

**Making sense of complex socio-ecological issues: a frame-analysis of  
Arctic natural resource development**

William Thomas Ronald Davies

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The candidate confirms that the work submitted is his own, except where work which has formed part of jointly-authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

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## PhD Publications

This thesis includes the following articles:

1. Davies, W., Wright, S. and Van Alstine, J. 2017. Framing a ‘climate change frontier’: international news media coverage surrounding natural resource development in Greenland, *Environmental Values* **26** (4): 481-502(22).
2. Davies, W., Van Alstine, J. and Lovett, J. 2016. ‘Frame conflicts’ in natural resource use: exploring framings around Arctic offshore petroleum using Q-methodology, *Environmental Policy and Governance* **26** (6): 482-497.
3. Davies, W. (n/a) Offshore oil drilling in the contemporary Arctic: examining the ‘discursive cacophony’ through a scalar approach. (Under review at *The Polar Journal*)

### Contribution of authors

I am the lead author for the articles outlined above. I designed the research objectives, the methodology, collected data (with the exception of some assistance for article (1)) and analysed the results. The contributions of other authors are outlined below.

1. Wright, S. Assisted in data collection and coding of international news media. Van Alstine, J. contributed in a supervisory role.
2. Van Alstine, J. and Lovett, J C. contributed in a supervisory role.
3. Van Alstine, J. and Lovett, J C. contributed in a supervisory role.

## **Rationale for publication by alternative format**

An alternative format thesis was chosen as the work of this thesis aligned into three strands suitable for publication. Each paper takes a distinct approach to frame analysis: examining media frames through content analysis of international news media; stakeholder frames through the use of Q-methodology; and scale-frame analysis through a broad range of data sources. Whilst distinct, they share an overarching theme in both empirical approach and research area that ensures there is coherence when compiled together.

The first chapter introduces the topic and places these papers within this overarching thematic context. More specifically, it situates the work within several research areas: wickedness in complex socio-ecological issues; framing and frame-conflicts; and the social construction of scale. How the three papers relate to the thesis' research aims and objectives are outlined. The methodology section details the thesis' research strategy, providing an overview on the methodological approach undertaken. The three empirical chapters make up the core of the thesis and are comprised of the three papers detailed in the PhD Publications section. The final chapter provides a discussion and conclusion around the subject of framing Arctic natural resource development, drawing insights from the empirical chapters.

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## **Abstract**

Environmental and natural resource issues are often framed in multiple ways by multiple stakeholders. This is especially the case in relation to Arctic natural resource development: a complex issue bearing the hallmarks of modern sustainability challenges. With the increasing attention placed towards the Arctic's natural resources comes a growing number of diverse voices, producing a discursive environment fertile for frame-conflicts and susceptible to misunderstanding, confusion and conflation. For many, the central challenge in tackling socio-ecological problems deriving from these complex issues centres on conflicting frames: from how problems are initially defined to what are appropriate solutions, these issues are social and political constructs and arenas for deep disagreement. As such, if policy efforts to meet the sustainability challenges associated with Arctic natural resources are to be successful, an understanding of frames proves essential. This thesis contributes towards this important research area by undertaking a frame-analysis of contemporary Arctic natural resource development.

This thesis consists of three empirical strands. The first examines media-frames in international news media coverage surrounding natural resources in an Arctic context. Using Greenland as a case-study, it illustrates a media portrayal of a close-knit relationship between a warming climate and natural resource development. The second strand uses Q-Methodology to explore frame-conflicts within a group of Arctic stakeholders around the issue of Arctic offshore petroleum, finding significant divergence across framings, with some bridges of consensus evident that could potentially facilitate collaborative policymaking. The third strand examines the role of scale-frames within the discussion around Arctic offshore petroleum, identifying several scale-challenges often related to the Arctic's nebulous relationship with scale. Themes emerging across these three strands point to a need for alternative conceptual approaches to space that capture the inter-relational complexity behind Arctic natural resource development. Relational geographies and assemblage-thinking are presented as useful conceptual lens in which to engage with this complexity.

This thesis argues that despite its inherent complexity, an understanding of the various ways Arctic natural resources are framed can offer guidance for policymakers such as highlighting the risks of dominant tropes, the existence of potential bridges and the

need for more refined terminology when necessary. In doing so, this thesis highlights the utility of mixed-methods frame analysis as a heuristic tool to better understand complex socio-ecological issues.

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## **List of Abbreviations**

ACIA: Arctic Climate Impact Assessment

AMAP: Arctic Monitoring and Assessment Programme

BP: British Petroleum

EEZ: Exclusive Economic Zone

ESRC: Economic and Social Research Council

EU: European Union

ICC: Inuit Circumpolar Council

IEA: International Energy Agency

IPCC: Intergovernmental Panel on Climate Change

MP: Member of Parliament

NGO: Non-Governmental Organisation

NIMBY: Not In My Backyard

OPEC: Organization of the Petroleum Exporting Countries

PCA: Principal Component Analysis

PM: Prime Minister

QCA: Qualitative Content Analysis

UN: United Nations

UNESCO: United Nations Educational, Scientific and Cultural Organization

USGS: United States Geological Survey

WWF: World Wildlife Fund

**Chapter 1**  
**Introduction**

## 1.1. Introduction

As the understanding of modern socio-ecological issues has grown (Ostrom, 2009; Buizer et al., 2011), the concept of ‘wickedness’ (issues possessing high levels of uncertainty, complexity and plurality) has been increasingly applied as a means of conceptualising them (Ayoub et al., 2009; Turnpenny et al., 2009; Balint et al., 2011; Whyte and Thompson, 2012). For many, the plurality of frames are central: from how problems are initially defined to what are appropriate solutions, these issues are social and political constructs and arenas for deep disagreement (Hisschemöller et al. 2001; Norton, 2012). As such, if efforts to tackle the challenges associated with wicked socio-ecological issues are to prove successful, an understanding of frames proves essential.

This is especially the case in relation to Arctic natural resources, with the development of hydrocarbons and rare-earth minerals representing examples of complex socio-ecological issues possessing an array of unique challenges (Roberts et al., 2010; Kämpf and Haley, 2014; Veland and Lynch, 2017). Furthermore, with the increasing attention placed towards the Arctic’s natural resources comes a growing number of diverse voices (Heininen et al., 2013), producing a discursive environment fertile for conflicting perspectives and susceptible to misunderstanding, confusion and conflation. In the contemporary Arctic, framing matters. Observing the ‘discursive cacophony’ surrounding Arctic natural resources, questions arise: What ‘Arctic’ is under discussion? At what levels is emphasis placed? In an increasingly globalised Arctic, how is natural resource development perceived internationally? Is Arctic natural resource use primarily about environment, economics, geopolitics or indigeneity? What bridges exist between seemingly irreconcilable positions? It is important questions such as these that this thesis seeks to address.

It does so by first exploring how Arctic natural resource development is framed globally, using Greenland as a case-study. International news media plays a significant role, contributing towards setting the tone and expectations for the burgeoning number of stakeholders engaging with the region. As such, media frames prove an important area of study. Whilst research examining media coverage around the contemporary Arctic exists (Christensen, 2013; Steinberg et al., 2014), it often takes the form of media coverage on the Arctic region in general or examining domestic news media

coverage in certain parts of the Arctic. This study makes a novel contribution by analysing how international news media portrays the specific issue of natural resource development in a particular region of the Arctic.

Second, this thesis takes the controversial issue of Arctic offshore petroleum development<sup>1</sup> and explores framings found across a group of stakeholders on the issue, empirically demonstrating the extent of frame conflicts and exploring possible bridges for consensus between these framings. As aforementioned, the negotiation between these framings lies at the heart of the challenges associated with wicked socio-ecological issues, especially for one as deeply contested as Arctic offshore. Given the influx of attention towards the contemporary Arctic and the offshore issue in particular, it is surprising that research explicitly exploring stakeholder perspectives remains fairly sparse (Mikkelsen and Langhelle, 2008; McDowell and Ford, 2014). This work seeks to address this research gap.

Third, acknowledging the interconnected, multi-scalar characteristics that underpin socio-ecological issues (Cash et al., 2006; Cumming et al., 2006), this thesis undertakes an examination of scale-frames in the contemporary discourse around Arctic offshore petroleum development. It does so with the purpose of pinpointing areas of incoherence and tensions littering the debate—important if collaboration and deliberative policy-making efforts are to succeed. The relationship of scale and the contemporary Arctic is an understudied field that this thesis seeks to contribute towards.

These three strands of frame-analysis, each approaching in different ways how Arctic natural resource development is framed, comprise this thesis' contribution to the literature, both in terms of studying framing in wicked socio-ecological issues and the Arctic social sciences on natural resources. Brought together, this thesis provides insights towards 'making sense' of the plurality surrounding Arctic natural resource development, offering novel and empirical research with an aim that greater knowledge of frame-plurality around this issue can contribute towards tackling its wickedness. Each strand is presented in the empirical chapters 2, 3 and 4, where specific details for background context, relevant literature and methodology are

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<sup>1</sup> The terms 'petroleum development' and 'hydrocarbon development' are used interchangeably throughout as well as the abbreviated term 'Arctic offshore'.

provided. The rest of this chapter takes the following structure. Section 1.2 presents the thesis' research aim and objectives. Section 1.3 provides an overview and historical context of Arctic natural resources. Section 1.4 presents a literature review of the wider research themes covered by this thesis: wickedness, framing and scale in socio-ecological issues. Section 1.5 outlines the research strategy used in this thesis, covering its research philosophy, methodological approaches and ethics. Section 1.6 concludes this chapter by outlining the structure of the following chapters.

## **1.2. Research Aim and Objectives**

This section presents the thesis' research aim, its research objectives and research questions related to these objectives. Research objectives 1, 2 and 3 are covered in Chapters 2, 3 and 4 respectively. The research philosophy that underpins these research aims and objectives and the research strategy used to achieve them are described in Section 1.5. Specific methodological details around data collection and analysis are presented in each relevant chapter.

### Research Aim

The overarching research aim of this thesis is *to explore the various ways in which Arctic natural resource development is framed.*

### Research Objectives

1) Examine how natural resource development in an Arctic context is framed internationally

- (a) How does international news media frame natural resource development in Greenland?
- (b) What are the consequences of these international news media frames?

- 2) Explore frames amongst stakeholders around an Arctic natural resource issue
  - (a) What frames exist around the subject of Arctic offshore petroleum?
  - (b) To what extent are there 'frame-conflicts' around Arctic offshore petroleum?
  - (c) What possible bridges for consensus exist between conflicting frames?
  
- 3) Examine the role of scale in framing Arctic natural resource development
  - (a) What scale-frames exist within the discourse surrounding Arctic offshore petroleum?
  - (b) What challenges are associated with these scale-frames?
  - (c) To what extent can a scalar approach act as a heuristic to pinpoint incoherencies surrounding Arctic offshore petroleum?

### **1.3. Background Context**

Before detailing the academic literature around this thesis' main themes, this section provides an overview of natural resources in Arctic and Greenland as well as the historical context of Arctic natural resource development. Reviews of the social sciences literature covering Arctic natural resources, Arctic offshore petroleum, Arctic stakeholders and the relationship of scale and the Arctic are located in the relevant empirical chapters 2, 3 and 4.

#### *1.3.1. Arctic natural resources*

Exact definitions of what constitutes the 'Arctic' (sometimes referred to as the Circumpolar North) can vary, though the most common refers to a simple geographical boundary: the territory and sea located between the North Pole and the Arctic Circle (Arctic Circle (66° 33' 44" North) (Finger-Stich and Finger, 2012). However, this

demarcation is hardly definitive and is often used transiently with other definitions such as temperature (the area with a July isotherm below 10° C), vegetation distribution (the northernmost boundary between boreal forest and tundra (ACIA, 2004)) and various political boundaries (e.g. the territory inhabited by Arctic indigenous populations) (see Figure 1.1) (Rekacewicz, 2012).

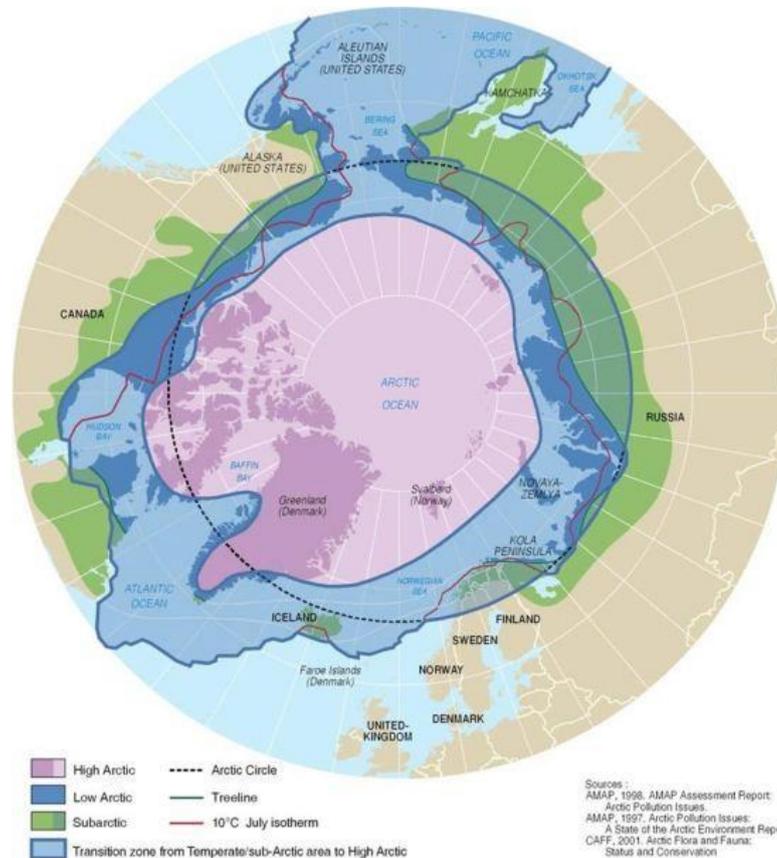


Figure 1.1. Map of the Arctic region (Rekacewicz, 2012)

The Arctic region is endowed with abundant natural resources, its resource wealth a diverse array of petroleum, coal, iron, ferro-alloy minerals, non-ferrous minerals, rare earth minerals, fisheries and forestry (Yoon and Kim, 2001; Lindholt, 2006; Dobretsov and Pokhilenko, 2010; Gautier et al., 2011). Lindholt's (2006) 'Arctic natural resources in a global perspective' details the Arctic contribution to global natural resource extraction sector production and estimates for current reserves. From this stocktake, one thing is particularly striking: a considerable majority of these resources are located in the Russian Arctic (though perhaps unsurprisingly given the vastness of Russia's Arctic territory). Arguably, it's the Arctic's offshore petroleum reserves which are attracting the most attention (Harsem et al., 2011), the US Geological

Survey's (USGS) frequently-cited Circum-Arctic Resource Appraisal in 2008 estimating close to a quarter of the world's undiscovered conventional petroleum reserves were located in the Arctic (USGS, 2008; Harsem et al, 2011). Significantly, 84% of these reserves are located offshore, of which 67% is estimated as natural gas (USGS, 2008).

The Arctic's natural resources are receiving increased attention, Brigham (2012) describes how 'once remote, Arctic continental shelves (among the broadest on the planet) have seemingly 'overnight' become coveted real estate due to their potential for hydrocarbon wealth and increasing marine accessibility' (p308). Whilst resource extraction in the Arctic is not exactly a new phenomenon, the recent explosion of interest suggests a future of resource activity at an extent previously unknown to the region. There exists a risk of governance and policy failing to keep up with this rapid change (Shadian, 2006; Humphreys et al., 2007). Environmental governance in the Arctic is complex (Koivurova, 2010; Exner-Pirot, 2012): the region is host to various governance systems ranging from local and national to regional, international and trans-national, incorporating myriad stakeholders (from within and outside the region), all who possess competing agendas and perspectives. In this context of rapid change and complex governance arrangements, it becomes increasingly pertinent to investigate how Arctic natural resource development is framed.

### *1.3.2. Greenlandic natural resources*

With a population comprised of 90% Inuit ethnicity, much of its landmass situated above 66°N, of which approximately 80% ice-covered (AMAP, 2010), Greenland is in many ways an emblematic Arctic nation. It is one of the world's largest countries (840,000 square miles) and one of the least-dense in terms of population (approximately 58,000). A part of the Kingdom of Denmark, Greenland has been progressing towards complete independence (Ackrén and Lindström, 2012) to become the first Inuit nation state (Nuttall, 2008). Greater autonomy was granted to Greenland in 2009 under the status of 'Self-Rule' which critically gave the country control over the use of its vast natural resource reserves (Harsem et al., 2011). These oil and mineral resources are diverse, comprising of iron ore, gold, diamonds, cryolite, lead, zinc, molybdenum, oil, natural gas, uranium and other rare-earth minerals (Nuttall, 2008).

Considerable rare earth metal reserves exist near the site of Kvanefjeld with some predicting Greenland could break China's geopolitically important monopoly (Nuttall, 2008; Long et al., 2012).

The USGS estimates vast offshore oil reserves in the west and north-east region of the country (Nuttall, 2008; USGS, 2008) and many commentators predict Greenland will play a large future role in Arctic oil and gas (Lindholt and Glomsrød, 2012). The Disko Bay region has become of particular interest, a consequence of its 'relative accessibility and promising subsea geological features' (McDowell and Ford, 2014, p98). A new hydrocarbon strategy was adopted in 1999 to encourage offshore oil exploration with several licensing rounds taking places throughout the 2000s (AMAP, 2010).

Underlying the debate over natural resources is the issue of independence: Greenland's hopes for independence are unlikely to come into fruition while it remains heavily dependent on annual subsidies from Denmark (in the region of €500 million) (Ackrén & Lindström, 2012). Greenland's natural resources offer economic independence; hence, the drive towards exploiting them. Core to any development are assurances that Greenlandic society receive a reasonable share of the profits, that local communities are informed and that local firms/workforce are involved to the greatest possible extent (AMAP, 2010, p95). Whilst responsible and environmentally cautious exploitation of natural resources are, in general, supported by the Greenlandic population, Nuttall (2012) notes 'how public disquiet over lack of appropriate consultation (and criticism over the absence of information about planned mega-projects) is leading to a situation where demands for legitimate public engagement in democratic and transparent discussion and debate over extractive industries are increasing' (p113). In the background of this resource interest and activity, traditional Inuit livelihoods are under threat from both environmental factors (where climate change is reducing ice extent) and cultural factors (where the social standing of the Inuit hunters is falling) (Parbring, 2010).

The next few decades are likely to see significant changes in Greenlandic society with natural resource development likely to play a central role. As such, understanding framings around the issue becomes increasingly important. Josef Motzfeldt,

Greenlandic MP and former Minister of Foreign Affairs, captures the essence of the challenges and opportunities it faces when he says:

‘We have to choose, on the one hand, between unrestricted exploitation of our resources in order to gain more independence, and, on the other hand, the protection of our nature, which is so dear to us in order to maintain our cultural heritage in the shape of a close interrelationship between human activity and changes in the environment.’ (Motzfeldt, 2008)

### *1.3.3. Historical Context*

In the contemporary Arctic, we witness anxieties, hopes and challenges around significant environmental degradation, exploitation of indigenous peoples and the geopolitical ramifications of increased natural resource development (Exner-Pirot, 2013). However, concerns of this kind are not a new phenomenon. Indeed, throughout the Arctic’s history, the social, environmental and economic impacts of natural resource exploitation have featured prominently. The history of Arctic natural resource extraction highlights many similar themes to those in a modern context, as well as differences. In the histories of whaling, mining and oil, concerns over overexploitation, the subjugation of indigenous people and environmental damage are prevalent.

Much like the Arctic of today, the region’s abundant resources have always appealed to outsiders seeking to exploit it for its economic potential. As far back as the sixteenth century, Europeans were travelling to the region to hunt fish, seal and whale, ‘all with a rapacity unprecedented in northern waters’ (McCannon, 2013, p79). The allure of an ‘Arctic resource bonanza’ (Emmerson, 2011, p195) has led to numerous resource booms, with the late-nineteenth century bringing, ‘[multitudes] of outsiders to many places in the far north: to Spitsbergen for coal, to Sweden’s Kiruna mines for iron, to eastern Siberia for gold, and to the seas and shoals, where new technologies placed larger quantities of fish, seals and whales within easy reach’ (McCannon, 2013, p155). In some respects, the Arctic resource rushes of the past have changed in character when compared to those found today. Resource booms like the Klondike gold rush of the late 1890s in Yukon, Canada were more haphazard and chaotic involving

individuals relying on limited available technology, whereas now resource rushes in the North require highly-developed, expensive technology from relatively large, organised (often state-owned) companies if they are to make a profit (Emmerson, 2011). Technological advancement serves as a key driver in Arctic resource development, helping expand accessibility in the region and make extraction profitable (Coates, 2014). Nevertheless, despite technological improvement and greater knowledge of the region, Emmerson (2011) writes how one aspect hasn't changed: '[the] Arctic remains a relatively unknown corner of the planet... a province on the geological frontier' (ibid., p196).

For the Arctic's indigenous peoples, the Arctic is far from an unknown frontier. Comprising of groups such as the Inuits, Sami and Nenets, the indigenous population have subsisted for thousands of years utilising the Arctic's terrestrial and marine natural resources by hunting, gathering, herding, whaling and fishing. This relationship with resource use is predicated on strong connections to landscape and nature (Nuttall et al., 2005). As colonialization by Western settlers swept across the region, it would come to have significant ramifications for the Arctic's indigenous population, leading to conflict over land and resources, and tensions between indigenous traditional lifestyles and ideas of 'modernity' that underpin Western society (Shadian, 2014). With the colonial dynamic between settler and indigenous becoming increasingly established over the centuries, an inevitable strain was placed on indigenous traditions, observers speaking of a corruption of Inuit culture (Stuhl, 2013) and lifestyles thrown into disarray as they were forced to embrace alien concepts such as 'land ownership, territorial boundaries and commercial exchange solely for the purpose of profit' (McCannon, 2013, p144). Vestiges of this colonial history are evident in the modern-day Arctic and the role of indigenous people in natural resource governance (Cameron, 2012).

As resource development progressed, indigenous rights have long been neglected throughout the Arctic, with indigenous peoples displaced and their interests often disregarded (Kulchyski, 2005; Avango et al., 2014; Coates, 2014). Whilst there is still a long way to go in ensuring indigenous rights are truly acknowledged, recent decades have witnessed a shift as Arctic indigenous peoples have established a greater polity (locally, nationally and regionally) after long struggles to demand a greater say in the

policymaking that shapes their communities and land (Nuttall et al., 2005). Nevertheless, Arctic indigenous political identity is complex and does not represent a uniform stance. Indigenous attitudes towards resource development are not confined to a reductionist narrative of ‘traditional versus modern’. Instead, as Hugh Brody argues, when it comes to indigenous rights, ‘what must be defended is not the traditional as opposed to the modern but, rather, the right of a free indigenous people to choose the components of their lives’ (cited in Riedlsperger et al., 2017, p319).

Discursive imaginaries of the Arctic may have changed over time (Ryall et al., 2010), but recurrent themes persist that echo much of what is found in the contemporary Arctic. In an essay dissecting the historical and geographical meanings behind the term the ‘New North’, Stuhl (2013) outlines how the deployment of this term (focusing on the Western Arctic) has shifted through the twentieth century. Within these iterations of ‘New North’ imaginaries, we witness narratives and the evolution of tropes that flourish in today’s discursive landscape: in Vilhjalmur Stefansson’s calls to dispel notions of the Arctic as a ‘frozen wasteland’ and instead be perceived as a place with rich economic potential for development; in colonial tensions between indigenous traditional livelihoods and settlers’ industrial exploitation of resources; in the opening of previously inaccessible areas for resource exploitation through improved technological and infrastructural capabilities; in the Arctic as a centre of activity and not ‘a place-to-be-passed through, or the fringe of a continental empire’ (ibid., p106); in the role of science in Arctic governance; and in a growing awareness of the differences and diversity across Arctic peoples. As Stuhl (2013) describes, these past narratives act as the ‘scaffolding’ in which discussion around modern Arctic natural resources take place.

Concerns around overexploitation and the environmental damage caused by natural resource development have existed for as long as extraction has occurred in the Arctic (McCannon, 2013). Overexploitation by European fishers and whalers have put pressure and even led to extinction of certain stocks, such as the bowhead whale in the Eastern Arctic in the early 1800s (Allen and Keay, 2001). A region that had remained relatively uncontaminated by industrial activity for most its past was by the mid-twentieth century experiencing considerable pollution and environmental degradation, the result of a growth of industrial infrastructure, greater energy use, and the sewage

and litter by-products of development (Avango et al., 2014). Mechanical disturbances from industrial activity have contributed towards environmental problems such as ecosystem disturbances, severe soil erosion, air pollution and soil contamination (Forbes, 2005). Pollution in the Arctic originates not only from within the region. Pollution created externally has caused detrimental environmental impact, notably through the 'Arctic haze', a phenomenon whereby anthropogenic air pollution from industrial processes in Eurasia drifts into the Arctic region (Barrie, 1986). This air-mass is primarily comprised of sulphates and particle organic matter but also includes chemicals such as black carbon and heavy metals (Quinn et al., 2007). The extent of airborne pollution carried to the north has grown as industrialisation has continued apace throughout the twentieth century (Stonehouse, 1986). This environmental vulnerability to large-scale pollution produced elsewhere is particularly pertinent in the contemporary context where many argue it is the consequences of fossil fuel burning around the globe that presents the greatest threat to the Arctic in the shape of climatic warming (Forbes, 2005).

It is the potential for large-scale fossil fuel extraction within the Arctic that has grabbed considerable attention over the last decade. Instinctively, this influx of interest would suggest oil and gas development in the Arctic as a relatively new occurrence. While the possibility of offshore oil fields at high polar latitudes (such as in the East Greenland Rift Basin (Gautier et al., 2011)) is certainly new, petroleum exploration has featured in the lower latitudes of the sub-Arctic since the early 1900s, no more so than in Alaska after an oil field on its southern coast was discovered and exploited (Pretes, 2005). It was not until 1960 that extensive exploration led to the discovery of huge reserves along Alaska's northern coast at Prudhoe Bay (ibid.). Around this period, vast oil deposits were also discovered in the Zapolyarnoye Field in the Soviet Union's Yamal-Nenets Autonomous Region and Norway began developing fields in the North Sea close to its southern coastline (Grace and Hart, 1986). Even in Greenlandic waters, oil companies were exploring the potential for oil wells (Gregersen, n.d.).

In Alaska, the completion of a pipeline in 1977, cutting across the state from north to south, transported oil to market for the first time, and led to a vast economic windfall. The economic boom experienced in Alaska following oil production (and in other oil-

producing Arctic states like Norway) influences modern-day debates in Arctic countries such as Greenland, who weigh the options of pursuing an oil production path (Pretes, 2005; Nuttall, 2008). Since 1977, tensions between economic development and environmental conservation have been played out in Alaska ever since, with the sensitivity of the Arctic's ecosystems to industrial activity central to arguments of those taking a conservationist stance (Forbes, 2005). The inherent risks involved with oil production were laid bare following the Exxon Valdez oil spill in 1989, when an oil tanker spilled 11 million US gallons into the Prince William Sound, at a devastating environmental and socio-economic cost (Picou et al. 1992; Peterson et al. 2003; Short et al. 2007). The effects of this disaster, still felt today, loom large over future Northern offshore oil projects, especially given how much worse the damage of a large oil spill at high latitudes would be in an environment of greater ecological sensitivity and where clean-up operations are considerably hindered in remote, challenging conditions (Huntington, 2009). An example of this can be witnessed in the vocal opposition in Norway to the gradual shift northwards of state-led oil ventures from the North Sea towards the Barents Sea, with the development of the Snøhvit field (Loe and Kelman, 2016).

If then, as some predict, the Arctic's future is one where it becomes a major oil-producing region, what lessons are there to learn from past 'oil' exploitation? Wood-Donnelly (2016) addresses this question by comparing historical experiences of the whale oil industry with the modern Arctic oil industry. This comparative work identifies many contextual similarities between both industries, what Wood-Donnelly (2016) describes as four lessons. First, the expansionist push to exploit oil in Arctic waters to avoid peak production echoes those of the whaling industry over a century ago, one that ultimately ended unsuccessfully. Second, the large operational costs and challenges of Arctic production ensure these are high-risk financial ventures, with every chance they will not return a profit unless precarious optimal conditions are maintained. Third, the potential for oil demand to dramatically reduce as the market steers towards renewable, less carbon-intensive energy sources, as happened to whale oil when it eventually became redundant as more viable alternatives were discovered. Fourth, a volatile regulatory environment can cast great uncertainty over continued future production, as is the case for the Arctic oil industry as regulations are drawn up to adapt to new circumstances.

As the above example highlights, there are many parallels to be found between the development of natural resources in the past with those taking place in the contemporary Arctic setting. There is, however, a feeling that challenges facing the present-day Arctic are arguably greater and more wide-reaching than ever before. As environmental changes and developmental pressures intensify, some describe the rise of ‘out-of-control development’ as representing an ‘arcticide’ (McCannon, 2013, p307). Others counter against such pessimistic proclamations, citing the diversity and resilience found in the Arctic’s history ‘should caution against any monolithic conclusions about its future’ (Howkins, 2013, p353). Regardless of what future awaits, what seems certain is exploitation of the Arctic’s natural resources will continue to profoundly shape the region’s environment and its people.

## **1.4. Literature Review**

This section provides a literature review on the wider research themes covered by this thesis. Firstly, as Arctic natural resource development is conceptualised as a socio-ecological issue possessing the characteristics of wickedness, a brief overview of academic literature covering this topic is provided. Secondly, with this thesis’ focus on the plurality aspect of wickedness, there is an overview on framing and frame-conflicts in socio-ecological issues. Lastly, academic literature on the conceptualisation of scale in relation to socio-ecological issues is detailed, contextualising Chapter 4’s exploration on scale-frames. The section concludes with a discussion on how this work contributes to the literature.

### *1.4.1. ‘Wickedness’ and socio-ecological issues*

“The search for scientific bases for confronting problems of social policy is bound to fail, because of the nature of these problems. They are ‘wicked’ problems, whereas science has developed to deal with ‘tame’ problems. Policy problems cannot be definitively described. Moreover, in a pluralistic society there is nothing like the undisputable public good; there is no objective definition of equity; policies that respond to social problems cannot be

meaningfully correct or false; and it makes no sense to talk about ‘optimal solutions’ to social problems unless severe qualifications are imposed first. Even worse, there are no ‘solutions’ in the sense of definitive and objective answers.” (Rittel and Webber 1973, p155)

In their oft-cited paper *Dilemmas in a General Theory of Planning*, Rittel and Webber (1973) coined the term ‘wickedness’ to describe what they felt was the inherent complexity underpinning social policy problems. The paper’s abstract (quoted above) succinctly captures the difficulties encountered when facing such problems, essentially around the challenges of defining problems and solutions in a pluralistic and complex society. They highlighted the dilemmas facing a planning profession fixated on the linear and simplistic approaches associated with scientific or engineering problems (Van Bueren et al., 2014) and struggling to comprehend such an approach was ‘not applicable to the problems of open societal systems’ (Rittel and Webber, 1973, p160). What their conception of wickedness did acted as acknowledgement of the new thinking required when approaching societal problems.

From its origins in planning, the wickedness concept has become an increasingly utilised concept in the field of natural resource management and environmental policy (Ayoub et al., 2009; Turnpenny et al., 2009; Balint et al., 2011; Thompson and Whyte, 2012). It has been applied for a range of subjects including chicken meat production (Van Bueren et al., 2014), forest management (Balint et al., 2010), climate change impacts on world heritage site (Perry 2015), fisheries (Chuenpagdee and Jentoft, 2009) and Alaskan offshore oil drilling (Kämpf and Haley, 2014). As Norton (2012) writes, ‘their concept of wicked problems aptly describes many environmental disputes, disputes that seem intractable, engendering endless controversy’ (p449). What constitutes wickedness is not formally defined. Rittel & Webber (1973) outlined ‘ten distinguishing properties’ of wicked problems, but this is far from definitive checklist, as they themselves admit. These properties are presented below:

1. There is no definitive formulation of a wicked problem.
2. Wicked problems have no stopping rule.
3. Solutions to wicked problems are not true-or-false, but good or bad.
4. There is no immediate and no ultimate test of a solution to a wicked problem.

5. Every solution to a wicked problem is a "one-shot operation"; because there is no opportunity to learn by trial and error, every attempt counts significantly.
6. Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan.
7. Every wicked problem is essentially unique.
8. Every wicked problem can be considered to be a symptom of another problem.
9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.
10. The social planner has no right to be wrong (i.e. planners are liable for the consequences of the actions they generate).

(Rittel and Webber, 1973)

Those using the wickedness concept in relation to environmental and natural resource issues often refine the concept, condensing the essence of Rittel and Webber's properties to reduce repetition. Turnpenny et al.'s (2009) wickedness criteria (inspired by Carley and Christie, (2000)) distil wickedness to four properties: uncertainty; inconsistency of needs, preferences and values; an unclear sense of all consequences and/or cumulative impact of collective action; and fluid, heterogeneous, pluralist participation in problem definition and solving (p347). Similarly, Duckett et al.'s (2016) criteria for wickedness identifies six descriptive categories that characterise wicked problems as the following: indefinable; ambiguously bounded; temporally exacting; repercussive; doubly hermeneutic; and morally consequential (p3). Salwasser (2002) presents a spectrum succinctly capturing how wicked natural resource problems differ to simple ones (Figure 1.2).

<b>Simple</b>	<b>Complex</b>	<b>Wicked</b>
clear, all agree	<b>Problem</b>	fuzzy, disagreement
Single	<b>Objectives</b>	multiple
Aligned	<b>Stakeholders</b>	fragmented
few, controllable	<b>Factors Influencing Objectives</b>	many, beyond control
Low	<b>Uncertainty</b>	high
low variability	<b>Relative Risks</b>	high variability
leads to clear choice	<b>Role for Science</b>	informs choices
not contentious	<b>Coping Strategies</b>	contentious
less valuable	<b>Decision Analysis</b>	more valuable

Figure 1.2. Salwasser's (2002) spectrum of complexity involved in natural resource problems (p12)

Ultimately, though slight variations in the use of terminology may exist, the essence of wickedness remains fairly consistent in its application: that is, issues possessing high levels of uncertainty, complexity and plurality.

This thesis focuses its attention on only the plurality aspect of wickedness as a focus on all aspects would not be possible given the practical limitations of this research. Nevertheless, it is arguably plurality that lies at the heart of wicked socio-ecological issues, as Norton (2012) explains: ‘the class of wicked problems are all expressions of diverse and conflicting values and interests, which cause individuals to view problems differently’ (p450). Indeed, a fundamental feature of the literature is the extent plurality of perspectives around issues contributes to its wickedness. They inherently involve multiple ‘fragmented’ stakeholders (Salwasser, 2002) who frame issues from differing perspectives (Alrøe and Noe, 2012; Head et al., 2016), a wicked approach embracing ‘the prima facie validity of multiple value perspectives’ (Thompson and Whyte, 2012, p5). The differences in framing wicked problems is to such an extent that there is ‘deep ambiguity in the ontological assumptions and metaphysical categories used in their articulation’ (Whyte and Thompson 2012, p442). Through a prism of myriad ontologies and divergent frames, the challenges of uncertainty and complexity are accentuated.

With the wickedness concept setting out the difficulties associated with certain issues, the literature presents various approaches in which to ‘tackle’ them. Unsurprisingly given their complexity, there is difficulty in providing neat solutions or overarching guidelines. Perry (2015) notes an inclination to ‘study to death’ wicked problems as a common but ineffectual way of addressing them, investing ‘heavily in data collection in contrast to making a decision’ that contributes to ‘overwhelming our policy alternatives’ (p3). Nevertheless, numerous strategies and approaches have been devised. Duckett et al.’s (2016) academic literature review of strategies used to tackle wicked problems offers a comprehensive overview, concisely illustrated by their ‘wicked wheel’ (Figure 1.3) that categorises these strategies by the six aforementioned properties.

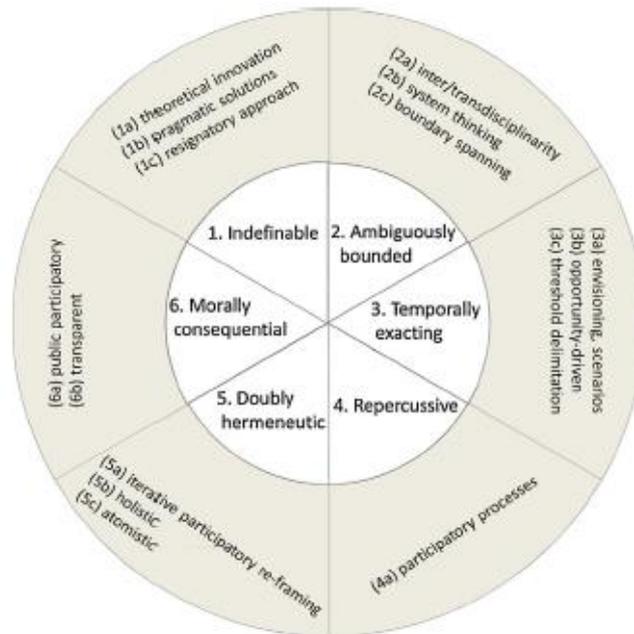


Figure 1.3. Duckett et al.'s (2016) 'wicked wheel' outlining the strategies to tackle wicked problems found in their academic literature review.

Strategies tend to emphasise the critical need to account for myriad competing perspectives, again highlighting how fundamental this aspect is for wicked problems. This thesis' mixed-method frame-analysis positions itself as one way in which to approach wicked socio-ecological issues. Some authors deploy the term 'clumsy solutions' as an effective strategy against wickedness. Described as flexible and creative, clumsy solutions seek to incorporate the four different perspectives found in social relations as outlined by a cultural theory approach: individualism, egalitarianism, hierarchy, and fatalism (Verweij et al., 2006; Khan and Neis, 2011). Accepting the strengths and weaknesses in each perspective, clumsy solutions seek common understanding, if not agreement (Perry, 2015). Clumsy solutions may be inefficient and time-consuming but by explicitly acknowledging these perspectival differences, some argue that they have potential to guide towards more effective solutions (Artmann, 2015).

Whilst not influenced from cultural theory like clumsy solutions, others similarly advocate deliberative and participatory approaches of a similar ilk, such as Balint et al.'s (2011) 'learning network approach' used in forest management in the Sierra Nevada or Brown et al.'s (2010) focus on active and collaborative learning. The importance of ensuring that, to the greatest possible extent, all perspectives are accounted for in decision and policymaking procedures lies at the heart of these

approaches; the guiding premise that wickedness can only be overcome if all stakeholders' preferences are properly factored in (Balint et al., 2011). Nevertheless, the idea that participation processes offer some form of universal panacea for wicked problems is criticised by some. Duckett et al. (2016) note some evident drawbacks, including greater overheads and more variability in terms of outcomes, while Turnpenny et al. (2009) warn that misguided implementation can suppress particular views.

Within the literature, there is general agreement that the intractable nature of wicked problems entails 'dissecting' (Perry, 2015), 'breaking down' (Duckett et al., 2016) or 'carving off' composite parts is ineffective (Xiang, 2013). In contrast, Norton (2012) describes the importance of 'working backwards' when facing wicked problems, accepting that no complete solution exists but focusing attention on aspects that could be approached more systematically and effectively. He proposes a Hierarchical Theory, a general-systems approach based on a 'multi-scalar manner' as a potential tool, that 'can bring some conceptual order to a disordered situation by proposing, discussing, and modifying various possible hierarchical models, models that represent systems as exhibiting particular scales and dynamics' (Norton, 2012, p460). Chapter 4's scalar approach is influenced by scale-thinking of this kind. Conceptual tools like these may not provide solutions, but do possess a clarifying quality that can reduce a problem's perceived intractability.

Wickedness is used to describe a large number of socio-ecological problems. Given the intrinsically complex and dynamic relationship between social and ecological systems, it raises the question: which socio-ecological problems are not wicked? As Xiang (2013) notes: 'in a socio-ecological system, wickedness, the ubiquity of wicked problems, is the norm, and present in almost every pressing issue area that matters to the human society today' (p2). If so, it could be argued that wickedness might merely act as a way of expressing the bewildering challenges of socio-ecological problems and nothing more (Thompson and Whyte, 2012). There is certainly much semantical ambiguity around the concept, with terms like 'messy' (Mitroff and Mason, 1980), 'turbulent environments', 'meta-problems' (Carley and Christie, 2000) and 'imbroglios' (Whyte and Thompson, 2012) often used interchangeably. It is not uncommon to find wickedness used as a shorthand label to describe a complex issue

involving irreconcilable stakeholders at the beginning of an article with the concept taken no further (Painter, 2009; Allen et al., 2014). Qualifying the extent of wickedness is seemingly problematic, the distinction further confused by terms like ‘uber-wicked’ (Turnpenny et al., 2009) and ‘super-wicked’ (Verweij et al., 2006) for broad issues like sustainable development and climate change. The extent that wickedness differentiates from similar theoretical approaches like complexity theory (O’Sullivan, 2004; Nowotny, 2005) certainly requires more attention (Duckett et al., 2016).

Despite some conceptual weakness, wickedness is used as an overarching concept in this thesis as it effectively captures the essence of challenges inherent with Arctic natural resource development. It is within this conceptual setting that the empirical chapters are positioned, each approaching framing in various ways in order to ‘make sense’ of its plurality.

#### *1.4.2. Frames and frame-conflicts in socio-ecological issues*

This thesis explores frames around Arctic natural resource development. The importance of how socio-ecological issues are framed has become increasingly recognised (Miller, 2000). Frames as a conceptual framework can be considered as one type of discourse approach (Hajer and Versteeg, 2005; Shmueli, 2008; Arts and Buizer, 2009) with the application of discourse theory to socio-ecological and sustainability issues receiving considerable interest in recent decades (Dryzek, 2005; Han Onn and Woodley, 2014). Whilst variations exist over the meaning of discourse within the social sciences (Späth, 2012), a commonly cited definition (Arts and Buzier, 2009) comes from Hajer (1995), who describes discourse as:

‘a specific ensemble of ideas, concepts, and categorisations that is produced, reproduced, and transformed in a particular set of practices and through which meaning is given physical and social realities (Hajer, 1995, p44)

The theoretical debates surrounding different approaches to discourse analysis are extensive and complex (see Jaworski and Coupland (1999) and Howarth (2000) for comprehensive overviews). The debate is often simplified into two general

perspectives: a Critical Discourse Analysis, focusing explicitly on linguistic components of discourse, and a Foucauldian perspective with less focus on linguistics, instead placing emphasis on how social practices, power and institutions are manifestations of discursive power (Fairclough, 2003; Doulton and Brown, 2009). In reality, approaches to discourse analysis tend to be more nuanced incorporating elements from varying perspectives, explicitly or otherwise (Arts and Buzier, 2009).

A frequently cited definition of frames is found in Schön and Rein's (1994) work on intractable policy controversies, where they describe frames as 'underlying structures of belief, perception and appreciation' behind particular standpoints (p23). The 'underlying' nature of frames entails an element of difficulty in their analysis, as the frames deployed by those discussing an issue are not necessarily explicitly presented (Lakoff, 2010). Frames act as a heuristic in which the complexity of reality is organised into something coherent and meaningful (Gamson et al., 1992; Carvalho, 2000) or as what Goffman (1974) refers to as 'the definition of the situation' and 'organisation of experience'. As a consequence, frames lead to the promotion of certain aspects over others; Entman (1993) describes the act of framing as:

'...selecting some aspects of a perceived reality and making them more salient in a communicating context, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described'

(Entman, 1993 cited in Van Lieshout et al., 2011, p38)

Van Hulst and Yanow (2016), expanding on Rein and Schön's (1977) work, describe five processes involved in framing: naming, selecting, categorizing, storytelling and sense-making. Sense-making, sometimes described as 'signification work' (Reinecke and Ansari, 2015), refers to the 'work' actors put in to comprehend an uncertain situation, often stemming from prior cognitive experiences with the issue. This is partly done for 'practical necessity', reducing the complexity of the issue and 'enabling them to frame the situation they are engaging in ways that they can act in and on' (Van Hulst and Yanow, 2016, p99). From this foundation, framing work involves the act of naming, categorising and selecting/omitting in order for certain aspects to be communicated. This work is then bound together, developed and

reinforced through a process of storytelling (or ‘narrative frames’), these stories offering coherence of meaning to what actors observe and how they think it should be (Miller, 2000; Van Hulst and Yanow, 2016).

