

Het Pand
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**WORKSHOP ON MARINE SPATIAL PLANNING:
THE MAKING OF A PLAN**



OSTC



Renard Centre of Marine Geology



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Introduction

During the preparation of and call for the project GAUFRE “Towards a spatial structure plan for sustainable management of the sea” it was decided from the very beginning to include a workshop halfway the project period. The project itself is meant to make way for scenarios for optimal spatial planning of the Belgian part of the North Sea.

Though the partners and stakeholders of the project were carefully chosen in order to cover an interdisciplinary approach, we knew that we had to make an additional step. It is only by interacting with other experts from different backgrounds and from different countries – all within the framework of marine spatial planning – that methodologies can be finetuned and recommendations can be set.

As this reader will explain, we wanted to go beyond the institutional and conceptual issues that are generally addressed in terms of spatial planning. Though we realise that we still have a lot to learn on that level, we feel that we have been through a whole institutional process already. It is therefore time to actually think about making a plan. The workshop should be seen in the light of this process. We do not expect to actually create a plan in two days but we do want to discuss the process and methodology towards this objective. We hope that the selection of experts in marine spatial planning with emphasis on academic rather than civil service background will contribute to this discussion.

On behalf of the organising and academic team behind this workshop, I would like to wish you a fruitful discussion and a pleasant stay in Gent.

Prof. Dr. Frank MAES

head Research Department of the Maritime Institute, University of Gent
coordinator of GAUFRE



The project

Background

The need for a spatial structure plan for the Belgian part of the North Sea is triggered by current discussions and public controversy on the use of the Belgian part of the North Sea as well as by policy priorities such as the Bergen Declaration (2002) of the 5th International Conference on the Protection of the North Sea. This is even more emphasised by an increased demand of present and future sea based activities. These user functions include shipping, fisheries and aquaculture, coastal defence, tourism and recreation, sand and gravel extraction, dredging and dredge disposal, energy production, nature protection, cables and pipelines, wrecks, off-shore bunkering, safe havens, and military use.

The general objective of the GAUFRE project “Towards a spatial structure plan for sustainable management of the sea” is the delivery of the scientific foundations for the development of such a spatial structure plan for the sustainable management of the Belgian part of the North Sea. It however wants to go beyond the mere result of producing a master plan for an optimal allocation of user functions. It is obvious that the current call of the project within the limited span of time (until December 2004) cannot contribute to a fully mature spatial structure plan. The project is therefore also putting emphasis on the methodological process towards a plan rather than the final product alone. The project brings 4 different teams together:

- Maritime Institute, International Public Law, University of Gent
- Marine Biology, University of Gent
- Marine Geology, University of Gent
- Ecolas inc., Environmental Consulting

It is clear that the issue of spatial planning at sea can be dealt with in different ways. The conceptual and institutional issues in marine spatial planning debates have been of main importance until now. Questions about drivers, definitions and principles but also about legislation, decision support structures and authorities, are interesting but tend to neglect the discussion on the actual making of a plan. Though we do not proclaim to have solved these issues for the Belgian situation, we have been already through a whole process of conceptual and institutional thinking. A general Law of the Marine Environment is in place. A draft proposal for a cooperation agreement regarding integrated coastal marine management is produced. And recently, a brand new Ministry of the North Sea has been created. It is only a matter of time before the demand for an actual marine spatial plan will be launched. The GAUFRE-project therefore would like to avoid the conceptual and institutional discussion and focus on the actual making of a spatial plan.

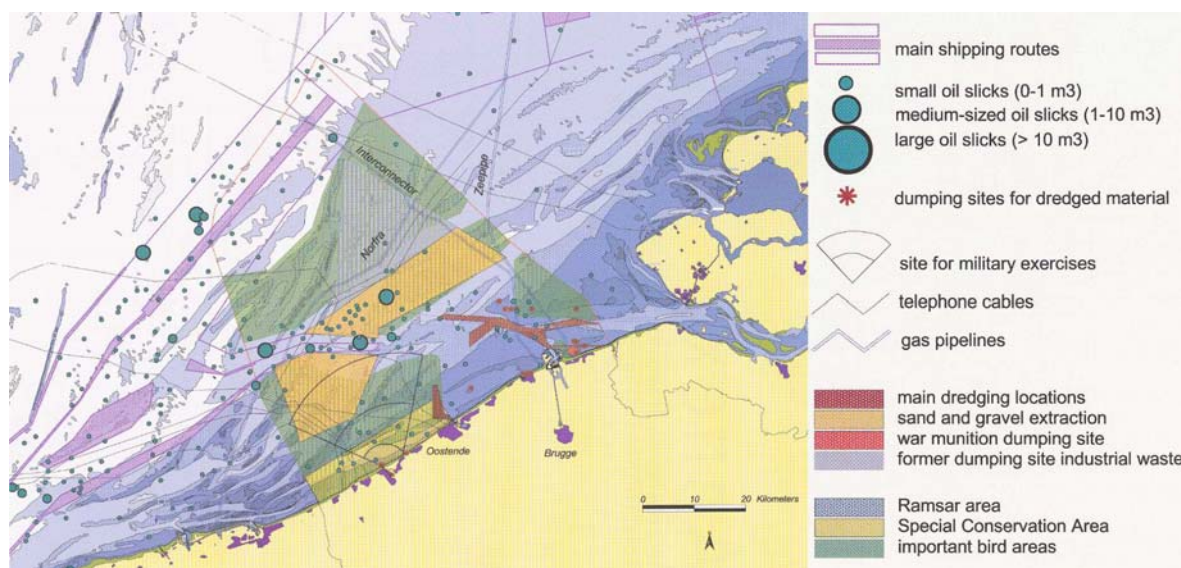
The actual development of a spatial structure plan takes into account a – relatively –small spatial area (about 2000 km² for the Belgian Continental Shelf) and tries to identify all relevant use functions (historical, recent and future) and their impacts, to optimally allocate space. Finding an optimal allocation implies an interdisciplinary approach in which environmental and socio-economic objectives are integrated and balanced. Such a project must go beyond the present scientific data and baseline values in order to come to a scientifically correct, synthesised and acceptable instrument for decision support.

