

Integrated Coastal and Marine Management in Northern Regions: Reconciling Economic Development and Conservation

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Executive summary

There will be increasing pressure on northern coastal and offshore resources for resource extraction as resources become scarce in more accessible regions. Marine navigation and transportation is likely to increase in response to economic development, and as ice cover reduces and the ice free season extends as a result of climatic changes. This article considers how economic development within northern coastal and marine regions may be reconciled with conservation. Conservation is defined as the consideration of the ecosystem and the socio-economic and cultural needs of local peoples, and environmental protection and mitigation when development occurs. Integrated coastal management may be a successful means to reconcile economic development and conservation values.

Existing, developing and *defacto* approaches to integrated management for northern coastal and marine regions are examined in the context of scenarios for economic development and conservation. These scenarios include marine shipping and hydrocarbon exploration and production for coastal and offshore waters of Alaska, northern Canada, and the North Sea.

The article concludes that approaches to integrated management which reconcile economic and conservation values will be complex and consultative. The approach will need to consider the interests of local peoples and communities, the needs of ecosystems and migratory communities, and environmental impacts and mitigation of development. The success of different approaches for reconciling economic development and conservation may be gauged by the range of issues and interests considered in these processes.

Role for integrated coastal and marine management

Existing, developing or de facto approaches to integrated management exist in varying extents for regions and sectors discussed below. Given the range of issues and interests, successful approaches to reconciling economic and conservation values will be complex and consultative. Successful approaches must also consider the interests of local peoples and communities, the needs of ecosystems and migratory species, and environmental effects and mitigation of negative impacts of economic development.

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Integrated coastal and marine management provides a framework and context for examining the interaction between complex issues and interests. Ideally it facilitates an explicit consideration of conflicting values of economic development and conservation, and some measured weighing of each. Despite imperfections in its application, one can state that unnecessary negative impacts will occur in its absence.

In a democracy, any process will also need to satisfy intangible and changing public concern for a pristine Arctic environment and, more generally, for pristine marine and coastal environments. This public concern for the Arctic environment has been expressed in diverse ways in Alaska, northern Canada, and Europe. It is interesting to note that there are parallel concerns in Europe and North America for pristine coastal and marine environments. For examples, these concerns may be said to underpin European Community initiatives for integrated watershed and coastal management.²

In both North America and Europe, integrated coastal and marine management has evolved and is driven by international obligations such as the UN Convention on the Law of the Sea.³ In Canada, the Convention has been implemented by the Oceans Act, which describes Canada's economic zones under the Convention, and contains an integrated approach to oceans management. The Oceans Act encourages the development of an ocean management strategy for Canada's oceans, including the Arctic Ocean and northern seas as the Beaufort Sea. The Act focuses on conservation which is based on the precautionary principle of avoiding harm. The Act requires Fisheries and Oceans Canada to take a lead role on behalf of federal departments and agencies, and to work cooperatively with provincial and territorial governments, First Nations and interested parties.

Given the complexity of Canadian coastal and marine management, the Oceans Act is not the only government initiative.⁴ In the northern context, Canada is relatively unique as it recognizes the interests and rights of Inuvialuit and Inuit peoples and establishes joint management boards and processes for offshore waters and resources under land claims agreements. The combination of these land claims agreements and government initiatives such as the Oceans Act requires the balancing of conservation and economic development in the arctic.

Within Europe, marine and coastal issues are equally driven by the international conventions and initiatives, such as the UN Convention on the Law of the Sea, and European Community

² For example, public concern about water quality and a pristine marine environment may be said to underpin the Water Framework Directive, and initiatives for coastal management.

³ Other international conventions include Programme A of Chapter 17 of Agenda 21, the United Nations Environment Programme Regional Seas Programme, the 1995 Global Programme of Action for the Protection of the Marine Environment from Land Based Activities, as well as specific initiatives focused on fisheries and migratory species.

⁴ While Fisheries and Oceans Canada has the lead federal role under the Oceans Act, Environment Canada and Heritage Canada address aspects of oceans planning, and have initiatives for the establishment of marine parks and conservation areas under their legislation. This legislation includes the Canada Wildlife Act, the National Parks Act and the proposed Marine Conservation Areas Act. J G M Parkes and E W Manning, *An Historical Perspective of Coastal Zone Management in Canada* (Fisheries and Oceans Canada: Oceans Conservation Report Series, 1998).

directives and initiatives. These directives and initiatives include the EU Water Framework Directive (Directive 2000/60/EC), Directive 79/409/EEC on the conservation of birds, Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna, and the Common Fisheries Policy.⁵ European directives and initiatives are then implemented by European member states, including the United Kingdom. Norway is not part of the Community, but may adhere to the directives and initiatives irrespective.