In research sharing similar aims as this thesis, scholars outline various examples of categorisation schemes of common frames found among stakeholders involved in an environmental dispute (Shmueli, 2008; Dewulf et al., 2009; Buijs et al., 2011). To present one prominent example, Gray (2003) outlines a categorisation scheme in Lewicki et al.'s (2003) exploration of intractable environmental conflicts. Here, three prevalent ‘generic frames’ are detailed: identity, characterisation and conflict management. Identity frames are concerned with how stakeholders identify themselves within the context of the issue; characterisation frames with how stakeholders understand others involved; and conflict management frames focus on how an individual feels a conflict should be managed and resolved (ibid.). Alongside these three generic frames are five less-prevalent frames: social control, risk, whole story, power and loss versus gain. Social control frames involve views on how society is and should be organised, using the four perspectives of social relations found in cultural theory; risk frames are concerned with the level and type of risk involved; power frames focus upon how power is distributed across stakeholders; whole story frames are larger narratives espoused by stakeholders that contextualise the issue; and gain versus loss frames relate to the extent stakeholders feel they will gain or lose in the situation (ibid.). Within these generic frames exist various other sub-categories, which can make the typology feel somewhat sprawling and unrefined.

The above example highlights the difficulty in forming a universal typology around the frame concept. Whilst some commonalities exist in terminology and wording, there is often much variation. Hence, the frames described in this thesis may not necessarily align with the categorisation of other similar research. An element of ambiguity is unsurprising given framing research ‘represents a smorgasbord of approaches that differ conceptually, ontologically and methodologically from each other’ (Dewulf et al., 2009, p156). For some, however, the flexibility of the frame concept raises concerns. While a diversity of theoretical approaches may have benefits, some argue there is a danger too much conceptual malleability can make it meaningless (Reese, 2007; Dewulf et al., 2009). In some cases, a blurring and

interchangeable use of terminology can contribute towards conceptual confusion (e.g. switching between ‘frames’ and discourses’ (see Hovardas and Korfiatis (2008)). However, such conceptual ambiguities are not unique to the framing literature. While acknowledging the academic debates around the meaning of the frame concept, these debates are not addressed in this thesis, as such conceptual scrutiny is beyond the scope of its research aims and objectives. Its use of frames, as outlined in the empirical chapters, relates to the emphasis on certain aspects of an issue and how this shapes problem and solution definitions (Entman, 1993).

For many, divergent frames lie at the heart of socio-ecological problems, where multiple stakeholders prioritise different socio-economic and environmental aspects, ascribe differing values or place importance at different scales (Leach, 2008; Jacobs and Buijs, 2011; Van Lieshout et al., 2011; Cairns and Stirling, 2014). It is divergent frames around Arctic offshore that are examined in Chapters 3 and 4. Often described as ‘intractable conflicts’ (Lewicki et al., 2003), stakeholder perspectives can vary to such an extent that interpretations of an issue are mutually incompatible (Hvordas and Korfiatis, 2008). In the context of a shift in environmental policy towards ‘the inclusion of a wider range of stakeholders and publics and for open and more deliberative policy-making forums’ (Bulkeley and Mol, 2003, p144), such intractability has implications for decision-makers. For such situations, frame analysis has particular utility, as it can help ‘clarify, simplify and communicate to the parties within the conflict the underlying roots of their respective positions and interests in order to further mutual understanding and facilitate compromise or resolution’ (Shmueli, 2008, p2048). Some argue frame analysis is the first step towards a ‘reframing’ process that may help resolve conflict (Buijs et al., 2011). This is especially significant in an Arctic context where norms around cooperation are increasingly being promoted (Käpylä and Mikkola, 2015).

This is not to suggest that frame analysis seeks to find consensus amongst all stakeholders involved in an environmental dispute. Whether or not achieving consensus between irreducible worldviews is even possible or indeed desirable (Nie, 2003; Cairns et al., 2014), there is growing understanding that effective policy requires some degree of unavoidable coordination between these divergent frames (Van Den Hove, 2006; Reed et al., 2009). How sufficient overlap between opposing positions

could be co-constructed to reach agreement offers rich opportunities for research (Dewulf et al., 2009). Some claim divergent frames can converge if stakeholders are better informed about the issue and that an optimal policy solution is attainable (Small et al., 2014). However, generally there is a belief that socio-ecological problems have ‘no single best solution, [therefore] decision makers must seek management policies and processes that are “satisficing”—that is, potentially broadly acceptable and implementable—rather than optimal’ (Balint et al., 2011, p2). As such, trade-offs and compromise are inevitable (Norton, 2005; Cairns et al., 2014). Frame analyses like this thesis are well-placed to aid in facilitating this process (Arts and Buizer, 2009).

### *1.4.3. Social construction of scale and socio-ecological issues*

A fundamental element of socio-ecological issues relates to their interconnected, multi-scalar nature (Cash et al., 2006; Cumming et al., 2006). The significance of scale, both its conceptualisation and its application, is increasingly recognised (Cash and Moser, 2000; Apostolopoulou and Paloniemi, 2012). Notions of scale are a prevalent theme throughout this thesis, whether explicitly focused on as in Chapter 4, or indirectly as in Chapter 2 and 3’s exploration of media and stakeholder frames. Given this, an overview of the academic discussion on scale and its relationship with socio-ecological issues proves useful to place this thesis in context. This section outlines the main themes found in the scale literature.

Definitions of scale and how it should be used are famously ambiguous (Marston et al., 2005; Leitner et al., 2008; Jones, 2009), something Sayre (2009) puts down to its ‘surfeit of meanings and uses’ (p96). Broadly speaking however, scale refers to ‘the spatial, temporal, quantitative, or analytical dimensions used by scientists to measure and study objects and processes (Gibson et al., 2000, p219). Scale can define environmental problems as well as the means to resolve them, its understanding essential for effective policy and management (Kok and Veldkamp, 2011). Human activities and associated environmental problems very rarely occur at a singular ‘scalar-level’, instead crossing multiple spatial and temporal scales; from local to global, immediate to long-term (Meadowcroft, 2002; Veldkamp et al. 2011). Subsequently, finding an appropriate institutional or political fix which effectively

negotiates this multi-level characteristic is often wrought with difficulty (Cash and Moser, 2000). Indeed, the tension between ‘political spaces’ (associated with conventional politic scales) and ‘environmental spaces’ (based around ecosystems) lies at the heart of the scalar debate in human-environment interactions (Larsen, 2008).

A portrayal of a simplistic realist-constructivist dualism regarding scale is unhelpful, with approaches often taking aspects of both realist and constructivist perspectives. The use of a continuum can prove a useful heuristic to capture such nuance. Manson's (2008) *Epistemological Scale Continuum* (presented in Figure 1.4) positions the diversity of epistemological approaches along a continuum, from logical positivism (realist) at one end and relativism (constructivist) at the other.

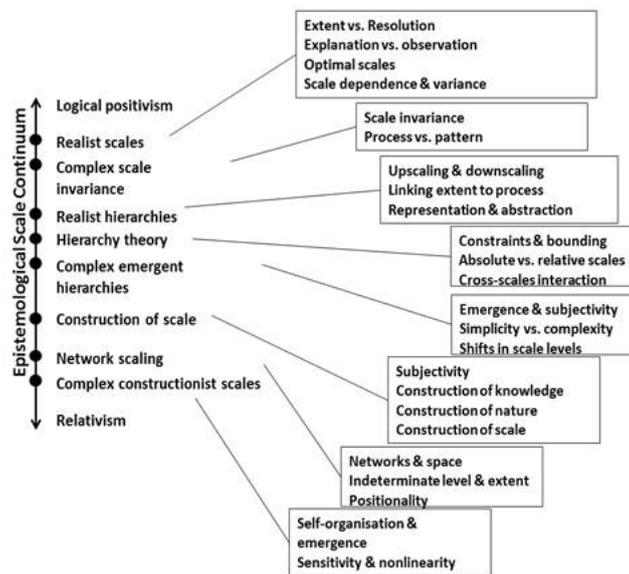


Figure 1.4. Epistemological Scale Continuum (Manson, 2008, p777)

This continuum highlights how no one correct epistemological course exists when approaching socio-ecological issues, with ‘each school of thought covering distinct advantages and challenges in dealing with any given scale problem and, by extension, there are often multiple entry points into any given complex human–environment system’ (Manson, 2008, p785). For research focusing on human-environment interactions, the ‘construction of scale’ entry-point on the continuum serves as particularly useful; Manson (2008) explains how ‘social constructionism is very applicable to the messy human research enterprise (in and of itself) and its focus on a world in which few nominally ‘natural’ systems remain untouched by human activity’

(p786). This is reflected in the thesis' research philosophy, which is described in the following section.

The thesis' research aims and objectives are aimed towards the constructivist side than the realist end of the epistemological scale continuum. For constructivists, scale is far from being a definitive, ontologically derived entity, but is in fact a socio-political construct (Towers, 2000; Brenner, 2001). Influenced by critical geographers such as David Harvey and Neil Smith (Sayre, 2009), scale constructivists direct a critical lens not on the scales themselves, but towards the processes behind how scale is created and utilised (Bulkeley, 2005; Sayre, 2009). This shift to a constructivist perspective of scale is, according to Delaney and Leitner (1997), 'a response to the inadequacy of inherited conceptions of geographic scale for understanding profound and perplexing transformations in the contemporary world' (p94). This is backed by Brenner (2001), who claims the scale debate has ignited due to 'globalization, shifting global-local relations, the reterritorialization of labour regulation, the apparent crisis of the Keynesian welfare national state and urban-regional reconstructing' (p591). As contemporary governance trends moved away from a state-centred focus towards both global and local levels, the term 'glocalization' was termed to encapsulate this shift (Swyngedouw, 1997).

Whilst the physical attributes of a particular environmental process have a measurable scalar impact, it is the social component that determines whether a particular environmental activity becomes a 'problem' requiring policy attention and the subsequent 'scale dimensions' of policy approach (Meadowcroft, 2002). This is noted by Meadowcroft (2002) when discussing scale in environmental problems:

'Physical impacts generated by a given activity will be linked to a complex of societal impacts; and the scale-profiles of these physical and these social impacts will be similarly coupled. But this coupling is 'loose' rather than determinate. Societal impacts and impact-scales are mediated through culture, economy and politics, and are constructed and re-constructed through conflict'.  
(Meadowcroft, 2002, p172-173)

Given the constructed nature of scale, it stands that scalar configurations of political organisation are both historically contingent and contestable. From the contestation,

reconstitution and reframing of scale comes a ‘politics of scale’, a term commonly applied to this approach. For Swyngedouw (2004), a key scholar within the ‘politics of scale’ field, current scalar configurations of socio-ecological issues are merely ‘temporary stand-offs in a perpetual transformative, and on occasion, transgressive, socio-spatial power struggle’ (p34).

Scaling is thus a critical part of the discursive struggles behind environmental policymaking, where different actors involved ‘reframe and re-position the issue to their own advantage’ (Harrison, 2006, p511). The concept of ‘scale-frames’ (or ‘scale-framing’) is often encountered in the literature and used in Chapter 4. This typology appears closely-related to discursive terms like ‘scalar-discourse’ and ‘scale-based discourse’. Kurtz’s (2003) provides a concise definition of ‘scale-framing’ as:

‘...the discursive practices that construct meaningful (and actionable) linkages between the scale at which a social problem is experienced and the scale(s) at which it could be politically addressed or resolved’

(Kurtz, 2003, p894)

Kurtz expands on this definition to offer three distinct ‘scale idioms’ within scale-frames utilised by social groups: scales of regulation (different institutional scales of regulation), means of inclusion/exclusion (discursive constructs designed to include or omit certain actors from the debate) and analytical category (defining the spatial units of analysis) (Kurtz, 2003). Van Lieshout et al.’s (2011) study of a ‘mega-farm’ project in a small Dutch village and Apostolopoulou and Paloniemi’s (2011) study of biodiversity conservation in Finland and Greece both emphasise the importance of scale-frames in decision-making, citing differences and mismatches within actors’ scale-framing as greatly hindering the policy process. Indeed, Van Lieshout et al. (2011) believe too few studies examine the relationship of scale-framings and policy.

Chapter 4’s study of scale’s relationship with Arctic offshore is positioned within a broad range of studies that explicitly examine the scalar dimension of socio-ecological issues, including biodiversity (Apostolopoulou and Paloniemi, 2012), conservation (Bosak, 2010), urban water policies (Swyngedouw, 2004; Keil and Debbane, 2005), industrial and agricultural pollution (Kurtz, 2003; Harrison, 2006; Van Lieshout et al., 2011) to cite just a few. Studies can approach the scale question from various angles.

Firstly, they can examine the cross-scalar challenges that occur in environmental management and policy. Examples include Saunders and Briggs' (2002) work on agricultural practices in Australia where they outline the stark mismatch between institutional and ecological scales in the management of the environmentally critical issue of soil salinity. To remedy the failings of this mismatch, they propose a 10-point plan to guide development, mostly focusing on bringing institutional scale aligned with the ecological. Olsson et al. (2007) provide another example of this type of approach, looking at ways in which to strengthen the links between 'fragmented organizational and institutional structures and compartmentalized and sectorized decision-making processes' and 'ecosystems characterized by complex interactions in time and space' (p28). They use the Kristianstads Vattenrike Biosphere Reserve in Sweden as a case study, and discover the importance of 'bridging organisations' for creating and maintaining cross-scalar linkage.

Other studies' interests lie in the processes behind scaling and the discursive struggles of scalar contestation in the policy process. These studies observe how actors within environmental conflicts 'discursively engage scale' to impact policy (Harrison, 2006, p512) and emphasise how 'scaling of the discourse of policymaking is central to environmental issues, as complex local situations are overlaid with multi-scaled problematics from the body to the global' (Keil and Debbané, 2005, p272). Examples include Kurtz's (2003) study of the controversial siting of a polyvinylchloride plant in rural Louisiana, where opposition groups 'leveraged *multiple* understandings of scale to move beyond an NIMBY stance and frame their grievance as part of a broader pattern of untenable permitting practices in Louisiana' (Kurtz, 2003, p911); or Bosak's (2010) study of conflict between locals and UNESCO over the designation of Nanda Devi Biosphere Reserve in India, a situation where competing notions of environmental justice collided and 'the way which scale became deployed by both sides becomes a central focus' of the debate (Bosak, 2010, p67).

When it comes to scale, it is the researcher's prerogative which approach is best-suited for their research needs. In agreement with Kok and Veldkamp (2011), a constructive place to start when studying scale in relation to environmental and natural resource management is 'the premise that scales are framed and that the challenge is in knowledge claims rather than in how reality works. This allows bypassing the issue

whether scales are real or constructed’ (p7). Thus, scale challenges largely derive from the contestation between how events are scale-framed by various actors (Moore, 2008). The research found in Chapter 4 is built on this conceptual foundation.

#### *1.4.4. Summary*

One way in which to view the frame-analyses that comprise this thesis is to see them as a means to try and better understand the wicked socio-ecological issue of Arctic natural resource development. Whilst not styled as a strategy to tackle wickedness *per se*, in exploring framings, the plurality of perspectives aspect of wickedness is studied and analysed. Using this knowledge can facilitate the ‘repercussive’ strategies outlined by Duckett et al. (2016), such as social learning and dialogue mapping. In agreement with Shmueli (2008), the simplifying and clarifying work of frame analysis can build a foundation for compromise and resolution. Chapter 2’s frame analysis of international news media coverage helps understand the framings that guide external perspectives, especially important given the expansion of stakeholder involvement and the likely unfamiliarity of many with the region. Chapter 3’s use of Q-methodology as a means to explore consensus and divergence across stakeholders is one example where such knowledge could contribute towards tackling wickedness. Furthermore, in Chapter 4’s contribution to the understudied subject of scale-frames (Van Lieshout et al., 2011), the utilisation of scale-frames in its scalar approach shares much in common with Norton’s (2005) suggested ‘Hierarchy Theory’ approach to wicked environmental problems; both acknowledging the importance of scale in socio-ecological issues and both using scale-thinking as a form of clarifying heuristic.

### **1.5. Research Strategy**

In this section, the overarching research strategy for this thesis is presented. Specific information about methods, data collection and analysis are found in each empirical chapter. This section presents a discussion of the thesis’ research philosophy, an overview of the two methodological approaches taken (Qualitative Content Analysis and Q-methodology) and why they were chosen, before concluding with some considerations on research ethics.

### *1.5.1. Research Philosophy*

In its collection and analysis of data to better understand aspects of society (Bailey, 2008), this thesis falls into the category of social research. Its methodological approach is predominantly qualitative, with some quantitative aspects in its use of statistical analysis techniques. With qualitative research home to a vast number of theoretical and methodological approaches, its definition proves difficult (Ritchie et al., 2014). Nevertheless, Denzin and Lincoln (2011) capture its essence in their description of qualitative research as ‘a set of interpretive material practices that make the world visible...qualitative researchers study things in their natural settings attempting to make sense of or interpret phenomena in terms of the meaning people bring to them’ (p3). Given this thesis’ overarching aim of understanding how the complex socio-ecological issue of Arctic natural resource development is framed, such a research approach is deemed appropriate.

The number of ontological standpoints within qualitative research is wide-ranging and can seem overwhelming to the social researcher seeking to determine where their research fits within the plethora of philosophical positions (Bailey, 2008). At one extreme sits realism, where an external reality exists independently of our understanding; at the other sits constructivism, where reality is a social construct (Arts and Buizer, 2009). However, qualitative research rarely lands neatly at these extremes. Indeed, in practice, achieving such ontological purity is somewhat unrealistic (Saunders et al., 2009). As Abbott (2004) writes, research paradigms should be viewed more as heuristics guiding research, these heuristics ‘open[ing] up new topics, to find new things. To do that, sometimes we need to invoke constructivism...[s]ometimes we need a little realism’ (p191, cited in Maxwell, 2012, p42). Research ontologies resemble more of a continuum than distinct silos of thought, their conceptual fluidity and ambiguity can lead to unhelpful distraction (Tashakkori and Teddlie, 1998). Whilst acknowledging the merits of both realist and constructivist perspectives and the importance of philosophical scrutiny, as the research aim and objectives of this thesis do not unambiguously suggest a realist or constructivist ontology (Saunders et al., 2009), a more pragmatic and flexible approach to its ontological standpoint is taken.

One such approach is ‘critical realism’. This perspective ‘assumes a ‘real world out there’, to which we give meaning through language and culture’ (Arts and Buzier, 2009, p342). Incorporating interpretive elements from constructivism to realism, this ontological standpoint takes mental phenomena (such as the ‘frames’ studied in this research) as part of the same reality and not existing in separate realms (Maxwell and Mittapalli, 2010). The appeal of this perspective lies in both explicitly acknowledging elements of realism and constructivism without committing too strongly to either side. What is of interest in this research is in the knowledge claims (i.e. how an issue is framed) not the ways in which reality works (Kok and Veldkamp, 2011). Whilst reluctant to pitch this work firmly to any specific philosophical standing, it is believed a critical realist approach offers an ontological pragmatism that avoids having to debate what is real and what is constructed.

Epistemologically, this thesis takes an inductive approach for Chapters 2 and 3. Inductive research entails ‘a ‘bottom-up’ process through which patterns are derived from observations of the world’ (Ritchie et al., 2014, p6). With the underlying aim of Chapters 2 and 3 to explore patterns of meaning within media texts and uncover patterns across stakeholders’ responses, an inductive approach was a natural fit. Nevertheless, an awareness that pure induction is not possible within the scope of qualitative research is important; ultimately no researcher can engage with a completely clear mind, devoid of assumptions accumulated from previous experience (Blaikie, 2007; Ritchie et al., 2014). Chapter 4, which explores the role of scale in framing Arctic offshore petroleum, represents an abductive approach. As Schwartz-Shea and Yanow (2013) write, ‘abductive reasoning begins with a puzzle, a surprise, or a tension, and then seeks to explicate it by identifying the conditions that would make that puzzle less perplexing’ (p27). Here, the puzzle relates to what is described as the ‘discursive cacophony’ surrounding offshore oil drilling in Arctic waters, with a scalar approach applied as a means to decipher and organise this cacophony and its challenges.

For Chapter 3, which involved Q-sort interviews with a diverse array of participants from varying backgrounds, issues of how a researcher’s positionality (such as race, nationality, age, gender, social and economic status, sexuality (Rose, 1997)) may influenced data collection had to be considered (Mullings, 1999). The extent of

whether the researcher was an ‘insider’ or ‘outsider’ during fieldwork was variable. Certainly in the Q-sorts that took place in Aasiaat, Greenland, the researcher was positioned as an outsider, especially in terms of nationality and culture. This may have influenced participants’ responses. However, the majority of participants were recruited through the assistance of two locals (also serving as interpreters during the interviews) whose familiarity with the area lessened the outsider status of the researcher. For participants who were delegates of Arctic-themed conferences, the researcher was positioned more as an insider, sometimes sharing professional interests and experiences. Whilst not possible to completely overcome influences of positionality during fieldwork of this kind, one can assume a position of ‘empathic neutrality’ (being transparent about their own values and assumptions while maintaining as neutral position as possible (Ritchie et al., 2014)) — a position the researcher strived to achieve during fieldwork.

## *1.5.2. Methodological approaches*

### 1.5.2.1. Qualitative Content Analysis

The methodologies used in Chapter 2 and 4 can be broadly described as qualitative content analysis (QCA): a ‘research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns’ (Hsieh and Shannon 2005, p1278). Described as pairing traditional content analysis with hermeneutical elements (Kuckartz, 2014), unlike quantitative content analysis QCA is more concerned with the underlying meaning found in messages of texts rather than counting particular instances in a quantified fashion (Frey et al., 2000).

QCA is well-suited for analysis of textual data where the ‘meaning’ the researcher is seeking is not standardised or immediately obvious and requires interpretation (Schreier, 2012). The abstract nature of frames ensures their measurement and extraction from content analysis in any standardised form proves extremely difficult, if not impossible (Matthes and Kohring, 2008). As such, QCA was an appropriate means in which to engage with the variety of texts analysed in both chapters, combining a systematic approach with interpretative methods that allowed subtlety

and nuance to obtain a greater understanding of underlying patterns of meaning (Carvalho, 2000). Whilst its hermeneutical leanings may reduce opportunities for exact replicability of findings found in quantitative content analysis, the atomising manner of precise categories and quantification that this method entails was deemed ineffectual in capturing abstract frames (Kuckartz, 2014). For example, when examining the role of scale, the scale categories or levels under discussion were not necessarily explicitly stated and required interpretation from the researcher to construct meaning; quantitative content analysis' focus on 'manifest content' of text could easily skip underlying meanings (ibid.).

The QCA approach differed slightly between Chapters 2 and 4. Coding of media frames in Chapter 2 was more inductive in nature. News media articles were read and coded with no predetermined categorisations outlined. An initial open coding process started by noting instances of particular terms. The next stage involved higher-order categories being developed that grouped terms the researchers felt belonged together. From these categories, which were subjectively determined through the duration of the data collection process, media frames were abstracted through interpretation (Elo and Kyngäs, 2008). Chapter 4 was less inductive, using what Hsieh and Shannon (2005) describe as 'directed content analysis'. Instances of scale, either explicit or inferred, were sought, using a guiding heuristic outlined in the methodology section of the chapter. While this heuristic guided data interpretation, coding was not assigned in a rigid deductive fashion. A fully deductive analysis was decided against, as it was felt such rigid coding structure lacks reflexivity and might lead to oversights within the data.

#### 1.5.2.2. Q-methodology

Chapter 3 uses Q-methodology in its exploration of frames and frame-conflicts within a group of Arctic stakeholders. Specific details about how Q-methodology was used are detailed in Chapter 3. Here, a brief overview of the method is provided and the reasons why it was chosen. First devised by William Stephenson (1935) in the field of psychology, Q-methodology's central premise is the study of subjectivity, or more specifically making subjectivity communicable so that it can be observed and analysed (Van Exel and de Graaf, 2005). As Brown (1986) notes, subjective opinions 'can be

shown to have structure and form, and it is the task of the Q-technique to make this form manifest for purposes of observation and study' (p58). Q-methodology attempts to capture subjective opinions through 'inverting' the factor analysis procedure often used in conventional survey and questionnaire methods (Watts and Stenner, 2005). Thus, as opposed to establishing patterns across traits (such as age, gender etc.), it seeks to establish patterns 'within and across individuals' (Barry and Proops, 1999, p339). From statistical analysis, social perspectives surrounding a certain theme or subject are deciphered. The terminology used to describe what is being sought through Q-methodology is diverse (e.g. viewpoints, beliefs, frames, opinions, social perspectives, discourse, narratives and so forth), but ultimately all Q-methodology studies are seeking to analyse subjectivity in some form.

Whilst there is flexibility and creativity in the Q-methodology process, there are distinct stages familiar in all studies (Eden et al., 2005; Frantzi et al., 2009). Firstly, a subject area is chosen. A wide-range of subject areas have been used in previous Q studies, especially related to environmental issues. Some examples include international conservation values (Sandbrook et al., 2011), planning responses for oil spills (Tuler et al., 2006), sustainability discourses (Barry and Proops, 1999) and wildfire management (Danielson et al., 2008). Once a subject area is chosen, the next stage requires the development of a 'concourse'. The concourse represents the 'volume of discussion on any topic' (Dryzek and Berejikian, 1993, p50); its development involves the collection of statements that captures the extent of opinions surrounding an issue. This collection can be conducted in several ways. A common method is extracting statements through qualitative interviews, described by Eden et al. (2005) as a 'naturalistic approach' (p415). However, concourse development can involve various secondary sources such as policy documents, media articles, conference proceedings, meeting notes, academic literature and company publications (Dryzek and Berejikian, 1993; Frantzi et al., 2009). Often secondary sources are combined with qualitative interviews to offer a 'semi-naturalistic approach' (Cairns, 2012). There is subjectivity involved in determining when the concourse is 'complete'; it is the researcher's prerogative to decide if the sample is 'saturated' and 'broadly representative' of the opinion domain (Watts and Stenner, 2005).

The next stage involves reducing the large number of opinion statements to something more manageable. Again, there is researcher subjectivity involved in this process. Some researchers use a heuristic device such as cell sampling or certain criteria to ensure the final selection of statements broadly represent the opinion domain. There are no fixed rules about how many statements the final Q-set should consist of, although often they are between the range of 36-60 (Eden et al., 2005).

Once the final set of statements are selected, this Q-set is then given to participants to sort in order of preference from 'least how I think to most how I think' (Webler et al., 2009, p22). Participants are strategically chosen who are knowledgeable and have different and well-informed opinions on the subject area (Frantzi et al., 2009). Conventionally, they are asked to sort these statements within a quasi-normal distribution. This is done not out of necessity, for the statistical technique does not require it, but to encourage participants to think more carefully about their rankings (Barry and Proops, 1999). During the Q-sorts, it is recommended the researcher asks participants about why they are ranking certain statements and allowing for open-ended comments at the end to add depth to insights gathered from the sort (Webler et al., 2009).

Q-methodology only requires a small sample for results to be statistically significant. Whilst some research involves as little as 12 participants, often the sample size is roughly in the range of 20-40 (Cairns, 2012). Once the Q-sort process is complete, statistical analysis is applied to the data set often using bespoke software such as PCQmethod. This analysis uncovers patterns across participants' responses, distilling 'particular combinations or configurations of themes which are preferred by the group' (Watts and Stenner, 2005, p70). The final stage involves the researcher verbally interpreting these emergent patterns and what they represent.

Q-methodology was chosen to answer research objective (2) for several reasons. The method enables frames to be empirically explored in a structured and organised manner (Barry and Proops, 1999; Cairns and Stirling, 2014). Its systematic methodological approach gives value when investigating framings around controversial environmental and natural resource issues, as can be seen in similar studies (e.g. Barry and Proops, 1999; Balint et al., 2011; Cotton and Mahroos-alsaiari, 2015). Importantly, through statistical analysis of variance of z-scores, the method

also offers the ability to empirically demonstrate the extent of ‘frame conflicts’ and explore possible bridges for consensus between these framings (Cotton, 2015). Other advantages include its requirement of only a small sample size, ensuring its application was not too ambitious given the constraints of fieldwork logistics (Frantzi et al., 2009). In addition, while its methodological procedures are relatively structured, Q-methodology offers scope for creativity and flexibility, especially with in how data is analysed and interpreted (Watts and Stenner, 2012). Furthermore, Q-methodology is very policy-relevant and provides policymakers with empirical data that can focus policy debates (Barry and Proops, 1999; Eden et al., 2005).

### *1.5.3. Research Ethics*

The research for Chapter 3 and 4 involved human participants and, therefore, required both a risk assessment and Ethical Approval from the University of Leeds Ethics Review Committee before data collection could begin. This was obtained in July 2013 (AREA 13-094). Confidentiality and anonymity was assured to all those who participated, often a critical part of social research of this kind (Babbie, 2007). Informed consent was sought from participants. Before starting the Q-sort interview, an overall outline of the project was briefly summarised verbally. Participants were asked to read a two-page information sheet (translated into Danish for Aasiaat-based participants). This contained key information outlining the project’s purpose, its methodology, assurances of confidentiality, ability for the participant to withdraw at any point, the importance of their consent and researcher’s contact details (see Appendix II). By taking part in the Q-sort, participants agreed to participate in this study and for their responses to be collected and analysed.

## **1.6. Thesis Outline**

This chapter has outlined the thesis’ research aims and objectives, placed the thesis and its contribution in the wider research context and detailed its research strategy. Chapter 2, 3 and 4 are the empirical chapters of this work, addressing research objectives 1, 2 and 3 respectively. Each empirical chapter is comprised of an

introduction to the specific research area, literature review, methodology, a presentation of research findings and a discussion section. Chapter 5 presents an overarching discussion of the findings and the conceptual, methodological and practical contributions of this thesis.

Chapter 2, addressing research objective (1), examines media-frames in international news media coverage surrounding natural resources in an Arctic context, using Greenland as a case-study. Undertaking a thematic analysis of a thousand English-language news media articles on the subject, various frames are identified within the context of an overarching frame.

Chapter 3, addressing research objective (2), uses Q-Methodology to explore frame-conflicts within a group of Arctic stakeholders, comprised of community members of Aasiaat, Greenland and delegates of Arctic-themed conferences, around the subject of offshore petroleum development. The issue was framed in various ways and despite significant divergence across framings, some potential bridges of consensus were evident.

Chapter 4, addressing research objective (3), examines scale-frames in the contemporary discourse around Arctic offshore petroleum development with the purpose of pinpointing areas of incoherence and tensions littering the debate. Several ‘scale-challenges’ are identified, with a common theme relating to the Arctic’s nebulous relationship with scale.

Chapter 5 brings together the empirical chapters to discuss the research as a whole. The importance of the research and the significance of its findings are outlined, followed by a discussion on the thesis’ conceptual, practical and methodological contributions. Limitations and opportunities for further research are then discussed before concluding remarks.

## **1.7. References**

Abbott, A. 2004. *Methods of Discovery: Heuristics for the Social Sciences*. New York, NY: W. W. Norton & Company.

- Ackrén, M. and Lindström, B. 2012. Autonomy Development, Irredentism and Secessionism in a Nordic Context. *Commonwealth & Comparative Politics* **50** (4): 494–511.
- Allen, J.H., Beaudoin, F., Lloyd-Pool, E. and Sherman, J. 2014. 'Pathways to Sustainability Careers: Building Capacity to Solve Complex Problems'. *Sustainability: The Journal of Record* **7** (1): 47–53.
- Allen, R.C. and Keay, I. 2001. The First Great Whale Extinction: The End of the Bowhead Whale in the Eastern Arctic. *Explorations in Economic History* **38** (4): 448–477
- Alrøe, H.F. and Noe, E. 2012. Observing Environments. *Constructivist Foundations* **8** (1): 39–62.
- Apostolopoulou, E. and Paloniemi, R. 2012. Frames of Scale Challenges in Finnish and Greek Biodiversity Conservation. *Ecology and Society* **17** (4): 9.
- AMAP. 2010. *Assessment 2007: Oil and Gas activities in the Arctic – Effects and Potential Effects. Volume 2*. Arctic Monitoring Programme. Oslo, Norway.
- Artmann, M. 2015. Managing Urban Soil Sealing in Munich and Leipzig (Germany)—From a Wicked Problem to Clumsy Solutions. *Land Use Policy* **46**: 21–37.
- Arts, B. and Buizer, M. 2009. Forests, Discourses, Institutions: A Discursive-Institutional Analysis of Global Forest Governance. *Forest Policy and Economics* **11** (5): 340–347.
- Avango, D., Hacquebord, L. and Wråkberg, U. 2014. Industrial Extraction of Arctic Natural Resources since the Sixteenth Century: Technoscience and Geo-Economics in the History of Northern Whaling and Mining. *Journal of Historical Geography* **44**: 15–30.
- Ayoub, N., Batres, R. and Naka, Y. 2009. An Approach to Wicked Problems in Environmental Policy Making. *WSEAS Transactions on Environment and Development* **3** (5): 229–239.
- Babbie, E.R. 2007. *The Practice of Social Research*. Belmont, CA: Thomson Wadsworth.
- Bailey, K. 2008. *Methods of Social Research*. New York, NY: Simon and Schuster.
- Balint, P.J., Stewart, R.E., and Desai, A. 2011. *Wicked Environmental Problems: Managing Uncertainty and Conflict*. Washington, DC, Island Press.
- Barrie, L.A. 1986. Arctic Air Pollution: An Overview of Current Knowledge. *Atmospheric Environment (1967)* **20** (4): 643–663.
- Barry, J. and Proops, J. 1999. Seeking sustainability discourses with Q methodology. *Ecological Economics* **28**: 337-345.

- Blaikie, N. 2007. *Approaches to Social Enquiry: Advancing Knowledge*. Cambridge, UK: Polity Press.
- Bosak, K. 2010. Ecotourism as Environmental Justice? Discourse and the Politics of Scale in the Nanda Devi Biosphere Reserve, India. *Environmental Philosophy*, **7** (2): 49–74.
- Brenner, N. 2001. The limits to scale? Methodological reflections on scalar structuration. *Progress in Human Geography*, **25** (4): 591–614.
- Brigham, L.W. 2012. Commentary: Thinking About the 'New' Arctic Geography. In: L. Heininen, (ed.). *Arctic Yearbook 2012. Akureyri: Northern Research Forum Table of Contents*, 308-310.
- Brown, S. 1986. Q Technique and Method. In: W.D. Berry, W.D. and Lewis-Beck, M.S. (eds.). *New Tools for Social Scientists*. Beverly Hills: Sage, 57-76.
- Brown, V.A., Harris, J.A. and Russell, J.Y. 2010. *Tackling Wicked Problems through the Transdisciplinary Imagination*. London, UK: Earthscan.
- Buijs, A.E., Arts, B.J.M., Elands, B.H.M. and Lengkeek, J. 2011. Beyond Environmental Frames: The Social Representation and Cultural Resonance of Nature in Conflicts over a Dutch Woodland. *Geoforum* **42** (3): 329–341.
- Buizer, M., Arts, B. and Kok, K. 2011. Governance, Scale and the Environment: The Importance of Recognizing Knowledge Claims in Transdisciplinary Arenas. *Ecology and Society* **16** (1).
- Bulkeley, H. 2005. Reconfiguring environmental governance: towards a politics of scales and networks. *Political geography*, **24** (8): 875–902.
- Bulkeley, H. and Mol, A.P. 2003. Participation and environmental governance: consensus, ambivalence and debate. *Environmental Values* **12**: 143–154.
- Cairns, R. 2012. Understanding Science in Conservation: A Q Method Approach on the Galápagos Islands. *Conservation and Society* **10** (3): 217-231
- Cairns, R, Sallu, S.M. and Goodman, S. 2014. Questioning calls to consensus in conservation: a Q study of conservation discourses on Galápagos. *Environmental Conservation* **41**: 13–26.
- Cairns, R. and Stirling, A. 2014. 'Maintaining planetary systems' or 'concentrating global power?' High stakes in frame conflicts of climate geoengineering. *Global Environmental Change* **28**: 25–38.
- Cameron, E.S. 2012. Securing Indigenous Politics: A Critique of the Vulnerability and Adaptation Approach to the Human Dimensions of Climate Change in the Canadian Arctic. *Global Environmental Change* **22** (1): 103–114.
- Carley, M. and Christie, I. 2000. *Managing Sustainable Development*. London: Earthscan.

- Carvalho, A. 2000. Discourse analysis and media texts: a critical reading of analytical tools. Paper presented at the *International Conference on Logic and Methodology, RC 33 meeting (International Sociology Association)*, Cologne, 3–6 October.
- Cash, D.W., Adger, W.N., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L., and Young, O. 2006. Scale and cross-scale dynamics: Governance and information in a multilevel world. *Ecology and Society*, **11** (2): 8.
- Cash, D.W. and Moser, S.C. 2000. Linking Global and Local Scales: Designing Dynamic Assessment and Management Processes. *Global Environmental Change* **10** (2): 109–120.
- Christensen, M. 2013. Arctic Climate Change and the Media: The News Story That Was. In: M. Christensen, A.E. Nilsson and N. Wormbs (eds.) *Media and the Politics of Arctic Climate Change: When the Ice Breaks*, Palgrave Macmillan, 26-51.
- Chuenpagdee, R and Jentoft, S. 2009. Governability assessment for fisheries and coastal systems: A reality check. *Human Ecology* **37**: 109–120.
- Coates, Ken. 2014. ‘History and Historiography of Natural Resource Development in the Arctic. Draft Gap Analysis #1. Resources and Sustainable Development in the Arctic. Available from: <http://yukonresearch.yukoncollege.yk.ca/wpmu/wp-content/uploads/sites/2/2013/09/Coates-cs-draft-for-web.pdf> [Accessed on 3 September 2017].
- Cotton, M. 2015. Stakeholder perspectives on shale gas fracking: a Q-method study of environmental discourses. *Environment and Planning A* **47** (9): 1944–1962.
- Cotton, M.D. and Mahroos-Alsaiari, A.A. 2015. Key actor perspectives on stakeholder engagement in Omani Environmental Impact Assessment: an application of Q-Methodology. *Journal of Environmental Planning and Management* **58**: 91–112.
- Cumming, G.S., Cumming, D.H. and Redman, C.L. 2006. Scale Mismatches in Social-ecological Systems: Causes, Consequences and Solutions. *Ecology and Society*, **11** (1): 14.
- Danielson, S., Santos, S.L., Webler, T. and Tuler, S.P. 2008. Building and Breaking a Bridge of Trust in a Superfund Site Remediation. *International Journal of Global Environmental Issues* **8** (1–2): 45–60.
- Delaney, D. and Leitner, H. 1997. The Political Construction of Scale. *Political Geography* **16** (2): 93–97.
- Denzin, N.K., and Lincoln, Y.S. 2011. *The SAGE Handbook of Qualitative Research*. Thousand Oaks, CA: Sage.

- Dewulf, A., Gray, B., Putnam, L., Lewicki, R. Aarts, N., Bouwen, R. and Van Woerkum, C. 2009. Disentangling Approaches to Framing in Conflict and Negotiation Research: A Meta-Paradigmatic Perspective'. *Human Relations* **62** (2): 155–193.
- Dittmer, J., Moisiso, S., Ingram, A., and Dodds, K., 2011. Have you heard the one about the disappearing ice? Recasting Arctic geopolitics. *Political Geography*, **30** (4): 202–214.
- Dobretsov, N.L. and Pokhilenko, N.P. 2010. Mineral Resources and Development in the Russian Arctic. *Russian Geology and Geophysics* **51** (1): 98–111.
- Doody, D.G., Kearny, P., Barry, J., Moles, R. and O'Regan, B. 2009. Evaluation of the Q-method as a method of public participation in the selection of sustainable development indicators. *Ecological Indicators* **9**: 1129-1137.
- Doulton, H. and Brown, K. 2009. Ten years to prevent catastrophe?: Discourses of climate change and international development in the UK press. *Global Environment Change* **19**: 191–202.
- Dryzek, J.S. 2005. *The Politics of the Earth: Environmental Discourses*. Oxford, UK: Oxford University Press.
- Dryzek, J.S. and Berejikian, J. 1993. Reconstructive Democratic Theory. *The American Political Science Review* **87**: 48-60.
- Duckett, D., Feliciano, D., Martin-Ortega, J. and Munoz-Rojas, J. 2016. Tackling Wicked Environmental Problems: The Discourse and Its Influence on Praxis in Scotland. *Landscape and Urban Planning* **154**: 44-56.
- Eden, S., Donaldson, A. and Walker, R.G. 2005. Structuring subjectivities? Using Q methodology in human geography. *Area* **37**: 413-422.
- Elo, S. and Kyngäs, H. 2008. The Qualitative Content Analysis Process. *Journal of Advanced Nursing* **62** (1): 107–115.
- Emmerson, C. 2011. *The Future History of the Arctic*. London, UK: Random House.
- Entman, R.M. 1993. Framing: Toward clarification of a fractured paradigm. *Journal of Communications* **43**: 51–58.
- Exner-Pirot, H. 2012. New Directions for Governance in the Arctic Region. In: L. Heininen, (ed.). *Arctic Yearbook 2012*. Akureyri: Northern Research Forum: 225–246.
- Exner-Pirot, H. 2013. What Is the Arctic a Case of? The Arctic as a Regional Environmental Security Complex and the Implications for Policy. *The Polar Journal* **3** (1): 120–135.
- Fairclough, N. 2003. *Analysing Discourse: Textual Analysis for Social Research*. London, UK: Routledge.

- Finger-Stich, A. and Finger, M. 2012. 25 Years of Arctic Environmental Agency: Changing Issues and Power Relations. *In: L. Heininen, (ed.). Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 195-223.
- Forbes, B. 2005. Environmental Problems. *In: Nuttall, M. (ed.). Encyclopaedia of the Arctic: Volume 1,2 and 3*. London, UK: Routledge, 568-572.
- Frantzi, S., Carter, N. and Lovett, J. 2009. Exploring discourses on international environmental regime effectiveness with Q methodology: A case study of the Mediterranean Action Plan. *Journal of Environmental Management* **90** (1): 177-186.
- Frey, L., Botan, C.H. and Kreps, G. 2000. *Investigating Communication*. New York, NY: Allyn & Bacon.
- Gamson, W.A., Croteau, D., Hoynes, W. and Sasson, T. 1992. Media images and the social construction of reality. *Annual Review of Sociology* **18**: 373–393.
- Gautier, D.L., Bird, K.J., Charpentier, R.R, Grantz, A, Houseknecht, D.W., Klett, T.R., Moore, T.E., Pitman, J.K., Schenk, C.J., Schuenemeyer, J.H., Sørensen, K., Tennyson, M.E., Valin, Z.C. and Wandrey, C.J. 2011. Oil and Gas Resource Potential North of the Arctic Circle. *Geological Society, London, Memoirs* **35** (1): 151–161.
- Gibson, C.C., Ostrom, E. and Ahn, T-K. 2000. ‘The Concept of Scale and the Human Dimensions of Global Change: A Survey’. *Ecological Economics* **32** (2): 217–239.
- Goffman, E. 1974. *Frame Analysis: An Essay on the Organization of Experience*. Cambridge, MA: Harvard University Press.
- Grace, J.D. and Hart G.F. 1986. Giant Gas Fields of Northern West Siberia. *AAPG Bulletin* **70** (7): 830–852.
- Gray, B. 2003. Framing of Environmental Disputes. *In: Lewicki, R., Gray, B. and Elliott, M (eds.). Making Sense of Intractable Environmental Disputes*. Washington, DC: Island Press, 11–34.
- Gregersen, U. n.d. *A summary of the oil & gas exploration history of Greenland*, Greenland Oil Industry Association, Available from: <http://www.goia.gl/OilGasinGreenland/History.aspx> [Accessed 18 March 2015].
- Hajer, M.A. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford, UK: Clarendon Press.
- Hajer, M. and Versteeg, W. 2005. A Decade of Discourse Analysis of Environmental Politics: Achievements, Challenges, Perspectives. *Journal of Environmental Policy & Planning* **7** (3): 175–184.

