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Comprehensive Ocean Zoning: Answering Questions about This Powerful Tool for EBM

Comprehensive ocean zoning (COZ) is potentially a powerful tool for integrating marine management at ecosystem scales. In this issue of MEAM, we look to places where zoning is being implemented, and address the following questions:

- 1) What is COZ and what benefits does it provide?
- 2) How does zoning in the sea differ from zoning on land?
- 3) How can zoning be achieved in light of different property-rights regimes?
- 4) How should the dynamics of marine ecosystems be addressed, given the somewhat static nature of the zoning tool?
- 5) What are the greatest challenges to implementing zoning?

What is comprehensive ocean zoning?

Ocean zoning is a set of regulatory measures used to implement marine spatial plans. Akin to land-use plans, marine spatial plans specify allowable uses in all areas of the target ecosystem or ecosystems. Different zones accommodate different uses — fishing, oil drilling, shipping, conservation, research, etc. — or different levels of use. As in municipal zoning, ocean zoning regulations address prohibitions on, or permission for, such uses. The zoning plans are portrayed on maps, because the regulations are area-based.

Contrary to wide perception, ocean zoning and marine spatial planning are not necessarily the same thing. Charles (Bud) Ehler and Fanny Douvère, who have spearheaded a UNESCO project to assess marine spatial planning (MSP) and its potential for promoting ecosystem-based management, say ocean zoning is only one tool for MSP. Their 2007 UNESCO publication *Visions for a Sea Change* — a report of the First International Workshop on Marine Spatial Planning — explains:

“There is no prerequisite for marine spatial planning to proceed as far as prescribed spatial allocations. It might instead simply indicate preferences or priorities.... Equally, zoning may not need to apply across the whole plan area in the sense that specific ‘zones’ might be identified —

e.g., a conservation priority zone — among one general zone that covers most of the area.”

Their report, available at www.unesco-ioc-marinesp.be/publications, is perhaps the most authoritative source so far on the subject of MSP, and describes comprehensive ocean zoning efforts in multiple countries. (Ehler and Douvère also co-edited the September 2008 issue of *Marine Policy* journal, which was devoted to the topic of marine spatial planning. To view abstracts from that issue, go to www.sciencedirect.com/science/journal/0308597X and follow the links to the September 2008 issue.)

Increasingly, marine planners and conservationists see potential in using zoning to help integrate marine management and make it more ecosystem-based. James Sanchirico of the University of California at Davis states that COZ should play a key role in fisheries management, for example. In a forthcoming paper for the *New York University Environmental Law Journal*, Sanchirico and his colleagues Josh Eagle and Barton Thompson consider problems related to fishing — both internal (such as overfishing and overcapitalization) and external (such as not incorporating values of healthy marine ecosystems). They suggest COZ could help overcome both sets of problems by resolving conflicts among and between interest groups, including by ensuring that these groups have a vested interest in the long-term health of resources. If a user group is given priority in resource allocation in a particular area, they reason, that group will work harder to ensure that area remains productive. “We contend that zoning creates a framework that can both ease the re-alignment of industry incentives as well as facilitate the attainment of the broader goal of healthier ocean ecosystems,” write Sanchirico, Eagle, and Thompson. They add that zoning could also help strengthen politically weak groups. If planners zoned areas for “non-use”, for example, the primary beneficiaries of those areas (i.e., the marine conservation community) would attain a greater voice in decisions across the entire seascape.

John Ogden of the Florida Institute of Oceanography highlights zoning’s role in improving the utility and efficiency of marine reserves. “We need to place our framing of marine reserves and our policy

continued on next page

Table of Contents

Comprehensive Ocean Zoning: Answering Questions about This Powerful Tool for EBM.....	1
The EBM Toolbox.....	4
EBM Perspective: Ocean Zoning is Inevitable.....	5
EBM Perspective: Correcting Misconceptions about Zoning — The Great Barrier Reef Example.....	6
Case Study: Creating a Zoning Plan for Belgium’s North Sea, with Lessons from Land-Based Zoning.....	7
The Status of Spatial Management in New Zealand?.....	8



arguments for them in the context of an overall effort in planning, and that involves zoning,” says Ogden. He says marine reserves are too often placed where they are for ad hoc reasons that have little to do with ecology. “Instead, we need to put reserves where they ought to be,” he says. Ogden believes that only COZ can provide that big-picture perspective.

