Integrated Marine Spatial Planning in U.S. Waters: The Path Forward

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for the Marine Conservation Initiative of the Gordon and Betty Moore Foundation

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SUMMARY

This paper, prepared for the Gordon and Betty Moore Foundation’s Marine Conservation Initiative, explores the concept of integrated marine spatial planning (i-MSP) as a technique for managing diverse ocean uses in a comprehensive and sustainable way. The paper is based on a review of relevant, recent literature (on i-MSP and similar concepts and on land use planning and public lands management), discussions with a wide range of ocean stakeholders and thirty confidential hour-long interviews conducted with ocean managers, ocean user representatives, and conservation experts.

The strengths and weaknesses of i-MSP are examined, both in theory and as practiced in a handful of places around the world. The paper then looks at a century of U.S. experience with urban land-use planning and public lands management to see what has been learned about reconciling economic development, social well-being, and ecosystem conservation on land and draw lessons that might be applicable to ocean management. Several options for implementing i-MSP in U.S. waters are analyzed, with comments about their merits and drawbacks.

The author concludes that marine spatial planning is a promising approach for achieving improved economic and environmental results when compared to existing ocean management. Suggestions are made for advancing i-MSP in the U.S. through legislative, regulatory, and executive channels at state and federal levels. Experience on land indicates that managers will need to create open and inclusive planning processes to ensure acceptance of the resulting plans.

To bring a broad range of perspectives to the table and forge consensus, advocates of i-MSP will need to educate ocean stakeholders about the concept of marine planning, inform them about experiences in U.S. state waters and countries around the world, and show them how i-MSP can help them achieve their ocean objectives while minimizing conflicts with other ocean users.
I. Background

A. Introduction to Integrated Marine Spatial Planning (i-MSP)

For centuries, people thought of the ocean as a vast and somewhat mysterious expanse. As governments began to focus on its riches in the last century, they looked to the ocean as an exciting new frontier for harvesting food, extracting mineral and energy resources, and promoting other forms of economic development. Ocean resource managers were tasked with encouraging and guiding this development. Then, over roughly the last two decades, hundreds of academic studies, a barrage of media accounts, and two high-level Commission reports documented disturbing declines in ocean health and in the ability of oceans to provide critical “ecosystem services,” such as storm protection, freshwater regulation, waste processing, and more (Field et al, 2002; Pauly, 1998; Worm et al, 2006; Millennium Ecosystem Assessment, 2005; Pew Oceans Commission, 2003; U.S. Commission on Ocean Policy, 2004). These reports also diagnosed many of the causes for these declines: the direct impacts of economic activities on land and at sea (such as intense coastal development, unsustainable resource extraction, crowded and conflicting ocean uses, pollution, changes in ocean temperature and chemistry, etc.) as well as failures of the ocean management system itself (including uncoordinated and sector-based management, limited understanding of ecosystem functioning, too many disconnected laws and agencies, etc.). The phenomenon of global climate change has added a whole new level of concern about potential human impacts on ocean ecosystems.

The solution commonly proposed by those who have studied these problems is to adopt a more integrated, systems approach, as embodied in the concepts of Integrated Coastal Zone Management (ICZM), a term coined in 1992 during the Earth Summit in Rio de Janeiro, and later Ecosystem-Based Management (EBM). Unfortunately there is continued confusion about what constitutes “true” EBM and how to translate it into management actions in ocean waters. One recent study (Arkema et al, 2006) distilled 18 different scientific definitions of EBM into a common set of distinguishing features. The authors then analyzed recent management plans at a number of ocean and coastal sites and found that the objectives being pursued were only loosely tied to the important features of EBM. Clearly there is much work to be done in translating integrative concepts into practice.