Methodology

The GAUFRE project can build on expertise gained during several recently finished projects. These projects generated a variety of input and data on ecosystem and socio-economic aspects. GAUFRE is therefore a logical next step in combining the present knowledge and bridging the gap towards a spatial structure plan for the Belgian part of the North Sea. GIS was selected as the underlying methodological platform. The methodological approach can be divided in several steps.

Step 1: Data

Current data and the Limited Atlas of the Belgian Part of the North Sea (2000) are used as a starting point. Knowledge on environmental aspects and the current situation of the user functions are partly available. This step aims at updating the knowledge base. It puts emphasis on issues such as missing data, availability of data, intensity of user functions, and identification and characterisation of future uses. Data are managed in a GIS for efficient follow up in the next steps.



Combined different user functions of the Belgian maritime zones (source: Maes, Cliquet, Seys, Meire & Offringa, Limited Atlas of the Belgian Part of the North Sea, Brussels, OSTC, 2000.)

Step 2: Zonation

This step should allow for the division of the Belgian part of the North Sea in homogenous zones. This division into compartments is based on a combination of several available data sets as developed during step 1. They include physical, hydrodynamical and ecological background data, and legal boundaries. The zones will be the basic units on which impact and allocation of spatial use is based. The characteristics of each zone can either be suitable for a certain user function or can exclude this user function from the area. This step therefore needs to address issues such as spatial scale, degree of resolution and the selection of a certain number of relevant data.

Methodology

Step 3: Interaction

An essential step toward spatially balancing and structuring the allocation of user functions, is a discussion on impacts. The analysis of impacts is carried out for the zones as described in step 2. Two levels of impacts are addressed. The single impacts on environment and on socio-economic aspects for each user function within a zone are assessed. Additionally, the interaction among user functions within a zone is identified. This leads to issues such as cumulative impacts, spatial conflict and temporal effects.

Step 4: Integration

This step is the most important step in actually evaluating the allocation of space towards user functions within the framework of sustainability. It is at the same time the most difficult and challenging step. It should start from a number of underlying principles related to sustainable management and policy measures. Different spatial structure scenarios – starting from the current one – are discussed in the light of impacts as identified in step 3 and using criteria based on environmental, social and economic considerations. This step will not only address interdisciplinary integration and evaluation. It will try to open the discussion towards the actual decision making for a marine spatial structure with emphasis on public discussion and stakeholder participation.

The workshop

Structure

The workshop is divided in two main parts. The first part gives an overview of the background, interests and current work of the different participants in the field of marine spatial planning. Rather than wanting to focus these presentations towards the actual objectives of the workshop, we decided to leave them open for personal emphasis and direction. In order to avoid long and general discussions during this part, questions and remarks will be avoided. It is therefore meant to be a mere introduction and inspection of each other's interests.

The second part of the workshop tries to address the above mentioned steps of the GAUFRE project. This part will be divided in four main sessions. The first two sessions aim at focusing the discussion on the Belgian situation, with an introduction to specific Belgian user functions, their issues and relevance. The two last sessions use these specific issues and aspects for a more methodological discussion. These sessions actually contribute to the GAUFRE steps building on specific information as gathered in the previous sessions.

Session 1: Non living resources

An introduction is given in terms of the Belgian state of the art for:

- certain historical user functions
- shipping, dredging and disposal of dredged material
- sand and gravel extraction, and
- energy related uses such as cables, pipelines and wind turbines

A short summary will emphasise the crucial issues for some of these user functions. The discussion will be built starting from certain relevant aspects and questions concerning certain user functions:

- Data on location and density of these specific use functions
 - Are there missing, insufficient or incomplete data?
 - Are all data available and accessible?
 - Is there a difference in scale of space and time?
 - Are some data superfluous?
- Zonation of these specific use functions
 - Suitability for user functions
 - Definition of homogenous zones and its indicators
- Impacts within these specific use functions
 - Effect on environment
 - Effect on socio-economic system
 - Indicators

Structure

Session 2: Living resources

An introduction is given in terms of the Belgian state of the art for

- fisheries and aquaculture
- tourism
- marine protected areas.

A short summary will again emphasise the crucial issues for some of these user functions. The discussion will be based upon certain aspects and questions concerning:

- Data on location and density of these specific use functions
 - Are there missing, insufficient or incomplete data?
 - Are all data available and accessible?
 - Is there a difference in scale of space and time?
 - Are some data superfluous?
- Zonation of these specific use functions
 - Suitability for user functions
 - Definition of homogenous zones and its indicators
- Impacts within these specific use functions
 - Effect on environment
 - Effect on socio-economic system
 - Indicators

Session 3: Data, zonation and interaction

This session will try to address the issues as generated by the two previous sessions. Each of the user functions was addressed by these sessions. The challenge however is to bring them all together and to actually make a plan taking into account the different data, zonation and interaction issues. This session therefore covers the three first GAUFRE steps and builds on specific questions as generated by sessions 1 and 2.

- Data
 - How to deal with missing, insufficient or incomplete data?
 - How to deal with availability of data?
 - How to choose the level of data? What about sampling point clustering?
 - How to detect the necessity of data?
- Zonation
 - How to deal with spatial scale?
 - How to deal with the degree of resolution and the size of the zones?
 - How to deal with suitability of zones for certain user functions?
 - How to define homogenous zones? On a legal basis or on a physical/environmental basis?
 - What criteria should be used for environmental zonation?