Some nations and authorities have acknowledged the value of zoning, even if few have instituted full-scale COZ. The State of Massachusetts in the USA recently passed the Massachusetts Ocean Act, which implicitly calls for spatial management of its three-mile territorial sea. The Act calls on state officials to

“...develop an integrated ocean management plan, which may include maps, illustrations and other media. The plan shall...set forth the Commonwealth’s goals, siting priorities and standards for ensuring effective stewardship of its ocean waters held in trust for the benefit of the public [and] shall identify appropriate locations and performance standards for activities, uses and facilities allowed...”

Implementing the act within state waters will likely require zoning that provides dedicated space for ocean industries like aquaculture and wind energy, with prohibitions on certain uses in specific zones, as exist in marine reserves.

Overall, COZ may provide benefits over other tools of marine management. These potential benefits include:

- Moving management away from fragmented sectoral efforts toward integrated, effective EBM that includes all uses of, and impacts on, the oceans;
- Overcoming the shortcomings of small-scale protected areas;
- Recognizing the relative ecological importance and environmental vulnerability of different areas;
- Allowing harmonization with terrestrial land use and coastal planning;
- Articulating private sector roles, responsibilities, and market opportunities; and
- Minimizing conflict between incompatible uses.

How does zoning in the sea differ from zoning on land, and can zoning be achieved without property rights?

Zoning in general was developed for use on land. In the ocean realm, COZ differs from land-use zoning, both in terms of the scale on which it is planned and the way it is implemented across the mosaic of private property, common property, and use-restricted landscapes and seascapes.

Whereas terrestrial zoning is usually small-scale, within the remit of municipal planning authorities, COZ often must recognize the wide linkages across marine and

coastal ecosystems. It must also systematically address uses of, and impacts on, the marine environment at a regional scale.

Lack of property rights in the ocean can hinder efforts to apply the land-based principles of zoning to the marine environment. However, zoning of communal or common property such as marine space and resources is possible by amending legislation toward use rights. In the social science field, property rights have been defined by some as “operational level” rights. In this context, such rights include *access* (right to enter), *withdrawal* (right to extract), *management* (right to regulate use), *exclusion* (right to deny access), and *alienation* (right to sell, lease, or transfer). Marine protected areas, seabed leasing, and military zones already exist that recognize and limit these kinds of rights.

“It is the lack of property rights in the ocean that makes the case for COZ so strong,” says Sanchirico. He argues that zoning, and the spatial allocation of uses that is part of COZ, will create “group property rights” that provide stewardship incentives and lead to rationalization of uses. These group property groups will also provide new incentives for user groups to organize themselves and become better involved in planning and management. In addition, he says, zoning can pave the way toward better management negotiations by endowing all user groups with assets and the flexibility to “trade” those assets as part of resource management negotiations, subject to environmental review.

How should the dynamics of marine ecosystems be addressed?

Marine ecosystem boundaries are porous, and most marine systems are both highly dynamic and poorly understood, contributing to significant management uncertainty. To the extent that management plans exist, there are critics who view zoning plans as static. They see a disconnect between the problem (managing dynamic ecosystems) and the solution (parceling ocean space via zoning plans that exist as maps on paper).

However, zoning need not be static. Zoning plans can be amended regularly to account for changing conditions. In fact, new technologies allow for dynamic zoning — not only in terms of moving boundaries, but also allowing users to recognize where those boundaries are in real time. GPS and other technologies on vessels could allow for seasonal movement of boundaries to be perceived instantly by users.

“We don’t have to wait for technological fixes to envision dynamic zoning,” says Sanchirico. “Zoning, as we envision it, introduces private and/or group contracting into the portfolio of ocean policy tools, which is a bottom-up way of addressing the fluidity of ocean conditions.”

“It is the lack of property rights in the ocean that makes the case for comprehensive ocean zoning so strong.”

