

Ocean Governance in the Netherlands North Sea

**Michael BARRY, Canada and Ina ELEMA and
Paul VAN DER MOLEN, the Netherlands**

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SUMMARY

There has been increasing interest in ocean governance and the concept of the marine cadastre recently. This is due to increasing pressure on the oceans, and the resulting tension between economic and environmental interests. A description and analysis of governance of the Netherlands North Sea contributes to this debate for a number of reasons. Commercial demands on the North Sea are intense. Shipping routes are very busy. The Netherlands is a major producer of natural gas. Naval conflicts and disputes over fishing rights involving the Netherlands date back more than 400 years. The Netherlands is hemmed in by neighbouring countries on land and at sea, and the activities of one country in the in the North Sea region can have a significant impact on the ocean environment in the other countries. Furthermore, there are a number of countries in the catchment area of rivers flowing into the North Sea. There is a need to govern the pollution and alien biological organisms that these rivers carry into the ocean. Governance has to be done at the regional and national levels to ensure that all the actors in the North Sea catchment area formulate and implement their various economic exploitation and environmental strategies harmoniously. This takes place in an environment of continual cycles of debate, compromise and synthesis in order to reconcile the competing objectives of different actors and institutions.

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1. INTRODUCTION

Management and governance of the oceans have become increasingly important in modern times. The question of ocean governance, ocean tenure, boundaries, and the notion of the marine cadastre to support ocean governance, have recently been the subject of a number of research projects in Australia (e.g. Grant and Williamson 1999, Collier *et al* 2000), Canada (e.g. Nichols *et al* 2000, Ng'anga *et al* 2001), New Zealand (e.g. Robertson *et al* 1999, Hoogsteden 2001), South Africa (e.g. Watermeyer 2001, Wonnacott *et al* 2001) and the USA (e.g. Fowler and Treml 2001).

Our interest is in how instruments, processes and structures that influence day-to-day administrative practices develop. In our observation, three forces shape these:

1. Directory and peremptory instruments - e.g. policies, treaties, laws, edicts, decrees, regulations and proclamations;
2. Dialectic processes – continual cycles of reconciliation, reconstruction and synthesis resulting from criticism, contradictions, conflicts and compromises pertaining to the status quo; and
3. Ad hoc policies and strategies – responses to unforeseen situations arising for which incisive, formal directives do not exist.

A description and analysis of ocean governance in the Netherlands can inform the debate on ocean governance as there is a long history of intense conflict and competition. Underlying this is the political geography of the Netherlands. Unlike the nations mentioned above, the Netherlands is hemmed in by adjacent and opposite countries (see figure 2). In the context of the total area of ocean over which these countries claim sovereignty, their neighbouring countries have a relatively minor influence. In contrast, the Netherlands' relatively small area of sovereignty in the North Sea is surrounded by England, Belgium and Germany, and other European states are in close proximity. And, unlike the nations mentioned earlier, competition for rights and access to the Netherlands' North Sea has been intense. And this competition dates back more than 400 years. The primary influences in the international law of the sea are occidental (Guy 2000). Much of this has been shaped by Netherlands experience and authoritative legal writings, such as *Grotius's Mare Liberum*. Moreover, due to the number of nations that border on the North Sea or fall in the catchment area of rivers running into the North Sea, there is a far greater need for a regional management focus than in many other regions of the globe.

2. NETHERLANDS OCEAN GOVERNANCE

2.1 Geography

The Netherlands sovereignty over the North Sea covers an area of more than 57 000 km², approximately one and a half times the surface area of the country's land mass. Although it is a small, densely populated country with a population of around 16 million people, it has a strong economy reflected in a GDP that is the 14th highest in the world. Competing demands for space in the North Sea are considerably greater than the 57 000 km² available. Current estimates amount to three times this available space (Netherlands 2000).

Fishing and North Sea oil and gas and their associated industries make an important contribution to Netherlands' gross domestic product (GDP). The Netherlands is Western Europe's largest natural gas producer. Trade, transportation and telecommunications are also important contributors to GDP, and they have a significant impact on shipping traffic in the North Sea. Rotterdam handles the highest tonnage of any seaport in the world, while all traffic for German Bight and Scandinavian ports pass over the Netherlands exclusive economic zone (EEZ).

