Arctic Offshore Oil and Gas Development: Advancing the Efficacy of Environmental Management through Regional Strategic Environmental Assessment

A Thesis Submitted to the College of Graduate Studies and Research

in Partial Fulfillment of the Requirements

for the Degree of Doctor of Philosophy

in the Department of Geography and Planning

University of Saskatchewan

Saskatoon

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ABSTRACT

Planning for offshore hydrocarbon development in Canada's Beaufort Sea currently occurs on a project-by-project basis. This is despite a collective understanding that impact assessment should go beyond the evaluation of site-specific project impacts to consider the broader policy and regional planning context in which development projects operate. The need for such a regional and strategic approach to impact assessment in Canada's Beaufort Sea, known as regional strategic environmental assessment (R-SEA), arises from the looming large-scale offshore hydrocarbon development in the region and the lack of a mechanism to plan for future energy development, establish a long-term regional vision, or assess and effectively manage the potential cumulative environmental and social effects arising from development. At such a critical moment, little research exists to advance R-SEA from a concept to an applied planning, assessment and decision-support process. This dissertation draws on experience from the implementation of strategic environmental assessment in offshore jurisdictions internationally, along with existing initiatives for marine planning in the Beaufort Sea, to advance effective R-SEA implementation in the region.

The research methodology includes a literature review, case reviews and key informant interviews. The research results are reported in three manuscripts. The first manuscript examines the influence of R-SEA on planning and development decisions in Norway, Atlantic Canada and the UK. The second manuscript examines existing planning, assessment, and science initiatives in the Beaufort Sea. The third manuscript identifies key opportunities for, and challenges to, the implementation of R-SEA in the Beaufort Sea. Significant findings demonstrate that R-SEA can offer a much-needed framework to accommodate and address stakeholder issues and concerns regarding future offshore development in the Beaufort Sea, despite acute implementation challenges, such as scepticism of scenario-based planning. Key findings reveal many expectations of what R-SEA could deliver in the Beaufort Sea, a result of the varied stakeholder priorities and goals. Understanding the root of different expectations and perceptions, ensuring follow-up programs pay attention to horizontal linkages between R-SEA strategies and current marine planning initiatives, and that supporting institutional arrangements are in place for a preferred strategy to succeed lie at the core of advancing R-SEA as a viable tool in the Arctic.

ACKNOWLEDGEMENTS

Special thanks go to my supervisor Dr. Bram Noble for his guidance and support throughout my PhD; it was an absolute privilege to work alongside him. I am also very grateful to my committee members Drs. Alec Aitken, Greg Poelzer, David Natcher, and Paul Hackett, as well as my external examiner, Dr. Patricia Fitzpatrick. I also greatly appreciate the time and insight offered by all interview participants – without them this research would not have been possible.

I would like to gratefully acknowledge the generous funding contributions I received including the Vanier Canada Graduate Scholarship, Dr. Rui Feng Award, John W. Davies Memorial Award, Northern Scientific Training Program, DFAIT Circumpolar World Fellowship, and the Arctic Institute of North America. Thanks also to Noelle Quin and Deborah Rodger for their friendship and support. Finally, many thanks to my family, especially my parents and Andrew, for their help and generosity that made it possible to balance my research and family.

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LIST OF ABBREVIATIONS

AANDC	Aboriginal Affairs and Northern Development Canada
BREA	Beaufort Regional Environmental Assessment
BSStRPA	Beaufort Sea Strategic Regional Plan of Action
CAPP	Canadian Association of Petroleum Producers
CCME	Canadian Council of Ministers of the Environment
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Agency
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
DECC	Department of Energy and Climate Change
DFO	Department of Fisheries and Oceans
EA	Environmental Assessment
ENGO	Environmental Non-governmental Organization
IFA	Inuvialuit Final Agreement
IMP	Integrated Management Plan
IOMP	Integrated Ocean Management Plan
IRC	Inuvialuit Regional Corporation
IRIS	Integrated Regional Impact Study
ISR	Inuvialuit Settlement Region
NEB	National Energy Board
NEPA	National Environmental Protection Act
NGO	Non-governmental Organization
NPD	Norwegian Petroleum Directorate
NRCan	Natural Resources Canada
OECD	Organization for Economic Co-operation and Development
PDO	Plan for Development and Operation
PPP	Policy, Plan, Program(me)
REA	Regional Environmental Assessment
R-SEA	Regional Strategic Environmental Assessment
SEA	Strategic Environmental Assessment
VEC	Valued Ecosystem Component

CHAPTER 1

INTRODUCTION

1.1 Research Purpose and Objectives

Previous research has shown that a strategic and regional approach to environmental assessment (EA) is needed in the context of offshore hydrocarbon planning and development (see BSStRPA 2008; Davey et al. 2000; Horvath and Barnes 2004; Kinn 1999), where projects operate in a large infrastructure network and the risks to marine environments are often high and of global relevance (Campagna et al. 2011; Wagner and Armstrong 2010). By their very nature, offshore energy projects require regional and strategic coordination (Spiridonov 2006; WWF 2005; Salter and Ford 2001). There are now various forms of strategic environmental assessment (SEA) for offshore energy planning and impact assessment ongoing internationally in Norway, the United Kingdom, Atlantic Canada and the United States (see Fidler and Noble 2012; Hasle et al. 2009; Wagner and Jones 2004). Yet, in Canada's western Arctic, an emerging energy frontier, planning for offshore hydrocarbon development continues to occur on a project-by-project basis (Doelle et al. 2012; Voutier et al. 2008).

Part of the challenge to advancing strategic environmental assessment is that a basic understanding of what a strategic approach to EA is and what it should deliver is still far from consolidated (Noble 2009; Vicente and Partidário 2006; von Seht 1999). To date, the majority of research on SEA has focused on sectoral applications of SEA in land use planning (Jones et al. 2005), transportation (Fischer 2006), and forestry (Gachechiladze et al. 2009). Research on SEA in the energy sector has focused on terrestrial systems (see Jay 2010; Noble 2008; Marshall and Fischer 2006; Noble 2002), but with very little empirical research on SEA offshore, particularly with respect to oil and gas development. This dissertation advances SEA in the energy sector by examining implementation challenges and opportunities of regional SEA (R-SEA) in Canada's western Arctic Beaufort Sea. Although R-SEA is gaining international momentum, the potential role of R-SEA in facilitating regional energy planning and impact assessment for offshore oil and gas development in Canada's Arctic remains to be evaluated.

The overall purpose of this research is to identify how a R-SEA framework could be used in the Beaufort Sea region to influence planning and development decisions in a broader, more

regional socioeconomic and environmental context than the current project-based EA approach. Specifically, through identifying key implementation challenges and opportunities based on the perceptions of stakeholders, this research will provide a greater understanding of how to advance R-SEA to inform and improve the efficacy of environmental management decision-making in the Beaufort Sea. The specific objectives of this research are to:

i. examine offshore SEA frameworks internationally to identify operational challenges and opportunities and their influence on oil and gas planning and decision-making;
ii. identify stakeholder perceptions regarding challenges and opportunities of current marine planning, assessment and science initiatives in Canada's western Arctic to ascertain whether and how these initiatives enable horizontal and vertical integration and effectively facilitate marine resource planning and decision-making; and
iii. identify key opportunities for, and challenges to, implementation of R-SEA in the Beaufort Sea based on a normative model and stakeholder expectations of R-SEA.

1.2 Environmental Assessment

Environmental assessment is broadly defined as a tool for identifying, predicting, evaluating, and mitigating the potential environmental impacts of a specific development project before major decisions and commitments about that project are made (Hanna 2009). The primary purpose of EA is to facilitate the consideration of the environment in planning and decision-making and, ultimately, to make it possible to arrive at decisions and actions that are more environmentally sustainable (Noble 2009). Originating from the US *National Environmental Policy Act* (NEPA) of 1969, which came into force in 1970, EA is currently amongst the most widely practiced environmental management tools in the world (Noble 2009; Cashmore et al. 2008). In Canada, EA emerged in the early 1970s as a policy requirement to screen for potential pollution effects of developments (Gibson 2002). It was legislated at the federal level under the *Canadian Environmental Assessment Act* (1992), and recently revised in 2012.

Environmental assessment has evolved considerably over the past 40 years (see Fundingsland Tetlow and Hanusch 2012); yet, despite its widespread international adoption it has been subject to much criticism (Bina 2007). A main limitation identified in the EA literature is that EA is often implemented too late in the decision-making process to influence decisions about options for development (Vicente and Partidário 2006), or to explore alternative

development futures (Gibson 2002; Partidário 2000). The process is often considered reactive and constrained to the assessment of individual development projects, and to project-based decision-making (Partidário 2000), thus reducing its ability to effectively manage the impacts of development, particularly cumulative impacts, that typically occur at a regional scale (Harriman and Noble 2008; Duinker and Greig 2007; Duinker 1994). Noble (2010: 251) further argues that project-based EA "in the absence of more strategic and regional processes is inherently constrained in its ability to facilitate decisions about development that are consistent with the broader principles of sustainability." Other notable challenges to EA over the years include its inability to meet broad sustainability objectives due, in part, to its too late application to support decisions about the nature and types of development that should be pursued (e.g., Gibson 2002; von Seht 1999); limited public involvement early in the policy and planning process (e.g., Diduck and Sinclair 2002); and insufficient monitoring and follow-up to feed-back and influence broader decision making processes (e.g., O'Faircheallaigh 2010; Morrison-Saunders and Bailey 1999).

As a result of the shortcomings of EA solely at the project level, there has emerged recognition of the need for and potential benefits of a more strategic approach to impact assessment (e.g. Dalal-Clayton and Sadler 2005; Gibson 2002; Partidário 2000). This is particularly the case in Canada, where project EA has become increasingly narrow in scope and application since its introduction in the early 1970s as a broad policy mandate (see Harriman Gunn and Noble 2009b), and with 2012 revisions to the *Canadian Environmental Assessment Act* that further reduce the scope, time frame for, and comprehensiveness of project EA applications (see Gibson 2012). Such narrowing in the scope and reach of EA emphasizes the need for a much higher level policy, plan and program oriented approach to planning for, and assessing the impacts of resource development.

1.3 Strategic Environmental Assessment

Variably defined, SEA broadly refers to the EA of policies, plans and programs (PPPs) and their alternatives (Sadler and Verheem 1996). An early and widely quoted definition of SEA, by Thérivel et al. (1992) is: "the formalised, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or programme and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in

publicly accountable decision-making". SEA is not a single, predetermined tool; rather it is a suite of related tools (WWF 2005) that is best described as 'one-concept, multiple forms' (Tonk and Verheem 1998). SEA is based on the premise that project-based EA, which in essence reacts to a proposed development, is not adequate alone to ensure sustainable development of the environment (Noble 2010). SEA is a way of ensuring that downstream project planning and development occurs within the context of desirable outcomes that society want to achieve; it therefore addresses the *sources* rather than the *symptoms* of environmental change (Noble 2010).

The key concept is that the SEA process focuses on assessing the potential environmental impacts of all types of proposed PPPs, and seeks to incorporate environmental considerations into the development of public policies. Strategic approaches to assessment serve to advance EA beyond the scope and mandate of project-based assessment to an earlier, higher level of environmental planning and decision-making. In this way, SEA is proactive, and under it questions like 'what is the preferred option' or 'what is the desired attainable end' are asked, rather than it being used to simply predict the most likely outcome of a predetermined type of project action (Noble 2002). In principle, SEA is intended to have a tiered-forward effect, meaning that the benefits of SEA application to high level policies trickle down, affecting plans and programs, and eventually influencing decisions about individual projects (Fischer 1999). The SEA approach is comprehensive as it broadens the policy target from individual decisions to the sequence of associated plans and programs; incorporates sustainability principles in the policy making process; enables tiering of environmentally structured actions; provides better context for assessment of cumulative effects; and considers the short and long-term environmental consequences.

SEA extends EA upstream, but at the same time it adopts a different set of principles and criteria from those used in project-based EA (Gunn and Noble 2011). Guiding principles and criteria for SEA encompass three components (Noble 2009). First, *system components* refer to the basic provisions and requirements for SEA and the position of SEA in the broader planning and decision-making environment (Noble 2010). This includes establishing clear provisions to undertake SEA, and applying sustainable development guiding principles. Second, *procedural components* address the methodological and process elements of SEA, such as alternatives, cumulative effects, monitoring, and participation and transparency. Finally, *results components* refer to the overall influence of SEA on decision-making and subsequent EA, including the

opportunity for broader system-wide learning and process development (Noble 2009). There is no single model of SEA that can be unequivocally applied (see Jones et al. 2005); rather, attention must be given to context, to regulatory opportunities and constraints, and to the tier of application (Noble 2010; Fischer 2002). While a large number of SEA-type processes exist, applications do not always occur under the SEA nametag.

The concept of evaluating the environmental impacts of PPP was first established under the US NEPA, which required an EA of proposed federal agency actions, constituting the first formal framework for both EA and SEA (Fundingsland Tetlow and Hanusch 2012; Jones et al. 2005). However, it was Wood and Djeddour who first coined the term SEA in 1989, referring to EAs appropriate to PPPs as more 'strategic' in nature than those applicable to individual development projects (Partidário 2000). Since then, SEA has gained international recognition as a formal approach to impact assessment, separate from project EA, and promoted by a number of high profile international developments (Noble 2009) including the World Bank's recommendation for policy EA, the report of the World Commission on Environment and Development (Our Common Future 1987), and the United Nations Earth Summit, Rio de Janeiro (1992).

In Canada, SEA has existed informally since the early 1980s, but it was not until 1990 that SEA was formally introduced in Canada, by way of *The Cabinet Directive on the Environment of Policy, Plan and Program Proposals*, which distinguished SEA from traditional project-based EA (Dalal-Clayton and Sadler 2005). The Directive was updated in 2004, providing procedural support to federal departments and agencies so as to ensure compliance with the Directive. Under the Directive, every PPP proposal submitted to a Minister or Cabinet for approval, which may result in either positive or negative environmental effects, is required to have an SEA (CEAA 1999). Outside the federal Cabinet Directive, however, no formal systems of SEA exist in Canada; applications largely have been limited to federal policy and program-based initiatives (Noble 2009; Dalal-Clayton and Sadler 2005). Further, although Canada is recognized internationally as a country that has made significant contributions to the development and advancement of SEA (see Sadler 2005), reviews of SEA practice and performance have concluded that SEA in Canada is not meeting its potential as a higher-order EA tool in support of sustainability (see Gibson 2002), and there remains a systematic separation of SEA from downstream regional and project-specific development decisions. For instance,

Noble (2009: 146) reviewed 10 case applications of formal and non-formal SEA across Canada and found "considerable variability in SEA experience and value added," adding that the systematic separation of SEA from downstream decision inputs, or project-based EA and assessment activities was particularly troubling.

In 2008, in an attempt to improve the application of SEA and extend SEA beyond the formal federal Cabinet Directive, as a more regional-based planning approach to impact assessment, the Canadian Council of Ministers of the Environment (CCME) commissioned a research program to develop R-SEA. Developed based on SEA principles (see Vicente and Partidário 2006; Partidário 1996), R-SEA was a means to promote regionalized applications of SEA, outside the scope of the federal Directive, so as to be more contextually relevant to regional policy and planning needs.

Formally adopted by the CCME (2009) as a regionalized model of SEA in Canada, R-SEA is a process designed to systematically assess the potential environmental effects, including cumulative effects, of alternative strategic initiatives (or PPPs) for a particular region. In this regard, R-SEA is focused on identifying and assessing alternative development futures for a region, rather than simply predicting and mitigating the impacts of individual projects, thus allowing for sustainability objectives and broad alternatives to be included in regional planning, development and management decision-making process (Harriman and Noble 2008). The overall purpose of R-SEA is to allow for more informed regional development decisions in support of sustainability (CCME 2009). Both SEA and R-SEA frameworks have similar objectives of integrating environmental considerations into higher-order decision-making processes and providing an early analysis of the relationships between PPPs. For the purposes of this thesis, the terms R-SEA and SEA are used in manner consistent with the source literature and case studies examined; however, the explicit focus of the thesis is on R-SEA given the regional scale and planning level of interest (i.e., the Beaufort Sea).

1.4 Energy Demand and Extraction

Over the past 40 years, worldwide total primary energy consumption has almost doubled, growing from 4,672 million tons of oil equivalent (Mtoe) in 1973 to 8,677 Mtoe in 2010 (IEA 2012a). The International Energy Agency's World Energy Outlook for 2012 predicts that global energy demand will continue to increase in the coming decades, increasing by over one-third

between 2011 and 2035 (IEA 2012b). This increase in demand is driven primarily by emerging economies. China accounts for the largest share of the growth in global energy use, with its demand predicted to rise 60% by 2035, followed by India (where demand more than doubles) and the Middle East. In contrast, OECD energy demand in 2035 is predicted to be just 3% higher than in 2010 (IEA 2012b). Fossil fuels are predicted to remain the principal sources of energy worldwide in 2035, although their combined share of the global energy mix is predicted to fall from 81% to 75% (IEA 2012b). Global oil demand in International Energy Agency's principal scenario (New Policies Scenario) increases slowly from a total of 87.4 million barrels per day (mb/d) in 2011 to 99.7 mb/d in 2035, again driven by demand in China, which accounts for 50% of the net increase.

Canada is a key player in today's energy markets as the world's fifth largest energy producer, sixth largest producer of crude oil, and third largest natural gas producer (CAPP 2012). Canada is also home to the third largest crude oil reserves in the world after Saudi Arabia and Venezuela (CAPP 2012). Prime Minister Harper's intention to transform Canada into an "energy superpower" was evident in his first speech as Prime Minister to business leaders outside of Canada, which occurred on July 14, 2006 to the Canada-UK Chamber of Commerce in London. This speech detailed how the emergence of Canada as an energy superpower would be rooted in the rapid expansion of the oil sands and increasing oil and gas development in the Arctic (Harper 2006). Subsequent directives from the Harper Conservatives have asserted Canada's importance as an energy superpower and the need to expand and diversify markets for Canada's fossil fuels.

The June 1997 Special Session of the UN General Assembly emphasized that sustainable patterns of energy production, distribution, and use are crucial to improvements in the quality of life (UNDP 2000). The relationship between energy production and use and sustainable development can be viewed from two standpoints (Rogner and Popescu 2000). First, energy availability provides an opportunity for prosperity, satisfying basic human needs, improving social welfare and economic development. On the other hand, to meet sustainability criteria, the production and use of energy must not endanger the quality of life of current and future generations. Today's discussions on energy use are increasingly dominated by major global concerns of over-population, pollution, water depletion, deforestation, biodiversity loss, and global climate deterioration (Lior 2010). While such global challenges are of critical

importance, impacts from fossil fuel production and consumption still abound at smaller scales depending on the region of the world examined. At the local scale, such impacts include air pollution arising from fossil fuel combustion, thermal pollution, and water use and contamination. Examples of impacts at the regional scale include acid deposition and tropospheric ozone depletion (Holdren and Smith 2000).

Oil and gas exploration and development are, and hold the potential to remain, the most significant engines of economic growth in the Canadian Arctic. If managed correctly, hydrocarbon development can provide for the long-term prosperity of the Arctic communities and bring significant economic benefits to the rest of Canada (Voutier et al. 2008). There are, nonetheless, concerns that other values, including maintenance of traditional lifestyles and protection of ecologically sensitive areas, must be safeguarded at regional and local levels (BSStRPA 2008). Canada recognizes the importance of these issues and is attempting to approach northern resource development in a sustainable fashion, in part through the Arctic Council, and the Northern Dimension of Canada's Foreign Policy (2009). This policy has four interrelated objectives including protecting Canada's environmental heritage, promoting economic and social development, exercising Canada's sovereignty, and improving and devolving governance.

1.4.1 Hydrocarbon Development in Canada's Western Arctic

Increasing interest in the development of western hydrocarbon resources, in particular Canada's western Arctic, occurs in a broader political economy of energy. This political economy is characterized by efforts to secure energy supplies in a future of increasing demand, amidst ongoing geopolitical instability, particularly in the Middle East. Global concerns about future energy supplies combined with decreasing Arctic sea ice coverage in recent years has spurred interest in Arctic oil and gas reserves as a means to boost supply (Johnstone 2010). For the oil and gas industry, Arctic and Subarctic regions are considered to be some of the world's last energy frontiers, increasingly important for meeting global energy demands (Nuttall 2008). According to the United States Geological Survey (2008), the Arctic contains around 25% of the world's largest remaining untapped gas reserves and undeveloped oil reserves. The discovered recoverable oil resource in the combined Mackenzie Delta - Beaufort Sea is between 1 billion barrels and 1.2 billion barrels, and the total recoverable oil resource may be as high as 10.6

billion barrels (Chen et al. 2007 in Callow 2012). The estimated discoverable marketable gas resource in the combined Mackenzie Delta - Beaufort Sea is between 9 and 10.4 trillion cubic feet, and the ultimate marketable gas resource may be as high as 56.9 trillion cubic feet (Drummond 2009 in Callow 2012).

The worldwide interest in Arctic hydrocarbons and the prospect of rising energy prices will likely guarantee a place for the Arctic in the investment plans of many transnational corporations (Beauregard-Tellier 2008). Prior to 2007, the majority of hydrocarbon exploration and development in the Beaufort Region was restricted to the continental shelf and nearshore region. In recent years, however, exploration licenses have been let in the deep offshore (Porta and Bankes 2011). The development and application of new exploration technologies are increasing the discovered resource, with exploration now extending to deep water areas (INAC 2010). The deep slope region of the Beaufort Sea has not been explored or assessed; however, the recent issuance of exploration licenses with high value work commitments is a strong indication that industry believes this area has the potential to hold large accumulations of hydrocarbons (Callow 2012).

The Beaufort Sea Large Ocean Management Area covers over one million km^2, encompassing the marine portion of the Inuvialuit Settlement Region (Figure 1-1), and has been identified as one of five priority areas for integrated ocean management by the Government of Canada (Cobb et al. 2008). The area contains the Tarium Niryutait Marine Protected Area and is rich in biological diversity, including benthic fauna, birds, marine and anadromous fish (e.g., arctic cod, arctic char, salmon), terrestrial mammals (e.g., caribou, arctic fox, lynx, arctic hare), and marine mammals (e.g., bowhead whales, beluga whales, ringed seal, walrus, polar bear) (Cobb et al. 2008). The marine resources of the Beaufort Sea provide sustenance and have been part of Inuvialuit fishing and hunting practices for centuries.

The Inuvialuit Settlement Region (ISR) was established as a result of the 1984 *Inuvialuit Final Agreement* (IFA) between six Arctic communities and the Government of Canada. The IFA was the first land settlement in Canada to include land ownership, both surface and sub-surface and the beds of water bodies. The ISR covers 906,430 km^2, of which the Inuvialuit own 90,643 km^2, with surface rights on 77,694 km^2 and both surface and sub-surface rights on the remaining 12,949 km^2 (Fast et al. 2005; IFA 1984) (Figure 1-1). The region's population, who are predominately Inuvialuit, is dispersed over six communities: Aklavik (approximate

population 630), Inuvik (approximate population 3590), Tuktoyaktuk (approximate population 1010), Paulatuk (approximate population 312), Ulukhaktok (approximate population 420), and Sachs Harbour (Ikahuak) (approximate population 120) (Pearce et al. 2011). Life is oriented toward the marine and terrestrial resources of the nearshore Beaufort Sea, and dependency on the region's wildlife resources, such as seal, whale, fish, caribou, and muskoxen, remain strong (Pearce et al. 2011; Usher 2002).