— James Sanchirico

What are the greatest challenges to implementing zoning?

Some of the greatest challenges to implementing MSP pertain to information requirements. There can be significant costs (in money and time) to gather the necessary information to develop a comprehensive plan and monitor the effects of zoning regulations. However, wide participation of user groups can help to bring costs of developing a zoning plan down, as user knowledge can be used to supplement scientifically derived knowledge.

Jim Ray, who served as environmental manager for Shell Global Solutions (a division of Shell Oil) and is now president of Oceanic Environmental Solutions, a consulting firm, says a key challenge in COZ involves understanding the various components of marine environments — physical, biological, chemical, geological, social/economic, etc. — and how they relate to each other. “There is far too little funding for the science needed to make planning decisions,” says Ray. He notes this is the case “even though scientifically justified decisions are generally more acceptable than politically justified ones, both to industry and to the public at large.”

Another obstacle to COZ is public misperception of what zoning entails, and industry apprehension of what it sometimes views as unwarranted restrictions or denial

of access. Some within the oil and gas industry, for example, view zoning as a means for the conservation community to push for blanket prohibitions over wide swaths of the seabed. In this context, the term “ocean zoning” is sometimes viewed skeptically as just another way of saying “marine protected area” — which already is a loaded term for some sectors.

Nonetheless, zoning advocates stress the potential positive aspects of COZ for industry: it can create a better climate for private sector investment in both ocean industries and marine conservation. Namely, in contrast to the status quo, zoning brings both clarity on rights and a guarantee that those rights will be honored.

A key step in the COZ process is the evaluation of how well existing management measures are achieving their objectives and goals. Ray says that in countries like the USA, sectoral (non-comprehensive) ocean zoning already exists in a variety of forms, from spatial management measures instituted by fisheries councils, to leases for oil and gas drilling. “We must identify the weaknesses in our current variety of ocean zoning measures, and determine what does and does not work,” says Ray. He says planners need to identify whether the various entities involved have any coordinating mechanisms, and how to harmonize their activities and effects.

Ray sees value in COZ as a tool, but also cautions against creating plans that cannot be carried out. “Where you have rules and regulations, you have to have monitoring and enforcement,” he says. “Yet in so many cases, the authorities in charge do not have the personnel, equipment, and funding to support that part of their mandates. It is a real issue, but many like to dismiss it as something they can’t do anything about.”

There is some debate about whether legislation to mandate zoning is necessary for applying zoning in MSP and EBM. On one hand, zoning was addressed extensively in negotiations on the Massachusetts Ocean Act, although whether it will be applied is still a question. On the other hand, comprehensive ocean zoning in Belgium is progressing despite the lack of a specific legal framework, suggesting that legislative mandates are not essential for being able to use zoning as a tool for EBM (see the case study on p. 7).

It is likely that the specific process for using COZ will differ from place to place. These refinements will reflect the legislative and regulatory framework already in place, the availability of data on ecosystems, services, and uses, and the acceptance of decision-makers and the public for the concept of COZ.

Comprehensive ocean zoning has much potential, but remains largely untested. UNESCO consultants Ehler and Douvere are developing guidelines for MSP and COZ. Their guidelines, due out in May 2009, will address:

- Approaches to establish the authority that allows the

Zoning offers user groups greater clarity on rights and a guarantee that those rights will be honored in the future.

For more information

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For links to more sources of information on ocean zoning: <http://depts.washington.edu/meam/COZ.htm>

How do you begin an ocean zoning process?


Bud Ehler and Fanny Douvere are developing guidelines for UNESCO on marine spatial planning and comprehensive ocean zoning. We asked them for tips on how to get started with an ocean zoning program. They suggested these three steps:

- **Make a “plan for planning” that can guide the allocation of available resources (people, money, information) within the time required.** This includes allocating appropriate amounts of time to key elements of the planning process: e.g., engaging stakeholders, identifying existing conflicts and compatibilities, developing alternative scenarios, identifying management measures, and preparing the plan. Developing a work plan should make the best use of available resources.
- **Plan to be adaptive.** It is a mistake to try to address every issue in the first round of planning. Use an open and inclusive stakeholder process to identify spatial management problems that are perceived as “real” and focus on them first. Demonstrate short-term benefits of MSP.
- **Focus on alternative future visions.** MSP is about creating a desired future, not simply documenting present conditions and extrapolating current trends.