Structure

- Interaction
 - How to deal with effects if not described in literature?
 - The use of a qualitative vs. a quantitative index for effects?
 - How to deal with spatial and temporal scale?
 - How to deal with effects on the environment? Ecosystem level? What indicators?
 - How to deal with effects on the socio-economic system? What indicators?
 - How to deal with cumulative impacts?
 - How to deal with hypothesised and/or delayed impacts?
 - How to deal with contrasting effects of one user functions on several components
 - How to compare or combine impacts from different user functions? Can we use impact classes?

Session 4: Evaluation and conclusions

The last session aims at summarising the previous discussions. We would like to state some answers on the questions as being addressed above. These answers might eventually be described as recommendations. This session however wants to go beyond the mere scientific and analytic approach of the previous sessions. Two additional aspects will be dealt with:

- Balancing environmental and socio-economic objectives
- Decision support and public participation

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Abstracts of presentations

**Proposal for a Spatial Offshore Plan -
the German North Sea Coastal Zone as an Example
Hans BUCHHOLZ**

Traditionally the oceans - the marginal seas in particular - are mainly used by navigation and fisheries and sometimes by tourism in short distance from the high water mark. For these purposes there is not much demand for spatial offshore planning.

The new planning challenge appears from the introduction of fixed offshore installations. There are already many of such installations: platforms for the exploration and exploitation of oil and gas, cables and pipelines. However, they were perceived as individual measures, and they have been planned accordingly. At present times we have to understand that we are at the beginning of a comprehensive and manifold use of the ocean. Therefore we need a comprehensive spatial planning with a holistic approach following the principles of ICZM because each limited resource needs pro-active planning.

A simple transfer of the well organized spatial planning system from the land to the marine area is not possible due to the different character of the water: it is highly mobile, it cannot be shut off by boundaries, it is more or less uninhabited, and it is widely unknown etc. However, some principles of the land oriented spatial planning principles may be transferred to the marine area in order to meet the usual national administrative procedures. Consequently there will be several different spatial planning systems of the respective states, at least for the time being.

The following steps to a spatial offshore plan should be considered:

- to define the planning region which should contain land and sea
- to map the relevant data of the living and non-living nature as well as of human uses
- to elaborate a vision (Leitbild) for the coastal zone, for the marine area in particular, and to get a political decision on this vision
- to arrange spatial plans on two levels of generalization: (i) a General Plan for the Coastal Zone of smaller scale, with appropriate area categories; (ii) Regional Plans for the Coastal Zone of larger scale with respective area categories. These plans should be the base for decisions by authorities.
- In order to achieve a sustainable development the planning procedure should follow the three main elements of an Integrated Coastal Zone Management: (i) management instead of hierarchic administration; (ii) participation of the stakeholders from the beginning; (iii) iterative planning process instead of final decisions.
- Coordination with neighbouring constituencies and states is essential.

The paper will discuss the application of these considerations to the German North Sea coastal zone.

Toward Integrated Management of Ocean Uses Through Zoning **Charles EHLER**

Designating areas of the ocean for specific oceanic uses, as a method for setting priorities for the use of marine areas or their resources, is not a new idea. Specific areas of estuaries and coastal waters have been set aside for fisheries management for hundreds of years, both in the developed and developing world. However, planning and managing ocean space in any comprehensive or integrated way through the use of zoning is relatively new. Since the early 1970s Australia's Great Barrier Reef Marine Park Authority has used a zoning approach to manage multiple uses of the world's largest marine protected area. Other countries, including the United States and the Philippines, have adopted similar zoning approaches in the management of their marine protected areas. Even more ambitiously, China has recently passed national legislation that requires development of multiple use zoning plans for its entire territorial sea.

Coastal and ocean managers throughout the world now recognize the importance of setting aside areas of marine waters for specific uses. For example, over 4,000 marine protected areas have been designated—an exponential increase over the past 10 years. Numerous other examples of areas designated for particular activities exist, in which other uses are excluded or restricted to eliminate conflicts. Historically these include, among many others, navigational channels, pipeline/cable corridors, dredged material disposal areas, fisheries closure areas, military firing ranges, and oil and gas drilling leases. Almost always, these “zones” are established through a variety of mechanisms under different authorities, and typically lack any inter-sectoral considerations or integrated planning and coordination.

The management or “governance” of human activities within specified coastal and marine space can have many objectives:

- Allocation with society and among government organizations of rights of use, ownership, and stewardship of marine resources within the space;
- Regulation of these rights of use, ownership, and stewardship;
- Separation of conflicting human activities;
- Protection of natural and/or cultural qualities of the space while allowing a range of other reasonable human uses;
- Designation of suitable areas for specified human uses, e.g., fishing, waste disposal, and transportation, while minimizing the effects of those uses on the quality of the entire space;
- Protection of critical or representative habitats, ecosystems and ecological processes;
- Monitoring and enforcement of these regulations by the appropriate authorities; and
- Provision of effective means to prevent and adjudicate disputes.

Ocean zoning is more complex in that it needs to address and manage activities on the ocean's surface, throughout the water column, and on and beneath the seabed. It is conceivable that one area of the ocean could support multiple uses (by different sectors) or several management objectives simultaneously, and it is also possible that one use or management objective would preclude all others. Ocean zoning may also have a temporal dimension, prohibiting uses of a period of time or on a seasonal basis.

This paper and presentation will examine existing examples of the application of zoning as one tool in a number of “incentives” that can be used to manage marine space in an integrated, multiple-use framework. Differences between zoning on the land and in the marine environment will be identified, e.g., mobile resources v. static boundaries, as well as problems of “open access,” but the benefits of marine zoning will be highlighted.