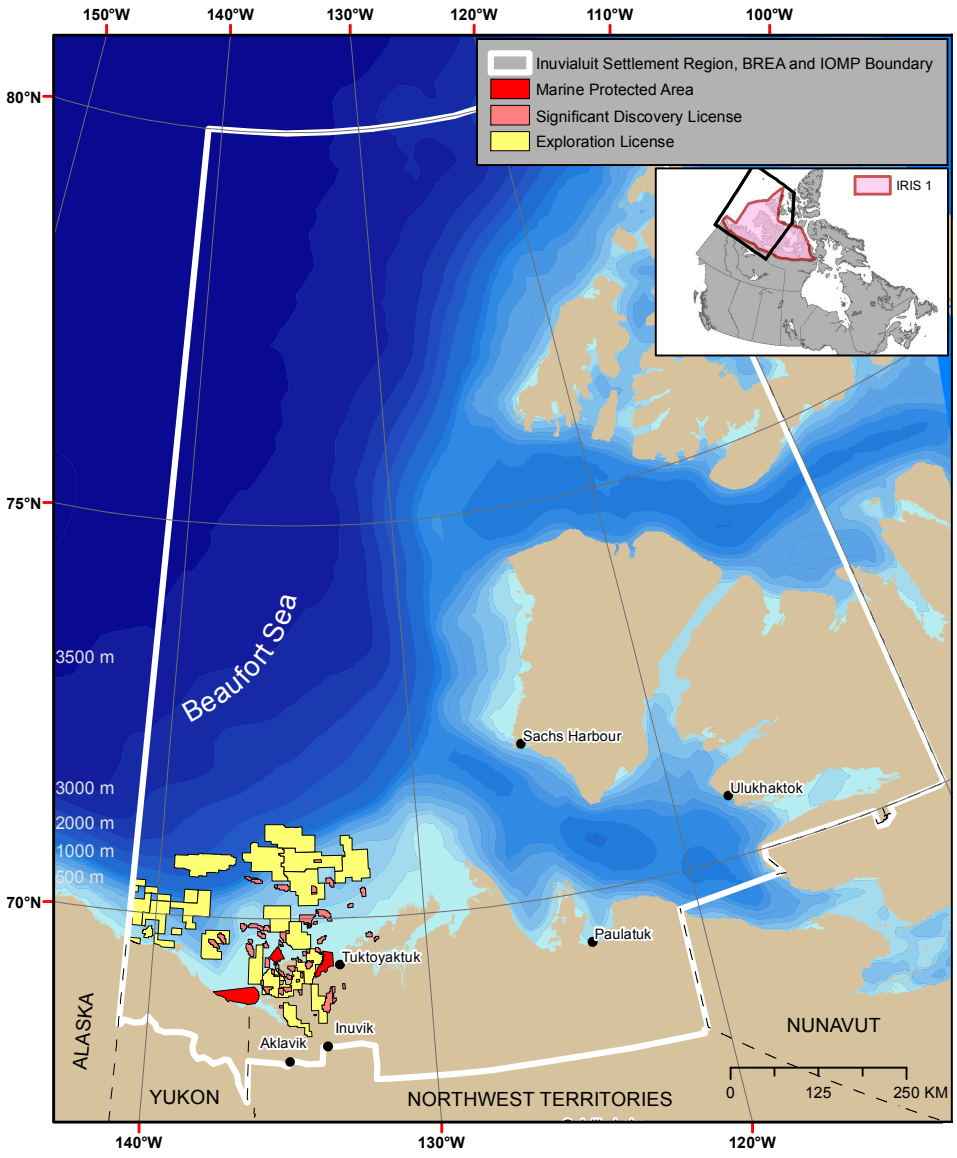

Figure 1-1. Inuvialuit Settlement Region of Canada's Western Arctic

Source: Map developed by Michael St. Louis, University of Saskatchewan

Under the IFA, the Inuvialuit ceded their rights in the offshore areas; however, they still provide input regarding offshore oil and gas development decisions on federal Crown lands in their settlement region and maintain a role and interest in offshore governance. The IFA provides a framework for co-management in the ISR between the Inuvialuit and the federal government. However, for all intents and purposes, the Government of Canada retains jurisdiction over and authority to manage the offshore resources of the Beaufort Sea, including the marine portion of the ISR. The National Energy Board (NEB) and Aboriginal Affairs and Northern Development Canada (AANDC) have independent but complementary roles in energy exploration and development in the Beaufort Sea: the NEB authorizes drilling, while AANDC administers rights to oil exploration. Fisheries and Oceans Canada (DFO) manages development authorizations under the *Fisheries Act* (1985), and the *Canadian Environmental Assessment Act* (2012) applies to projects whenever a federal authority has a decision-making responsibility.

Environmental assessment in the ISR is regulated under the *Canadian Environmental Assessment Act* (2012) and the IFA (1984). The federal Act provides the legislative framework for EA within the ISR; however, all developments in the ISR are subject to EA under the IFA, regardless of their size or magnitude of impact. Currently, project-based EA is the primary tool for planning for, assessing, and managing the impacts of offshore energy exploration and development. Challenges to the current approach to EA and regulation for offshore oil and gas in the Beaufort Sea have been documented by Ketilson (2011) and others (Doelle et al. 2012; Voutier et al. 2008; Erlandson and Sloan 2001). These include the narrow scope of EA and limited reach beyond the individual development project, uncertainty and efficiency of the process, the potential for duplication of effort in project assessment, and the lack of capacity to implement EA and regulatory programs. These limitations have generated considerable interest in regional and strategic approaches to offshore planning and assessment in the western Arctic, and are likely to be exacerbated by recent legislative and regulatory reforms to EA at the federal level in Canada (Canadian Environmental Assessment Act 2012), which further limit the scope of EA application, including the exemption of small projects (e.g., exploration), and set maximum 24-month time frames for the review of large projects (e.g., offshore development). Notwithstanding current, independent programs in the western Arctic focused on marine planning (e.g., Integrated Ocean Management Plan), baseline studies (e.g., Beaufort Regional Environmental Assessment), and scientific understanding of climate change (e.g., Integrated

Regional Impact Studies), there is no integrative planning and impact assessment framework to support PPP development and decisions about marine resource use, particularly with regard to deep offshore exploration and development.

The need for such a regional and strategic approach arises from the looming large-scale offshore hydrocarbon development in the region and the lack of a mechanism to plan for future energy development, establish a long-term regional vision, or assess and effectively manage the potential cumulative environmental and social effects arising from development (see Doelle et al. 2012; Arctic Council 2009). Furthermore, from the perspective of hydrocarbon engineering and coastal resource management, the delineation of onshore and offshore becomes blurred because much of the shallow Beaufort Sea is frozen in winter, making it indistinguishable from the nearby shore, and because directional drilling from onshore locations can penetrate targets at depth several kilometres offshore (Voutier et al. 2008). Consequently, terrestrial and marine oil and gas activities in this region require a higher degree of coordination than anywhere else in Canada, if not the world (Voutier et al. 2008).

As international attention turns to the Arctic to meet global energy demands, there is increased recognition of the need to upstream impact assessment and decision-making to plan for energy development prior to ramping-up individual energy projects (see Elvin and Fraser 2012; Arctic Council 2009; WWF 2005). The urgency for R-SEA is great, given the shortcomings with the existing project-based approach (see Doelle et al. 2012) combined with recent legislative and regulatory reforms to EA in Canada at the federal level (see Gibson 2012), and Canada's commitment to become an energy superpower (Hester 2007).

1.5 Research Approach

This research was approached in three phases, corresponding to the objectives described in Section 1.1, and adopted a mix of supporting research methods (Table 1-1). The first phase of the research focused on international SEA offshore Norway, Atlantic Canada and the United Kingdom. An in-depth literature review was conducted to characterize and explain gaps in knowledge, assess the nature of work already performed on offshore R-SEA, and further refine the research questions and objectives. The literature review focused on strategic and regional environmental assessment in resource management (e.g., definitions, concepts and approaches; purpose, principles, benefits; cases and applications), and regional environmental management

(e.g., ecosystem management; integrative management; regional planning and development) reported in international peer reviewed journal literature and 'grey' literature, including industry and government reports and publications. In Norway the Barents Sea Integrated Management Plan 2006 was reviewed, along with the Goliat offshore energy development project. In the case of the United Kingdom, two offshore SEA's were examined, along with the Laggan Tormore energy project. In Atlantic Canada, SEAs performed by the Canadian Newfoundland Labrador Offshore Petroleum Board were examined. A total of 20 interviews were also conducted with practitioners, regulators, industry representatives and environmental and other Non-governmental Organizations (NGOs) directly involved in SEA offshore Norway, Atlantic Canada and the United Kingdom.

The second phase of the research focused on marine planning in the Canadian Arctic. A literature review was conducted on regional environmental planning (e.g., marine spatial planning, ecosystem management and regional planning and development) reported in international journal literature and 'grey' literature including regional planning documents and community plans. Case examinations were conducted through document analysis of three current marine planning, assessment and science initiatives in the western Arctic, namely the Integrated Ocean Management Plan (IOMP), Beaufort Regional Environmental Assessment (BREA), and Integrated Regional Impact Study (IRIS). A total of 50 interviews were also completed with Inuvialuit co-management boards and agencies in the Inuvialuit Settlement Region (ISR) of the Beaufort Sea, municipal government, territorial and federal government, oil and gas industry representatives, private consultants, Environmental Non-governmental Organizations (ENGOs) and other energy interest groups. Interview data were analyzed using QSR NVivo© v.9; a computer software program designed to classify and manage qualitative information. Observation and participation at various conferences, including the ArcticNet IRIS Regional Workshop (Inuvik 2011) and the International Polar Year: From Knowledge to Action Conference (Montréal 2012), also contributed toward an overall understanding of each case reviewed.

The third phase of the research focused on the potential for implementation of R-SEA in Canada's western Arctic, specifically implementation opportunities and challenges. A literature review was conducted on strategic and regional environmental assessment (e.g., definitions, concepts, and approaches in the CCME R-SEA framework) reported in international peer

reviewed journal literature and government reports and publications. The 50 interviews from phase two, with Inuvialuit co-management boards and agencies in the ISR, municipal government, territorial and federal government, oil and gas industry representatives, private consultants, ENGOs and other energy interest groupss, were also used to support this third and final phase of the research. Interview data were again analyzed using QSR NVivo© v.9.

Table 1-1. Supporting Methods for Research Objectives

Research Objectives	1. International SEA Offshore	2. Marine Planning in the Arctic	3. Implementing R-SEA
Supporting Research Methods	Literature Review Case Examinations Interviews	Literature Review Case Examinations Observations Interviews	Literature Review Interviews

1.5.1 Ensuring Quality and Validity of Research

The interview protocol used in this research was approved and conducted under the terms of the University of Saskatchewan Behavioural Ethics Board. An Aurora Research Institute license to conduct research in the Northwest Territories, pursuant to the *NWT Scientists Act* (1988), was also secured. Confidentiality was maintained to the extent possible in reporting all of the information presented in this dissertation. The names of individual participants are not reported, but the names of the participant's organization or affiliation are presented so as to ensure credibility of the results. Efforts were also taken to preserve the credibility and validity of the qualitative data collected. Shenton (2004) argues that issues of validity of qualitative studies should be linked to trustworthiness, which can be achieved by the rigor through which the researcher has presented their material, making visible the practices of research, thus making it 'auditable'. Four widely applied and accepted criteria in qualitative research, proposed by Guba (1981), were adopted in this thesis to ensure trustworthiness (see Shenton 2004). First, to achieve 'credibility' several provisions were made by the author, including adoption of widely accepted and adopted methods of inquiry in the field of impact assessment (e.g., see Bina 2008a; Runhaar and Driessen 2007; Diduck and Sinclair 2002) and community research (Gearhead and Shirley 2007), triangulation via use of different methods and research participants, debriefing

sessions between the researcher and supervisor, and peer scrutiny of the project (e.g., committee meetings and presenting material at nation and international conferences). Second, to accomplish 'transferability' the research provided a rich description of background data to establish context for the study and detailed descriptions of phenomena in question to allow comparisons to be made. Third, to achieve 'dependability', overlapping methods were employed and a detailed methodological description was provided to allow the study to be repeated. Finally, to address 'confirmability', triangulation occurred to reduce effect of investigator bias and admissions of researcher limitations are cited (see Chapter 5).

1.6 Theoretical and Conceptual Perspective

SEA, as defined by Thérivel et al. (1992), is a systematic and comprehensive process for evaluating the environmental impacts of a PPP and its alternatives. However, since its inception there has been division amongst scholars and practitioners on fundamental matters regarding SEA's purpose and role in the planning process (Fundingsland Tetlow and Hanusch 2012). Is it intended to safeguard environmental concerns, foster sustainability, or support balanced decision-making taking into account all normative issues and interests (Thissen 2001)? Partidário (2005) concluded that SEA has transformed from an impact assessment tool to a process that facilitates strategic and integrative thinking in decision-making. Bina (2007) reached a similar conclusion, stating that SEA has evolved into a process for actively shaping and formulating strategic initiatives. Nevertheless, it is likely that the role and aims of SEA will vary according to the planning and decision-making context in which it is applied (Fundingsland Tetlow and Hanusch 2012). As a result, SEA has been regarded as 'a family of approaches' (Dalal-Clayton and Sadler 2005), and as an 'overarching concept rather than a unitary technique' (Brown and Thérivel 2000). In this thesis, SEA is regarded as a process to support the sustainable development of the oil and gas resource in the Beaufort Sea through strategic planning that balances the views and interests of the various stakeholders.

The nature of and links between science, society and technology have changed considerably since EA's inception (Cashmore et al. 2008). Literature offers two main interpretations of the role of science in EA: EA as applied science, and EA as civic science (Cashmore 2004). Though these broad theoretical perspectives are somewhat extreme interpretations, they provide valuable reference points to explain the perspective adopted in this

research. The notion that science is an entirely rational process of objective inquiry was the predominant perspective when EA was conceived in the late 1960s (Cashmore 2004). With the evolution of EA there has been a transition in practice from a strictly rational-technical paradigm to forms that also involve transactive, communicative and civic-oriented strategies (Gauthier et al. 2010; Armitage 2005). The civic spectrum is akin to the belief that EA is a decision tool used to empower stakeholders and allow them to play a role in promoting social justice. Social values are emphasized in the civic science perspective, and there is a role for both natural and social sciences, and facts and judgments (Cashmore 2004). This thesis is situated in the middle of the two perspectives, where applied science values are upheld and recognized as important to applied EA, but with a strong civic approach that accommodates social sciences and participatory decision-making as part of the planning and assessment process. This approach is particularly relevant in the Beaufort Sea region, where the IFA co-management framework already seeks to integrate the findings of applied science with traditional knowledge, and there is a strong focus on deliberation and participation in decision-making. The value of using applied science to inform decisions is well recognized, but there is also value in accommodating divergent interests and stakeholder values, such as traditional subsistence, conservation, and hydrocarbon development, in developing a strategic plan for resource development in the region.

Features of this theoretical positioning are reflected in the methodological approach taken in this study, as well as the nature of the research questions. By nature, R-SEA is a process oriented toward integrating environmental considerations into higher-order decision-making, and it depends both on quality data to support its application and contextual considerations of socio-political factors.

1.7 Thesis Organization

This thesis adopts a dissertation by manuscript style, formatted according to the requirements of the Department of Geography and Planning and the College of Graduate Studies and Research. Following the introductory chapter the thesis is organized into three manuscripts, each of which is presented as a single thesis chapter. The first manuscript (Chapter 2), "Advancing Strategic Environmental Assessment in the Offshore Oil and Gas Sector: Lessons from Norway, Canada, and the United Kingdom" (*Environmental Impact Assessment Review*, 2012, 34: 12-21), examines the efficacy of SEA offshore, in particular its influence on planning and development

decisions. The second manuscript (Chapter 3), "Stakeholder Perceptions of Current Planning, Assessment and Science Initiatives in Canada's Beaufort Sea" (*Arctic*, accepted for publication) examined how existing planning, assessment and initiatives in Canada's western Arctic work to facilitate a more coordinated and informed approach to planning, assessment and decision-making for sustainable offshore development in the offshore region. The third manuscript (Chapter 4), "Advancing Regional Strategic Environmental Assessment in Canada's Western Arctic: Implementation Opportunities and Challenges" (*Journal or Environmental Assessment Policy and Management*, 2013, 15: 1) identified key opportunities for and challenges to the implementation of R-SEA in Canada's Beaufort Sea. Chapter 5, the concluding chapter, revisits the main lessons and observations emerging from each manuscript and considers the larger implications as a body of research. The relevance of these findings is then discussed within the broader research context. The thesis concludes with future directions for research.

CHAPTER 2

ADVANCING STRATEGIC ENVIRONMENTAL ASSESSMENT IN THE OFFSHORE OIL AND GAS SECTOR: LESSONS FROM NORWAY, CANADA, AND THE UNITED KINGDOM

Preface to Chapter 2

This Chapter addresses the first objective of the thesis, to examine offshore SEA frameworks internationally and identify operational challenges and opportunities and their influence on oil and gas planning and decision-making. The Chapter has been published in the journal *Environmental Impact Assessment Review*, 2012, 34: 12-21, co-authored by Fidler (lead author) and Noble.

Abstract

Strategic environmental assessment (SEA) for offshore oil and gas planning and development is utilized in select international jurisdictions, but the sector has received limited attention in the SEA literature. While the potential benefits of and rationale for SEA are well argued, there have been few empirical studies of SEA processes for the offshore sector. Hence, little is known about the efficacy of SEA offshore, in particular its influence on planning and development decisions. This manuscript examines SEA practice and influence in three international offshore systems: Norway, Atlantic Canada and the United Kingdom, with the intent to identify the challenges, lessons and opportunities for advancing SEA in offshore planning and impact assessment. Results demonstrate that SEA can help inform and improve the efficacy and efficiency of project-based assessment in the offshore sector, however weak coordination between higher and lower tiers limit SEA's ability to influence planning and development decisions in a broad regional environmental and socioeconomic context.

2.1 Introduction

The shift from managing individual projects to more regional and integrative approaches has begun to take root internationally in environmental management. This is also the case in environmental assessment (EA), which has been subject to much criticism for its focus on individual project actions (see Harriman Gunn and Noble 2009a; Cashmore et al. 2008). The constraints of project-based EA are widely recognized and include inadequate consideration of cumulative effects and development thresholds (Duinker and Greig 2007); insufficient regional baseline data to detect environmental change (Dubé 2003); loss of mitigation opportunities because assessment occurred too late in the development sequence (Vicente and Partidário 2006); and limited public influence over the direction of development activity (O'Faircheallaigh 2010). As a result, there is now a collective understanding that EA must go beyond the evaluation of site-specific project impacts to consider the broader policy and regional planning context in which development projects operate (Noble and Harriman 2008; Partidário 2000).

The need for a strategic approach to EA is especially recognized in the context of offshore hydrocarbon planning and development (see BSStRPA 2008; Horvath and Barnes 2004; Kinn 1999; Davey et al. 2000;). Offshore hydrocarbon projects operate in a large network of infrastructure; the risks to marine environments are often high on a global scale (Campagna et al. 2011; Wagner and Armstrong 2010); and by their very nature such projects require regional and strategic coordination (Spiridonov 2006; WWF 2005; Salter and Ford 2001). Public attention has typically been less concerned with offshore versus onshore energy developments (see Haggett 2011). But, with recent spill events in the Gulf of Mexico drawing international attention to the offshore sector (see Amos 2011), there is a growing international debate about the risks and benefits of offshore hydrocarbon activity and the need for improved planning and impact assessment processes.

Recognition of the limits of project-based EA in proactively planning and managing oil and gas activities in offshore environments has been instrumental to the adoption of regional and Strategic Environmental Assessment (SEA) systems (Environment Canada 2004; Horvath and Barnes 2004). There are now various forms of SEA for offshore energy planning and impact assessment ongoing internationally (see Hasle et al. 2009; Wagner and Jones 2004). However, while the potential benefits of and rationale for SEA are well argued (Johnson et al. 2011; CCME 2009; Harriman Gunn and Noble 2009a; Environment Canada 2004), there have been

few empirical investigations of SEA in the offshore oil and gas sector with a view to understanding the efficacy of SEA and, in particular, its influence on planning and development. The majority of research on SEA in general, and in the energy sector in particular, has focused on terrestrial systems (see Jay 2010; Noble 2008; Jackson and Dixon 2006; Marshall and Fischer 2006; Noble 2002). There has been very little consolidation of international experiences with SEA offshore, and thus few opportunities for transferable learning.

There is a need for a better understanding of the nature and efficacy of SEA in the offshore energy sector and its role in planning and development decisions. This is particularly important for emerging energy frontiers, such as Canada's western Arctic, where planning for offshore hydrocarbon development continues to occur on a project-by-project basis (Voutier et al. 2008). As international attention turns to the Arctic to meet global energy demands, there is increased recognition of the need to advance upstream impact assessment and decision-making to plan for energy development prior to ramping-up individual energy projects (see Doelle et al. 2012; Elvin and Fraser 2012; Arctic Council 2009; WWF 2005). However, as Ketilson (2011) explains, both industry and government remain sceptical about SEA offshore, noting its 'unproven benefits.'

This paper examines international experiences with SEA in the offshore oil and gas sector and the lessons emerging from practice. Based on SEA offshore in Norway, Atlantic Canada and the United Kingdom (UK), the objective is to identify common lessons and opportunities to advance the efficacy of SEA as a means to influence offshore hydrocarbon planning and development decisions. The term 'SEA' is used to be inclusive of both legislated and informal SEA, including regional EAs and both single and multi-sector strategic planning and assessment frameworks. In the sections that follow, SEA is introduced in three international offshore systems, followed by an analysis of SEA practice and its influence on offshore oil and gas development decisions. The paper concludes with a discussion of the lessons emerging and the implications for advancing SEA for offshore planning and assessment.

2.2 International Systems of SEA Offshore

Three internationally recognized cases that are distinct in both the nature and context in which SEA operates in the offshore environment were identified: Norway, Atlantic Canada and the UK. In doing so, the aim was to derive common lessons and challenges that may transcend regional

context. Norway's offshore system provides a circumpolar context, focused on an integrated regional planning model; Atlantic Canada is sector-based, with SEA operating under a non-legislated federal directive; the UK offshore sector is mature, with SEA legislated under the EU Directive (2001/42/EC). Environmental assessment offshore in each of the three jurisdictions is well documented. For example, Hasle et al. (2009), Ottersen et al. (2011), and the Norwegian Petroleum Directorate (NPD 2009) detail Norway's offshore regulatory framework. In Atlantic Canada and the UK, the offshore system and associated EA and licensing regulations are described on the respective websites of the responsible authorities, including the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in Atlantic Canada (see http://www.cnlopb.nl.ca/), and the Department of Energy and Climate Change (DECC) in the UK (see http://offshore-sea.org.uk). Below a brief overview of each regulatory system is provided so as to offer context before presenting the analysis of SEA and its role and influence in each of the offshore regions.

2.2.1 Offshore Norway

Norway's offshore oil and gas reserves are beneath the North, Norwegian and Barents seas. Before offshore areas are made available for licensing preliminary EAs, and in some cases regional EAs (REAs), are carried out by the Ministry of Petroleum and Energy. Regional EAs were introduced under the *Petroleum Act* in 1997 in an effort to move away from piecemeal assessment and obtain timelier, efficient, and comprehensive assessment results (Salter and Ford 2001; Kinn 1999). Regional EAs have been completed in both the North Sea and Norwegian Sea. Companies proposing to operate in an offshore area also required to conduct a Plan for Development and Operation (PDO), which includes a site specific EA (see Bjørnbom et al. 2010). In 2006, Norwegian Parliament introduced an additional framework, an Integrated Management Plan (IMP), to capture all sectors in the offshore environment including oil and gas, fisheries, and shipping. Introduced first to the Barents Sea, similar plans for the Norwegian Sea commenced in 2009, with an IMP for the North Sea in the development phase (NPD 2009). Several sector-specific assessments in the Barents Sea were completed between 2002 and 2005, led by the relevant ministries responsible for oil and gas, shipping, and fisheries. Aggregate results have been used to inform IMP development by assessing total impact, identifying knowledge gaps and conflict areas, and establishing ecosystem-based management for existing

and new activities in the region. The Goliat project, discovered in 2000, approximately 50 km southeast of Snøhvit, was the first oil development project approved in the Barents Sea in the area subject to the IMP.

2.2.2 Offshore Atlantic Canada

In Atlantic Canada, oil and gas activity occurs offshore the provinces of Newfoundland and Labrador, and Nova Scotia. An independent joint federal-provincial petroleum board has been established in each province to manage hydrocarbon activity. The C-NLOPB, for example, is responsible for oil and gas activity offshore Newfoundland and Labrador and reports to both the federal and provincial governments. Offshore petroleum activities that require authorization by the C-NLOPB are also subject to EA pursuant to the federal *Canadian Environmental Assessment Act*. For proposed petroleum exploration and production, the C-NLOPB is designated as the federal authority and typically the lead responsible authority for EA authorization. In 2002, the C-NLOPB adopted a policy decision to start conducting SEAs to assess offshore regions prior to opening areas for development. This policy decision eventually became a requirement under the federal Cabinet Directive on SEA. The objectives of SEA under the C-NLOPB are to inform licensing in prospective offshore areas and to help streamline issues and considerations for subsequent project EAs. To date, six SEAs have been completed by the C-NLOPB, but the three major production facilities currently operating offshore Newfoundland and Labrador all exist in a 'non-SEA' region.

2.2.3 Offshore United Kingdom

The DECC is the principal regulator of the offshore oil and gas industry in the UK. In 1999, in anticipation of the EU Directive (2001/42/EC), the then Department of Trade and Industry instituted SEA as part of the offshore licensing process to determine which areas should be offered for licensing. Although SEA was only incorporated into law through the Directive in 2004, it was being carried out offshore through less formal arrangements. The intent of the Directive (Article 1) is to "provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes..." including offshore oil and gas plans and programs. Licensing for oil and gas offshore UK is based on quadrants; there are eight in total, each with a corresponding

SEA. At the project tier, an environmental study must still be carried out for developments to assess the likely impacts of proposed offshore activity, which is then submitted to the DECC for authorization. The Laggan-Tormore project is one such example of a recently sanctioned offshore gas project in the area of SEA 4 and 5, approximately 140 km northwest of the Shetland Islands. The project will involve construction of an offshore subsea production system, more than 140 km of pipeline, and an onshore gas terminal (see http://www.laggan-tormore.com/).