development of marine spatial management in a participatory manner that integrates issues across sectors;

- Setting up planning and analysis for marine spatial management that allows proactive, future-oriented management of oceans and coasts;
- Types of research, data and information essential to conduct marine spatial management that addresses both important ecological and socio-economic concerns;
- Incentives, institutional arrangements, and other considerations for successful implementation of marine spatial management;

- Processes to conduct practical stakeholder involvement in the pre-planning, planning, implementation and evaluation phases of marine spatial management; and
- Methods for the adaptation of marine spatial management plans to changing circumstances, including climate change, new political priorities or economic conditions.

Stay tuned! 

The EBM Toolbox Tools for ocean zoning

Editor's note: The goal of The EBM Toolbox is to promote awareness of software tools for facilitating EBM processes, and to provide advice on using those tools effectively. It is brought to you by the EBM Tools Network (www.ebmtools.org), a voluntary alliance of leading tool users, developers, and training providers.

By Sarah Carr

To provide comprehensive decision support for ocean zoning, toolkits will need to help stakeholders to:

- Define their social, economic, and ecological objectives;
- Develop configurations of zones with diverse plans, policies, and regulations;
- Estimate the degree to which zoning configurations will meet defined objectives; and
- Monitor performance of implemented zones at meeting defined objectives.

Purpose-built tools for ocean zoning are just starting to emerge, and one such tool is Marxan with Zones. Marxan with Zones helps create alternative zoning configurations that maximize the achievement of social, economic, and ecological objectives while minimizing the total social, economic, and ecological cost. In Marxan with Zones, planning units can be allocated to a variety of zones including conservation zones with various protection levels and zones with other land and sea uses, such as fishing, mining, oil and natural gas exploration,

and agriculture. The software was developed by the University of Queensland in partnership with Ecotrust USA and is based on the popular Marxan conservation planning software. Marxan with Zones will be available in the near future. To be notified of its release, sign up for the Marxan mailing list at marxan-owner@sib.uq.edu.au. (For more information on Marxan in general, including a handbook and manual on the software, go to www.uq.edu.au/marxan.)

Another emerging analytical method that will be useful for ocean zoning focuses on mapping the cumulative impact of different suites of human activities on the ocean. With this type of analysis, the overall impact of all human activities on ocean condition can be assessed. Furthermore, particular activities can be included or excluded from consideration to determine what suite of activities can best meet objectives for a given zone. An article in the 15 February 2008 issue of *Science* (Halpern et al. "A Global Map of Human Impact on Marine Ecosystems") provides a global cumulative impact map. To download the publication free of charge and learn more about the method and data layers used in the published analysis, go to www.nceas.ucsb.edu/GlobalMarine.

(Sarah Carr is coordinator for the EBM Tools Network. Learn more about EBM tools and the EBM Tools Network at www.ebmtools.org. Sign up for Network updates and contact Sarah at www.ebmtools.org/contact.html.)

EBM Perspective: Ocean Zoning is Inevitable

By Elliott A. Norse

Until the 1990s, scientists and policy-makers generally perceived the sea as the Earth's bountiful "last frontier", so few people could understand the need for zoning. But what was so recently inconceivable has now become inevitable. Why? It is for the same reason that conservationists don't want to position marine reserves randomly...why fishermen know where fishing is most profitable...why wave power field and net pen operators have specific location criteria...and why oil companies willingly pay huge amounts to drill in some places but not in others. More powerful tools for scientific exploration and commercial exploitation have made it much easier to locate things people want in the sea. As a result, competition for space is intensifying, and that is increasingly affecting marine life and people's interests. The frontier days are over. We're running out of what we most care about in the ocean. This convergence of changing perception and changing need is why zoning is going to happen.