2.2 History

The Netherlands has a long history of competition and conflict relating to access and usage of the ocean for trade and fishing. The modern doctrine of freedom of the seas, and the right of innocent passage, has largely been attributed to the Dutch jurist Hugo Grotius' *Mare Liberum* and English and Dutch naval campaigns against the Spanish and Portuguese. The *Mare Liberum* was published anonymously in 1608, during the 80 years war between present day Netherlands and Spain. It was written in response to the Treaty of Tordesillas of 1494 and papal edicts by Alexander VI (*Inter Caetera*, 4 May 1493) and Julius II (*Ea Quae*, 24 January 1493) (Guy 2000 citing van der Linden 1916). However, the legitimacy of these attempts to grab ownership of the oceans had also been challenged by naval force. The *Mare Liberum* was preceded by naval conflicts between the Spanish empire (which included present day Portugal) and the English and Dutch in the latter half of the 16th century. Moreover, English and Dutch mariners raided and plundered Spanish and Portuguese merchant ships in various parts of the globe.

There is also a long history of attempts to govern fishing and access to natural resources in the North Sea. For example, in 1609 James I of England issued a proclamation directed at the Dutch herring fleets, which attempted to place a levy on foreign fishing in English waters (Guy 2000). This tension over rights and access to fishing in the North Sea continues today.

2.3 Demands for Space, Access and Usage of the North Sea

Nowadays, in addition to the historical uses relating to trading and fishing, there are many competing, overlapping demands on the North Sea for access to space for infrastructure, the exploitation of natural resources, military use and the preservation of the natural

environment. This necessitates increasing levels of formal governance. Expected growth in telecommunications and utilisation of smaller oil and gas fields will greatly increase the demands on space for new cables and pipelines and the safety zones around them. Other demands on space in the next 30 years will be for mineral extraction, defence purposes, wind energy, shipping routes, airports, seaports, recreation and sea defences (Netherlands 2000). These demands are summarized in table 1 below.

Table 1 Access and Usage Demands on the Netherlands North Sea
(after Netherlands 2000)

Mining and Minerals Exploitation	Subsurface oil and gas. Mining of sand for land reclamation and sea defences.
Cables and pipelines	Oil and gas pipelines and undersea telecommunications and electricity cables.
Fishing and Aquaculture	Herring, mackerel, and demersal fish. Mussels are farmed in the Waddenzee.
Shipping and Transportation	Shipping routes, traffic separation schemes, ship queuing spaces and port sites.
Military Exercise Areas	Firing and practice ranges, ammunition depots.
Land Reclamation	Land reclamation has been practised in the Netherlands for centuries. The siting of a new international airport in what is currently open sea is under consideration.
Wind Energy	Proposals to locate wind energy farms in the North Sea are under consideration.
Recreation Areas	Beach and shoreline recreation and water-based recreation e.g. yachting.
Nature Conservation and Archaeological Sites	Ecologically sensitive areas, preservation of sea birds and marine fauna and flora. Preservation of view from the coast.
Scientific Research	Research relating to marine fauna and flora, fisheries, sea water and seabed chemical composition, water stratification and mixing, meteorology, currents, sediment transport and deposition, geomorphologic processes.
Pollution Management	The Bonn Agreement of 1983 is a commitment by North Sea coastal states together with the European Union relating to pollution in the North Sea.
Dumping Sites for Dredged Material	There are designated areas for dumping of unpolluted sand and mud from dredging operations.

3. NORTH SEA MANAGEMENT AND GOVERNANCE

There are three features to the Netherlands' North Sea governance strategies. The first feature comprises regional and international treaties, conventions and legislation. These establish the philosophy and value system relating to the North Sea region and a number of regulations relating to its usage. They address the environmental and economic tensions by seeking debate and synthesis over the many competing demands for rights and access to the North Sea outlined in table 1. Secondly, in the Netherlands, there exists at the national level a formal institution to debate, coordinate and manage conflict relating to policies, strategies and legislation affecting access to and usage of the North Sea. The third is a drive toward integrated spatial information systems to support policy and strategy formulation and day-to-

day administration. Networks of spatial and non-spatial databases in various government, parastatal and research institutions underlie this information infrastructure.