- Han Onn, A., and Woodley, A. 2014. A Discourse Analysis on How the Sustainability Agenda Is Defined within the Mining Industry. *Journal of Cleaner Production* **84**: 116-127.
- Harrison, J.L. 2006. 'Accidents' and invisibilities: Scaled discourse and the naturalization of regulatory neglect in California's pesticide drift conflict. *Political Geography*, **25** (5): 506–529.
- Harsem, Ø., Eide, A. and Heen, K. 2011. Factors influencing future oil and gas prospects in the Arctic. *Energy Policy* **39**: 8037-8045.
- Head, B.W., Helen, R. and Bellamy, J. 2016. Managing Wicked Natural Resource Problems: The Collaborative Challenge at Regional Scales in Australia. *Landscape and Urban Planning* **154**: 81-92.
- Heininen, L. 2013. *Arctic Yearbook 2013*. Akureyri: Northern Research Forum.
- Hisschemöller, M., Hoppe, R., Dunn, W.N. and Ravetz, J.R. 2001. *Knowledge, power, and participation in environmental policy analysis*. New Brunswick, NJ: Transaction Publishers.
- Hovardas, T. and Korfiatis, K.J. 2008. Framing Environmental Policy by the Local Press: Case Study from the Dadia Forest Reserve, Greece. *Forest Policy and Economics* **10** (5): 316–325.
- Howarth, D. 2000. *Discourse: Concepts in the Social Sciences*. Buckingham, UK: Open University Press.
- Howkins, A. 2013. A History of the Arctic: Nature, Exploration and Exploitation: Book Review. *Western Historical Quarterly* **44** (3): 353.
- Hsieh, H-F., and Sarah E. Shannon, S.E. 2005. Three Approaches to Qualitative Content Analysis. *Qualitative Health Research* **15** (9): 1277–1288.
- Humphreys, M, Sachs, J, and Stiglitz, J.E. 2007. *Escaping the Resource Curse*. Cambridge, UK: Cambridge University Press.
- Humrich, C. 2013. Fragmented International Governance of Arctic Offshore Oil: Governance Challenges and Institutional Improvement. *Global Environmental Politics* **13**: 79–99.
- Huntington, H.P. 2009. A preliminary assessment of threats to arctic marine mammals and their conservation in the coming decades. *Marine Policy* **33**: 77-82.
- Jacobs, M.H. and Buijs, A.E. 2011. Understanding Stakeholders' Attitudes toward Water Management Interventions: Role of Place Meanings. *Water Resources Research* **47** (1).
- Jaworski, A. and Coupland, N. 1999. *The Discourse Reader*. London, UK: Routledge.

- Jones, M. 2009. Phase Space: Geography, Relational Thinking, and beyond. *Progress in Human Geography* **33** (4): 487–506.
- Kämpf, M. and Haley, S. 2014. Risk management in the Alaska Arctic offshore: wicked problems require new paradigms. *The Polar Journal* **4**: 150–169.
- Keil, R. and Debbané, A-M. 2005. Scaling Discourse Analysis: Experiences from Hermanus, South Africa and Walvis Bay, Namibia. *Journal of Environmental Policy & Planning* **7** (3): 257–276.
- Khan, A.S. and Neis, B. 2010. The Rebuilding Imperative in Fisheries: Clumsy Solutions for a Wicked Problem? *Progress in Oceanography* **87** (1): 347–356.
- Koivurova, T. 2010. Limits and possibilities of the Arctic Council in a rapidly changing scene of Arctic governance. *Polar Record* **46**: 146–156.
- Kok, K. and Veldkamp, T. 2011. Scale and governance: conceptual considerations and practical implications. *Ecology and Society*, **16** (2).
- Kuckartz, U. 2014. *Qualitative Text Analysis: A Guide to Methods, Practice and Using Software*. Thousand Oaks, CA: Sage.
- Kulchyski, P. 2005. Indigenous Rights. In: Nuttall, M. (ed.). *Encyclopaedia of the Arctic: Volume 1,2 and 3*. London, UK: Routledge, 959-963.
- Kurtz, H.E. 2003. Scale frames and counter-scale frames: constructing the problem of environmental injustice. *Political Geography*, **22** (8): 887–916.
- Lakoff, G. 2010. Why it matters how we frame the environment. *Environmental Communication* **4**: 70–81.
- Larsen, H.G. 2008. Scaling the Baltic Sea Environment. *Geoforum* **39** (6): 2000–2008.
- Leach, M. 2008. Pathways to Sustainability in the Forest? Misunderstood Dynamics and the Negotiation of Knowledge, Power, and Policy. *Environment and Planning A* **40** (8): 1783-1795.
- Leitner, H., Sheppard, E., and Sziarto, K.M. 2008. The spatialities of contentious politics. *Transactions of the Institute of British Geographers*, **33** (2): 157–172.
- Lewicki, R., Gray, B. and Elliott, M. 2003. *Making sense of intractable environmental disputes*. Washington, DC: Island Press.
- Lindholt, L. 2006. Arctic Natural Resources in a Global Perspective. In S. Glomsrød and J. Aslaksen (eds.), *The Economy of the North*. Oslo: Statistics Norway, 27-39.
- Lindholt, L. and Glomsrød, S. 2012. The Arctic: No big bonanza for the global petroleum industry. *Energy Economics* **34**: 1465-147.

- Loe, J.S.P. and Kelman, I. 2016. Arctic Petroleum's Community Impacts: Local Perceptions from Hammerfest, Norway. *Energy Research & Social Science* **16**: 25–34.
- Long, K., Van Gosen, B., Foley, N. and Cordier, D. 2012. *The Principal Rare Earth Elements Deposits of the United States: A Summary of the Domestic Deposits and a Global Perspective*, USGS Scientific Investigations Report 2010-5220.
- Manson, S.M. 2008. Does scale exist? An epistemological scale continuum for complex human–environment systems. *Geoforum*, **39** (2): 776–788.
- Marston, S.A., Jones, J.P., and Woodward, K. 2005. Human geography without scale. *Transactions of the Institute of British Geographers*, **30** (4): 416–432.
- Matthes, J. and Kohring, M. 2008. The Content Analysis of Media Frames: Toward Improving Reliability and Validity. *Journal of Communication* **58** (2): 258–279.
- Maxwell, J.A. 2012. *Qualitative Research Design: An Interactive Approach: An Interactive Approach*. Thousand Oaks, CA: Sage, 145-168.
- Maxwell, J.A. and Mittapalli, K. 2010. Realism as a Stance for Mixed Methods Research. In: Tashakkori, A. and Teddle, C. (eds.). *SAGE Handbook of Mixed Methods in Social and Behavioural Research*, 2<sup>nd</sup> Edition. Thousand Oaks, CA: Sage, 241-272.
- McCannon, J. 2013. *A History of the Arctic: Nature, Exploration and Exploitation*. London, UK: Reaktion Books.
- McDowell, G. and Ford, J.D. 2014. The socio-ecological dimensions of hydrocarbon development in the Disko Bay region of Greenland: Opportunities, risks, and tradeoffs. *Applied Geography* **46**: 98–110.
- Meadowcroft, J., 2002. Politics and scale: some implications for environmental governance. *Landscape and urban planning*, **61** (2): 169–179.
- Mikkelsen, A. and Langhelle, O. 2008. *Arctic oil and gas: sustainability at risk?* London, UK: Routledge.
- Miller, C.A. 2000. The Dynamics of Framing Environmental Values and Policy: Four Models of Societal Processes. *Environmental Values* **9** (2): 211–233.
- Mitroff, I.I. and Mason, R.O. 1980. Structuring III-Structured Policy Issues: Further Explorations in a Methodology for Messy Problems. *Strategic Management Journal* **1** (4): 331–342.
- Moore, A. 2008. Rethinking Scale as a Geographical Category: From Analysis to Practice. *Progress in Human Geography* **32** (2): 203–225.
- Motzfeldt, J. 2008. Climate change in a Greenlandic perspective. Presentation at the *Trans-Atlantic Climate Conference*, Torshavn, Faroe Islands, 7-8 April.

- Mullings, B. 1999. Insider or Outsider, Both or Neither: Some Dilemmas of Interviewing in a Cross-Cultural Setting. *Geoforum* **30** (4): 337–350.
- Nie, M. 2003. Drivers of natural resource-based political conflict. *Policy Sciences* **36**: 307–341.
- Norton, B.G. 2005. Sustainability: A philosophy of adaptive ecosystem management. Chicago, IL: University of Chicago Press.
- Norton, B.G. 2012. The ways of wickedness: Analyzing messiness with messy tools. *Journal of agricultural and environmental ethics* **25**: 447–465.
- Nowotny, H. 2005. The Increase of Complexity and Its Reduction Emergent Interfaces between the Natural Sciences, Humanities and Social Sciences. *Theory, Culture & Society* **22** (5): 15–31.
- Nuttall, M., Berkes, F., Forbes, B. Kofinas, G., Vlassova, T. and Wenzel, G. 2005. Hunting, Herding, Fishing and Gathering: Indigenous Peoples and Renewable Resource Use in the Arctic. In. *Arctic Climate Impact Assessment*, 649–690. Cambridge: Cambridge University Press, 649-690.
- Nuttall, M. 2008. Self-rule in Greenland-towards the world’s first independent Inuit state. *Indigenous Affairs* **8**: 64–70.
- Nuttall, M. 2012. Imagining and governing the Greenlandic resource frontier. *The Polar Journal* **2** (1): 113-124.
- Nyman, E. 2012. Understanding the Arctic: Three popular media views on the north. *Political Geography* **31**: 399-401.
- Olsson, P., Folke, C., Galaz, V., Hahn, T., and Schultz, L. 2007. Enhancing the fit through adaptive co-management: creating and maintaining bridging functions for matching scales in the Kristianstads Vattenrike Biosphere Reserve Sweden. *Ecology and Society*, **12** (1), 28.
- Ostrom, E. 2009. A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science* **325**: 419-422.
- O’Sullivan, D. 2004. Complexity Science and Human Geography. *Transactions of the Institute of British Geographers* **29** (3): 282–295.
- Painter, B. 2009. *Sustainable Water Allocation for Families, Fish and Farming: a Wicked Problem or a Wicked Solution?* In: Proceedings of the 53rd Annual Meeting of the ISSS-2009. Brisbane, Australia. 12-17 July.
- Parbring, B. 2010. The Impact of Climate Change on Inuit and Sámi Societies. *Equal Climate*. Available from: <http://www.equalclimate.org/?module=Articles&action=Article.publicOpen&id=394> [Accessed 22 January 2013].

- Perry, J. 2015. Climate Change Adaptation in the World's Best Places: A Wicked Problem in Need of Immediate Attention. *Landscape and Urban Planning* 133: 1–11.
- Peterson, C.H., Rice, S.D., Short, J.W., Esler, D., Bodkin, J.L. Ballachey, B.E. and Irons, D.B. 2003. Long-Term Ecosystem Response to the Exxon Valdez Oil Spill. *Science* **302** (5653): 2082–2086.
- Picou, J.S., Gill, D.A., Dyer, C.L and Curry, E.W. 1992. Disruption and Stress in an Alaskan Fishing Community: Initial and Continuing Impacts of the Exxon Valdez Oil Spill. *Industrial Crisis Quarterly* **6** (3): 235–257.
- Pretes, M. 2005. Alaska. In: Nuttall, M. (ed.). *Encyclopaedia of the Arctic: Volume 1, 2 and 3*. London, UK: Routledge, 21-27.
- Quinn, P. K., G. Shaw, E. Andrews, E. G. Dutton, T. Ruoho-Airola, and Gong, S.L. 2007. Arctic Haze: Current Trends and Knowledge Gaps. *Tellus B* **59** (1): 99–114.
- Reed, M.S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C.H. and Stringer, L.C. 2009. Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management* **90**: 1933–1949.
- Reese, S.D. 2007. The framing project: A bridging model for media research revisited. *Journal of Communication* **57**: 148–154.
- Rein, M. and Schön, D. 1977. Problem setting in policy research. In: Weiss, C.H. (ed.) *Using Social Research in Public Policy Making*. Lanham, MD: Lexington Books.
- Reinecke, J. and Ansari, S. 2015. Taming Wicked Problems: The Role of Framing in the Construction of Corporate Social Responsibility. *Journal of Management Studies*. **53** (3): 299-329.
- Rekacewicz, P. 2012. Definitions of the Arctic. *UNEP/GRID-Arendal*. Available from: [http://www.grida.no/graphicslib/detail/definitions-of-the-arctic\\_12ba](http://www.grida.no/graphicslib/detail/definitions-of-the-arctic_12ba) [Accessed 28 October 2012].
- Riedlsperger, R., Goldhar, C., Sheldon, T. and Bell, T. 2017. Meaning and Means of “Sustainability”: An Example Form the Inuit Settlement Region of Nunatsiavut, Northern Labrador. In: Fondahl, G. and Wilson, G. (eds.). *Northern Sustainabilities: Understanding and Addressing Change in the Circumpolar World*. Basel, Switzerland: Springer.
- Ritchie, J., Lewis, J., Nicholls, C.M. and Ormston, R. 2014. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London, UK: Sage.
- Rittel, H.W.J. and Melvin M. Webber, M.M. 1973. Dilemmas in a General Theory of Planning. *Policy Sciences* **4** (2): 155–169.

- Roberts, A., Cassano, J., Döscher, R., Hinzman, L., Holland, M., Mitsudera, H., Sumi, A. and Walsh, J.E. 2010. A Science Plan for Regional Arctic System Modeling. International Arctic Research Center. Available from: <http://www.iarc.uaf.edu/sites/default/files/publications/reports/IARCTP10-0001.pdf> [Accessed 10 May 2014].
- Rose, G. 1997. Situating Knowledges: Positionality, Reflexivities and Other Tactics. *Progress in Human Geography* **21** (3): 305–320.
- Ryall, A. Schimanski, J. and Wærp, H.H. 2010. *Arctic Discourses*. Cambridge, UK: Cambridge Scholars Publishing.
- Salwasser, H. 2004. Confronting the Implications of Wicked Problems: Changes Needed in Sierra Nevada National Forest Planning and Problem Solving. *In: Proceedings of the Sierra Nevada Science Symposium: Science for Management and Conservation*. Kings Beach, CA.
- Sandbrook, C., Scales, I.R., Vira, B. and Adams, W.M. 2010. Value Plurality among Conservation Professionals. *Conservation Biology* **25** (2): 285–294.
- Saunders, D.A., and Briggs, S.V. 2002. Nature Grows in Straight Lines—or Does She? What Are the Consequences of the Mismatch between Human-Imposed Linear Boundaries and Ecosystem Boundaries? An Australian Example. *Landscape and Urban Planning* **61** (2): 71–82.
- Saunders, M., Lewis, P. and A. Thornhill, A. 2009. Understanding Research Philosophies and Approaches. *Research Methods for Business Students* **4**: 106–135.
- Sayre, N.F. 2008. Scale. *In: N. Castree, D. Demeritt, D. Liverman, and B. Rhoads (eds.). A Companion to Environmental Geography*. Oxford, UK: Blackwell, 95-108.
- Schön, D.A. and Rein, M. 1994. *Frame reflection: Toward the resolution of intractable policy controversies*. New York: Basic Books.
- Schreier, M. 2012. *Qualitative Content Analysis in Practice*. London, UK: Sage.
- Schwartz-Shea, P. and Yanow, D., 2013. *Interpretive research design: Concepts and processes*. New York: Routledge.
- Shadian, J. 2006. Remaking Arctic governance: The construction of an Arctic Inuit polity. *Polar Record*, **42** (3): 249–259.
- Shadian, J. 2014. *The Politics of Arctic Sovereignty: Oil, Ice, and Inuit Governance*. New York, US: Routledge.
- Shmueli, D.F. 2008. Framing in Geographical Analysis of Environmental Conflicts: Theory, Methodology and Three Case Studies. *Geoforum* **39** (6): 2048–2061.
- Short, J.W., Irvine, G.V., Mann, D.H., Maselko, J.M., Pella, J.J., Lindeberg, M.R., Payne, J.R., Driskell, W.B. and Rice, S.D. 2007. Slightly Weathered Exxon

- Valdez Oil Persists in Gulf of Alaska Beach Sediments after 16 Years. *Environmental Science & Technology* **41** (4): 1245–1250.
- Small, M.J., Güvenç, Ü. and DeKay, M.L. 2014. When can scientific studies promote consensus among conflicting stakeholders? *Risk Analysis* **34**: 1978–1994.
- Späth, P. 2012. Understanding the Social Dynamics of Energy regions—The Importance of Discourse Analysis. *Sustainability* **4** (6): 1256–1273.
- Steinberg, P., Brunn, J.M. and Ingrid, A.M. 2014. Covering Kiruna, a natural experiment in Arctic awareness. *Polar Geography* **37** (4): 273-297.
- Stephenson, W. 1935. Correlating Persons instead of Tests. *Journal of Personality* **4** (1): 17–24.
- Stonehouse, B. 1986. *Arctic Air Pollution*. Cambridge, Cambridge University Press
- Swyngedouw, E. 1997. Neither global nor local: “Glocalization” and the politics of scale. In: K. Cox (ed.) *Spaces of Globalization*. New York, NY: Guilford, 137-166
- Stuhl, A. 2013. The politics of the “New North”: putting history and geography at stake in Arctic futures. *The Polar Journal* **3** (1): 94-119.
- Swyngedouw, E., 2004. Globalisation or ‘glocalisation’? Networks, territories and rescaling. *Cambridge Review of International Affairs*, **17** (1): 25–48.
- Tashakkori, A. and Teddlie, C. 1998. *Mixed Methodology: Combining Qualitative and Quantitative Approaches*. Applied Social Research Methods 46. Thousand Oaks, CA: Sage.
- Thompson, P.B. and Whyte, K.P. 2012. What Happens to Environmental Philosophy in a Wicked World? *Journal of agricultural and environmental ethics* **25**: 485–498.
- Towers, G., 2000. Applying the political geography of scale: grassroots strategies and environmental justice. *The Professional Geographer*, **52** (1): 23–36.
- Tuler, S.P., Kay, R., Seager, T.P. and Linkov, I. 2006. Objectives and Performance Metrics in Oil Spill Response: The Bouchard-120 and Chalk Point Spill Responses. Greenfield, MA: Social and Environmental Research Institute.
- Turnpenny, J., Lorenzoni, I. and Jones, M. 2009. Noisy and Definitely Not Normal: Responding to Wicked Issues in the Environment, Energy and Health. *Environmental Science & Policy* **12** (3): 347–358.
- USGS. 2008. 90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic, *US Department of the Interior, US Geological Survey*. Available from: <http://www.usgs.gov/newsroom/article.asp?ID=1980> [Accessed 27 November 2013].

- Van Bueren, E.M., Van Bueren, E.L.T. and Van der Zijpp, A.J. 2014. Understanding Wicked Problems and Organized Irresponsibility: Challenges for Governing the Sustainable Intensification of Chicken Meat Production. *Current Opinion in Environmental Sustainability* **8**: 1–14.
- Van Den Hove, S. 2006. Between consensus and compromise: acknowledging the negotiation dimension in participatory approaches. *Land Use Policy* **23**: 10–17.
- Van Exel, N.J.A. and De Graaf, G. 2005. *Q Methodology: A Sneak Preview*. Available from: <http://qmethod.org/articles/vanExel.pdf> [Accessed 7 March 2013].
- Van Hulst, M. and Yanow, D. 2016. From Policy “Frames” to “Framing” Theorizing a More Dynamic, Political Approach. *The American Review of Public Administration* **46** (1): 92–112.
- Van Lieshout, M., Dewulf, A., Aarts, N. and Termeer, C. 2011. Do Scale Frames Matter? Scale Frame Mismatches in the Decision Making Process of a “Mega Farm” in a Small Dutch Village. *Ecology and Society* **16** (1): 38.
- Veland, S. and Lynch, A.H. 2017. Arctic ice edge narratives: scale, discourse and ontological security. *Area* **49** (1): 9-17.
- Veldkamp, T., Polman, N., Reinhard, S. and Slingerland, M. 2011. ‘From Scaling to Governance of the Land System: Bridging Ecological and Economic Perspectives’. *Ecology and Society* **16** (1).
- Verweij, M., Douglas, M., Ellis, R., Engel, C., Hendriks, F., Lohmann, S., Ney, S., Rayner, S. and Thompson, M. 2006. Clumsy Solutions for a Complex World: The Case of Climate Change. *Public Administration* **84** (4): 817–843.
- Watts, S and Stenner, P. 2005. Doing Q methodology: theory, method and interpretation. *Qualitative Research in Psychology* **2**: 67-91.
- Watts, S. and Stenner, P. 2012. *Doing Q methodological research: theory, method & interpretation*. London, UK: Sage.
- Webler, T., Danielson, S. and Tuler, S. 2009. *Using Q method to reveal social perspectives in environmental research*. Greenfield MA: Social and Environmental Research Institute.
- Whyte, K.P. and Thompson, P.B. 2012. Ideas for How to Take Wicked Problems Seriously. *Journal of Agricultural and Environmental Ethics* **25** (4): 441–445.
- Wood-Donnelly, C. 2016. From Whale to Crude Oil: Lessons from the North American Arctic. *Energy Research & Social Science* **16**: 132–140.
- Xiang, W-N. 2013. Working with wicked problems in socio-ecological systems: Awareness, acceptance, and adaptation. *Landscape and Urban Planning* **110**: 1–4.

Yoon, J. R. and Kim, Y. 2001. Reviews on Natural Resources in the Arctic: Petroleum, Gas, Gas Hydrates and Minerals. *Ocean and Polar Research* **23**: 51–62.

## Chapter 2

### **Framing a ‘climate change frontier’: international news media coverage surrounding natural resource development in Greenland**

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## **Abstract**

News media helps shape the discourse around natural resource issues, especially rapidly-emerging developments such as those taking place in the Arctic. Whilst the relationship between media and audience is complex, news media contributes towards setting the tone and expectations for the burgeoning number of stakeholders engaging with the region, especially in the case of Greenland. This study undertakes a thematic analysis of English-language news media coverage surrounding natural resource development in Greenland to explore how the issue is framed. Five media frames are identified: ‘emerging resource frontier’, ‘warming Arctic’, ‘high-risk activity’, ‘geopolitical Greenland’ and ‘vulnerable traditional societies’. An overarching frame is present within the coverage, one which depicts Greenland as ‘a climate change frontier’ facing ‘uncertainties in the face of rapid change’. Media portrayal of a close-knit relationship between a warming climate and a rush for natural resources in Greenland could be problematic for several reasons, namely the disparity between actual resource development taking place and an overemphasis on increased economic development following from increased warming.

**Keywords:** natural resource development, Greenland, climate change, resource frontier, Arctic, media frames

## 2.1. Introduction

News media influences discourse around natural resource issues (Entman, 2007; Barua, 2010; Hansen, 2010). It helps to form the frames of understanding people construct about the material world (MacDonald, 2003) and has tangible implications for natural resource governance by influencing stakeholders and decision-makers (Buhr and Hansson, 2011; Sadath et al., 2013; Soroka et al., 2013). For emergent and rapidly developing issues, the news media can often act as the main source of public information, especially if the issue involves places or characteristics its audience ‘have little or no direct experiential access to’ (Hansen, 2010, p181; Happer and Philo, 2013).

One emergent and rapidly developing issue that has garnered increasing global media coverage is ‘the changing Arctic’ (Koivurova, 2010). Placed under the global spotlight, the Arctic environment’s vulnerability to climate change lies at the heart of this attention (ACIA, 2004). Closely associated with this warming is the prospect of increased natural resource development, especially the region’s potential hydrocarbon reserves (Howard, 2009; Harsem et al., 2011). However, recent years have seen this narrative challenged, not so much downplaying the profound implications of climate change but wary of the notion a ‘resource rush’ is associated with this change (Young, 2012; Koivurova, 2013; Keil, 2014). Recent developments in the Arctic involve a complicated mixture of environmental, economic, social and political factors. As such, how news media worldwide engages with and frames this complexity for international audiences is of interest.

With the Arctic geographically remote from the majority of international news media audiences, an unfamiliarity with the region is likely. As Steinberg et al. (2014) note, ‘[f]ew people residing outside the region have first-hand experience of the Arctic... [f]or this reason media representations play an important role’ (p275). This is especially the case for Greenland, an autonomous dependency within the Kingdom of Denmark. With a small population (57,000) comprised of 90 per cent Inuit ethnicity, much of its landmass situated above 66°N and approximately 80 per cent ice-covered (AMAP, 2010), Greenland possesses a demography and geography arguably emblematic of the Arctic region. Relatively unknown internationally, Greenland has ‘entered the global consciousness and the global imagination in recent years’ (Nuttall,

2012, p113), a consequence of burgeoning interest in the Arctic. As Greenland begins to establish itself on the global stage, the ways in which international news media discusses the country's resources are of importance, helping set the tone and expectations of the increasing number of global stakeholders engaging with the country.

Nevertheless, legitimate concerns exist around the oversimplification and exaggeration of media influence on audiences (Olausson, 2011), where an axiomatic assertion is too often made automatically assuming the 'media are central to explaining the dynamics of contemporary societies' (Couldry, 2005, p181). Whilst acknowledging the complexity of media-audience relationships and remaining wary of the dangers of oversimplification, news media still acts as an important source of discourse that sets agendas (Stamm et al., 2000) and guides public opinion (Doulton and Brown, 2009; Steinberg et al., 2014).

Exploratory in nature, this study undertakes a thematic analysis to explore the various ways in which English-language news media coverage frames natural resource development in Greenland. Here, the focus is upon 'external perspectives' to Greenland, so Greenlandic and Danish language news media coverage is not explored. The paper begins by briefly touching upon the current social sciences literature covering Arctic and Greenland natural resource development. The methodology and the study's conceptual underpinnings are then outlined followed by a presentation of the five frames identified: 'emerging resource frontier', 'warming Arctic', 'high-risk activity', 'geopolitical Greenland' and 'vulnerable traditional societies'. An overarching frame is present within international news media coverage, one which depicts Greenland as 'a climate change frontier' which faces 'uncertainties in the face of rapid change'. The implications of this framing are then discussed before concluding remarks.

## **2.2. Arctic and Greenlandic natural resources: social science perspectives**

As political and media attention surrounding Arctic natural resources has burgeoned, so has the Arctic social sciences literature. Common topics of interest include

indigenous peoples, environmental change and regional geopolitics (Nyman, 2012). In essence, the literature aims to better understand the complex dynamics of Arctic natural resource development and the competing agendas and perspectives that shape it. That the Arctic is ‘changing’ is commonly cited, with something akin to a ‘new Arctic’ emerging (Stuhl, 2013; Doel et al., 2014). There is a general acceptance amongst Arctic scholars that growing interest in the region has largely been driven by a combination of rapidly warming climate and the perceived ‘opening up’ of the region creating greater access to its abundant natural resource base and possible shipping routes (Lindholt, 2006). The literature examines various aspects of this ecological and socio-economic change, from local to global, postulating possible futures and conceptually analysing the Arctic (Keskitalo, 2004; Young 2012; Avango et al., 2013; Knecht and Keil, 2013).

Of particular fascination are the region’s offshore petroleum reserves and the socio-economic and ecological ramifications of potential hydrocarbon development. Indeed, oil and gas features prominently within the contemporary Arctic discourse for numerous reasons (Avango et al., 2013): the vast estimates predicted by the US Geological Survey (USGS, 2008); the controversy surrounding offshore activity in wake of the Deepwater Horizon incident in 2011; and the relationship between fossil fuel use and climate change. In their analysis of discourse surrounding oil and gas, Mikkelsen and Langhelle (2008) note tensions and opportunities between economic development, environmental degradation and indigenous rights, claiming a ‘certain inevitability about increased Arctic oil and gas exploration and production’ (p352). Concerns exist that resource abundance could lead to a confrontational situation as each state vies for a greater share of prized resources (Wilson Rowe, 2013). However, some contradict these claims, citing well-established mechanisms for cooperation and the lure of offshore petroleum being, in reality, not particularly important to most Arctic countries for a variety of economic and technical reasons (Young, 2011; Lindholt and Glomsrød, 2012; Keil, 2014).

Peer-reviewed research on natural resource development in Greenland is relatively sparse compared to other parts of the Arctic. This is understandable given its very small population, although there are signs in recent years that this is changing (Nuttall, 2012; McDowell & Ford, 2014; Ren, 2014). The issues and themes are similar to the

wider Arctic literature: impacts of dramatic climate change, the opening-up of the region, traditional livelihoods and the sustainability challenges of pursuing economic development without environmental degradation. Particular to Greenland is the pivotal role natural resource development will play in determining whether ambitions of political independence from Denmark are realised (Nuttall, 2008). Contrary to this independence narrative, McDowell & Ford (2014) rarely found the issue mentioned when interviewing Disko Bay inhabitants about potential hydrocarbon development.

Studies that have included an exploration of media coverage around Arctic natural resource development are relatively few in number and often not explicitly focused on natural resources. Steinberg et al. (2014) explore contemporary Arctic discourse by examining how various news-outlets frame an ‘Arctic media event’, in this instance the Arctic Council ministerial meeting held in Kiruna, Sweden in 2013. Journalists focusing on common ‘hot topics’, such as natural resources, shipping routes and climate change, was widely observed, along with divergent framings of the region’s relevance. One common theme found across all the media reports analysed was ‘a common understanding that the Arctic is increasingly important not so much for what *it is* as for what it may *become*’ (Steinberg et al., 2014, p286). Nyman (2012) reviews three books from the proliferation of Arctic-themed literature published in recent years as a foundation to discuss popular media views, emphasising ‘the difficulties in translating the issues of a complex region with a variety of actors, resources, opportunities and concerns’ (p401). Wilson Rowe (2013) details how both English-language and Russian media depict the Arctic region as a zone of potential conflict. Christensen’s (2013) analysis on representations of Arctic climate change in three newspapers between 2003 and 2010 finds melting sea-ice ‘addressed as both a global and local risk category’ (what she terms ‘scalar transcendence’) and its coverage bringing together several ‘complex questions’ under one banner (‘topical multiplicity’) (p39). In an examination of petroleum discourse in the European Arctic, Jensen (2007) outlines two competing discourses, pro-oil and anti-oil, within Norwegian media coverage. Only one example exists of media analysis in relation to contemporary Greenland, Bjørst’s (2012) examination of the shifting political positions in the climate debate within Danish-language media between 2001 and 2011. These studies all offer insight on media discourse surrounding various aspects of the contemporary Arctic. Rather than focusing on either the Arctic region in general or

examining domestic news media coverage in certain parts of the Arctic, this study makes novel contributions by analysing how international news media portrays the specific issue of natural resource development in a particular region of the Arctic, in this case, Greenland. How this was undertaken is now outlined in the methodology section.

## **2.3. Methodology**

### *2.3.1. Background context*

Greenland is one of the world's largest countries (840,000 square miles) and also one of the least dense in terms of population. A Danish colony for over two hundred years (1721-1953) Greenland has been progressing towards complete independence and aims to become the first Inuit nation state (Nuttall, 2008). Greater autonomy was granted to Greenland in 2009 under the status of 'Self-Rule', which critically gave the country control over the use of its vast natural resource reserves (Harsem et al., 2011). These oil and mineral resources are diverse, comprising of gold, diamonds, iron ore, cryolite, lead, zinc, molybdenum, oil, natural gas, uranium and other rare-earth minerals (Nuttall, 2008). Rare-earth mineral reserves are considerable near the site of Kvanefjeld<sup>2</sup>. Whilst some extractive activity has previously occurred in Greenland, it has been on a relatively small-scale (e.g. the Nalunaq gold mine) (Long et al., 2012). The US Geological Survey estimates vast offshore oil reserves in the west and north-east region of the country (USGS, 2008). The Disko Bay region has become of particular interest, a consequence of its 'relative accessibility and promising subsea geological features' (McDowell and Ford, 2014, p98) (see Figure 2.1).

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<sup>2</sup> See <http://www.ggg.gl/investor-information/asx-announcements/greenland-government-introduces-uranium-licensing-framework-for-the-kvanefjeld-multi-element-project/> [Accessed 18 November 2014]

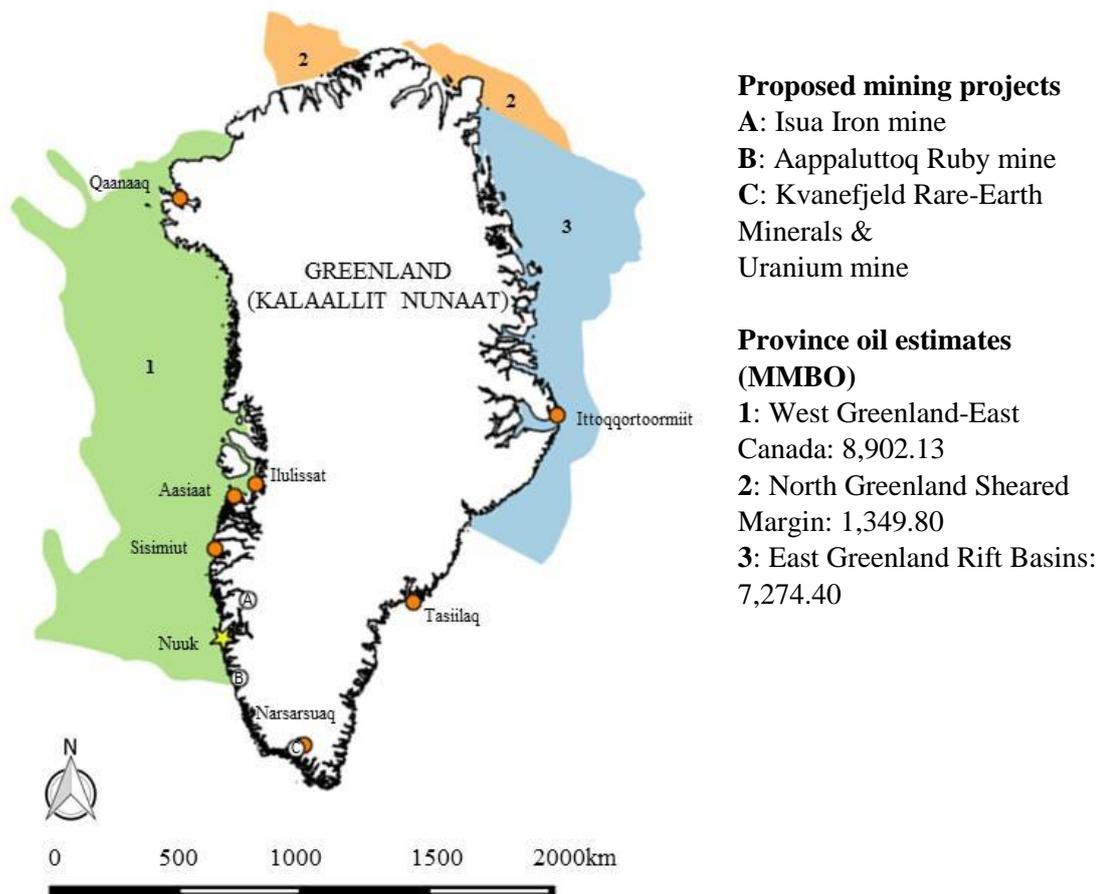


Figure 2.1. Map of Greenland. The map presents proposed mining projects and oil estimates for geologic provinces within Greenlandic waters. Data: USGS, 2008.

### 2.3.2. Conceptual framework

In its exploration of English-language news media coverage around Greenlandic natural resource development, this paper uses a thematic analysis to identify media frames. Thematic analysis expands upon the quantitative nature of content analysis ‘to go beyond observable material to more implicit, tacit themes and thematic structures’ (Joffe, 2011, p211). The method involves the identification, analysis and reporting of ‘themes’ within data (Braun and Clarke, 2006). Themes are described as patterns of meaning that are either explicitly or implicitly found in the content of a dataset (Joffe, 2011). When carried out effectively thematic analysis offers a useful means to ‘summarize key features of a large body of data, and/or offer a ‘thick description’ of the data set’ (Braun and Clarke, 2006, p97).

Thematic analysis is a useful analytical tool to identify patterns of meaning (i.e. ‘media frames’) relating to how the media comprehends, understands and portrays certain events and issues (Gitlin, 1980; Reese, 2007). Entman (1993) describes framing as ‘selecting some aspects of a perceived reality and making them more salient in a communicating context, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described’ (p38). Frames act as structures of perception and beliefs behind particular standpoints (Schön and Rein, 1994) and a means in which the complexity of reality is organised into something coherent and meaningful (Gamson et al., 1992; Carvalho, 2000). In this instance, how international news media organises the complex reality surrounding natural resources in Greenland into a coherent picture. Media frames matter (Tierney et al., 2006; Lakoff, 2010) as the emphasis or neglect of certain aspects ‘defines the boundaries of the debate by placing the event or issue within a certain sphere of meaning’ (Gandiwa et al., 2014, p2).

### *2.3.3. Data collection*

This study focuses on the period between January 2004 and February 2014, a period where global attention towards Arctic issues burgeoned (Koivurova, 2010). An online search of English-language news media was conducted (e.g. newspapers, wire articles, press releases and industry reports). The *LexisNexis* database was queried using the search terms ‘Greenland’ and ‘Mining’ or ‘Oil’ to return articles that contained this term within the body or headline text. There are some limitations in taking this approach. The choice of key words could potentially omit certain facets of news media coverage and subsequent omission of particular patterns as a result. Furthermore, in only analysing English-language news media the breadth of possible articles returned is restricted. Nevertheless, whilst such a search cannot provide a definitive account of the global news media discussion around Greenland natural resource development, *LexisNexis* is widely-regarded as a comprehensive database with an extensive global spread of news and industry publications and has been used in many other studies for similar purposes (see Nerlich (2010), Jaspal and Nerlich (2013), Tyrrell and Clark (2014)). As such, it is felt the articles obtained offer a useful snapshot of the news media discussion worldwide. The thousand ‘most relevant’ articles were determined

algorithmically via *LexisNexis* and selected for analysis. Of the chosen articles, 277 were disregarded as irrelevant (e.g. a reference to Greenland, Virginia) or duplications of the same article over several news outlets. Articles were read and coded with no predetermined categorisations outlined. Categories were instead developed as analysis progressed, offering a flexibility to the coding approach. Two researchers analysed five hundred articles each, of which a sample were cross-referenced to reduce researcher bias (Krefting, 1991; Butcher et al., 2001). Once complete, this coding facilitated an interpretative analysis of the articles' content whereby frames within the news media coverage were identified. Whilst coding was used to facilitate this interpretation, this analysis was qualitative in its approach, not quantitative. The nature of interpretative approaches ensures exact replication of findings is limited. However, interpretative methods offer the subtlety and nuance to obtain a greater understanding of underlying patterns of meaning around a particular issue (Carvalho, 2000).

## **2.4. Media Frames**

### *2.4.1. Emerging resource frontier*

This frame sees Greenland portrayed as a 'new frontier' in resource development (The Scotsman, 2008): a depiction commonly-ascribed to the Arctic as a whole in recent years. This frame centres around three elements: abundance, remoteness and activity.

Littered throughout the news media coverage are references to the abundance of Greenland's natural resource base. This abundance is characterised by hyperbolic language describing Greenland's reserves as 'glistening riches' (Associated Press, 2009), a 'mining bounty' and 'a veritable treasure chest of minerals' (The Times, 2010). The use of oil-rich Saudi Arabia as a comparison for equivalent estimates of oil emphasises the vast quantities and potentially society-changing levels of wealth under discussion. In a similar fashion to petroleum, Greenland's rare-earth mineral deposits are spoken of as globally-significant quantities, the biggest outside the world's dominant exporter, China.

Greenland's 'remoteness' is emphasised throughout, contributing to the construction of Greenland as a 'frontier space', as well as part of a wider Arctic frontier region.

Here, frontier is characterised more in geographical terms with ‘explorers’ entering ‘one of the most remote corners of the globe’ (Associated Press, 2006). Nonetheless, when this remoteness is coupled with Greenland’s cold, harsh climate, not only do we witness a ‘new’ frontier space becoming explored, but also an activity pushing the frontiers of modern technology and its technical capability to extract resources in such challenging conditions.

The language used to describe Greenland’s remoteness is worthy of particular attention. A contrast exists between one perspective leaning towards a more environmental-conservationist description of remoteness and another depicting a desolate hinterland at the world’s periphery. Observing the former, we see Greenland’s environment described in positive terms, emphasising what is ‘there’ and what could be lost with increased resource development. Its environment is depicted as a ‘pristine environment’ (The Guardian, 2014), ‘untouched’ (Carleton Place, 2010) and ‘one of the world’s last wildernesses’ (India/Pak, 2012). The latter focuses more on what is not there with an emphasis on the harshness of environmental conditions and lack of human activity, with Greenland’s environment consisting of ‘barren wastelands’ (Yukon, 2012a) and ‘frozen wastes’ (The Guardian, 2013).

The third component shaping this frame centres on the flurry of resource interest and activity in Greenland. To the backdrop of Greenland’s resource abundance and geographical remoteness, considerable attention is placed on the extent of activity and whether political structures and environment systems can keep up with its pace. Greenland is depicted as a resource frontier facing a sudden free-for-all in which it is ill-equipped to cope. This is highlighted in the hyperbolic language used to describe the pace of activity. Pertinent examples include ‘the scramble for Greenland acreage’ (Investors Chronicle, 2009), ‘mining firms are in a mad dash to cash in on Greenland’s bounties’ (Mail and Guardian, 2014), and ‘a huge stampede, the gold rush of the 21<sup>st</sup> century’ (Daily Mail, 2010).

#### *2.4.2. Warming Arctic*

Closely associated to notions of an emerging resource frontier is climate change. Positives of climate change tend to outweigh discussion about negatives with phrases such as ‘warming fuels dream of hidden wealth’ (Associated Press, 2009) and ‘global

warming is a gift from the heavens' (The Globe and Mail, 2010) commonplace. Climate change is ever-present, routinely used as background context to the emerging resource accessibility: 'ice thaw fuelled by global warming make Arctic exploration more feasible' (The Calgary Herald, 2011) and '...global warming also has helped spur the potential oil boom in Greenland' (Washington Times, 2009). A nuanced portrayal is less prevalent. More familiar discussions of climate change tend to emanate from stories featuring actions by Greenpeace, for example in the wake of their disruption of the Cairn drilling season: 'Cairn might be a step closer to finding oil off Greenland, but this takes us one step back in the fight against climate change' (Agence France Presse, 2010).

Impacts on Greenlandic communities from climate change are occasionally referenced. 'Climate change is destroying the traditional shrimping economy of Greenland' (FPBN, 2013) and 'all Inuit leaders agree climate change is having a big impact on their communities' (CBC, 2009) are two such examples. Tensions exists between taking action on climate change and resource extraction: 'the island's leaders treat potential oil reserves and melting ice as two separate issues' (Associated Press, 2008). This 'delicate balance' of 'a haven for environmentalists looking for evidence of global warming and as the latest frontier for oil and gas' (The Herald, 2008) is one that defines the tone and structure of news media coverage.

There is acceptance that this change is inevitable, which has fostered the development of an adaptation argument: 'Anderson isn't keen on saving the ice – "it's too late for that already, it's going"' (Halesowen News, 2009). This movement towards adaptation highlights an interesting observation, that unlike many other climate debates there is little discussion whether it is occurring or not. Climate change and its impacts are considered to be definitive and happening. References are made using present or even past tenses: 'climate change has been 'helpful rather than unhelpful' to miners in Greenland' (Associated Press, 2009); 'the changes that climate change has brought' (Targeted News Services, 2013). This contrasts with language commonly associated with climate change discourse that focuses more on future projections and scenarios (Nakicenovic and Swart, 2000).

### 2.4.3. *'High-risk' activity*

The term 'risk' is prevalent throughout the articles. What becomes evident, however, is the different interpretation of what constitutes risk. This divide is most keenly observed between industry interpretations of risk and those of an environmental and socio-economic perspective. Extraction in the Arctic is often described as a 'high-risk, potentially high-reward' venture of which Greenland is an often cited example. This could refer to multiple types of risk, yet the pervasive use of the term relates to the possibility of financial loss. Statements from industry representatives discuss 'a 'frontier opportunity', with risks and rewards both high' (European Spot Gas Markets, 2010). This view of risk is exemplified by Cairn's decision to bring in additional partners following failure to discover commercial quantities of petroleum '...to re-balance its portfolio to reduce its exposure to the high-cost, high-risk frontier waters offshore Greenland' (Platts Oilgram New, 2012).

A proportion of the coverage was company statements, stock updates and investment advice which used the term risk in a technical or legalistic form. Statements regarding the extraction potentials of plots regularly contained disclaimers like '[f]orward-looking statements address future events and conditions and therefore, involve inherent risks and uncertainties' (PR Newswire US, 2005), while expected minerals are discussed as 'risked potential'.

Environmental NGOs and social commentators also describe Arctic resource extraction as a high risk venture. However, this focused less on economic and operational considerations, instead deploying the term risk to describe the potential negative consequences to society and the environment. Discussions on environmental and societal risks are often intertwined with Greenlandic lifestyles' strong relationship with nature, such as hunting and fishing. Risks are often discussed with references to the 'pristine' or 'untouched' environment, or 'traditional society' by news agencies and environmental groups.

The debate over environmental risk became more pronounced following the Gulf of Mexico disaster in which an estimated 4.4 million barrels of oil were spilled from a BP drilling rig (Crone and Tolstoy, 2010). This oil spill is closely associated with the risks of Arctic drilling and an illustration of potential disasters. Cairn Energy

acknowledged this shift, providing statements on their ‘risk mitigation programme’, ‘well control and risk management’ and their efforts ‘to manage all the risks very clearly and in a focused way’, broadening their definition of risk to environmental and technical considerations and moving away from the language of investment.