While this discussion continues, population growth and engineering advances are leading to increased demands on ocean space. Rising energy prices and concerns about climate change have led to a recent surge in proposals to develop renewable energy sources offshore; declining populations of fish and seafood species have spurred the development of large-scale ocean aquaculture; storm impacts, exacerbated by rising sea-level, create a demand for new sources of sand to replenish beaches. We are on the brink of a more crowded ocean and actions over the next few years will determine how well that growth is managed. A small but expanding community of academics and practitioners has been developing the concept of comprehensive, spatially-explicit ocean and coastal management as a practical way to implement integrated management, or EBM, and to plan proactively for the 21st century ocean.
Conveying complex concepts in accessible, consistent terminology has been a challenge in coalescing this growing movement. Box 1 describes some of the different terms that have been adopted over time, with an attempt to parse the nuances in their meaning and use. Preliminary market research sponsored by SeaWeb has attempted to determine which terms resonate most effectively with the public, but the results have so far been inconclusive. In this paper, the term integrated marine spatial planning (i-MSP) is used because it stresses three critical attributes: integration of all potential ocean uses, including conservation; spatial allocation for activities within a defined area; and the need to engage managers and interested stakeholders in a forward-looking planning exercise to guide subsequent actions. But i-MSP does not end with a plan--the subsequent phases of implementation, management, and monitoring must also be part of any i-MSP effort.

B. Purpose of this report

The Gordon & Betty Moore Foundation’s (GBMF) Marine Conservation Initiative aims to “establish resilient and productive coastal marine ecosystems, managed sustainably for current and future generations, using comprehensive area-based management and improved fisheries management ...” Over the last few years, GBMF staff have explored the issue of area-based management through the academic literature and by speaking with its practitioners, resulting in multi-year investments to advance this topic. These grants have supported implementation efforts at state and regional levels in North America as well as research and policy development. The purpose of this report is to assist GBMF staff in better understanding the theory, practice, and future of i-MSP and to suggest ways that GBMF might be able to further advance this ocean management strategy throughout U.S. waters.

The Moore Foundation specifically asked that this study: “…examin[e] the potential benefits and drawbacks of using area-based management (ABM), and specifically ocean zoning, as a tool to protect and restore resilient and productive marine ecosystems while increasing user certainty and reducing conflicts. The [paper] will identify key opportunities and obstacles in implementing ABM in the United States, drawing on case studies and lessons learned in the U.S., Canada, and other countries. The […] paper will not only articulate the concept of ABM, but move to the next level by providing concrete evidence that demonstrates whether, and if so in what ways, this management structure is preferable and how it might be implemented in the United States.”
Box 1  What to Call It?

There is a growing consensus that we must find a way to overcome the historically uncoordinated, sector-based system of ocean and coastal management, an approach that has allowed continued degradation of the oceans and disruption of ecosystem services. Deciding how to accomplish that, and what exactly to call the new approach, has been a challenge. Below are a number of concepts and terms that have been introduced, with some hints at the nuances in their meanings and use.

Integrated Coastal Zone Management (ICZM)
Coined during the 1992 Earth Summit in Rio de Janeiro, ICZM describes an adaptive, integrated approach for achieving sustainable resource management in coastal areas (UNCED, 1993). The European Commission (EC) describes ICZM as a dynamic, multi-disciplinary and iterative process to promote sustainable management of coastal zones that seeks to balance economic development and use of the coastal region, protection and preservation of coastal areas, minimization of loss of human life and property, and public access to the coastal zone (Recommendation 413/2002/EC of the European Parliament and Council). The EC encourages all its member states to practice ICZM.

Ecosystem-Based Management (EBM)
EBM aims to protect ecosystem structure, functioning, and processes; recognize the inter-connectedness within and among systems; integrate ecological, social, economic, and institutional perspectives; and be place-based or area-based (from McLeod et al, 2005). Some authors refer more generically to ecosystem approaches to management or more narrowly to specific applications such as ecosystem-based fisheries management, but neither of these captures the full value of EBM. The term is widely embraced in the scientific community and many people believe EBM is practical and sufficiently well-defined to be implemented now (Murawski, 2007). Others complain that it is too vague to help managers carry out their day-to-day responsibilities and not readily understood by the public.