If one considers the North Sea, the OSPAR Commission for the Protection of the Marine Environment of the Northeast Atlantic is also relevant. The United Kingdom and Norway are two of the sixteen members to the 1992 agreement. The Northeast Atlantic has been divided into five subregions, including the arctic and the greater North Sea. Strategies have been developed for the protection and conservation of ecosystems and biological diversity of the maritime areas, and for environmental goals and management mechanism for offshore activities.⁶ Over and above these international, European and regional obligations, individual countries, like the United Kingdom, may also have their own unique concerns and approaches.⁷

Marine navigation and shipping in the circumpolar arctic

Marine navigation and shipping is changing rapidly in the circumpolar arctic, primarily due to climatic changes. In North America, while an ice free northwest passage may be possible, it is open only for limited periods of the summer. Overall, ice cover is diminishing, and the ice free season is extending. Climatic changes are likely to increase shipping activity in certain regions of the North American arctic. Given the lessening ice cover and greater ice free season in the European and Russian arctic, a northeastern sea route may become operational. This route begins in northern Europe, and proceeds through the Scandinavian and Russian arctic, ending in Asia.

⁵ Please also see :The Influence of EU Policies on the Evolution of Coastal Zones Study (Contract ERDF No. 98.00.27.049 of the Institute for European Environmental Policy (12 November 1999)).

⁶ OSPAR Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area (Ref no. 1998-19) and OSPAR Strategy on Environmental Goals and Management Mechanisms for Offshore Activities (Ref no. 1999-12), both available on the website, www.ospar.org.

⁷ For example, in the United Kingdom, on 10 February 2000, the Minister of Transport, Lord MacDonald, announced the establishment of a consultative process to examine the establishment of Marine Environmental High Risk Areas (MEHRA). These MEHRA would protect sensitive and coastal environments at particular risk from pollution from shipping, and the areas would provide guidance to shippers and future government policy. The Department of Environment, Transport and Regions engaged a consultant to prepare a methodology for the identification of areas for potential MEHRAs, and a report has been published. Two recent regional and sectoral initiatives have also taken place. Another UK initiative is the Port Marine Safety Code, and the related Guide to Good Practise on Port Marine Operations. The Port Marine Safety Code introduces a national standard for every aspect of port marine safety, and its object is the adoption of good practise. The Guide to Good Practise on Part Marine Operation has been written support the Code. Whenever a duty or obligation is identified in the Code, advice on its implementation is provided in the Guide. The object of the Guide is to summarize and publicize industry good practise for those responsible for port marine safety.

Shipping throughout the world is governed by a international regime, which results from international conventions and national legislation. By comparison, tourism and marine navigation for the purpose of tourism is not as regulated internationally, and may be subject to a lesser degree of national and local regulation. The shipping regime in the United States is exception to this international regime. As the country is not signatory to all the necessary conventions, shipping in the United States is governed by domestic legislation particularly with respect to limits on liability. For example, for oil spills from ships, the United States relies on the Oil Pollution Act of 1990, which applies to all types of oil and ships, and casts a broader liability net than international conventions.

International conventions play a very prominent role in regulating commercial shipping, and liability for oil and other spills from those ships. Key international conventions for shipping and oil spills from ships are the International Convention on Civil Liability for Oil Pollution Damage, 1969 and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971. The International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea was adopted on May 3, 1996, and complements these conventions though it excludes pollution damage. These conventions are implemented within different countries under national legislation. For example, in Canada, these conventions are implemented under the Canada Shipping Act.

Given the breadth of the Canadian arctic, marine transportation occurs on a regional basis in the western and eastern portions. Transportation occurs through Hudson Bay to the Port of Churchill, Manitoba and portions of the eastern Arctic, Nunavut Territory for the purposes of tourism, shipping and community refueling. Given the historic transportation patterns associated with oil and gas activities in the 1970s and 1980s, increased transportation could have significant impacts on beluga whales and marine protected areas. Northern Transportation Company Limited (NTCL) is the primary transporter of bulk products and dry cargo to communities, defence sites, the exploration industry and businesses and northern Canada and Alaska. NTCL's operations are divided into two main geographic sectors: the Mackenzie River and the western Arctic which includes the Kitikmeot region of Nunavut and Alaska; the eastern Arctic which is comprised of the Kivalliq and Baffin regions of the Nunavut Territory and northern Manitoba.