My oldest friend often reminds me that "Perception is reality." The way people perceive oceans determines how we govern and manage them. If we envision them as homogeneous and invulnerable, without meaningful spatial patterns of geology, oceanography, biology, socioeconomics and governance, and if we don't perceive that their diversity and productivity are at risk, zoning them seems unnecessary.

But if we see as marine scientists, boaters, tourists, fishermen, aquaculturists, petroleum geologists and wind farmers do — that the oceans are a complex mosaic of places, each a distinctive composite of natural processes and human activities — we realize that a "one-size-fits-all" placeless approach doesn't make sense. Moreover, if we acknowledge that ocean places are increasingly vulnerable to human impacts, as marine conservation experts do, it becomes clear that governing and managing them as we have done will not bring better results. Places matter.

As a marine biologist who began working in conservation 30 years ago, I think the question is not "Will nations adopt comprehensive zoning as the framework for marine ecosystem-based management?" It is, "Why and how will they do it?" Here I address *why*, recognizing that the latter will be crucial: the devil *is* in the details. Perhaps we can address *how* in the near future.

On land, realtors say that just three things affect the desirability of a parcel of real estate: location, location, and location. Can it be otherwise in the sea? Only if pat-

terns of primary production resulting from topography and currents do not affect where species feed and spawn. And only if cultural traditions and proximity to harbors and markets do not affect where people fish.

On land people "get" that different places have different values and use them accordingly. But the sea's fluid connections and resistance to human observation (98% of marine animal species live in, on, or immediately above the seafloor, which is mostly too deep for human visitors) leads people to think that the sea is homogeneous. It is not. Understanding these similarities and differences allows us to craft place-based governance and management that can actually work, ecologically and socioeconomically.

Smart observers rightly point out that the USA and other countries are already zoning their waters. Government agencies that oversee certain sectors grant them rights to use specific places in the sea for specific

purposes, such as oil drilling. But they are doing it piecemeal. Ignoring the interests of other sectors and of conservation fosters uncertainty, litigation and political strife. A sector-by-sector ocean "land rush" that yields piecemeal *de facto* zoning is hardly ecologically sound, economically efficient, or fair and wise governance. Comprehensive ecosystem-based zoning — a transparent, public

participatory, adaptive process for establishing ecological and socioeconomic objectives throughout a government's jurisdiction — is a far more workable way to govern what happens in the sea.

There is good economic reason to zone: zoning reduces intersectoral competition for ocean space by separating uses that are incompatible. I am told that China has adopted comprehensive ocean zoning to ensure that areas where water quality is still suitable for aquaculture are not given over to other competing uses. Other countries facing the loss of biodiversity and fisheries, such as the United States, have begun embracing the idea of ecosystem-based management without fully accepting that ecosystems are places, which means that conserving them requires zoning. The "sweet-spot" where these approaches overlap is ecosystem-based spatial planning and zoning to accommodate both ecological and socioeconomic objectives. It is the only "win-win" solution to our increasing demand for ocean space.

The path of wisdom is to accept the inevitable, especially when it offers the hope of resolving the problems we have made for ourselves. ■

Editor's note

Elliott Norse is president of Marine Conservation Biology Institute, a marine conservation NGO.

"A sector-by-sector ocean 'land rush' that yields piecemeal *de facto* zoning is hardly ecologically sound, economically efficient, or fair and wise governance."

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EBM Perspective: Correcting Misconceptions about Zoning – The Great Barrier Reef Example

Editor's note

Jon Day is director of conservation for the Great Barrier Reef Marine Park Authority (GBRMPA) in Australia.

By Jon Day

Most people associated with managing marine or coastal areas have heard of the Great Barrier Reef (GBR). Many also know that the GBR is an extremely large marine park and may even be aware that there are different zones that prohibit various activities in certain areas. There are, however, many misconceptions about the zoning scheme.

Zoning provides a spatial framework for managing use while providing differing levels of protection for different areas. In some parts of the world, zoning is based solely around allowing, or prohibiting, specific activities in specific areas. In the GBR the emphasis is on providing a spectrum of zones with differing objectives. The objectives and the provisions in the zoning plan then clarify what activities are appropriate in the zone.