The Environment Sets the Limits for Sustainable Management of the Sea **Anamarija FRANKIC**

The health and sustainable use of coastal and sea resources are of critical importance given their role in food production, economic activity, genetic biodiversity and recreation. In addressing integrated coastal management it is essential to strike a balance between the need for economic development and the need for natural resources conservation within the same management plan. Therefore, integrated coastal management and sustainable development should include careful consideration of a multiplicity of parameters and their interactions. Planning for sustainable uses is a process that comprehensively and holistically analyses natural resources conditions, human uses and socio-economic aspects. Through effective research, monitoring and incentive programs that maintain ecosystem integrity and balance human values, economic development can be attained in an environmentally and socially sustainable manner. The proposed approach for sustainable use of coastal, marine and land resources is that *'the environment sets the limits for sustainable management and development'*.

One of the most critical challenges is to find suitable sites for different sea -based activities and maintain healthy ecosystem functioning. The first step in this process is to identify the environmental conditions necessary for each activity to succeed. In the case of the Belgian part of the North Sea, the activities/uses include: shipping, fisheries, aquaculture, coastal defense, tourism and recreation, sand and gravel extraction, dredging, energy production, nature protection, cables and pipelines, wrecks, off-shore bunkering, and military use. Determination of suitability involves an evaluation of natural and anthropogenic limitations of a certain area in order to decide if the locality can support the activity (finding "an optimal allocation for user functions"). Developed protocols for each coastal/sea activity can be used as environmental quality standards that will help guide and control activities within certain environmental limits. Ultimately, through guidance of monitoring programs (environmental and socio-economic), better information can be incorporated into the analytical protocols. This will improve evaluations, and complete the feedback loop for the sustainable management planning of the sea and the coast.

Adequate policy addresses the resolution of potential use conflicts, which is often hindered by lack of information or appropriate methodologies. Management choices will be required when certain activities can appear in the same locations based on suitability analysis of the area (e.g aquaculture vs tourism/beach area vs sand/gravel extraction). In these instances, choice has to be based on environmental requirements for the activity and the activity's interaction with the environmental resources (environmental impact assessment, EIA). First priority should be given to the activity with the highest environmental suitability level and the lowest adverse impact on the respective land/water ecosystem. In addition, implementation and decision-making must incorporate socio-economic suitability and cultural factors. Involving the community in the planning and decision-making process is an important step toward acceptability and success of the sustainable management. The use suitability and use conflict analyses (Geographic Information System, GIS models) support the interdisciplinary aspects of sustainable coastal management planning, and decision-making processes addressing where, how and why different uses will mostly succeed in sustainable manner.

**Sustainable Management of the Sea – the Importance of Clear Objectives –
Perspectives from the Great Barrier Reef
Richard KENCHINGTON**

The social, economic and environmental importance and the needs for sustainable management of marine ecosystems are now widely understood and increasingly reflected in legislation and institutional structures.

Designing management systems to respond to the needs poses difficult challenges. In marine ecosystems the biology of plants and animals, and the consequent issues of scale, variability and linkage in space and time, limit the effectiveness of terrestrially derived concepts of spatial planning. Many uses with different levels of impact may occur in the same area. It is important to understand the issues of cumulative and interactive impacts on the natural system and on each other. Unless planning can be conceived to reflect the issues of uses and sustainability at an ecosystem scale, territorial boundaries or fences to delimit different uses are of limited value. Recruits, nutrients and food for plant and animal populations may come from distant spawning areas and impacts such as pollution may come from distant areas and different jurisdictions..

The biophysical foundation of marine management is not the major constraint to planning. With current technologies seabed habitat mapping is relatively easy and, depending on the general applicability of the inherent assumptions, modelling can provide a reasonable understanding of biophysical constraints and opportunities for management. The issue is to devise the most effective contemporary solution to sustainability in the face of multiple uses and impacts, natural variability and resilience of the ecological system in the face of individual and cumulative impacts.

A fundamental issue is that we do not manage the sea or marine environments. We have no means for significant management of most of the ecosystem processes. We can hope to manage human behaviours to influence what people do, or do not do, to marine resources and habitats. There is a challenge in this because the concept that human activity can damage the sea is very recent. Most people were brought up with notions of the seas as vast, remote, dangerous - a source of food and resources for the brave, and a limitless sink to absorb the wastes of life on land. The fact that we are holding this workshop demonstrates that we are in transition but the process of achieving the necessary changes in behaviour must go beyond experts telling the rest of the community what to do. It has to involve a process of collective development of reasonable decision rules.

Management plans can address the purposes and conditions of use and entry to areas of a marine ecosystem but to do so requires an open approach to planning. It requires broad involvement of interested, affected and impacting parties in the development of decision rules or operating principles. These should lead to the identification of reasonable constraints and opportunities for managing impacts and achieving objectives subject to an overarching objective of sustainability. The process should be far reaching because quite frequently impacting parties may be unaware of their impacts or connection to the marine ecosystem. Where they operate in a different jurisdiction these problems are compounded.

The operating principles should identify areas of common agreement for overarching management principles. They will also clarify matters where different sectors have conflicting objectives that may be addressed by limitations to contain impacts within demonstrably sustainable levels or by spatial or temporal separation. A process based on broadly discussed and understood operating principles can help to achieve the best feasible contemporary solution to manage human behaviours. It should also provide the basis for ongoing adaptation and revision as understanding of management and perceptions of reasonable behaviour evolve in the light of actual experience.

Legislation, Policy and Long Term Developments in the Dutch EEZ
Bart KORF

Our North West European society has lots of wishes to be allocated in the North Sea: not only the more traditional uses of fishing, shipping and maritime defence, but also oil and gas drilling, sand dredging, wind energy and the allocation of marine protected areas are forms of present day use. Even making an artificial island off our coast to be used as an airport has been considered.

By these developments it is becoming more and more crowded at the North Sea. The appearance of the sea will change drastically in the decennia to come. Even in the seemingly endless vastness of the sea competition for space for the accomodation of the different human uses will come into being in the next years. We cannot foresee when this will happen exactly, but inevitably competition will come into being in the next future.