For the Beaufort Sea, marine transportation occurs through the east and west channels of the Mackenzie River. Currently, barge traffic predominantly enters the Beaufort Sea through the east channel, while the west channel is primarily used by smaller, local boats travelling to camps or along the coast. In recent years, service to Alaska has expanded from primarily serving the oil and gas industry, to include transportation of deck cargo and the supply and delivery of bulk petroleum products to the Alaska North Slope communities. These shipping activities are likely to continue and increase, particularly as oil and gas activities increase. NTCL follows the designated route laid out by hydrography and the Canadian Coast Guard.⁸ If oil and gas activities in the Canadian or US Beaufort Sea increase, further parties are likely to provide marine transportation services. These shippers will either move goods by barge through the Mackenzie River, or deep

⁸ This route is used by all commercial, private and government vessels, and is the route referred to in the Beaufort Sea Beluga Management Plan discussed below. NTCL and other parties have not adopted the restrictions on marine navigation recommended for Zone 1 areas under the Plan due to the shallow and shifting depths of the channels. Personal communications supporting the following report:

draft shipping from the west coast along the Alaskan Arctic Coast. There also have been some tentative discussions on the creation of a deepwater port in the Canadian Beaufort Sea.

The Beaufort Sea region is also a tourist destination. Tourism activities may be nature-based with cultural tourism, eco-tourism or adventure travel. Each activity is distinct, with different impacts relating primarily to transportation. Tourism activities consist of trips to communities and fishing and whaling camps; fly-in wildlife viewing, fishing and bird watching trips; and hiking and kayaking. Tourism activities are not necessarily neutral, and can have significant impacts on both species and habitat. Low flying aircraft in support of tourism is already a concern in the Mackenzie Delta, and referred to in the Beaufort Sea Beluga Management Plan. Increased marine and ground transportation will occur as tourism increases.

Commercial shipping in northern Canada is regulated under regimes which specify dates and zones when shipping is permitted, and which permit shipping outside that season subject to factors such as the type of ship and ice thickness. This regime has reporting and notice requirements. However, no approvals are required for the movement of ships, and commercial shipping does not require an environmental assessment. Shipping in these arctic waters is subject to the Arctic Waters Pollution Prevention Act, and the Arctic Shipping Pollution Prevention Regulations which describe a system of shipping safety control zones under the Act. A policy document entitled "The Shipping Safety Control System" describes the system of dividing Arctic waters into 16 zones, and provides dates for which each zone is open for different types of vessels. Based on this system, certain ships have access to all zones at all times, while other ships have more restricted access. As the Canadian regulatory regime did not consider ice thickness, it has since been augmented by the Arctic Ice Regime Shipping System.⁹

Each country will have its own, but parallel means of regulating navigation and shipping in northern waters. All these regimes will reflect international conventions and commercial realities for shipping. Though it is not yet implemented, the International Maritime Organization (IMO) is developing a Code of Polar Navigation that may influence navigation in northern Canada. In 1997, IMO members began considering a draft code that has been developed since 1993 by an external working group. The external working group was composed of representatives of Canada, Finland, Germany, Norway, Russia, Sweden and the United States, and technical experts, specialists and ship operators. The code addresses pollution prevention, communications and survival equipment, crew qualifications, and operational measures in polar waters.¹⁰

⁹ This system allows vessel Masters to decide whether it is safe for their vessel to travel in Arctic waters based on a formula that considers ice thickness and vessel classification or type. It also allows the shipping season to be extended based on ice cover and ship configuration. There are extensive reporting requirements prior to and after travelling in these waters. For example, section 4.0 of the Arctic Ice Regime Shipping System requires reports from ships involved in arctic traffic. Three reporting procedures are defined. There are Arctic Canada Traffic System (NORDREG) reporting requirements, though these are voluntary. For ships requiring Icebreaker Escort, there are reporting requirements such as the types of ship and its capabilities. Finally, there is a reporting procedure for ships using the Arctic Ice Regime Shipping System outside the Zone/Date system. In this case, there is an Ice Regime Routing Message and an After Action Report Required. (Arctic Ice Regime Shipping System, TP 12819, 17-22).

¹⁰ Transport Canada Safety and Security, Marine Safety Review, (Volume 1, No. 3).