There are seven zones: the General Use Zone allows the widest range of marine activities, and the Preservation Zone the fewest. Under each objective for each zone, the GBR Zoning Plan sets out in detail two specific lists of “use or entry” provisions: a list of activities that are allowed to occur in that zone without a permit, and a list of activities that may occur after a permit has been granted. If an activity is not on either list, then it is effectively prohibited. For communication with the wider public, the allowable activities in the Zoning Plan have been made into a simple activity/zoning matrix.

Contrary to popular belief, not all activities listed in the Zoning Plan can occur with a permit. For example, activities such as aquaculture or harvest fishing that may or may not have an impact MAY be permitted even in Habitat Protection Zones, but only after undergoing a detailed permit assessment process.

There is also a special “catch-all” permit provision in the GBR Zoning Plan (*“any other purpose consistent with the objective of the zone...”*) that provides for new technology or activities that were not known when the Zoning Plan was approved and which therefore are not in either of the above lists. In all zones an activity that is not specifically listed but is deemed to be consistent with the zone objective may be considered for a permit. This essential requirement (i.e., to be consistent with the zone objective) is an important first consideration whenever a permit application is considered for a particular zone. The *“any other purpose”* provision is an important “safety net” that has enabled new activities to be considered while maintaining the integrity of the overall zoning scheme.


Another misconception is that the Marine Park was zoned when implemented. The first zoning plans were progressively developed for parts of the Marine Park in the early 1980s, but it was not until 15 years after the Marine Park was declared (i.e., 1988) that the entire area was zoned. From 1988 until mid 2004, less than 5% of the entire GBR was zoned in highly protected “no-take” zones.

The Representative Areas Program did rezone the entire Marine Park during a single comprehensive planning process, and today one-third of the GBR (i.e., 117,000 km²) is now highly protected. An additional one-third is protected from activities that would impact the benthic habitat (including Habitat Protection Zones, Conservation Park Zones, and Buffer Zones).

While zoning is a key management instrument for the conservation and management over the entire area (344,400 km²), another misconception concerns the role that zoning plays in the GBR Marine Park. Zoning does provide a spatial basis for determining where many activities can occur, but zoning is only one of many spatial management tools used in the GBR. Some of the other management tools or strategies applied in the GBR Marine Park include:

- Permits;
- Statutory “plans of management”;
- Site plans/special management areas;
- Other spatial restrictions (e.g., defense training areas, shipping areas, agreements with traditional owners);
- Best environmental practices/codes of practice; and
- Partnerships with industry.

A final misconception is that zoning and hence management of the GBR is confined to just the “wet bits” in the Marine Park. Legislative controls apply equally to the airspace above the Marine Park (up to 3000 feet) as well as into the seabed; and in November 2004, the State of Queensland “mirrored” the Commonwealth zoning in most of the adjoining State waters, so there is now complementary zoning for virtually all the State and Commonwealth waters within the entire GBR World Heritage Area.

For more information on the GBR zoning system, including history of the zoning program and maps, go to www.gbrmpa.gov.au/corp_site/management/zoning. 

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Case Study: Creating a Zoning Plan for Belgium's North Sea, With Lessons from Land-Based Zoning

Belgium's relatively small ocean area, totaling 3600 km², is under great pressure, being centrally located in one of the most heavily exploited marine areas in the world. The many uses of marine resources and space in this patch of the North Sea, the increasing user conflicts, and the emergence of new uses has required a move away from what was previously an ad hoc approach to managing the marine environment. The new direction is a forward-looking strategy using marine spatial planning (MSP).

"Belgium has done some pioneering work on MSP in previous years," says Fanny Douvere, a consultant on UNESCO's MSP program. "It is one of the first countries that implemented a multiple-objective marine spatial plan, long before MSP was even on the European/international agenda." In 2002, a federal minister was appointed to manage the Belgian Part of the North Sea (BPNS), and shortly thereafter a master plan for the BPNS was set. Although there remains no technical basis for marine spatial planning in Belgian law, the first two phases of the master plan are now operational. The plan addresses the core issues of developing offshore wind production, designating marine protected areas, accounting for sand and gravel extraction, and other factors. The figure below illustrates the plan's spatial delimitations for such purposes.