We may consider if our legislation is able to cope with these developments. The present day legislation for the EEZ of the Netherlands consists of a set of different sectoral laws: Mining Law, Sand and Gravel Extraction Law, and the Law for the Management of Public Works. Also the Environmental Impact Law and several other environmental laws apply to activities in the EEZ. These are adequate for the time being.

So there is no general, more integrated law in force. Recently our government has decided to enforce the Nature Conservation Law and the Flora and Fauna Law in the EEZ. At the same time she has decided that there is no need for a special North Sea Law.

At the moment some relevant policy documents are in process in my country: a.o. the “Nota Ruimte” (National Policy Document on Spatial Planning) and the Integrated North Sea Management Plan 2015; the latter is a plan of the directorate North Sea of the Public Works Authority. Furthermore in January 2004 a workshop on Spatial Planning of the North Sea is organized by the OSPAR secretariat in order to deal with section 76 – 79 of the Bergen Declaration (containing the conclusions of the Fifth International Conference on the Protection of the North Sea, March 2002, Bergen, Norway). So the national and international North Sea policy is beginning to move slowly towards a more integrated approach. In my opinion international cooperation and tuning is very important in this process.

Methodological Input from Flemish Spatial Structure Planning for Marine Planning **Hans LEINFELDER**

Introduction

Since the start of the 1990s Flanders has developed a new spatial planning policy, called structure planning. In 1996 and 1999 it resulted in new legislation that replaced the existing national law, already dating from 1962, and in 1997 the first Spatial Structure Plan for Flanders was approved by the Flemish government and parliament.

Although without doubt spatial planning on land differs fundamentally from marine planning, input from the experiences with the Flemish structure planning methodology can be useful for marine planning.

First my presentation will focus on the procedural aspects of spatial structure planning in Flanders which, until now, have showed succesful in developing public support for the spatial policy plan. Second I shall highlight the content of a structure plan, or better said, the successive steps in building up a coherent plan. Because of the fundamental differences between spatial and marine planning I shall try to give an initial translation of the terms/jargon of spatial planning in – may be – useful terms for marine planning. Finally I shall briefly center on the necessary steps for implementation.

Procedural aspects of spatial structure planning

Spatial structure planning is considered as a form of strategic planning. Fundamentally this means that spatial structure planning is not comprehensive. It is no longer possible to cope with all the problems and qualities in our complex society. The sectoralisation in vertical, quasi isolated departments in government structure on the one hand and the increasing ambitions at the different policy levels (European, national, regional, local, transborder, ...) on the other hand, don't improve the conditions for the former technical planning approach, typical for the 1960s and 1970s (fordism).

As a result of these changing planscape, starting a spatial structure planning process is defining the scope (problems, qualities, opportunities, ...) of the planning process to focus the research, the analyses and the debate. The scope is defined through discussion between relevant stakeholders who will get involved more deeply in and will be convinced of the necessity of the planning process by a common sense of scope.

The planning process itself is being developed on three simultaneous and coinciding tracks.

The first track is the development of a long term vision on the spatial structure of a region and consists of an abstract, but strategic vision crystallised in spatial concepts. Where do we want to be within 10, 15, 20, 30, 50, ... years ?

As the development of a long term vision takes time, because of negotiations and the slowness of political decision making, short term actions are made possible on the second track. Anyhow, these actions need to fit in the long term vision under construction so a permanent feed back between the two tracks is necessary. Vice versa the experiences with and the gain of public support through the short term actions will support the development of the long term vision.

The third track is communication. Communication between different policy levels, negotiation with stakeholders, information and participation of civil society, are absolute necessities to come to a long term vision and the realisation of short term actions.

Successive steps in the development of a spatial structure plan

Of course the development of a spatial structure plan starts with the analysis of the existing situation. As mentioned before it is however impossible and desirable to make a comprehensive analysis so the scope of the strategic plan already influences the topics studied throughout the analysis. The aim of the analysis is an integrated image of the main structuring spatial elements in a certain region, also called the existing spatial structure. In practice this analysis is often

executed through, first, the morphological and functional analysis of different spatial substructures – the physical system, the settlement structure, the structure of open area functions (nature, agriculture, ...), the structure of economic activities, the traffic infrastructure – and second, the integration (which is more than an addition) of these substructures which highlights the spatial relationships between the different substructures. In marine planning the emphasis will probably be more on functional rather than on morphological features. Intuitively potential substructures for marine planning could be the physical system (currents, relief, geology), nature (bird routes and stopping places, ...), fishery, harbours, energy production, recreational activities, courses of navigation for the transport of people or freight, undersea cables, ... The territorial combination of several substructures (functions and activities) can result in the definition and characterisation of subregions in the analysed region.

The next step in the development of the spatial structure plan is the formulation of a "desired" spatial structure. Taking into account the existing spatial structure an overall vision for the region is defined. Hesitating to formulate a vision for the sea, the overall vision of the Spatial Structure Plan for Flanders, "Flanders, open and urban", illustrates that a vision is in fact a stepping stone which gives direction to the spatial concepts, the policy perspectives and the actions that are formulated later on in the plan. A spatial concept gives expression in a condensed way, in words and in images, in which way government thinks about the future spatial development. As a spatial concept can be expressed in an image, it means that the content of a spatial concept has to be locatable. The integration of the different spatial concepts results in an schematic image of the desired spatial structure. This desired spatial structure can consequently be operationalised in development perspectives and actions for the different substructures, analysed before. The step of formulating concepts and their integration in a desired spatial structure has to guarantee the coherence of the development perspectives and actions.

Necessary steps for implementation

In Flanders spatial structure planning ends with the formulation of perspectives and actions. This implies that a spatial structure plan is quite abstract and vague and as a consequence is not powerful enough to limit individual property rights. It is no more than a political vision on spatial development and thus only binds the involved government levels.