2.3 Examining International Practice

Following the lead of previous reviews of SEA (see Noble 2009; Dalal-Clayton and Sadler 2005; Jones et al. 2005), each offshore system was reviewed based on a set of normative criteria derived from the SEA evaluation literature (see Gunn and Noble 2011; Noble, 2009; Fischer and Gazzola 2006; Gibson et al. 2005; Jones et al. 2005) (Table 2-1). There is no universal set of criteria that is equally applicable to all SEAs (Partidário 2000; Fischer 2002); however, adopting a normative approach does provide a common framework to analyze SEA practices across different contexts (Noble 2009). This was important to the study as the focus was on identifying common lessons, opportunities and constraints that may transcend regional or regulatory context. The list of criteria was simplified in comparison to many of the above mentioned reviews of SEA performance. The objective was not to 'score and compare' performance across the three international SEA offshore systems per se; rather, the objective was to examine the nature and efficacy of SEA as a means to influence offshore planning and development decisions and to identify and explain common opportunities and constraints across the three cases.

The three systems were reviewed using regulations and impact assessment and planning reports, complemented by semi-structured interviews. A total of 45 practitioners, regulators, industry representatives, and environmental and other non-government organizations (NGOs) directly involved in SEA offshore in the respective regions were contacted for an interview. A total of 20 interviews were conducted: 9 in Norway, 7 in Atlantic Canada, and 4 in the UK. No UK regulators were willing to participate, thus potentially influencing the nature of the results in the UK context. Continued efforts to secure UK regulator participation also influenced the response rate: of the 25 non-respondents, 10 were UK regulators. The balance was industry and environmental and other non-government organizations distributed equally across the three cases. All participants were asked a series of semi-structured questions based on the criteria

identified in Table 2-1. In each jurisdiction an offshore development project was identified to examine how SEA had influenced offshore activities at an operational level, and to understand better the specific regulatory system. Interview results were organized, coded thematically and analyzed using QSR NVivo© v.9, a computer software program designed to classify and manage qualitative information. Results are presented in the sections below on the basis of each criterion.

Table 2-1. Criteria for International Reviews of SEA Offshore

Criteria	Description
Structural Requirements	*Institutional Foundation for SEA*
1. Objectives and purpose	▪ Clear provisions or requirements to undertake SEA; clear purposes and objectives
Procedure	*Process components concerning the various methodological and process elements of SEA, i.e. the practice*
2. Timing	▪ Early enough to address deliberations on purposes and guide initial review of plans, policies or programs
3. Participation	▪ Opportunity for meaningful participation and deliberations; ability to influence decision-making
4. Tiering and coordination	▪ Assessment undertaken within a tiered system of EA, planning and decision-making; defined linkages between subsequent activities
5. Alternatives	▪ Comparative evaluation of potentially reasonable alternatives or scenarios
6. Cumulative effects	▪ Consideration of cumulative effects
Output and Results	*Influence SEA has on decision-making and project-based EA, including learning and process improvement*
7. System-wide learning	▪ Opportunity for learning and system improvement through review framework; monitoring and adaptation; cyclical feedback
8. Influence on decision-making	▪ Demonstrate influence to downstream initiatives and activities

2.3.1 SEA Objectives and Purpose

Norway's multi-sectoral IMP is intended to provide a sustainability framework to ensure the co-existence of different industries within an offshore area. All interviewees said that the objectives and role of the IMP process offshore were clear. As described by one government participant, offshore energy planning and assessment represents "two kinds of systems coming together – the

IMP is strategic in nature, providing authorities with a holistic framework to base decisions on, whereas the regional EAs are spatially organized, and informed, in part, by the management plan."

In the case of Atlantic Canada, SEA is undertaken at the program level under the authority of the C-NLOPB prior to issuing bids for exploration. One NGO participant described SEA offshore as a "complicated process to navigate," but in terms of the mandate and structure of SEA "the drivers are clear." An industry participant similarly noted that the objectives of SEA are well defined, but cautioned that "those in the public domain may not fully appreciate the process or understand its benefits." As one regulator explained, SEA offshore is different in depth and content to those performed at the federal level under the Cabinet Directive, which were described as "policy instruments." SEA offshore was said to not fully conform to the view of SEA under the Cabinet Directive; not fitting "the pure SEA definition," but reflecting the C-NLOPB's function as an oil and gas regulator who makes decisions on the issuance of licences rather than policy options.

Though in the UK the mandate and purpose for SEA are laid out in legislation, one SEA consultant explained that "there is some flexibility in terms of objectives; you can approach it from a mechanistic manner, or set the objective of ensuring the plan or program being assessed does not link to environmental degradation." There is a prescribed mandate and regulations to guide SEA, but one academic participant noted "it is just a long approval process, and the higher level components get lost." This is consistent with the views of an industry participant who, based on direct involvement with the DECC for offshore licensing and environmental permitting, said that the experience was such that "SEA's intent is unclear and expectations on what it will deliver, nominal." Another academic participant summed-up, when it comes to the purpose and mandate of SEA at the level at which decisions are made about specific developments, "SEA is not as significant a tool as you think."

2.3.2 Timing

Industry characterized Norway's IMP as allowing regulators to ask, early on, "do we know enough, do we have enough knowledge in these areas to approve further activity?" One industry participant identified the IMP as a valuable process to collect information to aid with early decision-making concerning a policy, plan or program. A regulator explained that the process is

about determining how to move forward and, in the context of offshore hydrocarbon development, to determine where future leasing could occur. The participant went on to explain that timing was much different between the Barents Sea and Norwegian Sea, as much petroleum activity has already occurred in the Norwegian Sea, adding that "the IMP does not have the same function in the Norwegian Sea as the Barents Sea when it comes to creating a framework and conditions for planning." The Barents Sea IMP occurred early enough to provide substantial input and informed policy and subsequent programs and, as a result set out stringent environmental requirements for projects such as the Goliat development (see Knol 2011).

Informing offshore planning and the issuance of rights was identified as one of the major intents and benefits of SEA offshore Atlantic Canada. SEAs are initiated only in areas where no offshore oil and gas operations currently exist. As such, SEA is intended to establish a baseline condition for a potential licensing area and the results used by the C-NLOPB for licensing decisions and, in principle, by industry to augment their baseline assessment in subsequent project EAs. In practice, however, whether this early baseline assessment is useful to project EA is unknown. There are no projects operating in SEA areas. In the Jeanne d'Arc Basin, for example, Canada's most active offshore oil field, there are several operating projects but without the guidance of SEA. Projects in the area have already been subject to federal EA, and industry and regulators alike noted that there existed a sufficient information base. As one industry participant explained, we are "unsure if a SEA could create a greater understanding of new issues."

Under the UK system, SEA is intended to inform decisions being taken about a plan or program – whether to proceed, modify it, or abandon it altogether. One consultant explained that SEAs occur sufficiently early, illustrating that "there are instances where we recommend holding off on blocks to offer." An industry participant, however, currently operating in SEA areas 4 and 5, noted that if the SEA was not complete before the Laggan-Tormore project it would have not made an operational difference, since studies performed for the project would have been derived from source data regardless. Evidently, in this case, a license had already been granted to the proponent in an earlier round. The mature nature of UK offshore sector means that SEA is used to inform decisions for subsequent licensing rounds, but frequently in areas where activity already exists and licenses are already let.

2.3.3 Participation

Industry described Norway's IMP process as "an effective approach to bring aboard stakeholders," while "complying with principles of democracy and stakeholder engagement." The consultation process for offshore development has evolved since the first IMP, after industry "criticized authorities that the consultations performed were not as open as the ones the oil and gas industry had to follow in EA." The process was modified with a stronger emphasis on engagement and, in 2006, a working group with representatives from relevant authorities, sectors and research institutions was established to facilitate more direct communication between stakeholders (OSPAR 2010). This level of IMP engagement and consultation, however, does not eliminate conflict over project developments. The Goliat project, for example, was subject to significant controversy (see Bjørnbom et al. 2010) due to it being the first oil project scheduled for the Barents Sea. But, the proponent identified considerable value from the IMP, particularly during project consultations, because there was an opportunity to demonstrate how project design and mitigation measures were linked to strategic government-led plans and policies.

In Atlantic Canada, a regulator explained that "the absence of SEA was the 'hole' in the regulatory process prior – there were mechanisms for participation in project-EA, but the licenses have already been issued." A C-NLOPB participant further noted that it just "makes sense as an initial engagement measure...to be involved in the SEA to get in on the ground to help inform what might come later." In the case of the Labrador Shelf SEA (Sikiumuit Environmental Management 2008), for example, the local Nunatsiavut Aboriginal government jointly determined with the C-NLOPB what mitigation measures and restrictions should be applied within the offshore area for future developments. SEA provided an opportunity for stakeholders to contribute early in offshore planning and assessment. However, because the focus was at the pre-licensing stage, there was limited industry involvement. A C-NLOPB participant noted "industry has on rare occasions provided comments to SEAs, through the public process, but have tended not to be represented...and instead have been interested bystanders from a SEA front."

Under the UK system, the Directive requires public consultation – emphasizing consultation with inter-alia, environmental authorities and public participants. Consultation meetings are open to all public, and when a SEA report is released public notifications are issued. However, an industry participant maintained that those who show up to meetings and

provide input, particularly at the SEA scoping stage, are typically government departments, advisors, and environmental interest groups. One academic participant explained that engaging with the public becomes more difficult as development moves offshore, maintaining that this challenge "seems to be as a result of impacts being less direct and tangible at an individual level." Further, the scope of SEA offshore is limited to plans and programs, which may reduce the capacity to publically debate policy alternatives (see Bina 2008b). As a result, one academic participant suggested that the public view of SEA is one of a formality and a process conducted in support of offshore development.

2.3.4 Tiering and Coordination

Norway's IMP was described by a government participant as providing "the big picture" of where activity can occur and what conditions must be placed on petroleum development (e.g., discharge, drilling, and exploration restrictions), which are enforced by the Ministry of Petroleum and Energy. Companies then perform a detailed EA, referring back to the IMP conditions. Before amendments to the *Petroleum Act* (1997), PDO applications and EAs were prepared on an individual project basis, receiving much criticism from industry due to the duplication of work for companies, resulting also in narrowly scoped and redundant EAs. That said, the Barents Sea IMP is not tiered toward individual field developments and is not necessary for the approval of new developments; it focuses holistically on all activities, and not specific offshore oil and gas development operations. In the Norwegian Sea, REAs fulfill a similar role to help guide project activities and avoid duplication and redundancy of assessments, but are tiered specifically toward offshore petroleum activities. As such, there has emerged new debate as to whether there should be two regional-type impact assessments for all offshore regions, with one geared specifically toward petroleum activities.

In Atlantic Canada, tiering can only be described in terms of intent, as no projects are operating in areas where SEAs have been completed. One regulator contended that SEAs tend to focus on sensitive areas, noting that not only is that important information for the C-NLOPB but also "from a procedural fairness point of view, it describes the sensitivities in the wider area for any company that wants to bid on a parcel." The C-NLOPB's perspective on tiering is related to its purpose for conducting SEA, being an early assessment that can inform subsequent permitting and the issuance of licences. Using seismic surveying as an example, if there are ecologically

sensitive areas identified through SEA, the intent is that an EA would focus in detail on these areas as opposed to focusing on areas that may not be regionally significant. A consultant to industry noted that SEA could be used as a reference document for industry, adding that "it is a lot easier for industry to use a SEA rather than having to go back to all the original sources to locate information," but at the same time cautioned that from a project permitting perspective "SEA is not an exhaustive compendium." One NGO participant similarly described SEA as a potential "guide for further activities," but noted that this can also be detrimental from a socioeconomic perspective in that the current absence of socioeconomic considerations at the strategic tier can carry forward to the project tier.

SEA at the licensing stage offshore UK is well defined in respect to regulatory requirements to ensure potential environmental implications of proposed activities are properly assessed prior to consent and permits being granted (see Thérivel and Walsh 2006). In practice, however, the application of SEA to inform regulatory licensing decisions has been relatively limited and static to this higher tier, with seemingly trivial input to subsequent lower level assessments. From the perspective of one operator, the two SEAs in which the Laggan-Tormore project exists had "no implication or influence on the project or EA." Another industry participant noted that the only way the SEA linked to an offshore project "was as a reference document," adding that, even with nine years of experience in the UK offshore oil and gas industry, (s)he was "unsure how SEA is used by regulators…"

2.3.5 Alternatives

Alternative scenarios were not explicitly identified in Norway's IMP; however, action thresholds in environmental monitoring programs were present to inform future scenario planning (Massachusetts Ocean Partnership 2009). The IMP process was based on multiple sector-based EAs to produce a regional picture of existing impacts, intended to inform management plans and courses of action for future development. In principle, the concept of alternatives evaluation is inherent to the IMP as the process is focused on preferable options for development and conservation in the region, including the consideration of future changes or threats to planning, such as climate change.

In Atlantic Canada, the Labrador Shelf Offshore Area SEA contains in its objectives and purpose statement reference to the importance of alternatives in SEA, citing Thérivel et al.

(1992); however, the alternatives considered in the SEA are inherently restrictive as the C-NLOPB makes decisions only as to issue licences or not, and does not address broader policy scenarios or offshore development trajectories. One regulator explained that though SEA would conventionally address broad alternatives, the C-NLOPB is "an offshore oil and gas regulatory body, so the only decision we are making, subject to government sanction, is whether or not to issue licences, versus the broader energy questions." 'Alternative means' are identified in offshore SEAs that relate to licence issuing decisions and the potential implications of licensing, including such matters as seismic versus exploratory drilling, conditions on the location and timing of activities and, in the Labrador Shelf SEA, hypothetical development situations and potential outcomes.

Alternatives are considered in UK SEA, as a requirement of the Directive and prescribed in regulation. In practice, however, one consultant explained that "they are generally a simplistic set of alternatives," which commonly include to carry forward the draft plan as proposed; to not proceed with the plan; or to modify the plan with spatial or temporal restrictions. Feedback from NGOs has targeted the restrictive nature of alternatives, and the need to consider broader alternatives, such as more efficient energy options. However, similar to Atlantic Canada, these policy issues are beyond the mandate of the offshore regulator, and are outside the scope of the specific tier at which SEA is applied. The omission of policies from the scope of the EU's SEA Directive is thought to be a serious deficiency by some (Fischer et al. 2002, cited in Jay 2010); however, others, including a consultant who was directly involved with SEAs 1-8, said that SEA documents would "become enormous and mechanistic" and would not be as effective if a policy direction was added to decisions.

2.3.6 Cumulative Effects

The various uses of Norway's offshore regions and its resources have traditionally been assessed and managed separately (Ottersen et al. 2011). Under the IMP, there emerged an opportunity to better understand the cumulative effects of the activities of different sectors in the offshore region, and to better assess the effects of new activities and the ability of ecosystems to adapt and respond to change (OSPAR 2010). During the Barents Sea IMP review, however, challenges arose in the evaluation of cumulative effects as the scale applied to evaluate impacts and enable cross-sector cumulative effects assessment (CEA) turned out to be of little practical value. This

was due to the different intents and values imposed by each sector when performing their assessments (Ottersen et al. 2011), and the lack of coordination of common variables and indicators to measure cumulative change.

In Atlantic Canada, CEA does not formally occur until the project EA tier. A consultant to industry acknowledged that it would be "worthwhile if SEA went one step further and did a CEA, it would help streamline the process...rather than each project taking it upon themselves." Interestingly, however, a NGO participant advocated against a more regional approach to CEA maintaining that such an approach is not valuable or practical "unless you have a specific proposed activity in an area and determine what you need to look at." This participant viewed the regional concept of CEA under SEA as too broad, adding that SEAs, when dealing with cumulative effects, never identify a specific activity (e.g., seismic drilling), and without these parameters to inform models and monitoring it remains unclear what cumulative effects are being assessed. An industry participant agreed, adding that "the accuracy of cumulative effects is one thing that varies at the SEA level, but is spoken to more adequately at project level EA."

Offshore UK, SEA Directive 2001/42/EC does provide an opportunity to address cumulative effects at the strategic level. The Directive requires the consideration of "likely significant effects ...including cumulative and synergistic effects..." In principle, the UK approach provides a regional context and opportunity to assess the cumulative significance of activities as an integral part of the SEA process (see Cooper 2004). In the offshore environment, however, one consultant commented that CEA is considerably difficult because there are a lot of unknowns, and went on to explain that at the strategic tier you "can conjecture cumulative impacts as best you can; at the project level, you can consider specifics, but when you extend to national or regional level it is a challenge, an imperfect science."

2.3.7 System-wide Learning

Both government and industry participants indicated that Norway's IMP has helped inform the public and alleviate misperception about oil and gas industry impacts to the marine environment, and that a significant amount of learning has occurred as a result of actors sharing expertise and knowledge. One consultant considered learning a defining feature of the IMP, with an opportunity to revisit policy through regulator-based performance monitoring and the deployment of new assessments every five years. Ongoing marine research and mapping efforts

to identify data gaps and integrate new data on long-term effects with risk assessment tools was identified as core to ongoing IMP improvement. Described by Knol (2010: 8) as a "learning process," the IMP incorporates ongoing and *ex post* evaluation through adaptive management strategies in environmental monitoring programs, and the sharing of information between sectors and through the inclusion of external scientific advisory committees (see Massachusetts Ocean Partnership 2009). A participant from Norway's offshore industry noted that one of the most important elements resulting from the IMP in recent years has been that each industry is treated equally and there is now an ability to apply similar assessment methods across sectors to identify impacts to the offshore environment.

System learning and improvements in Atlantic Canada have occurred through increased efforts to engage the public and interest groups, and were identified by the C-NLOPB as important to the evolution of SEA. The first two offshore SEAs conducted, for example, were performed with limited engagement of the public. The C-NLOPB recognized the need and value to ensure a more objective and participatory analysis and created working groups, with external stakeholder representation, to contribute to scoping and technical reviews. Multiple participants concurred that by involving interested or affected actors the SEA process has been enhanced and better informed as decision-making is now subject to greater deliberation. Improved participation was said to have led to the inclusion and consideration of new information raised through dialogue between regulators and fishers who have specific local knowledge of the marine environment. Others noted improvements in the spatial boundaries of SEAs. Based on lessons from the first SEA in the Laurentian sub-basin, a C-NLOPB participant explained that the spatial boundary was too small and did not align with SEA's intent. The C-NLOPB subsequently broadened the areas of its offshore SEAs to avoid "creating patchwork assessments."

Similar learning was identified by UK participants. The UK's first offshore SEA, for example, was limited in opportunity for public input – it was described by one consultant as an "internal exercise." Comparable to Atlantic Canada, subsequent SEAs have evolved to include more opportunities for participation (see ODPM 2005). The creation of a steering group, noted one consultant, "has helped draw in a fairly wide range of stakeholders with interest in the area." Feedback through monitoring and evaluation was also identified as an important opportunity to provide information that can be used to identify specific performance issues, and inform

subsequent decision actions. The Directive itself was also reported to have modified certain aspects of SEA practice, with more tailored requirements, specifically adding indicators to objectives to establish stronger links with monitoring and the evaluation of predicted effects. Similar to Atlantic Canada, however, socioeconomic assessment was identified as an area where little learning and improvement seems to have occurred. One consultant noted that SEA could "fulfil the Directive without going into socioeconomic impacts."

2.3.8 Influence on Decision-making

The IMP approach offshore Norway helped authorities create an intra-directorate plan to inform future development. Based on the IMP's results, measures and requirements to prevent and reduce negative impacts have influenced decisions made by the Ministry of Petroleum and Energy, such as restrictions or conditions for industry operations. In the case of the Goliat project, for example, an industry participant maintained that the IMP and requirements from authorities have made it easier to focus on project-specific issues and has heightened the need to take a precautionary approach to operations. For industry, an important outcome of the IMP has been continuous research and development to find technical solutions that are economically feasible to comply with strict environmental regulation (see Hasle et al. 2009). Already, industry has started collecting information requested in the IMP's environmental baseline and monitoring programs to help address knowledge gaps. Other industry proponents perceived the IMP as having a positive influence on project operations, indicating that regulatory authorities have a better basis for decisions, which leads to greater predictability for industry. Coordination between REA and project EA in the Norwegian and North seas were reported to have also resulted in improvements in the efficiency and effectiveness of the overall review process (see Hasle et al. 2009; Kinn 1999).

In Atlantic Canada, SEA has enabled early-stage decision-making for offshore regulators. For proponents, SEA is promoted as supporting investment decisions, and providing a reference point for baseline knowledge. For example, through the identification of sensitive fish spawning areas in an SEA, requirements would be set for project-specific EAs concerning the timing and location of drilling operations. The Orphan Basin SEA (LGL 2003) findings, for example, demonstrate how SEA was designed to inform prospective activity in the study region, whereby special, non-standard or strict mitigation measures have been identified to be applied to future

developments because of the need for special planning around sensitive marine habitats. Based on the views of participants, SEA in Atlantic Canada, at least in principle, offers a valuable framework to inform downstream planning and mitigation activity; however, the demonstrated influence could not be verified in absence of offshore operations in the SEA areas.

Under the UK system, SEA assists responsible authorities to determine what areas may be subject to activity (i.e., exploration licensing), and places certain spatial or temporal conditions upon activities in those areas. One consultant explained that SEA has "undoubtedly had an influence upon offshore oil and gas decision-making," referencing the identification of exclusion areas when blocks are determined inappropriate for petroleum development. The downstream influence of SEA on project EA, however, appears weak with real SEA influence restricted largely to higher level decision-making. The decisions made by responsible authorities have some bearing on offshore operations; however, this influence was not apparent at the operational level given industry participants' experience and view that "SEA has had no influence on planning or project-based EA." Industry participants maintained that there is no expectation of what SEA is expected to deliver, and "unless the project is going against the SEA report, then SEA has no real influence on decision-making." This disconnect was further compounded by a view held by one academic participant, "that developers and consultants have not caught on to the idea or notion of strategic," and industry's viewpoint that the "system in place for offshore oil and gas regulation is spread thin on government capacity terms, which impedes implementation and operations." The most obvious limitation identified was the lack of a tiered system and decision-making that carried forward to lower level EAs, owing perhaps to a range of interlinked factors, including: the DECC is said to be doing a poor job of communicating the purpose of SEA; operators are said to be missing the potential value and application of SEA; and SEA is understood to be confined to strategic planning decisions.

2.4 Lessons and Implications for Advancing SEA Offshore

The goal of this paper was not to 'test' the performance of SEA offshore across jurisdictions, as the institutional context of SEA varies considerably (see Hilding-Rydevik and Bjarnadóttir 2007). Rather, the goal was to facilitate a better understanding about the roles and constraints of SEA in the offshore sector, and to identify common lessons, challenges, and opportunities that may transcend context in order to advance SEA as a tool for the planning and development of

offshore oil and gas. In the sections that follow a number of observations and lessons concerning the general practice of SEA in offshore environments that emerged from the three cases are discussed.

2.4.1 Normative versus Applied SEA

First, the purpose and deliverables of SEA in the offshore environment often differ from the ambitious expectations about SEA identified in the academic literature, and by project proponents and other stakeholders. In the UK, for example, SEA offshore is restricted to the higher tier of identifying areas for licensing. Though requirements for SEA are set out in regulation, industry still perceived a lack of clarity as to the purpose of SEA and how it informed or improved decisions at the project level. In Atlantic Canada, the regulator's view and application of SEA as a tool for licensing decisions was in contrast to the academic view of SEA, and also in contrast to SEA as described under the Canadian federal SEA directive. Such differences lead to false expectations about what SEA is intended to deliver offshore, and to whom, and dismay with the overall process.

The results suggest that what SEA can and should deliver in the context of the offshore oil and gas sector may not be consistent with the expectations of SEA that have been developed based largely on land use planning and 'on-shore' policy and good-practice frameworks. The objectives, constraints, and intent of SEA in the offshore sector need to be made clear for all interested parties if the results of the process are to be a demonstrated, accepted and worthwhile part of planning and development (see Dalal-Clayton and Sadler 2005). For emerging offshore energy frontiers, such as Canada's western Arctic, there is a need to clearly establish the scope and intent of SEA prior to ramping-up individual energy projects. In this way, the relationship between strategic approaches and the intended contribution to project-based actions can be articulated at the outset. The pre-existence of project operations, EA and prior licensing approvals in Atlantic Canada and the UK appeared to be a constraint to stakeholder's understanding of the actual role and added benefits of SEA.

2.4.2 Timing, Role and Influence

Related to the above, the benefits of SEA in the offshore environment hinge not only on connecting results to operational decisions and activities, but also on ensuring that SEA is

conducted early enough to effect change and influence development actions (see Harriman Gunn and Noble 2009b). Though in each of the cases reviewed the timing of SEA was, in part, dependent on the regulatory context and purpose of the assessment, timing proved to be critical in all three cases in ensuring how much influence SEA actually had on downstream decisions. In the Barents Sea, for example, where petroleum activity was the main driver for the IMP, early application allowed authorities to measure existing impacts and identify sensitive areas to inform future planning and decision-making in a relatively untouched, yet politically contested and ecologically sensitive region. Alternatively, in the UK, where several project developments had preceded SEA, the merit of its application appeared weaker due to the lack of input to on-going operations. In certain areas offshore Atlantic Canada, namely the Jeanne d'Arc Basin, SEAs have not been conducted specifically because projects have already been initiated and SEA was seen as adding little value in such circumstances.