Commercial shipping in all northern waters is subject to the clauses issued by international marine underwriters, which may impose surcharges for insurance risk premiums for vessels who operate outside a very narrow time period. This is to adjust for what the underwriting community perceives as increased risks, and may impose financial impacts on shipping. Insurance interacts with legislation and international conventions as some legislation and conventions require insurance, or proof of financial responsibility which could be satisfied by insurance.¹¹ Oil spills arising from commercial shipping involve insurance and international shipping conventions. Ship and cargo owners hold protection and indemnity insurance coverage against third party claims, including those costs associated with the cleanup of an oil spill. In recent years, the conventions for pollution and civil liability for oil spills have been revised to increase compensation, and to cover environmental damages and countries' expanded economic zones under the Law of the Sea Convention. They also attach liability to one party, the ship owner, and thereby minimize national and international litigation. Despite these requirements, the level and type of insurance in most northern and international waters is primarily determined by the commercial needs of the ship and cargo owner and other parties involved in the business transaction. Shipping in the United States is likely to have some additional requirement, given the specific liability regime in place for shipping in those waters.¹²

If one considers the combination of international shipping conventions, conventions governing liability from spills from ships, national legislation, and marine insurance, one can perceive a pattern where the combination of these interlocking measures act to minimize and preclude accidents for commercial shipping, and to provide for cleanup when these accidents do occur. Additional environmental, and specifically northern measures are now being considered for this international regime. As a result, international and national shipping and the related regulatory regime can readily be consistent with integrated coastal and marine management. Given the financial underpinnings of shipping and the focus on minimizing and rectifying damages, shipping can also be said to illustrate a balance between economic development and conservation.

Hydrocarbon exploration and production activities in the Beaufort Sea and the North Sea

Offshore hydrocarbon development is occurring in coastal areas and continental shelves around the world. As more conventional energy resources are depleted, parties naturally look to offshore regions for hydrocarbon exploitation. For example, hydrocarbon development has been proposed for most coastal regions of Canada and the United States, and for the arctic coast of Scandinavia. Northern regions also need economic development, which typically can only be met by resource based activities due the small populations and distances of these regions from markets.

Hydrocarbon development may be problematic in any coastal and marine regions, given the impact of accidental spills and releases, and related air and marine transportation. It may be especially problematic for northern regions due to greater environmental sensitivities of ecosystems and species. Hydrocarbon exploration and production is discussed for the Canadian and US Beaufort Sea, the east coast of Canada, and the North Sea adjacent to the United Kingdom and Norway.

¹¹ For example, evidence of insurance, and proof of financial responsibility is required under of the Canada Shipping Act, which requires Canadian and other ships to identify the name and address of the ship's insurer who provides pollution insurance cover for the ship.

¹² This discussion of shipping in the circumpolar arctic is derived from the following reports of the author:

Resources are the basis of most industries in Alaska and northern Canada, and are likely to have the greatest impact on integrated management and marine protection for these waters. Hydrocarbon development has already occurred or is underway in Alaska and northern Canada, with the industry now being in a period of expansion. In Canada, these activities are subject to federal and territorial legislation, and administrative processes established under northern land claims agreements. Local communities are economically involved through employment, joint ventures and providing support services.

Within Canada, sixty-two significant discovery licenses for hydrocarbons were issued for the Beaufort Sea in the 1970s and 1980s. Further leases and licences were issued on adjacent lands. New oil and gas leases were issued in 1999 and 2000 land leases, and seismic activities have been occurring on land in the Mackenzie Delta for the past three years. Given the work expenditure commitments in 1999 and 2000 leases, producers are likely to be active over the next few years in exploring and proving natural gas reserves, even if they are willing to defer transporting those reserves to southern markets. The 1999 and 2000 leases specify that operators wishing to carry out activities required to comply with all federal environmental requirements defined in the Inuvialuit Land Claims Agreement as well as the Canadian Environmental Assessment Act, the Canada Oil and Gas Operations Act, the Territorial Lands Act, the Arctic Waters Pollution Prevention Act, and other legislation. Conditions in the leases indicate that the work season may be restricted to those months when the activity will not have a significant environmental impact on sensitive fish and mammal habitats, birds or other species, and that there may also be conditions for drilling fluids and waste discharges. Further, site specific environmental protection plans may be required prior to the commencement of activity. The inclusion of these conditions in the lease offerings are important as they provided the eventual lease holder with notice that there will be environmental restrictions on oil and gas exploration and production.