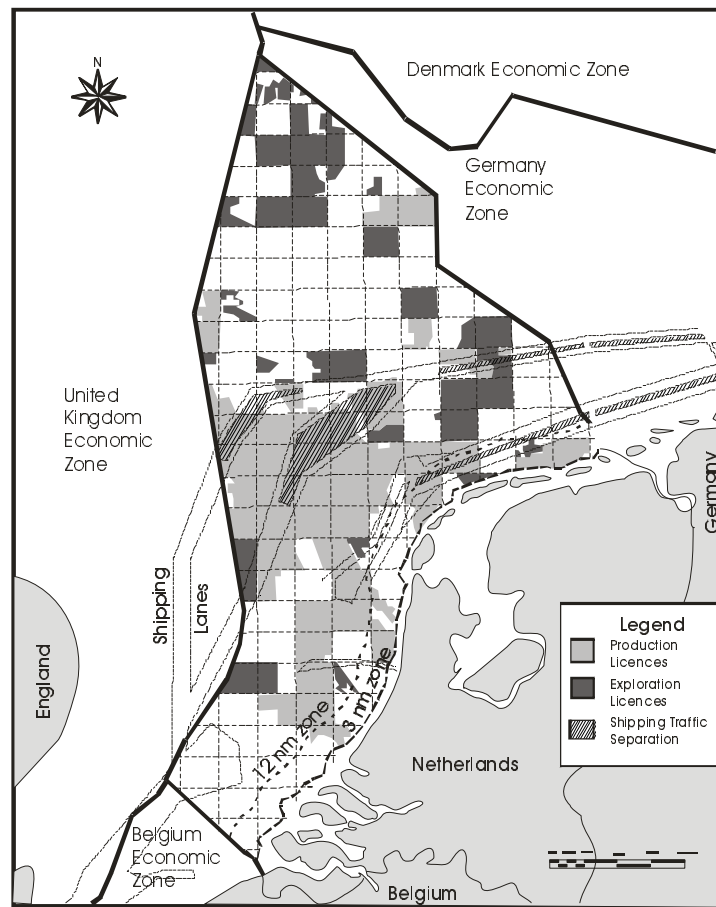


FIGURE 1 Netherlands North Sea Oil and Gas Permit Areas, and Shipping Routes

4. REGIONAL POLICY AND GOVERNANCE

A number of actors, both local and international, are involved in governance of the North Sea. Certain policies and regulations relating to the North Sea region are determined internationally. Issues that are regionally negotiated and regulated are the positions of international boundaries, fishing practices and quotas, shipping traffic management and management of the natural environment.



Figure 2 North Sea Catchment Area

4.1 Boundaries

International boundaries of the Netherlands' territorial sea and the continental shelf have been negotiated with Belgium, Germany and the United Kingdom over the past forty years. The Ministry of Foreign Affairs is mandated to negotiate international boundaries. Technical assistance on the application of the law of the sea is provided by the Navy's Hydrographic Service, which also adjudicates and calculates technical definitions of international boundaries. International boundaries relating to the continental shelf have been ratified with Belgium, Germany and the United Kingdom. The adjacent territorial sea boundary with Belgium has been ratified. However, there are still issues that have not been finalised. The technical definition of the territorial sea boundary with Germany up to 3 nm offshore has been determined but not ratified (see figure 1), but the territorial sea boundary with Germany between 3 and 12 nm is still under negotiation.

The technical determination of baselines and offshore boundary lines is complex. Moreover, besides geometrical determinations based on the equidistance from baselines method, the principle of equity is often applied. Equity considerations have overridden pure technical definitions in two boundary adjudications involving the Netherlands. The continental shelf boundary with Germany was decided after the case had been brought before the International Court of Justice, which ruled in favour of Germany in 1969. Using the equidistance from

baselines method, the German continental shelf would have been completely enclosed by Denmark and the Netherlands, which the Court deemed inequitable (ICONA 1992). Consequently, the continental shelf boundaries were adjusted to fit the pattern depicted in figures 1 and 2. More recently, the continental shelf part of the maritime boundary between the Netherlands and Belgium involved a technical determination of the boundary being adjusted to provide a delimitation that was considered more equitable to Belgium before the boundary was ratified by the two nations.