Though early application is best, before licenses are issued, that there is still merit to SEA coming late in the offshore planning and development process – where licenses or projects already exist. Ketilson (2011) reports stakeholder concerns in Canada's western Arctic that once rights are issued, the window of opportunity for SEA has closed. Evidently SEA late in the decision process is less influential in setting strategic direction; however, SEA post-rights issuance or post-project approval is important to both industry and regulators for regional monitoring and feedback for improved project performance, risk management, assessing the potential cumulative impacts of future development, and determining the need for policy or planning intervention to adjust the current development trajectory.

2.4.3 Alternatives Consideration versus Mandate

Alternative assessment is identified as core to SEA (see Fischer 2007; Noble and Storey 2001) however, the nature of alternatives considered in each of the three systems examined was inherently restrictive when compared to the academic expectation, but was consistent with the context and intended purposes of SEA in each offshore system. In the UK and Atlantic Canada, for example, the degree to which alternatives could reasonably be considered was constrained by the tier of application at the plan or program level, the regulator's mandate of issuing rights, and the level of pre-existing offshore development. Those alternatives that were considered were limited to the same types of alternatives often considered at the project tier. The absence of

broader policy-level alternatives was a noted deficiency in the SEA process. However, others argued that incorporating policy into SEA offshore may sound reasonable in principle, but in practice would be overly ambitious and regulators, who are responsible largely for rights issuance, have neither the mandate nor capacity to undertake such a broad assessment.

2.4.4 Participation, Interest and Influence

Each jurisdiction recognized the importance of public participation, reinforcing SEA's communicative potential as a means to influence decisions (see Runhaar and Driessen 2007). The nature of engagement, however, varied considerably. Participation in SEA is often promoted as providing greater opportunity for stakeholders to inform the direction of decisions about development (see Sinclair et al. 2009). As evidenced by local Aboriginal engagement in setting mitigation standards for the Labrador Shelf SEA, Atlantic Canada, even at the strategic tier local communities can influence decision outcomes. The case of the Goliat project in the Barents Sea illustrated an additional, but indirect benefit of participation with observable benefits accruing to a project proponent. Here, public engagement in the IMP at the strategic tier provided a knowledge base for stakeholders such that the proponent was able to demonstrate to the public, at the project tier, the consistency of project mitigation actions with higher level IMP goals and priorities. The result was increased efficiencies in EA for the proponent. In the UK, however, there has been much less direct public engagement, confirming Sinclair and Diduck's (2009) observation that the lack of participation at the strategic level can result in cynicism and a perception that decisions are foregone conclusions.

The challenge for SEA reflects what Heiland (2007) describes as the participation paradox – there is, in principle, greater opportunity for engagement and influence at the strategic tier, but often less interest in engagement due to the high level and, often abstract nature of decisions. This challenge is exacerbated in the offshore context, where biophysical impacts are often geographically removed from the public and traditionally deemed 'out-of-sight, out-of-mind.' Recent media attention to Arctic energy exploration and to the risks of offshore development following the Gulf of Mexico spill event may heighten, at least in the short term, public interest; however, over the long term, ensuring meaningful participation in SEA offshore will require a much more concerted effort on behalf of regulators than what has traditionally been the case. Early and meaningful participation is needed to determine the acceptable level of

public risk associated with the development of offshore hydrocarbon resources, and to prepare communities for the potential onshore socioeconomic impacts of development.

2.4.5 SEA Offshore for Onshore Impacts

Socioeconomic issues received relatively limited attention in each of the three offshore systems reviewed. Results illustrated that socioeconomic issues, when considered, focused primarily on fisheries, presumably as the main pathway of socioeconomic impact. Notwithstanding recognition in the US mid-Atlantic offshore industry in the mid-1970s that onshore communities need to be considered part of the planning and assessment process for offshore development (see US Office of Technology Assessment 1976), the onshore impacts of offshore development, specifically the onshore geography of benefits and risks, is largely absent from offshore SEA systems. For example, directives on SEA can be fulfilled offshore both in Atlantic Canada and the UK with only limited attention to socioeconomic issues.

There is a need and an opportunity for SEA offshore to adopt a much broader approach to socioeconomic issues than solely marine resource use conflicts, to contribute to community planning in advance of offshore development. Norman (2005) argues that the well-being of coastal communities should be paramount in marine resource decision-making, and there is a need to focus on what the socioeconomic implications will be in the region surrounding the most prospective basins. SEA provides a window to integrate socioeconomic considerations early in the planning of offshore oil and gas systems (see Noble and Harriman 2008) and, as such, there is a need for increased attention in SEA to identifying what "communities…need to be able to do and know when confronting the opportunities, threats and challenges of offshore oil and gas" (Norman 2005: 108).

2.4.6 Capacity and for Cumulative Effects Assessment Beyond the Sector

The potential for SEA as a tool to assess cumulative effects is well argued, but the benefits have not been clearly demonstrated in offshore practice. Results reveal that practitioner and regulator views of the value of SEA as a tool to assess cumulative effects offshore did not align with current academic literature on the subject. Duinker and Greig (2007), for example, amongst others, argue that CEA is ineffective at the project scale and a more regional, strategic approach to CEA is necessary. However, in Atlantic Canada participants argued that the strategic tier is

too broad and abstract for CEA, and that the project level, where there is more detail and information available concerning actual offshore operations, is the most appropriate tier for assessing cumulative effects. Perhaps the level of offshore activity in Atlantic Canada influenced participants' views on CEA, as many expressed the challenges of taking a regional approach to CEA in an area where relatively little activity occurs. Norway, on the other hand, offered a more favourable view of CEA beyond the project tier (see Salter and Ford 2001) - the high level of hydrocarbon activity in the Norwegian and North seas has been the subject of cumulative effects studies through REA for more than a decade. However, the multi-sectoral nature of early assessments under the higher-tiered IMP proved difficult to coordinate cumulative effects understanding.

The dynamics at play across all three jurisdictions appear to be consistent with Creasy's (2002) view that CEA beyond the project tier is difficult to implement because the agencies responsible for development often have neither the authority nor the capacity to address multi-sectoral cumulative effects. It can be concluded that the most significant constraints to CEA in offshore SEA systems are institutional and methodological rather than scientific and technical (see also Noble and Harriman 2008). Any institution established for SEA offshore must have the mandate and the capacity to assess cumulative effects beyond single-sector initiatives, to direct regional monitoring programs, and to ensure that SEA outputs are implemented in subsequent planning and project actions.

2.4.7 Tiering in Non-Tiered Planning Systems

Finally, although tiering is considered by many to be a major driver and benefit of SEA (see Fischer 2007; João 2005), the tiered forward benefits and influence of SEA were not fully realized in all three offshore systems. When realized, the benefits of the trickle-down approach were often subtle, if not indirect. Interestingly, only Norway's IMP process demonstrated a tiered forward planning system, and notably it was the only system that focused on multiple offshore resource activities and is not formally labeled as SEA. The Norwegian case illustrates how SEA can serve to streamline project-specific EA by demonstrating the consistency and compliance of a project's EA with higher-tiered offshore planning and management priorities. In contrast, offshore Atlantic Canada and the UK, though both formal, directive-based SEA systems, there was less evidence of tiering and downstream influence. In both jurisdictions, SEA

offshore is sector-specific and largely confined to facilitating strategic decisions about licensing offshore areas and, in the case of Atlantic Canada, providing regional baseline information. There were some obvious benefits, such as information being applied to assist regulators with exploration licensing decision-making and determining whether certain offshore areas, due to their ecological sensitivity, are suitable for development. However, many of the anticipated benefits associated with SEA were less apparent. In the UK, the SEA Directive assumes tiering of SEAs and EAs at different planning levels, and Article 3(2) of the Directive requires SEA for plans and programs to set the framework for future development and consent of EA projects (see Arts et al. 2005). However, beyond DECC licensing decisions the influence of SEA was less evident with seemingly trivial linkages to subsequent lower level assessments. The UK system, although well established under the SEA Directive proved limited in its ability to tier and influence decision-making at an operational level.

The mandate of SEA may simply be too narrow in offshore Atlantic Canada and the UK to have the broad influence and benefits often expected of it. While the true influence and efficacy may be tested best through the adaptation of offshore practices based on lessons emerging, it was recognized that tiering and influence may not be immediate in all cases and results may be long-term and delayed, if not too subtle to measure. International experiences demonstrate that, ultimately, the influence of SEA on subsequent actions and decisions is, to a significant extent, a reflection of the nature of inputs and objectives of the SEA process. It is difficult to realize the benefits of tiering in SEA offshore where the underling planning system itself is either not tiered or non-existent.

2.5 Conclusion

Strategic environmental assessment for offshore oil and gas planning and development is on-going internationally in select jurisdictions, but the sector has received limited attention in the SEA literature. There have been few empirical studies of SEA processes for the offshore sector, and little is known about how SEA influences and improves planning and development. Based on experiences in Norway, Canada, and the UK results demonstrate that SEA offshore is following in the footsteps of its predecessor, project-based EA. Regardless of SEA context, the results illustrated limited ability of SEA offshore to operationalize CEA at a regional level; limited attention to addressing broader socioeconomic concerns though participation and

engagement; a process often too narrowly scoped to generate the benefits often expected of SEA; and too little attention to maximizing downstream influence through tiering processes. Context is important to consider when reviewing the nature and efficacy of SEA systems; by applying a set of normative criteria the paper's findings showed that in many respects the limitations to SEA offshore are a direct result of context – specific regulatory or capacity constraints on SEA systems and on its ability to influence decision processes.

In conclusion, the assumption that SEA is a solution to the shortcomings of project-based EA in the offshore oil and gas sector, and can help inform and improve the efficacy and efficiency of project-based assessment, was not consistently supported across all three systems reviewed. International experience suggests that SEA administered in the offshore for strictly petroleum licensing, and managed by a single authority, will be inherently restrictive in nature and challenge the delivery of influential SEA. To effectively deliver on the benefits of SEA, and to ensure appropriate planning for the onshore impacts of offshore development, a multi-sectoral approach is required in the offshore environment, with direct tiering and terms and conditions for project-specific developments and regional monitoring programs. Though there are multiple models of SEA for offshore planning and development, a consistent message is that without clear coordination between higher and lower tiers, SEA will fail to achieve not only its objective, but decisions about offshore development will continue to be made in a restrictive environmental and socioeconomic context.

CHAPTER 3

STAKEHOLDER PERCEPTIONS OF CURRENT PLANNING, ASSESSMENT AND SCIENCE INITIATIVES IN CANADA'S BEAUFORT SEA

Preface to Chapter 3

This Chapter addresses the second objective of the thesis, to identify stakeholder perceptions regarding challenges and opportunities of current marine planning, assessment and science initiatives in Canada's western Arctic to ascertain whether and how these initiatives enable horizontal and vertical integration and effectively facilitate marine resource planning and decision-making. The Chapter has been accepted for publication in *Arctic*, co-authored by Fidler (lead author) and Noble.

Abstract

Many regional studies and planning initiatives have occurred in the Beaufort Sea over the past 20 years, and currently three major initiatives are underway – the Integrated Ocean Management Plan, the Beaufort Regional Environmental Assessment and the Integrated Regional Impact Studies, which focus on planning, regional assessment, and science, respectively. Despite the mounting pressures for offshore energy development, there has been limited attention on whether these initiatives facilitate a more coordinated and informed approach to planning, assessment and decision-making for sustainable offshore development in the region. This gap is addressed by examining stakeholder perceptions of the existing initiatives to ascertain whether and how these initiatives enable horizontal and vertical integration, and effectively facilitate marine resource planning and decision-making. Results demonstrate three key issues as essential to a more coordinated, regional approach to marine resource planning and management in relation to offshore development: horizontal integration between management bodies, vertical tiering from the strategic level and regional scale to the operational level and project scale, and establishing an overarching vision for regional planning and development in the Beaufort Sea.

3.1 Introduction

Planning for and managing the impacts of offshore energy development requires a more integrative and anticipatory framework than project- and sector-specific environmental impact assessment (Fidler and Noble 2012; Katsanevakis et al. 2011; de Reynier et al. 2010; Crowder and Norse 2008). This is particularly the case in Canada's western Arctic Beaufort Sea (see BSStRPA 2008; IGC 2004), which is characterized by competing interests in hydrocarbon development, traditional use and marine conservation (see Cobb et al. 2008; Fast et al. 2005). Whether and how Canada plans for and manages the impacts of energy development on its Arctic marine environment has important domestic and international implications. Canada's Beaufort Sea may be considered a testing ground for the country's overall preparedness to manage the impacts of major offshore energy development, and a signal to the rest of the world of its interest in the long-term sustainability of Arctic marine resources.

However, Canada currently lacks an overarching vision and integrated planning and assessment framework for development in the western Arctic (see Fidler and Noble 2012; Ketilson 2011). Decisions about offshore development occur largely on a project-by-project basis (Voutier et al. 2008). There have been many regional studies and planning initiatives in Canada's western Arctic over the past thirty years (see CAPP 2009; BSStRPA 2008). Currently, the largest and most significant of these are the Integrated Ocean Management Plan (IOMP), the Beaufort Regional Environmental Assessment (BREA) and the Integrated Regional Impact Studies (IRIS), focused on planning, regional assessment, and science, respectively. Each initiative is distinct in terms of its structure and purpose and may offer tangible benefits to support more informed decision-making about future Arctic development. However, there has been limited attention to whether and how they enable horizontal and vertical integration or facilitate a more coordinated and informed approach to planning, assessment and decision-making for sustainable offshore development.

The purpose of this paper is to examine stakeholder perceptions regarding the challenges and opportunities of current marine planning, assessment and science initiatives in Canada's western Arctic. The intent is not to undertake a comparative evaluation, since each initiative was established for a different purpose. Rather, the objective is to examine whether and how these initiatives effectively facilitate marine resource planning, assessment and decision-making in light of mounting pressures for offshore energy development. Each of the IOMP, BREA, and

IRIS initiatives is introduced below, followed by an analysis of their individual and collective opportunities and constraints. The paper concludes with lessons emerging from and the implications for advancing a more integrated planning and management approach in the Beaufort Sea.

3.2 Beaufort Sea Large Ocean Management Area

The Beaufort Sea Large Ocean Management Area (LOMA) covers over one million km^2, encompassing the marine portion of the Inuvialuit Settlement Region (ISR) (Figure 3-1), and has been identified as one of five priority areas for integrated ocean management by the Government of Canada (Cobb et al. 2008). The area contains the Tarium Niryutait Marine Protected Area and is rich in biological diversity, including benthic fauna, birds, marine and anadromous fish (e.g., arctic cod, arctic char, salmon), terrestrial mammals (e.g., caribou, arctic fox, lynx, arctic hare), and marine mammals (e.g., bowhead whales, beluga whales, ringed seal, walrus, polar bear) (Loseto et al. 2010; Cobb et al. 2008). The marine resources of the Beaufort Sea provide sustenance and have been part of Inuvialuit fishing and hunting practices for centuries.

The Beaufort Sea is also rich in hydrocarbon resources (INAC 2010; Harrison 2006), and has been subject to cycles of offshore activity for more than forty years. Prior to 2007, areas open for licensing were restricted to the continental shelf in waters less than 100 m deep, and an extensive amount of research has been conducted on the near shore region. Over the past five years exploration licenses have been let in the deep offshore, generating new questions around Canada's preparedness for drilling in frontier regions (Elvin and Fraser 2012; Porta and Bankes 2011). Tension regarding the administration of offshore oil and gas is particularly evident in the Beaufort, where challenges over development are intensified by safety issues, including controversial relief well regulation; risk and benefit debates for those who inhabit the region (see Porta and Bankes 2011); and concern regarding long-term ecological impacts and climate change (see Burkett 2011; Prowse et al. 2009).

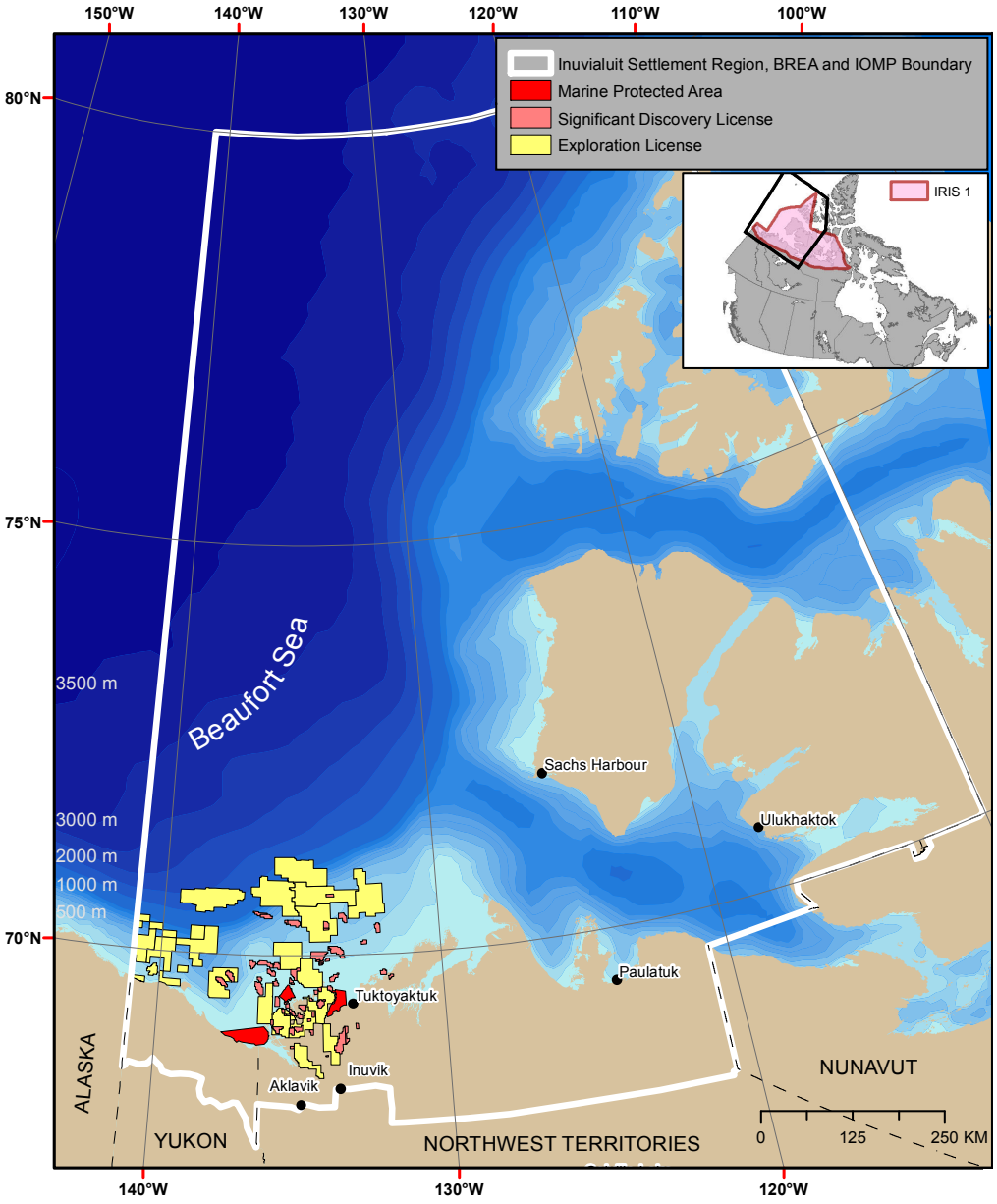

Figure 3-1. Inuvialuit Settlement Region of Canada's Western Arctic

Source: Map developed by Michael St. Louis, University of Saskatchewan

The *Inuvialuit Final Agreement* (IFA) (1984), a negotiated agreement between the Inuvialuit of Canada's western Arctic and the Government of Canada, provides a framework for the co-management of land and marine resources in the ISR; however, the Government of Canada retains jurisdiction over and authority to manage Canada's western Arctic offshore

marine environment, including the offshore region of the ISR. The National Energy Board (NEB) and Aboriginal Affairs and Northern Development Canada (AANDC) have independent, but complementary roles in the Beaufort Sea: the NEB authorizes drilling, while AANDC administers industry rights for oil exploration. Fisheries and Oceans Canada (DFO) manages development authorizations under the *Fisheries Act* (1985), and the *Canadian Environmental Assessment Act* (2012) applies to projects whenever a federal authority has a decision-making responsibility.

3.3 Current Planning, Assessment and Science Initiatives

The IOMP emerged within the context of Canada's Oceans Strategy, released in 2002 to facilitate implementation of the *Oceans Act* (1996). The IOMP, which identifies DFO as the coordinator and facilitator for oceans management, is intended to balance ecological conservation with sustainable development through a multi-stakeholder process. With partners from Aboriginal, Territorial and Federal governments, northern residents, ENGOs, and private interests, the IOMP aims to guide development planning in a manner that reflects the goals and values of those who occupy and have interests in coastal, island, and ocean areas. It builds on the work of previous initiatives including Inuvialuit Community Conservation Plans, the Beaufort Sea Strategic Regional Plan of Action, and the Beaufort Sea Integrated Management Planning Initiative (Beaufort Sea Partnership 2009). Having already facilitated an ecological assessment of the area and developed a regional governance process to support inter-departmental and inter-governmental oceans governance processes, the remaining, and perhaps most challenging step is to implement the plan and monitor and evaluate outcomes.

BREA is a multi-stakeholder regional assessment initiative that emerged, in part, as a response to the Inuvialuit Game Council's request to the federal Minister of Environment (IGC 2004) for a regional assessment of the development of offshore oil and gas resources in the Beaufort Sea (see Voutier et al. 2008). In 2008, the Beaufort Sea Strategic Regional Plan of Action (BSStRPA 2008) identified the need for a coordinated and strategic approach to environmental assessment in the region (BSStRPA Steering Committee 2008). The federal response was BREA – a four-year, $21.8M CDN research project designed to collect data on specific issues related to offshore oil and gas development. Led by AANDC, the purpose of BREA is to ensure that governments, Inuvialuit and industry are better prepared for offshore oil

and gas development by identifying and filling gaps in environmental baseline data related to offshore activities and the marine environment, and supporting efficient regulatory decision-making by providing information to all stakeholders for the purpose of project specific assessments.

IRIS is a science-based program focused on the impacts of climate change in the Arctic. Led by ArcticNet, a federal Network of Centres of Excellence Program, the goal of IRIS is to integrate results from ArcticNet science programs to produce regional reports on the implications of climate change for the Arctic. There are four IRIS designated areas; IRIS 1 encompasses the Western and Central Arctic including the ISR and the Kitikmeot region of Nunavut. IRIS is intended to contribute the knowledge needed to formulate policies and adaptation strategies for the Canadian coastal Arctic by providing information and recommendations to assist policy and regional decision-makers on the impacts of climate change to physical and socioeconomic environments.

3.4 Study Methods

The three initiatives were examined based on a review of research reports and policy and planning documents, supplemented by semi-structured interviews, and observation at conferences. In addition to international peer reviewed journal literature, data sources included conference proceedings, government documents, industry reports, websites and regional planning documents (Table 3-1). Documents were reviewed to identify each initiative's foundation, objectives and purpose and procedural components including stakeholder participation, coordination with other initiatives, and tiering to influence lower level decision-making, such as project-based impact assessment.

A total of 76 participants were contacted for interviews of which 50 agreed to participate. Interviews were on average 90 minutes in length. Interviews with Inuvialuit co-management boards and northern governments were conducted in-person in Inuvik, Northwest Territories. The remainder occurred over the telephone. Interview participants were selected based on their experience in and knowledge of offshore oil and gas development, planning and decision-making in the Beaufort Sea. Participants were members of the various Inuvialuit co-management boards and agencies and the Joint Secretariat (n = 11); the ISR Municipal Government (n = 2); the Gwich'in Chiefs and Gwich'in Resource Board (n = 3); the oil and gas industry (n = 6); the

Government of the Northwest Territories, specifically the Water Board, Industry Tourism and Investment, and the Department of Executive (n = 4); the Federal Government, comprised of AANDC, CEAA, DFO, NEB, and NRCan (n = 13); private consultants (n = 5); ENGOs (n = 2); and other energy interest groups (n = 4) researching or working in the region.

Participants were asked a series of semi-structured questions exploring: i) the background, purpose and intent of each initiative; ii) emerging benefits, opportunities, challenges and limitations of each initiative; and iii) coordination and communication efforts amongst initiatives. Interview results were organized, coded thematically and analyzed using QSR NVivo© v.9, a computer software program designed to classify and manage qualitative information. In cases where participants did not want their comments attributed to their department, or where their personal identity may be compromised, they are referred to in the results only by the broader organization with which they are affiliated.