#### *2.4.4. Geopolitical Greenland*

Within parts of the news media coverage we see explicit efforts to place Greenland within a geopolitical context. The emphasis is on the strategic importance of Greenland: its geographic location and the political ramifications of its large deposits of high-demand minerals in a globalised world. This frame positions issues of energy security, foreign policy and sovereignty at the forefront, relegating more domestic concerns of the debate, such as local pollution effects on fisheries or community upheaval from foreign workers.

There is a strong notion of Greenland emerging from isolation and realigning its position in a globalised world. Here, an increasingly autonomous Greenland, with well-documented aspirations of eventually achieving full-independence from Denmark (Nuttall, 2012), is keen to establish itself as a global player in its own right, using its natural resources as important leverage in this process. In this context, domestic political decisions surrounding natural resources can ‘pack a global punch’ (Scotland on Sunday, 2013), with the country having ‘so much to offer the globalised world’ (Architects Journal, 2012). Greenland’s global significance has much to do with the type and abundance of its mineral wealth. Such are the importance of rare-earth minerals to high-tech industries and oil to a global economy hugely dependent on hydrocarbons, it is perhaps unsurprising the news media talks up Greenland’s significance in the global arena and how ‘this once easily forgettable island is poised for great things’ (RIN, 2013).

Much is written on the increasing international attention towards Greenland. With Greenland shifting away from the auspices of Danish colonial rule, it enters unknown geopolitical territory. When combined with the general uncertainty of an Arctic-influx due to a warming climate, this has led to concerns that Greenland is particularly vulnerable from foreign influence. World powers most commonly described in the news media as trying to wield influence are China and the EU. China’s perceived

influence is largely through its involvement with several proposed large-scale mining projects, such as the \$2.3 billion iron-ore mine just outside the capital Nuuk (Nuttall, 2012), which has since failed to attract the required investment to continue. Viewed through a geopolitical lens, parts of the news media discuss these investments as part of a larger territorial game by China, a ‘Chinese master plan to take over the Arctic and its resources’ (RIN, 2013). Such suggestions tend to be refuted by Greenland politicians and Chinese officials labelling concerns over a Chinese invasion as ‘polar paranoia’ (The Financial Daily, 2012). Regardless, this idea of a geopolitical power struggle over Greenland and its resources is consistently reasserted when news media coverage presents headlines, such as the ‘EU scrambles for Greenland's wealth: ‘Raw material diplomacy’ to exploit icy wilderness’ (The Guardian, 2012) and ‘US signals it is ready for Arctic oil battle’ (The Guardian, 2011b).

#### *2.4.5. Vulnerable traditional societies*

This frame places natural resources as more of a social-cultural issue for Greenlanders, with less concern for the global implications of resource development. Here, the common issues are about the tensions between modernisation and traditional livelihoods, the influx of immigrant workers and their impacts on the nation’s small population. Concerns by non-Greenlandic commentators are aired about Greenland’s ability to effectively govern resource extraction, given the economic disparity between its public institutions and the clout of large international oil and mining companies. The size of the population is often referenced in relation to the question of ‘whether such a tiny population can cope’ (The Financial Daily, 2012). Even when spoken in positive terms, language is more aspirational in tone: ‘Greenland's ambition is to have sufficient capacity’ or ‘a traditional society trying to make its own way in the world’ (Toronto Star, 2012).

One of the central social concerns is the impact of high levels of immigration. Some of these concerns relate to the impact on working conditions and employment, partly fuelled by the 2012 Large Scale Project Act that relaxed rules on foreign recruitment: ‘[the national labour union] does not want local pay scales undermined or jobs lost to foreign workers’ (Yukon News, 2012b). A second debate is fostered by the Inuit Circumpolar Council whose current leader, the Greenlandic Aqqaluuk Lynge, regularly makes statements concerning immigration. Greenland’s small population

being overrun is his most common argument against development, examples including ‘we cannot afford to be a minority in our own country’, ‘large numbers of workers are brought in from outside, indigenous people risk becoming a minority’ (The Guardian, 2011a) and ‘the many thousands of foreign workers they would bring in would have a devastating impact on what is already a very fragile Greenlandic culture’ (Cyprus Mail, 2014).

Despite concerns about immigration, potential for investment from a domestic perspective has largely been covered in favourable terms and even as essential, with most people seeing it ‘not as opportunity, but as necessity’ (The Financial Daily, 2012). The social and economic issues that are present in Greenland are regularly mentioned, with references to alcoholism and suicide. This is often related to dwindling populations as unemployment increases. Consequently, exploitation of resources is given as an opportunity to resolve this: ‘[w]e cannot live with unemployment and cost-of-living increases while our economy is at a standstill’ (The Telegraph, 2013).

## **2.5. Discussion**

### *2.5.1. A climate change frontier facing an uncertain future*

Of the five frames identified, two frames, ‘warming Arctic’ and ‘resource frontier’, serve as contextual background in which the Greenland natural resource development story is then told and whereby other frames of risk, vulnerable traditional societies and geopolitics emerge. These two frames are often employed in unison, with a warming climate emphasised as a key factor in Greenland emerging as a resource frontier. Interestingly, this relationship is seldom refuted by the global news media. Such is the close association of these two frames, they can be bought together to encapsulate the global news media’s framing of Greenland: ‘climate change frontier’, a remote frontier space abundant with globally sought-after minerals emerging in an era of established climate change. Perhaps it is unsurprising to find the global news media’s framing of Greenland natural resource development in such a manner. With climate change becoming increasingly ingrained in the global discourse, greater global media interest on its impacts is inevitable and with the Arctic region warming twice as fast as the rest

of the world (ACIA, 2004), Greenland natural resource development was always likely to be tied up with the wider climate change discourse. Similarly, the resource quantities under discussion coupled with the remoteness and relatively untouched Arctic environment of Greenland was always likely to lend itself to a certain frontier imagery.

With a ‘climate change frontier’ setting the context, we observe three different frames central to Greenland natural resource development: ‘vulnerable traditional societies’, ‘high-risk activity’ and ‘geopolitical Greenland’. A central characteristic tying these three frames together is one of *uncertainties in the face of rapid change*. As Greenland becomes a climate change frontier space, what will happen to traditional livelihoods or Greenland’s geopolitical standing in the Arctic/wider world? How risky is resource activity in Greenland? Is it even financially viable to develop resources in Greenland? In the case of offshore oil, are there any reserves at all? Questions of ecological, economic and social uncertainty regarding all aspects of Greenland’s natural resource development permeate through much of the global news media coverage. This uncertainty is accentuated by the novelty of both Greenland as a natural resource-producing space and the contemporary environmental problems it faces, namely rapid climate change. Figure 2.2 visualises the relationship between these five frames.

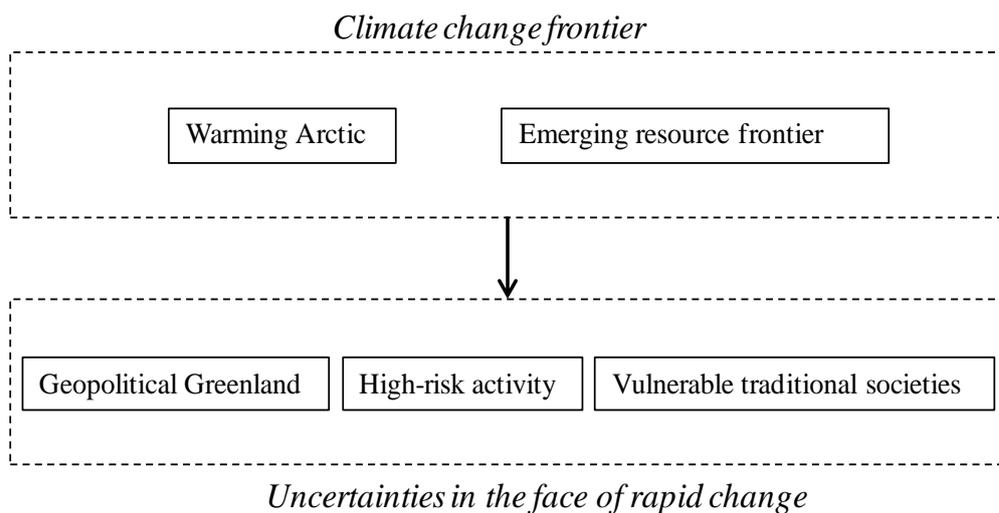


Figure 2.2. Schematic visualising the relationship between the five frames identified within international media coverage of Greenland natural resource development.

### 2.5.2. *Problematic framing?*

One question emerging from this work is to what extent is the framing of a climate change frontier problematic? Whilst news media depictions of this kind certainly echo reality to some degree (the Arctic climate is warming with dramatic effect and natural resource interest in this remote part of the globe is on the rise) the extent to which Greenland natural resource development is a ‘frontier’ opening up through ‘climate change’ is certainly subject to debate. With regards to notions of an emerging resource frontier, despite the excitable talk the truth remains that limited extraction activity has taken place in the last decade, nor is this likely to change in next decade at the least (Nuttall, 2012). In this respect, there is a danger of global news media getting ahead of itself and contributing to inflated expectations that do not match up to reality. Furthermore, the use of frontier-style terms, such as ‘barren wastelands’, ‘pristine environments’ and ‘wilderness’, risks underplaying the people of Greenland’s voice in natural resource development. Indeed, observing the language sometimes used, it could quite easily be mistaken the area under discussion was the remote regions of the North Pole, not the territory of Greenland.

As for a warming Arctic driving a race for resources, it is unclear how much of this is a factor and not merely a backdrop in which natural resource interest takes place. There appears to be no incidences where a warmer climate has been linked *directly* to resource activity and it is impossible to know how much interest in Greenland’s resources would have still existed even if the climate wasn’t warming to the extent it is. In light of widespread media coverage that strongly associates the two, there is certainly a need for empirical research exploring the extent of this relationship. Whilst talk of increased accessibility, longer summer seasons and reduced sea-ice cover are sure to encourage greater enthusiasm from extractive industries, some argue a warmer climate is not necessarily favourable, e.g. increased sea-ice melt may increase iceberg hazards for offshore activity (Lindholt and Glomsrød, 2012). What can be said with some certainty is consistent global demand for commodities such as hydrocarbons<sup>3</sup> and rare-earth minerals coupled with Greenland’s strive for economic independence

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<sup>3</sup> Whilst global demands for hydrocarbons are unlikely to dwindle in the near future, the dramatic fall of the price of oil in January 2015 has raised questions about the economic viability of pursuing offshore oil in the Arctic. See - <http://www.alaskaenergyforum.com/article/plunging-oil-prices-cast-doubt-on-arctic-drilling> [Accessed 22 April 2015]

would have almost undoubtedly led to some degree of interest. That oil exploration took place in Greenlandic waters during the 1970s (Gregersen, n.d.), a time before climate change was a widely acknowledged phenomenon and its impacts felt, attests to this. Indeed, it is interesting to note how discussions from decades ago about Greenland's natural resources bear striking resemblance to those of the present day (see Miles and Wright, 1978).

By intrinsically combining climate change with resource activity in Greenland there is a danger of overemphasising the trope that increased economic development follows from greater climate change. Climate change depicted positively as a key to unlock Greenland's vast economic potential might overshadow more negative consequences of rapid warming, such as impacts on traditional livelihoods or disruption of fisheries, especially in a country seeking to drastically improve its economic output. To counter this, perhaps an effort to 'reframe' (Doyle, 2011) Greenland natural resource development and decouple climate change from resource development is required, with each approached on their own terms. This is not to completely refute any relationship between the two, but could arguably allow for more nuanced accounts of developments in Greenland.

## **2.6. Concluding Remarks**

The portrayal of a close-knit relationship between a warming climate and a rush for natural resources in Greenland echoes much of what has been written in the wider Arctic social sciences literature over the last decade. Nevertheless, a sceptical turn has emerged amongst Arctic scholars against this simple narrative (Young, 2012; Koivurova, 2013; Keil, 2014). This scepticism is not reflected in the news media coverage observed here, although this could change in the future. However, the absence of a 'resource rush' would arguably represent a less captivating story for media audiences and unlikely to receive as much attention. Given the issue's complex nature, capturing its intricacies through compendious media coverage is always going to be a challenging, if not near-impossible, task. Therefore, a certain framing is required to engage readers and place developments in an understandable context. Nevertheless, with growing global attention towards developments in Greenland and

the wider Arctic, this framing becomes of increasing significance. Media frames percolate into the policy space for those stakeholders involved with the issues at hand but not necessarily familiar with the region, facilitating misinformation in the policy process or overemphasising certain areas of the debate (Hansen, 2011; Soroka et al., 2013).

The extent to which these frames impact policy and governance surrounding Arctic natural resources requires further research. There are plenty of opportunities to expand on the exploratory findings of this work. A focus on Greenlandic and Danish language news media would prove an interesting comparison. Observing similarities, differences and tensions between how different stakeholder groups frame the issue, from ground-level Greenlandic community to Arctic and global-wide policy circles, would offer useful insight. Similarly fruitful would be to delve deeper into the notion of ‘risk’ that presented itself in this analysis, what is meant by various stakeholders when they speak of ‘risk’ and why such differences matter. The complexity and contemporary nature of Greenland’s changing environment serves as fertile ground for research into the juxtaposition between climate change and natural resource development.

## 2.7. References

- ACIA, 2004. *Impacts of a Warming Arctic: Arctic Climate Impact Assessment*, Cambridge, UK: Cambridge University Press.
- AMAP, 2010. *Assessment 2007: Oil and Gas activities in the Arctic – Effects and Potential Effects. Volume 2*. Arctic Monitoring Programme. Oslo, Norway.
- Avango, D., Nilsson A.E. and Roberts P. 2013. Assessing Arctic Futures: Voices, Resources and Governance. *The Polar Journal* **3** (2): 431-446.
- Barua, M. 2010. Whose issue? Representations of human-elephant conflict in Indian and international media. *Science Communication* **32**: 55–75.
- Bjørst, L.R. 2012. Politiske positioner og skift i den grønlandske klimadebat fra 2001 til 2011. *Tidsskriftet Grønland* **60** (1): 2-19.
- Braun, V. and Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* **3**: 77–101.

- Buhr, K. and Hansson, H. 2011. Capturing the stories of corporations: A comparison of media debates on carbon capture and storage in Norway and Sweden. *Global Environmental Change* **21**: 336–345.
- Butcher, H.K., Holkup, P.A., Park, M. and Maasz, M. 2001. Thematic Analysis of the Experience of Making a Decision to Place a Family Member with Alzheimer's Disease in a Special Care Unit. *Research in Nursing & Health* **24**: 470-480.
- Carvalho, A. 2000. Discourse analysis and media texts: a critical reading of analytical tools. Paper presented at the International Conference on Logic and Methodology, RC 33 meeting (International Sociology Association), Cologne, 3–6 October.
- Christensen, M. 2013. Arctic Climate Change and the Media: The News Story That Was. In: Christensen, M., Nilsson, A.E. and Wormbs, N. (eds.). *Media and the Politics of Arctic Climate Change: When the Ice Breaks*. London, UK: Palgrave Macmillan, 26-51.
- Couldry, N. 2005. Transvaluing media studies. In: Curran, J. and Morley, D. (eds.). *Media and cultural theory*. Abingdon: Routledge, 177-194.
- Crone, T.J. and Tolstoy, M. 2010. Magnitude of the 2010 Gulf of Mexico oil leak. *Science* **330**: 634–634.
- Doel, R.E., Wråkberg, U. and Zeller, S. 2014. Science, Environment, and the New Arctic. *Journal of Historical Geography* **44**: 2–14.
- Doulton, H. and Brown, K. 2009. Ten years to prevent catastrophe?: Discourses of climate change and international development in the UK press. *Global Environment Change* **19**: 191–202.
- Doyle, J. 2011. Acclimatizing nuclear? Climate change, nuclear power and the reframing of risk in the UK news media. *International Communication Gazette* **73**: 107–125.
- Entman, R.M. 1993. Framing: Toward clarification of a fractured paradigm. *Journal of Communications* **43**: 51–58.
- Entman, R.M. 2007. Framing bias: Media in the distribution of power. *Journal of Communications* **57**: 163–173.
- Gamson, W.A., Croteau, D., Hoynes, W. and Sasson, T. 1992. Media images and the social construction of reality. *Annual Review of Sociology* **18**: 373–393.
- Gandiwa, E., Sprangers, S., Van Bommel, S., Heitkönig, I., Leeuwis, C. and Prins, H.H. 2014. Spill-over effect in media framing: Representations of wildlife conservation in Zimbabwean and international media. *Journal for Natural Conservation* **5**: 413-423.
- Gitlin, T. 1980. *The whole world is watching: Mass media in the making & unmaking of the new left*. Oakland, CA: University of California Press.

- Gregersen, U. n.d. *A summary of the oil & gas exploration history of Greenland, Greenland Oil Industry Association*, Available from: <http://www.goia.gl/OilGasinGreenland/History.aspx> [Accessed 18 March 2015].
- Hansen, A. 2010. *Environment, media and communication*. New York: Routledge.
- Hansen, A. 2011. Communication, media and environment: Towards reconnecting research on the production, content and social implications of environmental communication. *International Communication Gazette*. **73**: 7–25.
- Happer, C. and Philo, G. 2013. The role of the media in the construction of public belief and social change. *Journal of Social and Political Psychology* **1**: 321–336.
- Harsem, Ø., Eide, A. and Heen, K. 2011. Factors influencing future oil and gas prospects in the Arctic. *Energy Policy* **39**: 8037-8045.
- Howard, R. 2009. *The Arctic gold rush: The new race for tomorrow's natural resources*. London, UK: Continuum.
- Jaspal, R. and Nerlich, B. 2013. Fracking in the UK press: Threat dynamics in an unfolding debate. *Public Understanding of Science*. **23** (3): 348-363.
- Jensen, L.C. 2007. Petroleum discourse in the European Arctic: the Norwegian case. *Polar Record* **43**: 247–254.
- Joffe, H. 2011. Thematic Analysis. In: Harper, D. and Thompson, A.R. (eds.). *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners*. Hoboken: John Wiley & Sons, 209-223.
- Käpylä, J and Mikkola, H. 2015. On Arctic Exceptionalism: Critical Reflections in the Light of the Arctic Sunrise Case and the Crisis in Ukraine'. *The Finnish Institute of International Affairs Working Paper* 85.
- Keil, K., 2014. The Arctic: A new region of conflict? The case of oil and gas. *Cooperation and Conflict* **49**: 162–190.
- Keskitalo, E. C. H. 2004. *Negotiating the Arctic: The construction of an international region*. New York, NY: Routledge.
- Knecht, S. and Keil, K. 2013. Arctic geopolitics revisited: spatialising governance in the circumpolar North, *The Polar Journal* **3** (1): 178-203.
- Koivurova, T. 2010. Limits and possibilities of the Arctic Council in a rapidly changing scene of Arctic governance. *Polar Record* **46**: 146–156.
- Koivurova, T. 2013. The Dialectic of Understanding Progress in Arctic Governance. *Michigan State International Law Review* **22** (1): 1-21.
- Krefting, L. 1991. Rigor in qualitative research: The assessment of trustworthiness. *The American Journal of Occupational Therapy* **45**: 214–222.

- Lakoff, G. 2010. Why it matters how we frame the environment. *Environmental Communication* **4**: 70–81.
- Lindholt, L. 2006. Arctic Natural Resources in a Global Perspective. In: Glomsrød, S. and J. Aslaksen, J. (eds.). *The Economy of the North*. Oslo: Statistics Norway, 27-39.
- Lindholt, L. and Glomsrød, S. 2012. The Arctic: No big bonanza for the global petroleum industry. *Energy Economics* **34**: 1465-147.
- Long, K., Van Gosen, B., Foley, N. and Cordier, D. 2012. *The Principal Rare Earth Elements Deposits of the United States: A Summary of the Domestic Deposits and a Global Perspective*, USGS Scientific Investigations Report 2010-5220.
- Macdonald, M. 2003. *Exploring media discourse*. Oxford, UK: Oxford University Press.
- McDowell, G. and Ford, J.D. 2014. The socio-ecological dimensions of hydrocarbon development in the Disko Bay region of Greenland: Opportunities, risks, and tradeoffs. *Applied Geography* **46**: 98–110.
- Mikkelsen, A. and Langhelle, O. 2008. *Arctic oil and gas: sustainability at risk?* London, UK: Routledge.
- Miles, P. and Wright, N.J.R. 1978. An outline of mineral extraction in the Arctic. *Polar Record* **19**: 11–38.
- Nakicenovic, N. and Swart, R. 2000. *Emissions Scenarios*. Cambridge: Cambridge University Press.
- Nerlich, B. 2010. “Climategate”: paradoxical metaphors and political paralysis. *Environmental Values* **19** (4): 419–442.
- Nuttall, M. 2008. Self-rule in Greenland-towards the world’s first independent Inuit state. *Indigenous Affairs* **8**: 64–70.
- Nuttall, M. 2012. Imagining and governing the Greenlandic resource frontier. *The Polar Journal* **2** (1): 113-124.
- Nyman, E. 2012. Understanding the Arctic: Three popular media views on the north. *Political Geography* **31**: 399-401.
- Olausson, U. 2011. “We’re the ones to blame”: Citizens’ representations of climate change and the role of the media. *Environmental Communication* **5**: 281–299.
- Reese, S.D. 2007. The framing project: A bridging model for media research revisited. *Journal of Communication* **57**: 148–154.
- Ren, C. 2014. Cool or hot Greenland? Exhibiting and enacting sustainable Arctic futures. *Journal of Cleaner Production* **111** (B): 442-450

- Sadath, N., Kleinschmit, D. and Giessen, L. 2013. Framing the tiger—A biodiversity concern in national and international media reporting. *Forest Policy and Economics* **36**: 37–41.
- Schön, D.A. and Rein, M. 1994. *Frame reflection: Toward the resolution of intractable policy controversies*. New York: Basic Books.
- Soroka, S., Farnsworth, S., Lawlor, A. and Young, L. 2013. Mass media and policy-making. In: Araral Jr, E., Fritzen, S. Howlett, M. Ramesh, M and Wu, X. (eds.). *Routledge Handbook of Public Policy*. New York: Routledge, 204-214.
- Stamm, K.R., Clark, F. and Eblacas, P.R. 2000. Mass communication and public understanding of environmental problems: the case of global warming. *Public Understanding of Science* **9**: 219–237.
- Steinberg, P., Brunn, J.M. and Ingrid, A.M. 2014. Covering Kiruna, a natural experiment in Arctic awareness. *Polar Geography* **37** (4): 273-297.
- Stuhl, A. 2013. The politics of the “New North”: putting history and geography at stake in Arctic futures. *The Polar Journal* **3** (1): 94-119.
- Tierney, K., Bevc, C. and Kuligowski, E. 2006. Metaphors matter: Disaster myths, media frames, and their consequences in Hurricane Katrina. *Annals of the American Academy of Political and Social Sciences* **604**: 57–81.
- Tyrrell, M. and Clark, D.A. 2014. What happened to climate change? CITES and the reconfiguration of polar bear conservation discourse. *Global Environmental Change* **24**: 363-372.
- USGS. 2008. 90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic, *US Department of the Interior, US Geological Survey*. Available from: <http://www.usgs.gov/newsroom/article.asp?ID=1980> [Accessed 27 November 2013].
- Wilson Rowe, E. 2013. A dangerous space? Unpacking state and media discourses on the Arctic. *Polar Geography* **36** (3): 232-244.
- Young, O.R. 2011. The future of the Arctic: cauldron of conflict or zone of peace?. *International Affairs* **87** (1): 185-193.
- Young, O.R. 2012. Building an international regime complex for the Arctic: current status and next steps. *The Polar Journal* **2** (2): 391-407.

## Chapter 3

### **‘Frame conflicts’ in natural resource use: exploring framings around Arctic offshore petroleum using Q-methodology**

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## **Abstract**

Environmental and natural resource issues are often framed in multiple ways by different stakeholders. Given their complexity, how these issues are framed can diverge significantly, leading to ‘frame conflicts’. Frame conflicts have implications for decision-makers when addressing socio-ecological problems; this is especially the case for Arctic offshore petroleum. Q-methodology is used to explore framings found across a group of stakeholders on the issue of Arctic offshore petroleum development, to empirically demonstrate the extent of frame conflicts and to explore possible bridges for consensus between these framings. The issue was framed in various ways: as a global sustainability concern; a development panacea for Arctic communities; an issue where economic reality clashes with environmental idealism; and an issue centred on local sustainability concerns. Despite significant divergence across framings, some potential bridges of consensus were evident, centring on ideas of traditional livelihoods, the importance of emphasising ‘human’ aspects of the debate and the inherent risks involved in Arctic offshore petroleum. The implications and challenges of frame conflicts around Arctic offshore petroleum are discussed.

**Keywords:** frame conflicts, Arctic offshore petroleum, Q-methodology, Arctic stakeholders

### 3.1. Introduction

Environmental and natural resource issues are often framed in multiple ways by multiple stakeholders (Lewicki et al., 2003; Dewulf et al., 2005). Given their complexity, how these issues are framed can diverge significantly, leading to ‘frame conflicts’. For many, the central challenge in tackling socio-ecological problems centres on these conflicting perspectives: from how problems are initially defined, to what are appropriate solutions, these issues are social and political constructs and arenas for deep disagreement (Hisschemöller et al., 2001; Norton, 2012). As the requirement to further involve stakeholders becomes embedded in environmental policy (Bulkeley and Mol, 2003; Reed et al., 2009), choosing a course of action amidst seemingly incommensurable worldviews can prove a near-impossible task. This becomes harder still when the issue is regional, transboundary or global in scope (Susskind, 1994).

This is especially the case in relation to Arctic offshore petroleum development: a deeply-contested issue that has received much global attention in recent years (Keil, 2014). The extent of contention over the issue is perhaps best symbolised by incidences in 2010 and 2013 when environmental protesters attempted to occupy offshore rigs in both Greenlandic and Russian waters respectively; events that brought stakeholders vehemently opposed with those in favour<sup>4</sup>. The issue is complex, bearing the hallmarks of ‘wickedness’ that typifies modern sustainability challenges (Xiang, 2013, p2; Kämpf and Haley, 2014) and offering fertile ground for frame conflicts to emerge.

In practice, sustainable development often translates as ‘negotiations in which workable compromises are found that address the environmental, economic and human development objectives of competing interest groups’ (Kates et al., 2005, p19). How issues are framed, and the negotiation between these framings, lies at the heart of sustainability challenges, especially for an issue as deeply contested as Arctic offshore. As such, a better understanding of framings and the bridges between conflicting frames is vital, as this aids ‘progress in developing and implementing sustainability and resource management policies’ (Curry et al., 2013, p624). This

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<sup>4</sup> <http://www.bbc.co.uk/news/world-europe-24170129> [Accessed 18 June 2014]

paper contributes to this understanding by using Q-methodology to investigate frames within a group of ‘stakeholders’ around the issue of Arctic offshore. Increasingly used in the environmental social sciences (Doody et al., 2009; Sandbrook et al., 2010; Albizua and Zografos, 2014), Q-methodology aims to capture subjective opinions through ‘inverting’ the factor analysis procedure often used in conventional survey and questionnaire methods (Watts and Stenner, 2005). As opposed to establishing patterns across traits (such as age, gender etc.), it seeks to establish patterns ‘within and across individuals’ (Barry and Proops, 1999, p339). From a combination of statistical analysis and subjective interpretation, social perspectives surrounding a certain theme or subject are deciphered. Unlike other more discourse-inspired approaches towards policy frames that are qualitative in nature, Q-methodology combines statistical techniques and subjective interpretation to empirically explore ‘frames’ (or ‘viewpoints’) in a structured and organised manner (Barry and Proops, 1999; Frantzi et al., 2009; Cairns and Stirling, 2014). This systematic methodological approach gives Q-methodology particular value when investigating framings around controversial environmental and resource issues (Cotton and Mahroos-Alsaiari, 2015).

The study’s aims are as follows: to explore and detail framings around the subject of Arctic offshore; to empirically demonstrate the extent of ‘frame conflicts’; and finally to explore possible bridges for consensus between these framings. The paper takes the following format. Firstly, there is a brief outline of the literature on frame conflicts in natural resource use and Arctic offshore. The methodology section details each stage of the Q-methodology process used in this study. The results section presents five frames before detailing potential bridges for common-ground between these frames. Implications of these findings are discussed before concluding remarks.

## **3.2. Literature review**

### *3.2.1. Frame conflicts around natural resource use*

The complexity of socio-ecological problems, such as those related to natural resource use, is well-documented (Ostrom, 2009). They possess an inherent complexity that makes them difficult to define and distinguish from other problems (Chuenpagdee and Jentoft, 2009). As such, they involve a situation where ‘different participants in public

discourse, acting on very different interests and diverse values, will not only differ about the ends and the means toward social improvement, they will also differ regarding how to formulate, or “frame” what is the real problem to be addressed’ (Norton, 2012, p450). ‘Framings’ (or ‘frames’, used interchangeably here) serve as a useful means in which to articulate the various ways such complex, multifaceted issues are perceived into something more coherent and meaningful (Gamson et al., 1992; Cairns and Stirling, 2014). As ‘underlying structures of belief, perception and appreciation’ (Schön and Rein, 1994, p23), frames put emphasis on certain aspects of an issue and in doing so shape problem and solution definitions (Entman, 1993). The way in which an issue is framed can diverge significantly; diverse and conflicting frames around natural resource use are commonly found (Lewicki et al., 2003; Dewulf et al., 2005), prioritising different socio-economic and environmental aspects, ascribing differing values or placing importance at different scales (Leach, 2008; Van Lieshout et al., 2011; Cairns and Stirling, 2014).

These frame conflicts have policy implications for decision-makers when addressing socio-ecological problems, especially in light of the shift in environmental policy towards ‘the inclusion of a wider range of stakeholders and publics and for open and more deliberative policy-making forums’ (Bulkeley and Mol, 2003, p144). Ultimately, the greater the number of stakeholders involved, the greater the possibility for conflict (Zhang and Fung, 2013). As the ways in which socio-ecological systems are interconnected in an increasingly globalised world becomes better understood, the net identifying ‘relevant stakeholders’ must be cast wider, adding further complexity to stakeholder definition (Waddock, 2011; Thompson and Whyte, 2012).

Whether consensus between irreducible worldviews is near-impossible or indeed desirable (Nie, 2003; Cairns et al., 2014), there is growing understanding that effective policy requires some degree of unavoidable coordination between these conflicting perspectives (Van Den Hove, 2006; Reed et al., 2009). Some argue that differences in belief can converge if stakeholders are better informed about the issue and that an optimal policy solution is attainable (Small et al., 2014). However, generally there is a belief that socio-ecological problems have ‘no single best solution, [therefore] decision makers must seek management policies and processes that are “satisficing”— that is, potentially broadly acceptable and implementable— rather than optimal’

(Balint et al., 2011, p2). As such, trade-offs and compromise are inevitable (Norton, 2005; Cairns et al., 2014).

### *3.2.2. Arctic offshore petroleum and 'Arctic stakeholders'*

The Arctic is commonly cited as representing a complex socio-ecological system facing an array of unique challenges (Roberts et al., 2010). The Arctic has received considerable attention in recent years, usually attributed to pronounced sea-ice loss from rapid climate change and the subsequent increased accessibility to the region's abundant natural resources, especially offshore petroleum (Humrich, 2013). The issue is complex, comprising of myriad, interrelated elements at various scales: climate change's relationship with fossil fuel use and the Arctic in particular; a warming, ice-free Arctic's role in various global and climatic processes and feedback mechanisms (Kelmelis, 2011); the risk of a large oil spill where the socio-ecological impacts are often predicted as devastating (Huntington, 2009), with what constitutes adequate safety measures and appropriate liability fiercely debated; the tensions of negotiating economic security for Arctic communities and nations with concerns of environmental protection under the spotlight of global NGO campaigns; and globalisation and its implications for traditional livelihoods (Exner-Pirot, 2012).

Research on Arctic offshore, which explicitly focuses upon stakeholder perspectives, is relatively sparse; one research gap this paper aims to address. Work includes Mikkelsen and Langhelle (2008) who explored the sustainability implications of Arctic oil and gas by undertaking a pan-Arctic discourse analysis, which reiterated the fundamental tensions between economic, environment and indigenous rights around the issue. Similarly, McDowell and Ford's (2014) work looking at community perspectives around offshore in Northwest Greenland observed a mixture of nuanced perspectives with an acute awareness that trade-offs were inevitable. In contrast, Jensen (2007) finds a more simplistic dualism in Norwegian media discourse, one where pro- and anti- stances are clearly defined. In its use of Q-methodology to uncover framings around Arctic offshore and examine disagreement and consensus, this study expands upon this previous research.

Regarding Arctic offshore it is worth noting Avango et al. (2013) when they ask, ‘But when and how do these hydrocarbons become a resource, and for whom? Who are the actors that articulate Arctic oil and gas as a resource?’ (p439). The literature often makes reference to ‘Arctic stakeholders’ (Exner-Pirot, 2012), or the region’s ‘main actors’ (Keil, 2014), but rarely specifies who fits into this category or where the line is drawn. Indeed, often when stakeholders are the focus, legitimacy is assigned to some without any explanation as to why others are deemed illegitimate (Friedman and Miles, 2002; Reed et al., 2009). In the case of offshore, the lines are especially blurred given the association with global processes like climate change and energy markets as well as more ground-level concerns such as oil spill pollution and Arctic indigenous communities. As such, this study’s approach to defining stakeholders around the issue echoes Young (2012) when he claims ‘both non-Arctic states and non-state actors have legitimate interests in what happens in the new Arctic’ (p405). In light of the ‘geography of voices’ changing in the Arctic (Avango et al., 2013; Heininen et al., 2013), the net on what constitutes a stakeholder is cast wide for this study to reflect the issue’s wide-reaching and multi-scalar nature.

### **3.3. Methodology**

Whilst there is flexibility and creativity in the Q-methodology process, it often follows five distinct stages (Eden et al., 2005; Cairns et al., 2014). Firstly, a ‘concourse’ is developed. The concourse represents the ‘volume of discussion on any topic’ (Dryzek and Berejikian, 1993, p50); its development involving the collection of statements that are broadly representative of opinions surrounding a particular issue. Once completed, the concourse is then refined into a ‘Q-set’: a smaller, more manageable, collection of opinion statements that maintains as much coverage and balance of the broader concourse as possible. The Q-set is then given to a purposively selected group of participants. Participants are strategically chosen who are knowledgeable and have well-informed opinions on the subject area (Frantzi et al., 2009). Conventionally, they are asked to sort these statements within a quasi-normal distribution. This is done not out of necessity, for the statistical technique does not require it, but to encourage participants to think more carefully about their rankings (Barry and Proops, 1999). During the Q-sorts, it is recommended the researcher asks participants about why they

are ranking certain statements and allowing for open-ended comments at the end to add depth to insights gathered from the sort (Webler et al., 2009). Once participants have completed the sorting process, correlation and factor analysis is then applied to the collated dataset. This analysis uncovers patterns across participants' responses, distilling 'particular combinations or configurations of themes which are preferred by the group' (Watts and Stenner, 2005, p70). The final stage involves the researcher verbally interpreting these emergent patterns and what they represent.

In this study, the topic of focus was defined as 'the debate surrounding offshore petroleum development in the Arctic'. A semi-naturalistic approach (Cairns, 2012) was taken to concourse development. Statements were collected from a range of primary and secondary sources between September 2013 and February 2014. Sources included: informal interviews during a field visit to Nuuk, Greenland in October 2013 and amongst delegates at various Arctic themed conferences; Arctic-related policy publications (e.g. Arctic Council documents); NGO campaign literature; media and academic publications. In total, 311 statements were collected before reaching 'saturation': a point where it was felt the addition of further statements no longer contributed to the concourse's diversity (Eden et al., 2005).

As this study was not testing a particular theory, an 'unstructured approach' was taken (Cairns, 2012) in refining the concourse into a Q-set. Key themes were identified within the concourse and statements categorised in order for the Q-set to be as representative of the concourse as possible, with efforts made to ensure there was a balance of pro- and anti-offshore statements. The categories and number of statements within each were as follows: Environmental and socio-economic impacts (14); Governance issues (9); Climate change and fossil fuel use (7); Arctic characteristics (4); Technical challenges and oil spills (7). In total, the Q-set comprised of 41 statements (presented in Table 3.1). Whilst a Q-set that perfectly captures every aspect of a topic is in reality not possible, not too much concern should be placed on achieving a 'perfect Q-set', for it is how participants engage with the statements that Q-methodology is interested in. As Stainton Rogers (1995) writes, 'even a less than ideal [Q-set], because it invites active configuration by participants ("effort after meaning"), may still produce useful results' (p183). It is believed the Q-set devised here is

sufficiently representative of the debate surrounding Arctic offshore to explore framings of the issue.

Unlike conventional R-statistics, participants are the ‘variables’ in Q-methodology studies, the items (in this instance, the statements) are the sample. Therefore, it is important that participants are carefully chosen in the same fashion that irrelevant or poorly-thought variables in an R-statistical survey are not desirable (Watts and Stenner, 2012). Here, participants were strategically chosen on the basis that they were likely to have expressed views on Arctic offshore and would represent a diversity of opinion on the subject. Whilst the aim of this study is not to conduct a comprehensive stakeholder analysis *per se* (for example Wilkes-Allemann et al. (2015)), participant sampling was undertaken with the intention of achieving as diverse a pool of stakeholders as possible. This involved community members of Aasiaat, Greenland, a town that served as a base for oil exploration in 2010, as well as delegates of various Arctic-themed conferences<sup>5</sup> that took place in late-2014/early-2015, where discussions around oil have featured prominently in recent years. In total, 38 participants were recruited, a number within the range of 20-40 found in most Q-studies (Brown, 1980). Participants included public sector workers, high-school teachers, fishers, tourist operators in Aasiaat and representatives from large oil companies, environmental NGOs, Arctic Council groups, media and academic institutions amongst the Arctic conference delegates.

Participants completed the Q-sort using the software package *FlashQ* between August 2014 and February 2015. Participants were initially asked to read statements and place them into three categories: Agree, Disagree and Uncertain. Next, they were asked to rank statements in a forced quasi-normal distribution from -4 to +4 depending on how representative or not they are of their views, with -4 being ‘most disagree’ and +4 being ‘most agree’ (see Figure 3.1). Once the sort was completed, they were interviewed about their statement rankings. Q-sort interviews in Aasiaat took place in-person, whilst interviews with Arctic conference delegates took place online through the use of Skype. For Aasiaat-based participants, the statements were translated into

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<sup>5</sup> Arctic Circle Assembly ([www.arcticcircle.org](http://www.arcticcircle.org)) and Arctic Frontiers ([www.arcticfrontiers.com](http://www.arcticfrontiers.com)) [Accessed 15 September 2014]

Danish<sup>6</sup> by a professional translator and an interpreter was on-hand during follow-up interviews. Not all participants partook in follow-up interviews due to time constraints, although the vast majority did (36 of 38).

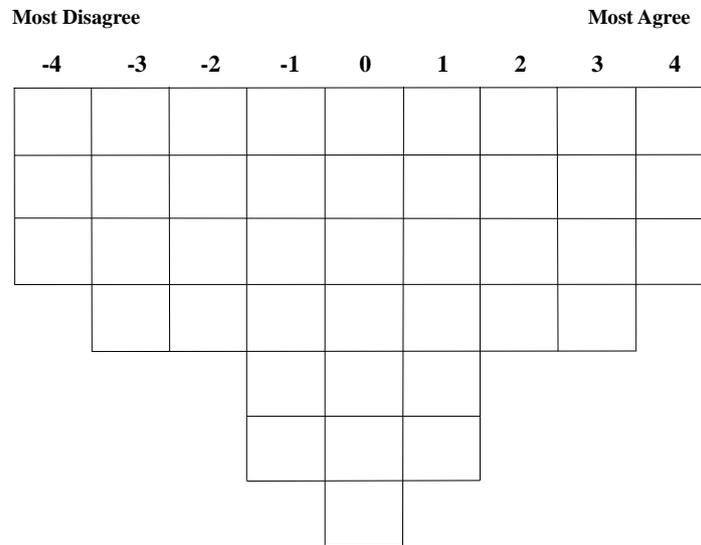


Figure 3.1. The Q-sort grid

Once data was collected, all 38 Q-sorts were inter-correlated with one another to form a correlation matrix. Using *PQMethod* software, principal component analysis (PCA), a factor analysis technique, was performed on this matrix to extract ‘factors’, a factor representing ‘patterns or clusters of similarity’ within the correlation matrix (Watts and Stenner, 2012). Statistical criteria were used to determine the number of factors extracted (detailed in the following section)<sup>7</sup>. The extracted factors were then rotated using Varimax orthogonal rotation technique in order to ‘maximise the amount of study variance explained’ (ibid., p125). Ultimately, the use of PCA and Varimax are the more objective and ‘mathematically-correct’ statistical techniques available to identify patterns amongst the Q-sorts. Factors are represented by ‘factor arrays’, essentially an ‘idealised Q-sort’ calculated by averaging sorts that significantly loaded on a particular factor (Watts and Stenner, 2005). These arrays represent

<sup>6</sup> Statements were not translated into Kalaallisut (Greenlandic) on the advice of scholars based at Ilisimatusarfik (University of Greenland). Unlike English and Danish which are similar languages with a shared linguistic ancestry and are easily translatable from one another, Kalaalissut is so linguistically different that ensuring the meaning of statements would be translated was not possible.

<sup>7</sup> It should be noted, however, that the use of such statistical criteria is not wholly objective and whilst such criteria helpfully guides the factor extraction process, it ultimately a subjective process (Watts and Stenner, 2012).

approximations of the frames expressed by extracted factors, what Cairns et al. (2014) describe as ‘hypothetical constructs’ (p16). These constructs were then interpreted subjectively, facilitated by both the use of z-scores (which allowed for inter-factor comparison), as well as extensive reference to follow-up interview transcripts and notes (Frantzi et al., 2009).

### **3.4. Frames**

Four factors were extracted from the collated Q-sort matrix. This number was determined using a variety of statistical criteria commonly-used in PCA extraction (Kaiser-Guttman, two-or-more significantly loading Q-sorts and Humphrey’s rule (Watts and Stenner, 2012)), all of which were satisfied through a four factor solution (upward of a four factor solution, only a few participants loaded on additional factors, with these factors significantly correlating with one another). In total, these four factors accounted for 51% of cumulative variance, above the 35-40% Watts and Stenner (2012) describe as ‘ordinarily considered a sound solution on the basis of common factors’ (p105). Once extracted, estimated ‘factor arrays’ were created by averaging the sorts that significantly loaded onto a particular component ( $P < 0.01$ )<sup>8</sup>. Participants who significantly loaded onto more than one factor were deemed ‘confounded’; these sorts were not used to estimate arrays (Watts and Stenner, 2005). Where participants significantly loaded negatively onto a factor, a mirror-image of the factor array was used for analysis (ibid.). Factor arrays are presented in Table 3.1 and participant loadings for each factor presented in Table 3.2. Verbal interpretations of the frames uncovered are now discussed.

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<sup>8</sup> This significance is calculated, according to Brown (1980), by the equation  $2.58(1/\sqrt{N})$  with N equalling the number of statements in the Q-set.

