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

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ABSTRACT

There will be increasing pressure on northern coastal and offshore regions 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. Integrated coastal management may be a useful process to reconcile economic development and conservation values.

Existing, developing and *de facto* 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. These approaches to integrated management are one means of considering marine resources and their utilization with a sustainable development framework. These approaches may also be a means of reconciling marine protection and other sectors such as shipping, hydrocarbons and fisheries.

The article concludes that approaches to integrated management which reconcile economic and conservation values will be complex and consultative. The approaches 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.

ADDITIONAL INDEX WORDS: *integrated coastal and marine management, shipping and navigation, offshore hydro - carbon development, circumpolar arctic*

INTRODUCTION

There will be increasing pressure on northern coastal and offshore regions 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. Economic development within northern coastal and marine regions needs to be reconciled with conservation. Integrated coastal management may be a useful process to reconcile economic development and conservation values.

Existing, developing or *de facto* approaches to integrated management exist to varying extents for regions and sectors discussed below. Given the range of issues and interests, approaches that reconcile economic and conservation values will be complex and consultative. Integrated coastal and marine management can provide 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. Conservation may be 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. Despite imperfections in its application, unnecessary negative impacts will occur in the absence of any integrated management approach.

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. There are parallel concerns in Europe and North America for pristine coastal and

marine environments, which underpin European Community initiatives for integrated watershed and coastal management. For example, public concern for water quality and a pristine marine environment supports the EU Water Framework Directive and initiatives for coastal management.

In Europe and North America, integrated coastal and marine management is evolving in response to international, regional and national initiatives. International initiatives include the UN Convention on the Law of the Sea; sustainable development and marine commitments under Agenda 21, as well as 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 and specific initiatives for fisheries and migratory species.

In Europe, European Community directives and policies are regional initiatives that support national efforts for coastal and marine management. European directives and initiatives include the EU Water Framework Directive (Directive 2000/60/EC), Directive 79/409/EEC on the conservation of birds (the Birds Directive), Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna (the Habitat Directive), and the Common Fisheries Policy. 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. These directives may be used in different ways for coastal and marine areas. For example, the United Kingdom has been utilising the Habitats Directive to designate a protected marine area.

The OSPAR Commission for the Protection of the Marine Environment of the Northeast Atlantic is relevant for the North Sea. 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. These strategies include the OSPAR Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area and the OSPAR Strategy on Environmental Goals and Management Mechanisms for Offshore Activities.

In addition to international, European and regional obligations, individual countries, like the United Kingdom, also have their unique concerns and approaches. For example 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 (MEHRAs) in the

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. The government of the United Kingdom expects to announce the locations of areas that identified as MEHRAs in the spring of 2002. 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 Practice 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 Practice on Port 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 summarise and publicise industry good practise for those responsible for port marine safety.

In Canada, the Convention on the Law of the Sea 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 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.

The Oceans Act is not the only federal government initiative. 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. In the northern context, Canada is relatively unique as it recognises 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.

Marine navigation and shipping in the circumpolar arctic

United Kingdom. These MEHRAs would protect sensitive and coastal environments at particular risk from pollution

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. Thus, climatic changes are likely to increase shipping activity in the North American arctic on a regional basis. 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. This discussion of shipping in the circumpolar arctic is derived in part from the two reports of the author: *Regulatory Framework for Integrated Management and Marine Protection in Canadian Arctic Ocean*, and *Regulation of Marine Transportation and Implications for Oceans Management in Hudson Bay*.

Commercial shipping is governed by a international regime, which results from international conventions and their implementation by 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. These Conventions provide liability and compensation regimes for oil spills occurring from ships. Conditions and limits have been revised under the 1992 Protocols to the Conventions. Conventions are implemented within different countries under national legislation. For example, in Canada, these Conventions are implemented under the Canada Shipping Act. 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. It has only been ratified by two states. Once it is ratified and implemented, it will complements these other conventions though it excludes pollution damage.

Given the breadth of the Canadian arctic, marine transportation occurs on a regional basis in the western and

eastern portions. 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; and 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. NTCL follows the designated route laid out by hydrography and the Canadian Coast Guard. 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.

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 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. For example, low flying aircraft for tourism is already a concern in the Mackenzie Delta, and referred to in the Beaufort Sea Beluga Management Plan. Marine and ground transportation will increase 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 sixteen 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. 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 arctic 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 under the Arctic Ice Regime Shipping System.

Given similar realities, each northern country will have its own but usually parallel means of regulating navigation and shipping in their arctic waters. All these national regimes reflect international conventions and commercial shipping practises. 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.

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. 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.

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 minimise 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.

If one considers the combination of international shipping conventions, conventions for liability for spills from ships, national legislation, and marine insurance, there is a pattern where the combination of these interlocking measures act to minimise 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 minimising 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. 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. The discussion of hydrocarbon activity and related matters in the Beaufort Sea is derived from two reports of the author on a regulatory framework for integrated management and marine protection in Canadian Arctic Ocean; and an analysis of the Inuvialuit Final Agreement and marine protected areas under the Oceans Act.

