical analysis in Chapters 4, 5, and 6 revealed that these three expressions of constitutive power are interlinked in three significant ways. First, maps make cartographic truth-claims through their visual representation such as their use of projection, focal point, signs, and colours. Second, these truth-claims are embedded in already existing dominant assumptions about the Arctic, for example, the 'natural' existence of nation states. Thus, the maps make use of cartographic naturalisation by reinforcing these assumptions as well as establishing new ones. Third, the cartographic naturalisation of a particular representation can lead to the materialisation of the expectations about what is not yet. Although I have found that the differences between the three constitutive effects are not so easily distinguishable and that they seemingly 'follow' each other, I have found it productive to study them separately since they highlight different aspects of maps' constitutive power.

In addition, although the three expressions of constitutive power operate simultaneously, I have also found that maps differ in how and what they emphasise regarding constitutive power. Cartographic truth-

claiming is perhaps the strongest constitutive effects of Google Maps since it is an overarching 'atlas' and 'world map' making 'general' claims about how to view the world and the Arctic. The NSIDC map makes truth-claims about the existence of a definable 'ice edge', but also contributes strongly to the naturalisation of scientific knowledge and technology as the most legitimate sources of knowledge for understanding the Arctic. Similarly, the USGS maps also naturalise the position of scientific knowledge over other types of knowledge and make powerful truth-claims about the existence of undiscovered oil and gas in the Arctic. Yet, of the three maps studied in this thesis, the cartographic materialisation is most obvious in the USGS maps, since these maps put a good deal of emphasis on what is yet to be discovered. These maps clearly show the relations between sight and site and as such establish the conditions of possibility for political response (Campbell 2007, p. 361). Thus, the USGS maps tap into notions of expectations about the future that are difficult to contest, unless they are actually found to be exaggerated.

Moreover, compared to previous studies of the power of maps, which tend to focus on how the map-maker's interests are implicated in the map or how well a map communicates its political message, I find that unpacking cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation provides a more exhaustive understanding of how maps perform the political and how the constitutive power of maps operates. Thus, I not only have provided a critique of previous work, but also have pointed out the unchallenged assumptions and visions upon which the map representations are based.

Maps constitute 'the Arctic'

By studying the power of maps, we have learned how the Arctic is constituted through discursive practices and visual representations

embedded in maps. The empirical analysis has shown how maps are central in creating particular points of departure from which 'the Arctic' and issues in the Arctic are understood. More specifically, the three maps analysed are shown to give rise to particular systems of meaning and values upon which political visions and potential action in the Arctic are directed and legitimised. The three maps have contributed to the unproblematic acceptance of the constitution of particular objects – i.e., the Arctic as a peripheral blue void, as an emerging economic zone, and as a resource frontier. They have also constituted particular subjects – i.e., the Arctic states as the main actors, and the silencing and marginalising of local Arctic peoples and indigenous cultures. Through these visual representations, maps constitute dominant views of the Arctic and its politics.

Considering the three maps together, one could argue that they build a coherent outlook on the future of the Arctic: Google Maps already portray the Arctic Ocean as an ice-free zone and the Arctic as being on 'the edge' – a frontier – of the world. At the same time, the NSIDC map represents the melting of Arctic sea ice through the use of orange median lines to contrast the white mass of sea ice. Thus, the NSIDC map contributes to raising expectations about the opening of a 'new' ocean, as shown in Google Maps, as well as the possibilities of soon accessing previously inaccessible natural resources, which are constituted as 'real' and discoverable in the USGS maps. In this way, this NSIDC map and the USGS maps limit political thinking, visions, and alternatives to an ice-free future that can lead to economic 'growth' through the extraction of natural resources previously made inaccessible by the Arctic sea ice. On the other hand, the three maps could also be seen as a warning about a future, encouraging actors to mitigate the impacts of climate change and to seek alternatives for how the Arctic's future can be thought of and imagined. This reimagining can be supported by the inclusion of more maps to build a basis for other political alternatives. As I suggested in Chapter 4, circumpolar maps that depict the various indigenous

groups in the Arctic (Figure 6, p. 119) help people become aware of these groups, who are actually living with the impacts of climate change and who will be affected by the different political alternatives emerging from different visions of the future.

Moreover, my critique in this thesis has not been centred on seeking to abolish the use of the maps that I analyse, rather I emphasise the underlying assumptions that inform how these maps depict 'the Arctic'. Through an empirical investigation and through theoretical reasoning I have sought to show how the constitutive power of maps operates. In my empirical analysis I have shown that maps tend to reinforce and reproduce prevalent dominant discourses, rather than seeking to deliver new insights and thoughts about the future and how to change practices that are detrimental to the Arctic such as mitigating greenhouse gas emissions and adapting to the changes brought by climate change. Finally, I advocate the use of many types of maps when discussing politics, especially Arctic politics. This implies that a need to recognise that all maps are constituted by politics as well as having the possibility of constituting politics. Hence, the tendency to use maps to create allegedly objective scientific certainties needs to be constantly questioned to achieve a fuller picture of the functions and powers of maps.