Although the adjudication of the international boundaries has largely been determined, a number of conflicts and inconsistencies over territorial sea and continental/EEZ boundaries remain unresolved. Two main reasons for this are, firstly different institutions use different definitions for the baselines from which boundaries are determined, and secondly, lags in updating national legislation to bring it into line with the international law of the sea. For example, Netherlands mining legislation relating to the continental shelf still refers to a 3 nm limit on the territorial sea. And, European fishing authorities and the Navy's Hydrographic Service do not use the same baseline to determine fishery limits (Elema and de Jong 2002).

4.2 Fishing

Conflicts between economic interests and preservation of certain fish species in the North Sea are continual. For example, over-fishing has resulted in a number of fisheries being in danger of collapse (e.g. cod) (Ananova 2003). The European Union's (EU) Common Fisheries Policy, revised in 2003, applies to the North Sea and is binding on member states. At present, the EU holds emergency powers that permit it to make ad hoc decisions that may override existing directives and policies. For example, the cod fishing season was closed temporarily in 2001 as the resource had been over fished to the point of collapse (European Commission 2003, Reuters 2001).

As a member of the European Union (EU), the Netherlands is bound by EU fishing laws and policies in the EEZ, but not in its territorial sea. The determination of quotas, closed seasons and closed areas for breeding are major areas of conflict between the EU and member states. Sustainable practices that affect the region have to be balanced against the survival of commercial operations and the livelihoods of fishermen in individual countries. Attempts to reduce the size of fishing fleets and impose EU quotas are continually challenged and debated.

4.3 Shipping

Shipping routes in the North Sea are among the busiest in the world. Shipping routes and traffic separation schemes, shown in figure 1, were introduced in the 1970's. In consultation with coastal states, these are established by the International Maritime Organisation in terms of the International Convention for the Safety of Life at Sea (SOLAS, ch V, s8) (IMO 1998). However, a coastal state may determine shipping routes in its territorial waters in terms of the United Nations Convention on the Law of the Sea (UNCLOS).

4.4 Natural Environment

Management of the natural environment is performed under a system of regional co-governance. European Union laws and directives, specifically the Directives relating to Birds (79/409/EEC) and Habitats (92/43 EEC) affect the governance of the North Sea (EU Nature Legislation 2001). In addition, the Council of Europe influences policy in a number of ways. For example, the Netherlands is a signatory to the Convention on the Conservation of European Wildlife and Natural Habitats, the Bern Convention. Moreover, the Council produces Guiding Principles for the Spatial Development of Europe (Council of Europe 2001). The Netherlands is also a signatory to the Convention on the Conservation of Migratory Species of Wild Animals (1979).

At ministerial level, there have been five International Conferences on the Protection of the North Sea attended by the ministers responsible for the protection of the North Sea environment and the rivers entering the North Sea. Belgium, Denmark, France, Germany, the Netherlands, Norway, Sweden, United Kingdom and the European Commission participate in these conferences. (Norway is not a EU member). Arising out of these conferences and the declarations pertaining to them, there are regular meetings of the Committee of North Sea Senior Officials (CONSSO), which comprises senior officials representing the North Sea states and the European Commission. Aspects of the Declarations have been codified in international and European Union law (North Sea Conference 2002).

The main tasks of CONSSO are to organize the work necessary to follow up on the conference declarations, to review progress in the implementation of the actions agreed upon by the previous conferences, and to organise further conferences. The first three declarations relate to the control and enforcement of regulations to reduce emissions, which affect the North Sea environment. More recently, the scope of the Convention has, *inter alia*, been extended to cover fisheries, habitats, spatial planning, the protection of species control over the release of genetically modified species into the environment, and the prevention of eutrophication (North Sea Conference 2002).