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 are 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. 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. Local peoples and communities 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 authorised 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 portion of that sea, while the Inuvialuit harvest in the Canadian portion of the 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 oil and gas activities, and for integrated management and marine protection in the Beaufort Sea. In

Canada, there are significantly lower limits on liability for oil and activities for offshore oil and gas activities under national legislation, than the limits for oil spills from ships under national legislation and international conventions. Land claims agreements add another layer as complexity. For example, the terms of the Inuvialuit Final Agreement imply a level of liability for offshore oil and gas activities that, at the very least, exceeds the minimal standards in national legislation.

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 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 arctic risks such as icebergs. It is also a region of both biological productivity and ecological sensitivity. The maritime region has a unique regulatory regime for coastal and offshore hydrocarbon development. While federal legislation and agencies, such as the National Energy Board and the Canadian Environmental Assessment Agency, continue to be in place, much responsibility for the issuance of leases and other matters is focused within Canada-Nova Scotia Offshore

Petroleum Board and the Canada-Newfoundland Offshore Petroleum Board.

Aspects of the regulatory regime for offshore waters of Nova Scotia portion of the Sable Offshore Energy Project are briefly discussed. Controversial hydrocarbon exploration licences for coastal regions of Cape Breton, Nova Scotia are also discussed. The Sable Offshore Energy Project includes complex voluntary measures and proposed marine protected areas. 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. Fisheries and Oceans Canada, along with other government agencies and proponents, has participated in voluntary initiatives for the Sable Offshore Energy Project. 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 developed for Sable Island, a 41 kilometre 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 Practice was 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.

Last, a Code of Practice was 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.

The Canada-Nova Scotia Offshore Petroleum Board issued three Exploration Licences 2364, 2365 and 2368 to two companies for the western and eastern coasts of Cape Breton, Nova Scotia. Due to public concerns, a public review was announced in 2000 by the Board, with final Terms of Reference for this review and a Report of Concerns being issued in 2001, and hearings scheduled for January 10 to 31, 2002. As the environmental assessment process under the Canadian Environmental Assessment Act did not apply to offshore seismic or drilling applications, the only basis for public review was under the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act.

These Accord Acts provide that the Board could appoint a single Commissioner, and no funding is available for public participation. Despite broader implications of the issuance of the first coastal licence, and the first licence within the Gulf of St Lawrence, the Terms of Reference limit the review to public interest in oil and gas exploration and drilling in the three licence areas. Under the Terms of Reference, the Commissioner is required to submit for March 29, 2002, a report on the results of the Public Review to the Board and federal and provincial government Ministers.

As the hearing is only just under way, the Commissioner's Report of Concerns was issued in October 2001. The Report of Concerns provides some indication as to the nature of concerns with the licences, and coastal hydrocarbon development. One area of concern is effects on the ecosystem, which included general concerns, seismic operations, and exploratory drilling and related operations. Even at this preliminary stage, there were widely differing views as to the extent of the impacts, the sufficiency of evidence, and the onus of proof. Another area of concern was potential socio-economic effects, including effects on traditional economic activities like fisheries and tourism, the health of the local population, and aesthetics impacts on residential and recreational areas. Socio-economic concerns include impacts on local aboriginal populations who may have rights into the licence areas.

The Report of Concerns also summarises issues that are of public concern, but not included in the Terms of Reference. These include policy issues such as whether the approval of the activities in the licence areas will open up

the entire Gulf of St Lawrence to hydrocarbon exploration and development, the impacts of resulting production facilities and pipelines on productive fishing areas, whether a review should have been conducted by a federal environmental assessment review office to ensure objectivity, and should a full environmental assessment be conducted before any activities are approved.

In summary, if codes of practice are considered in conjunction with other measures for environmental mitigation for the Sable Offshore Energy Project, offshore hydrocarbon activities can be consistent with integrated management and marine protection. The controversy surrounding coastal leases in the Cape Breton region of Nova Scotia may be indicative of the inherent difficulties of any developments in coastal regions, particularly in a beautiful and populated area of the province, versus developments that occur in more distant offshore waters. It also is indicative of some of the limitations of the regulatory regime and its lack of public consultation and input prior to the issuance of exploration leases. Exploration leases were issued, creating corporate expectations, despite foreseeable public and environmental concerns with even the possibility of hydrocarbon activity in proximity to this coast.

The combined use of codes of practices, in conjunction with regulation, for the Sable Offshore Energy Project serves as a useful model for future hydrocarbon development and regulation in the Canadian Beaufort Sea. Extensive hydrocarbon production is occurring and will continue to occur off the east coast of Canada prior to production in the Canadian Arctic, allowing for the accumulation of experience in reconciling development and conservation. Offshore development on the east coast of Canada could also 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 communities will participate in decisions for hydrocarbon development, environmental mitigation, and conservation.