When the necessity occurs to implement certain aspects of the structure plan so far that it has consequences for decisions of individuals, these aspects have to be translated in an implementation plan. Because of the judicial statute of these implementation plans they have to be very precise, very specific in zoning, ...

**Blending Information: The Use of Local Ecological Knowledge for
Spatial Planning at Sea
Grant MURRAY**

Spatial planning at sea often involves attempting to integrate economic, social and environmental dimensions into management plans for specific geographic areas. To be effective, spatial planning requires accurate and relevant information about the marine environment as well as the dynamics of historical and contemporary marine resource usage patterns. Knowledge about past marine ecosystems is particularly important when management is concerned with restoring degraded ecosystems or areas. Resource status and usage patterns in marine areas are often difficult to gauge and scientists and managers rarely have enough, or the right kind of, information to ensure effective spatial planning. Fisheries science, for example, often only has access to quantitative, large-scale, off-shore data that can be limited to species of commercial importance.

We begin with the argument that the environmental knowledge of local resource users can be an effective complement to scientific knowledge for spatial planning at sea. It may also be essential for interpreting more traditional types of data. Local ecological knowledge (LEK) is based on the experience of local resource users, and is quite different from normal 'science' in that it is usually transmitted orally, is place based, and can have significant time depth. Although the information gathered from any one fisher is usually limited to the particular geographic area with which they have direct experience, their knowledge is often highly detailed and specific to areas not always covered by fisheries science. Furthermore, this knowledge can, at least in theory, be collected and aggregated to construct a larger scale, highly detailed picture of local fisheries extending back several decades (Neis and Felt, 2000). The qualitative, long-term, local, and coastal character of fishers' observations, in other words, can be seen as spatially and temporally complementary to more 'scientific' information (Neis et al., 1999).

The presentation will give a few examples of 'useful' information that LEK can provide (see Hutchings, 1996 and Neis et al., 1999). In managing scarce stocks or sub-populations, for example, LEK can illuminate aspects of local stock structure including movement patterns, spawning grounds, juvenile habitat and spatial patterns in fish morphology. Dates when fish are caught in fixed gear in different locations can indicate seasonal and directional movements of fish populations, while negative trends in CPUE can be quantified on a decadal scale which provides a clearer picture than landings information alone. Furthermore, harvesters may also have information on commercially insignificant but ecologically important species that may appear as bycatch. LEK researchers have developed specific methods to reconstruct historical changes in the fisheries of the northwest Newfoundland and Labrador coasts of eastern Canada. This research involves combining different types of information, including Local Ecological Knowledge (LEK), archival information contained in the historical record, and 'scientific' information from a variety of sources. In the case of LEK, sampling strategies to arrive at a sample of fishers from different areas and fisheries should attempt to reflect the social, spatial and technological complexities of current and past fisheries in our study area. In our LEK research, we actually include two different types of semi-structured interviews, including taxonomic interviews with older, retired fish harvesters and career history interviews with recently retired fish harvester experts. Both types of interviews involve verbal and chart data, where ecological (and other) information is either drawn directly on maps or remains verbal, but where the maps are used to generate and focus discussion. Some additional challenges and advantages related to doing this kind of research include sampling issues, concerns about data interpretation and 'filtering', and finding 'linkages' between different types of data. Overall, neither system (LEK or 'normal' science) alone provides a comprehensive portrayal of environmental phenomenon and human interactions with the environment. Combining these knowledge sources with archival data has the potential to create a new knowledge system with significant potential to increase the effectiveness of spatial planning in marine environments.

**Conflicts in German Offshore Waters (mainly the EEZ) and
First Approaches for a Solution by Spatial Plannings
Eike RACHOR**

Since several years, new developments have occurred in offshore waters of the North Sea and the Baltic Sea, mainly by new plannings for wind farms (1), sand and gravel exploitation and also nature conservation (according to the European Habitats and Birds Directives). Until now, there exists no legal instrument to direct such plannings and restrict them to suited, conflict-poor areas. On land, Germany uses the instrument of spatial planning (“Raumordnung”) to reduce conflicts and allow for very early decisions about suited sites for different uses, especially such of priority for specific developments.

Within the coastal waters (up to 12 nautical miles) and, becoming more important, within the exclusive economic zone (EEZ), no such instrument was applicable until now. This was recognized also by the Conference of the German Ministers for Raumordnung in December 2001, when a proposal was made to the Federal government to develop a strategy for spatial development and to investigate whether the German laws of Raumordnung can be applied to the EEZ.

The Land Niedersachsen (Lower Saxonia) has already initiated spatial planning within its coastal waters, where large areas belong to the Wadden Sea National Parc.

In the EEZ, permissions for wind farms and sand and gravel extraction are given by specific laws, which consider each application as an individual act and must not regard parallel plannings in a greater distance from the site in question.

During the last weeks, the Federal Ministry for Environment had allowed for an open discussion of potential proposals for the European NATURA 2000 network, by which areas to be possibly developed to marine nature reserves were put forward (2). In addition, areas outside such prospective reserves suited for large wind farm constructions (“Eignungsgebiete” for wind energy converters) have also been proposed and are now in discussion. Such new developments are considered to be helpful also for investors and may be regarded first steps to the necessary spatial planning in offshore waters.

Naturally, such plannings should consider developments also in the neighbouring countries’ EEZs, which requires international cooperation and coordination.

(1) see: www.bsh.de/de/Meesnutzung/Wirtschaft/Windparks/index.jsp, esp. maps

(2) see: www.HabitatMareNatura2000.de/

The Belgian Sea
Hance SMITH

The purpose of this presentation is to consider the practical implementation of a sea use planning system for Belgium. It first considers salient points regarding the geography of the 'Belgian Sea'. This is followed by a brief discussion of the vision and purpose underlying the establishment of such a system; stages of plan development; the format of the plan(s); and a brief conclusion.