Regional Ocean Governance
The concept of Regional Ocean Governance was embraced by both recent ocean commissions. As described on the Joint Ocean Commission Initiative website, “regional ocean governance refers to a governance mechanism established by a coalition of state governments, with participation by the federal government, to address ocean and coastal issues that cross political boundaries. While state and federal governments need to play a strong leadership role, regional ocean governance initiatives must engage participation by the full spectrum of governmental and nongovernmental stakeholders in the region.” (www.jointoceancommission.org) Regional governance embraces the principles of EBM, but focuses on the importance of cooperation between adjacent states and corresponding federal authorities to bring it about.

Marine Spatial Planning (MSP)
MSP is a process for analyzing and allocating ocean space for multiple uses in order to achieve specified ecological, economic, and social objectives (IOC, 2007). A stakeholder-driven MSP process results in a comprehensive plan for a marine region. Advocates of MSP, a term widely adopted in Europe, see it as a real-world solution that embodies the principles of EBM. Some scientists think MSP fails to capture the full complexity of true EBM, while some U.S. coastal managers have expressed concern that the term implies some form of centralized control. Unfortunately, this concept’s significance has been diluted by those who use the term to describe any form of spatial management, even when it is focused on a single sector. (For example, papers about siting MPA networks and creating closed areas for fishing were included in a recent conference session on marine spatial planning.)

Integrated Maritime Spatial Planning
A term officially adopted by the European Union in its Blue Book on Maritime Policy (Commission of the European Communities, 2007), it combines Marine Spatial Planning with the older concept of Integrated Coastal Zone Management to deliver a spatial planning approach that includes onshore, nearshore, and offshore areas.

Ocean Zoning
Similar to the distinction on land between comprehensive planning and zoning, ocean zoning takes a marine spatial plan to the next step by creating a zoning map for a marine region, with areas allocated for different uses and corresponding regulations for each use or area. For many years, advocates in the U.S. have been warned to avoid “the Z word,” on the premise that some people would associate it with top-down, bureaucratic, centralized planning. Although some managers repeated this fear in interviews for this report, others thought the public held generally positive views about the value of planning and zoning based on their local, land-based experiences.

Area-Based Management (ABM), Integrated Management (IM), Integrated Multiple Use Ocean Management (IMUOM), Integrated Marine Spatial Planning (i-MSP)
This is just a sampling of alternate coinages, in use in different regions or by different writers. These terms generally incorporate some combination of MSP and OZ, with the goal of achieving EBM. The proliferation of terms is evidence of the ongoing effort to find more descriptive and accessible language for a powerful new concept.
C. Methodology

This paper is based on two types of research: an extensive review of relevant, recent literature (on i-MSP and similar concepts, and on land use planning and public lands management; see Bibliography) and a series of confidential, one-on-one interviews, conducted in-person or by telephone, with a selection of ocean stakeholders including academics, NGOs, state and federal managers, and representatives of the major ocean industry sectors. Each interview lasted approximately one hour and drew from a common set of questions. Because the interviewees were so varied, with very different backgrounds and levels of familiarity with ocean policy, a strict script was not used. Rather, the conversation was allowed to flow naturally while covering as many core questions as possible.

II. The Strengths and Weaknesses of i-MSP

A. What is i-MSP all about?

Historically, people viewed the ocean as a vast expanse that could supply human needs, absorb human wastes, and accommodate human uses without limits. It was treated as a classic commons, with little, if any, centralized control. Gradually, coastal nations exerted increased sovereignty over ocean areas, mainly to assert ownership of resources and to oversee the primary activities of fishing, navigation, and military use. Over the last century, the kinds of activities taking place in ocean waters, and resultant claims on ocean space, have exploded (see Boxes 2 and 3).

In a series of interviews conducted by the Marine Conservation Biology Institute (MCBI) in 2006, federal agency staff reported significant conflicts between ocean users and foresaw more conflicts arising due to continued migration toward the coasts and new technologies. In my interviews, as in MCBI’s, spatial conflicts were perceived as being particularly keen among ocean energy, aquaculture, and fishing, and between all of these and the designation of marine protected areas (MPAs). More subtly, marine scientists are beginning to realize that uncontrolled ocean uses also conflict with the ocean’s ability to supply certain irreplaceable “ecosystem services” such as storm protection, freshwater regulation, waste processing, flood control, nutrient cycling, erosion control, climate regulation, and disease control.