Douvere says Belgium is also noteworthy for its anticipatory approach to new uses of the sea and seabed. She cites work done in the context of the GAUFRE project, whose name is a Dutch acronym for "Toward a Spatial Structure Plan for Sustainable Management of the North Sea". Involving multiple research teams at the University of Ghent, the two-year GAUFRE project (2003-2004) developed alternative scenarios for future use of ocean space. "This is in contrast to most other ocean zoning efforts (academic or otherwise), which normally concentrate on what exists today, not where we are going, or want to go, in the future," she says. GAUFRE's scenarios have informed the ongoing planning process for the BPNS.

Zoning in Belgium presents an example of how COZ could proceed in other marine areas with a high degree of use and heavy congestion of users. However, Belgium's zoning process is somewhat unusual, since it grew organically out of the country's long-enshrined land-use planning. A key component of Belgium's land zoning has been what the country calls "biological valuation", in which all land areas are assessed for their intrinsic biodiversity value.

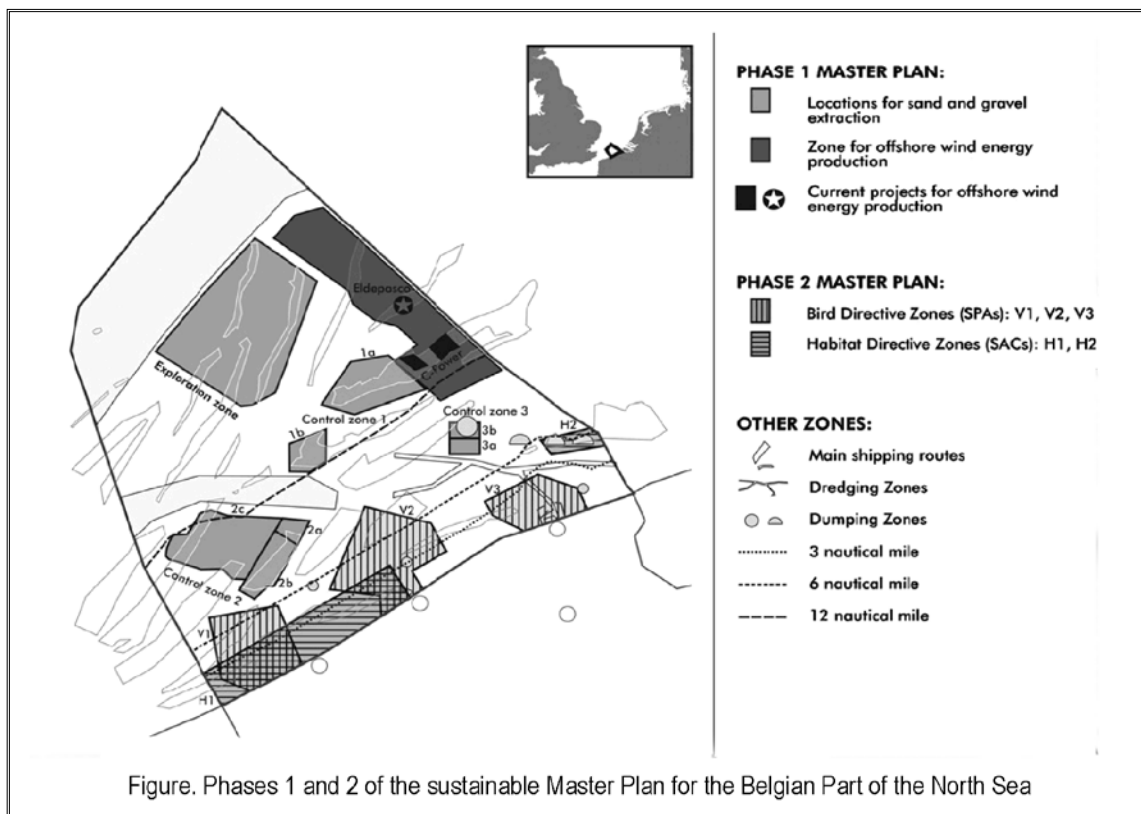
GAUFRE undertook similar biological valuations for Belgium's small marine territory. For a description of the criteria used to evaluate the relative importance of

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different marine areas and habitats, see http://corpi.ku.lt/pdf/concept_for_biological_valuation.pdf. For examples of the maps that resulted from such valuations, see www.encora.eu/coastalwiki/Marine_biological_valuation_maps_-_an_example_from_Belgium.