Table 3.1. Statement scores for each frame ('factor array')

Statements	Frame			
	A	B	C	D
1. The world's guilt about climate change should not prevent Arctic communities from the potential benefits of offshore petroleum development	0	+1	+2	-1
2. Offshore petroleum drilling activity poses a threat to several endangered species of marine mammals as it releases harmful chemicals into the fragile Arctic waters	+1	-1	-1	0
3. The influx of foreign workers from offshore petroleum development will bring devastating impacts on already fragile Arctic cultures	0	-1	-3	-4
4. The Arctic is ecologically sensitive but it is possible to have responsible offshore petroleum drilling	-2	+3	+4	0
5. The 'coexistence' of oil, fisheries and fragile ecosystem is not possible in the Arctic	-1	-3	-4	-1
6. The money from offshore petroleum development is important as it can fund independence for countries such as Greenland	0	+3	+1	-3
7. There are potential benefits from global warming in the Arctic	+1	0	+1	0
8. The risks of an oil spill in Arctic waters are exaggerated	-4	0	-2	-3
9. Local communities will benefit greatly from infrastructure investment resulting from offshore petroleum drilling in Arctic waters	-3	+4	+2	-1
10. Pursuing offshore petroleum development weakens Arctic communities' position in climate change discussions	-1	-1	+1	-2
11. Greater involvement of stakeholders 'external' to the Arctic is a good thing regarding offshore petroleum development	-2	0	0	+1
12. The work of oil companies during offshore petroleum development can offer scientific benefits for local communities, e.g. information on migratory patterns of whales	-1	+2	+1	0

13. Arctic nations such as Greenland need the money oil brings for education and health	0	+4	+3	-4
14. Within the Arctic offshore petroleum debate, more needs to be done to emphasise the Arctic is not a single region but many regions, each with their unique interests and concerns	+2	+3	-1	+4
15. What is needed for Northern territories across the Arctic is not only hope that petroleum will provide everything they need but to have longer term strategies in place that do not depend so much on petroleum development	+4	+1	+1	+4
16. Offshore petroleum development can bring back young people to Arctic communities	-1	+2	0	-1
17. Politicians are rushing the decisions regarding Arctic offshore petroleum development as they want the money now	0	-1	+3	+3
18. Offshore drilling directly infringes on the ability of Arctic indigenous communities to continue with their traditional livelihoods	0	-2	-2	-3
19. It is impossible to clean up after an oil spill in the Arctic	0	-1	0	+2
20. Even the experts don't know the true risks involved in Arctic offshore petroleum drilling	+3	-3	-3	-1
21. Traditional Ecological Knowledge has a role to play in ensuring ecologically safe Arctic offshore petroleum development	+3	+2	-2	0
22. Local communities have a direct voice and involvement with offshore petroleum projects	-3	+2	-3	+1
23. Environmentalist groups have been using indigenous groups to push their agenda on the Arctic offshore petroleum issue	-3	+1	-4	0
24. Climate change from fossil fuel use is the biggest threat to the Arctic environment	+4	0	0	-2
25. There should be more focus on emphasising 'a human dimension' to the debate about offshore oil drilling in the Arctic, not just the environmental one	+2	+4	0	+1
26. Oil spill accidents in the Arctic are more devastating than elsewhere in the world	+2	-2	-1	0
27. We are really better off leaving fossil fuels in the ground and I don't think anybody can really disagree	-2	-4	-2	+3
28. There should be more discussion about the 'elephant in the room': that fossil fuel extraction means more climate change	+3	0	+3	+1

29. The Arctic has responsibility to provide some of the commodities the world is going to need	-4	0	+3	-4
30. Oil drilling in Arctic waters should be a concern for people across the globe	+2	-3	+2	-2
31. Arctic reserves could hold enough oil and gas to meet global demand for several years. The world has a need for petroleum and so it is important this resource is exploited	-4	+3	+2	-3
32. Since climate change is going to happen anyway, we should explore how to take advantage of it in the Arctic	-2	-2	+4	+3
33. There is no 'rush' for the Arctic offshore petroleum, in reality production is decades from happening	+1	0	+1	+3
34. Like it or not, history shows that offshore petroleum has never been developed anywhere without spills	+1	-1	-1	+2
35. NGOs have a role to play in ensuring oil companies undertake best practice exploration in the Arctic	+1	+1	0	+2
36. Most Arctic indigenous communities are in a vulnerable position regarding private companies, lacking the resources and capacity to represent themselves adequately in relationship with industries like the oil sector	+4	+1	0	+1
37. It is regrettable that the Arctic will not be kept pristine but the economic opportunities from Arctic offshore petroleum are too great to ignore	-3	+1	+4	-2
38. The ones who will suffer most from oil drilling in Arctic waters will be the fishermen and the people living from the oceans	-1	-3	-1	+1
39. The Arctic should be a conservation zone with zero offshore petroleum drilling	+1	-4	-4	-1
40. In the Arctic, the oil industry is recklessly putting profit before the environment	-1	-4	-1	+2
41. There is a risk that local communities will become mere 'spectators' amid the oil rush	+3	-2	-3	+4

Table 3.2. Participant loading for each factor. Bold text with an 'X' indicates that participant significantly loaded on this factor (P<0.01)

Participant	Frame			
	A	B	C	D
1. AAS1	0.0496	0.0335	<b>0.5654X</b>	0.3647
2. AAS2	0.2545	-0.2538	<b>-0.5997X</b>	0.2138
3. AAS3	0.1482	0.2299	0.0921	<b>0.7094X</b>
4. AAS4	0.2386	0.1965	<b>0.4878X</b>	0.108
5. AAS5*	0.4914	-0.0124	0.0005	0.6127
6. AAS6	-0.1936	<b>0.4496X</b>	-0.1596	0.1388
7. AAS7	<b>0.5753X</b>	-0.2795	0.3932	0.1291
8. AAS8	0.2828	-0.3355	-0.1067	<b>0.6862X</b>
9. AAS9	0.2409	0.0855	0.2754	<b>0.4195X</b>
10. AAS10	0.0127	<b>0.5358X</b>	-0.2771	-0.0582
11. AAS11	0.0547	-0.2071	-0.0174	<b>0.6243X</b>
12. AAS12**	0.3358	-0.1041	0.0688	-0.2355
13. AAS13*	-0.0604	0.2824	<b>0.4216X</b>	0.3375
14. AAS14	0.1259	<b>0.6236X</b>	0.3436	-0.13
15. AAS15	0.1268	0.1982	<b>0.5998X</b>	-0.131
16. AAS16	0.0455	<b>0.6398X</b>	-0.2826	0.0102
17. AAS17*	0.5753	-0.0793	0.4056	0.0889
18. AAS18	-0.001	<b>0.5721X</b>	0.1995	0.1535
19. AAS19	0.1014	-0.0831	-0.0622	<b>0.6762X</b>
20. ARC1	-0.0588	<b>0.8156X</b>	0.2612	-0.2845
21. ARC2*	0.6827	0.1128	-0.0223	0.4252
22. ARC3	<b>0.7444X</b>	-0.2951	-0.213	0.0425
23. ARC4*	0.583	-0.3558	-0.2355	0.4123
24. ARC5	<b>0.7223X</b>	0.0515	-0.2239	0.2155
25. ARC6	0.0385	<b>0.8273X</b>	0.2113	-0.1178
26. ARC7	<b>0.6011X</b>	0.2079	0.2019	0.2061
27. ARC8	-0.2214	<b>0.7032X</b>	0.163	-0.0811
28. ARC9*	0.5179	-0.4488	-0.3753	0.1255
29. ARC10*	0.5602	-0.1079	-0.4874	0.3187
30. ARC11	<b>0.7171X</b>	-0.0069	0.1182	0.0635
31. ARC12	-0.0747	<b>0.6921X</b>	0.3272	0.0577
32. ARC13*	0.4531	0.4462	0.1866	0.019
33. ARC14	<b>0.7869X</b>	0.2438	-0.2783	0.0218
34. ARC15	<b>0.6646X</b>	-0.0391	0.1216	0.2686
35. ARC16	0.2025	0.2055	-0.0806	<b>0.4847X</b>
36. ARC17	0.2671	0.0313	<b>-0.5036X</b>	0.1482
37. ARC18	-0.049	<b>0.674X</b>	0.1238	0.1725
38. ARC19	<b>0.632X</b>	-0.2178	-0.1002	0.2128

Eigenvalues	6.46	5.7	3.42	3.8
% study variance	17	15	9	10
% cumulative variance	51			

Significantly loading sorts

Frame A	7, 22, 24, 26, 30, 33, 34, 38
Frame B	6, 10, 14, 16, 18, 20, 25, 27, 31, 37
Frame C	1, 2 (-ve), 4, 13, 15, 36 (-ve)
Frame D	3, 8, 9, 11, 19, 35

\*Confounded sorts 5, 17, 21, 23, 28, 29, 32

\*\*Non-significant sorts 12

AAS: Aasiatt resident  
ARC: Arctic conference  
delegate

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Frame A: Unsustainable development: from global climate to local communities

Arctic offshore is an environmentally and socially damaging activity at various scales: ranging from its global environmental impact through association with climate change (#24,+4; #28,+3) to the social impacts of vulnerably-placed local communities (#22,-3; #36,+4; #41,+3). Arctic offshore's association with climate change is a big concern and deserving greater attention in the debate (ARC10: *"I don't think there is enough discussion, especially at these Arctic conferences. There seems to be a huge disjuncture or some cognitive dissonance"*). Furthermore, offshore is unnecessary either as an economic imperative or as a commodity to the global market (#37,-3; #29,-4; #31,-4) (ARC11: *"I am not sure we have a need for petroleum, we have a need for energy for sure, but maybe we would just leave this kind of development behind"*). There is a feeling the activity is too risky, especially in the Arctic (#20,+3; #26,+2; #8,-4; #4,-2). Every aspect of the activity is not opposed: there is acceptance fossil fuel dependent societies cannot completely forgo oil extraction (#27,-2) and there is no strong belief that oil companies are particularly reckless (#40,-1). Nevertheless, offshore drilling in the Arctic is an activity antithetic to notions of sustainable development at all levels.

### Frame B: ‘Development panacea’ for Arctic communities

Arctic offshore serves as a ‘development panacea’ for Arctic communities. Positives associated with activity are manifold: local communities will benefit immensely, with Arctic nations receiving a considerable economic boost, money that can fund better healthcare, education and greater independence (#9,+4; #13,+4; #6,+3). Furthermore, local communities are included in these projects, their livelihoods unthreatened (#22,+2; #21,+3; #18,-2; #38,-3) (ARC1: *“I think that might have been a risk many years ago, but I think local communities are incredibly vocal and I think very powerful”*). The benefits are not just locally or nationally based: Arctic petroleum is essential in providing an invaluable commodity to a global market (#31,+3; #27,-4). As such the notion of the Arctic being a conservation area with zero drilling is strongly rejected (#39,-4). Responsible offshore development with minimal environmental impact in the Arctic is possible, with a feeling too much emphasis has been placed on the environmental aspects of the issue (#4,+3; #5,-3; #20,-3; #40,-4; #25,+4), especially from people unfamiliar with the Arctic region (#23,+1; #30,-3) (ARC6: *“I think it is easy when you are far away from a place, it is easy to make some predetermined judgement on what should happen there based on your values, you end up building it out of ignorance”*). Climate change is an unimportant aspect of the discussion (#1,+1; #7,0; #10,-1; #24,0; #28,0) (AAS6: *“Global warming and offshore oil are not related”*).

### Frame C: ‘Economic reality’ > ‘environmental idealism’

Ideally, petroleum would stay underground and the Arctic environment kept pristine. However, in reality the economic opportunities are too great and the world requires petroleum with Arctic reserves likely to play an important role (#37,+4; #27,-2; #29,+3; #31,+2) (AAS1: *“It would look good in an idealistic vision, but the money would be too great, you cannot ignore it”*). Arctic offshore brings many positive opportunities, most notably economic ones for Arctic nations and communities (#9,+2; #13,+3), and can take place without impeding traditional livelihoods or excluding local people (#4,+4; #20,-3; #18,-2; #41,-3). Whilst importance is placed on the

relationship between climate change and fossil fuel use (#28), Arctic communities should not feel guilty taking advantage (#1,+2 #10,+1), as there is a belief that little can stop climate change from happening (#32,+4). There is a tension between what is realistically possible with what is ideally preferred. This is reflected in uncertainty and indecision around certain aspects of the issue; for example, the extent in which local communities are involved in projects (#41,-3; #22,-3) or how much concerns surrounding climate change should affect development (#28,+3 #10,+1).

Frame Cii (bi-polar): Uncertainty, wary of exaggerated environmental risks

The issue is complex and though there are some arguments in favour of Arctic offshore, in reality it is not environmentally-safe (#5,+4; #39,+4; #20,+3; #4,-4) nor economically-beneficial (#37,-4; #29,-3; #13,-3; #31,-2) enough to justify. Nevertheless, the environmental risks are often overstated, especially by environmental groups (#23,+4; #8,+2; #17,+3). The complexity of socio-economic and environmental factors involved in the issue entails contradictory attitudes around certain aspects are inevitable (#41,+3; #22,-3; #28,-3; #10,-1).

Frame D: Local sustainability at risk

Environmentally responsible offshore drilling in the Arctic that provides significant economic development to local communities is illusory. Oil drilling without deleterious environmental impacts is not possible (#34,+2; #19,+2; #40,+2; #38,+1) and local communities are unlikely to receive much of any economic benefits, income which is anyway not imperative (#13,-4; #6,-3; #37,-2) (ARC16: *“I mean all the benefits they are talking about, that the oil and gas industry can bring to a particular region is just not like that. Yes, it creates jobs for places but not for the locals”*). As such, there is too much global attention surrounding the issue, when in reality minimal activity is actually taking place and won't for decades (#33,+2; #17,+3). Issues related to impact on local communities should stand at the forefront of the debate, with the effects of offshore development on people around the globe less of a concern (#30,-2): whether it is the role of Arctic petroleum in global commodities markets (#29,-4;

#31,-3) or wider environmental concerns around climate change (#24,-2; #32,+3; #10,-2).

### **3.5. Disagreement and consensus statements**

By analysing variance across z-scores it is possible to observe consensus statements as well as the most contentious statements across factors. Statements that most polarised opinion are of interest as they represent aspects of the debate likely to lead to confrontation and conflict. The five most contentious statements are presented below.

*1. Arctic reserves could hold enough oil and gas to meet global demand for several years. The world has a need for petroleum and so it is important this resource is exploited (31)*

*2. The Arctic has responsibility to provide some of the commodities the world is going to need (29)*

*3. There is a risk that local communities will become mere 'spectators' amid the oil rush (41)*

*4. Arctic nations such as Greenland need the money oil brings for education and health (13)*

*5. It is regrettable that the Arctic will not be kept pristine but the economic opportunities from Arctic offshore petroleum are too great to ignore (37)*

The two most contested statements revolve around the importance of petroleum and resource exploitation in general. A clear divide exists between those who perceive Arctic offshore as necessary in the context of an oil-dependent world and those who believe the opposite: that a shift in the world's relationship is required, if not abruptly at least as part of a longer-term vision. Other highly-contested statements centre on the economic imperative for Arctic nations and communities and the extent in which these communities are likely to be excluded, either in the decision-making process or from any economic windfall.

*PQMethod* presents statements that did not distinguish between any factors at a non-significance of both  $P < 0.01$  and  $P < 0.05$ . No statements met this statistical criterion for 'consensus', often used in Q studies (see Sandbrook et al., 2010; Cairns et al., 2014; Cotton, 2015). This indicates the extent of frame conflicts amongst the sampled Arctic stakeholders. However, factor analytical techniques such PCA and Varimax are not the only means in which to analyse data collected by the Q-methodology process. There is potential to interpret the dataset via alternative means to explore possible avenues for consensus (Cotton & Mahroos-Alsaiari, 2015). Firstly, by analysing follow-up interview transcripts where participants were asked to expand upon their feelings towards the statements and, secondly, by examining closely how participants initially categorised and then ranked statements.

Possible areas for consensus emerged, with several statements of particular interest: 18, 36, 25, 15, and 8. Statement 18 (*Offshore drilling directly infringes on the ability of Arctic indigenous communities to continue with their traditional livelihoods*) was generally ranked low by participants, standing as seventh in terms of consensus across discourses. Given frames B and C's emphasis on local benefits from offshore development, a low placement might seem unsurprising. However, for the more critical frames A and D, there were also a relatively low placement for A (0) and a notably low score of -3 for D. Follow-up interviews provided various insights as to why this statement was generally disagreed with. The term 'traditional livelihoods' is significant here, as even participants who emphasised how oil development could have detrimental societal impacts still tended to disagree traditional livelihoods would be impeded. For some, this was because the notion of traditional livelihoods did not tally with the modern reality; they no longer existed or were disappearing already. Some referred to past experience of oil companies working in the town and saw no reason why such activity would infringe on traditional livelihoods. Then there is the belief co-existence between modern industry and tradition is a viable possibility, that strength of traditional culture is too strong for it to disappear and that an ability to adapt is a fundamental part of the indigenous identity. It is clear that what constitutes traditional livelihoods and subsequently how they could be affected by offshore is subject to debate.

For statement 36 (*Most Arctic indigenous communities are in a vulnerable position regarding private companies, lacking the resources and capacity to represent themselves adequately in relationship with industries like the oil sector*), participants generally agreed with this sentiment, the statement ranking the fourth-highest average score (1.34) and only 5% placing the statement in the negative category during initial sorting. For many, this power disparity is obvious, inevitable and just the reality of the situation. Arctic communities will always be vulnerable when faced against the power of oil companies, due to their small population sizes and limited education opportunities. One participant explained how these communities are already in a vulnerable position due to their dependency on the state, with oil companies likely to simply replace the state if offshore projects came into fruition. Ultimately, it seemed generally accepted amongst participants that underrepresentation in some form was inevitable given the circumstance.

Statement 25 (*There should be more focus on emphasising 'a human dimension' to the debate about offshore oil drilling in the Arctic, not just the environmental one*) ranked eighth in terms of consensus across frames and was received favourably by participants (73% agreed with the statement). Only one participant initially placed the statement in the 'disagree' category. The statement bridged the gap between frames, the 'human dimension' component interpreted in various ways. For those with a more positive inclination towards Arctic offshore, the need to emphasise the 'human' stemmed from a concern the Arctic was perceived as 'a pristine environment that needs to be locked up and saved for the rest of humanity' and 'ignores the fact that people live there and subsist from, work within and play in this area'. Those with an inclination to oppose offshore felt an overemphasis on environmental aspects of the debate risked relegating Arctic peoples' desires and concerns out of consideration. There were also those who felt there was a false dichotomy in talking about offshore in separating environment and human as they were inherently intertwined. That there was more to the Arctic offshore debate than just environmental concerns was reiterated throughout by participants.

Statement 15 (*What is needed for Northern territories across the Arctic is not only hope that petroleum will provide everything they need but to have longer term strategies in place that do not depend so much on petroleum development*) was the

highest-ranked statement across the participants, no-one initially disagreed and only four were uncertain. The statement emphasised the importance of thinking longer-term, reflecting participants' points of view that there was too much short-termism surrounding the Arctic offshore debate, be it in discussions around economic prosperity for Arctic communities, becoming heavily-dependent on single resource or how important Arctic resources would be to global society in the long-run.

Lastly, the frames presented in this study generally support a divergence between support and opposition for offshore activity (supportive Frames B and Ci correlated very low with opposing Frames A and D). However, responses to statement 8 (*The risks of an oil spill in Arctic waters are exaggerated*) offered an interesting bridge across this divergence. Whilst a few participants strongly agreed this assertion reflected their point of view, the majority reacted negatively to the idea that risks from oil spills were exaggerated, as such it was the statement most placed in the negative category during the initial sorting phase (54%) as well as possessing the lowest average score, -1.89. It is noteworthy that most participants who loaded significantly onto frame B, despite advocating Arctic offshore as technically-possible and environmentally-safe, did not strongly believe that oil spill risks were exaggerated.

### **3.6. Discussion**

Whilst factor arrays can only be approximations and that ranking statements is clearly not intended to replicate the exact structure in which people think, the production of factor arrays, derived as they are from participants' active configuration of statements, offers useful insight on how an issue is framed. Q method may be unable to offer 'perfect representation' of discourses, but its strengths lie in observing how participants engage with various aspects of the debate, both in how they rank statements against each other and what meaning they ascribe to statements when asked for their interpretation. These Q-sorts, when combined with follow-up interviews, provide a helpful tool to explore ways in which the issue is framed.

Several frames emerged across the participant group, which varied in their framing of developmental priorities, environmental consequences, social impacts, economic outlooks and at what 'scale' the issue is approached from. Broadly speaking, the

frames fall into two categories: those that question Arctic offshore in the context of sustainable development, either multi-scalar in focus (A, Cii) or specifically a local-level focus (D), with those questioning what alternative development possibilities are, both for Arctic communities and the wider globe (B, Ci). Relating these frames to Dryzek's (1997) typology of global environmental discourses (in a similar fashion to Cotton (2015)), the former category resonates with elements of 'survivalism' and 'sustainable development', worldviews concerned with resource depletion and 'stresses imposed on global ecosystems' (p129); the latter echoing 'Promethean' and 'economic rationalism' sentiments in its belief that development and economic growth are paramount and, if pursued, will mitigate environmental concerns, especially in the case of frame B. Whilst there was a clear divergence in attitude towards Arctic offshore, between support for and opposition against, the simplistic polarisation of 'environmentalist' versus 'industrialist' sometimes associated with environmental issues was not really evident here (Dayton, 2000). That a diversity of frames emerged across the participant group was unsurprising, due to the highly-contested nature of the debate played out in the public realm and the diversity of stakeholders chosen to participate. Therefore, it reaffirms the extent of contentiousness surrounding this controversial issue, one that seemingly pits economic development so directly against environmental preservation and ecological responsibility (Jensen, 2007; Mikkelsen and Langhelle, 2008; Exner-Piort, 2012).

The scalar dynamics found in the uncovered frames highlight the challenges of ever-widening stakeholder inclusiveness. If, as in frame A, Arctic offshore is framed with a large onus on climate change and its global implications, the onus becomes one of 'global sustainability' with the world's population all considered legitimate stakeholders. Of course, these concerns do not necessarily tally with frames centred on national or more local levels (frames B and D). Emphasis on different scalar aspects influences priorities and policy direction. In relation to Arctic offshore, positive and negative impacts of this development are experienced differently at different scales, both spatially and temporally. Ultimately, what could be construed as beneficial for Arctic communities and nations in the short-term (e.g. economic windfall) could stand in opposition to what is beneficial in the long-term for the globe (e.g. climate change mitigation). Clearly this is huge simplification of complex issue, but serves to highlight a fundamental 'scale tension' found at the core of Arctic offshore, one that

is exemplified by events such as Greenpeace activists occupying an oil rig to dissuade Greenland from pursuing the offshore development path.

Whilst frame conflicts evoke sustainability challenges by raising the likelihood of confrontation, this is not necessarily an undesirable situation. As Nie (2003) writes, ‘conflict is to be expected and is often a sign that democracy is working’ (p333). Indeed, calls for consensus can risk creating a hegemony that drowns out any alternative voices in the debate (Cairns et al., 2014). Nevertheless, if sustainable development principles of inclusivity are embraced, environmental and natural resource management must find means to negotiate frame conflicts. By identifying frames and explicitly outlining consensus and conflict around an issue (Cotton and Devine-Wright, 2011; Curry et al. 2013), Q-methodology certainly serves as a useful starting point. In terms of practical implications for Arctic offshore, there is particular utility of research of this kind for Arctic governance bodies run on a consensus basis and characterised by diverse stakeholder involvement, such as those affiliated with the Arctic Council (an intergovernmental forum and a prominent feature within the governance constellation surrounding Arctic issues (Young, 2012)).

In relation to potential bridges identified in this study, it is possible to see how a governance body like the Arctic Council can act as a useful negotiator between frame conflicts around Arctic offshore. For statement 18, we saw a greater need to understand Arctic indigenous peoples and the meaning behind ‘traditional livelihoods’. Likewise, in statement 36, there is an acknowledgement that the power differential between Arctic communities and large oil companies requires more balance. Making indigenous groups ‘permanent participants’ and bolstering their prominence in the region’s governance is certainly a step towards addressing such concerns. Statements 15 and 25 both emphasised the importance of the ‘human aspects’ of the debate and for longer-term vision for Arctic communities. Freely available research, such as the Arctic Human Development Report<sup>9</sup>, through the council’s Sustainable Development Working Group, can provide important insights around these issues. Statement 8 suggests that although offshore critics and enthusiasts might share little in common, there is an understanding of the high-risk involved with

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<sup>9</sup> <http://www.svs.is/en/projects/arctic-human-development-report-ii> [Accessed 6 June 2016]

Arctic offshore. The council's motivation to create Arctic-wide standards, such as 2013's Oil Spill Response Agreement, and the continuing work of the Emergency Prevention, Preparedness and Response Working Group can be seen as a way of trying to ensure there are regulations and processes in place to manage the risks at an acceptable level. These examples are just some of the ways in which the Arctic Council has the potential to act as a useful negotiator of frame conflicts around Arctic offshore. This is not to imply the council is the optimal policy mechanism or that the examples mentioned above are particularly effective, but merely to reflect upon the potential a body like the Arctic Council has.

As this study did not take an R-method statistical approach, it cannot make representative claims for the extent of revealed frames within the population or account for the number of different frames that exist, as the sample size is too small and participant selection non-random. Furthermore, with only one 'local population' sampled, representation of local communities Arctic-wide is not possible. Nonetheless, as with other Q-studies, a brief discussion on how stakeholders aligned with different frames is worthwhile as a 'point of reflection' (Cotton, 2015) and a 'working hypothesis' (Ockwell, 2008, p278) for further research. Whilst loadings towards B (*Development panacea' for Arctic communities*) were spread fairly evenly across participants, A (*Unsustainable development: from global climate to local communities*) was affiliated strongly with Arctic conference delegates and D (*Local sustainability at risk*) with Aasiaat community members. That Aasiaat community members might place greater onus on local aspects of the debate is perhaps unsurprising. Likewise, that Arctic conference delegates might place a greater emphasis on climate change given the issue's prevalence at Arctic-focused conferences.

### **3.7. Concluding Remarks**

The study has empirically shown the extent of frame conflicts around the issue of Arctic offshore, in-line with the highly-contested debate found in the public realm. Frame conflicts around natural resource use are seemingly inevitable. As has been discussed, this is not necessarily an undesirable situation but does raise challenges.

Whilst seeking a shared vision over the issue of Arctic offshore was not this paper's goal, exploring potential bridges of consensus across different framings emphasises that despite differences, frames do not exist mutually exclusive from one another. Here bridges centred on ideas of traditional livelihoods, the importance of emphasising 'human' aspects of the debate and the inherent risks involved in Arctic offshore. Given the complexity of natural resource issues, negotiating the mosaic of frames surrounding them can never be a simple process. With its systematic approach and flexible use of quantitative and qualitative techniques, Q-methodology offers a useful, replicable tool for practitioners and policymakers to explore frames, how they contrast with one another and bridges between them. This is undoubtedly an essential step towards tackling some of the sustainability challenges inherent with natural resource use.

### 3.8. References

- Albizua, A. and Zografos, C. 2014. A Values-Based Approach to Vulnerability and Adaptation to Climate Change. Applying Q methodology in the Ebro Delta, Spain. *Environmental Policy and Governance* **24**: 405–422.
- Avango, D, Nilsson, A.E. and Roberts, P. 2013. Assessing Arctic futures: voices, resources and governance. *The Polar Journal* **3**: 431–446.
- Balint, P.J., Stewart R.E., Desai A. and Walters L.C. 2011. Wicked environmental problems: managing uncertainty and conflict. Washington, DC: Island Press.
- Barry, J. and Proops, J. 1999. Seeking sustainability discourses with Q methodology. *Ecological Economics* **28**: 337-345.
- Brown, S.R. 1980. Political subjectivity: Applications of Q methodology in political science. New Haven, CT: Yale University Press.
- Bulkeley, H. and Mol, A.P. 2003. Participation and environmental governance: consensus, ambivalence and debate. *Environmental Values* **12**: 143–154.
- Cairns, R. 2012. Understanding Science in Conservation: A Q Method Approach on the Galápagos Islands. *Conservation and Society* **10**(3): 217-231
- Cairns, R, Sallu, S.M. and Goodman, S. 2014. Questioning calls to consensus in conservation: a Q study of conservation discourses on Galápagos. *Environmental Conservation* **41**: 13–26.

- Cairns, R. and Stirling, A. 2014. 'Maintaining planetary systems' or 'concentrating global power?' High stakes in frame conflicts of climate geoengineering. *Global Environmental Change* **28**: 25–38.
- Chuenpagdee, R and Jentoft, S. 2009. Governability assessment for fisheries and coastal systems: A reality check. *Human Ecology* **37**: 109–120.
- Cotton, M. and Devine-Wright, P. 2011. Discourses of energy infrastructure development: a Q-method study of electricity transmission line siting in the UK. *Environment and Planning A* **43**: 942-960.
- Cotton, M.D. and Mahroos-Alsaiari, A.A. 2015. Key actor perspectives on stakeholder engagement in Omani Environmental Impact Assessment: an application of Q-Methodology. *Journal of Environmental Planning and Management* **58**: 91–112.
- Cotton, M. 2015. Stakeholder perspectives on shale gas fracking: a Q-method study of environmental discourses. *Environment and Planning A* **47** (9): 1944-1962.
- Curry, R., Barry, J. and McClenaghan, A. 2013. Northern Visions? Applying Q methodology to understand stakeholder views on the environmental and resource dimensions of sustainability. *Journal of Environmental Planning and Management* **56**: 624–649.
- Dayton, B. 2000. Policy frames, policy making and the global climate change discourse, *In: Social discourse and environmental policy: an application of Q methodology*, Addams H. and Proops, J. (eds.). Cheltenham: Edward Elgar, 71–99.
- Dewulf, A., Craps, M., Bouwen, R., Taillieu, T. and Pahl-Wostl, C. 2005. Integrated management of natural resources: dealing with ambiguous issues, multiple actors and diverging frames. *Water Science and Technology* **52**: 115–124.
- Doody, D.G., Kearny, P., Barry, J., Moles, R. and O'Regan, B. 2009. Evaluation of the Q-method as a method of public participation in the selection of sustainable development indicators. *Ecological Indicators* **9**: 1129-1137.
- Dryzek, J.S. and Berejikian, J. 1993. Reconstructive Democratic Theory. *The American Political Science Review* **87**: 48-60.
- Dryzek, J. 1997. *The Politics of the Earth*. Oxford University Press: Oxford.
- Eden, S., Donaldson, A. and Walker, R.G. 2005. Structuring subjectivities? Using Q methodology in human geography. *Area* **37**: 413-422.
- Entman, R.M. 1993. Framing: Toward clarification of a fractured paradigm. *Journal of Communications* **43**: 51–58.
- Exner-Pirot, H., 2012. New Directions for Governance in the Arctic Region. *In: L. Heininen, (ed.). Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 225–246.

- Frantzi, S., Carter, N. and Lovett, J. 2009. Exploring discourses on international environmental regime effectiveness with Q methodology: A case study of the Mediterranean Action Plan. *Journal of Environmental Management* **90** (1): 177-186.
- Friedman, A.L. and Miles, S. 2002. Developing stakeholder theory. *Journal of Management Studies* **39**: 1–21.
- Gamson, W.A., Croteau, D., Hoynes, W. and Sasson, T. 1992. Media images and the social construction of reality. *Annual Review of Sociology* **18**: 373–393.
- Heininen, L., Exner-Pirot, H. and Plouffe, J. 2013. From Regional Transition to Global Change: Dualism in the Arctic. In: L. Heininen, (ed.). *Arctic Yearbook 2013*. Akureyri: Northern Research Forum, 24–31.
- Hisschemöller, M., Hoppe, R., Dunn, W.N. and Ravetz, J.R. 2001. *Knowledge, power, and participation in environmental policy analysis*. New Brunswick, NJ: Transaction Publishers.
- Humrich, C. 2013. Fragmented International Governance of Arctic Offshore Oil: Governance Challenges and Institutional Improvement. *Global Environmental Politics* **13**: 79–99.
- Huntington, H.P. 2009. A preliminary assessment of threats to arctic marine mammals and their conservation in the coming decades. *Marine Policy* **33**: 77-82.
- Jensen, L.C. 2007. Oil discourse in the European Arctic: the Norwegian case. *Polar Record* **43**: 247–254.
- Kates, R.W., Parris, T.M. and Leiserowitz, A.A. 2005. What is sustainable development? Goals, indicators, values, and practice. *Environment: Science and Policy for Sustainable Development* **47**: 8–21.
- Kämpf, M. and Haley, S. 2014. Risk management in the Alaska Arctic offshore: wicked problems require new paradigms. *The Polar Journal* **4**: 150–169.
- Keil K. 2014. The Arctic: A new region of conflict? The case of oil and gas. *Cooperation and Conflict* **49**: 162–190.
- Kelmelis, J.A. 2011. Arctic Warming Ripples through Eurasia. *Eurasian Geography and Economics* **52** (1): 56–78.
- Lewicki, R., Gray, B. and Elliott, M. 2003. *Making sense of intractable environmental disputes*. Washington, DC: Island Press.
- Leach, M. 2008. Pathways to Sustainability in the forest? Misunderstood dynamics and the negotiation of knowledge, power, and policy. *Environment and Planning A* **40**: 1783-1795.

- McDowell, G. and Ford, J.D. 2014. The socio-ecological dimensions of hydrocarbon development in the Disko Bay region of Greenland: Opportunities, risks, and tradeoffs. *Applied Geography* **46**: 98–110.
- Mikkelsen, A. and Langhelle, O. 2008. *Arctic oil and gas: sustainability at risk?* London, UK: Routledge.
- Nie, M. 2003. Drivers of natural resource-based political conflict. *Policy Sciences* **36**: 307–341.
- Norton, B.G. 2005. *Sustainability: A philosophy of adaptive ecosystem management*. Chicago, IL: University of Chicago Press.
- Norton, B.G. 2012. The ways of wickedness: Analyzing messiness with messy tools. *Journal of agricultural and environmental ethics* **25**: 447–465.
- Ockwell, D.G. 2008. “Opening up” policy to reflexive appraisal: a role for Q Methodology? A case study of fire management in Cape York, Australia. *Policy Sciences* **41**: 263–292.
- Ostrom, E. 2009. A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science* **325**: 419-422.
- Reed, M.S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C.H. and Stringer, L.C. 2009. Who’s in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management* **90**: 1933–1949.
- Roberts, A., Cassano, J., Döscher, R., Hinzman, L., Holland, M., Mitsudera, H., Sumi, A. and Walsh, J.E. 2010. A Science Plan for Regional Arctic System Modeling. International Arctic Research Center, <http://www.iarc.uaf.edu/sites/default/files/publications/reports/IARCTP10-0001.pdf>.
- Sandbrook, C., Scales, I.R., Vira, B. and Adams, W.M. 2010. Value Plurality among Conservation Professionals. *Conservation Biology* **25** (2): 285–294.
- Schön, D.A., Rein M. 1994. *Frame reflection: Toward the resolution of intractable policy controversies*. New York: Basic Books.
- Small, M.J., Güvenç, Ü. and DeKay, M.L. 2014. When can scientific studies promote consensus among conflicting stakeholders? *Risk Analysis* **34**: 1978–1994.
- Stainton Rogers, R. 1995. Q methodology. In: Smith, J.A., Harré, R. and Langenhove, L. (eds.). *Rethinking Methods in Psychology*. London, UK: Sage, 178–192.
- Susskind, L.E. 1994. *Environmental diplomacy: Negotiating more effective environmental agreements*. New York: Oxford University Press.

- Thompson, P.B. and Whyte, K.P. 2012. What Happens to Environmental Philosophy in a Wicked World? *Journal of agricultural and environmental ethics* **25**: 485–498.
- Van Den Hove, S. 2006. Between consensus and compromise: acknowledging the negotiation dimension in participatory approaches. *Land Use Policy* **23**: 10–17.
- Van Lieshout, M., Dewulf, A., Aarts, N. and Termeer, C. 2011. Do Scale Frames Matter? Scale Frame Mismatches in the Decision Making Process of a “Mega Farm” in a Small Dutch Village. *Ecology and Society* **16** (1): 38.
- Waddock, S. 2011. We are all stakeholders of Gaia: A normative perspective on stakeholder thinking. *Organization and Environment* **24**: 192–212.
- Watts, S and Stenner, P. 2005. Doing Q methodology: theory, method and interpretation. *Qualitative Research in Psychology* **2**: 67-91.
- Watts, S. and Stenner, P. 2012. *Doing Q methodological research: theory, method & interpretation*. London, UK: Sage.
- Webler, T., Danielson, S. and Tuler, S. 2009. *Using Q method to reveal social perspectives in environmental research*. Greenfield MA: Social and Environmental Research Institute.
- Wilkes-Allemann, J., Pütz, M. and Hirschi, C. 2015. Governance of Forest Recreation in Urban Areas: Analysing the role of stakeholders and institutions using the institutional analysis and development framework. *Environmental Policy and Governance* **25**: 139–156.
- Young, O.R. 2012. Building an international regime complex for the Arctic: current status and next steps. *The Polar Journal* **2** (2): 391-407.
- Xiang, W.N. 2013. Working with wicked problems in socio-ecological systems: Awareness, acceptance, and adaptation. *Landscape and Urban Planning* **110**: 1–4.
- Zhang, Y. and Fung, T. 2013. A model of conflict resolution in public participation GIS for land-use planning. *Environment and Planning B* **40**: 550–568.

## Chapter 4

### **Offshore hydrocarbon development in the Arctic: examining the ‘discursive cacophony’ through a scalar approach**

Davies, W. (n/a) Offshore hydrocarbon development in the Arctic: examining the ‘discursive cacophony’ through a scalar approach. (Under review at *The Polar Journal*)

## **Abstract**

Discussions surrounding the contemporary Arctic resemble a ‘discursive cacophony’ with competing discourses framing complex issues in myriad ways, particularly in the case of offshore hydrocarbon development. This cacophonous setting makes fertile ground for misunderstanding, confusion and conflation, especially around what type of ‘Arctic’ is under discussion. Collaboration and deliberative policy-making efforts will struggle to succeed if differences in the way fundamental aspects are framed are not properly acknowledged and points of incoherence clearly outlined. With the role of scale central to many socio-ecological problems, taking a ‘scalar approach’ offers one potential means in which to organise the complex discourse around the issue. In light of this, this paper explicitly examines scale-frames in the discourse around Arctic offshore hydrocarbon development with the purpose of pinpointing areas of incoherence and tensions littering the debate. Several ‘scale-challenges’ are identified: Global Arctic, Arctic Region, Arctic Peoples and Arctic Rush. A common theme of these scale-challenges relates to the Arctic’s nebulous relationship with scale. This work points to a critical need for a more refined terminology when describing the issue.

**Keywords:** Arctic, offshore hydrocarbon development, scale-frames, scale-challenges, discourse

## 4.1. Introduction

Recent decades have witnessed increasing attention towards the Arctic (Nyman, 2012). This interest has resulted in an influx of conferences<sup>10</sup>, national strategies<sup>11</sup>, intergovernmental forums<sup>12</sup>, institutions<sup>13</sup> and environmental campaigns<sup>14</sup> all dedicated to Arctic issues. With this growing attention comes a growing number of voices (Heininen, 2013). Resembling more of a ‘cacophony of voices’ than ‘coherent discourse’ (Young, 2004, p212), the discursive environment surrounding the contemporary Arctic is both complex and highly contested. The Arctic is simultaneously one of the last petroleum frontiers (Lindholt and Glomsrød, 2012), an indigenous homeland (Fabbi, 2013), a ‘global ecological barometer’ (Shadian, 2006, p250), a ‘scientific laboratory’ (Numminen, 2010) and a pristine wilderness (Exner-Pirot, 2012). A place where ‘sustainable development’ and ‘international cooperation’ are core governance principles (Mikkelsen and Langhelle, 2008), a ‘scramble for resources’ is taking place (Sale and Potapov, 2010), charismatic megafauna is disappearing (Struzik, 2013) and will be potentially ice-free and unrecognisable by the end of the century (Dittmer et al., 2011). Consequently, when issues pertaining to the contemporary Arctic are under the spotlight, something akin to a ‘discursive cacophony’ emerges, with competing discourses framing complex issues in myriad ways. This is particularly the case for offshore hydrocarbon development, a controversial issue bearing the hallmarks of ‘wickedness’ affiliated with complex socio-ecological problems (Kämpf and Haley, 2014).

Muller (2014) describes how such situations in natural resource management are characterised more by ‘commotion, or chaos, than as productive places in which collaborators are working together to move forward to a place of common ground’ (p138). Certainly, the discursive cacophony emanating from conferences, media and

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<sup>10</sup> e.g. Arctic Frontiers ([www.arcticfrontiers.com](http://www.arcticfrontiers.com)), Arctic Circle Assembly ([www.arcticcircle.org](http://www.arcticcircle.org)), Arctic Energy Summit ([arcticenergysummit.institutenorth.org](http://arcticenergysummit.institutenorth.org)), The Economist’s Arctic Summit (<http://www.economistinsights.com/sustainability-resources/event/arctic-summit-2014>) [Accessed 5 September 2015]

<sup>11</sup> See <http://www.arctic-council.org/index.php/en/document-archive/category/12-arctic-strategies> [Accessed 5 September 2015]

<sup>12</sup> e.g. Arctic Council working groups such as Conservation of Arctic Flora and Fauna (CAFF), Sustainable Development Working Group (SDWG)

<sup>13</sup> e.g. the Arctic Centre in Lapland, the Arctic University of Tromsø

<sup>14</sup> e.g. Greenpeace’s ‘Save the Arctic’ – [www.savethearctic.org](http://www.savethearctic.org), WWF and Coca-Cola’s ‘Arctic Home’ campaign – [www.arctichome.com](http://www.arctichome.com) [Accessed 5 September 2015]

campaigns around Arctic offshore makes it difficult to envision how collaborative policy efforts might negotiate sustainability challenges associated with the activity. Furthermore, this cacophonous setting makes fertile ground for misunderstanding, confusion and conflation, particularly around what type of ‘Arctic’ is under discussion. The appeals of one audience member during a breakout session at the Arctic Circle Assembly 2013 encapsulates such concern:

‘I think we have serious intellectual incoherence at this meeting and I think we have got to start addressing these issues, what we mean by the Arctic belonging to all of mankind and yet some groups in the Arctic have special privileges. It doesn't work both ways’.

Such incoherence has consequences. The evolution of policy-making forums like the Arctic Council and growth in inclusive forums like the Arctic Circle Assembly are indicative of a shift towards wider involvement of stakeholders and greater onus on cooperation in Arctic issues (Kankaanpää and Young, 2012; Steinberg and Dodds, 2015). Collaboration and deliberative policy-making efforts of this kind will struggle to succeed if differences in the way fundamental aspects are framed are not properly acknowledged and points of incoherence clearly outlined. How best then to overcome incoherence and negotiate the discursive cacophony?

Taking a ‘scalar approach’ offers one potential route. Recent work on ‘scale-frames’ helps us to understand the role of scale in contested discourse surrounding natural resource issues (Van Lieshout et al., 2011; Apostolopoulou and Paloniemi, 2012). Defined by Kurtz (2003), scale-frames are ‘the discursive practices that construct meaningful (and actionable) linkages between the scale at which a social problem is experienced and the scale(s) at which it could be politically addressed or resolved’ (p894). Competing scale-frames lead to scale-challenges (Moore, 2008): areas of incongruity and tension between scales that are particularly stark. For many, scale is central to the challenges facing complex socio-ecological problems (Norton, 2005; Olsson et al., 2007), with how individuals, institutions or society frame them at different scales/levels having considerable implications (Meadowcroft, 2002). Arctic offshore is no different; that it is considered a complex issue has much to do with its far-reaching, multi-scalar, socio-ecological impacts affecting a diverse and widespread number of stakeholders at all levels (Kämpf and Haley, 2014).

Understanding the role of scale in discourse takes on importance in an Arctic offshore context where conflicting ontologies abound (Veland and Lynch, 2017) and there exists a lack of clarity over many aspects of the issue. In light of this, this paper explicitly examines scale-frames in the contemporary discourse around Arctic offshore during 2013-14, a period of heightened interest around the issue, with the purpose of pinpointing areas of incoherence and tensions littering the debate. Several scale-challenges are found, largely related to the Arctic's nebulous relationship with scale. The paper takes the following format: firstly, a brief literature review on scale-frames and Arctic offshore is provided followed by the methodology used. Four scale-challenges are then outlined before the implications of these scale-challenges and the utility of a scalar approach are discussed.

## **4.2. Literature Review**

### *4.2.1. Scale in discourse*

Scale, its conceptualisation and application, has received growing interest in the sustainability and environmental policy literature (Apostolopoulou and Paloniemi, 2012). For many, scale lies at the heart of sustainability challenges (Gibson et al., 2000; Cumming et al., 2006; Olsson et al., 2007). The complexity and multifaceted nature of socio-ecological systems (Ostrom, 2009) can make examining the role of scale difficult. Cash et al.'s (2006) Cross and Multi-Scale Dynamics categorisation offers one heuristic in which to approach scale in human-environment interactions. They outline the following scales as 'critical in understanding and responding to human-environment interactions' (p3): spatial, temporal, jurisdictional, institutional, management, networks and knowledge. Understanding the cross-scale interaction between these different scales at various levels is key to identifying scale challenges and their solutions.

Within the scale debate, constructivist arguments have become an important facet (Bulkeley, 2005; Keil and Debbané, 2005; Sayre, 2009; Stanley, 2009) with a greater understanding of 'the role of society in constructing and manipulating knowledge, reality, and scale in complex human-environment systems' (Manson, 2008, p778). For constructivists, scale is far from being a definitive, ontologically derived entity but is

in fact a socio-political construct (Towers, 2000; Brenner, 2001). Given the constructed nature of scale, it stands that scalar configurations are both historically contingent and contestable. For Swyngedouw (2004), current scalar configurations of socio-ecological issues are merely ‘temporary stand-offs in a perpetual transformative, and, on occasion, transgressive, socio-spatial power struggle’ (p34). Scaling is thus a critical part of the discursive struggles behind environmental management debates, where different actors ‘reframe and re-position the issue to their own advantage’ (Harrison, 2006, p511). Scale-frames have been examined for a range of environmental management issues, e.g. biodiversity (Apostolopoulou and Paloniemi, 2012), conservation (Mansfield and Haas, 2006; Bosak, 2010; Wyborn and Bixler, 2013), the Baltic Sea (Larsen, 2008) and industrial and agricultural pollution (Harrison, 2006; Van Lieshout et al., 2011).