<table>
<thead>
<tr>
<th>Box 2 Common Uses of Ocean Space</th>
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<tbody>
<tr>
<td>Commercial fishing</td>
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<tr>
<td>Aquaculture</td>
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<tr>
<td>Shipping</td>
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<tr>
<td>Oil &amp; gas production</td>
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<td>Renewable energy production</td>
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<tr>
<td>Sand and gravel mining</td>
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<tr>
<td>Dredging and dredged material disposal</td>
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<tr>
<td>Artificial islands for offshore use</td>
</tr>
<tr>
<td>Pipelines, cables, transmission lines</td>
</tr>
<tr>
<td>Bio-prospecting (for pharmaceuticals and other applications)</td>
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<tr>
<td>Water supply through desalinization</td>
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<tr>
<td>Military training and deployment</td>
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<tr>
<td>Recreational fishing</td>
</tr>
<tr>
<td>Shore based recreation</td>
</tr>
<tr>
<td>Recreational boating and cruise ships</td>
</tr>
<tr>
<td>Scientific research</td>
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<tr>
<td>Ocean observations (for research and applications)</td>
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<tr>
<td>Ecosystem conservation (through MPAs and reserves)</td>
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<tr>
<td>Cultural and historic preservation (e.g., shipwrecks and other submerged artifacts)</td>
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</tbody>
</table>

(adapted from Visions for a Sea Change, 2007)
As each new activity developed, some system of oversight was put in place, although the tenor of that oversight—from fairly strict controls to explicit cheerleading—has varied between uses and over time. The last fifty years have seen a shift from U.S. policies that actively promoted resource use (see the report of the Commission on Marine Science, Engineering and Resources, 1969) toward a focus on environmental protection and long-term sustainability (U.S. Commission on Ocean Policy, 2004). The end result of this evolution in ocean management is a tangle of uncoordinated, inconsistent laws overseen by dozens of different government agencies with conflicting mandates. The fundamental recommendation from both recent ocean commissions was for more efficient, integrated, ecosystem-based management of the nation’s ocean space.

A number of proposals have been made for achieving this integration. The Joint Ocean Commission Initiative (JOCI), which includes members of the recent Pew Oceans Commission and U.S. Commission on Ocean Policy, is advancing the creation of broadly constituted, multi-stakeholder, multi-issue Regional Ocean Councils. A number of environmental NGOs are promoting new federal legislation (introduced to Congress in 2007 and 2008 as HR21) which would enshrine the concept of ecosystem-based management as national policy. But an eclectic mix of academics, managers, and politicians around the world have been exploring the possibilities of pursuing i-MSP, including explicit ocean zoning, as a concrete, practical way to coordinate expanding ocean activities.

Specifically, the purposes of i-MSP are:

- to provide a strategic, integrated and forward-looking framework for all uses of the ocean to help achieve sustainable development, taking into account environmental, social, and economic objectives;
- to apply an ecosystem approach to the regulation and management of activities in the marine environment that safeguards ecological processes and overall resilience to ensure the environment has the capacity to provide and support social and economic benefits;
- to allocate space in a rational manner which achieves stated objectives, avoids or minimizes conflicts and, where possible, maximizes synergy between sectors;
- to identify, safeguard, recover or restore important components of coastal and marine ecosystems including natural heritage and nature conservation resources. (adapted from English Nature, 2006)

The practice of i-MSP involves analyzing the physical and ecological attributes and the human uses within a defined marine region and then allocating space to different uses in a way that achieves agreed upon ecological, economic, and social objectives. Similar to the practice of land use planning, i-MSP typically results in a comprehensive plan for an ocean region that can then be implemented by creating a zoning map, issuing regulations for each zone and activity, and ensuring a system of monitoring and enforcement (IOC, 2007).
Interest in i-MSP has accelerated over the last few years, due in part to the arrival of new members of the ocean family vying for space. Two of the most visible, and potentially valuable, new participants are discussed below.