From a sea use planning perspective, the key coastal and marine environmental regions involved are the Schelde, the inshore coastal area, and the open sea respectively. Key aspects of sea use patterns include the global shipping route connecting the English Channel and the North Sea; the cross-Channel ferry routes; and major Belgian port approaches. Also a high priority are aggregate dredging, demersal fisheries, coastal leisure activities, waste disposal, and conservation uses. The overall spatial plan or plans will be built on the interactions among the uses, and the relationships between the uses and the environment.

The presentation briefly considers the vision and purpose of the spatial planning approach in this case. Fundamental ideas relate to development, sustainability, connectivity and governance. There follows the specific objectives – particularly the national objectives, but also taking account of the federal structure of Belgian government and the local authority level; and EU and international dimensions which are of particular significance in the present case. The technical underpinnings of the spatial planning approach are also outlined (Matrix).

The stages of plan development are grouped into three themes. First are the information bases involved, including research, scoping of the plan(s) and formation of stakeholder networks. This is followed by development based on conferences and workshops and pilot study areas, taking due account of the influence of cultural factors such as language. Management of plan development is considered in terms of stakeholders, political aspects, implementation and monitoring.

Factors to be taken into account in formatting spatial plans include external influences: environmental, technological, economic, social, political and risk all of which have regional implications. The objectives are also considered; followed by the roles of the organisations involved and the nature and degree of integration required at various geographical scales.

Finally, concluding comments are made regarding the Belgian Sea, vision and purpose, stages and format

**Using GIS to Facilitate Public Participation in the
Spatial Management of a Marine Commons**

Kevin St. MARTIN

The marine commons is increasingly managed using spatial approaches and methodologies. For example, fisheries have been typically addressed in terms of quantities by species for numeric allocation but management bodies are now turning toward more localized and inherently spatial forms of management (e.g. rotating closures, Marine Protected Areas, areas of concern relative to endangered species or habitats, ecosystems approaches, and community-based management zones). The implementation of spatial approaches is made possible by new technologies and methods such as GIS. At the same time, these technologies are producing new ontological understandings of the marine environment as a spatially diverse “landscape” inhabited by a variety of users and interests. New categorizations of the marine environment are produced and reified via these technologies. While the marine commons has always been a heterogeneous environment, it has been difficult to represent it as such without the advent of GIS technologies and the ever-expanding collection of spatial data in digital form. Both the natural environment (e.g. benthic habitats, bottom morphology) and the social environment (e.g. fishing zones, energy production areas) are produced via maps that detail their characteristics and locations.

These newly emerging geographies of the marine environment do not typically include local and community-based understandings of space. Indeed, they often “over-write” the geography of the marine environment as understood, for example, by fishermen or recreational users. How the common marine environment is being defined via new spatial technologies employed by official agencies, etc. directly contributes to an effective dissonance between new images of the environment and those maintained by coastal communities and the public. Integrating the spatial understandings of community members/public groups as central to the formation of spatial management plans will produce a process where the public is engaged at the fundamental level of producing/defining the space of the common marine environment.

Research on the use of GIS as part of a public participatory methodology has led to the emerging field of PPGIS (public-participatory GIS), which focuses on the integration of local understandings of the environment as vital to the management of natural resources and commons spaces generally. For example, my own work maps locations of primary and secondary importance to fishing communities (defined by home port locations and gear types). These communities (in the U.S. Northeast) rely upon particular resource areas of the marine environment and have come to inhabit and intimately understand such areas. Integrating data layers depicting areas utilized by particular communities as well as the local environmental knowledge produced by such communities will contribute greatly to the spatial management of the fisheries commons. In addition, the visualization of “community spaces” on the commons provides communities with a sense of inhabitation and stewardship that is often eroded by images of the commons depicting only resources or government produced zones of management. Connecting on-shore communities to the specific off-shore locations upon which they depend provides a concrete basis for participation at a number of levels.

The PPGIS approach is clearly valid beyond the case of fisheries and might be used as a way to integrate a variety of commons “inhabitants” (e.g. recreational or other user groups) into the spatial management of common marine environments. Integrating these groups and their geographic understandings and uses of the marine environment is an important step toward avoiding the dissonance that often results from official mappings of the environment that ignore the perceptions and experiences of local communities.

Programme

Day 1 (16 January 2004)

Morning session

8.30 Registration of workshop participants (upon invitation)

9.00 Opening of the workshop

Dr. Frank MONTENY, Belgian Federal Science Policy Office
Ms. Cathy PLASMAN, cabinet of Ministry of the North Sea

9.10 Welcome to participants and introduction to the workshop

Prof. Dr. Frank MAES, coordinator GAUFRE project

9.30 Short presentation by participants: their experience, background and contribution

Prof. Dr. Hans BUCHHOLZ
Dr. Paul GILLILAND
Dr. Charles EHLER
Dr. Anamarija FRANKIC
Dr. Arthur HANSON
Dr. Maggie HILL
Prof. Dr. Richard KENCHINGTON

10.45 Coffee/tea break

11.15 Short presentation by participants: their experience, background and contribution

Dr. Grant MURRAY
Drs. Bart KORF
Drs. Hans LEINFELDER
Dr. Eike RACHOR
Prof. Dr. Hance SMITHE
Dr. Kevin St. MARTIN

12.30 Lunch

Afternoon session

13.30 Session I: Non-living resources

Moderator: Dr. Jan SCHRIJVERS

15.30 Coffee/tea break

16.00 Session II: Living resources

Moderator: Dr. An CLIQUET

18.00 End of day 1

Programme

Day 2 (17 January 2004)