Table 3-1. Supplementary Sources of Information

Resources	**Marine Initiatives**		
	BREA	**IOMP**	**IRIS**
Conference observations and proceedings	Canada – United States Northern Oil and Gas Research Forum, Calgary, AB, 30 November - 2 December 2010. IRIS 1 Regional Workshop, Inuvik, NT, 11-15 April 2011 IPY: From Knowledge to Action Conference, Montreal, QC, 23- 27 April 2012.		IRIS 1 Regional Workshop, Inuvik, NT, 11-15 April 2011 IPY: From Knowledge to Action Conference, Montreal, QC, 23- 27 April 2012.
Grey literature	BREA Request for Proposals 2011- 2012 Geoffroy and Gauthier 2011, Beaufort Sea Data Mining Project	Beaufort Sea Partnership Integrated Ocean Management Plan (IOMP) for the Beaufort Sea: 2009 and Beyond, 2009.	ArcticNet (2010) Impacts of Environmental Change in the Canadian Coastal Arctic: A Compendium of Research Conducted during ArcticNet Phase I (2004-2008).

3.5 Results

3.5.1 Integrated Ocean Management Plan

Benefits and Opportunities

The IOMP's collaborative, multi-stakeholder arrangement was the most notable benefit reported by participants. Focused on specific oceans management challenges, the IOMP was seen as providing an access point for government agencies, Aboriginal peoples, industry and other interested partners to share information and discuss values and goals for ocean resource use and management. The participatory framework that facilitated the IOMP played an important role in its endorsement in 2010. One federal government participant noted:

> The reality across the Beaufort Sea region is that political, economic, and cultural contexts are extremely diverse and the biggest opportunity is that the collaborative partnership formed could be advantageously transferred to forward other initiatives.

IOMP participants identified its comprehensive scope as a strength, citing how it linked management issues across marine and coastal ecosystems and addressed uses of the marine environment and related impacts at a regional scale. One Joint Secretariat participant described this approach to managing impacts at a level above an individual resource sector as the IOMP's most significant feature. A number of participants commented positively on the opportunity to examine stressors, such as the impacts of climate change (e.g., retreating sea ice, which results in the opportunity for invasive species and range extensions of fish in Beaufort Sea populations), and enter into scenario and cumulative impact discussions before development proceeds. This anticipatory nature of the IOMP, providing an opportunity to prevent harmful exploitation and unintended impacts from occurring, together with its long-term prospect with no end date, were acknowledged as both benefits and opportunities by one DFO participant. An ENGO participant added that:

> …while some parties [members of IOMP] worried that they did not know where the Plan would lead, in terms of planning decisions or the need for regulatory reform, to do nothing was not an option, and the Plan enabled decision-making to occur with the best possible information, knowing that data will be revisited and consequently that management could be adapted in response to changing conditions.

The cascading situation where the IOMP sets high level goals, such that certain tools and instruments could then be developed allowing individual agencies to reach operational objectives, is seen as enabling a tiered forward-planning process. Participants noted that the broad-based framework for protecting and understanding the marine environment provides an opportunity for certain instruments like marine spatial planning and marine protected areas to be accomplished under the IOMP.

Limitations and Challenges

Implementation and enforcement were two related and significant concerns identified by participants. Impetus is hard to achieve with broad-based initiatives, one Inuvialuit board member explained, as the IOMP is "cumbersome and unfocused" and tries to tackle too many issues. Participants, including industry, Inuvialuit and government addressed the challenges of applying concepts to a planning framework that were neither clearly nor easily definable, like 'health of the oceans' and 'sustainability'. Although most participants described the IOMP as a valuable planning exercise and beneficial in principle, they also viewed it as deficient in practical implementation. The absence of legislation to support planning and to accomplish IOMP goals was seen as a significant hindrance. As explained by one Joint Secretariat participant:

> None of the legislative instruments: *Fisheries Act, Oceans Act* and *IFA*, are strong enough, or pertinent to sustain the health and well being of the Beaufort Sea...this is a capacity glitch of DFO, which has a strong coordination role under the *Oceans Act* but no mandate to lead or impose other member agencies to perform their roles and implement the Plan.

According to an industry participant, the challenge with IOMP implementation was the absence of overarching governance in the region, noting that while the plan aimed to create a comprehensive approach it was "impeded by the silos effect it sought to overcome." The IOMP is a means to bring everyone together, explained one territorial government participant, but it "does not change what each member is doing with regard to research in the region." Industry voiced concern that a non-binding plan could further complicate planning and development in the region. This participant stated "people say put the information out there – it will help, but from a regulatory perspective it may create tension," for example, if a map were produced that identified a certain area as sensitive which had already been subject to oil and gas leasing.

A second concern was the lack of funding and capacity. One Joint Secretariat participant identified the lack of funding for IOMP implementation, and for tools that would attach to the IOMP (e.g., marine protected area establishment), as a "total failure of government." Several participants involved with the IOMP's working groups maintained that without legislative backing it is difficult to acquire the funding required to fulfill the IOMP's objectives. Funding restrictions were also said to inhibit the capacity of IOMP members to be involved. A Joint Secretariat participant explained that their involvement, through the participation as chair of the council and steering committee, was not as meaningful as it could be largely because of capacity issues and not having the resources to perform background research. The participant went on to add:

> It is the same people doing the work, and there is limited constituency, and at the regional level it is fairly small organizations trying to accomplish big things without sufficient funding resources. Community involvement on behalf of the Inuvialuit, for instance, with six communities, stresses community resources. IOMP may engage participants with a speciality in traditional knowledge, and if it is the same people you are asking questions to over time, then the quality of input diminishes.

A federal government regulator added that a common problem encountered with all regional planning exercises is that concerns and solutions are identified but resources are rarely available for implementation.

Finally, interviews revealed industry's scepticism about the IOMP delivering any tangible benefits in the near future, with no expectation of it being able to directly support oil and gas planning, impact assessment and decision-making. Those participants advocating the potential of the IOMP suspected that the oil and gas industry's concern was a result of the perception that it could impact their bottom line by compromising access and affecting the certainty of licensing approvals, leading to restrictive operating conditions. However, these views were not expressed by the industry. Instead, one industry participant stated:

> DFO is not our key regulator and the initiative is not legally binding, instead being policy based; therefore, while the knowledge of resources and habitats is improving, there is currently no clear indication as to how the exercise will influence oil and gas decision-making in a positive, effective way. If it were an integrated forum where resource managers bought into it, sure there could be

> benefits as it draws people together, but in practice other departments haven't bought in and it is seen as a DFO initiative.

Another industry participant said that there needed to be more buy in from federal departments for the IOMP to effectively influence oil and gas decision-making, and resource managers, namely Environment Canada, DFO and AANDC "need to collaborate in a more meaningful manner." Overall, interview results showed that without a functional governance framework, decisions championed in the IOMP could contradict or create tension with established management structures.

3.5.2 Beaufort Regional Environmental Assessment

Benefits and Opportunities

Industry attributed BREA's success to its support of offshore activity without delving into high level governance issues. BREA facilitates discussions relevant to the regulatory process, explained one industry participant, and will help AANDC execute its duties concerning offshore development in a more effective way. Consistent with BREA's intent, one federal government regulator maintained that:

> In an era of fiscal constraints, particularly towards science, BREA has allowed [AANDC] to gather information vital to future oil and gas decision-making. It will make information readily available in an understandable format for all parties and stakeholders at technical and community useable levels.

A territorial government participant noted that BREA was the "first real money" the federal government has put toward assessing data gaps in the last twenty years, and in doing so represents a considerable commitment toward the Beaufort region and pending hydrocarbon development. An IRC participant similarly noted that BREA represented an investment to the Beaufort Sea that would result in new science and data that will better inform management decisions. A private consultant explained that "BREA will inevitably support development in the region" because it "will fill knowledge gaps in the offshore that if not filled could stop projects from going ahead," such as current knowledge gaps in deep water with respect to fish."

Interviewees from industry, Inuvialuit boards and agencies, and federal regulators all identified making scientific and socioeconomic data more accessible as a primary goal of BREA.

Participants noted that by addressing data gaps and providing regional baseline data there would be time and cost savings to all parties involved in an energy project environmental assessment process. From the Joint Secretariat perspective, for example, there was optimism that BREA would help streamline project evaluations by addressing, up front, a number of issues that occur in each individual project environmental assessment, such as waste management. It was explained that the regional approach adopted by BREA was intended to identify features that could be dealt with once, on a regional basis, thus providing an acceptable baseline that others could reference and enable the unique characteristics of the project specific environment to be addressed in more detailed project-specific assessments. A more efficient process could occur, explained one federal regulator, if proponents "do not have to repeatedly address concerns about regional species distribution." By addressing certain issues on a regional scale, and having agencies and stakeholders agree on evaluations of potential impacts, several Inuvialuit participants reported this could ease the burden placed on communities during individual project application and assessment processes. As one participant explained, "people realized that it is expensive and time consuming and puts a lot of pressure on communities for consultation if every time you do something you need to go through entire EA review." An AANDC participant further added:

> …if we can overlap that project specific EA on the regional EA conditions then we are taking some of the onus off the proponent and putting it back on the responsible authority to describe our understanding of the environment. By overlaying it you have a risk analysis, based on the regional picture, then when evaluating project specific EA you are evaluating it more critically. The regional EA can provide that basic regional template.

Interview results indicated overall that there are common issues that could be addressed for the entire Beaufort Sea. As explained by one industry participant, "if BREA generated information that had buy in from all parties, companies could supplement the process with detailed studies guided and informed by regional data, as opposed to re-generating information repeatedly," as is the current state.

Finally, BREA's framework, which is founded on stakeholder involvement through industry support and Aboriginal leadership, was identified by industry as a process in which the "Inuvialuit are very much engaged participants, with a degree of ownership." One territorial

government participant noted that the research that industry, individual government departments and international organizations conduct makes the region a complicated and active science environment, and that "the forum arrangement set up by AANDC allows for participants to share information and coordinate activities." According to an AANDC participant, BREA's venue brought stakeholders together to address issues not easily dealt with in the regulatory setting, such as preparedness, and building a knowledge base in communities through consultations and workshops. An NRCan participant explained that the multi-stakeholder element of BREA is "...a beneficial approach to distinguish whether identified science gaps are true science gaps in terms of making more informed decisions, prioritizing research to address the intent, and supporting front line EA decision-making."

Several industry participants also reported that consultations with communities under the BREA initiative would ensure that regional scale issues are addressed, thus allowing more project-specific issues to be the focus of questions raised during the environmental assessment process. Collectively, participants reported the value of having discussions in the absence of project applications, "meaning that people are thinking ahead in terms of what they will need to have in place and be prepared for."

Limitations and Challenges

Many participants expressed frustration with how BREA unfolded, noting that the purpose of BREA was well-founded but that the objectives have since changed. Several Inuvialuit participants noted that BREA was "not to be a funding pot for other programs", but that many "satellite research programs are latching on to BREA funds" and diminishing its intent as a regional environmental assessment. Some territorial government and Joint Secretariat participants noted that BREA's shift in focus from what the Inuvialuit had originally requested, a regional and strategic environmental assessment process, to that of a series of regional baseline studies was a political move by the federal government to control and reinforce their role in the offshore arena. Several Inuvialuit participants expressed frustration that BREA changed course as a result of decisions being made at a higher level. For example, a Joint Secretariat participant said that BREA was getting "hijacked" because of government funding cuts elsewhere and thus other government departments are becoming reliant on BREA funds. One federal regulator explained:

> It is a complicated and cumbersome process…having too many people's opinions and trying to do things by consensus. Delayed decisions have therefore frustrated the Inuvialuit, who see the initiative being driven by science departments that see an opportunity to get funding to do research, and bulldozing through the process with little respect for northern needs.

BREA terminology also presented challenges, as people were critical that BREA is not actually an 'environmental assessment.' One industry proponent noted that "people constantly query 'what' is being assessed." The participant went on to explain that the Inuvialuit wanted baseline data to go toward an assessment, and that "it is vital to keep the EA component because without it the initiative would lack a goal." A federal government participant, however, offered a different opinion and said that the direction of BREA had shifted as a result of AANDC's hesitancy to go ahead with a regional strategic assessment: "an intentional move away from a regional assessment to that of a science synthesis given the lack of capacity to perform one."

A related concern was BREA's scope and methodology. One NEB participant explained that challenges related to scoping influenced BREA's direction, because at the onset of BREA the inability to reach consensus on how to move forward was complicated by many factors, including land claim and sovereignty issues. This meant that the "only way to design the project so that it could deliver results was to scope it tightly around science." The participant went on to note that a lot of weight was given to a "bottom-up" approach to scoping BREA, versus having a prescribed list of issues to address. However, an NRCan participant explained that upon conducting community consultations the regional issues identified were relatively modest compared to the large technical proposals submitted and subsequently funded under BREA. This experience highlights the challenge of developing a program with clear objectives at the management level and doing so in a manner that enables flexibility and inclusion of interests and affected parties. The result, noted one Inuvialuit participant, was that "attention to community effects is on the weak side."

Other methodological limitations noted by interviewees included a BREA timeframe that was deemed too restrictive, and insufficient funding to effectively begin to address the science gaps identified. A Joint Secretariat participant described BREA as a "tactical plan that is short term, where a strategic long-term plan is needed." The participant explained that BREA was intended to address a significant gap in the Beaufort Sea, the lack of a cumulative effects framework, but given the limited budget allocated to the development of a cumulative effects

framework, over a four-year timeframe, "it is unlikely a suitable framework will result." An NRCan participant criticized BREA for its focus only on collecting baseline data on current conditions rather than undertaking a much broader scenario-based assessment of future conditions in the region to aid in planning and decision-making.

Finally, implementation was a major concern voiced by the majority of participants. For example, a Joint Secretariat participant noted:

> BREA will put information out there but it is not coordinating the efficiency of how information will be used…it is the age-old question whether the design of the programs will result in useable data. How BREA will facilitate, feed or front load the specific EA approvals for development plans and applications remains unknown.

One DFO regulator participant said even when BREA is completed data mining may still be required to locate pertinent information for specific development decisions, adding that there "needs to be a tool to manage information and a person designated responsible for the tool." This notion of BREA as a "one-off" exercise was identified by most participants as something that could jeopardize any progress achieved through the initiative itself. An industry participant stressed that "government needs to not only sign on to data so that it does not need to be revisited during each EA, but ensure information is updated and carried forward to enable EA studies to be plugged into a regional assessment." One CEAA participant expressed concern that scientists may be "blindly conducting science without context," and in the end BREA will be little more than a data gathering exercise rather than an analytical process intended to support decisions about offshore development.

3.5.3 Integrated Regional Impact Studies

Benefits and Opportunities

The IRIS is focused on repackaging and synthesizing information already generated through a number of different disciplinary focused research projects into a more accessible format. Science investment in the Beaufort Sea region is quite rich in terms of programming from the International Polar Year, and IRIS builds on that by offering scenarios for climate change in order to assist development proponents and decision-makers. Participants recognized that the value of the initiative comes from its attention to climate change scenarios, an area of science

particularly critical in the Arctic where climate change impacts and the progressive loss of sea ice bring unpredictability to oil and gas operations. Addressing information gaps through collaborative research initiatives between academia and the oil and gas industry was reported by participants to have generated information that will benefit policy makers, regulators, industry, northern residents and other stakeholders. As Pyc and Fortier (2011:9) explained, "because of the collaboration, much of this information not only informs risk-based assessment and responsible operations, but also contributes to the general scientific knowledge of this remote, extreme and important Arctic environment." Participants knowledgeable about IRIS reported the practical value of synthesizing existing data, as opposed to undertaking an exercise that does not guarantee tangible results.

Limitations and Challenges

A major challenge related to IRIS's structure and the lack of clarity about its provisions and output. One ArcticNet IRIS participant explained:

> The structure has been a contentious topic because there has not been a clear vision or direction of the IRIS format and how to conduct the study, making it a discombobulated process. This challenge emerged with previous IRIS' in the eastern Arctic where no one knows what the IRIS is and how it should be produced…it will be somewhat organically generated integrated regional impacts, based on funded projects in the region.

The IRIS 1 boundary crosses Nunavut and the Inuvialuit Settlement Region.A participant from the Inuvialuit Regional Corporation was unsure how IRIS 1 would support policy and decision-making if results are politically incompatible, based on ecosystem boundaries versus administrative boundaries. Several Inuvialuit Regional Corporation and Joint Secretariat participants noted that IRIS's "community based science was weak and the initial communication strategy to involve communities was poor." A DFO regulator identified the need for ArcticNet and their studies to engage northern regulators, stating that IRIS "knows the communities are important, but misses the people who actually make the decisions." Many northern participants viewed the academic foundation of ArcticNet with cynicism. The manner in which results are reported, as evidenced by previous ArcticNet undertakings in the eastern

Arctic, were, according to one regulator, based "largely in the south, not in the north, nor to regulators in the north."

3.6 Discussion

Three key issues emerged as essential to the efficacy of current IOMP, BREA and IRIS initiatives in supporting a more coordinated, regional approach to marine resource planning and management related to pressing offshore development. These include horizontal integration between management bodies, vertical tiering from the strategic level and regional scale to the operational level and project scale, and the establishment of an overarching vision for regional planning and development in the Beaufort Sea.

3.6.1 Horizontal Integration

If planning, assessment and science initiatives such as the IOMP, BREA and IRIS are expected to provide direction and guidance for ocean activities, and contribute to a better understanding of regional environmental effects and meet agreed-upon management objectives, both independently and collectively, improved horizontal integration is required. For instance, when considering the design and implementation of regional programs Noble and Harriman (2008) argue that "greater attention must be paid to horizontal linkages between strategies… and reporting systems." Crowder and Norse (2008) explain that the current sectoral-based approach has resulted in fragmentation, and spatial and temporal mismatches in governance of the marine ecosystem. Murawski (2007) further maintains that it is not always the science that is limiting to advance the understanding of factors influencing ecosystems, but the will of political systems to make decisions in controversial and uncertain circumstances.

The multijurisdictional context in which the IOMP and BREA operate is characterized by a large multi-stakeholder process with two separate federal authorities trying to assert their respective planning and management mandates. The research participants were sceptical that IOMP endorsement on behalf of federal departments could be equated with actual support, owing in part to what Jessen (2011) describes as "federal silos" that impede agency cooperation. Lane (2008: 860) identifies such fragmentation of environmental responsibilities among government departments as a hindrance to managing resources "…in a way that recognizes their inter-dependence with the wider human–ecological system, or to manage them in concert with

other departments." Regulatory authorities remain responsible for implementing management policies and measures within their established mandates. Yet, management initiatives cannot successfully operate without a strong institutional framework that establishes cooperation between departments and stakeholders and sets appropriate timelines, irrespective of potentially conflicting agendas. Bellamy (2007), cited in Lockwood et al. (2009), refers to the need to balance co-operation and competition arising from organizational self-interest as a key challenge to regional natural resource management.

The results in Canada's western Arctic revealed 'possessiveness' amongst federal departments and the need for greater communication and cooperation of initiatives by high-level secretariats. This reflects the view of Keogh et al. (2006), in that stronger leadership is required to bring efforts into a coordinated program to achieve meaningful results at a strategic level. The initiatives examined in this paper all started with good intentions to bring clarity to process and understanding and to address regionally important issues. While there is complementarity amongst the three initiatives, the results show that without clear and transparent horizontal linkages it would be difficult to achieve a functional system of governance to support improved development planning, assessment and decision-making in the Beaufort Sea.

3.6.2 Vertical Tiering

The results suggest some progress toward managing resources on a broader regional scale, and at a more strategic scale, but also reveal an overarching concern as to whether higher level planning initiatives can actually influence lower level development decisions. Much of the work undertaken by the IOMP, BREA and IRIS do address issues that are directly relevant to lower level decision-making, such as project impact assessment; the challenge for all three initiatives is determining how the data and knowledge generated is best translated and used to actually influence lower level decision-making. None of the three initiatives was envisioned to directly support project-level assessment, but rather to provide background information so that when making assessments and determining the significance of impacts there is data available upon which to base such decisions. There is an assumption that the data and information generated will be useful to such assessment and decision-making processes, but there are no clear mechanisms to ensure either its use or its usefulness.

The transformative nature in which these three Arctic initiatives have emerged has allowed for flexibility in planning and scoping. This flexibility and holistic approach have generated mixed responses, in particular for the IOMP, since critics question how such lofty goals like having a pristine environment and healthy fish stocks can be translated into usable decision support criteria for reviewing and evaluating the merits of individual applications for project developments. If there is no concerted influence downstream, where decisions and actions are taken about physical development in the offshore, then the role of such higher level efforts may be trivial. While there is the potential for strategic initiatives to support lower level decision-making, the critical information required at the project level needs to be identified and a mechanism created whereby the data generated are collated and translated into a usable format for project assessments (Noble 2003). At the same time, the rationale for and process of integration between high-level policies and on-the-ground data collection and decision-making need to be clear to all stakeholders (Katsanevakis et al. 2011).

3.6.3 Guiding Vision

Whilst current initiatives in the Beaufort Sea have advanced past the mindset in which 'tunnel vision' decision-making is acceptable (see Murawski 2007), there is still no overarching and agreed upon vision to either guide or bridge the range of current marine planning and management efforts that exist. Johnson et al. (2011) describe the importance of setting desired outcomes as part of a future vision of regional planning and development, and setting management strategies that are protective of those outcomes in order "to improve context and understanding of the kinds of development that can be supported, where it can be supported within a region and when." Johnson et al. (2011) also maintain that the public's role in a regional visioning exercise is critical to "establish the link between what society wants for a given region and the management approaches and development strategies that will be designed to achieve them." At the international level, UNESCO's Visions for a Sea Change (2006) similarly emphasizes the need for a clear strategic direction for what is to be achieved within an ocean management area to complement bottom-up stakeholder involvement and interests; to strengthen the vertical integration between national policy guidance and targets and their regional delivery; and facilitate horizontal integration across economic sectors or agencies of government (Ehler and Douvere 2007).

The author advocates that such a vision for Canada's western Arctic would offer corresponding guidance mechanisms to help resolve overlap and the disjointed nature of current marine planning and management initiatives, and aid subsequent decision-making through an integrated framework. However, without a policy component to address regulatory and planning deficiencies in the region, layering and overlap appear inevitable (see Jessen 2011) – especially given that a different institution administers each initiative. The results indicate agreement that strategic planning is recognized as important in the Beaufort Sea (see also Ketilson 2011); however, there remains much opposition to developing an Arctic vision and cynicism toward translating a strategic vision into operational terms. The reasons identified are threefold: first, regional strategic approaches to planning and assessment in the context of ocean management are still not well defined and effective implementation strategies not developed; second, successful implementation would require restructuring of current management institutions; and third, there is concern that additional planning efforts would result in yet another bureaucratic layer to a decision-making environment that is described by many as cumbersome.

These views reflect what Murawski (2007) refers to in the context of ecosystem-based management as myths; that is, propagated principals to maintain status quo among sectoral interests. Murawski maintains that such resistance is due to the perception that unlike sectoral management, the benefits and objectives are not as well defined as they are for an individual sector. The unknown nature of measures necessary to meet regional ocean management goals can therefore result in resistance to its adoption and thus to a more effective bases for marine spatial management.

Murawski's (2007) view, however, is not without some opposition. Arkema et al. (2006), for example, report than when translated from academic literature to practice, the objectives of regional and strategic planning and management initiatives often miss critical ecological and human factors emphasized in literature, and planners and managers often lack a clear approach or toolset for implementing such overarching planning and management programs (see also Noble et al. 2012). Similarly, with no articulated vision of what Canada is trying to achieve in Arctic Ocean management, participants view the lack of integration amongst current initiatives as contributing to layering, and a major constraint toward achieving a more cohesive regional planning framework.

3.7 Conclusion

This paper set out to examine stakeholder perceptions regarding the challenges and opportunities of current marine planning, assessment and science initiatives in Canada's western Arctic and whether and how these initiatives effectively facilitate marine resource planning, assessment and decision-making in light of mounting pressures for offshore energy development. It is necessary to further our scientific understanding of the Arctic environment; however, there is also need for a framework that moves beyond data collection to inform the creation and analysis of future development scenarios such that potential cumulative effects, regional impact mitigation and monitoring needs can effectively direct decision-making about offshore energy development. This is beyond the collective abilities of current offshore planning, assessment and science initiatives in the Beaufort Sea. Currently, the IOMP, BREA and IRIS operate without a regional framework for effective integration – the potential for duplication, inefficiencies and even contradiction abounds.

There is need for a more integrative and strategic planning and assessment framework in the Beaufort Sea – a framework to coordinate current initiatives, combine data for planning and assessment, and set strategic priorities for the future management, development and conservation of the region. In the author's view, this may be achieved, at least in part, through regional strategic environmental assessment, a framework for assessing the potential environmental effects of alternative strategic initiatives, policies, plans, or programs for a region for the purpose of informing the preparation of a development strategy and associated environmental management framework (see CCME 2009). The need for such an approach is particularly urgent given expanding interests in offshore development (Callow 2012), combined with recent changes to the *Canadian Environmental Assessment Act* that significantly reduce the timelines for assessment and restrict the scope of federal assessment applications (see Gibson 2012). Although various models of regional strategic environmental assessment have begun to emerge in offshore jurisdictions internationally (see Fidler and Noble 2012), the concept remains untested in Canada's western Arctic.