(a) Ocean-based Renewable Energy

Background The ever-moving oceans, and the winds above them, represent huge reservoirs of energy. In recent years, engineers have discovered innovative ways to extract this energy via increasingly efficient and robust technologies. One industry enthusiast estimated that the power that could be extracted from the Gulf Stream off Florida's coast alone would be sufficient to supply all of that state’s energy needs. At the same time, global climate change and rising oil prices have increased the urgency of finding new, carbon-free energy sources. The result is a surge of interest in ocean energy projects.

So far, three federal agencies have some role in the development of this new energy source: (1) Congress granted the Minerals Management Service (MMS) authority to regulate renewables on the Outer Continental Shelf (outside state waters, typically beyond 3 miles from shore), building on that agency's historic oversight of offshore oil and gas; (2) the Federal Energy Regulatory Commission (FERC) has asserted authority over wave and tidal energy in the Territorial Sea (i.e., within 12 miles from the shore) as an extension of their responsibility to regulate hydrokinetic energy projects (hydropower dams) on land; and (3) the Department of Energy (DOE), after a long hiatus, is investing new money in technology development and assessment for ocean-based renewables. (Note that there is a troublesome overlap in the MMS and FERC programs, namely authority over wave power in the area from 3 – 12 miles from shore.) Within state waters, many additional agencies may have roles to play.

Issues Virtually everyone seems to agree that safe, ecologically sensitive expansion of offshore renewable energy would be a good thing for the economy, the global environment, and perhaps even national security. But there are a number of challenges to overcome. The technical challenges involved in constructing and maintaining large, moving structures in the harsh, salty ocean environment are well-defined and probably surmountable—the industry, with support from DOE, is making excellent progress. Local environmental and aesthetic concerns will obviously need to be addressed. But administrative and management uncertainties may prove to be some of the trickiest problems to resolve.

In different ways, both MMS and FERC are having a hard time breaking out of their historical roles and perspectives. MMS is basing its program to a large extent on the one it created for offshore oil and gas. But the renewables industry is not nearly as experienced, well-financed, well-understood, or mature as oil and gas. They may need different approaches, with more built-in adaptability, to get started. Meanwhile FERC is treating ocean wave devices as analogs to hydropower dams since both harness the power of moving water. But the technologies involved, and the settings in which they operate, actually have little in common. (The interviews revealed widespread complaints about FERC’s approach being “premature,” “confusing,” not transparent or inclusive, “inflexible,” and was told that “FERC doesn’t seem to understand the concept of coastal planning and management” or to accept the preeminent role of states in coastal waters. Fewer complaints were leveled at MMS, but their draft regulations had not yet been issued so people may have been reserving judgment.)

Furthermore, although both agencies understand the need to assess the potential negative impacts of proposed renewable energy facilities (such as collisions, ecosystem disruption, noise, direct injury to animals, etc.), neither is looking beyond specific permit applications to consider how renewable energy fits in with all the other potential uses in an area, or to assess the “opportunity cost” of allowing a semi-permanent structure to be built without considering other possible uses of that site that may have higher economic or social value.

From the perspective of industry proponents and investors, there is still a high level of uncertainty along the path toward commercialization. Before investing large amounts of money in advanced technology development and environmental assessments, they want to feel confident that ocean space will be available to them, at a known cost, under a stable regulatory regime. Based on my interviews, this industry includes a mix of “true believers,” who feel that ocean renewables are akin to a public service, and more hard-nosed investors who are intrigued by a potentially lucrative business opportunity. In both cases they are looking to Congress and the states for direct subsidies, favorable tax treatment, and help in streamlining the regulatory process, all of which have been tried in European countries over the last decade.

What’s next? There will undoubtedly be continued action on ocean renewables in Congress, through federal and state agencies, and within the private sector. But can the leaders in each of these venues be persuaded to think about offshore energy in the broader context of i-MSP? As mentioned above, Congress will need to clarify the overlap of FERC and MMS authorities in the 3-12 mile zone. That provides an opportunity to direct the agencies to look at how their programs relate to offshore management of other uses. The industry representatives I spoke with believed there could be value in multi-user, multi-agency dialogues about offshore use, as long as they are clearly focused on “finding compromises and solving problems, not intellectual debate!” Revision of the draft regulations at MMS and ongoing permit reviews at FERC provide additional venues to get a broader variety of ocean users involved.