Morning session

9.00 Session III: Data, zonation and interaction (1)
Moderator: Dr. Jan MEES

10.30 Coffee/tea break

11.00 Session III: Data, zonation and interaction (2)
Moderator: Dr. Bart DE WACHTER

12.30 Lunch

Afternoon session

14.00 Session IV: Evaluation and conclusions (1)
Moderator: Prof. Dr. Frank MAES

15.30 Coffee/tea break

16.00 Session IV: Evaluation and conclusions (2)
Moderator: Prof. Dr. Frank MAES

17.30 Conclusions and closure of workshop

18.00 Closing reception

Practical information

ARRIVAL AT BRUSSELS AIRPORT : THURSDAY 15/01/2004

Brussels International to Gent Sint Pieters by train

By train, Brussels International is less than twenty minutes from Gent city centre. From 6 am till nearly midnight, the Airport City Express directly links the airport with Gent St. Pieters railway station (every 4 and 48 minutes after the hour). A one-way ticket costs €7,50 in second class. The railway station at the airport is located in the basement (level -1) of the terminal building itself. There are also two extra indirect trains that bring you to one of the three Brussels stations where you can get a connection to Gent.

In case you want to make use of the shuttle service or a taxi to Gent, we want to inform you that this service will not be refunded by the project.

Gent-Sint-Pieters to the city center of Gent

Hotel IBIS KATHEDRAAL
Limburgstraat 2
9000 GENT
Tel. : +32/9/233 00 00
Fax : +32/9/233 10 00

Arrival in Gent with your own car:

To reach the hotel, please follow the motorway (E40 from Brussels and E13 from Antwerp) direction Gent. Leave the motorway exit Gent-Centrum. This leads you along a park bringing you all the way to Gent Zuid. Because of the limited private parking space at the hotel, we would advice you to take one of the following parkings (all indicated at Gent Zuid).

- Parking Kouter (parking named P5)
- Parking Sint-Michiels (parking named P7)

Arrival in Gent by train :

At the Gent-Sint-Pieters railway station the trams 1 and 10 take you to the city centre; get off at the 8th stop (St. Niklaasstraat) and you find the hotel after a 5 minutes walk.

You can also take a taxi in front of the Gent-Sint-Pieters railway station.

THURSDAY EVENING 15/01/2004

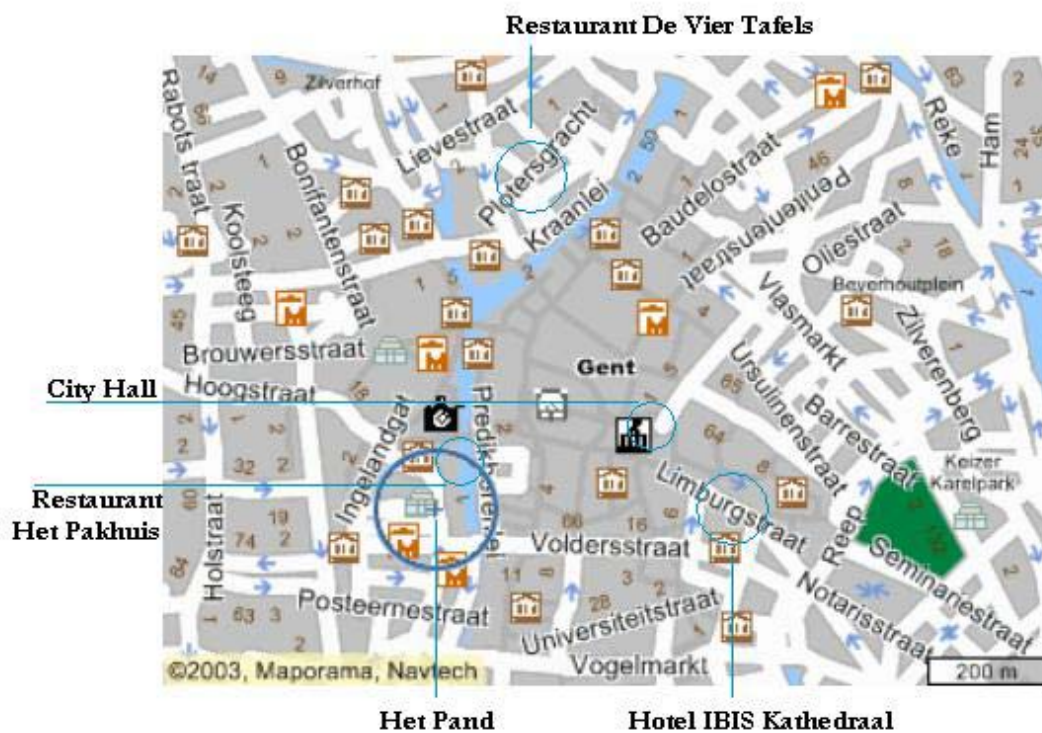
Restaurant DE VIER TAFELS
Plotersgracht 6
9000 GENT
Tel. : 09/225 05 25

- Appointment at 7 pm in the reception hall of the hotel
- From there we go together to Restaurant “De Vier Tafels”
- In case of late arrival we meet at 8 pm in the restaurant itself

FRIDAY 16/01/2004 AND SATURDAY 17/01/2004

Venue HET PAND
Conference room "Oude Infirmierie"
Onderbergen 1
9000 GENT
09/264 83 05

- The venue can easily be reached on foot (about 10 minutes from your hotel)
- The lunch, on Friday 16 and on Saturday 17 January will take place at the venue "Het Pand" itself



FRIDAY EVENING 16/01/2004

Restaurant HET PAKHUIS
Schuurkenstraat 4
9000 Gent
09/223 55 55

- We will jointly go to the restaurant after the last session of day 1
- In case you would like to join us by own means, aperitif is served by 7 pm

SATURDAY EVENING 17/01/2004

Closing reception CITY HALL of GENT

- We will jointly go to the city hall after the last session of day 2
 - In case you would like to join us by own means, Belgian beers are served by 6.30pm
-