The Wadden Sea is viewed as being of special environmental significance. Regional co-governance of the Wadden Sea between the Netherlands, Germany and Denmark is addressed through the Trilateral Governmental Conferences, of which the 9th was held in October 2001. At this conference, it was decided to submit an application to the IMO for the designation of the Wadden Sea as a Particularly Sensitive Sea Area (PSSA). The nomination of the Wadden Sea national parks and nature reserves, or parts of them, as a Natural World Heritage Site is also being explored (Wadden Sea 2001, North Sea Conference 2002).

4.5 Pollution

Pollution is a major factor in busy sea-lanes and offshore mining areas. The Bonn Agreement (1983) between Belgium, Denmark, France, Germany, the Netherlands, Norway, Sweden, the United Kingdom and the European Community set guidelines for practical, operational and technical cooperation relating to pollution of the North Sea. It's primary aims are 1) to offer

mutual assistance and cooperation in combating pollution; and 2) execute surveillance as an aid to detecting and combating pollution and to prevent violations of anti-pollution regulations (Bonn Agreement 1983).

The Netherlands is also a signatory to the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR 1992), which seeks to avoid pollution from land-based sources, dumping or incineration, and pollution from other offshore sources. Moreover, there is a commitment to share relevant research results. OSPAR is now working, through the North Sea Regional Task Team, on an assessment of all aspects of the marine environment of the North Sea as part of its overall assessment of the marine environment of the convention's maritime area. OSPAR will undertake work on species and habitats by collecting and evaluating information on the impact on the marine environment (including species and habitats) of human activities identified by OSPAR, other than those leading to inputs of substances (OSPAR 1992).

These are the main regional factors that govern strategies to exploit and manage the North Sea. We now describe national structures, instruments and processes.

5. NATIONAL GOVERNANCE, POLICY AND STRATEGY FORMULATION AND THE DRAFTING OF LEGISLATION

At the national level, formal institutions for the coordination of North Sea governance and policy formulation have been in place for nearly 25 years. The most prominent institution in terms of overall national governance is IDON, an abbreviation that translates loosely as interdepartmental deliberations over North Sea policy and governance. The primary purpose of IDON is to debate and coordinate policies, directives and legislation pertaining to the North Sea which various ministries formulate. IDON was created in 1998. It superseded a similar body, the Interdepartmental Coordinating Committee for North Sea Affairs (ICONA), which was created in 1977.

We begin by discussing IDON and then discuss other relevant actors outside of this institution.

INTERDEPARTMENTAL DELIBERATIONS OVER NORTH SEA GOVERNANCE (IDON)	
MINISTRY OF TRANSPORT, PUBLIC WORKS & WATER MANAGEMENT	—
<ul style="list-style-type: none"> • NORTH SEA ADMINISTRATION • WATER POLICY • FREIGHT & SHIPPING 	
MINISTRY OF DEFENCE	U
<ul style="list-style-type: none"> • COASTGUARD • NAVY 	
MINISTRY OF ECONOMIC AFFAIRS	
<ul style="list-style-type: none"> • OIL & GAS MINING & EXPLORATION 	
MINISTRY OF AGRICULTURE, NATURE MANA GEMENTS & FISHERIES	O
<ul style="list-style-type: none"> • FISHING • NATURE CONSERVATION 	
MINISTRY OF FOREIGN AFFAIRS	
<ul style="list-style-type: none"> • FOREIGN AFFAIRS 	N
MINISTRY OF HOUSING, SPATIAL PLANNING & ENVIRONMENT	
<ul style="list-style-type: none"> • NATIONAL SPATIAL PLANNING 	

Figure 3 IDON

As portrayed in figure 3, IDON is made up of 10 representatives from different government sub-structure levels (e.g. agency, directorate general, directorate, department) in six ministries. Largely for historical reasons, some of the functions of the different ministries and their sub-structures overlap. For example, the Ministry of Transport, Public Works and Water Management administers certain terrestrial surface mining activities (e.g. sand mining) and performs certain nature management activities. Other ministries conduct similar activities. For instance, the Ministry of Economic Affairs manages production and exploration licences for sub-surface mining of oil and gas. The Ministry of Agriculture, Nature Management and Fisheries holds overall responsibility for management of the natural environment.