CHAPTER 4

ADVANCING REGIONAL STRATEGIC ENVIRONMENTAL ASSESSMENT IN CANADA'S WESTERN ARCTIC: IMPLEMENTATION OPPORTUNITIES AND CHALLENGES

Preface to Chapter 4

This Chapter addresses the third objective of the thesis, identify key opportunities for, and challenges to, implementation of R-SEA in the Beaufort Sea based on a normative model and stakeholder expectations of R-SEA. The Chapter has been accepted for publication in *Journal of Environmental Assessment Policy and Management,* 2013, 15:1, co-authored by Fidler (lead author) and Noble.

Abstract

The absence of Regional Strategic Environmental Assessment (R-SEA) in Canada's western Arctic has raised many questions concerning the country's preparedness for offshore Arctic energy development, given the constraints of project assessments in addressing long-term cumulative impacts of energy development on the marine environment and local communities. There has been much interest in R-SEA in recent years, and a growing body of research on the benefits of strategic approaches to environmental assessment, but relatively little attention has been given to implementation. This paper examines key opportunities for and challenges to the implementation of R-SEA in Canada's western Arctic. Results reinforce concerns that the current approach to environmental assessment in Canada's western Arctic is insufficient to address expanding offshore energy development. However, results also indicate several challenges to be addressed to advance R-SEA in the offshore environment including governance, stakeholder resistance to a futures-based approach, the timing of implementation, managing the diversity of expectations about R-SEA, and the nature and scope of alternatives assessment.

4.1 Introduction

Oil and gas exploration licenses continue to be let in the deep offshore of Canada's western Arctic, resulting in new questions around Canada's preparedness for drilling in frontier regions (Elvin and Fraser 2012). Tensions regarding the planning and management of offshore energy development is particularly evident in the hydrocarbon rich Beaufort Sea, where challenges over energy development are intensified by controversial relief well regulation; risk and benefit debates for those who inhabit the region (see Porta and Bankes 2011); concern regarding long-term impacts on an ecologically sensitive marine environment (Burkett 2011); and the uncertainties of Arctic climate change (Prowse et al. 2009). This culmination of conditions, along with the current project-driven regulatory environment, has generated considerable discussion on the need for regional strategic environmental assessment (R-SEA) (see Noble et al. 2013; Doelle et al. 2012; WWF 2005).

The Canadian Council of Ministers of the Environment (CCME) (2009) defines R-SEA as a "process designed to systematically assess the potential environmental effects, including cumulative effects, of alternative strategic initiatives, policies, plans or programs (PPPs) for a particular region." The overall objective of R-SEA is to inform the preparation of a development strategy and environmental management framework for a region (CCME 2009) and, in doing so, identify strategies and priorities for future management and development while enhancing the efficacy of project-level environmental assessment (EA) (see Harriman Gunn and Noble 2009a). The interest in regionally-based, strategic approaches to EA stems from the limited capacity of project-based EA to address cumulative effects (Elvin and Fraser 2012; Gunn and Noble 2011), the desire for Aboriginal groups to be more involved in development planning (see Porta and Bankes 2011), and the recognized need to ensure that development decisions are set within a broader environmental planning and management framework (CCME 2009). In select international offshore oil and gas regimes, such as Norway, Atlantic Canada, and the United Kingdom, such higher-level approaches to assessment are already beginning to emerge in practice (Fidler and Noble 2012; Hasle et al. 2009).

The absence of R-SEA in Canada's western Arctic has raised many questions about Canada's preparedness for offshore energy development (see Doelle et al., 2012; Elvin and Fraser 2012; Porta and Bankes 2011; Arctic Council 2009). Notwithstanding several regional planning, baseline collection and science-based marine initiatives ongoing in Canada's western

Arctic (e.g., Integrated Ocean Management Plan, Beaufort Regional Environmental Assessment, Integrated Regional Impact Study), and recognition at the national (e.g., CCME 2009) and international levels (e.g., Arctic Council 2009) of the importance of R-SEA, there remains no consolidated framework of R-SEA in the Beaufort Sea, and whether and how such a framework can or should be implemented remains unaddressed. Research by Ketilson (2011) and Noble et al. (2013), for example, revealed scepticism around R-SEA in Canada's Beaufort Sea, describing it as "unchartered territory" with many questions of whether and how it can deliver benefits and influence decision-making. Part of the problem is that the majority of attention on the subject has been on the need for and benefits of such a framework (see Bina 2007) rather than on implementation issues to advance R-SEA from a novel concept to a practical planning, assessment and decision support process.

The purpose of this paper is to examine key opportunities for and challenges to the implementation of R-SEA in the Beaufort Sea of Canada's western Arctic. The current Beaufort Sea planning, assessment and decision-making environment is examined against the normative model and expectations of R-SEA. Current support for R-SEA implementation for offshore planning and management is explored and areas of disagreement amongst stakeholders identified. The intent is not to propose another layer of legislation to what is perceived by some as an already complex regulatory offshore environment (see Callow 2012), but to provide a foundation for advancing R-SEA from concept to practice. In the following sections the conceptual basis for R-SEA is introduced and the current state of EA in the Beaufort Sea discussed. Results report on the overall readiness for R-SEA implementation in the Beaufort Sea and the needs and interests of key actors. The paper concludes with a discussion of the implications of applying R-SEA and foreseeable challenges to implementation.

4.2 Regional Strategic Environmental Assessment

Canada is recognized internationally as a pioneer in strategic environmental assessment (SEA) (see Sadler 2005); but the application of formal SEA in Canada is restricted to federal matters under a federal Cabinet Directive (see Noble 2009). In 2008, the CCME, a forum of federal, provincial and territorial governments, commissioned a research program to develop a more regionalized framework for SEA in an attempt to extend SEA beyond the federal Cabinet Directive and to facilitate a more regional-based, planning approach to impact assessment. The

intent was to develop a framework to guide the development of PPPs and strategic initiatives above the project tier, influencing regional development programs and project specific actions and decisions (see Table 4-1).

Developed by Harriman Gunn and Noble (2009a), R-SEA was founded on SEA principles (see Vicente and Partidário 2006; Partidário 1996) as a means to ensure that planning and assessment for a region supports the most desired outcomes rather than the most likely ones. The goal was to advance a more regionally based EA and planning approach to address environmental and social issues at the strategic tier of decision-making (Harriman Gunn and Noble 2009a). The focus of R-SEA is on informing the development or evaluation of alternative scenarios or PPPs for a region and then assessing those alternatives based on their potential for cumulative effects and in consideration of social, economic, environmental and planning goals (CCME 2009). Amongst its defining features are its regional scope, strategic nature, and consideration of cumulative effects (Noble and Harriman 2009). Its methodological approach is founded on the integration of existing knowledge, experience, and theory drawn from strategic (Vicente and Partidário 2006; Noble and Storey 2001; Partidário 2000), cumulative (Noble 2008; Dubé 2003; Bonnell and Storey 2000) and regional EA (Noble and Harriman 2008). As a framework for regional application, it is intended to be context sensitive and "tailor-made to the kind of decisions at stake and the nature of the decision-making processes in place" (Partidário and Clark 2000).

Table 4-1. Potential Benefits of R-SEA

• Facilitates the development of improved PPPs and strategic initiatives
• Provides a more regional focus for development and decision-making
• Ensures that cumulative effects assessment is captured at the appropriate tier and scale
• Contributes to regional sustainability goals
• Enables and encourages data sharing from regional and project impact monitoring programs
• Facilitates state-of-the-region environmental monitoring and reporting
• Saves time and resources by providing a means to streamline subsequent project EA
• Establishes goals, thresholds, or maximum allowable limits against which to conduct project-based performance and impact assessment

Source: CCME (2009); Harriman Gunn and Noble (2009a)

4.3 R-SEA Framework

The R-SEA framework and guiding principles are described in detail by Harriman Gunn and Noble (2009a) and the CCME (2009). R-SEA consists of three interrelated phases: a pre-assessment phase, an impact assessment and evaluation phase and a post-assessment phase, each with corresponding stages (see Figure 4-1). The pre-assessment involves developing a reference framework, scoping key issues, and identifying drivers and patterns of change in the region and how they have influenced valued ecosystems components (VECs). This requires identifying the main issues and concerns in the region along with the core principles that will be used to guide the assessment process. Tiering opportunities with regional initiatives and EA are also identified, as are necessary partners and partnerships, and terms of reference for the R-SEA developed. Scoping serves to establish VECs, temporal and spatial boundaries for the assessment, and sets management targets, objectives or thresholds against which future conditions and alternative scenarios of cumulative change can be assessed.

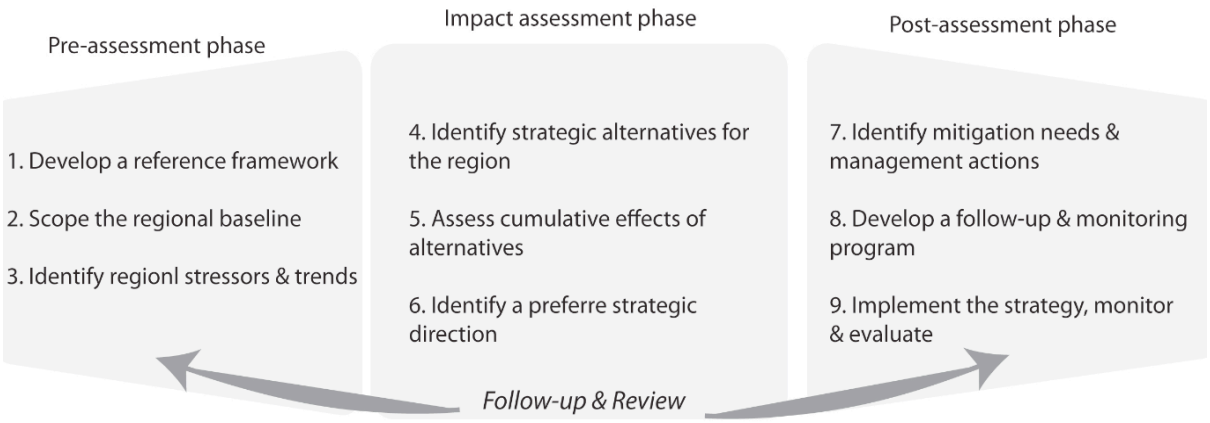

Figure 4-1. Methodological Framework for R-SEA

Source: CCME 2009, based on Noble and Harriman 2009; Noble and Storey 2001

The impact assessment phase focuses on developing alternative options or scenarios of development and conservation for the region, and an assessment of the potential effects on, threats to, or changes in the state of VECs under each scenario. Cumulative effects and

condition changes under each scenario are identified, and the significance of those changes and effects relative to current or past baseline conditions, thresholds, or desirable levels of change examined. More than one strategic alternative may be the outcome, and the iterative nature of the process may require re-assessing alternatives based on consideration of mitigation and management needs. The objective is to establish a preferred or satisficing PPP direction.

The post-assessment phase involves making plans to mitigate or compensate for potentially unavoidable impacts associated with the identified PPP, and developing a follow-up and monitoring program for effects monitoring, goals achievement or performance evaluation, feedback on management effectiveness, and communication. This stage of the process is essential because PPPs are often formulated under uncertainty and their effectiveness is often sensitive to broader social and economic conditions (see CCME 2009; Cherp et al. 2007). Finally, in order to facilitate implementation and ensure that PPP strategies are put into action, there is a need to prescribe roles and resources for implementation and on-going monitoring; undertake a formal public review process of the proposed strategy, and establish a regular review period to revisit the PPP, evaluate its efficacy and adjust accordingly.

4.4 Research Methods

4.4.1 Beaufort Sea Study Area

The Beaufort Sea Large Ocean Management Area (LOMA) covers over one million km^2, encompassing the marine portion of the Inuvialuit Settlement Region, and has been identified as one of five priority areas for integrated ocean management by the Government of Canada (Cobb et al. 2008). The area contains the Tarium Niryutait Marine Protected Area and is rich in biological diversity, including benthic fauna, birds, marine and anadromous fish (e.g., arctic cod, arctic char, salmon), terrestrial mammals (e.g., caribou, arctic fox, lynx, arctic hare), and marine mammals (e.g., bowhead whales, beluga whales, ringed seal, walrus, polar bear) (Cobb et al. 2008). The marine resources of the Beaufort Sea provide sustenance and have been part of Inuvialuit fishing and hunting practices for centuries. The Beaufort Sea is also rich in hydrocarbon resources (Callow 2012; INAC 2010; Harrison 2006). Prior to 2007, the majority of hydrocarbon exploration and development was restricted to the continental shelf and nearshore region. In recent years exploration licenses have been let in the deep offshore, raising

concern about industry and government preparedness for drilling in frontier regions (Porta and Bankes 2011).

Under the 1984 *Inuvialuit Final Agreement* (IFA), a negotiated agreement between the Inuvialuit of Canada's Northwest Territories and the Government of Canada to establish the Inuvialuit Settlement Region, the Inuvialuit ceded their rights in the offshore areas; however, they still provide input regarding offshore oil and gas development decisions on federal lands in their settlement region and maintain a role and interest in offshore governance. The IFA provides a framework for co-management in the Inuvialuit Settlement Region between the Inuvialuit and the federal government. However, for all intents and purposes, the Government of Canada retains ownership and authority to manage the offshore resources of the Beaufort Sea. The National Energy Board and Aboriginal Affairs and Northern Development Canada (AANDC) have independent but complementary roles in energy exploration and development in the Beaufort Sea: the National Energy Board authorizes drilling, while AANDC administers rights to oil exploration. Fisheries and Oceans Canada manages development authorizations under the *Fisheries Act* (1985), and the *Canadian Environmental Assessment Act* (2012) applies to projects whenever a federal authority has a decision-making responsibility.

Project-based EA is the primary tool for planning for, assessing, and managing the impacts of offshore energy development. Challenges to EA and regulation for offshore oil and gas in the Beaufort Sea have been documented by Noble et al. (2013) and others (Doelle et al. 2012; Ketilson 2011; Voutier et al. 2008; Erlandson and Sloan 2001), and include the narrow scope of EA and limited reach beyond the individual development project, uncertainty and efficiency of the process, the potential for duplication of efforts in project assessment, and the lack of capacity to implement EA and regulatory programs. These limitations, combined with recent legislative and regulatory reforms to EA (Canadian Environmental Assessment Act 2012) in Canada at the federal level that further limit the scope of EA application, including the exemption of small projects (e.g., exploration), and set maximum 24-month time frames for the review of large projects (e.g., offshore development), have generated considerable interest in regional and strategic approaches to offshore planning and assessment in the western Arctic. Notwithstanding current, independent programs in the western Arctic focused on marine planning (e.g., Integrated Oceans Management Plan (IOMP)), baseline studies (e.g., Beaufort Regional Environmental Assessment (BREA)), and scientific understanding of climate change

(e.g., Integrated Regional Impact Studies (IRIS)), there is no integrative planning and impact assessment framework to support PPP development and decisions about marine resource use, particularly with regard to deep offshore energy. What R-SEA is and what it should deliver in the western Arctic is "still far from consolidated" (Ketilson 2011: 2); R-SEA remains largely untested and the capacity for implementation is unknown.

4.4.2 Data Collection and Analysis

Data collection was based on semi-structured interviews with Inuvialuit co-management boards and agencies and the Joint Secretariat (n = 11); the Inuvialuit Settlement Region Municipal Government (n = 2); the Gwich'in Chiefs and Gwich'in Resource Board (n = 3); the oil and gas industry (n = 6); the Government of the Northwest Territories, specifically the Water Board, Industry Tourism and Investment, and the Department of Executive (n = 4); the Federal Government, comprised of Aboriginal Affairs and Northern Development Canada, the Canadian Environmental Assessment Agency, Fisheries and Oceans Canada, the National Energy Board, and Natural Resources Canada (n = 13); private consultants (n = 5); environmental non-government organizations (n = 2); and academics and other energy interest groups (n = 4) researching or working in the region. Interviews with Inuvialuit and northern governments were conducted in-person in Inuvik, Northwest Territories. The remainder occurred over the telephone. Interview participants were selected based on their experience in and knowledge of offshore oil and gas development, planning and decision-making in the Beaufort Sea.

Participants were asked a series of semi-structured questions exploring: i) existing challenges and opportunities with the current approach to and provisions for offshore oil and gas impact assessment, planning, management and decision-making in the Beaufort Sea; and ii) critical factors, issues and concerns to be addressed through R-SEA in the Beaufort Sea, including participant views on stakeholder roles and the responsible authorities to lead and manage R-SEA. Interview results were organized using the CCME R-SEA framework described above as a general guide, coded thematically and analyzed using QSR NVivo© v.9, a computer software program designed to classify and manage qualitative information.

4.5 Results

Results are presented below based on each of the three broad phases of R-SEA: pre-assessment, assessment and post-assessment. In cases where participants did not want their comments attributed to their department, they are referenced by the broader organization with which they are affiliated.

4.5.1 Pre-Assessment Phase

There was a diversity of expectations on an appropriate reference framework for R-SEA, specifically what R-SEA should deliver in the Beaufort Sea. For industry, an expectation of R-SEA was to deliver greater certainty through predictability and consistency in the regulatory process. "Being able to have clear guidance on the where's and when's allows for more effective planning," explained one industry proponent. A federal government participant explained that R-SEA should be designed to "expedite the EA permitting stage by addressing problems early, and proactively solving them, rather than the current approach that is focused on mitigating negative impacts." Inuvialuit, ENGO, and some government participants advocated for R-SEA as an early assessment tool that could potentially restrict development activity if the results from a preliminary analysis were unfavourable, either in terms of environmental sensitivities or data gaps. As one ENGO participant explained, the current approach under EA is "how can we; with R-SEA it is 'should we." The majority of Inuvialuit participants said that R-SEA should be a front-end assessment of conditions, when preparing leases and putting areas up for auction and tenure, to guide whether and how areas are opened for future development.

There was agreement amongst participants regarding enforceability and responsibility for R-SEA. Most said that R-SEA should be regulated so that it is enforceable and provides certainty in planning and decision-making. However, one ENGO participant explained that greater certainty meant different things to different stakeholders: for some, certainty through R-SEA means greater support for establishing marine conservation areas; for industry certainty means that project approvals are expedited; for the Inuvialuit it means that their right to access and benefit from marine resources is protected.

There was also agreement that responsibility for R-SEA implementation should be shared between the federal government and Inuvialuit, with strong industry involvement. An environmental consultant noted that creating a new body for R-SEA "would add to the

perception of regulatory complexity…thus it would be better to expand and support [an existing] regulatory body through better funding, staff and technical support." A federal government participant maintained that the only way for R-SEA to be successful is through a process founded on stakeholder involvement so that "all interested and affected parties have a meaningful place at the table to influence decision-making and identify potentially conflicting values and ensuring such issues are addressed in the scoping stage." An 'industry-led' initiative was proposed by many industry and private consultant participants, with one participant explaining that "industry has financial resources so a partnership is ideal, and an umbrella partnership with industry, federal government and Inuvialuit could eliminate the 'us and them' mentality that currently exists." Such an umbrella partnership with industry was viewed with scepticism by other participants, including Inuvialuit. According to an Inuvialuit participant, the Inuvialuit view R-SEA as a means to "long term empowerment contributing increased confidence in decision-making, versus the current landscape which is plagued with contempt at the regional level as to how decisions are made at the federal level."

Participants deemed it necessary that R-SEA incorporate existing initiatives in the Beaufort Sea, namely IOMP, BREA and IRIS, and build upon already identified data and knowledge gaps, and address sociocultural and economic impacts. Most Inuvialuit participants recognized the need to 'scope-in' onshore sociocultural and economic values in R-SEA for offshore development as a priority issue; industry, government and ENGO alike supported this need. The difficulty, one Inuvialuit participant explained, is that legislation does not address socioeconomic impacts the same way it does biophysical, and offshore activities have shown very little socioeconomic benefit for the Inuvialuit. When industries seek access to resources onshore they are required under the *Inuvialuit Final Agreement* to negotiate benefit agreements. Although industry is not legally required to do so offshore, some companies have voluntarily struck benefit agreements. For example, one industry participant explained that "the Inuvialuit wish to have offshore plans tailored to them as long-term development; we [industry proponent] feel this is reasonable to respect and have entered into agreements with the IRC [Inuvialuit Regional Corporation]." However, this particular company's opinion was not widely supported; other industry interviewees were opposed to reaching voluntary agreements with the Inuvialuit for offshore development, noting that regulatory framework does not require such actions.

A final issue raised concerned baseline data. Results indicated disagreement, particularly amongst those consultants involved in offshore EA practice, as to the amount and adequacy of existing baseline data. Some participants said that there is a large amount of existing information, but that there are still significant data gaps that need to be addressed. One environmental consultant noted that "EAs conducted offshore in the 80s were nearshore, primarily scientific, focused on oil spill response, and the regulatory regime was quite different then," thus highlighting the need for new data to adequately assess proposed drilling in the deep offshore. In contrast, another environmental consultant stressed that the necessary data is available, but it is not effectively managed. The participant explained "there is a tremendous amount of information that isn't being as used as effectively as it could be. R-SEA would not involve ascertaining new data, rather taking existing information and formatting it into a vehicle more readily accessible and understandable."

4.5.2 Impact Assessment Phase

The use of alternatives assessment in R-SEA, and identifying a 'preferred' PPP direction, was an issue of considerable debate. The academic literature identifies alternatives as fundamental to R-SEA (see Gunn and Noble 2009; Duinker and Grey 2007), but there was dissent as to the usefulness of, and approach to, alternatives for R-SEA in the Beaufort Sea - specifically scenario-based approaches. There was no support for or against the use of alternatives assessment based on participant affiliation. For example, one industry participant explained that strategic planning is useful with scenarios, noting that it "doesn't have to be detailed per se, but can offer direction of how much development to permit and at what frequency." Similarly, an environmental consultant referred to the Norwegian and American regulatory regime, where cumulative impacts are examined before licensing, adding that in Canada, the practice has been to view each licensing call as a standalone exercise, and "we need to formalize the process, and look at the potential cumulative effects of licenses." A Fisheries and Oceans Canada regulator also saw the value in scenarios and explained: "if R-SEA could tell me where development needs to stop in terms of effects, that is the answer I need."

Others disagreed as to the usefulness and applicability of alternatives based assessment and the use of scenarios. Some participants noted that identifying strategic alternatives or ways to proceed, for instance, scenario planning, staged development, or restrictions toward permitting

quotas, is not necessary in the Beaufort Sea given the lack of current development activity. The "pace of development will occur naturally," an environmental consultant participant expressed, "and will be determined, in part, by infrastructure capacity." Some industry participants were also sceptical, and concerned that entertaining alternative scenarios of development and conservation, including the scenario of 'no development', would not support their economic bottom line. For example, one industry participant explained that:

> Industry is opposed to preferred scenarios because *whose* preferred scenario? Preferred scenario as an oil proponent is access to *my* resources. The Inuvialuit's preferred scenario is they get benefits with minimal impact. How does a preferred scenario unite industry, Inuvialuit and government? Preferred scenarios are polarizing, and latching onto a preferred development can end up killing a project.

An ENGO participant added fodder to industry's unease, noting: "it's entirely possible that you could have policy on energy and environment side that could restrict the ability to develop resources."

When PPPs and strategic options are developed through R-SEA, results reveal the importance of accommodating the preferences and priorities of stakeholders. Ensuring that risk and benefit debates take place, for instance, was posed by an Inuvialuit participant as an important issue in prioritizing regional PPPs and development strategies: "are there economic benefits for the Inuvialuit if development activities proceed, if so is it worth the trade-off for potential disruption of the ecosystem if there was an oil spill?" Results also showed that industry goals require careful consideration so that R-SEA does not automatically foreclose development opportunities. One participant from territorial government explained that "industry pay huge sums for rights and without industry there is no economic development and without a regulatory environment that supports industry then we fail to support a main element of Canada's Northern Strategy, economic development." It is important when identifying a strategic alternative for offshore development that there is the potential to deliver favorable results for industry. An industry participant explained that sequencing development through a strategic planning process should be viewed in a positive fashion in that data could support more, as opposed to fewer wells.

A final issue was assessing cumulative effects. Some participants saw the potential to

address cumulative effects through R-SEA, and the uncertainty that characterizes the cumulative effects assessment of alternative futures as a positive attribute of R-SEA; others viewed the lack of concreteness around regional cumulative effects as a negative feature of R-SEA. An industry participant explained that "there are so many approaches to assessing cumulative effects that it is confusing, and less than useful, even harmful to industry if the assessment isn't carried out effectively with clearly established boundaries, funding and expertise." Consistent with the CCME's (2009) view of R-SEA, some participants emphasized that long-term assessment horizons are characterized by vast uncertainties about change and external drivers and can lead to corresponding uncertainty about what effects are most likely to occur in the future. Those in favour of R-SEA for cumulative effects assessment maintained that it must be stakeholder-based and a participatory process. An industry participant added that "regional scale, with multi-stakeholder participation, holds potential for cumulative effects assessment – a staple to success." Participants also identified various elements that required attention when approaching cumulative effects through R-SEA, including regional baseline data and the importance of considering the complexity of the cumulative effects issues and pathways in marine environments.