Regarding scale, it is the researcher’s prerogative which approach is best-suited for their research needs. Here, the conceptual framework of scale-frames and scale-challenges is applied to the Arctic offshore debate as a means to highlight particular incoherence and tensions. This is in agreement with Kok and Veldkamp (2011) who claim the most constructive place to start when studying scale in relation to environmental and natural resource management is ‘the premise that scales are framed and that the challenge is in knowledge claims rather than in how reality works. This allows bypassing the issue whether scales are real or constructed’ (p7). Thus, scale challenges largely derive from the contestation between how events are scale-framed by various actors (Moore, 2008).

#### *4.2.2. Arctic hydrocarbons and scale*

Academic interest in contemporary Arctic developments has burgeoned, the region’s hydrocarbon reserves alongside dramatic sea-ice melt acting as key drivers for this growing attention (Nyman, 2012; Wood-Donnelly, 2016). The Arctic has witnessed a process of ‘region-building’ in recent decades, largely through the Arctic Council, with ‘sustainable development’ a discourse prominently featured in this building process (Keskitalo, 2004). Some emphasise globalisation and global environmental

change as having a marked impact in these developments (Nilsson, 2012; Young, 2012). It is in this context in which Arctic offshore is positioned.

In the Arctic social sciences literature focusing on offshore hydrocarbon development, issues of scale are often alluded to, but not always directly addressed. The issue is often described as complex, especially in terms of governance where there are challenges of negotiating multilevel interactions between local, national, regional and international levels with fragmented governance constellations (Humrich, 2013; Pelaudeix, 2015). Research can take an explicitly pan-Arctic approach (e.g. Mikkelsen and Langhelle (2008), Keil (2014)), or can focus on one particular area/country (e.g. Norwegian Arctic (Jensen, 2007), Alaskan Arctic (Kämpf and Haley, 2014)) while associating developments within a context of a wider, more generalised Arctic region.

There are few studies that explicitly explore the role of scale in discourse surrounding Arctic offshore in any significant depth: a research gap this work seeks to address. McDowell and Ford (2014) touch upon scale in their study of socio-ecological dimensions of hydrocarbon development in Greenland, a consequence of their use of political ecology in their analysis. Nevertheless, beyond a brief mention of cross-scale effects it does not constitute a detailed analysis of scale and how it is framed. Nilsson's (2012) work on the 'politics of scale' in the shifting emphasis of Arctic environmental politics explores the relationship between Arctic and scale, if not specifically focusing on the issue of Arctic offshore, concluding there has been a shift away from 'low politics' towards a 'high politics'. Perhaps most pertinent is recent work by Veland and Lynch (2017), which examines epistemic narratives around what they describe as the 'Arctic ice edge'. They observe how scale and discourse are woven together in the contemporary Arctic, described as '[a]n icon of climate change, a frontier of shipping and petroleum industries, and the home of Indigenous peoples' and where 'story-lines connect in discursive and material ways with places remote from the Arctic' (Veland and Lynch, 2017, p9). Veland and Lynch (2017) outlined the challenges of the plurality of different scale-frames around the Arctic, but, unlike here, do not develop how a scalar approach might offer utility in tackling these challenges.

### 4.3. Methodology

This work represents an interpretative analysis, one that is abductive in nature. As Schwartz-Shea and Yanow (2013) write, ‘abductive reasoning begins with a puzzle, a surprise, or a tension, and then seeks to explicate it by identifying the conditions that would make that puzzle less perplexing’ (p27). Here, the puzzle relates to the observed discursive cacophony and its scalar components surrounding offshore hydrocarbon development in the Arctic. This observation emerged during a period of undertaking fieldwork on stakeholder perceptions around Arctic offshore, researching media coverage of oil and mining in Greenland and attending several international Arctic conferences during 2013-14. Interested in understanding this puzzle, attention was placed on the corpus of data that emerged from this period: a collection of primary and secondary sources that represented a useful snapshot of the discussion around Arctic offshore during this time. 2013-14 was a period of particular interest coinciding with heightened excitement around Arctic offshore development, with events such as the grounding of Shell’s oil drilling rig Kulluk at the turn of 2013, the Arctic Council’s signing of the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic, the imprisonment of Greenpeace campaigners by Russian authorities and beginning of production at the Prirazlomnaya Arctic offshore platform (Heininen, 2013, Fries, 2014). The sources used are as follows:

Proceedings of two Arctic-themed conferences, both held in Iceland during October 2013: the Arctic Energy Summit and the Arctic Circle Assembly. Materials used were plenary and breakout session recordings, participant observation notes, informational interviews with delegates, informal discussions and associated grey literature. Discussion of offshore hydrocarbon development was prevalent throughout these events.

Data from a thematic analysis of international media coverage on natural resource development in Greenland<sup>15</sup>.

Data from 38 interviews undertaken during fieldwork in 2013-14. Interviewees include residents of Aasiaat, Greenland (a town that has served as a base for

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<sup>15</sup> Davies, W., Wright, S. and Van Alstine, J. (2017) Framing a ‘climate change frontier’: international news media coverage surrounding natural resource development in Greenland, *Environmental Values*, 26(4): 481-502(22)

oil exploration in the past) and a diverse collection of delegates of Arctic-themed conferences<sup>16</sup>.

Transcripts from the Bureau of Ocean Management's public hearings relating to the draft Supplemental Environmental Impact Statement for Lease Sale 193 in the Chukchi Sea, Alaska<sup>17</sup>.

Transcripts from oral evidence presented to the British House of Lords' Select Committee on the Arctic<sup>18</sup>.

A scalar approach was applied as a means to decipher and organise the cacophony and its challenges. Cash et al.'s (2006) aforementioned Cross and Multi-Scale Dynamics categorisation was used as a guiding framework. This framework outlines seven key scale categories found in human-environment interactions and the levels found within these categories: Spatial (areas), Temporal (rates, durations and frequencies), Jurisdictional (administrations), Institutional (rules), Management (plans), Networks (links) and Knowledge (truths). With this categorisation scheme as a guide, the data sources were initially coded for instances of scale, either explicit or inferred (e.g. the Arctic described as a global commons was labelled 'Spatial and Jurisdictional', the Inuit Circumpolar Council (ICC) declaration labelled 'Networks and Institutional'). After this initial grouping, the coded sections were then examined for 'cross-scale, cross-level interactions' that might contribute towards scale challenges (e.g. how certain framings around Jurisdictional levels might clash with framings around Network levels). From this analysis, four key scale challenges were identified and are outlined in the following section.

There are several limitations to this research approach. Firstly, the dataset used in this analysis was not created in a predetermined and systematic fashion. As such, there are limitations around the generalisability of findings, especially given the sources chosen for analysis could arguably reflect researcher bias. Whilst aware of this limitation, the scope of this research is not to make representative claims around frequency or extent

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<sup>16</sup> Davies, W., Van Alstine, J. and Lovett, J. (2016) 'Frame conflicts' in natural resource use: exploring framings around Arctic offshore petroleum using Q-method, *Environmental Policy and Governance*, 26: 482-497.

<sup>17</sup> See <http://www.boem.gov/ak193/> [Accessed 10 September 2015]

<sup>18</sup> See <http://www.parliament.uk/business/committees/committees-a-z/lords-select/arcticcom/publications/> [Accessed 10 September 2015]

of scale challenges within the discursive space surrounding Arctic offshore. Indeed, in practical terms this would prove challenging to properly reflect the full breadth of this discussion. Instead, this research analyses part of the discussion to shed light on *some* of the scalar tensions found within Arctic offshore discourse. There are similarities to this approach with case-study analysis, in how it seeks the ‘understanding of particular instances of phenomena’ (Mabry, 2008, p214 cited in Van Leeuwen, 2010, p46). The data used here, a diverse and broad mixture of primary and secondary sources that focus on specific areas within the Arctic as well as the Arctic more generally offer a useful snapshot from which worthwhile insights can be inferred. Another limitation relates to the interpretative approach to data analysis. While a guiding framework provides an element of structure for data interpretation, the subjectivity within this analytical approach inevitably has consequences for the replicability of findings, e.g. the researcher might omit certain aspects out through bias or categorise sections differently. Nevertheless, while acknowledging these limitations, we can have confidence in the findings of this research. This study’s transparency and procedural clarity in its methodology, the broad sample found in its corpus construction and thick description of data texts are, as Gaskell and Bauer (2000) describe, indications of confidence and relevance in qualitative research of this kind.

#### **4.4. Scale challenges in Arctic offshore discourse**

##### *4.4.1. Global Arctic*

Across the dataset, numerous examples of Arctic offshore being framed at a global level were identified. One variant of a global scale-frame centred on a ‘globally-significant’ space in terms of environmental conservation. Here, the Arctic is under threat from catastrophic environmental degradation with consequences for people the world over. Emphasis is placed upon scaling the Arctic more on its ecological role in the wider biosphere. The Arctic represents a ‘place of shared opportunities and shared responsibilities on a global scale’<sup>19</sup> and ‘a global sanctuary that the whole of humanity can share and ensure that it is not destroyed’<sup>20</sup>, with those cynical of this view

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<sup>19</sup> *Head of Conservation, Global Arctic Programme, WWF, House of Lords’ Select Committee on the Arctic, November 2014*

<sup>20</sup> *Head of Greenpeace, Arctic Circle Assembly 2013, Russia and the Arctic session, October 2013*

lamenting the '[common] propaganda that the Arctic is a pristine environment that needs to be locked up and saved for the rest of humanity'<sup>21</sup>.

The Arctic's global characteristics are commonly emphasised through the association of offshore development with climate change and the Arctic's particular vulnerability to changing climatic conditions. In explicitly tying Arctic offshore with climate change, responsibility and impact are scaled outwards from the Arctic region to include the whole planet. Arctic offshore will not only destroy 'a particularly important ecological asset of the planet' but also 'in a way that will exacerbate catastrophic climate change'<sup>22</sup>. In this context, climate change is positioned as the foremost concern over Arctic offshore. As an Alaskan fisherman explains during a public hearing on offshore oil development in the Chukchi Sea:

'I'm opposed to allowing this lease sale to go forward for two main reasons: The first and perhaps most critical is the effect of burning the oil reserves on our atmosphere and oceans. The most recent IPCC report says we have to leave most of the world's oil, gas and coal reserves in the ground if we are going to keep the world from heating up beyond two degrees Celsius'<sup>23</sup>.

Another type of global framing, often deployed by oil industry representatives, centres on resource reserves. Arctic offshore becomes globalised through its importance of hydrocarbons to the global economy and its rising energy demands. As such, there exists a pressing need to exploit the Arctic's abundant reserves. Arctic offshore is contextualised around a commodity of significant global utility and the need to meet a world demand, and takes place within a 'resource frontier' opening up to the globe. This is exemplified in the following quotes from an oil company representative and a Canadian government representative:

'Take 2040, for example, we believe that 60% of the energy mix will be fossil fuel, so we will still need a lot of energy in the future, and current fields are declining, so just to fill the gap, we really need more energy, and we know that

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<sup>21</sup> *US oil company employee, Interview on the subject of Arctic offshore hydrocarbon development, November 2014*

<sup>22</sup> *Head of Greenpeace, Arctic Circle Assembly 2013, Press conference, October 2013*

<sup>23</sup> *Alaskan fisherman, Public Hearing for 193 Remand - Chukchi Sea Bureau of Ocean Energy Management, December 2014*

25% of the resources that remain to be found are in the Arctic. That is the big picture of our view of the Arctic'<sup>24</sup>.

'[The] IEA predicts that global energy demand will increase by more than one third by 2035...Given this growing energy demand, energy extraction from remote and unconventional resources such as those found in the Arctic will be needed'<sup>25</sup>.

Indeed, some go so far as to express 'the Arctic has responsibility to provide some of the commodities the world is going to need'<sup>26</sup>.

When framed globally, Arctic offshore becomes a natural resource issue about climate change, fossil fuel dependency, conservation, energy markets and global sustainability. The oceanic Arctic represents a vulnerable and ecologically-significant polar environment in the world's biosphere, its resource wealth and its impacts belonging to global society.

A core scale challenge associated with Global Arctic scale-frames relates to the cross-scale interactions between 'spatial' and 'jurisdictional' scales (i.e. the environmental space with the political space). More specifically, it relates to cross-scale, cross-level interactions between a global space and national, provincial and local levels. This scale challenge stems from an opening-up and a spreading-out of stakeholder involvement. A globalised version of the Arctic raises a fundamental challenge: if the Arctic belongs to all of humanity, how does/can this align with an Arctic as a region of nation-states, provinces and local communities in terms of stakeholder legitimacy and responsibility?

The case of Russia's imprisonment of Greenpeace's activists symbolises this challenge. An internationally diverse collection of activists representing a global campaign to protect the Arctic protest at an oil rig located in what can be described as 'Arctic waters': an action explicitly global in its outlook. Nevertheless, the oil rig's

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<sup>24</sup> Vice-President, Arctic Unit, Statoil, House of Lords' Select Committee on the Arctic, September 2014

<sup>25</sup> Canadian Northern Economic Development Agency, Arctic Energy Summit 2013, *An Integrated Approach to Energy and Sustainable Development in the National Interest session*, October 2013

<sup>26</sup> Geologist, University of Copenhagen, Arctic Circle Assembly 2013, *Greenland's Perspective on the Arctic session*, October 2013

location in Russia's exclusive economic zone (EEZ) ultimately meant a confrontation with conventional Westphalian notions of sovereign territorial space. As a representative of the Russian government noted at the Arctic Circle Assembly 2013 in response to Greenpeace's globalising of the issue,

‘There is the Russian legislation, Russian law which regulates cases like this and I believe the Russian law is competent enough to deal with this issue... there is no need for actions like the one organised by Greenpeace’<sup>27</sup>.

Here is a clear example of the difficulties behind notions of a global Arctic space. The act of making Arctic offshore an explicitly world concern rubs uneasily with a Russian Arctic space and the priorities and concerns that exist at the national level, which in this instance are positioned in stark opposition with the environmental activists.

Ultimately, when Arctic offshore is framed in terms of a global commons, lower jurisdictional levels risk being relegated to lesser relevance or omitted entirely, raising salient governance questions of legitimacy, ownership, responsibility and consequences.

#### *4.4.2. Arctic Region*

Framing of the geopolitical and environmental space in which offshore activity takes place varies greatly within the discourse surrounding Arctic offshore. On the one hand, offshore development takes place in a clearly-demarcated geopolitical space based on shared environmental characteristics. On the spatial scale, this environmental region is crudely wedged somewhere between landscape and global, centred on the ice of the Arctic Ocean and spreading to the surrounding land masses down towards 66°N latitude. Emphasis is placed on the region's defining environmental characteristics, including its harsh polar climate, cryospheric landscape and extreme seasonal variability, echoed in the words of one NGO representative, who describes that ‘in relation to oil extraction it is more important to look at the ice coverage and also from

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<sup>27</sup> *Russian government representative, Arctic Circle Assembly 2013, Russia and the Arctic session, October 2013*

risks of icebergs'<sup>28</sup>. Within this environmental region sit the eight 'Arctic states', resembling a geopolitical bloc, and, through the UN Law of the Sea Convention, claim a considerable majority of the ocean estimated to possess oil reserves. The common challenges involved with offshore development in this region are such that an 'Arctic-wide' approach is deemed expedient, with some raising the idea of an Arctic federation, such as one audience member at the Arctic Energy Summit, who asks 'why not some federation of Arctic states, that could safeguard our environment and communities?'<sup>29</sup> Praise of the Arctic Council and its affiliated agreements on offshore activity exemplify this, with trust placed on 'the work of the Arctic Council in addressing the various challenges of the Arctic' especially 'the oil spill response agreement'<sup>30</sup> and the significant work '[the] Arctic Council has long undertaken with the aim to helping to ensure that resource development in the Arctic proceeds in a responsible manner'<sup>31</sup>.

On the other hand, the space under discussion in the Arctic offshore debate is considerably diverse, both in terms of physical and human geography. This variation is to such an extent that offshore hydrocarbon development in different parts are fundamentally different propositions. Here, talking about an Arctic Ocean as a 'single unit' is misleading:

'One misconception is that the Arctic is a single region. In our view, there are many Arctics and the oil industry must recognise this and gauge accordingly'<sup>32</sup>.

'[People] who talk about the Arctic as a single unit...I think it is a huge misconception. If you look at the difference between the US Arctic and the Norwegian Arctic for instance, there is no ice offshore in Norway which is a huge factor'<sup>33</sup>.

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<sup>28</sup> *NGO representative, Interview on the subject of Arctic offshore hydrocarbon development, September 2013*

<sup>29</sup> *Speaker, Summary session, Arctic Energy Summit 2013, October 2013*

<sup>30</sup> *Speaker, Ministry of Industry and Innovation, Iceland, Arctic Energy Summit 2013, An Integrated Approach to Energy and Sustainable Development in the National Interest session, October 2013*

<sup>31</sup> *Canadian Northern Economic Development Agency, Arctic Energy Summit 2013, An Integrated Approach to Energy and Sustainable Development in the National Interest session, October 2013*

<sup>32</sup> *Speaker, Statoil, Arctic Circle Assembly 2013, Arctic Energy Cooperation session, October 2013*

<sup>33</sup> *Arctic conference representative, Interview on the subject of Arctic offshore hydrocarbon development, November 2014*

‘I think that when it is reported in the media, people assume the Arctic is this monolithic region’<sup>34</sup>.

When the oceanic Arctic is broken down into composite parts of varying extremity with regards to technical ability to operate (as Statoil does with its acreage, breaking down areas into three categories based on water depth and ice severity: Workable, Stretch and Extreme), the utility of labelling all offshore activity under the same banner becomes problematic. Oil drilling in icy waters such as the Greenland Sea is not the same as in the Norwegian Barents Sea. Similarly, whilst a shared regional identity is projected by the Arctic states through bodies like the Arctic Council, significant differences exist within this geopolitical bloc. Governance structures, political cultures and approaches to natural resource management vary between these countries, with the differences between Russia and the US commonly used to exemplify this. As such, institutionally this geopolitical bloc is unlikely to transform into an Arctic union or develop an overarching constitution binding these states together.

The challenge associated with varied Arctic definitions centres on the interaction between various scales: spatial (the Arctic environment under discussion), jurisdictional (the geopolitical arrangement of Arctic states) and institutional (the rules governing this Arctic space). There is a tension between an Arctic framed as a homogenous environmental and geopolitical region with one framed in more fragmented terms. The former’s emphasis on the commonalities shared across the region points towards approaching offshore activity in Arctic terms: be it in its governance, in media coverage of hydrocarbon development in the Arctic, in discussion at Arctic-themed conferences or campaigns against Arctic offshore. Nonetheless, significant regional variation raises doubts over labelling all offshore activity under the same banner. When the oceanic Arctic is broken down into composite parts of varying extremity with regards to technical ability to operate, how useful is taking an ‘Arctic approach’ in these circumstances? The words of one speaker at the Arctic Circle Assembly 2013 capture these concerns:

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<sup>34</sup> *Journalist, Interview on the subject of Arctic offshore hydrocarbon development, November 2014*

‘...a lot of environmental differences in various parts of the Arctic mandate perhaps that bi-lateral standards between adjoining states or between two or three states may make a lot more sense than trying to have a common standard, where some parts of the Arctic you have difficult ice conditions to deal with and in others you don’t’<sup>35</sup>.

Environmental campaigns and political strategies that little acknowledge this variation risk simplifying the nuanced reality.

When Arctic offshore is under discussion, the Arctic in which it takes place is framed in varied ways; the term Arctic neither objective nor static. The scale challenge is in striking a balance between a simple, homogenous Arctic and a complex, heterogeneous Arctic.

#### *4.4.3. Arctic Peoples*

The Arctic offshore issue can be framed in terms of the opportunities and challenges facing the region’s indigenous peoples. The position of indigenous peoples represents a scalar curiosity: with the meaning of ‘indigenous’ malleable and indistinct, scale-frames of ‘Arctic indigeneity’ take on varied forms. Firstly, there is an association with ‘local’, with indigenous groups situated on the frontline of development. Here, terms like ‘local communities’ and ‘indigenous groups’ are either bundled up together or used synonymously, with little distinction made between them. The words of one speaker representing the Inuit Tapiriit Kanatami at the Arctic Energy Summit 2013 encapsulate this:

‘All the indigenous people that live around the circumpolar world, this home to us and we live with the frontline effects of development. We have in the past and we will continue to do so. Our common responsibility is to continually strive to tip the balance in favour of local people’<sup>36</sup>.

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<sup>35</sup> *Speaker, Brookings Institute, Arctic Circle Assembly 2013, Arctic Energy Cooperation session, October 2013*

<sup>36</sup> *Speaker, Inuit Tapiriit Kanatami, Arctic Energy Summit 2013, Sustainable Development and Traditional Ways of Living session, October 2013*

Furthermore, Traditional Ecological Knowledge (or ‘Traditional Knowledge’) is often referred to in discussions around Arctic offshore and indigenous peoples. With its onus on contextual, specific and cultural knowledge related to locality, traditional knowledge positions indigenous peoples as local experts and symbolises Arctic indigeneity’s affiliation with the community level.

Secondly, Arctic indigeneity is framed in a way that brings together disparate indigenous groups under a common identity. Their traditional lifestyles and relationship with resources and landscape are the commonalities that bind people of the Arctic together. Terms like ‘Arctic Peoples’ project the region’s indigenous groups as a homogenous entity spread across a vast land mass. In doing so, an Arctic indigenous level is projected, albeit a geographically ill-defined one, based around abstract notions of a homeland. This is indigenosity expressed in a more generalised sense than family and kinship found at a community level. Instead, it emphasises the societal and trans-societal connections across an Arctic space. This amalgamation of a diverse collection of indigenous groups as ‘peoples of the Arctic’ has governance impacts, magnifying their voice to be heard at a global level and reiterating the Arctic as a ‘homeland’ for those whose livelihoods and traditions are connected to the landscape in a certain way. Organisations such as the ICC and the Sami Council embody this imagining of the Arctic. A member of the Sami Parliament articulates this Arctic indigenous connection:

‘There are a couple of indigenous peoples that we say are related to us in terms of culture and tradition: especially, the Inuit in the west and also the Nunaat to the east. However, the indigenous people in the Arctic have at least one basic thing in common: our lives and cultures are closely tied to the gathering and removal of resources. I mean things like fishing, hunting, trapping and reindeer herding. Our identities, individually and collectively, are closely connected to how we make use of and connect ourselves to the resources and landscape’<sup>37</sup>.

Arctic Peoples scale challenges involve cross-scale, cross-level interactions between jurisdictional and network scales. An Arctic indigeneity in which indigenous groups might identify themselves is difficult to pin down. Declarations like the ICC’s

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<sup>37</sup> *Political Advisor, Sami Parliament, House of Lords’ Select Committee on the Arctic, September 2014*

Resource Development Principles, referred to by several indigenous speakers at Arctic conferences, can be viewed as attempts at making the abstract nature of Arctic indigeneity into something more tangible (Koivurova 2010) and thus more applicable in terms of natural resource governance. As one indigenous representative explains, ‘the declaration allowed the Inuit of the four countries to get together to talk about this critical issue’<sup>38</sup>. Nevertheless, relating more with network scale categorisation (family, kin, society, trans-society) than jurisdictional (localities, provincial, national, international), the alignment of indigeneity's nebulosity with traditional governance levels creates a scale challenge. For example, an abstract Arctic homeland, where the differentiation between land and sea is not as explicit, can contrast markedly with conventional notions of marine sovereignty. This disparity can lead to frustrations as seen in the remarks of one Point Hope resident at a public hearing on offshore oil development in the Chukchi Sea: ‘You guys are making this decision for us. We have no jurisdiction in these federal waters even though we have been here for thousands of years’<sup>39</sup>. This sentiment is expressed by an Inupiat leader when he discusses potential offshore oil development and questions who uses the sea and who ‘owns’ the resources and how ‘perhaps it is time for indigenous people, including my fellow Inupiat, to ponder a challenge to the current status quo of how do we share in the resources that are taking place in our homeland’<sup>40</sup>.

The conflation of ‘indigenous’ with ‘local’ risks bundling together two quite separate elements of natural resource governance. This synonymy between indigenous and local can prove problematic, such as the case with oil and gas development in Sakhalin, Russia, where a desire from foreign investors to meet World Bank standards on indigenous peoples’ engagement suffered problems as only a small percentage of the local population were indigenous peoples. As one academic explained to House of Lords’ Select Committee on the Arctic, ‘the local issues were much more complicated and were not actually related to a very small indigenous population’<sup>41</sup>. The indigenous-local conflation muddles culture, ethnicity and geography in such a way that what is

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<sup>38</sup> *Speaker, Inuit Tapiriit Kanatami, Arctic Energy Summit 2013, Sustainable Development and Traditional Ways of Living session, October 2013*

<sup>39</sup> *Point Hope resident, Public Hearing for 193 Remand - Chukchi Sea Bureau of Ocean Energy Management, November 2014*

<sup>40</sup> *Speaker, U.S. Arctic Research Commission, Arctic Circle Assembly 2013, Polar Law: The Rights of Indigenous Peoples session, October 2013*

<sup>41</sup> *Academic, Statoil, House of Lords’ Select Committee on the Arctic, October 2014*

meant by statements such as ‘Arctic peoples should be at the heart of decision-making in the far north’<sup>42</sup> become difficult to decipher.

Ultimately, the scale challenge here revolves around negotiating the malleability of the term ‘indigenous’: its dual meaning of association with jurisdictional locality near sites of offshore extraction and with broader themes of regional identity and culture.

#### *4.4.4. Arctic Rush*

Temporally, scale-frames around Arctic offshore are varied: from short-term economic and environmental imperatives to emphasis on protracted development timelines and uncertainty in the future around global demand of oil.

Underpinning much of the discussion around recent Arctic developments is rapid regional environmental change. This is especially so with Arctic offshore, where a rapidly warming climate and melting sea-ice are commonly presented as the fundamental driver in offshore oil exploration. From this, a scenario is depicted of oil companies rushing to the Arctic in order to take advantage. For some, there is a problematic mismatch between this rapid environmental change and policy. For example, ensuring information provided to policymakers does not become quickly outdated, a concern expressed by one member of an Arctic Council working group, where they describe, ‘in an environment that is perhaps changing rapidly...the biggest challenge is how to shorten that gap between when information is collected to where it is processed in a form that policymakers can access’.

A backdrop of rapid change and concomitant rush sets a tone of urgency around Arctic offshore with headlines like ‘Rushing for the Arctic’s Riches’<sup>43</sup> and misconceptions that the Arctic oil reserves will be developed in five years<sup>44</sup>. A temporal tension exists between an urgency to act now with the extensive time-frames involved in oil exploration and production (e.g. decades-long lead times, unknown timelines for

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<sup>42</sup> *Head of Campaigns for the Greenpeace Arctic Programme, House of Lords’ Select Committee on the Arctic, October 2014*

<sup>43</sup> *"Rushing for the Arctic’s Riches" - New York Times headline, December 2013*

<sup>44</sup> *Arctic conference delegate, Interview on the subject of Arctic offshore hydrocarbon development, 2014*

discovery). The disparity between the two is particularly stark for Arctic offshore: an environment warming twice as fast as the rest of the world where for any given energy project the challenging conditions ensure the timeframe is at least as twice as long. Perspectives over what constitutes long and short, adequate and inadequate, immediate and distant are at conflict. The following quotes from speakers at the Arctic Energy Summit 2013 highlight such differences: ‘20 or 30 years for the Arctic is very little time’<sup>45</sup>; ‘These are decades long projects...there is time therefore to do things right’<sup>46</sup>; ‘No drilling in the Arctic not until 2020, there is lots of time’<sup>47</sup>; ‘2020 is only seven years from now’<sup>48</sup>.

Temporal challenges towards the lower levels of jurisdictional scale include the potential for immense economic benefits for communities and smaller nations contributing to an ‘excitement’ that promises riches in the immediate, but in reality is decades away. As an Icelandic government representative explains, ‘when they see that this is not going to make us an OPEC today or tomorrow, they immediately lose interest’<sup>49</sup>. Projections of an economy based on hydrocarbons and resource exploitation in the near-future fuel this excitement, the former Greenlandic PM Aleqa Hammond speaking of hoping to see the ‘necessary transformation of the Greenlandic economy towards mining and oil and gas related activities within her own lifetime’<sup>50</sup>. However, when framed in the long-term, this excitement is questioned. This is seen in those who claim uncertainty around reserve estimates (‘Let’s face it, it could also be dry wells’<sup>51</sup>), those who believe global action on climate change could impact oil demand (‘If we, as a society or as a set of industrialised nations, are choosing to respond to climate change in any meaningful way, frankly that rules out that kind of

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<sup>45</sup> *Speaker, Murmansk Regional Public Organization "Association of Kola Saami", Arctic Energy Summit 2013, Development of the North, for the People of the North session, October 2013*

<sup>46</sup> *Oil company representative, Arctic Energy Summit 2013, An Integrated Approach to Energy and Sustainable Development in the National Interest session, October 2013*

<sup>47</sup> *Canadian government representative, Arctic Energy Summit 2013, An Integrated Approach to Energy and Sustainable Development in the National Interest session, October 2013*

<sup>48</sup> *Audience member, Inuvialuit Game Council, Arctic Energy Summit 2013, Energy, Sustainable Development and Traditional Ways of Living, October 2013*

<sup>49</sup> *Icelandic government representative, Arctic Energy Summit 2013, An Integrated Approach to Energy and Sustainable Development in the National Interest session, October 2013*

<sup>50</sup> *Speaker, Greenlandic Prime Minister, Arctic Circle Assembly 2013, Opening session, October 2013*

<sup>51</sup> *Oil company representative, Arctic Energy Summit 2013, Development of the North, for the People of the North, October 2013*

exploration and exploitation in the Arctic'<sup>52</sup>), and those who believe the importance of oil might diminish ('It will not be as important, there will be new technology'<sup>53</sup>). Ultimately, there are simply 'too many variables to say how it would look in 15-20 years'<sup>54</sup>.

## 4.5. Discussion

The act of drilling for hydrocarbons in Arctic waters involves myriad socio-ecological implications, with people framing the issue in a diversity of ways. As such, it bears all the hallmarks of 'wickedness' and associated governance challenges (Balint et al., 2011). That Arctic offshore is 'complex' is hardly revelatory (Kämpf and Haley, 2014); indeed all environmental and natural resource issues can arguably be described as such. What is interesting here, however, is the extent issues of scale are ubiquitous within the discourse plurality that surrounds Arctic offshore. Competing scale-frames, deployed either explicitly or subtly, create a discursive environment in which the 'intellectual incoherence' mentioned in the introduction can flourish. This is especially apparent at the growing phenomena of international conferences dedicated to Arctic issues, where the offshore issue finds itself placed within a vague and wide-ranging context.

The scalar approach taken here (explicitly seeking the ways in which an issue is framed at different scale/levels) was used to pinpoint aspects of the Arctic offshore discussion particularly prone to confusion and conflation. In this analysis, four key aspects were identified as Global Arctic, Arctic Region, Arctic Peoples and Arctic Rush. For participants engaging in the Arctic offshore debate, an understanding of how various frames associated with these scale challenges are deployed matters: Arctic offshore discussed in terms of a global commons is very different to that discussed as a local and national concern; an Arctic framed as a single environmental region contrasts greatly with one broken down into its composite parts; peoples of the Arctic defined by geography clash with definitions based on culture and ethnicity; and

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<sup>52</sup> *Greenpeace representative, House of Lords' Select Committee on the Arctic, October 2014*

<sup>53</sup> *Aasiaat resident, Interview on the subject of Arctic offshore hydrocarbon development, August 2014*

<sup>54</sup> *Environmental NGO representative, Interview on the subject of Arctic offshore hydrocarbon development, August 2013*

discussion of present-day impacts of Arctic offshore differ against forecasts decades into the future. An acute awareness of scale offers greater clarity and can help steer away from misunderstandings and misguided policy efforts: for example, the EU calling for a moratorium on Arctic offshore oil in 2012 despite having no jurisdictional authority in the waters where drilling was taking place (Østhagen, 2012); the aforementioned conflation of local and indigenous peoples by foreign investors in the Russian Arctic; or the overexcitement that can engulf towns during the early exploration stage despite the uncertainty of production and long timescales involved.

Central to these scale challenges are two underlying tensions. Firstly, between ‘Outsider vs Insider’. This tension is compounded by increasingly globalised Arctic. Who counts as a relevant stakeholder in this context? As one Arctic Circle Assembly 2013 attendee commented, ‘should Arctic people have a say what people are doing in London, for example?’<sup>55</sup> The globalising of discourse around Arctic offshore resonates with wider trends over recent decades where environmental issues are rescaled towards a global level (Andonova and Mitchell, 2010). Some voice concerns that imposition of global agendas fail to take into account local realities (Adger et al., 2001; Bosak, 2010; Hajer et al., 2015). Leitner et al. (2008) describe this as how ‘scalar discourses of globalization might contribute to the reification of the global scale and the suppression of resistance’ (p116). The extent of what ‘stake’ individuals have in this issue and how policy efforts, at all levels, tackles this question is a fundamental one.

‘Heterogeneous vs. Homogeneity’ represents another tension. In some ways, when faced with the challenges associated with offshore development, an inclination to accentuate the common characteristics that define the Arctic environment and its population is understandable. There is utility in this approach: for example, campaigns, where the Arctic label offers what one NGO representative describes as a ‘simple narrative’<sup>56</sup> that acts as a useful shorthand in conveying to laypeople the risks involved with hydrocarbon development in a polar environment. It can act as a lynchpin for policy to build around such as Arctic Council’s agreements on offshore

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<sup>55</sup> *Engineer, oil industry, Interview on the subject of Arctic offshore hydrocarbon development, November 2014*

<sup>56</sup> *Environmental NGO representative, Interview on the subject of Arctic offshore hydrocarbon development, November 2013*

oil, or act as a foundation in which disparate and varied indigenous groups can consolidate their voices. However, a simplified Arctic can prove problematic. In deploying the ‘Arctic-label’ in broad-brush strokes, there is a risk of regional diversity becoming hollowed out and conflated into an unhelpful simplicity. In this context, it could be argued this simple, homogenous Arctic might resemble a ‘chaotic conception’, what Sayer (1992) describes as ‘a bad abstraction [that] arbitrarily divides the indivisible and/or lumps together the unrelated and the inessential, thereby ‘carving up’ the object of study with little or no regard for its structure and form’ (p138). The Arctic as an ‘emergent scale’ (Manson, 2008) in which to frame offshore activity might act as a hindrance to more nuanced discussions, such as separating areas where environmental conditions share more in common with the North Sea than those with more extreme, polar characteristics, or the differing political situations Arctic indigenous groups find themselves under.

Despite considerable academic attention, scale remains a slippery, elusive concept to pin down (Jessop et al., 2008). Given this, some go as far to argue abandoning the concept altogether (Marston et al., 2005). In discourse analysis, the process of perfectly capturing what scale (or ‘level’) is under discussion proves a difficult task as actors rarely frame issues into neatly-defined scales and levels. This is unsurprising given the complexity of natural resource issues. In this context, whilst frameworks like Cash et al.’s (2006) offer some guidance for interpretation, to follow them rigidly is not possible, as there are always overlaps and blurred edges. Nevertheless, while not denying the ontological and epistemological difficulties involved with scale, there is much to be gained from taking a scalar approach when examining a discursive environment rife with confusion and conflation as in the case of Arctic offshore. Veland and Lynch (2017) warn against ‘[s]implifying the wickedly complex decision context concerning human activities at the ice edge’ (p7). Whilst it is certainly true simplifying a complex situation is undesirable, there is however a danger in fixating too much on complexity and becoming overwhelmed. Whilst there is merit in acknowledging complexity and wickedness of modern socio-ecological problems, more is required to overcome this complexity and organise it into something more manageable. A scalar approach can assist in this process. Through the use of frameworks like Cash et al.’s (2006), a scalar approach serves as an organisational heuristic to highlight particular tensions, distilling them from the discursive noise

surrounding the subject. The greater clarity provided in doing so helps ensure the specificities of what is under discussion are clear and distinct. From such a position, more effective dialogue and policy efforts can emerge.

This work points to a critical need for a more refined terminology in describing Arctic offshore. Greater clarity is required in clearly demarcating what is under discussion. The use of the term Arctic as shorthand does a disservice by unhelpfully conflating too many aspects under one umbrella. Spatially, terms like Upper/Lower Arctic and European/North American/Russian Arctic should feature more prominently in policy, campaigns and media. The challenges of a global Arctic would not disappear. While less associated with a global commons than the Upper Arctic, offshore activity in the Lower Arctic would still have global impacts. It would, however, help sharpen focus, reduce potential for misunderstandings and ensure the socio-ecological differences within the Arctic region are not glossed over. Similarly, the ambiguity of terms like Arctic peoples and peoples of the North not only leads to generalisation of a diverse range of groups, but contributes to conflation of ethnicity and culture with locality. A reduction in the use of such terms, replaced by more specific definitions of people impacted at the frontline of this activity is recommended. Furthermore, greater effort should be made in separating out the short-term and immediate socio-ecological impacts of Arctic offshore with the longer-term, future impacts.

#### **4.6. Concluding Remarks**

The future of Arctic offshore remains uncertain. A dramatic fall in oil prices<sup>57</sup> and Royal Dutch Shell's withdrawal from its Arctic exploration programme<sup>58</sup> in 2015 have raised some questions around its viability and likelihood. Nevertheless, as the Arctic continues its considerable rise in global attention, discussions around offshore hydrocarbon development will continue to remain complex, framed in different scalar configurations by actors positioned at different levels. In this context, clarity is

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<sup>57</sup> <http://www.nytimes.com/interactive/2016/business/energy-environment/oil-prices.html> [Accessed 15 May 2016]

<sup>58</sup> <http://www.reuters.com/article/us-shell-alaska-idUSKCN0RS0EX20150928> [Accessed 15 May 2016]

essential. An acute awareness of the role of scale within the discourse can help those partaking and observing to avoid confusion and help focus upon critical tensions. This is not to suggest a scalar approach can simplify a complex situation. However, this understanding can act as a basis for the development of more effective policy and governance arrangements that are literate in the multi-scalar complexity of the issue. Whilst the exact form of what these arrangements might take is subject to debate, an understanding of scale-frames is an important component in meeting the sustainability challenges associated with Arctic offshore.

#### 4.7. References

- Adger, W.N., Benjaminsen, T.A., Brown, K., and Svarstad, H. 2001. Advancing a political ecology of global environmental discourses. *Development and Change* **32** (4): 681–715.
- Andonova, L.B. and Mitchell, R.B. 2010. The Rescaling of Global Environmental Politics. *Annual Review of Environment and Resources* **35** (1): 255.
- Apostolopoulou, E. and Paloniemi, R. 2012. Frames of Scale Challenges in Finnish and Greek Biodiversity Conservation. *Ecology and Society* **17** (4): 9.
- Balint, P.J., Stewart, R.E., and Desai, A. 2011. *Wicked Environmental Problems: Managing Uncertainty and Conflict*. Washington, DC, Island Press.
- Berkman, P.A. and Young, O.R. 2009. Governance and Environmental Change in the Arctic Ocean. *Science* **324** (5925): 339–340.
- Bosak, K. 2010. Ecotourism as Environmental Justice? Discourse and the Politics of Scale in the Nanda Devi Biosphere Reserve, India. *Environmental Philosophy* **7** (2): 49–74.
- Brenner, N. 2001. The limits to scale? Methodological reflections on scalar structuration. *Progress in Human Geography* **25** (4): 591–614.
- Bulkeley, H. 2005. Reconfiguring environmental governance: towards a politics of scales and networks. *Political Geography* **24** (8): 875–902.
- Cash, D.W., Adger, W.N., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L. and Young, O. 2006. Scale and cross-scale dynamics: Governance and information in a multilevel world. *Ecology and Society* **11** (2): 8.
- Cumming, G.S., Cumming, D.H. and Redman, C.L. 2006. Scale Mismatches in Social-ecological Systems: Causes, Consequences and Solutions. *Ecology and Society* **11** (1): 14.

- Dittmer, J., Moisiu, S., Ingram, A., and Dodds, K. 2011. Have you heard the one about the disappearing ice? Recasting Arctic geopolitics. *Political Geography* **30** (4): 202–214.
- Exner-Pirot, H. 2012. New Directions for Governance in the Arctic Region. *In: L. Heininen (ed.). Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 225–246.
- Fabbi, N.C. 2012. Inuit Political Engagement in the Arctic. *In: L. Heininen (ed.). Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 161-177.
- Fries, T. 2014. This Year in the Arctic: 2014 Highlights Arctic Yearbook 2014. *In: L. Heininen, H. Exner-Pirot and J. Plouffe and Plouffe J. (eds.). Arctic Yearbook 2014*. Akureyri, Iceland: Northern Research Forum, 15-26.
- Gaskell, G. and Bauer, M. 2000. Towards Public Accountability: Beyond Sampling, Reliability and Validity. *In: M. Bauer and G. Gaskell (eds.). Qualitative Researching with Text, Image and Sound*. London: Sage Publications, 336-350.
- Gibson, C.C., Ostrom, E., and Ahn, T.-K. 2000. The concept of scale and the human dimensions of global change: a survey. *Ecological Economics* **32** (2): 217–239.
- Hajer, M., Nilsson, M., Raworth, K., Bakker, P., Berkhout, F., de Boer, Y., Rockström, J., Ludwig, K., and Kok, M. 2015. Beyond Cockpit-ism: Four Insights to Enhance the Transformative Potential of the Sustainable Development Goals. *Sustainability*, **7** (2): 1651–1660.
- Harrison, J.L. 2006. ‘Accidents’ and invisibilities: Scaled discourse and the naturalization of regulatory neglect in California’s pesticide drift conflict. *Political Geography* **25** (5): 506–529.
- Heininen, L. 2013. *Arctic Yearbook 2013*. Akureyri: Northern Research Forum.
- Humrich, C. 2013. Fragmented International Governance of Arctic Offshore Oil: Governance Challenges and Institutional Improvement. *Global Environmental Politics* **13** (3): 79–99.
- Jensen, L.C. 2007. Petroleum Discourse in the European Arctic: the Norwegian Case. *Polar Record* **43** (3): 247–254.
- Jessop, B., Brenner, N. and Jones, M. 2008. Theorizing Sociospatial Relations. *Environment and Planning, D, Society and Space* **26** (3): 389.
- Kämpf, M. and Haley, S. 2014. Risk management in the Alaska Arctic offshore: wicked problems require new paradigms. *The Polar Journal* **4** (1): 150–169.
- Kankaanpää, P. and Young, O.R. 2012. The effectiveness of the Arctic Council. *Polar Research* **31** (1): 1–14.

- Keil, K. 2014. The Arctic: A new region of conflict? The case of oil and gas. *Cooperation and Conflict* **49** (2): 162–190.
- Keil, R. and Debbané, A.M. 2005. Scaling discourse analysis: Experiences from Hermanus, South Africa and Walvis Bay, Namibia. *Journal of Environmental Policy & Planning*, **7** (3): 257–276.
- Keskitalo, E.C.H. 2004. *Negotiating the Arctic: The Construction of an International Region*. New York: Routledge.
- Koivurova, T. 2010. Sovereign states and self-determining peoples: Carving out a place for transnational indigenous peoples in a world of sovereign states. *International Community Law Review* **12** (2): 191–212.
- Kok, K. and Veldkamp, T. 2011. Scale and governance: conceptual considerations and practical implications. *Ecology and Society* **16** (2).
- Kurtz, H.E. 2003. Scale frames and counter-scale frames: constructing the problem of environmental injustice. *Political Geography* **22** (8): 887–916.
- Larsen, H.G. 2008. Scaling the Baltic Sea Environment. *Geoforum* **39** (6): 2000–2008.
- Leitner, H., Sheppard, E., and Sziarto, K.M. 2008. The spatialities of contentious politics. *Transactions of the Institute of British Geographers* **33** (2): 157–172.
- Lindholt, L. and Glomsrød, S. 2012. The Arctic: No big bonanza for the global petroleum industry. *Energy Economics* **34** (5): 1465–1474.
- Mabry, L. 2008. Case Study in Social Research. In: P. Alasuutari, L. Bickman and J. Brannen (eds.). *The SAGE Handbook of Social Research Methods*. London: Sage Publications, 214–227.
- Mansfield, B. and Haas, J. 2006. Scale framing of scientific uncertainty in controversy over the endangered Steller sea lion. *Environmental Politics* **15** (1): 78–94.
- Manson, S.M. 2008. Does scale exist? An epistemological scale continuum for complex human–environment systems. *Geoforum* **39** (2): 776–788.
- Marston, S.A., Jones, J.P., and Woodward, K. 2005. Human geography without scale. *Transactions of the Institute of British Geographers* **30** (4): 416–432.
- McDowell, G. and Ford, J.D. 2014. The socio-ecological dimensions of hydrocarbon development in the Disko Bay region of Greenland: Opportunities, risks, and tradeoffs. *Applied Geography* **46**: 98–110.
- Meadowcroft, J. 2002. Politics and scale: some implications for environmental governance. *Landscape and Urban Planning* **61** (2): 169–179.