The National Spatial Planning Agency is concerned with the development of national spatial policy, which serves as a framework within which detailed decisions of a spatial nature should be formulated. The land and sea are not viewed as separate in Netherlands spatial planning, although this philosophy has only been adopted in spatial planning policy in recent years (Netherlands 2000).

In terms of the fifth National Policy Document on Spatial Planning, objectives that relate to the North Sea are:

1. maintaining the vitality of the natural systems of the North Sea,
2. incorporating economic uses into it in such a way that they do not damage it, and
3. coordination of the economic uses.

(Netherlands 2000)

Building on table 1, specific activities at sea that need to be managed to achieve these objectives are:

- Shipping routes, traffic separation and anchoring areas are laid down in national policy. Activities that impede shipping are excluded from these areas in accordance with the Mining Rights Map.

- The coastal zone may not be undermined by objects in the sea.
- Unobstructed views from the coast are to be maintained. Structures that are proposed within 12 nm of the coast will only receive permits if significant public interest is at issue. Moreover, good design is important.
- Cables and pipelines should be combined and limited to specific routes.
- The removal of unused cables and pipelines should become obligatory.
- The North Sea is part of the National Ecological Infrastructure
- 2nd National Military Training Grounds Structure plan will determine how much of the North Sea is required by the Ministry of Defence.
- Sand dredging for land reclamation is only permitted at depths of more than 20 metres

The Ministry of Transport, Public Works and Water Management has mandated a number of sub-structures to administer various aspects of the North Sea. The Directorate-General of Freight Transport deals with general freight transportation policy, shipping policy and safety. What is of interest in the context of ocean governance is the determination and management of shipping routes and traffic separation schemes. These are determined by the IMO, but proposed, demarcated and managed by the Ministry of Transport, Public Works and Water Management.

The Directorate-General Public Works and Water Management, largely through its North Sea Directorate (DNZ), is mandated with the governance of North Sea business related to shipping, fishing, dredging, sand mining, the ocean environment and recreation. It has a fleet of ships which are tasked with performing certain hydrographic surveys (e.g. survey of navigational hazards), demarcating shipping routes and harbour approach routes, and pollution clean ups. It is responsible for implementing the Bonn agreement of 1983. As stated earlier, this relates to regional management of pollution in the North Sea. The North Sea Directorate maintains one of the major information systems in the North Sea, which we describe below. Environmental work relating to seabird counts is also conducted by the North Sea directorate (DNZ).

The Ministry of Defence has representatives from the Coastguard and the department of Defence on IDON. The Coastguard involves a partnership between two Ministries. It falls under the Ministry of Defence, and personnel are drawn from the Navy. However, ships and other equipment are supplied by the Ministry of Transport, Public Works and Water Management, Directorate-General Public Works and Water Management. The Navy represents military interests (e.g. military exercise areas) and the Naval Hydrographic Service.

The Ministry of Economic Affairs, mainly through the Directorate-General for Competition and Energy and the State Supervisor of Mines, administer subterranean mining and mineral exploration, which in the North Sea currently pertains to oil and gas. The Netherlands continental shelf is divided into blocks of 10' x 20' (N x E) for licences relating to exploration and production. These fixed term licences are governed by the Mining on the Continental Shelf Act (1996). As can be seen in figure 1, there are subdivisions of these blocks, which were done in terms of earlier versions of the Mining on the Continental Shelf Act (e.g. 1967, 1976). Conflict between mining and other interests is managed through

debates in IDON and a number of formal instruments. In terms of a series of Royal Decrees, there are restrictions on production and exploration activities in certain areas. Other areas are closed to these activities (e.g. military exercise areas). Locating production and exploration drilling platforms close to shipping routes is determined in conjunction with the Ministry of Transport, Public Works and Water Management's North Sea Directorate.