4.5.3 Post-Assessment Phase

Follow-up and monitoring emerged as a key issue in the post-assessment phase, specifically regarding R-SEA's added value to management and decision-making. An Inuvialuit participant explained the value that could come from understanding the outcomes of decision-making through follow-up, not only as it pertains to R-SEA, but also by applying performance evaluation results to implementation targets of the *Inuvialuit Final Agreement*: "follow -up monitoring would be beneficial to offer land claim beneficiaries some tangible data on the effectiveness of mitigation and management actions." A significant shortcoming identified under current EA in the Beaufort Sea was the lack of follow-up and monitoring; as one industry participant explained, "regulatory agencies do not monitor very well – they don't look at it from a larger regional perspective and it doesn't go back into a planning process." A Joint Secretariat participant agreed, noting that monitoring is "more for the purposes of meeting regulatory requirements than fulfilling a practical purpose." Congruence in monitoring methods and data collection emerged as important to R-SEA, with industry's project-specific monitoring efforts

able to provide a valuable contribution to the monitoring of VECs. Consistent with the CCME (2009) it is necessary to ensure monitoring and data are quality controlled, transferable and comparable. Failure to achieve congruence may lead to problems in comparing monitoring results. As an ENGO participant explained: "if you allow proponents to form their own monitoring plan you get a mishmash of data with different methodologies that makes obtaining a coherent picture challenging. Make sure the monitoring plan is well defined for the proponent so the data received is comparable and can be used to inform a regional picture."

Finally, participants identified the need for an adaptive approach to implementation. An industry participant expanded on the need for flexible and adaptable implementation:

> Dealing with so many uncertainties we need to reserve flexibility to adjust as development unfolds. R-SEA model might be the best thing in the world, but it could be useless in affecting change if it cannot accommodate public opinion and values. When dealing with so many uncertainties with regard to how the offshore will develop, it must be modifiable.

An ENGO participant added that it must demonstrate that the views of the affected public are taken seriously and integrated, where possible, in the final design of the strategic alternative, and "it has to be a living document informed by public opinion, so that the outcomes are reflected by inputs." The importance of implementing R-SEA as an iterative and adaptive process was deemed as core to R-SEA's success, particularly when it comes to VECs and having "a system built in for ensuring VECs are validated regularly, as values change over time."

4.6 Discussion: Advancing R-SEA in the Beaufort Sea

There are several issues and challenges that need to be addressed to advance R-SEA in the Beaufort Sea; yet there appears to be a foundation from which to move forward. The goal of this paper was to identify key issues and gaps that may pose challenges or opportunities for R-SEA implementation in the Beaufort Sea. What follows are a number observations concerning R-SEA implementation. Although based on Canada's western Arctic, the lessons and observations are relevant to other national and international offshore jurisdictions.

4.6.1 Diversity of Expectations

Diversity in expectations of what R-SEA is expected to address and deliver in the Beaufort Sea is

a challenge to its development and implementation, particularly when attempting to establish a reference framework. Though most expectations of what R-SEA should accomplish in the Beaufort Sea were consistent with what R-SEA can potentially deliver (see CCME 2009), results reinforce the work of Noble et al. (2013), Ketilson (2011) and Vicenté and Partidário (2006) who respectively observed that R-SEA's role, particularly in energy sector PPP development and assessment, is neither well developed nor understood, and hence the nature of R-SEA remains unclear to many.

Part of the challenge may be attributed to the flexibility of R-SEA as an approach to planning and assessment. Although some have argued that structure and consistency is core to strategic approaches (Fischer 2003), others like Partidário (2000), Nilsson and Dalkmann (2001) and the CCME (2009) maintain that SEA-based initiatives must be flexible to regional and local context. In the Beaufort Sea, flexibility proved to be a desirable characteristic of R-SEA; however, a challenge associated with flexibility was the establishment of clear purpose and scope for R-SEA and reaching agreement on the specific questions and problems to be addressed. Failure to agree on the scope of R-SEA early on in the process poses a major impediment to its adoption, implementation and ultimate effectiveness.

Poor understanding of, or disregard for, context can lead to simplified judgments about resource systems, and consequently failures in management efforts (Bina 2008a). To ensure that R-SEA can emerge as an accepted and worthwhile part of planning and decision-making processes, constraints and intent need to be agreed upon at the outset and made clear to all interested parties (see Dalal-Clayton and Sadler 2005). This is currently not the case in the Beaufort Sea. The diversity of expectations reinforce Dalal-Clayton and Sadler's (2005) findings that R-SEA needs to be better understood if it is to be welcomed into decision-making for resource planning and development. However, notwithstanding the variety of opinions on what R-SEA should do in the Beaufort Sea, there was consensus that something needs to be done and that the current project-based approach is not sufficient.

4.6.2 Scepticism and Resistance about a Futures-based Approach

Notwithstanding increasing calls for R-SEA in the Beaufort Sea, there remains scepticism and resistance, albeit by the minority, that R-SEA will not be a fair process for all stakeholders and certain procedural benefits, such as establishing regional targets and thresholds, may have

adverse impacts for industry. Resistance to R-SEA implementation was rooted in one of the most fundamental components of R-SEA, that of examining alternative futures (see CCME 2009; Jones et al. 2005) and selecting a strategic course of action. Particular scepticism emerged regarding the need for scenario planning given the lack of current offshore energy activity in the region; suggesting limited understanding of the purpose of R-SEA and the role of scenarios in planning and assessment. This was not surprising. Duinker and Greig (2007) report that, although scenario-based approaches are most appropriate to the task of planning for and assessing the impacts of future development, they are significantly underutilized and promoted in EA practice. Scenario-based approaches are about examining 'what may happen,' 'what is most likely to happen,' and 'what would we prefer to happen' concerning the development and outcomes of development in a particular region (see Rubin and Kaivo-oja 1999). In a region characterized by much uncertainty concerning the future impacts of offshore resource development, as noted by interview participants, scenario-based analysis is ideally suited for grappling with such uncertainties and a shift away "from trying to estimate what is most likely to occur toward questions of what are the consequences and most appropriate responses under different circumstances" (Duinker and Greig 2007: 209). Interestingly, the consideration of strategic alternatives early in decision-making, before irreversible development decisions are taken, was an opportunity and potential benefit of R-SEA that most Inuvialuit participants supported. However, among those who accepted the need for scenario use and evaluation in the Beaufort, there were many different opinions on what scenarios should be considered and what they would be willing to accept - ranging from seismic free areas to energy policy on renewable versus non-renewable energy futures.

4.6.3 Understanding Stakeholder Resistance and Scepticism

Resistance and scepticism regarding alternative assessments and scenario based approaches may be a result of the perceived risk of being locked into a PPP that is seen as 'less than desirable' for any individual interest. This was a particular concern raised by industry; however, more attention is needed to understanding stakeholder resistance to address the root cause of this perception. Such scepticism could stem from fear of legislation of R-SEA outputs, or the lack of flexibility for industry to plan for and control its future as it has had the liberty to do to date in the Beaufort. The level of disdain regarding the current regulatory system by industry

participants is not improving. Erlandson (2009) argues that the problem with northern regulatory systems is not that they are complex, but that they don't work in relation to the business cycle for oil and gas development. Erlandson (2009:419) further reports that operators in the petroleum sector "can't count on standards of administrative law such as consistency, predictability and timeliness that are taken for granted elsewhere," and their perceptions of risk have risen over the last 10 years. Such stark findings illustrate deeply rooted public policy problems that have been well documented by others (see Abele 2009; McCrank 2008), which have lead in part to cynicism on behalf of industry on the government's ability to effectively and efficiently manage the offshore environment. In this way, industry seemed skeptical not of change per se, but rather the government's capacity to effectively carry out and implement an R-SEA.

Vicente and Partidário (2006) argue that such perceptions are influenced by individual cultural and social contexts, including past experience, and that understanding the root of the problem and the different perceptions of a problem lie at the core of SEA activities. Ultimately, however, if no PPP direction is identified, then R-SEA is no more than a data collection exercise with little value added to development assessment and decision-making (see CAPP 2009) and, arguably, no different than past efforts in the Beaufort region. If there is a lack of commitment to identifying and charting a course in the western Arctic through R-SEA, then perhaps R-SEA is not the right tool. On the other hand, if there is a lack of commitment from certain stakeholders, as is the case in the Beaufort, then perhaps there is a need for better education regarding R-SEA. This could be accomplished through, for example, empirical case study learning from other offshore jurisdictions to demonstrate that R-SEA does not arrive at polarizing decisions, nor is it a command and control type process (see Knol 2010; Hasle et al. 2009). Instead, it is a means of integrating environmental and broader sustainability considerations in regional PPPs. There is a need to bring forward evidence from case applications that R-SEA can achieve its objectives without adding significant delays to regulatory and decision-making processes. Nevertheless, if industry is fundamentally opposed to R-SEA this will pose a significant challenge to implementation. This is particularly the case given the current national political climate that is driving energy investment as a result of Prime Minister Harper's commitment for Canada to be an energy superpower (see Hester 2007), and the relaxing of federal environmental assessment laws and regulations to promote more rapid exploration, development and approval processes (see Gibson 2012).

4.6.4 Good Governance

R-SEA can help advance good regional governance for resource planning and assessment, as intended by the CCME (2009), but there was concern by some participants that R-SEA would simply be another layer of government. Scott (2008) maintains that SEA's contribution to good governance has been made without examination of the tensions inherent within good governance discourse, and that the SEA-good governance nexus is more an objective than a reality. In other words, R-SEA can help advance good governance, but its success in doing so is largely dependent on the extent to which stakeholders are engaged and able to participate in and influence decision-making. This kind of circumspect thinking emerged in the results, as some participants saw R-SEA adding another layer of bureaucracy with no guaranteed benefits. For some Inuvialuit participants, there was concern that R-SEA could be a process dictated at the federal level, eroding decision-making power and influence within the Inuvialuit Settlement Region. This perceived risk of loss of control was exacerbated by concerns over the possibility of industry leading R-SEA initiatives, and playing a key role in the environmental management of the region. Despite these concerns, there was broad agreement that government should play a lead role in R-SEA through a multi-stakeholder approach.

The OECD (2006: 46) reports that "SEA supports *good governance* by: encouraging stakeholder participation ... [and] Increasing transparency and accountability' as well as 'clarifying institutional responsibilities.'" The increased transparency afforded by SEA at the regional level can be a potential catalyst for increased efforts at joined-up government through "increas[ing] pressures to overcome bureaucratic fragmentation and jurisdictional conflict", according to Stinchcombe and Gibson (2001: 354) in Scott (2008). The Inuvialuit have been active participants in multi-stakeholder government processes to improve and prepare for offshore development for decades (see CAPP 2009). In this way, existing multi-stakeholder initiatives such as the IOMP, BREA and IRIS may help set a foundation or establish pre-conditions for R-SEA success. As laudable as these initiatives have been, however, ubiquitous governance challenges prevail (see Erlandson 2009), which from the Inuvialuit perspective comes from the "requirements of legislation and institutions, mainly federal, that are layered on top of those of the Inuvialuit Settlement Region, and which were not designed to be coordinated with each other" – or even complimentary (Cournoyea 2009: 391). Fundamental governance and coordination challenges such as these may be addressed in part through R-SEA; however, given

their legislative depth they will likely continue to challenge offshore planning and management efforts and be a significant challenge to R-SEA implementation.

4.6.5 Social Impacts

Results support Norman's (2005) findings that the well-being of coastal communities should be paramount in marine resource development, and there is a need for R-SEA to focus on the onshore socioeconomic implications of offshore development. Porta and Bankes (2011) echo the concern that many Inuvialuit participants raised regarding risks and benefits: "of all the players involved in an Arctic offshore oil and gas program, Inuit communities bear the greatest risk, and with the current system benefits are not proportionate to these risks." Oil and gas investments can have significant positive local, and in the case of major projects, regional and national economic impacts; however, extractive industry investments can also give rise to a range of negative effects (Wagner and Armstrong 2010). The potential negative effects of resource extraction proved to be a major concern for participants, especially the Inuvialuit.

Benefit plans emerged as a contentious topic; the seabed where offshore drilling occurs is Crown land but unlike for onshore arrangements industry is not legally obliged in the offshore to establish impact and benefit agreements. Porta and Bankes (2011) maintain that the absence of a legal trigger to negotiate benefit agreements for offshore production fails to balance the risks and benefits of those operations for local communities. There is an opportunity for R-SEA to integrate socioeconomic considerations early in the planning of offshore oil and gas systems (CCME 2009), and, R-SEA could potentially integrate benefit agreements into the assessment process and offer decision makers and local interests a better understanding of the broader development planning cycle. This could enable an evaluation of how such agreements contribute to the region and maximize economic benefits, prior to specific project-based negotiations, and whether they support regional goals and R-SEA objectives. The roles of these two potentially complementary processes, R-SEA and negotiated benefit agreements, in contributing toward more informed decision-making requires further examination. To date, the focus on research on benefit agreements in relation to environmental management has focused exclusively on project-level EA, namely in the mineral sector (see Noble and Fidler 2011), and suggest that such agreements have emerged, in part, due to the inadequacies of project-based assessments in addressing cumulative effects, socioeconomic impacts and follow-up (Galbraith et al. 2007). It

may well be the case that such agreements need to remain outside the scope of R-SEA, but in the context of impact management and Arctic offshore planning the current system requires reform (Doelle et al. 2012). Cournoyea (2009: 392) argues that while the Inuvialuit are adaptable people, it is the federal government's responsibility to invest in public services such as health, and social services, concluding that "if the only investment in capacity is in reaction to development after the fact, it will come too late."

4.6.6 Post-Assessment and Implementation

Overall participants had much more to say, and raised many more concerns, regarding the pre-assessment and assessment phases of R-SEA than they did about implementation and post-implementation evaluation of the PPPs that emerge from R-SEA. Although the lack of follow-up and monitoring under EA (see Morrison-Saunders and Arts 2004; Arts et al. 2005) was raised by study participants, relatively little comment was made regarding what comes after R-SEA, when a PPP or course of action is identified. This is not surprising, as Gachechiladze et al. (2009) report that most SEA research and practice has focused almost exclusively on pre-decision stages, in particular the development and application of SEA systems and methodological frameworks, with limited attention to the post decision follow-up stage. With limited attention to monitoring for undesirable effects during the PPP's implementation, it will prove difficult to draw conclusions on planning assumptions and apply these to subsequent assessments (see Cherp et al. 2007). The lack of consideration to post implementation is particularly concerning given the noted uncertainties associated with development in the offshore region.

The necessary supporting institutional environments to ensure that a preferred strategy can succeed, or that management actions are in place in order for a preferred strategy to be considered viable, remains underdeveloped both in the academic literature (Gachechiladzeis et al. 2009) and in practice. Problematic in this regard, and consistent with Noble (2003), is that R-SEA output and decision outcomes are to a significant extent a function of the input and quality of the R-SEA process. If institutional arrangements to support the implementation of R-SEA output have not been considered during the entire R-SEA process, efforts performed in the pre-assessment and assessment phase could prove futile. The result is an R-SEA process that resembles no more than a visioning and data collection exercise but with no implementation or

links to decision-making. Shannon (1998) maintains that institutional arrangements are just as important as the scientific and technical aspects of understanding and conducting assessments, as they establish a template for patterns of relationships and administrative mechanisms to manage effects. Although partnerships exist in the Beaufort Sea through various multi-stakeholder programs and initiatives, no research on the network of institutional arrangements has been conducted to establish whether existing arrangement can support R-SEA implementation. There is a documented need to better understand the ways in which institutional arrangements affect the advancement and implementation of R-SEA. Even the most well intended strategies are of little value if they are not put into action (CCME 2009).

4.7 Conclusion

Large-scale offshore hydrocarbon development is looming in the Canadian Beaufort Sea, but there is no R-SEA framework to help plan for future energy development, establish a long-term regional vision, or to assess and effectively manage potential cumulative effects. A majority of stakeholders have advocated for R-SEA in the Beaufort (e.g., Arctic Council 2009; IGC 2004), and there is optimism that a foundation exists through the application of the CCME R-SEA model to guide and advance offshore planning and assessment. This paper set out to identify key opportunities for and challenges to the implementation of R-SEA in the Beaufort Sea, and in doing so examined support for its implementation and identified areas of stakeholder disagreement. Although acute implementation challenges were identified, such as issues of governance and the nature and scope of alternatives assessment, findings reveal particular challenges to the current project EA approach and show that R-SEA offers a much needed framework to begin addressing stakeholder concerns about future offshore development in the region. The CCME framework provides a starting point to advance R-SEA in Canada's western Arctic and ensure that offshore development in the region reflects the intended and desirable outcomes of stakeholders, as opposed to the most likely ones.

CHAPTER 5

CONCLUSION

5.1 Introduction

The shift from managing individual projects to more regional and integrative approaches has begun to take root internationally in environmental management. The interest in regionally-based, strategic approaches to EA stems from the limited capacity of project-based EA to address cumulative effects and alternatives (Harriman Gunn and Noble 2009a), the desire of public and indigenous groups to be more involved in development planning (Porta and Bankes 2011), the need to integrate sustainability considerations at the early stages of development through PPPs (Harriman and Noble 2008), and recognition that development decisions should be set within a broader environmental planning and management framework (CCME 2009; Partidário 2000). As a result, there is now a collective understanding that EA must go beyond the evaluation of site-specific project impacts to consider the broader policy and regional planning context in which development projects operate (Elvin and Fraser 2012; Noble and Harriman 2008; WWF 2005; Partidário 2000).

The widespread international adoption of SEA is linked intrinsically to an increased understanding of the relationship between development and environment (Fundingsland Tetlow and Hanusch 2012). Recognition that biophysical systems cannot be viewed or managed in isolation to human systems, and that these systems must be managed in an interconnected and adaptable manner is well documented in environmental governance literature (see Plummer and Armitage 2007; Adger et al. 2005; Berkes et al. 2003). The need for a strategic approach to EA is recognized especially in the context of offshore hydrocarbon planning and development (see BSStRPA 2008; Horvath and Barnes, 2004; Davey et al. 2000; Kinn 1999) where projects operate in a large infrastructure network and the risks to marine environments are often high on a global scale (Campagna et al. 2011; Wagner and Armstrong 2010). By their very nature, such projects require regional and strategic coordination (Spiridonov 2006; WWF 2005; Salter and Ford 2001). There are now various forms of SEA for offshore energy planning and impact assessment ongoing internationally (see Hasle et al. 2009; Wagner and Jones 2004); yet, in

Canada's western Arctic, an emerging energy frontier, planning for offshore hydrocarbon development continues to occur on a project-by-project basis (Doelle et al. 2012; Voutier et al. 2008).

The absence of a strategic approach to environmental planning and assessment in the Beaufort Sea continues to raise many questions concerning Canada's preparedness for offshore energy development (Doelle et al. 2012; Porta and Bankes 2011; WWF 2005). Concerns exist over the ability of current project-driven assessment to address the long-term cumulative environmental and social impacts of offshore development on the marine environment and local communities (see Arctic Council 2009; Doelle et al. 2012). Notwithstanding several regional planning, baseline collection and science-based marine initiatives ongoing in Canada's western Arctic (e.g., IOMP, BREA, IRIS), and recognition at the national (e.g., CCME 2009) and international levels (e.g., Arctic Council 2009) of the importance of a strategic approach, there remains no consolidated framework of R-SEA in the Beaufort Sea. Questions over whether and how such a framework can or should be implemented remain unaddressed.

Part of the challenge to implementation of R-SEA in general is that the majority of research attention on the subject has focused on demonstrating the need for and benefits of such a framework (see Bina 2007), rather than on examining implementation issues to advance R-SEA from a novel concept to applied planning, assessment and decision support process. This research examined how an R-SEA framework could be used in the Beaufort Sea to influence planning and development decisions in a broad, regional socioeconomic and environmental context. Specifically, through identifying key implementation challenges and opportunities based on stakeholder perceptions, this research advanced a greater understanding of how to advance R-SEA principles and frameworks to inform and improve the efficacy of environmental management and decision-making. The specific objectives of the research were to:

i. examine offshore SEA frameworks internationally to identify operational challenges and opportunities and their influence on oil and gas planning and decision-making;
ii. identify stakeholder perceptions regarding challenges and opportunities of current marine planning, assessment and science initiatives in Canada's western Arctic to ascertain whether and how these initiatives enable horizontal and vertical integration and effectively facilitate marine resource planning and decision-making; and

iii. identify key opportunities for, and challenges to, implementation of R-SEA in the Beaufort Sea based on a normative model and stakeholder expectations of R-SEA.

5.2 Key Findings

The first manuscript, "Advancing strategic environmental assessment in the offshore oil and gas sector: Lessons from Norway, Canada, and the United Kingdom" (*Environmental Impact Assessment Review*, 2012, 34: 12-21), set out to examine the efficacy of SEA offshore, in particular its influence on planning and development decisions. Based on the need for a better understanding of the nature and efficacy of SEA in the offshore energy sector and its role in planning and development decisions (Jay 2010), the findings are important to informing emerging energy frontiers, such as Canada's western Arctic, where there is an articulated need and interest to advance R-SEA (see Doelle et al. 2012; Elvin and Fraser 2012; Arctic Council, 2009; WWF 2005). The three international offshore SEA systems were reviewed by examining regulations and impact assessment and planning reports, complemented by 20 semi-structured interviews with practitioners, regulators, industry representatives, and NGOs directly involved in SEA offshore in Norway, Atlantic Canada and the United Kingdom. Each offshore system was examined based on a set of normative criteria derived from the SEA evaluation literature (see Gunn and Noble 2011; Noble 2009; Fischer and Gazzola 2006; Jones et al. 2005).

The results revealed seven key findings. First, in terms of normative versus applied SEA, the purpose and deliverables of SEA in the offshore environment often differ and were much more restrictive than the ambitious expectations about SEA identified in the academic literature. Second, though early application of SEA, prior to offshore license issuance, is considered ideal and most influential in directing planning and development decisions, there is still merit to SEA coming late in the offshore planning process, post license issuance, even though certain options for planning and development may be foreclosed. Third, alternatives assessment is identified as core to effective SEA (see Fischer 2007; Noble and Storey 2001), but the nature of alternatives considered in each of the three offshore systems examined was inherently restrictive when compared to academic expectation about the range of alternatives that should be considered in SEA, including 'no development' alternatives; this was, in part, a reflection of the timing of SEA application in the policy and planning process. Fourth, each jurisdiction recognized the importance of public participation in SEA processes, reinforcing SEA's communicative potential

as a means to influence decisions (see Runhaar and Driessen 2007), but the offshore 'out of sight, out of mind' nature of the industry proved problematic in some cases in sustaining public engagement. Fifth, socioeconomic issues received relatively limited attention in each of the three offshore systems reviewed in comparison to biophysical considerations, particularly the onshore socioeconomic impacts associated with offshore development. Sixth, the potential for SEA as a tool to assess cumulative effects is well argued, but the benefits have yet to be clearly demonstrated in offshore practice due, in part, to agencies responsible for development having neither the authority nor capacity to address multi-sectoral cumulative effects. Finally, although tiering is considered by many to be a major driver of SEA (see Fischer 2007; João 2005), the tiered forward benefits and influence of SEA were not fully realized in the three cases examined. SEA appeared to have only limited, direct influence on subsequent levels or tiers of planning and assessment due in large part to a lack of clear coordination between higher and lower tiers. Overall, the manuscript demonstrated how SEA informs and improves the efficacy and efficiency of project-based assessment offshore; however, it also demonstrated how weak coordination between higher and lower tiers limits SEA's ability to influence planning and development decisions in a broad regional environmental and socioeconomic context. The lessons and challenges that emerged from the three cases transcend their specific regional offshore context, and therefore provide transferable learning for the Beaufort Sea and other offshore areas.

The second manuscript, "Stakeholder Perceptions of Current Planning, Assessment and Science Initiatives in Canada's Beaufort Sea" (*Arctic,* accepted for publication), examined how existing initiatives facilitate a more coordinated and informed approach to planning, assessment and decision-making for sustainable offshore development. The objective was to understand stakeholder perceptions regarding the challenges and opportunities of current marine planning, assessment and science initiatives in Canada's western Arctic, thus providing an assessment of the current policy and planning landscape in the context of resource development. The IOMP, BREA and IRIS initiatives were reviewed using desk-based analysis of research reports and policy and planning documents, supplemented by 50 semi-structured interviews with Inuvialuit co-management boards and agencies, municipal government, territorial and federal government, oil and gas industry, private consultants, and ENGOs and other energy interest groups. Interview participants were selected based on their experience in and knowledge of offshore oil and gas

development, planning and decision-making in the Beaufort Sea.