In this thesis, I have shown how commonplace maps constitute the Arctic as a knowable, regulatable space. For example, such visual representations have constitutive effects on how nature becomes a particular object and how Arctic peoples become particular subjects. These representations might also influence the ways in which people live, identify themselves, and contemplate their lives. There is a danger of limiting political alternatives to one story about the Arctic and its future. Therefore, drawing on Boria's insights, I argue that representation, such as those found in maps, are indeed "the precursor to action: before we can change reality, we must first be able to represent

the state of affairs we wish to bring about" (2015, p. 143). Thus, instead of arguing for abolishing the use of maps to convey information, I advocate the making and use of various types of maps that highlight different projections, focal points, cardinal directions, symbols, colours, and languages. This in turn could enable the reconceptualization of alternative futures for the Arctic. In what follows, I present my methodological contributions and discuss the use of this methodology to understand the power of maps.

Maps as visual representations

In this thesis, I have argued for the need to include maps as part of the study of visual politics. To problematise and analyse contemporary maps as visual representations, I have developed an analytical framework (Chapter 3) based on the merging of analytical elements associated with the visual politics and critical cartography fields, coupled with elements from Bacchi's 'What's the problem represented to be?' approach. The main methodological contribution of this thesis lies in its pluralist approach to interpreting and deconstructing maps as visual representations and not merely as textual representations as suggested by Harley (1989). This includes a close-reading of the maps' use of different cartographic elements such as projections and cardinal directions as well as its use of symbolism such as signs and colours. Moreover, by drawing on Bacchi's approach, I also find that I have contributed to enhancing this type of problematisation and thinking beyond policy analysis, which is something Bacchi (2018) has encouraged.

Furthermore, the analytical framework is built to allow a close-reading of specific maps in order to unpack their constitutive power and to analyse them as if they were 'strange' and unfamiliar. In this way, I have uncovered map codes and assumptions required in order to understand the map as well as to highlight elements that might have passed

unquestioned if the analysis had focussed on what the map-maker intended. For example, instead of approaching the NSIDC map as primarily being intended to represent the extent of Arctic sea ice on 23 September 2018, I scrutinise its representation of all land areas as homogenously grey. I also consider the relative lack of place names and the hierarchy built into the few place names mentioned. However, I acknowledge that this close reading of the maps leaves little room for also including the analysis of other forms of power. For example, I could have focussed more on mapping actions and mapping effects as grounded in cultural practice – (i.e., how maps are used such as in Kitchin, Dodge, and Perkins 2009, p. 16) – to understand the more direct power of maps. Or I could have examined in more detail the situatedness of the map (Hansen 2011) and the different institutions that the maps in question emerge from and their specific material and the institutional power within the context of the Arctic and beyond. These considerations have an obvious corollary: Why do the three maps originate in the USA?

Moreover, my analytical aim has not been to improve the design of maps or make them more accurate or 'ethical', as advocated by Harley (1991). Rather, I have raised critical awareness of the constitutive power of maps, and in so doing I have sought to broaden the perspective on how maps help to constitute politics. This involves calling for a wider and more diverse inclusion of maps when trying to understand commonplace ideas about the Arctic. As opposed to previous studies of the power of maps, which have focussed on maps portraying a particular country and mainly in a historical perspective, I have analysed three contemporary maps that represent different aspects of a region – the Arctic. Overall, by arguing for understanding power as constitutive, this thesis has shown that maps, like other visual representations, can influence political meaning-making, thinking, and acting in various ways that are relevant to the study of power and politics. However, maps differ from many other visual representations because of their truth-

claiming effects and contributions to naturalising certain forms of knowledge, the latter of which is based on scientific claims made by scientific agencies as in the case of the NSIDC and USGS. Maps are also different from images because they work at the level of fundamental worldviews – as 'social unconsciousness' (Bacchi 2009) – about the world and all in it. Yet, a key theoretical contention of this thesis has been that it is precisely the dual character of maps as being both scientific objects and aesthetically appealing artefacts that helps to strengthen their authority and legitimacy and ultimately their constitutive power. If people did not get pleasure out of gazing at maps or did not find maps interesting, they would not enjoy such a wide audience and cultural legitimacy. In a contemporary setting, this is enhanced by digital technology that makes maps accessible and enables the inclusion of a good deal of data, with Google Maps in particular possessing many user options. Rather than viewing modern maps as being beyond public and scholarly scrutiny, I have argued for the need to critically assess the constitutive power of contemporary maps representing the Arctic region. Moreover, since it is their visual representation that strengthens the cartographic truth-claiming, cartographic naturalisation, and cartographic materialisation, I argue that maps need to be considered more seriously within visual politics studies. I regard this field as an avenue for understanding maps as visual representations, harbouring constitutive power that differs from previous conceptions of the power of maps. To conclude this chapter, I will reflect on potential avenues for further research on the power of maps.