The State holds the rights to minerals in the Netherlands. Oil and Gas exploration and production is done as a partnership between the State and private organisations. The licence holder holds an agreement of cooperation with Energy Control Netherlands (EBN), which falls under the Ministry of Economic Affairs. EBN contributes 40% of the production and exploration costs, and in turn receives 40% of the profits from oil and gas production ventures.

The Ministry of Agriculture, Nature Management and Fisheries has two representatives on IDON, one for fisheries and the other for nature conservation and management. Commercial fishing permits are governed by EU quotas. However, the distribution of quotas allocated to the Netherlands is decided by fishing organisations themselves. Actors not directly represented on IDON include the National Institute for Applied Science (NITG TNO), various scientific organisations and the Netherlands Cadastre. The Navy's Hydrographic Service is a passive member of IDON as other defence force members represent it on IDON.

The Navy's Hydrographic Service is responsible for conducting hydrographic surveys and publishing charts and other nautical information covering the Dutch Continental Shelf and adjacent waters, together with the waters surrounding the Netherlands' Antilles and Aruba. As mentioned above, it also provides technical support to the Ministry of Foreign Affairs relating to the International Law of the Sea.

In general, the Netherlands Cadastre plays a passive role in North Sea governance. Based on boundaries determined by the Navy's Hydrographic Service, the Netherlands territorial sea has been divided up into a series of parcels. Parcels that are within 1 km of the shoreline are registered in ownership in the name of local authorities. Parcels extending from this 1km line to the 12 nm boundary of the territorial sea have been registered in State ownership. However, these State owned parcels of ocean are not used in the processes to govern the territorial sea.

5.1 Information Systems

Accurate geographic information as integral to planning, policy formulation and administration has long formed a tool of the Netherlands' North Sea management strategy. A North Sea Atlas for Netherlands Policy and Management was produced for ICONA in 1992 by various substructures in the Directorate-General Public Works and Water Management, Ministry of Transport, Public Works and Water Management. The Atlas contained information about ocean biology, minerals, shipping, water composition, recreation, data and a number of other relevant themes. It was primarily a government working document as it included tools for performing overlay analyses by tracing different thematic maps.

Nowadays, GIS have superseded the Atlas. The primary GIS for North Sea governance is run by the North Sea Directorate (DNZ). A current initiative to ensure that comprehensive information relating to various proposed projects and locations is incorporated and accessible through a single user interface is the Law and Policy Information System (BREIN) project. The objective is to provide a facility whereby a user can access all the law and policy information relating to a particular location in the North Sea (e.g. a proposed wind farm) using the GIS. A survey and analysis of more than 60 documents relating to the North Sea, which incorporate laws, regulations, policies, covenants, international and national conventions, and guidelines has been prepared for this purpose by the Netherlands Institute for the Law of the Sea (Oude Elferink and Dotinga 2000).

Besides the GIS of DNZ, there are a number of other purpose specific GIS's, such as that of the Navy's Hydrographic Service. GIS is also used for fisheries and environmental management. NITG-TNO, the institution that manages geological data, owns a GIS for their own purposes. Data is shared and exchanged between a number of governmental and scientific institutions and private companies such as oil and telecommunications companies. However, data that are confidential to a particular institution are not shared. For example, NITG-TNO hold mineral exploration data that have been acquired through large private investments. These data are not released into the public domain.

There are initiatives to develop a national spatial data infrastructure in the Netherlands. A pilot project, National Clearinghouse for Geographic Information (NCGI), is in process. However, to date sharing of data to govern and manage the North Sea tends to be done through informal networks. As a result of applications for access and usage rights being examined by a number of different government institutions, certain role players discovered that they were collecting data that had already been produced by others. This has resulted in particular institutions being designated "owners" of certain data and others update their data from them. Data sharing takes place, but formal data exchange standards have not been established and not all institutions keep meta-data. A possible explanation for this is that until recently many international spatial data infrastructure initiatives have tended to ignore ocean data. Moreover, meta-data do not exist for certain data sets that were collected when it was not common practice to generate meta-data.