Results demonstrated three key issues that are essential to the efficacy of current initiatives in support of a more coordinated, regional approach to marine resource planning and management in relation to offshore development in the Beaufort Sea. These include horizontal integration between management bodies, vertical tiering from the strategic level and regional scale to the operational level and project scale, and the establishment of an overarching vision for regional planning and development in the Beaufort Sea. Results also demonstrated the need for a more integrative and strategic planning and assessment framework in the Beaufort Sea – a framework to coordinate current initiatives, combine data for planning and assessment, and set strategic priorities for the future management and development of the region. Such a framework is beyond the collective abilities of current offshore planning and management initiatives in the Beaufort Sea, but is consistent with R-SEA, which focuses on identifying possible future scenarios and sustainable regional outcomes (Harriman Gunn and Noble 2009a) rather than on mitigating the outcomes of decisions already taken under a project-based EA scenario (Noble 2009; Marshall and Fischer 2006).

The final manuscript, "Advancing Regional Strategic Environmental Assessment in Canada's Western Arctic: Implementation Opportunities and Challenges" (*Journal* of *Environmental Assessment Policy and Management*, 2013, 15: 1) identified key opportunities for, and challenges to, the implementation of R-SEA. There has been much interest in R-SEA, and a growing body of research on the benefits and opportunities of strategic approaches to EA, but very little attention on implementation. The current Beaufort Sea planning, assessment and decision-making environment was examined against the normative CCME (2009) model and expectations of R-SEA, with the intent of providing a foundation for advancing R-SEA from concept to practice. 50 semi-structured interviews were conducted with Inuvialuit co-management boards and agencies, municipal government, territorial and federal government, oil and gas industry, private consultants, and ENGOs and other energy interest groups. Interview participants were selected based on their experience in and knowledge of offshore oil and gas development, planning and decision-making. The purpose was to examine current stakeholder support for R-SEA implementation for offshore planning and management and areas of potential disagreement amongst stakeholders.

The results indicate that there are a number of issues and challenges that need to be

addressed in order to advance R-SEA in the Beaufort Sea, but there is also a considerable foundation already in place. In terms of challenges for R-SEA implementation in the Beaufort Sea, several key issues emerged. First, the diversity in expectations of what R-SEA is expected to address and deliver in the Beaufort Sea was identified as a key challenge to its development and implementation, particularly when attempting to establish a reference framework for R-SEA design, purpose and objectives. Second, there was scepticism and resistance, albeit by the minority of participants, regarding the assessment of alternative futures through R-SEA and selecting a preferred strategic course of action and the implications, which from an industry perspective could be restrictive. Third, and closely related to this, there emerged a need to better understand stakeholder resistance in order to address the root cause of scepticism. Some participants, for example, were concerned that R-SEA would simply add another layer of government regulation with no guaranteed benefits to planning or decision-making, indicating that more research is necessary on the topic of R-SEA and good governance in order to ensure its effective implementation. Fourth, in terms of social impact planning and management, further efforts are required to address onshore impacts at a broader regional level and ensure benefits are proportionate to risks. Finally, although results showed that stakeholders had given some consideration to, and expressed concerns about, R-SEA process, design, data and alternatives assessment, there has been very little consideration given to post-implementation evaluation of R-SEA. This is particularly concerning given the noted uncertainties associated with development in the offshore region. Overall, this manuscript showed that a foundation exists through the application of the CCME R-SEA model to guide and advance offshore planning and assessment in the region. Although acute implementation challenges were identified, findings reinforce that the current regulatory regime is not sufficient and R-SEA does offer a much needed framework to accommodate and begin addressing stakeholder issues and concerns about future offshore development in the region.

5.3 Lessons from Practice for Advancing R-SEA in the Beaufort Sea

This research identified both opportunities and challenges to advancing R-SEA in the Beaufort Sea. The following sections step back from the specific results of each manuscript and focus on three overarching challenges that must be addressed if R-SEA is to become an accepted, worthwhile, and effective planning, assessment and decision support process in Canada's

western Arctic.

5.3.1 Context Sensitivity and Managing Expectations

Bina (2007) suggests there has been systematic growth of expectations attached to SEA. Certainly in the case of the Beaufort Sea there were many expectations of what R-SEA could deliver, and a diversity of expectations resulting from the varied stakeholder priorities, values and goals. This variety illustrates the diverse political, economic and cultural context of the region, which has, in part, resulted in skepticism about and resistance to R-SEA in the Beaufort Sea. It was argued by some that R-SEA would not be a fair process for all stakeholders in the region and that certain planning and decision-support benefits of R-SEA, such as establishing regional targets and thresholds for development, would have potentially adverse impacts for industry. Stakeholder resistance and scepticism regarding alternative assessments in R-SEA and the use of scenario based approaches appeared to be a result of the perceived risk of being locked-in to a PPP that may be 'less than desirable' for any individual interest. This perception, while potentially realistic depending on a stakeholders' initial expectations, is arguably too focused on the possible negative outcomes of the findings of an R-SEA and fails to adequately consider possible benefits, such as increased certainty with respect to the magnitude, location and/or timing of development. Vicenté and Partidário (2006) argue that perceptions are influenced by individual cultural and social contexts, including past experience. Understanding the root of the different perceptions of R-SEA thus lies at the core of advancing it as a viable tool in the Arctic.

There are two contrasting approaches for addressing this diversity of expectations. Some have argued that structure and consistency is core to strategic assessment approaches (Fischer 2003); others such as Partidário (2000), Nilsson and Dalkmann (2001) and the CCME (2009) maintain that SEA-based initiatives must be flexible to regional and local context. The need for R-SEA to be sensitive and accommodating to regional context, is consistent with Howitt (2001) who noted that resource localities are not asocial, apolitical or ahistorical, and thus resource management, conceived here as R-SEA, can benefit from learning from international offshore regimes (see Chapter 2) but more importantly must be context sensitive (Hilding-Rydevik and Bjarnadóttir 2007). In this way the role and aims of R-SEA vary according to the planning and decision-making context in which it is applied (Fundingsland Tetlow and Hanusch 2012). Based

on the current challenges and opportunities associated with the current IOMP, BREA and IRIS initiatives in the Beaufort, as identified in this thesis, it can be concluded that an approach situated between the two spectrums (i.e., structured and flexible) is appropriate. Implementation challenges identified in the IOMP, for instance, were attributed to the initiative being too cumbersome and unfocused, in part a result of trying to accommodate too many issues. While many participants upheld the value of a flexible and adaptable R-SEA model, challenges related to a lack of structure and consistency in the IOMP demonstrated that too much flexibility can have negative implications on implementation.

Although challenging, acknowledging complexity and regional context will be critical to successful implementation of R-SEA in the Beaufort Sea (see also Elvin and Fraser 2012; Abele 2009). Like many circumpolar indigenous populations, the Inuvialuit are faced with formidable challenges that are intimately tied to climate change, resource development and geopolitical transformations (Irlbacher-Fox and Mills 2009; Van Loon 2009). The precise way in which Arctic ecosystems will respond to climate change and other stressors remains unknown (Prowse et al. 2009). Normative SEA literature, best practice SEA case studies, evaluative criteria, and so forth all provide valuable information toward the development and application of R-SEA methodology and processes. However, equally important, particularly in this regard, is creating a framework that reflects and respects the governance arrangements, such as the IFA and its environmental and wildlife co-management institutions, and the fragility of Arctic ecosystems.

5.3.2 Implementation and Follow-up

Most SEA research and practice has focused almost exclusively on pre-decision stages, in particular the development and application of SEA systems and methodological frameworks, with limited attention to the post decision follow-up stage (Gachechiladze et al. 2009; Partidário and Arts 2005; WWF 2005). In the Beaufort Sea, participants generally had much more to say, and raised many more concerns regarding the pre-assessment and assessment phases of R-SEA than they did about the actual implementation and post-implementation evaluation of the PPPs that emerge from R-SEA. Even though the lack of follow up and monitoring under current project-based EA (see Morrison-Saunders and Arts 2004; Arts et al. 2005) was consistently raised as problematic by study participants, relatively little was said regarding what comes after R-SEA, when a PPP or course of action is identified.

The thesis results further suggest that if R-SEA follow-up is to contribute to a better understanding of regional or cumulative environmental effects, then follow-up programs must pay greater attention to horizontal linkages between SEA strategies and current initiatives so that monitoring and reporting systems can be shared, where appropriate (see Gachechiladze et al. 2009). In international case studies (see Chapter 2) and in the Beaufort, the common finding was an assumption that the data and information generated at a strategic regional level would be useful to lower level assessment and decision-making processes, including project-based EA; however, in many cases there was limited attention given to the process of integration between high-level policies and on-the-ground decision-making. This may be problematic in the Beaufort Sea, as in other jurisdictions, as PPPs are often formulated in abstract terms, resulting in vague directions for acting. The international case studies presented in Chapter 2 indicate that if there is no concerted tiering of regional decisions or information downstream to where decisions and actions are taken about physical development in the offshore, then the influence of higher level efforts may be trivial. While there is the potential for strategic initiatives to support lower level decision-making, the critical information required at the project level needs to be identified and a mechanism created whereby the data generated are collated and translated into a usable format for project assessments (Noble 2003).

Consistent with Sanchez and Silva Sanchez (2008), the notion of tiering pervades the SEA literature but has received limited critical attention in real applications. This thesis suggests that many of the disappointments regarding tiering and downstream influence are a result of inadequately linking the pre-assessment and assessment R-SEA stages to post-assessment and implementation. There is an opportunity to learn from implementation deficiencies seen in other sectors and case studies (e.g., Gachechiladze et al. 2009), and the challenges related to tiering in the offshore environment (Chapter 2), and move beyond the basic recognition that follow-up and post-implementation activities must be done (see CCME 2009) toward developing the governance frameworks, principles and good practice guidance needed to advance follow-up in R-SEA from concept to actual practice.

There currently exists a significant amount of information related to the Beaufort Sea, but this exists in a variety of sources and formats. An R-SEA deliverable should therefore entail an information management portal that expands upon, or links to, existing tools such as the Arctic Institute of North America's ASTIS database and AANDC's Petroleum and Environment

Management Tool. The overall objective would be to minimize duplication of effort and facilitate regulatory processes by providing a specific entry point for the delivery and dissemination of relevant information.

5.3.3 Governance: Horizontal Integration and Cooperation

Scott (2008) maintains that SEA's contribution to good governance has been made without examination of the tensions inherent within good governance discourse, and that the SEA-good governance nexus is more an objective than a reality. In part, the thesis findings (see Chapter 4) support this statement, as there is no guarantee that R-SEA will lead to good governance if the appropriate steps are not taken to determine which parties and partnerships have the capacity to carry out R-SEA and implement the results. In the Beaufort Sea there was concern amongst some stakeholders that R-SEA could add considerable regulatory complexity and even erode the decision-making power and influence of the Inuvialuit if R-SEA was nationally-driven, or the decision-making power and influence of the federal government if R-SEA was inherently regional-driven.

Institutional arrangements have challenged previous and current initiatives in the Beaufort Sea (e.g., IOMP, BREA), by what Jessen (2011) describes as 'federal silos' that impede horizontal coordination. According to Stinchcombe and Gibson (2001: 354), the increased transparency afforded by SEA at the regional level can be a potential catalyst for "increased efforts at joined-up government through 'increas[ed] pressures to overcome bureaucratic fragmentation and jurisdictional conflict". A federally led R-SEA has the potential to support Erlandson's (2009: 421) call for "greater coordination, at a senior level, across all federal departments and agencies involved in resource management and decision-making". Increased coordination and collaboration between federal departments would be beneficial, but must simultaneously maintain the influence and decision-making power of the Inuvialuit. While there is potential for R-SEA to advance good governance (see OECD 2006), its ability to do so is not a foregone conclusion and is largely dependent on horizontal coordination and cooperation, and the degree to which stakeholders may influence decision-making.

Closely related to PPP implementation, it is necessary that supporting institutional arrangements are in place to ensure that any preferred strategy can succeed, or that management actions are in place for a preferred strategy to be considered viable. Sheelanere et al. (2013)

argue that the major challenge in scaling up from the project scale to the regional scale in EA lies not only in understanding a broader range of ecological interactions, but also in negotiating the additional institutional and management complexity involved in broader, more regionally focused planning and management processes. Institutional coordination and support for regional and strategic EA, however, remains relatively underdeveloped in the academic literature (Gachechiladze et al. 2009). Consistent with Slootweg and Jones (2011) and Jiliberto (2011) more emphasis is needed on governance, institutions and the level of management needed with regard to the ability, commitment and preparedness to implement and manage R-SEA systems.

The results of this thesis illuminate tensions between science and sociopolitical factors in the Beaufort Sea, which are supported by Murawski (2007) who maintains that it is not always the science that is limiting to advance the understanding of factors influencing ecosystems, but the will of political systems to make decisions in controversial and uncertain circumstances. In the Beaufort, R-SEA will have to contend with governance challenges which, according to Abele (2009), arise as a result of yesterday's decisions being today's immutable conditions. In this respect there are three main challenges: i) making new governance arrangements work, ii) Canada's old and limited approach to northern development, and iii) securing the well being of people. Governance and coordination challenges such as these may be addressed in part through R-SEA; however, given their legislative depth they will likely continue to challenge offshore planning and management efforts and be a significant challenge to R-SEA implementation.

In the Beaufort Sea, implementation should take effect through a co-management framework, which could safeguard principles and goals outlined in the IFA and expand upon existing decision-making structures. If R-SEA is to be successful, issues of government action to establish supportive legislation, policies and authority structures must be addressed and developed. A federal - Inuvialuit management framework would therefore have corresponding legislation to ensure i) R-SEA is carried out, and ii) the results are enforceable under the current EA regime. Legislation would detail decision-making arrangements, and define responsibility, authority, and accountability mechanisms. The legal basis would formalize rules and legitimize the R-SEA process in a manner that reflects Inuvialuit and other stakeholder interests and concerns.

5.4 R-SEA Research Needs, Directions and Opportunities

Despite the widespread international application of SEA, it is not free from ambiguities; scholars and practitioners still appear divided on such fundamental matters as concept and approach (Jiliberto 2011; Bina 2007). The earliest definitions of SEA were strongly grounded in EA, which was developed in the late 1960s. According to Bina (2007), the fact that EA would not apply beyond projects to PPPs was the first, and remains the single most common reason cited as justification of the need for SEA. Many of the original arguments in support of SEA therefore are focused on the need to overcome EA shortcomings, including inadequate consideration of cumulative effects (Duinker and Greig 2007); insufficient regional baseline data to detect environmental change (Dubé 2003); loss of mitigation opportunities because assessment occurred too late in the development sequence (Vicente and Partidário 2006); and limited public influence over the direction of development activity (O'Faircheallaigh 2010).

SEA has experienced a widespread adoption of its procedures internationally, as well as a systematic growth related to what it should address and deliver (Jiliberto 2011; Bina 2007). The last decade has witnessed significant attempts to strengthen the concept of and approach to SEA, as a result of the progressive opening of SEA research to other disciplines, and as a response to advancement in practice (Bina 2007; Chaker et al. 2006). In other words, the role of assessment is changing as it moves upstream, targeting the early stages in the design of development proposals, and the processes and contextual factors (see Hilding-Rydevik and Bjarnadóttir 2007) that shape proposals. The ongoing debate around the role of SEA has integrated theories from disciplines including planning (Richardson 2005; Eggenberger and Partidário 2000), knowledge and decision-making (Kørnøv and Thissen 2000) and strategy formation (Cherp et al. 2007). The new focus on dialogue and negotiation means assessment is becoming more participatory, not only in terms of involving civil society, but in seeking greater cooperation and coordination between government agencies, development sectors, and sources of expertise that have an interest or contribution to make (Bina 2007). There is a growing prominence on the opportunity of using SEA as a means for rational and social forms of learning and to strengthen the capacity for environmental planning (Stinchcombe and Gibson 2001). These advancements have led to changes in the role of SEA, and have been crucial in the development of a revised interpretation of its strategic dimension that has strengthened its differentiation from project-based EA.

While SEA is still evolving and expectations of what it can and should deliver are expanding, global challenges linked to increasing pressures on the natural environment are adding to the complexity by imposing additional challenges for SEA to contend with (Fundingsland Tetlow and Hanusch 2012). For example, there is an opportunity for SEA to manage climate change issues (see Wilson and Piper 2010) by developing tools to better incorporate environmental thresholds and limits, yet there is only limited understanding and demonstrated application of climate science in SEA. Trends of cross-fertilization with other disciplines are also increasingly shaping the future direction of SEA theory and policy analysis.

Fundingsland Tetlow and Hanusch (2012) document a sizeable consensus in academic literature that the way in which SEA has evolved since the early 1990s has been a positive one, adding that the biggest and possibly most successful sector of SEA application has been in spatial terrestrial planning. There are other sectors with extensive SEA application that have been well documented in academic literature, such as transportation and forestry, but there remains limited research on the application and efficacy of SEA in offshore energy. Partidário (2011: 437) observed that "while much experience already exists, SEA is still far from a mature stage"; this is particularly the case in offshore oil and gas SEA. Consistent with Vicente and Partidário (2006), for instance, R-SEA's role in energy sector PPP development and assessment is neither well developed nor understood, and hence the nature of R-SEA remains unclear to many (Ketilson 2011).

This thesis addressed the absence of research on R-SEA in offshore oil and gas planning and assessment through the examination of international offshore case studies, and documented the benefits of, but also challenges to R-SEA implementation and effectiveness. Although SEA is increasingly argued as the tool of choice for regional and cumulative effects assessment, planning and management in the offshore (e.g., Elvin and Fraser 2012), the benefits of such have yet to be clearly translated or demonstrated in practice. In the Beaufort Sea, for example, many participants still favoured approaching cumulative effects on an individual project scale rather at the regional scale, notwithstanding the volumes of literature and evidence from past practice about the limitations of project-based CEA and the inability to effectively assess and manage cumulative effects at the project scale (e.g., Bonnell and Storey 2000). The tiered forward benefits of, and potential for SEA to influence next level decisions were also found to be weak, with limited coordination between higher and lower tiers of planning and assessment, thus

limiting SEA's ability to influence development decisions. These observed challenged or shortcomings, combined with the inherently restrictive nature and view of alternatives in SEA in the offshore sector, reflect the very issues that spurred the development of SEA as a higher-order planning and assessment process, operating above, but providing direction to the project tier. The assumption that SEA is a solution to the shortcoming of project-based EA in the offshore oil and gas sector was not consistently supported in the Beaufort region, and its purpose and expectations about its deliverables in the offshore environment differ from the ambitious expectations about SEA identified in the academic literature. This knowledge provides an important foundation when examining R-SEA's potential and implementation challenges and opportunities in the Arctic region.

Collectively, the research results from the three manuscripts emphasize the value of collaborative planning theory and the need to understand context in relation to a variety of factors, such as cultural and political issues, that influence stakeholder decision-making and ultimately R-SEA. In line with the thesis results, and as pointed out by several authors in the SEA community (e.g., Hilding-Rydevik and Bjarnadóttir 2007; Bina and Wellington 2005; Cashmore and Nieslony 2005; Partidário 2005; Kørnøv and Thissen 2000), there is a need to understand context in relation to SEA implementation, as well to adapt SEA to the specific context to ensure successful implementation. Acknowledging this, the thesis results reinforce the work of Hilding-Rydevik and Bjarnadóttir (2007) in that understanding context is crucial to further our understanding of how SEA should be implemented, as well as determining reasonable expectations with respect to the outputs resulting from the application of SEA. In this way, results also reinforce the work of Owens et al. (2004) and others who put forward arguments that an expert driven, objective and rational impact assessment does not necessarily align with the reality of planning processes. Instead of a technocratic top down approach, current IOMP, BREA and IRIS initiatives in the Beaufort sustain the value of participatory civic models, focused on aspects such as deliberation, dialogue, and cooperation (see Jiliberto 2011).

A key contribution of this research is that the definition of R-SEA must remain flexible and continue to steer away from hard positivism toward more open political (Bartlett and Kurian 1999) and collaborative approaches, aimed at consensus-building (Owens et al. 2004; Thérivel and Partidário 2000). The research illuminates the growing prominence and opportunity of using R-SEA as a means for learning and strengthening the capacity for environmental planning. The

potential of R-SEA to strengthen public policy governance was recognized; however, future research is required in this regard, since no specific evaluation has been made on the subject and experience in this regard is ambiguous and ambivalent (OECD 2009). A significant implication of this research is that while R-SEA has the potential to support good governance it should not be understood "as a mechanism that could promote change by acting upon the entire machinery of government, seeking to improve not only specific plans or projects, but also to change political institutions and the worldviews and behaviour associated with them" (Bina 2007). The growing expectations of R-SEA thus represent both opportunities and threats, and the capacity of R-SEA to exert influence when there is an overload of expectation and objectives will prove a future challenge.

5.5 Conclusions

The purpose of this research was to identify how an R-SEA framework could be used in the Beaufort Sea region to influence planning and development decisions in a broader, more regional socioeconomic and environmental context than the current project-based approach. Specifically, through identifying key implementation challenges and opportunities based on the perceptions of stakeholders, the research provided a greater understanding of how to advance R-SEA in the region and in doing so inform and improve the effectiveness of environmental management decision-making.

It was possible to achieve the research objectives despite the research limitations. The first limitation was with respect to the breadth of interviews undertaken. While a diversity of stakeholders was contacted and interviewed, given the breadth of departments, agencies and stakeholders involved in offshore resource management there were gaps in terms of representation from certain regulatory authorities. The research was also restricted to a social science driven approach. Examination of the application of R-SEA in the Arctic offshore would be enriched by also adopting an applied science and engineering perspective, particularly to cumulative effects assessments and industry effects, predictions and impacts. The Deepwater Horizon oil blowout in the Gulf of Mexico occurred shortly after this research began, and the new federal *Canadian Environmental Assessment Act* also came into force after the conclusion of this research. Neither event was predictable or controllable, and their influence on participant's views of R-SEA, and the research overall, is unknown.

This research provided a better understanding of how to advance R-SEA in the Beaufort Sea. The need for such an initiative arises from the looming large-scale offshore hydrocarbon development in the region and the lack of a mechanism to plan for future energy development, establish a long-term regional vision, or assess and effectively manage the potential cumulative effects arising from development. The urgency for R-SEA is great, given the current national political climate and the rapid and increasing environmental changes that are occurring in the region. Prime Minister Harper's commitment to be an energy superpower is driving energy investment (see Hester 2007), and the relaxing of federal environmental assessment laws and regulations (Canadian Environmental Assessment Act 2012) to streamline exploration, development and approval processes raises fears that environmental oversight will be diminished. Changes to the *Canadian Environmental Assessment Act* that significantly reduce the timelines for assessment and restrict the scope of federal assessment applications (see Gibson 2012) will likely have significant effects on the value of analysis and output of project-based EA. Such changes further increase the need for an overarching assessment of potential effects at a regional level, and a development and management plan to mitigate those effects. This is particularly the case given the very specific challenges that ice and extreme weather conditions pose for key components of Arctic offshore oil and gas development and regulation, including oil-spill preparedness and response, compliance and monitoring, transportation, and site decommissioning and remediation (Porta and Bankes 2011; Arctic Council 2009).

With respect to environmental changes and stressors, Canada's Arctic regions are at the forefront of climate change (Pearce et al. 2011; Lawrence et al. 2008; IPCC 2007). The Arctic is warming at rates greater than other parts of the planet, causing shifts in baseline populations and ecosystem function that are poorly monitored and understood (Arctic Council 2004). Other environmental challenges facing the Arctic ecosystem include the accumulation of environmental pollutants, the arrival of non-native species and biodiversity loss (Prowse et al. 2009). Despite these challenges, baseline data and understanding of ecosystem function and Arctic species and their environment are less complete than for many other marine ecosystems where offshore oil and gas development is under way (Arctic Council 2004). The Arctic Human Development Report (2004), mandated under the Arctic Council, reported that Arctic societies are resilient, but with unprecedented rapid human induced change and stressors, biodiversity and humans populations are at risk. Elvin and Fraser (2012) maintain that the juxtaposition of

resource abundance and fragility is an important consideration as environmental impacts of large-scale energy development and operation can have significant adverse consequences on ecosystems (e.g., Deepwater Horizon oil blowout in the Gulf of Mexico, Exxon Valdez spill in Alaska).

The convergence of these trends demands more than strategic and integrative thinking – it demands action. This is the greatest need identified by this research. The potential environmental and social risks of inaction are enormous, and this research has demonstrated that the current approach to offshore planning and assessment in the region is insufficient. Improper cumulative effects assessments, for instance, prohibit Canada from achieving its goals under the *Federal Sustainable Development Act* (2008) and the *Oceans Act* (1996) of maintaining the integrity of resource extraction without compromising the ability of future generations to do the same (Elvin and Fraser 2012). The question of whether Canada will step up and advance R-SEA is particularly timely given that in 2013 Canada will once again assume the Chair of the Arctic Council - 16 years after its first Chair in 1996-98. Canada played an instrumental role in the creation of the Arctic Council, a consensus-based, high-level intergovernmental forum that works to promote the environmental, social and economic aspects of sustainable development in the region. The question now is whether Canada will uphold that tradition of sound environmental management or whether we will further lag behind other Arctic nations. Canada has the opportunity to lead the way to environmentally safe oil and gas development in the Arctic Ocean. Recognizing the important role of R-SEA in the development of the fledging deep offshore Arctic oil and gas industry is a key step in moving development forward in an efficient and environmentally responsible manner.

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