- Mikkelsen, A. and Langhelle, O. 2008. *Arctic oil and gas: sustainability at risk?* London, UK: Routledge.
- Moore, A. 2008. Rethinking scale as a geographical category: from analysis to practice. *Progress in Human Geography*, **32** (2): 203–225.
- Muller, S. 2014. Co-motion: Making space to care for country. *Geoforum*, 54, 132–141.
- Nilsson, A.E. 2012. The Arctic Environment—From Low to High Politics. In: L. Heininen (ed.). *Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 180-194.
- Norton, B.G. 2005. *Sustainability: A philosophy of adaptive ecosystem management*. Chicago: University of Chicago Press.
- Numminen, L. 2010. Breaking the ice: Can environmental and scientific cooperation be the way forward in the Arctic? *Political Geography* **29** (2): 85–87.
- Nyman, E. 2012. Understanding the Arctic: Three popular media views on the north. *Political Geography* **31** (6): 399–401.
- Olsson, P., Folke, C., Galaz, V., Hahn, T., and Schultz, L. 2007. Enhancing the fit through adaptive co-management: creating and maintaining bridging functions for matching scales in the Kristianstads Vattenrike Biosphere Reserve Sweden. *Ecology and Society* **12** (1): 28.
- Ostrom E. 2009, A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science* **325**: 419-422.
- Østhagen, A. 2012. The Arctic Dialogue in Brussels: Are we talking about the same ‘Arctic’?. The Arctic Institute. Available from: <https://www.thearcticinstitute.org/arctic-dialogue-brussels/> [Accessed 19 May 2016].
- Pelaudeix, C. 2015. Governance of Arctic Offshore Oil & Gas Activities: Multilevel Governance & Legal Pluralism at Stake. In: L. Heininen, H. Exner-Pirot and J. Plouffe (eds.). *Arctic Yearbook 2015*. Akureyri, Iceland: Northern Research Forum, 214-233.
- Sale, R. and Potapov, E. 2010. *The Scramble for the Arctic: Ownership, Exploitation and Conflict in the Far North*. London: Frances Lincoln.
- Sayer, A. 1992. *Method in social science: A realist approach*. New York: Psychology Press.
- Sayre, N.F. 2008. Scale. In: N. Castree, D. Demeritt, D. Liverman, and B. Rhoads (eds.). *A Companion to Environmental Geography*. Oxford, UK: Blackwell, 95-108.
- Schwartz-Shea, P. and Yanow, D. 2013. *Interpretive research design: Concepts and processes*. New York: Routledge.

- Shadian, J. 2006. Remaking Arctic governance: The construction of an Arctic Inuit polity. *Polar Record* **42** (3): 249–259.
- Stanley, A. 2009. Just space or spatial justice? Difference, discourse, and environmental justice. *Local Environment* **14** (10): 999–1014.
- Steinberg, P.E. and Dodds, K. 2015. The Arctic Council after Kiruna. *Polar Record* **51** (1), 108–110.
- Struzik, E. 2013. Polar bears ‘may need to be fed by humans to survive. *The Guardian*. Available from: <https://www.theguardian.com/environment/2013/feb/07/polar-bears-fed-by-humans-survive> [Accessed 25 May 2016].
- Swyngedouw, E. 2004. Globalisation or ‘glocalisation’? Networks, territories and rescaling. *Cambridge Review of International Affairs* **17** (1): 25–48.
- Towers, G. 2000. Applying the political geography of scale: grassroots strategies and environmental justice. *The Professional Geographer* **52** (1): 23–36.
- Van Leeuwen, J. .2010. *Who Greens the Waves? Changing Authority in the Environmental Governance of Shipping and Offshore Oil and Gas Production*. Wageningen: Wageningen Academic Publishers.
- Van Lieshout, M., Dewulf, A., Aarts, N., and Termeer, C. 2011. Do Scale Frames Matter? Scale Frame Mismatches in the Decision Making Process of a ‘Mega Farm’ in a Small Dutch Village. *Ecology and Society* **16** (1).
- Veland, S. and Lynch, A.H. 2017. Arctic ice edge narratives: scale, discourse and ontological security. *Area* **49** (1): 9-17.
- Wood-Donnelly, C. 2016. From whale to crude oil: Lessons from the North American Arctic. *Energy Research & Social Science* **16**: 132–140.
- Wyborn, C. and Bixler, R.P. 2013. Collaboration and nested environmental governance: scale dependency, scale framing, and cross-scale interactions in collaborative conservation. *Journal of Environmental Management* **123**: 58–67.
- Young, O.R. 2004. Review of Negotiating the Arctic: The Construction of an International Region, by E. C. H. Keskitalo. *Polar Research* **23** (2), 211–213.
- Young, O.R. 2012. Building an international regime complex for the Arctic: current status and next steps. *The Polar Journal* **2** (2): 391–407.

**Chapter 5**  
**Discussion and Conclusion**

## **5.1. Introduction**

This thesis is a mixed-method frame-analysis. It started with an inductive, exploratory look at how Greenlandic natural resource development is framed by English-language international news media. Here, two prominent themes emerged: how places like Greenland were tied into the wider Arctic more generally and the prominence of Arctic offshore oil and gas within the natural resource development story. As such, the following chapters focused their attention towards the wider Arctic and more specifically towards Arctic offshore. Stakeholder frames around the Arctic offshore issue were examined in a systematic, quasi-quantitative manner through the use of Q-methodology with a diverse collection of participants chosen to reflect the increasingly diverse involvement of stakeholders in the Arctic. Next, insights garnered from these two chapters were built upon. With the role of scale as a prevalent theme, the final empirical chapter sought to investigate in an abductive manner scale-framing around the Arctic offshore issue across a collection of Arctic-themed events and discussions that represented a snapshot of the contemporary discourse. Brought together, this thesis represents a body of work that tries to make sense of the contentious issues surrounding Arctic natural resource development, in particular the nature of the discussion and where conflicting perspectives lie.

The chapter takes the following structure: first, the importance of this research and the motivations behind it are outlined. A discussion on the significance of the findings takes place before reflecting on the thesis' conceptual, practical and methodological contributions. This is followed by a discussion on limitations and potential for further research, before concluding.

## **5.2. Importance of this research**

Critical to assessing the importance of this research and what it set out to achieve is to ask the question, why is there a need to make sense of complex socio-ecological issues? Here, the term 'make sense' is used to describe the process of understanding frame plurality. Complex socio-ecological issues are conceptualised as wicked problems that are fundamental challenges of sustainability (Cocklin, 2009; Duckett et al., 2016) characterised by complexity, uncertainty and plurality. This research sought to understand aspects of their wicked characteristics, with a general aim that

its empirical, conceptual and methodological insights on frame plurality might contribute practically towards policy and governance that tackles these challenges. The desire to make sense of complex socio-ecological issues is one based around normative principles of sustainable development (Meadowcroft, 2000). Definitions of sustainable development are manifold (Giddings et al., 2002) and given its value-laden and normative foundations, the concept is famously difficult to pin down analytically (Sala et al., 2015). However, Kates et al. (2005) capture its essence when they write how sustainable development often translates as ‘negotiations in which workable compromises are found that address the environmental, economic and human development objectives of competing interest groups’ (p19). This describes the central tenant of sustainable development as both the recognition and the negotiation of multiple perspectives (Giampietro, 2003). As such, it is paramount that tackling sustainability challenges requires research that details these multiple perspectives and develops the tools and concepts to explore both their recognition and negotiation. It is in this spirit that this frame analysis was undertaken.

This research presents the case of Arctic natural resource development as a complex socio-ecological issue possessing an array of unique challenges (Roberts et al., 2010; Kämpf and Haley, 2014; Veland and Lynch, 2017). As the historical context presented in Section 1.3.3 outlines, these challenges are not necessarily new to the region. However, for the present-day Arctic they appear greater and more wide-reaching than ever in the context of profound environmental change and intensifying developmental pressures (McCannon, 2013). For this reason, any research dedicated to unpacking and understanding the essence of these challenges is both pertinent and, some would argue, of the utmost urgency. The influx of scholarly work devoted to the contemporary Arctic in recent years is indicative of this growing sense of importance (Nyman, 2012). This research contributes towards this burgeoning literature of understanding challenges facing the Arctic.

A combination of research methods was used to investigate several aspects of framing Arctic natural resource development: the framings guiding external perspectives looking in towards the Arctic, bridges and conflicts between Arctic stakeholders and the scalar tensions within Arctic discourse. Researching each aspect is of significance. Understanding the framings that guide external perspectives is important in a situation where the Arctic’s ‘geography of voices’ (Heininen, 2013) is expanding and the Arctic

is considered increasingly as ‘part and parcel of systemic global economic, technological, cultural and environmental change’ (Global Arctic, n.d.). This is especially the case given the likely unfamiliarity of many with the region (Steinberg et al., 2014). As the number of stakeholders engaging with the Arctic burgeons, they bring with them expectations and understandings of the region that can have influence on narratives taking place in Arctic policy arenas.

Divergent and competing framings are central to the sustainability challenges associated with complex socio-ecological issues (Norton, 2005; Balint et al., 2011). Underpinning these frames are often tensions of scale and the contestation between how issues are scale-framed (Cumming et al., 2006; Larsen, 2008; Moore, 2008). Development and implementation of sustainability policies requires an understanding of conflicting frames and the bridges between them (Curry et al., 2013; Armatas et al., 2016), especially with a general shift towards greater stakeholder inclusiveness in the environmental policymaking process (Bulkeley and Mol, 2003; Reed et al., 2009). Indeed, research of this kind is particularly relevant in the Arctic, where norms around sustainable development feature prominently (Koivurova, 2010; Käpylä and Mikkola, 2015).

### **5.3. Significance of findings**

Several findings emerged from this research and are detailed in Chapters 2-4. In this section, the significance of key findings, their relationship to the literature and the extent to which they contribute to the advancement of knowledge are discussed.

#### *5.3.1. A ‘Climate Change Frontier’*

Five frames were identified when examining international news media coverage surrounding Greenlandic natural resource development: ‘emerging resource frontier’, ‘warming Arctic’, ‘high-risk activity’, ‘geopolitical Greenland’ and ‘vulnerable traditional societies’. These findings resonate with much research surrounding Arctic developments in the last decade, as well as Greenland more specifically. Discussions around a frontier imaginary (Nuttall, 2013), impacts of dramatic warming (Kelmelis, 2011), the risky nature of extractive activity in the Arctic region (Plouffe, 2012), the Arctic as a growing geopolitical hotspot (Borgerson, 2008; Dittmer et al., 2011) and

vulnerability of indigenous populations (Trainor et al., 2007) have all featured prominently in the literature. This research makes an original contribution by presenting empirical evidence of how key themes within the Arctic social sciences literature over the last decade are represented in English-language international news media framings. Furthermore, the focus on Greenland contributes to knowledge of a part of the Arctic that has received relatively little academic attention.

From these frames, an overarching frame can be conceptualised: a ‘climate change frontier’ as the contextual background to Greenlandic natural resource development, in which other frames characterised by ‘uncertainties in the face of rapid change’ are situated. This relationship offers a novel conceptual contribution. Whilst climate change and a frontier imaginary are two prominent themes of the contemporary Arctic space, by bringing them together, the term ‘climate change frontier’ concisely captures the way in which Greenland’s natural resources are positioned in a paradigm of established climate change. This ties in with ideas of the Arctic region serving as a ‘canary in the coal mine’ in the global climate change narrative (Foley, 2005; Borgerson, 2008). Rapid and significant change in the Arctic climate is intrinsically entwined with the development of Greenland’s natural resources. Within this setting, there is emphasis on the uncertainty facing Greenland, as it faces the unknowns of a rapidly changing Arctic. This emphasis on uncertainty and unknowns echoes the findings of similar work on Arctic media coverage (Steinberg et al., 2014).

The motivation behind investigating this topic stemmed from this thesis’ first research objective to ‘examine how natural resource development in an Arctic context is framed internationally’. To assess the significance of the findings in relation to this research objective, it is important to consider how representative of international perspectives the news media sources used here are and the extent in which international news media influences perspectives of global stakeholders engaging with the Arctic region. Addressing the former, clearly international news media cannot fully account for the breadth or diversity of international perspectives, especially in the case of this research given the limitations of language and the number of publications examined. However, achieving such a full account is not realistically possible. What investigating international news media coverage does provide is a window onto the discursive

environment international audiences are likely exposed to, offering a snapshot of the ‘outside world’s perceptions’ looking in towards the Arctic.

Regarding the latter, the extent media influences have on its audiences is subject to debate. Some are wary of exaggerating its influence (Couldry, 2005; Olausson, 2011), others assert its importance in shaping opinions and agendas (Stamm et al., 2000; Doulton and Brown, 2009). This research positions itself with McCombs' (2014) theoretical stance that ‘the information provided by the news media plays a key role in the construction of our pictures of reality’ (p6) and, as such, helps influence the frames stakeholders and decision-makers might use to understand the material world (Macdonald, 2003). Furthermore, its influence is enhanced when audiences have little direct experience of the issue under discussion, often acting as the main source of public information (Wanta et al., 2004; Hansen, 2010; Happer and Philo, 2013). In this context, investigating international news media coverage provides a useful conduit into understanding the framings that guide external perspectives.

What is the significance of the media frames uncovered in this research? As Brigham (2014) writes, given the complex future facing the region, ‘it is very important that the international audience be provided with accurate and informed information about the Arctic’ (p12). While the scope of this research was not to test the veracity of news media coverage, the media frames uncovered here resemble some of the ‘Arctic myths’ that the World Economic Forum describe as ‘particularly pervasive’ (World Economic Forum 2014, p2). These include notions of an unclaimed frontier space, abundant resources easily accessible because of huge sea-ice loss and high-stake geopolitical tensions. Media framing echoing these myths may prove problematic, potentially percolating into a policy space with a growing number of stakeholders and facilitating misinformation in the policy process (Hansen, 2011; Soroka et al., 2013). In this context, detailing these media frames is of significance.

### *5.3.2. Environmental-Economic and Global-Local frame plurality*

Several frames emerged within the group of stakeholders who undertook Q-methodology interviews on the subject of Arctic offshore petroleum development. The ‘Unsustainable Development’ frame views the activity as environmentally and

socially damaging with fossil fuel extraction seen as an outdated pursuit. The 'Development Panacea' frame sees the activity as a huge opportunity for Arctic communities in need of economic and social development. 'Economic Reality>Environmental Idealism' frame places offshore activity in more pragmatic terms, highlighting the environmental risks but swaying towards the realities of economic imperatives. A frame swaying towards environmental pragmatism was also uncovered. Lastly, the 'Local Sustainability at Risk' frame places the activity as primarily a local issue, where communities close to offshore development were vulnerably placed.

Broadly-speaking, the identified frames do not deviate much from those found in similar contentious socio-ecological issues. There are commonalities in these frames with findings from other similar Q-method studies. Examples include Cairns' (2012) research on discourses around conservation in the Galápagos Islands, where the 'Conservation of Galápagos as an international/global concern' discourse she identifies bears similarities with the 'Unsustainable Development' frame found here. Similarly, the 'Economic Pragmatist' narrative identified in Mattson et al.'s (2006) Q-method study on large carnivore management shares traits with this study's 'Economic Reality>Environmental Idealism' frame, as does the 'Development Panacea' frame with the 'Economic Growth and environmental scepticism' account found in Cotton's (2015) research on stakeholder perspectives around shale gas in the UK. Furthermore, these frames echo Dryzek's (2005) typology of global environmental discourses, with elements of 'survivalism', 'sustainable development', 'Promethean' and 'economic rationalism' found across identified frames.

The extent of frame-conflicts around the Arctic offshore issue was empirically shown through no statements meeting the statistical criterion for consensus between frames. The contentiousness of the Arctic offshore issue is well-documented (Mikkelsen and Langhelle, 2008; Palmer, 2009) and these findings provide empirical evidence to reaffirm this. As the frames detailed above highlight, this contentiousness did not manifest in a simplistic polarisation of pro- and anti- stances, as Jensen (2007) found when studying Norwegian media discourse around offshore oil and gas development and which sometimes can be associated with controversial environmental issues

(Dayton, 2000). The plurality of conflicting perspectives uncovered here resonates with wickedness literature around socio-ecological issues.

Nonetheless, this research does point to some potential bridges. In an issue as contentious as Arctic offshore, identifying bridges is of significance, offering insights into potential avenues for building common ground that can facilitate the ‘satisficing’ outcomes required to tackle sustainability challenges (Balint et al., 2011). This motivation to seek common ground for this purpose is shared with collaborative networks such as Arctic Dialogue, that bring together various stakeholders involved in Arctic offshore ‘[to] provide an environment for result oriented conversation where stakeholders from different Arctic countries with different perspectives and issues are engaged’ (Makki, 2012, p137). Potential avenues amongst the stakeholder group included the shared perception of the high risk involved in oil spills, the ambiguity around the term traditional livelihoods and the importance of not losing sight of the ‘human’ aspects of the issue. They offer starting points in which a constructive dialogue around this contentious issue might be built upon.

This research is significant for a number of reasons. For one, while the Arctic offshore issue has received much attention within academic literature, there are relatively few examples where stakeholder perspectives have been explicitly examined in the fashion undertaken in this thesis. In particular, there exists a sparsity of research committed to seeking out potential areas of common ground in this contentious issue. This research contributes important work towards filling this gap. Secondly, that frames found in the specific context of Arctic offshore resemble findings from other socio-ecological issues contributes towards an interesting research avenue: that despite considerably different contexts in terms of geography and natural resource, there might exist common, universal themes found in stakeholder framings around socio-ecological issues.

### *5.3.3. Outsider-Insider and Homogenous-Heterogeneous scale tensions*

Four scale challenges were identified in the scale frame analysis of primary and secondary sources representing a snapshot of the discussions around Arctic offshore during 2013-14. These scale challenges highlight two underlying tensions within the

Arctic offshore discourse: between stakeholders outside and inside the Arctic region, and between the Arctic as a homogenous and heterogeneous space. The 'Global Arctic' scale challenge relates to the framing of the Arctic offshore within the context of a global commons space, with a risk of lower levels being relegated to lesser relevance or omitted entirely. From this, governance questions around legitimacy, ownership, responsibility and consequences are raised. The 'Arctic Region' scale challenges highlights the tension behind the varying frames of the geopolitical and environmental space in which offshore activity takes place, between a clearly-demarcated geopolitical space based on shared environmental characteristics with a space considerably diverse in its physical and human geography. The governance questions raised from this scale challenge include finding a balance between capturing commonalities across the Arctic while accounting for its diversity. The 'Arctic Peoples' scale challenge relates to the framing of Arctic offshore in terms of the opportunities and challenges facing the region's indigenous peoples. The scale challenge here revolves around negotiating the malleability of the term 'indigenous': its dual meaning of association with both jurisdictional locality near sites of offshore extraction and with broader themes of regional identity and culture. The 'Arctic Rush' scale challenge involves the varying timeframes projected onto a rapidly changing Arctic space. Temporal tensions exist between an urgency to act now (either to generate economic development for nations and communities or to take action to prevent environmental degradation in a rapidly warming region) with longer term concerns (the extensive timeframes involved in oil exploration and production, and uncertainties around oil reserves and its future market value).

Elements of the themes outlined in these scale challenges are found throughout the academic literature on Arctic offshore (Nilsson, 2012; McDowell and Ford, 2014; Veland and Lynch, 2017). Ideas around challenges related to globalisation, Arctic indigeneity, and regional definitions in and of themselves are not new (Keskitalo, 2004; Shadian, 2006; Heininen, 2013). Where the original contribution of these findings lies is in their detailing of tensions between differing scale-frames apparent within Arctic offshore discourse and how they contribute to misunderstandings, incoherencies and conflation. These findings are of significance. With the discursive environment surrounding the contemporary Arctic both complex and highly-contested, there is difficulty in envisioning how collaborative policy efforts might

negotiate sustainability challenges associated with Arctic offshore. Through its application of theoretical work around the importance of scale-framing in complex socio-ecological issues (Meadowcroft, 2002; Norton, 2005; Olsson et al., 2007), this research has flagged key areas of misunderstanding, incoherencies and conflation in the Arctic offshore context, represented here as scale-challenges. Pinpointing these scale challenges contributes knowledge that can facilitate the development of policy and governance arrangements that can tackle the issue's multi-scalar complexity.

#### **5.4. Conceptual contributions: Place, region and scale in framing of Arctic natural resource development**

Underpinning the core empirical findings of this research is the role of place, region and scale in framings around Arctic natural resource development and the extent in which differences in how Arctic space is imagined and at what scale emphasis is placed contributes towards the issue's contentiousness. Termeer et al. (2016) acknowledge how many frame controversies around wicked socio-ecological problems are essentially conflicts of scale. The case of Arctic natural resource development is no exception. Nevertheless, what this research points to is how the concepts of place, region and scale in frame plurality around Arctic natural resource development are highly relevant. In part due to its geographical, biophysical, cultural and political context, it presents unique challenges for sustainability governance. Two cross-cutting conceptual themes emerged throughout this research: how framings of Arctic natural resource development can relegate the importance of the local and the difficulties of negotiating Arctic exceptionalism.

##### *5.4.1. Simplistic framings of place: relegating the 'local'*

In framings of a frontier space and globalised Arctic, we witness how their spatial and scalar attributes raise questions for sustainability governance. In the 'Resource Frontier' frame, as evidenced in media coverage outlined in Chapter 2, there is an emphasis on a certain geographical characteristic in which Arctic natural resource development takes place, stemming from notions of the Arctic as a wilderness and remote hinterland. In essence, this framing characterises the Arctic space by placing

emphasis on ‘what is not there’: depicting an empty space to be either explored or exploited. As Sluyter (1999) describes, resource frontiers are built on the myth of emptiness, a trope that defined colonialist foundation myths of Western development and emphasise territories as devoid of people (Hufford, 2016). While the resource frontier imaginary described in Chapter 2 may lack the severity of the Arctic’s colonial past centred on unclaimed territory, elements of this myth of emptiness are evident in descriptions of frozen wastelands and barren tundra. Ultimately, the effect of this frontier imaginary serves to relegate, even omit, local inhabitants from the natural resource development story. In this context, it is understandable why some might see disconcerting echoes in tying the contemporary Arctic into a resource frontier narrative (McCannon, 2013). There are risks in a resource frontier framing becoming established within policy narratives. As McCarthy and Cramb (2009) explain, ‘[the] frontier becomes somewhat like a *tabula rasa*, a blank page on which, with the implementation of the right policies, developmental agendas might be written’ (p113). This research did not seek to establish the extent of framings within policy narratives, but, as Chapter 2 showed, we witness frontier imaginaries’ presence in international news media coverage. Governance bodies within the region should remain alert to the potential of a growing number of stakeholders engaging with the contemporary Arctic space being influenced by the frame of the frontier imaginary.

Similarly, we witness the same risks in the contextualisation of Arctic natural resource development at a globalised scale. Most prominently in the ‘Global Commons’ framing evident in environmental NGO campaigns around Arctic offshore outlined in Chapter 4, where the Arctic Ocean is demarcated as a space beyond sovereign jurisdiction, signifying global access and responsibility. Framed as an important ecological asset of the planet, the Arctic becomes entwined in a global ecological narrative, particularly by its tightly-woven relationship with climate change (Van Alstine and Davies, 2017). Like the resource frontier framing, there is a risk in this framing relegating the significance of local inhabitants from the natural resource development issue. This does not necessarily entail that local inhabitants’ voices go unheard, but can get diluted and lost in a wider global narrative. As Bravo (2009) notes, ‘the dominant climate change narratives which emphasise the power of global climate systems to threaten northern communities, do so largely at the cost of masking the voices of northern citizens themselves’ (p258). As is seen throughout this research,

the association with climate change, arguably the most pre-eminent of global narratives (Miller, 2004), makes Arctic natural resource development, particularly Arctic offshore, susceptible to be framed as a ‘global concern’ at the expense of more local ones.

Both frontier and global framings of the Arctic space may demote the significance of Arctic inhabitants, but do so by fundamentally different means: crudely, the former is built on an unclaimed space, the other on a space claimed by all. These frames represent the extreme ends of the unclaimed – claimed spectrum. In between both these ends lies a complex reality in which Arctic natural resource development finds itself situated, where accountability, responsibility, consequences, ownership and sovereignty exist in myriad forms across the region’s human settlements, terrain, sovereign waters, high seas and polar ice. An important task then for the governance of sustainability around Arctic natural resource development is to counter simplistic frames around frontier and global spaces to ensure this complex reality is not blurred over.

#### *5.4.2. To what extent is natural resource development in the Arctic region an exceptional case?*

A prevalent theme throughout this thesis relates to the exceptionalism of the Arctic natural resource development case. The idea of the Arctic treated as an exceptional space is not new (Gerhardt et al., 2010). Traditionally, this Arctic exceptionalism is associated with romantic notions of an exotic and harsh polar environment, untouched wilderness and indigenous lifestyles intertwined with the landscape (Young, 1992). More recently, Arctic exceptionalism has also taken the form of ‘a unique region detached from global political dynamics’ and ‘an apolitical space of regional governance, functional co-operation, and peaceful co-existence’ (Käpylä and Mikkola, 2015, p5). However, what are the effects of a perceived exceptionalism?

In the Arctic’s unique geography and greater sensitivity to environmental impact than anywhere else in the world, we witness calls for the region to require ‘special attention’ (Verhaag, 2002, p559). This is understandable. Nevertheless, it does raise questions how this requirement for special attention has implications for the concerns and desires of Arctic inhabitants. For example, in the case of Aasiaat, Greenland, how differently

should the pursuit of offshore oil development be viewed from elsewhere in the world? In interviews with Aasiaat residents undertaken in the fieldwork for Chapter 3, there were numerous occasions where participants wondered why offshore oil development should be viewed as any different to offshore oil developments taking place elsewhere and the sense that their circumstance was not particularly unique nor of global significance. Should their location in the Arctic's unique geography and at the frontline of climate change influence decisions to pursue a resource development path as so many others have done? This is not to endorse any particular development path, but to query the extent different rules apply in the Arctic context. As Section 5.3 describes, the stakeholder frames emerging from the Q-methodology interviews share many similarities with other natural resource issues. There is, however, within much of the literature discussing Arctic natural resource development a prevailing sense that there is somehow *more* at stake in the Arctic (Verhaag, 2002; Veland and Lynch, 2017).

Reflecting on Arctic exceptionalism requires examining definitions of the Arctic, with this research evolving to take a critical lens. Initially, the Arctic broadly represented the northern polar regions, the meaning of the term 'Arctic' not placed under particular scrutiny. However, as the research project developed, it became increasingly clear that what is meant by the 'Arctic' is far more complex and worthier of closer inspection than simply used as shorthand to describe a geographical space. Dissecting Arctic definitions is more than just a semantic curiosity. As has been shown in this thesis, there are implications in the deployment of the Arctic label to describe the region's physical and human geography. The Arctic label can provide a simple narrative to galvanise support for environmental campaigns and act as a common tie for the region's indigenous peoples to amplify their presence in the policy sphere. There is, however, the risk that the nuance of regional diversity can get lost in these broad definitions (Young, 1992; Martello, 2004; Gerhardt et al., 2010). This frame analysis found an 'Arctic' of myriad applications, its meaning malleable to manipulation, at once specific yet simultaneously ambiguous.

This research presents an original conceptual contribution in its critical examination of the Arctic-scale to highlight how differing framings of the Arctic space influence sustainability challenges associated with natural resource development such as offshore oil development. The task for Arctic governance systems is finding a careful

balancing act, one capturing the commonalities that tie the region together, whilst reflecting the diversity of peoples and environments that exist within the Arctic space.

#### *5.4.3. A different approach to space: relational and assemblage geographies*

What this section has highlighted is a need for alternative conceptual approaches to space that capture the interrelational complexity underpinning Arctic natural resource development. Massey's (2005) philosophical and theoretical work on the conceptualisation of space is particularly pertinent; it calls for a reimagining of our understanding of space based on three central propositions: that space is a product of interrelations; that it is a sphere of coexisting heterogeneity; and that it is always under construction (p9). These propositions resonate with the findings of this research and can offer conceptual guidance on how to approach the challenges of simplistic framings and the heterogeneity-homogeneity of the Arctic space.

Central to Massey's (2005) conceptualisation of space is relational geography. This concept conceives space as the product of interrelations, a 'co-productive spatiality' (Woodard and Jones III 2005, p512) constituted by human-space interactions from 'the immensity of the global to the intimately tiny' (Massey, 2005, p9). In its approach to social-spatial interactions, relational geography resonates with the critical realism ontological standpoint taken in this research (discussed in Section 1.5.1) (Woodard and Jones III, 2005). Embracing a relational-geographical perspective offers an approach that can help counter simplistic frames underpinning resource frontier and global spaces. Barney (2009) describes how relational understandings of frontier spaces unpack 'emergent scaled power geometries' at play within these spaces (p148). Importantly, this allows 'locality, communities and rural ecological landscapes [to] emerge with a significant degree of agency, articulated and constructed in relation to an assemblage of other actors and processes' (ibid., p148). Understanding Arctic natural resource development through a relational perspective can shift the focus away from geographical space and more towards the power dynamics behind it. Sites of extraction become less about their location within a frontier space and more about their position within a multi-scalar assemblage of actors, institutions, processes, flows and objects. As such, emphasising how complex interrelations construct the Arctic

space acts to counter against its ‘hollowing out’ that underlie frontier and global framings.

As part of this relational-geographical approach, assemblage theory (Deleuze and Guattari, 2004; Robbins and Marks, 2009) offers a useful conceptual language that can help decipher the internal tensions and heterogeneous mixture of constituent parts that make up projections of an Arctic space in which natural resource development takes place. Much like wickedness, assemblages engage with the ‘messiness and complexity of phenomena’ (Anderson et al., 2012, p175). Assemblages understand phenomena as the result of ‘wholes characterised by relations of exteriority’ (DeLanda, 2006, p10 cited in Dittmer, 2014, p387), with each component part of an assemblage capable of interacting and being expressed differently within multiple assemblages (Dittmer, 2014). Through this conceptual lens, we can observe the portrayal of Arctic exceptionalism as akin to the construction of ‘Arctic assemblages’: meso-level concepts (Marston et al., 2005) that sit across, within and beside other multi-scalar assemblages involved in Arctic natural resource development, such as indigenous networks, ecosystems, global capital processes driving resource extraction and geopolitical structures of sovereignty and nation-states. Not clearly-defined or bounded, these Arctic assemblages are constantly in-flux, embodying ‘the open-ended, unfinished nature of social formations’ (Anderson et al., 2012, p175). The scalar fluidity of thinking in assemblages provides a useful analytical standpoint to examine and unpack the Arctic meso-level and question the driving forces behind the construction of Arctic exceptionalism. Ultimately, how and why do different components of an Arctic assemblage become expressed to represent a certain ‘Arcticness’? (Kelman, 2017). Assemblage thinking can build upon the groundwork offered by this research in trying to answer these questions.

## **5.5. Implications for policy and governance**

As highlighted throughout this thesis, a fundamental question for policy and governance of Arctic natural resource development is how best to approach the challenges of scale, described by Wilbanks and Kates (1999) as ‘one of the great overarching intellectual challenges of our age’ facing environmental governance and natural resource issues (cited in Haarstad, 2014, p89). Nevertheless, the findings from

this thesis point to several recommendations that can assist in negotiating the frame plurality surrounding Arctic natural resource development and its scalar components. These recommendations are especially relevant to policymakers involved in the growing contemporary Arctic policy sphere.

*Countering the resource frontier narrative.* While the geography of the Arctic might make it susceptible to resource frontier imaginaries, efforts should be made to counter this narrative. Not only does such a narrative fuel unrealistic hype and expectation, especially to those unfamiliar to the region, but in portraying a frontier space there are worrying echoes of the Arctic's colonial past and the risk of relegating the significance of local inhabitants. Countering the resource frontier narrative is not to suggest downplaying the realities of the Arctic as remote, sparsely-populated, rapidly-changing and relatively new to the modern extractive industries seeking to become established in the region. It is instead to suggest a greater emphasis towards the region's human geography and inhabitants living in proximity to these developments. Such a shift would dilute the impact of a resource frontier narrative and in doing so contribute towards enhancing the presence of Arctic inhabitants within the debate.

*Enhance cross-scale linkages through bridging organisations.* The multi-scalar characteristics of Arctic natural resource development present considerable policy and governance challenges. Amalgamating local knowledge, concerns and consequences with levels up to the global (and vice versa) is notoriously difficult (Ostrom, 2010). Bridging organisations offer one potential avenue to facilitate development of scale-sensitive policy and governance. These organisations provide an intermediary across scales/levels and between different arenas (Cash et al., 2006), connecting local communities with other organisational levels (Olsson et al., 2007). Positioned in an intermediary role, bridging organisations can facilitate vertical and horizontal collaboration, promote learning and co-production of knowledge across scales and offer a forum for conflict resolution (ibid.). In terms of practical implementation, the Arctic Council is well-placed to cultivate bridging organisations. Expanding on the work of its six Working Groups, it could create a Working Group specifically committed to engaging in bridging work across levels, offering an arena for deliberative dialogue on scale challenges around natural resource development.

*Greater clarity over the Arctic under discussion.* As discussed in Chapter 4, there exists a need for the use of a more refined terminology in describing Arctic natural resource development, with greater clarity over demarcating what is under discussion. The use of the term Arctic can lead to the conflation of too many aspects under one umbrella. Spatially, terms like Upper/Lower Arctic and European/North American/Russian Arctic should feature more prominently in policy, campaigns and media. Doing so would help sharpen focus, reduce potential for misunderstandings and ensure the socio-ecological differences within the Arctic region are not lost. Similarly, the ambiguity of terms like Arctic Peoples and Peoples of the North not only leads to generalisation of a diverse range of groups, but contributes to conflation of ethnicity and culture with locality. A reduction in the use of such terms, replaced by more specific definitions of people impacted at the frontline is recommended.

## **5.6. Methodological contributions**

Each empirical chapter shared similar aims to identify frames, albeit in different ways. Qualitative Content Analysis was the approach taken for two chapters: Chapter 2 comprised of an inductive analysis of solely secondary data, Chapter 4 an abductive analysis of a mixture of primary and secondary data. In its use of Q-methodology, Chapter 3 used a different approach, a qualitative methodology with quasi-quantitative characteristics in its analysis of primary data. Several aspects of the methodological approaches undertaken in this thesis offer novelty and original contributions. One example is in Chapter 3's use of other statistical techniques to identify consensus statements within the dataset. Conventionally, Q-methodology studies only use factor analysis and principle component analysis as techniques to analyse data. However, Chapter 3 shows how other approaches to the dataset, such as examining how participants initially categorised and ranked statements, can provide useful insight for data interpretation. Like Balint et al. (2011), this novel approach shows how there are other means to examine Q-sort data and reinforces the utility and flexibility of the Q-methodological approach (Watts and Stenner, 2012). The scalar approach undertaken in Chapter 4 offers another original methodological contribution. This approach took the conceptual cross-and-multi-scale-dynamics categorisations developed by Cash et al. (2006) and used them as a guiding framework to code and interpret the dataset.

Building on Norton's (2005) ideas of 'Hierarchy Theory' as a means of offering a clarifying tool in which to dissect wicked socio-ecological issues, this scalar approach provides an original and novel means in which to analyse the scalar aspects within a textual dataset.

This thesis brings together each methodological approach in what it describes as a mixed-method frame analysis. Each empirical chapter can stand alone as an individual piece of research. However, there is synergy between their methodological approaches, with data from one chapter feeding into another. For example, insights from Chapter 2's thematic analysis contributed towards Q-concourse development in Chapter 3 and data for Chapter 4. Similarly, follow-up interviews to Q-sorts provided data for Chapter 4's scale-frame analysis. While interconnections between each research component exist, there is, however, potential to enhance this synergy between each research component, tightening the connections between them so they feed more directly into one another. In doing so, there is potential to develop a structure for a framework in which to examine frame plurality in socio-ecological issues.

Each research component examines a different aspect of frame plurality. The first component, thematic analysis, examines frames more broadly, allowing the researcher to explore frames within a dataset in an inductive manner. Here, the thematic analysis component focused upon a dataset of media articles, but this approach is not restricted to examining media frames and can be applied to any relevant dataset (e.g. a collection of policy documents). The findings from the thematic analysis can feed into the development of the second research component, Q-methodology, helping develop the Q-concourse and identify relevant stakeholders. Through Q-methodology, the second research component specifically examines stakeholder frames and the conflicts and bridges between them. Alongside the quantitative data produced through Q-sort interviews, follow-up interviews provide a rich body of qualitative data. This qualitative data in tandem with the dataset from the first component can feed into the third component, the scale-frame analysis, which examines the scalar aspects underpinning framings. How each research component is connected is visualised in Figure 5.1.

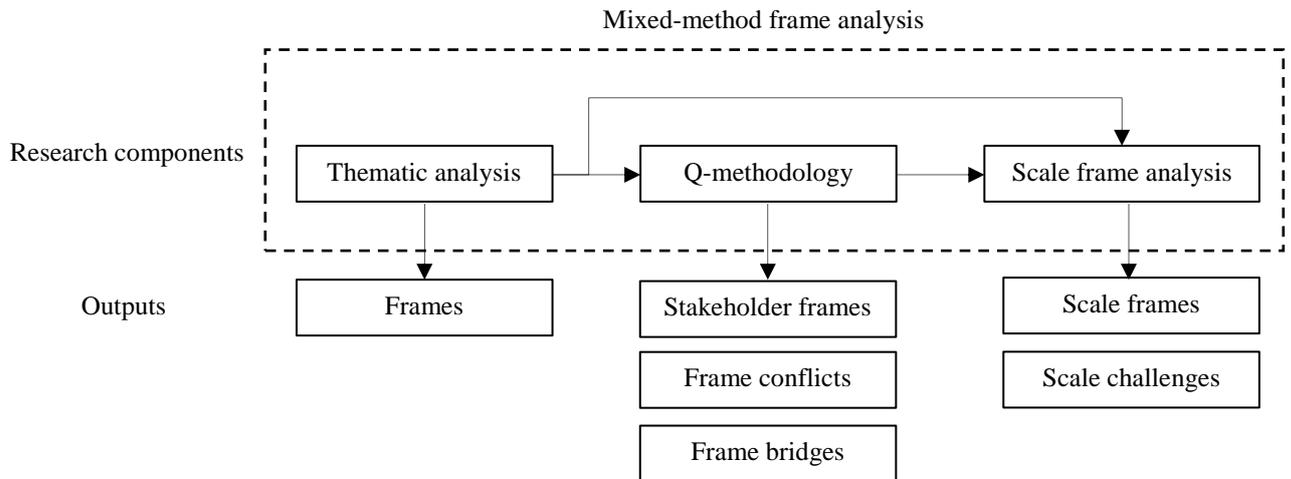


Figure 5.1. The relationship between research components and their outputs

In combination, this toolkit provides a novel structure to approach analysing frames, producing outputs to help unpack frame plurality around a given socio-ecological issue. The development of this methodological framework evolved as the project progressed and is one of this research’s central methodological contributions.

### 5.7. Limitations

Whilst this thesis produced novel and interesting insights on contemporary framings around Arctic natural resource development, there are, however, several limitations with this study. This section addresses some of these limitations.

A core limitation of this study is found in the interpretative elements of the research approach, such as qualitative content analysis in Chapters 2 and 4 and interpretation of factors in Chapter 3. Applying interpretative approaches of this kind limits the opportunity for exact replicability of findings. This has much to do with the nature of qualitative research itself, which focuses its attention on the phenomenological interpretation of non-numerical information; an approach that inherently involves aspects of subjectivity (Leung, 2015). This does not necessarily constitute a methodological weakness *per se*. As discussed in Chapter 4’s methodology section, we can have confidence in qualitative research of this kind through transparency in

methodological procedures and corpus construction, and in its thick description of data (Gaskell and Bauer, 2000). However, it does present a limitation by reducing the possibilities for testing the robustness of the research's findings.

To eradicate subjectivity in qualitative research is not possible (nor necessarily desirable). However, its inherent limitations can be reduced through the application of procedural clarity in methodology and interpretation (Leung, 2015). While this research applied this procedural clarity in its methodological components, there is arguably room for improvement in structuring its interpretative components so that they are more replicable. Nevertheless, efforts were made to enhance the replicability of this research: for example, cross-referencing between two researchers of the media articles sample used in Chapter 2 to reduce researcher bias, and the use of a guiding framework to structure data interpretation in Chapter 4. Furthermore, aspects of the Q-sort interview procedure are well-suited for replication.

As touched upon within the empirical chapters, there are limitations to each dataset in how representative they are. In Chapter 2, international news media on Greenlandic natural resource development was represented by a *LexisNexis* database queried for certain terms and limited to English language. Similarly, for Chapter 4, the collection of documents, transcripts, recordings and other materials used were said to represent a 'snapshot' of the discussion around the subject of Arctic offshore. Clearly, both datasets are incapable of offering a fully comprehensive scope of either international news media or the discussion around Arctic offshore. This is understandable given practical constraints of time and resources. Nevertheless, their representativeness is open to a degree of criticism around the generalisability of the findings. While it is argued these datasets are sufficiently comprehensive enough to infer findings, it is important to acknowledge their limitations.

This thesis might also benefit from greater synergy between each research component. During the process of this research, the initial broad focus of natural resource development narrowed more specifically towards offshore hydrocarbon development. Similarly, a focus on Greenland shifted towards an Arctic space. Consequently, the connections between each research component were not as coherent as they could have been. There is potential to improve these connections. For example, the data and findings from the thematic analysis could feed more directly into Q-concourse

development. While this does not detract from this research's findings, a tighter synergy between research components would help improve this research as a coherent whole.

The rapidly changing context surrounding Arctic natural resources development acts as another limitation. By researching a contemporary issue where the situation is continually developing, there is a risk of findings becoming outdated. Examples include the political situation in Greenland that has witnessed several changes in a relatively short space of time during the period of this research. Whilst the government's approach to developing its oil and mining industries has not altered considerably, these developments highlight how quickly the situation can change. Then there is the dramatic fall of global oil prices in recent years, which has had a particular impact on Arctic offshore petroleum activity given the high costs of production and its commercial viability. When coupled with the lack of successful discoveries of substantial hydrocarbon reserves, it is clear the future of Arctic offshore remains deeply uncertain. This does not negate the insights of this thesis, which is interested in how complex socio-ecological issues like Arctic natural resource development are framed and the challenges associated with these frames. While researching an ongoing, contemporary issue has benefits in terms of its novel contribution, there are questions over the research's relevance, if, for example, Arctic offshore petroleum development fails to materialise.

## **5.8. Opportunities for Further Research**

There exists a rich potential for further research to build upon the findings of this thesis. The continually changing context of Arctic natural resource development offers scope for longitudinal studies. An interesting research avenue would be to observe how frames around Arctic natural resources might differ over time as impacts of climate change become increasingly manifest. For example, Q-sort interviews could be undertaken with the same participant group at different times to observe and analyse changes and the reasons behind them. Indeed, there is potential to not only look forward, but also cast attention backwards to examine how the Arctic natural resource story has developed in the decades preceding the recent influx of interest. Applying

the methods of Chapters 2 and 4 for past time-periods presents an opportunity for comparative work that would reveal useful insights about how frames have changed and the factors that have contributed to any similarities or differences.

The findings of Chapter 3's Q-method study provide several avenues for further research. Its findings suggested a difference between how Aasiaat community members and Arctic conference delegates aligned onto different frames. These differences could be explored in greater depth by using a different methodological approach that is capable of making inferences across population (e.g. R-method surveys). Such research could then map frames aligned with different stakeholder groups across different levels. This could provide a foundation for an analysis of the power dynamics behind these frames and help answer questions around how and why these framings arise. Another way to expand on Chapter 3's findings could involve adapting the Q-method process to explore deeper the scalar aspects of framing: for example, developing a Q-concourse comprised of statements specifically focused on scale for participants to engage with.

This thesis positions itself as an exploration of plurality associated with wickedness and complex socio-ecological issues. As discussed in Chapter 1, this represents only one aspect of wickedness. Research exploring other aspects of wickedness around Arctic natural resource development, such as uncertainty and complexity, would greatly complement this thesis. This might take the form of modelling and mapping complexity around an Arctic natural resource issue or research examining how decision-making can account for deep uncertainty (Kwakkel et al., 2016).