Because GAUFRE's marine biological valuations were performed and published after Belgium's ocean zoning began in 2002, the valuation maps have not been used to full effect in the country's zoning work. Nevertheless, marine managers and ecologists see the potential for biological valuation maps to support future marine spatial planning. Steven Degraer of the Royal Belgian Institute of Natural Sciences, who participated in GAUFRE, is confident the valuation maps will be used. "There is definitely some government interest," he says, "but I think (and understand) that people still feel unsure about how to implement our results." This key step in moving from developing scenarios (as was done by the GAUFRE project) to developing and implementing zoning maps must rely on good information on which areas or habitats are most important to protect.

The GAUFRE website (www.maritieminstituut.be/main.cgi?s_id=158) includes the project's final report, featuring structural maps that describe various scenarios for Belgium's ocean territory. GAUFRE leader Frank Maes of the University of Ghent says the structural maps the project developed were dynamic and explained a vision. "They are not detailed and cannot be used as a legal basis for zoning activities at sea," he says. "Rather, they are used as guiding maps for future actual zonation or reallocation of existing activities, as far as the latter is possible. The bases for the structural maps are values and principles of sustainable development, trying to merge economic, social and ecological parameters."

Maes says the maps are used in stakeholder participation aimed at developing consensus on zoning regulations. "The challenge in the future," says Maes, "will be to do this exercise in a transboundary context — e.g., structural maps for the whole North Sea. This includes stakeholder and public participation processes in all eight North Sea countries. And that's very difficult." **M**

The status of spatial management in New Zealand?

When New Zealand began developing a national oceans policy a decade ago, marine policy-makers there and elsewhere anticipated the country might enact the world's first national-level comprehensive ocean plan in its attempt to achieve EBM. However, according to Cath Wallace, senior lecturer in economics and public policy at Victoria University of Wellington, and Barry Weeber of Weeber Consultants, "The rhetoric of ecosystem-based management is used but not practiced in New Zealand." They say marine zoning is provided for in New Zealand's environmental management in its territorial sea (to 12 nautical miles), but is primarily used to provide for and control aquaculture. The nation has still not completed its oceans policy.

"In the exclusive economic zone (EEZ), New Zealand's environmental management is patchy, so mining and many other activities lack environmental controls," say Wallace and Weeber. "Law in development for the EEZ may include zoning and some degree of ecosystem-based management, but further marine protected areas are blocked until 2013."

They continue, "In practice, proposals for marine reserves, spatial management, and controls on fishing encounter vigorous opposition from commer-

cial fishing interests and their allies. The property rights, held in individual transferable quotas (ITQs), empower opposition to conservation measures and have made the politics of spatial management and protection much more difficult. For the most part, spatially based management has been neglected in favor of stock management within quota areas." Exceptions, they note, include aquaculture areas, small local areas of Maori customary management, and a broad network of Benthic Protection Areas criticized by conservationists as primarily involving unfishable, low-biodiversity areas. (See the November 2007 issue of *MPA News* for a description of the network, at <http://depts.washington.edu/mpanews/MPA91.htm>.)

The limited use of zoning mechanisms has been ad hoc, say Wallace and Weeber. "However, the proposed EEZ regulations, which are a cut-down version of the original Oceans Policy, may indeed introduce ecosystem-based management and zoning," they say. "We can only wait to see." **M**

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In our next issue: EBM vs. EBFM

The next issue of MEAM will explore the similarities and differences between ecosystem-based management (EBM) and ecosystem-based fisheries management (EBFM), as well as the tools used for each.

Do you have examples of ecosystem-based fisheries management in practice, including successes or failures? If so, please let us know about them at editor@meam.net. Thank you — we look forward to hearing from you.