Hydrocarbon activity in the North Sea is advanced, as hydrocarbons have been explored and produced since the 1960s. 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 Netherlands and Germany are smaller North Sea producers. Norway has the largest fields producing fields in the North Sea. Norway also has access to and is considering exploiting more northern hydrocarbon reserves in the Barents Sea. The United Kingdom has the highest number of producing fields in the North Sea. Development of the North Sea fields began in the middle of the 1960s. By the beginning of 2000, there were 109 oil fields, 87 gas fields and 16 condensate fields in production offshore. Despite the age of the hydrocarbon sector in the continental shelf, further activity is likely to occur in the North Sea.

While regulation of hydrocarbon activity by other countries in North Sea such as Norway, is also relevant, this analysis limits itself to regulation of hydrocarbon activity by the United Kingdom. Regulation of the United Kingdom's offshore hydrocarbon industry, and the impact of this industry on oceans management, is briefly explored. This regulation is examined as it illustrates the interplay between international approaches, European directives, regional initiatives such as the OSPAR Commission, and national approaches for and affecting oceans management. Unless otherwise noted, information for regulation of the offshore hydrocarbon industry for the North Sea is located on the website of the United Kingdom's Oil and Gas Directorate

The United Kingdom's offshore environmental regime for hydrocarbons has evolved over the past thirty years in response to changing impacts on the environment by the oil and gas industry, and changing public perception of risks. The present regime is made of legislation and regulation, conditions in consents granted under the petroleum licensing regime and international conventions. Additional powers are available under the Pollution Prevention and Control Act 1999. The key institution in the Department of Trade and Industry's Oil and Gas Directorate. Relevant international conventions, European directives and regional initiatives may be applied by the Oil and Gas Directorate.

The Offshore Installations (Emergency Pollution Control) Regulations 2002 have been proposed to provide safeguards in the event of threatened or actual pollution from an offshore installation. It is intended to provide safeguards that are not currently available under national legislation, and in a manner intended to be consistent with regulation of shipping. The Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation Convention) Regulations 1998 require operators to have an oil spill plan which is approved by the Department of Trade and Industry, and which will be implemented if a spill occurs. The overall objective of the parallel regulations for offshore installations is to implement the recommendations of the report arising from the grounding of the Sea Empress, "Command and Control: Report of the Lord Donaldson's Review of Salvage and Intervention and their Command and Control". These regulations apply only to the offshore oil and gas industry, and provide the Secretary of State with powers and responsibilities to protect the marine environment for incidents that will or may result in significant pollution

The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 applies the EU Habitat Directive and Birds Directive to oil and gas activities on the United Kingdom's continental shelf outside 12 mile territorial waters. Among other matters, they address the designation of special areas of conservation under the Habitats Directive, and special protection areas under the

Birds Directive. Guidance notes issued in 2001 address the impact of these regulations on oil and gas activities, and geological surveys and shallow drilling in these waters.

The proposed Offshore Chemicals Regulations 2001 will implement the OSPAR Decision on a Harmonised Mandatory Control System for the Use and Reduction of the Discharge of Offshore Chemicals. Draft Offshore Chemicals Regulations 2001, and Draft Guidance Notes on the Offshore Chemicals Regulations 2001 are currently available, as regulations have not yet been enacted. Lastly, at a national level, regulations require assessments of environmental effects of offshore production and pipelines. This occurs under the Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999, and related guidance notes.

It is always complex to understand the interaction between offshore hydrocarbon activity, and initiatives for integrated coastal and marine management. In Europe and the UK, this is due in part to the layers of international, European, and national requirements influencing for hydrocarbon activity and integrated coastal and marine management. It is also due to the developing understanding that marine resources are part of an overall sustainable development framework, and the recognition of the need to develop effective mechanisms to reconcile sectoral interests, like hydrocarbons and shipping, with marine protection.

Governments have always considered environmental impacts of offshore hydrocarbon activities in their authorization and operation. In the past, governments may not have considered hydrocarbon activities in the context of activities in other sectors, and in light of the overall impact of all these activities on marine species and ecosystems. For the United Kingdom, this appears to be gradually changing. For example, regulation to implement coastal and marine management is being implemented at the same time as more detailed environmental regulation for the offshore hydrocarbon sector. Significant steps seem to be underway to ensure that environmental impacts of the hydrocarbon activity are minimized, and that some consistency is developing for the regimes for hydrocarbons and shipping.

One interesting issue is the role of public, particularly local communities and peoples for integrated coastal and oceans management for the North Sea and coastal and offshore regions. The multi-layered requirements suggest direction is likely to come from senior levels of European or national government, rather than local communities and peoples. Direction may come from large non-governmental organizations that focus on marine species and habitat and conservation, but will these concerns exactly coincide with local communities and peoples. Further, for oil and gas activities on the continental shelf in the North Sea, who are the most appropriate and affected communities and peoples? No party, other than the national government, has

recognized rights and responsibilities in the offshore. This is in contrast to Canada where an increasing plethora of regional and local governments, peoples and organizations have recognized interests in both arctic and more southerly offshore waters.

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. Economic development and conservation is not necessarily incompatible, as 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 and with differing levels of participation by local communities and peoples.

Any approach to integrated management that reconciles economic and conservation values will be complex and consultative. The approach will need to consider by some means 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, may be gauged by the range of issues and interests that are considered in these approaches.

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