6. LESSONS

The main lessons provided by the Netherlands case, and the North Sea case in general, is that firstly, effective ocean governance requires continual, transparent debate over economic and environmental concerns. It is necessary to debate policies, management strategies, laws, permits and other similar instruments at regular intervals at international, ministerial and operational level to achieve an integrated system of cooperative governance. And it is necessary that action extend beyond mere debate. Thus, an institution such as CONSSO has been tasked with implementing resolutions and measuring the effectiveness of various strategies that are formulated at various forums. Moreover, the fact that IDON, and its predecessor ICONA, have existed for more than 25 years underlines the need for such institutions at the national level. Secondly, the structural tension between economic interests and environmental needs is inherent in the situation and conflict is continual and natural.

Different actors can be expected to strive to maximise the benefits of their particular constituencies in debates and negotiations. The challenge is to achieve compromise and synthesis of different objectives. However, even legal decrees that may be regarded as peremptory, such as the EU requirement to reduce fishing fleet sizes, may be ignored at times. Institutions such as the European Court of Justice form part of the infrastructure required to deal with these incidents. Thirdly, the democratic culture of the North Sea situation encourages good governance. Although there are numerous tensions and conflicts, in the long term, most of the actors in western Europe understand what needs to be done and are prepared to make compromises. Moreover, there is a great deal of transparency in the governance processes. Fourthly, the land and sea should not be seen as separate. The entire North Sea catchment area has been included in the North Sea Conferences' area of interest and Netherlands spatial planning policy documents now emphasize this principle. Fifthly, the debates over management and governance, and the planning, formulation and implementation of various strategies need to be underpinned by good quality, integrated spatial information. Formal and informal networks, instruments and structures and a culture of cooperation underpin this information infrastructure, which the Netherlands has been working towards for a number of years.

In conclusion, management of the Netherlands North Sea relies on cooperative governance involving numerous national and regional actors and institutions, and a system of tenure that empowers the State and the European Union to act in the event of unforeseen circumstances. Tenure is governed through a system of permits, leases and servitudes of limited duration, where the State retains substantial power. Specialists in different ministries allocate permits. Coordination is done through legislation, policy and institutions such as IDON and CONSSU. Rights are not allocated to third parties on the basis of ownership. They are usage rights of limited duration. This allows flexibility, which is sensible given the environmental sensitivity of the oceans and our lack of knowledge of the effects of intervention and other factors that affect renewable marine stocks.

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BIOGRAPHICAL NOTES

Mike Barry moved to the Geomatics Engineering Department at the University of Calgary at the end of 2002. Prior to that he was an Associate Professor in the Department of Geomatics at the University of Cape Town. He has PhD, MBA and BSc(Survey) degrees. His research interests are in land tenure, analysing and managing change in applying cadastral systems, and spatial data analysis.

Ina Elema holds an MSc in Geodetic Engineering from the Delft University of Technology. Ina has occupied several posts in the Royal Netherlands Navy (RNLN), including 3 years at the Royal Netherlands Naval College. She works as head of the department of Geodesy and Tides of the Hydrographic Service of the RNLN. She currently deals with integrated navigation and technical aspects of law of the sea.

Paul van der Molen is chair of FIG Commission 7. He holds a degree in geodesy from the Delft University of Technology, and acts as director of the international branch of the Dutch Cadastre and Land Registry Agency. He is a visiting professor at the International Institute for Geoinformation and Earth Observation ITC (Netherlands).

CONTACTS

Michael Barry
 Department of Geomatics Engineering
 University of Calgary
 2500 University Drive NW
 Calgary, Alberta
 CANADA, T2N 1N4
 Tel +1 403 220 5826
 Email barry@geomatrics.ucalgary.ca
www.geomatrics.ucalgary.ca/~barry

Ina Elema
 Hydrographic Service RNLN
 P.O. Box 90704
 2509 LS The Hague
 THE NETHERLANDS
 Tel. +31 70 3162826
 Fax: +31 70 3162843
 Email: IA.Elema@mindef.nl
www.hydro.nl

Paul van der Molen
Netherlands Cadastre and Public Registers
Agency
P. O. Box 9046
NL-7300 GH Appeldoorn
THE NETHERLANDS
Tel +31 55 5285 258
Fax +31 55 5285 029
Email paul.vandermolen.kadaster.nl