Conceptualisations of the Arctic and how they might impact natural resource governance is another pertinent avenue for investigation. Research could expand upon Chapter 4's findings to further explore the discursive influence of the term 'Arctic' to investigate the power dynamics and politics underpinning its use and the way it is defined. Another research direction might compare the Arctic natural resource context with other regions. For example, research could build upon preliminary comparative work such as Van Alstine and Davies' (2017) comparison between Greenlandic and Ugandan oil exploration. Here, characteristics of the Arctic and East African resource frontier are compared, examining each context's materiality, global interest, governance arrangements and community perspectives, to better understand the

similarities and differences between them. In-depth research that builds upon this preliminary exploration would help unpack some of the region-specific challenges associated with the Arctic and shine further light on what differentiates the contemporary Arctic from other regions in the world.

The questions proposed in Section 5.4.3 over how and why different components of the Arctic assemblage become expressed to represent a certain ‘Arcticness’ might provide a useful starting point for further research. There is scope to explore the relationship between the Arctic assemblage with other assemblages involved in natural resource development. Of particular interest would be analysing the interplay between the Arctic assemblage and the oil assemblage that forms modern hydrocarbon capitalism (an assemblage whose variety of actors, organisations, infrastructure, governance structures and processes are staggeringly complex) (Appel et al., 2015). Appel et al. (2015) argue how ‘localised political economies’ present unique manifestations of the wider oil assemblage (p18). Following this, there is fertile ground for future research that explores the ways in which components of an Arctic assemblage (e.g. its physical geography, institutional structures, indigenous networks) overlap and interact with the wider oil assemblage to create a uniquely Arctic context for oil development.

## **5.9. Conclusion**

The overarching aim of this thesis was to examine frames around complex socio-ecological issues, with Arctic natural resource development providing an exemplar case. This research was motivated by the belief that frame plurality lies at the heart of the sustainability challenges associated with Arctic natural resource development. In agreement with Cairns (2011), research of this kind is a vital step in the search for solutions to meet these challenges. By undertaking various frame-analyses to examine and unpack the frames around Arctic natural resource issues, in particular Arctic offshore petroleum, this thesis has made empirical, conceptual and methodological contributions towards the advancement of knowledge in both how Arctic natural resource development is framed and how framing of complex socio-ecological issues can be studied.

Exploring how international news media frames Greenlandic natural resource development provided insight into the ways Arctic natural resources are framed from an international perspective. Empirically detailing frames around the issue offered a foundation for conceptual insight on tropes that guide international news media coverage and what some of the implications of these might be. Given the expansion of stakeholder involvement from outside the Arctic region, these insights are increasingly of importance.

Examining frames within a diverse group of stakeholders through the use of Q-methodology provided empirical detail on some of the frames around the Arctic offshore issue. Furthermore, by applying statistical analysis, it allowed the extent of conflict and consensus to be explored. With relatively little research exploring stakeholder perspectives around Arctic offshore, insights on potential bridges and areas of acute intractability are of particular significance in an Arctic context, where norms around cooperation feature prominently.

Analysing scale-frames in Arctic offshore provided insight on conflation and incoherence within the contemporary discourse. This pointed towards a need for clearer terminology on certain aspects of the issue. In addition, detailing the challenges of scale-frames around Arctic offshore allowed for the under-examined relationship of scale and the Arctic to be explored and highlighted how a scalar approach might offer some means to clarify the plurality associated with complex socio-ecological issues.

Two crosscutting themes emerged from this research: how frames around Arctic natural resource development relegate the importance of the local and the difficulties underpinning Arctic exceptionalism. They highlight a need for alternative conceptual approaches to space that capture the interrelational complexity behind Arctic natural resource development. Relational geographies and assemblage-thinking are presented as useful conceptual lens in which to engage with this complexity.

This research should interest those involved in the growing Arctic policy sphere. The media, stakeholder and scale frames outlined, the bridges and tensions between them and the methods used in this thesis can help inform collaboration and deliberative policy-making efforts. Findings from this thesis suggest the use of clearer

terminology, when discussing Arctic issues; an awareness of dominant tropes prevalent within the Arctic natural resource discourse; and an acknowledgment of the stark global-local tensions found in the Arctic. These insights have particular relevance for policymaking in the contemporary Arctic.

The title of this thesis talks of making sense of complex socio-ecological issues. With its mixed-method frame-analysis, this thesis has focused on one aspect of wickedness and contributed knowledge that can help make sense of the plurality surrounding Arctic natural resource development. The wickedness concept emphasises that fully comprehending every facet of issues such as Arctic natural resource development is unachievable. While this may be so and should be acknowledged, it should not entail that research addressing complexity, uncertainty and plurality is somehow futile. The insights from this thesis contribute, in their own small way, towards tackling the ‘untameable beast’ of wickedness (Duckett et al., 2016, p11). As the previous section highlighted, there is rich potential to build upon this research. Indeed, as the context surrounding Arctic natural resource development continues to face significant change, research of this kind remains imperative, if the associated challenges are to be understood and effectively tackled.

## 5.10. References

- Anderson, B., Kearnes, M. McFarlane, C. and Swanton, D. 2012. On Assemblages and Geography, *Dialogues in Human Geography* **2**: 171–189.
- Appel, H., Mason, A. and Watts, M. 2015. Oil Talk. In: Appel, H., Mason, A. and Watts, M. (eds.). *Subterranean Estates: Life Worlds of Oil and Gas*. London, UK: Cornell University Press, 1-26.
- Armatas, C., Venn, T. and Watson, A. 2016. Understanding Social–ecological Vulnerability with Q-Methodology: A Case Study of Water-Based Ecosystem Services in Wyoming, USA. *Sustainability Science*.
- Balint, P.J., Stewart, R.E., and Desai, A. 2011. *Wicked Environmental Problems: Managing Uncertainty and Conflict*. Washington, DC, Island Press.
- Barney, K. 2009. Laos and the Making of a 'relational' resource frontier. *The Geographical Journal* **175** (2): 146–159.
- Borgerson, S.G. 2008. Arctic Meltdown: The Economic and Security Implications of Global Warming. *Foreign Affairs*, March/April: 63–77.

- Bravo, M. 2009. Voices from the Sea Ice: The Reception of Climate Impact Narratives. *Journal of Historical Geography* **35** (2): 256–278.
- Brigham, L. 2014. The Changing Arctic: New Realities and Players at the Top of the World. *Asia Policy* **18**: 5-13.
- Bulkeley, H. and Mol, A.P. 2003. Participation and environmental governance: consensus, ambivalence and debate. *Environmental Values* **12**: 143–154.
- Cairns, R. 2011. *A critical analysis of the discourses of conservation and science on the Galápagos Islands*. PhD thesis. University of Leeds. Available from: <http://etheses.whiterose.ac.uk/2301/> [Accessed 12 May 2015].
- Cairns, R. 2012. Understanding Science in Conservation: A Q Method Approach on the Galápagos Islands. *Conservation and Society* **10** (3): 217-231.
- Cash, D.W., Adger, W.N., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L., and Young, O. 2006. Scale and cross-scale dynamics: Governance and information in a multilevel world. *Ecology and Society*, **11** (2): 8.
- Cocklin, C. 2009. Environmental Policy. In: Kitchin, R., Thrift, N. (eds.). *International Encyclopaedia of Human Geography*. Oxford, UK: Elsevier, 540-545.
- Cotton, M. 2015. Stakeholder perspectives on shale gas fracking: a Q-method study of environmental discourses. *Environment and Planning A* **47** (9): 1944-1962.
- Couldry, N. 2005. Transvaluing media studies. In: Curran, J. and Morley, D. (eds.). *Media and cultural theory*. Abingdon: Routledge, 177-194.
- Cumming, G.S., Cumming, D.H. and Redman, C.L. 2006. Scale Mismatches in Social-ecological Systems: Causes, Consequences and Solutions. *Ecology and Society*, **11** (1): 14.
- Curry, R., Barry, J. and McClenaghan, A. 2013. Northern Visions? Applying Q methodology to understand stakeholder views on the environmental and resource dimensions of sustainability. *Journal of Environmental Planning and Management* **56**: 624–649.
- Dayton, B. 2000. Policy frames, policy making and the global climate change discourse, In: Addams, H. and Proops, J. (eds.). *Social discourse and environmental policy: an application of Q methodology*, Cheltenham, UK: Edward Elgar, 71–99.
- DeLanda, M. 2006. *A New Philosophy of Society: Assemblage Theory and Social Complexity*. London, UK: Continuum.
- Deleuze, G., and Guattari, F. 2004. *A Thousand Plateaus*. London: Continuum.
- Dittmer, J. 2014. Geopolitical Assemblages and Complexity. *Progress in Human Geography* **38** (3): 385–401.

- Dittmer, J., Moisiso, S., Ingram, A., and Dodds, K., 2011. Have you heard the one about the disappearing ice? Recasting Arctic geopolitics. *Political Geography*, **30** (4): 202–214.
- Doulton, H. and Brown, K. 2009. Ten years to prevent catastrophe?: Discourses of climate change and international development in the UK press. *Global Environment Change* **19**: 191–202.
- Dryzek, J.S. 2005. *The Politics of the Earth: Environmental Discourses*. Oxford, UK: Oxford University Press.
- Duckett, D., Feliciano, D., Martin-Ortega, J. and Munoz-Rojas, J. 2016. Tackling Wicked Environmental Problems: The Discourse and Its Influence on Praxis in Scotland. *Landscape and Urban Planning* **154**: 44-56.
- Entman, R.M. 1993. Framing: Toward clarification of a fractured paradigm. *Journal of Communications* **43**: 51–58.
- Foley, J.A. 2005. Tipping Points in the Tundra. *Science* **310** (5748): 627–628.
- Gerhardt, H., Steinberg P.E., Tasch, J., Fabiano, S.J. and Shields, R. 2010. Contested Sovereignty in a Changing Arctic. *Annals of the Association of American Geographers* **100** (4): 992–1002.
- Gaskell, G. and Bauer, M. 2000. Towards Public Accountability: Beyond Sampling, Reliability and Validity. In: M. Bauer and G. Gaskell (eds.). *Qualitative Researching with Text, Image and Sound*. London: Sage Publications, 336-350
- Giampietro, M. 2003. *Multi-Scale Integrated Analysis of Agroecosystems*. London, UK: CRC Press.
- Giddings, B., Hopwood, B. and O'Brien, G. 2002. Environment, Economy and Society: Fitting Them Together into Sustainable Development. *Sustainable Development* **10** (4):187–196.
- Global Arctic. n.d. *Global Arctic*. Global Arctic (blog). Available at: <https://www.globalarctic.org/> [Accessed 14 September 2017].
- Haarstad, H. 2014. Climate Change, Environmental Governance and the Scale Problem. *Geography Compass* **8** (2): 87–97.
- Hansen, A. 2010. *Environment, media and communication*. New York: Routledge.
- Hansen, A. 2011. Communication, media and environment: Towards reconnecting research on the production, content and social implications of environmental communication. *International Communication Gazette*. **73**: 7–25.
- Happer, C. and Philo, G. 2013. The role of the media in the construction of public belief and social change. *Journal of Social and Political Psychology* **1**: 321–336.

- Heininen, L. 2013. *Arctic Yearbook 2013*. Akureyri: Northern Research Forum.
- Hufford, M. 2016. Deep Commoning: Public Folklore and Environmental Policy on a Resource Frontier. *International Journal of Heritage Studies* **22** (8): 635–649.
- Jensen, L.C. 2007. Petroleum discourse in the European Arctic: the Norwegian case. *Polar Record* **43**: 247–254.
- Kämpf, M. and Haley, S. 2014. Risk management in the Alaska Arctic offshore: wicked problems require new paradigms. *The Polar Journal* **4**: 150–169.
- Käpylä, J and Mikkola, H. 2015. On Arctic Exceptionalism: Critical Reflections in the Light of the Arctic Sunrise Case and the Crisis in Ukraine'. *The Finnish Institute of International Affairs Working Paper* 85.
- Kates, R.W., Parris, T.M. and Leiserowitz, A.A. 2005. What is sustainable development? Goals, indicators, values, and practice. *Environment: Science and Policy for Sustainable Development* **47**: 8–21.
- Kelman, I. 2017. *Arcticness: Power and Voice from the North*. London, UK: UCL Press.
- Kelmelis, J.A. 2011. Arctic Warming Ripples through Eurasia. *Eurasian Geography and Economics* **52** (1): 56–78.
- Keskitalo, E.C.H. 2004. *Negotiating the Arctic: The construction of an international region*. New York, NY: Routledge.
- Koivurova, T. 2010. Limits and possibilities of the Arctic Council in a rapidly changing scene of Arctic governance. *Polar Record* **46**: 146–156.
- Kuckartz, U. 2014. *Qualitative Text Analysis: A Guide to Methods, Practice and Using Software*. Thousand Oaks, CA: Sage.
- Kwakkel, J.H., Walker, W.E. and Haasnoot, M. 2016. Coping with the Wickedness of Public Policy Problems: Approaches for Decision Making under Deep Uncertainty. *Journal of Water Resources Planning and Management* **142** (3).
- Larsen, H.G. 2008. Scaling the Baltic Sea Environment. *Geoforum* **39** (6): 2000–2008.
- Leung, L. 2015. Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care*, **4** (3): 324–327.
- Macdonald, M. 2003. *Exploring media discourse*. Oxford, UK: Oxford University Press.
- Makki, M. 2012. Evaluating Arctic Dialogue: A Case Study of Stakeholder Relations for Sustainable Oil and Gas Development. *Journal of Sustainable Development* **5** (3): 34–45.

- Marston, S.A., Jones, J.P., and Woodward, K. 2005. Human geography without scale. *Transactions of the Institute of British Geographers*, **30** (4): 416–432.
- Martello, M.L. 2004. Global Change Science and the Arctic Citizen. *Science and Public Policy* **31** (2): 107–115.
- Massey, D. 2005. *For Space*. Thousand Oaks, CA: Sage.
- Mattson, D.J., Byrd, K.L., Rutherford, M.B., Brown, S.R. and Clark, T.W. 2006. Finding common ground in large carnivore conservation: mapping contending perspectives. *Environmental Science & Policy* **9** (4): 392-405.
- McCannon, J. 2013. *A History of the Arctic: Nature, Exploration and Exploitation*. London, UK: Reaktion Books.
- McCarthy, J.F. and Cramb, R.A. 2009. Policy Narratives, Landholder Engagement, and Oil Palm Expansion on the Malaysian and Indonesian Frontiers. *The Geographical Journal* **175** (2): 112–123.
- McCombs, M. 2014. *Setting the Agenda: Mass Media and Public Opinion, 2nd Edition*. Cambridge, UK: Polity Press
- McDowell, G. and Ford, J.D. 2014. The socio-ecological dimensions of hydrocarbon development in the Disko Bay region of Greenland: Opportunities, risks, and tradeoffs. *Applied Geography* **46**: 98–110.
- Meadowcroft, J. 2000. Sustainable Development: A New (Ish) Idea for a New Century?. *Political Studies* **48** (2): 370–387.
- Meadowcroft, J. 2002. Politics and scale: some implications for environmental governance. *Landscape and Urban Planning* **61** (2): 169–179.
- Mikkelsen, A. and Langhelle, O. 2008. *Arctic oil and gas: sustainability at risk?* London, UK: Routledge.
- Miller, C.A. 2004. Climate Science and the Making of a Global Political Order. In: Jasanoff, S. (ed.). *States of Knowledge: The Coproduction of Science and Social Order*. London, UK: Routledge, 46–66.
- Moore, A. 2008. Rethinking scale as a geographical category: from analysis to practice. *Progress in Human Geography*, **32** (2): 203–225.
- Nilsson, A.E. 2012. The Arctic Environment–From Low to High Politics. In: L. Heininen (ed.). *Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 180-194.
- Norton, B.G. 2005. *Sustainability: A philosophy of adaptive ecosystem management*. Chicago: University of Chicago Press.
- Nuttall, M. 2013. Zero-Tolerance, Uranium and Greenland’s Mining Future. *The Polar Journal* **3** (2): 368–383.

- Nyman, E. 2012. Understanding the Arctic: Three popular media views on the north. *Political Geography* **31**: 399-401.
- Olausson, U. 2011. “We’re the ones to blame”: Citizens’ representations of climate change and the role of the media. *Environmental Communication* **5**: 281–299.
- Olsson, P., Folke, C., Galaz, V., Hahn, T., and Schultz, L. 2007. Enhancing the fit through adaptive co-management: creating and maintaining bridging functions for matching scales in the Kristianstads Vattenrike Biosphere Reserve Sweden. *Ecology and Society* **12** (1): 28.
- Ostrom, E. 2010. Polycentric Systems for Coping with Collective Action and Global Environmental Change. *Global Environmental Change* **20** (4): 550–557.
- Palmer, A.C. 2009. Under what conditions can oil and gas developments in the Arctic be acceptable, and to whom?. *Polar Record* **45** (233): 113-117.
- Plouffe, J. 2012. Thawing Ice and French Foreign Policy: A Preliminary Assessment. In: L. Heininen (ed.). *Arctic Yearbook 2012*. Akureyri: Northern Research Forum, 51-79.
- Reed, M.S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C.H. and Stringer, L.C. 2009. Who’s in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management* **90**: 1933–1949.
- Robbins, P. and Marks, B. 2009. Assemblage Geographies. In: Smith S.J., Pain, R., Marston S.A. and Jones III, J.P. (eds.) *The Sage Handbook of Social Geographies*. Thousand Oaks, CA: Sage, 176-195.
- Roberts, A., Cassano, J., Döscher, R., Hinzman, L., Holland, M., Mitsudera, H., Sumi, A. and Walsh, J.E. 2010. A Science Plan for Regional Arctic System Modeling. International Arctic Research Center. Available from: <http://www.iarc.uaf.edu/sites/default/files/publications/reports/IARCTP10-0001.pdf> [Accessed 10 May 2014].
- Sala, S., Ciuffo, B. and Nijkamp, P. 2015. A Systemic Framework for Sustainability Assessment. *Ecological Economics* **119**: 314–325.
- Shadian, J. 2006. Remaking Arctic governance: The construction of an Arctic Inuit polity. *Polar Record* **42** (3): 249–259.
- Sluyter, A. 1999. The Making of the Myth in Postcolonial Development: Material-Conceptual Landscape Transformation in Sixteenth-Century Veracruz. *Annals of the Association of American Geographers* **89** (3): 377–401.
- Soroka, S., Farnsworth, S., Lawlor, A. and Young, L. 2013. Mass media and policy-making. In: Araral Jr, E., Fritzen, S. Howlett, M. Ramesh, M and Wu, X. (eds.). *Routledge Handbook of Public Policy*. New York: Routledge, 204-214.

- Stamm, K.R., Clark, F. and Eblacas, P.R. 2000. Mass communication and public understanding of environmental problems: the case of global warming. *Public Understanding of Science* **9**: 219–237.
- Steinberg, P., Brunn, J.M. and Ingrid, A.M. 2014. Covering Kiruna, a natural experiment in Arctic awareness. *Polar Geography* **37** (4): 273-297.
- Termeer, C., Dewulf, A., Karlsson-Vinkhuyzen, S.I., Vink, M. and van Vliet., M. 2016. Coping with the Wicked Problem of Climate Adaptation across Scales: The Five R Governance Capabilities. *Landscape and Urban Planning* **154**: 11–19.
- Trainor, S.F., Chapin III, F.S., Huntington, H.P., Natcher, D.C. and Kofinas, G. 2007. Arctic Climate Impacts: Environmental Injustice in Canada and the United States. *Local Environment* **12** (6): 627–643.
- Van Alstine, J, and Davies, W. 2017. Understanding Arcticness: Comparing Resource Frontier Narratives in the Arctic and East Africa. In. Kelman, I. (ed.). *Arcticness: Power and Voice from the North*. London, UK: UCL Press, 89–101.
- Veland, S. and Lynch, A.H. 2017. Arctic ice edge narratives: scale, discourse and ontological security. *Area* **49** (1): 9-17.
- Verhaag, M A. 2002. It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment. *Georgetown Environmental Law Review* **15**: 555-579.
- Wanta, W., Golan, G. and Cheolhan, L. 2004. Agenda Setting and International News: Media Influence on Public Perceptions of Foreign Nations. *Journalism & Mass Communication Quarterly* **81** (2): 364-377.
- Watts, S. and Stenner, P. 2012. *Doing Q methodological research: theory, method & interpretation*. London, UK: Sage.
- Wilbanks, T.J. and Kates, R.W. 1999. Global Change in Local Places: How Scale Matters. *Climatic Change* **43** (3): 601–628.
- Woodard, K., and Jones III, J.P. 2005. Ontology. In. Gregory, D., Johnston, R., Pratt, G., Watts, M. and Whatmore, S. (eds.). *The Dictionary of Human Geography 5th edition*. Oxford, UK: Wiley-Blackwell, 511–513.
- World Economic Forum. 2014. Five Arctic Myths. Global Agenda Council on the Arctic. Available from: [http://www3.weforum.org/docs/GAC/2014/WEF\\_GAC\\_Arctic\\_FiveArcticMyths\\_Brochure\\_2014.pdf](http://www3.weforum.org/docs/GAC/2014/WEF_GAC_Arctic_FiveArcticMyths_Brochure_2014.pdf) [Accessed 19 August 2017].
- Young, O.R. 1992. *Arctic Politics: Conflict and Cooperation in the Circumpolar North*. Hanover, NH: University Press of New England.

## **Appendix I**

### *A. Cited news media references for Chapter 2*

Agence France Presse (24/08/2010) ‘Cairn discovers gas in offshore Greenland amid protests’.

Architects Journal (28/08/2012) ‘Sustaining Greenland at the Venice Biennale’.

Associated Press (18/07/2006) ‘Greenland opens new round of concessions for oil exploration in fragile Arctic’.

Associated Press (14/01/2008) ‘Greenland opens to oil firms; melting ice unlocks reserves’.

Associated Press (28/09/2009) ‘In Greenland, warming fuels dream of hidden wealth’.

Carleton Place (05/05/2010) ‘Greenland oil rush looms’.

Cyprus Mail (31/01/2014) ‘Greenland’s race for modernity’

Daily Mail (21/08/2010) ‘Miners In New Gold Rush For Rare Earth Metals’.

European Spot Gas Markets (29/11/2010) ‘For the Record’.

Foreign Policy Blogs Network (FPBN) (29/10/2013) ‘Analysis: Implications of Greenland's decision to allow uranium mining’.

Halesowen News (21/11/2009) ‘Predicting a future for the Arctic’

India/Pak (02/08/2012) ‘EU eyes Greenland resources’.

Investor Chronicle (21/10/2009) ‘Explorers chase Greenland spoils’.

Mail & Guardian (10/01/2014) ‘Navigating the Arctic minefield’.

PlattsOilgram News (29/08/2012) ‘Cairn expands in Morocco as profits slump’.

PR Newswire US (20/06/2005) ‘Cabo announces Greenland drilling contract with International Molybdenum Ltd.’

Resource Investing News (RIN) (04/02/2013) ‘Greenland Resource Sector Confirms No Favoritism’.

Scotland on Sunday (12/03/2013) ‘Greenland election becomes vote on foreign investments’.

Targeted News Service (17/01/2013) ‘Spotlight on the Arctic at Brussel's Cine-ONU’.

The Financial Daily (09/11/2012) 'Expectations as China eyes riches'.

The Globe and Mail (02/10/2010) 'The Inuit of Greenland have weather on their side'

The Guardian (04/07/2011a) 'Arctic resource wealth poses dilemma for indigenous communities'.

The Guardian (13/05/2011b) 'US signals it is ready for Arctic oil battle: Environmentalists fear carve-up of resources: WikiLeaks cables raise spectre of new cold war'.

The Guardian (16/03/2013) 'Financial: Greenland voters send warning to oil and mining companies: Government ousted over fears for country's assets: Campaigners alarmed by foreign investors in Arctic'.

The Guardian (01/08/2012) 'Environment: EU scrambles for Greenland's wealth: 'Raw material diplomacy' to exploit icy wilderness Melting offers prize of ore and gems as well as oil'.

The Guardian (06/01/2014) 'A new frontier: UK mining company joins scramble for Greenland's mineral riches: Chinese backing sought for Arctic iron ore project: Environment will not suffer insists firm's boss'.

The Herald (17/01/2008) 'Fears as melting ice brings new interest in Greenland's oil and gas'.

The Scotsman (11/01/2008) 'Greenland the new frontier for Cairn'.

The Telegraph (04/11/2013) 'Greenland - the world's newest frontier; With huge reserves of minerals, oil and gas buried under their icebound nation, Greenland's tiny population may be about to become very rich'.

The Times (7/1/2010) 'Thawing assets; Global warming will ease access to the vast mineral wealth of Greenland, writes Kieran Cooke, but at what cost to local people and the environment?'

Toronto Star (11/11/2012) 'China eyes Greenland's natural riches; But great expectations could lead to greater disappointments, for locals and investors'.

Washington Times (22/06/2009) 'Danish island fuelled for independence; Control of oil reserves could build up economy'.

Yukon News (21/09/2012a) 'Race is on as ice melt reveals Arctic treasures; "We are aware that is because we now have something to offer, not because they've suddenly discovered that Inuit are nice people."'

Yukon News (28/09/2012b) 'Melting Greenland weighs perils against potential; "For me, I wouldn't mind if the whole ice cap disappears'.

## B. Participant Q-sorts for Chapter 3

AAS1

-4	-3	-2	-1	0	+1	+2	+3	+4
22	31	2	20	35	25	24	28	17
39	6	38	10	29	18	13	32	37
23	16	26	27	12	11	15	4	19
	34	5	21	36	30	9	33	
			41	14	1			
			3	40	7			
				8				

AAS2

-4	-3	-2	-1	0	+1	+2	+3	+4
31	16	4	34	14	13	33	39	27
37	1	7	12	11	22	2	20	41
30	10	35	15	25	23	3	5	19
	29	40	32	17	36	26	24	
			9	18	8			
			6	28	38			
				21				

AAS3

-4	-3	-2	-1	0	+1	+2	+3	+4
29	37	1	19	4	11	12	33	17
3	6	30	16	2	21	28	35	15
39	26	10	7	27	25	9	14	41
	5	18	13	38	8	32	40	
			31	20	24			
			36	34	22			
				23				

AAS4

-4	-3	-2	-1	0	+1	+2	+3	+4
18	21	19	31	1	41	9	29	36
3	39	12	34	4	37	14	32	2
5	22	27	15	30	33	28	24	13
	8	40	26	25	38	6	17	
			7	16	11			
			23	35	10			
				20				

AAS5

-4	-3	-2	-1	0	+1	+2	+3	+4
37	29	27	30	18	20	13	36	25
12	8	22	28	2	38	32	33	17
16	6	24	4	11	9	34	15	41
	31	1	23	39	26	35	14	
			40	3	19			
			10	5	7			
				21				

AAS6

-4	-3	-2	-1	0	+1	+2	+3	+4
21	29	12	8	11	27	3	17	9
30	18	41	2	19	4	22	35	37
7	39	10	1	40	25	31	6	23
	32	38	5	34	14	13	20	
			33	36	16			
			26	28	15			
				24				

AAS7

-4	-3	-2	-1	0	+1	+2	+3	+4
11	31	9	1	18	14	30	40	17
8	7	22	4	38	33	24	21	34
27	19	29	37	20	12	36	35	32
	23	5	3	41	28	26	39	
			25	10	15			
			13	6	2			
				16				

AAS8

-4	-3	-2	-1	0	+1	+2	+3	+4
18	29	21	3	25	33	7	41	14
6	16	37	24	28	11	40	15	32
13	31	35	30	9	5	26	36	27
	8	4	23	39	38	34	19	
			22	20	2			
			1	12	17			
				10				

AAS9

-4	-3	-2	-1	0	+1	+2	+3	+4
10	5	27	31	8	37	18	15	34
39	16	19	28	11	4	20	35	25
9	3	24	38	30	12	36	21	32
	13	23	33	1	26	17	41	
			6	2	29			
			7	14	40			
				22				

AAS10

-4	-3	-2	-1	0	+1	+2	+3	+4
28	27	32	17	5	1	13	4	6
24	7	9	20	41	16	25	19	36
40	35	37	18	39	38	23	14	2
	30	33	29	3	8	15	31	
			26	12	22			
			10	34	21			
				11				

AAS11

-4	-3	-2	-1	0	+1	+2	+3	+4
3	2	30	1	14	40	19	27	15
31	18	6	9	10	25	36	22	38
13	20	8	34	41	7	17	39	26
	29	24	4	28	35	32	33	
			21	37	12			
			5	11	23			
				16				

AAS12

-4	-3	-2	-1	0	+1	+2	+3	+4
22	37	3	36	15	28	39	21	2
41	7	16	18	14	27	38	13	34
17	40	4	8	26	9	35	5	33
	25	19	29	32	12	1	24	
			30	11	20			
			6	31	23			
				10				

AAS13

-4	-3	-2	-1	0	+1	+2	+3	+4
24	29	30	21	35	32	36	19	31
23	8	39	27	34	28	13	4	9
22	3	40	41	5	26	12	25	1
	6	20	10	38	18	37	33	
			11	14	16			
			2	17	7			
				15				

AAS14

-4	-3	-2	-1	0	+1	+2	+3	+4
5	41	3	40	14	33	11	32	9
39	17	18	26	28	23	29	21	13
38	37	7	22	34	20	31	25	6
	27	8	35	12	4	16	15	
			24	1	10			
			30	36	2			
				19				

AAS15

-4	-3	-2	-1	0	+1	+2	+3	+4
20	18	39	25	21	37	15	26	7
5	40	23	1	27	32	28	6	29
8	22	41	9	11	31	12	13	4
	3	35	2	19	17	10	30	
			38	34	24			
			33	36	16			
				14				

AAS16

-4	-3	-2	-1	0	+1	+2	+3	+4
32	39	10	17	28	36	38	14	31
26	27	30	8	9	35	19	25	23
5	34	37	21	20	18	29	4	24
	40	1	33	2	7	6	41	
			11	3	15			
			13	12	22			
				16				

AAS17

-4	-3	-2	-1	0	+1	+2	+3	+4
31	41	9	27	37	6	33	24	36
16	19	23	39	7	21	10	26	17
22	8	29	12	32	20	1	13	15
	34	30	11	38	4	14	40	
			3	25	28			
			18	2	35			
				5				

AAS18

-4	-3	-2	-1	0	+1	+2	+3	+4
18	34	26	2	17	37	7	31	9
33	39	40	12	36	15	35	32	25
29	27	10	3	38	14	16	13	28
	30	23	11	19	21	1	6	
			20	22	41			
			4	24	5			
				8				

AAS19

-4	-3	-2	-1	0	+1	+2	+3	+4
8	10	30	31	1	40	4	19	33
3	12	24	38	21	28	17	35	34
7	18	29	16	20	22	39	41	27
	36	37	6	2	26	11	14	
			9	5	32			
			13	15	25			
				23				

ARC1

-4	-3	-2	-1	0	+1	+2	+3	+4
38	40	26	10	30	15	1	14	9
5	39	20	11	3	12	22	31	13
27	32	33	28	24	36	21	4	6
	41	17	19	29	16	35	37	
			2	23	25			
			18	8	34			
				7				

ARC2

-4	-3	-2	-1	0	+1	+2	+3	+4
8	7	13	4	12	2	26	28	14
29	37	22	27	16	21	20	30	33
39	9	3	18	5	23	17	25	15
	31	40	32	36	10	34	35	
			6	41	38			
			1	11	24			
				19				

ARC3

-4	-3	-2	-1	0	+1	+2	+3	+4
29	11	38	12	40	30	7	39	24
37	9	4	13	21	10	41	3	36
31	22	33	14	34	32	2	28	20
	8	1	16	18	26	17	15	
			35	27	25			
			6	23	19			
				5				

ARC4

	-4	-3	-2	-1	0	+1	+2	+3	+4
31	4	9	32	10	34	36	41	19	
8	37	22	39	18	28	25	38	26	
1	13	16	3	30	20	35	15	5	
	23	12	29	14	17	2	24		
			21	27	40				
			6	7	11				
				33					

ARC5

	-4	-3	-2	-1	0	+1	+2	+3	+4
37	31	33	39	27	22	14	25	24	
8	32	6	4	7	2	12	19	30	
29	40	23	13	10	34	41	28	15	
	9	38	16	36	35	20	26		
			3	11	21				
			18	17	5				
				1					

ARC6

	-4	-3	-2	-1	0	+1	+2	+3	+4
40	41	38	32	8	33	22	21	14	
5	34	30	29	24	37	36	13	25	
39	19	27	11	28	26	23	12	9	
	20	17	18	31	35	16	6		
			3	10	1				
			2	15	4				
				7					

ARC7

	-4	-3	-2	-1	0	+1	+2	+3	+4
27	10	9	13	29	26	18	24	36	
3	39	37	6	14	38	4	1	41	
23	5	12	31	28	7	2	15	25	
	8	22	17	32	35	20	21		
			11	34	19				
			33	16	30				
				40					

ARC8

	-4	-3	-2	-1	0	+1	+2	+3	+4
39	36	41	17	32	15	35	22	23	
19	30	26	5	29	21	9	12	25	
27	40	38	2	34	16	31	13	8	
	11	20	18	6	1	4	33		
			3	37	24				
			10	28	7				
				14					

ARC9

	-4	-3	-2	-1	0	+1	+2	+3	+4
7	31	12	6	15	24	38	2	34	
32	4	35	3	10	5	36	30	19	
29	37	13	16	11	14	17	18	39	
	8	22	33	21	27	20	26		
			23	28	41				
			25	9	40				
				1					

ARC10

	-4	-3	-2	-1	0	+1	+2	+3	+4
31	4	1	3	22	7	17	19	14	
37	32	13	39	12	30	24	20	27	
29	33	11	38	16	18	25	5	15	
	8	6	9	41	2	40	28		
			35	21	23				
			10	34	36				
				26					

ARC11

-4	-3	-2	-1	0	+1	+2	+3	+4
37	5	18	4	25	30	13	26	15
31	22	12	11	33	7	41	35	39
8	29	19	38	32	40	14	6	21
	10	23	9	20	36	34	28	
			17	16	3			
			24	1	2			
				27				

ARC12

-4	-3	-2	-1	0	+1	+2	+3	+4
20	23	17	29	7	36	8	15	4
18	41	3	27	2	31	35	25	21
40	30	5	26	37	14	1	13	12
	24	39	11	32	33	22	16	
			10	19	9			
			38	28	6			
				34				

ARC13

-4	-3	-2	-1	0	+1	+2	+3	+4
5	18	22	28	3	4	24	33	7
17	41	10	29	36	1	21	25	14
31	38	27	2	11	23	12	9	15
	8	30	19	16	35	6	20	
			13	39	34			
			40	32	26			
				37				

ARC14

-4	-3	-2	-1	0	+1	+2	+3	+4
32	31	11	23	38	3	24	28	36
29	8	22	4	19	12	33	15	20
37	17	40	39	27	10	41	14	25
	9	34	5	2	6	18	21	
			1	13	30			
			26	7	35			
				16				

ARC15

-4	-3	-2	-1	0	+1	+2	+3	+4
8	27	32	17	11	36	35	24	26
31	23	10	4	38	37	25	28	34
29	16	9	12	18	41	2	14	33
	39	6	40	15	7	5	30	
			3	13	21			
			22	19	1			
				20				

ARC16

-4	-3	-2	-1	0	+1	+2	+3	+4
8	24	20	5	15	6	23	10	41
26	22	3	13	2	37	32	25	19
29	9	4	30	35	36	28	16	34
	39	40	27	7	38	33	14	
			1	21	17			
			11	31	18			
				12				

ARC17

	-4	-3	-2	-1	0	+1	+2	+3	+4
4	28	38	22	39	26	18	5	36	
32	6	3	9	40	34	15	16	14	
1	17	12	13	24	25	37	7	23	
	31	29	8	33	11	27	41		
			19	35	21				
			20	10	2				
				30					

ARC18

	-4	-3	-2	-1	0	+1	+2	+3	+4
39	40	35	19	29	7	6	16	4	
27	32	2	33	30	24	9	17	14	
10	38	23	20	34	25	31	41	11	
	5	3	36	1	37	15	22		
			18	8	21				
			26	28	13				
				12					

ARC19

	-4	-3	-2	-1	0	+1	+2	+3	+4
26	4	10	11	23	1	6	15	17	
37	29	9	3	16	7	40	24	36	
8	22	12	13	2	32	39	34	20	
	31	35	25	21	14	33	41		
			27	28	30				
			19	38	5				
				18					

## **Appendix II**

### *A. Information Sheet for Q-sort participants (English)*

#### **Research project title: Examining stakeholder perspectives at different levels of the Arctic offshore petroleum debate**

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information.

Take time to decide whether or not you wish to take part.

#### **What is the project's purpose?**

The debate surrounding offshore petroleum drilling is a strongly contested issue; no more so than in the Arctic. This study aims to explore the various opinions and perspectives towards offshore petroleum development in the Arctic. Specifically, it explores and compares how Arctic stakeholders at different levels perceive aspects of the issue such as impacts and policy responses. Results from this work will contribute to better understanding stakeholder perceptions of the offshore issue and how policy, at various governance levels, can work more effectively in the Arctic.

#### **Why have I been chosen?**

Participants are chosen for this study on the basis they are involved in the Arctic policy community in some form.

#### **Do I have to take part?**

Taking part in the research is entirely voluntary. It is up to you to decide whether or not to take part. If you do decide to take part, you can withdraw at any time without giving a reason.

#### **What will happen to me if I take part?**

The research project involves the use of Q-methodology, a qualitative method deriving from psychology that explores perspectives held by particular group of people on a particular issue by incorporating an element of statistical analysis. In this case the Arctic policy community's perspectives on the issue of offshore petroleum development in the Arctic.

If you agree to participate in the research, you will undertake a Q-sort interview (using a program provided by the researcher) followed by a short interview. For the Q-sort interview you will be asked to read 41 statements that represent the discussion surrounding the issue of Arctic offshore petroleum' and then sort and rank these statements according to how much you agree or disagree with them on a scale between -4 (Most disagree) to +4 (Most agree). After the sorting process, you will be asked questions on why you are ranked certain statements in a particular way.

#### **Will my taking part in this project be kept confidential?**

Yes. All information will be kept strictly confidential and you will not be identifiable in any publications resulting from this work.

**Will I be recorded, and how will the recorded media be used?**

The follow-up interview will be recorded, transcribed and then analysed. Information from the transcripts may be used in presentations, lectures and publications but will be anonymous; nothing will identify you from any related publication. Audio data will be stored in secure, encrypted electronic devices and no-one else other than those involved in the research project can gain access to this data.

**What are the possible disadvantages and risks of taking part?**

There are no risks involved with taking part in this research.

**What are the possible benefits of taking part?**

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will provide insights into the nuanced perspectives of the Arctic policy community regarding the issue of Arctic offshore petroleum and help facilitate environmental policy that better encapsulates these perspectives.

**What will happen to the results of the research project?**

Results from this research will contribute towards a PhD thesis undertaken at the University of Leeds, UK as well as likely contributing to an article in an academic journal.

**Who is organising and funding the research?**

The research is carried out by a PhD candidate at the University of Leeds, UK and is funded by the Economic & Social Research Council (ESRC) as part of its White Rose Doctoral Training Centre.

**If you agree to take part you will be given a copy of this information sheet.**

**Your participant is greatly appreciated. Thank you for your time.**

**Further contact information**

If you have any further questions or queries, please feel free to get in contact using the information below.

**William Davies**

Sustainability Research Institute  
School of Earth and Environment  
University of Leeds  
LS2 9JT  
Email: [geo3wd@leeds.ac.uk](mailto:geo3wd@leeds.ac.uk)  
Tel (UK) +44 (0) 113 343 5572  
<http://www.see.leeds.ac.uk/people/w.davies>

## *B. Information sheet for Q-sort participants (Danish)*

### **Forskningsprojektets titel: Interessent perspektiver på forskellige niveauer i den arktiske offshore oliedebat**

Du er blevet inviteret til at deltage i et forskningsprojekt. Før du beslutter dig for at deltage eller ej, er det vigtigt, at du forstår hvad baggrunden for denne undersøgelse er, og hvad det indebærer. Tag dig tid til at læse følgende informationer omhyggeligt igennem og diskuter gerne med andre, hvis du har lyst til det. Spørg hvis der er noget der ikke er helt klart, eller hvis du ønsker yderligere oplysninger. Tag dig god tid til at beslutte, hvorvidt du ønsker at deltage.

#### **Hvad er projektets formål?**

Spørgsmålet omkring offshore olieboringer er meget omstridt, ikke mindst i det arktiske område. Denne undersøgelse har til formål at udforske de forskellige holdninger og syn på offshore olieudvikling i arktis. Nærmere bestemt undersøges der, hvordan de involverede i arktisk politik og samfund opfatter forskellige aspekter af emnet – dets påvirkning, politiske reaktioner og involvering af interessenter. Resultatet fra denne undersøgelse vil bidrage til mere viden om interessenters forståelse af offshore-spørgsmålet samt om hvordan lovgivningsarbejde og beslutningsprocesser på forskellige niveauer kan fungere mere effektivt i det arktiske område.

#### **Hvorfor er jeg blevet valgt til at deltage?**

Deltagerne er udvalgt til denne undersøgelse fordi de bor i byen Aasiaat.

#### **Skal jeg deltage?**

Deltagelse i denne undersøgelse er helt frivilligt. Det er op til dig at beslutte, om du vil deltage. Du kan til enhver tid vælge ikke at deltage eller træde ud af undersøgelsen uden grund.

#### **Hvad sker der med mig, hvis jeg deltager?**

Forskningsprojektet som denne undersøgelse indgår i omfatter brugen af Q-metoden. Dette er en kvalitativ metode med rødder i psykologien, der udforsker bestemte grupper af menneskers holdninger or meninger om et bestemt emne ved at bruge et element af statistisk analyse. I dette tilfælde er det det Aasiaatiske samfunds syn på spørgsmålet om offshore olieudvikling i arktis.

Hvis du indvilger i at deltage i denne undersøgelse, vil du deltage i et Q-skema interview (ved at bruge computerprogrammet stillet til rådighed af forskeren) efterfulgt af en kort samtale. Under Q-skema interviewet vil du blive bedt om at læse 41 udsagn, der hver repræsenterer forskellige holdninger i debatten omkring "arktisk offshore olie". Derefter vil du blive bedt om at sortere og kategorisere disse udsagn i forhold til hvor meget, du er enig eller uenig med dem på en skala mellem -4 (meget uenig) til +4 (meget enig). Efter sorteringsprocessen vil du blive spurgt om, hvorfor du har klassificeret visse udsagn på en bestemt måde.

#### **Vil min deltagelse i dette projekt blive behandlet fortroligt?**

Ja. Alle oplysninger vil blive behandlet strengt fortroligt, og du vil ikke kunne identificeres i publikationer som følge af dette arbejde.

**Vil samtalen blive optaget og hvordan vil optagelsen blive brugt?**

Det efterfølgende interview vil blive optaget, transskriberet og derefter analyseret. Passager fra det transskriberede interview vil kunne blive brugt i præsentationer, foredrag og publikationer men vil være fuldstændig anonyme. Intet vil kunne identificere dig i forbindelse med brugen af dette materiale. Optagelsen gemmes i sikre, krypterede, elektroniske enheder og ingen andre end de, der er involveret i dette forskningsprojekt kan få adgang til disse data.

**Hvad er de mulige ulemper og risici ved at deltage?**

Der er ingen risiko forbundet med at deltage i denne forskning.

**Hvad er de mulige fordele ved at deltage?**

Der er ingen umiddelbare fordele ved at deltage i projektet, men formålet med denne undersøgelse er at skabe større forståelse for og nuancere forskellige arktiske interessenters syn og holdninger i debatten vedrørende spørgsmålet om arktisk offshore olie. Dette vil kunne hjælpe til at forbedre det miljøpolitiske arbejde, så det på bedre vis spejler de forskellige lokale holdninger og perspektiver.

**Hvad skal resultaterne fra undersøgelsen bruges til?**

Resultaterne fra denne undersøgelse vil bidrage til en ph.d.-afhandling foretaget på University of Leeds, Storbritannien, og det forventes at resultaterne vil blive brugt i en artikel til et akademisk tidsskrift.

**Hvem organiserer og finansierer forskningen?**

Forskningen er gennemført af en ph.d.-kandidat ved University of Leeds, Storbritannien og finansieres af det økonomiske og sociale råd for forskning (ESRC) som er en del af White Rose ph.d Training Center.

**Hvis du indvilger i at deltage får du en kopi af dette informationskema.  
Din deltagelse er yderst værdsat. Tak for din tid.**

**Yderligere kontaktoplysninger**

Hvis du har yderligere spørgsmål eller forespørgsler, er du velkommen til at tage kontakt via nedenstående oplysninger.

**William Davies**

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