Oil exploration and production has occurred in the Alaska Beaufort Sea, with proposals underway to explore US waters adjacent to Canadian waters. There is interest in the US in energy development in offshore regions of the Alaska North Slope in the offshore areas adjacent to the National Petroleum Reserve-Alaska and the Arctic National Wildlife Refuge. Areas proposed for leasing include offshore lands adjacent to the disputed Alaska and Canadian boundary in the Beaufort Sea. There has also been a long history of pipeline proposals to remove natural gas from Alaska and the Canadian Beaufort Sea, with further proposals underway now. It is not clear which project or pipeline route will proceed, or the time frame of that implementation. Oil and gas exploration and development activities, and the construction of either project and pipeline route will result in increased activities in the Canadian Arctic Ocean and Beaufort Sea and the eventual removal of this gas. Either project and pipeline route is also likely to result in increased impacts on the proposed marine protected area and adjacent areas. Despite national boundaries, developments in either the Canadian or US Beaufort Sea will affect adjacent territories, marine ecosystems, and local communities and peoples.¹³

Local peoples such as the Inuvialuit and the Inupiat harvest beluga whales, seals and other fish and marine species in the offshore waters of the Beaufort Sea, as authorized by legislation and in accordance with subsistence harvesting rights. Looking at the Beaufort Sea beluga whale population, the Inupiat in Alaska harvest the Beaufort Sea beluga whale stock in the US Beaufort

¹³ For example, given the prevailing pattern of the Beaufort Sea gyre and other currents, hydrocarbon spills or seeps in the Canadian Beaufort Sea will affect US waters.

Sea, while the Inuvialuit harvest in the Canadian Beaufort Sea. The Inupiat and the Inuvialuit are also parties to an agreement between themselves to coordinate management and research in the US and Canada. The Inuvialuit Final Agreement establishes joint management boards and processes for environmental assessment, fish and wildlife management, and wildlife compensation. The Inuvialuit participate through nominating members to the joint management boards, and through their involvement in the process as applicants for approvals and affected commercial and private interests. The Department of Indian Affairs and Northern Development and the National Energy Board are the primary regulators of hydrocarbon activity, though Fisheries and Oceans Canada, Environment Canada and the Canadian Environmental Assessment Agency must be considered for integrated management and marine protection in the Beaufort Sea.

The Beaufort Sea Beluga Management Plan is the result of the joint efforts of Fisheries and Oceans Canada and the Inuvialuit. One of the goals of the Plan is to maintain a thriving population of beluga whales in the Beaufort Sea. The Plan does this by creating beluga management zones, with varying levels of protection. Zones 1A and B are the most strict designation with restrictions on oil and gas exploration and production, and tourism. No ports may be developed, and shipping activities are confined to defined shipping routes. Development activities outside the zone are evaluated for their impact on beluga whales and their habitat, and on water quality and quantity. Some aspects of the Plan have been formally implemented by Fisheries and Oceans Canada and the Coast Guard. Similarly, the Department of Indian Affairs and Northern Development considers the Plan when issuing oil and gas leases.

The boundaries of a proposed marine protected area for the Canadian Beaufort Sea under the Oceans Act is the same as the boundaries of the Zones 1A lands in the Plan. The proposed marine protected area is intended to protect all fish and marine species and their habitat, and is not restricted to beluga whales. Some integrated management approaches under the Oceans Act are occurring for Beaufort Sea, and include the Plan, the proposed marine protected area, and an integrated management approach for the Canadian Beaufort Sea. Overall, the Plan may be viewed as an voluntary initiative and an existing management tool for protecting beluga whales and their habitat, and regulating the subsistence harvest. In practice, any protected area incorporating beluga whales and other marine species or integrated management approaches for the Beaufort Sea are likely to reflect and include significant elements of the Plan.

The east coast of Canada is the country's newest "energy frontier" , with significant oil and natural gas production, and pipeline transportation to nearby markets in northeastern United States. While this is not strictly an arctic region, it is subject to some forms of arctic risks such as icebergs. The regime for the Sable Offshore Energy Project is briefly discussed as offshore regulation is characterized by complex voluntary measures and proposed marine protected areas. Fisheries and Oceans Canada, along with other government agencies and proponents, has participated in voluntary initiatives for the Sable Offshore Energy Project. The project is a multi-billion dollar energy development occurring in offshore waters of Nova Scotia, and on land in Nova Scotia and New Brunswick. Codes of practice have been developed to address environmental aspects of this project, and are discussed for: Sable Island, Country Island and Fishermans Harbour, and the "Gully", a submarine feature near the edge of the Scotian Shelf.