Avenues for further research

Here I reflect on potential avenues for further research that centres on the power of maps and their ability to shape political alternatives of what is politically possible and what is not. This includes asking critical questions about the maps that are part of our everyday experience: What

do they do to us and how do they reflect our understanding of political, economic, and environmental dilemmas? While my thesis mainly focuses on the map as a visual representation and not the map-maker, there exists interesting emerging possibilities for how to make maps. More specifically, today's technology and increased accessibility to geographical information are making it possible for non-cartographers to make maps (Crampton 2002, 2009; Wood 2010). This can open up a new avenue for maps as tools for the marginalised. Wood (2010, p. 111) argues that this "counter-mapping" is a way towards democratising map-making and map use beyond state institutions. I acknowledge the potential of counter-mapping to produce a wider variety of maps that could inspire different ways of thinking about the world and the Arctic in particular. For example, if people living in the Arctic were given the opportunity to strengthen their own map-making practices and make their own maps in large scale, preferably digitally, this could better reflect a local understanding of the changing circumstances and conditions to a wider audience.

As argued by Jeremy Black (1997), indigenous senses of space are potent because they have direct meaning for the people concerned rather than being abstractions produced by professional cartographers. However, he also warns us against romanticising indigenous map-making because it neglects the power involved in any knowledge creation and that map-making always involves a selection and a bias towards what is being mapped. Moreover, while the information represented in the maps may be generated from local voices, the base map that this information is represented in may not be. For example, the Sami Parliament of Sweden uses Google Maps as the base map to show reindeer herding territories suggesting the usefulness of Google Maps for a wide range of purposes.[78] Even though Google Maps shows such herding territories it

[78] See *Sámediggi*/Sami Parliament of Sweden – *Rennäringens markanvändning.* Retrieved from https://www.sametinget.se/underlag

does not depart from Google's representation that, among other things, highlights the territorial possessions of the Swedish state.

Moreover, as pointed out by Branch, the hegemonic position of territoriality maps which focus on the location of nation states continue to be "the only natural way to depict the world" (2014, p. 88). Therefore, it is the geometric understanding of political authority that still dominates the world and our understanding of it. States have come to represent political authority in the form of border posts and border controls (Branch 2014). Thus, maps contribute to making life difficult for non-state actors or non-territorial peoples, such as seasonal nomads within the Sami population of the Arctic. Moreover, maps make it difficult to think of other ways of organising the world. Here I see the potential for developing an IR reading of maps that considers how maps impose limits on thinking and imagining the world and international relations beyond the state. Moreover, it would be fruitful to research how maps have made particular identities tied to that of particular states or regions of the world. This could include field work where focus groups are presented with alternative maps depicting their own hometown or region. Such empirical work could lead to interesting answers of how maps affect self-understanding and self-identification. From the point of view of environmental studies, this way of presenting alternative maps could inspire new thinking that is needed to get us out of the ecological and environmental crisis the world is currently facing. As argued by Litfin, the global environmental change is a process where people are both the cause of change and the object of change: "It is a result of certain social choices and commitments, whether conscious or not, and will only be ameliorated by alternative choices" (1997, p. 33).

Moreover, as I noted in Chapter 4, Google Maps depicts the world as emanating from its user's own geographical position and as such allows a view the world centred on her or his specific location. An interesting point for further research would be to scrutinise what this centring on the individual does to map reading and the constitution of our

understanding of the Arctic and its politics – how it limits ideas about the future and narrows new ways of thinking about places and issues in the Arctic and beyond. Moreover, Google Maps is an instructive example of a profit-driven map-making actor that slowly, albeit steadily, is getting a dominant position within global map usage and as such in the constitution of political understandings across the world. Hence, it becomes important to be aware of how one map-making actor constitutes our understanding and use of maps in our everyday lives and contemplates what implications this might have for the construction of dilemmas and opportunities in international relations. This is related to the increasing use of Artificial Intelligence and algorithms in mediating online information. Today, algorithms are increasingly deciding what information people get to see (Kaempf 2018). Thus, Kaempf argues that "digital technology has moved us further away, rather than closer, to the idea of generating a diversity of views about world politics" (2018, p. 103).

Therefore, it is critical to study maps as part of digital technology. In the case of Google Maps and similar mapping services, this most notably concerns the commercialisation of maps and the increasing individualisation and narrowing down of worldviews and what effects this has on constituting politics. A key question here, then, is whether the invisibility of pressing political and social issues can at all attract our attention and by extension political intervention. Furthermore, as noted by William Rankin (2016), we are now walking around with politics in our pockets, with our smartphone easily accessible. Given this, it would be interesting to critically explore the significance of always having access to updated digital maps, with their individualised outlook and tailoring of information affecting our understanding of political opportunities and dilemmas. Moreover, this would provide insight into the constitutive power of maps in more aspects of our daily lives.

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This thesis contends that maps have constitutive power. As such they mediate political meaning-making and frame the conditions for political alternatives to emerge or to be silenced. To illustrate the constitutive power of maps, three contemporary maps are analysed with emphasis on how they limit and enable certain conceptualisations of the Arctic and politics within that region. The thesis, moreover, is an attempt to further conversations between visual politics and critical cartography in investigating the constitutive power of maps in international politics.

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Lund University
Faculty of Social Science
Department of Political Science
ISBN 978-91-7753-988-9
ISSN 0460-0037