First, a Code of Practice was been developed for Sable Island, a 41 kilometer island located 290 miles southeast of Halifax, Nova Scotia. The island is important as a migratory bird sanctuary being the breeding ground of rare species, though the island is best known for its population of feral horses. The code addresses project activities on the island, vessel routing in the vicinity of the island, aircraft flights near and over Sable Island, and waste management. Additionally,

access and activities on Sable Island are regulated, and the island is subject to the Migratory Bird Sanctuary Regulations. The Fisheries Act protects marine mammals, and a conservation strategy for Sable Island has been prepared by the Sable Island Conservation Strategy Advisory Committee. Another Code of Practise has been developed to protect the uniqueness and integrity of seabird colonies of Stormont Bay, and the tern colonies of Country Island and Fishermans Harbour. The code addresses project activities, vessel routing in the vicinity, aircraft flights near and over Country Island and Fishermans Harbour, waste management and media and visitor training. The Canadian Wildlife Service is considering a migratory bird designation for Country Island, and are managing the Country Island Tern Restoration Program, in association with the Nova Scotia Department of Natural Resources. Lastly, a Code of Practise has been developed to protect the unique characteristics of the "Gully". The Gully is a prominent submarine erosional canyon at the edge of the Scotian Shelf, and approximately 45 kilometres east of Sable Island. Fifteen species of whale and dolphin have been identified in the area., and the core area of the Gully has been declared as one of the three whales sanctuaries in the northeast coast of Canada. Fisheries and Oceans Canada and other parties are attempting to establish the Gully as a marine protected area under the Oceans Act. The Parks Canada has also identified the Gully as a feature meriting special status. The code addresses vessel routing near the Gully, aircraft flights near the Gully, and waste management. Other than for emergency reasons, no vessel is permitted to proceed into the core area of the Gully. Aircraft are restricted from flying over Sable Island or the whale sanctuary unless it is an emergency, or advance written approval has been obtained from government agencies and the project.

If one considers codes of practise, in conjunction with other measure for marine protection and integrated management for the Sable Offshore Energy Project, it appears offshore hydrocarbon activities need not be inconsistent with integrated management and marine protection. The intermingled use of codes of practises with regulation is an important model for future hydrocarbon development and regulation in the Canadian Beaufort Sea, given the more extensive hydrocarbon production occurring off the east coast of Canada. It also may be an interesting model for other regions of the circumpolar arctic. As a result of northern land claim agreements in Alaska and Canada, local peoples and most local communities will already participation hydrocarbon development, environmental mitigation, and conservation measures for coastal and marine waters.¹⁴

Hydrocarbon activity in the North Sea is advanced, as the region has been explored and produced since the 1970s. Norway is the largest European oil exporter and has the most proven reserves at 10.4 billion barrels of proven oil reserves, and 47.7Tcf of natural gas reserves. The United Kingdom is the largest exporter in the European Union. Denmark, the Netherland and Germany are smaller North Sea producers. The United Kingdom has the highest number of producing fields in the North Sea, though Norway as the largest fields. Norway also has access to and is considering exploiitng more northern hydrocarbon reserves. Regulation of hydrocarbon activity in the North Sea by the United Kingdom is briefly explored. Regulation by other countries such as Norway is also relevant. However, the United Kingdom is briefly explored as it illustrates the interplay between European directives, regional initiatives such as the OSPAR Commission, and national approaches.

¹⁴ This discussion of hydrocarbon activity and related matters in the Beaufort Sea is derived from the following reports of the author:

Conclusions and recommendations

Integrated coastal and marine management provides a framework and context for examining the interaction between complex issues and interests. Ideally it facilitates an explicit consideration of conflicting values of economic development and conservation, and some measured weighing of each. Explicit or implicit approaches to integrated management are in place for shipping and hydrocarbon development in all the regions and scenarios discussed.

The reconciliation between economic development and conservation, within the framework of integrated coastal and marine management, is illustrated for shipping and hydrocarbon activities in different northern regions of the globe. Integrated management will always be a continuum with various degrees of success. In certain contexts such as northern Canada, economic development and conservation may be precipitated by requirements of land claims agreements, and explicitly occurs done in the context of integrated management. In other regions such as the UK, integrated management may occur implicitly as a result of a variety of overlapping processes.

Any approach to integrated management that reconciles economic and conservation values will be complex and consultative. The approach will need to consider the interests of local peoples and communities, the needs of ecosystems and migratory communities, and environmental impacts and mitigation of development. The success of these different approaches to reconciling economic development and conservation, in the context of integrated management, can be gauged by the range of issues and interests that are considered in these processes.