One suggestion put forward by several observers is to establish a few “test sites,” linked by transmission lines to land,
where a variety of renewable energy companies could conduct operational-scale technological and environmental assessments at lower cost and with less administrative hassle than needed to obtain an actual permit. This would give everyone time to learn more before committing to expensive structures in specific places.

**Box 3 (b) Offshore Aquaculture**

**Background**  With growing international demand for fish and seafood products, accompanied by declines in many wild fish stocks, ocean aquaculture (sometimes referred to as mariculture) has been a growth industry for some time, primarily in Europe and Asia. Initially, facilities were located in coastal and nearshore waters, at sites with protection from waves and storms. This has led to a number of problems including conflicts with other coastal users, water pollution, competition with native species, and destruction of sensitive coastal ecosystems. New technologies are allowing fish pens to be constructed in deeper waters further from shore. This may reduce some of the ecosystem impacts, although it does not eliminate conflicts over space. Even if all the engineering and environmental concerns were addressed, the U.S. regulatory regime remains unclear, with MMS possibly having authority through the Energy Act, the Regional Fisheries Management Councils asserting their interest, and NOAA’s relatively new Office of Aquaculture acting more as a cheerleader than a regulator. (A recent report from that office is entitled “Why the U.S. Should Embrace Aquaculture” and calls for regulations that “encourage … investment in aquaculture.”)

Individuals who have struggled to establish viable aquaculture operations were eager to share stories about their years of struggle and setbacks, from experimenting with different species, to reassuring anxious investors, winning over local communities and officials, navigating multiple permit agencies, struggling with engineering failures, and finding the right markets for their products.

**Issues**  Many of the broad concerns raised about offshore aquaculture are similar to those discussed above in the context of offshore renewables: technical challenges, environmental impacts, and management confusion. Environmental advocates are pushing for strict controls and monitoring of any outflow from the fish pens, including excess feeds, waste products, chemicals, or escaped fish. They have also called for strict liability provisions in case problems arise down the road—a deal-breaker for most investors.

Potential investors are generally feeling skittish about the level of regulatory uncertainty in this country. As one venture capitalist said, “International proposals are more feasible.” The permitting process in the U.S. is “unclear, with multiple authorities and unpredictable timelines.” “It’s hard to get permits for the kind of large scale operations necessary to reach profitability.” A good argument can be made that the Regional Council system established to manage wild fisheries is not appropriate for the aquaculture industry: the nature of the participants involved and the activities themselves have little in common. Some aquaculture proponents believe they would be better off within the USDA, since aquaculture more closely resembles the raising and harvesting of livestock than the pursuit of wild stocks. However, introducing a new agency with entirely different traditions and practices into the ocean scene might make it even more difficult to achieve cross-sector coordination. Ironically, one aquaculturist commented that NOAA’s new Aquaculture Office may have been too explicitly pro-aquaculture, leading to mistrust among NGOs and a very polarized debate.

None of the people I spoke with, no matter their perspective on the merits of offshore aquaculture, seemed to have thought about the broader multiple-use issues involved in allocating ocean space. As one enthusiastic promoter said, “Oh, there’s lots of space out there!”

**What’s next?**  Offshore aquaculture will almost certainly continue to grow in response to demand. In fact, the potential for seaweed and other marine vegetation to serve as feedstocks for biofuels may provide a whole new angle for the industry. Some progress has been made in bringing ENGOs and responsible industry representatives together to share perspectives and begin to discuss mutually acceptable standards. The Ocean Stewards Institute was created as a trade group for growers, suppliers, equipment manufacturers, and others who want to promote a robust, sustainable, offshore aquaculture industry. One of their goals is to create widely accepted MSC-style certification standards for farmed fish.

The aquaculture legislation introduced repeatedly by the Bush administration was not widely embraced, so a new Congress and White House will have the ability to start fresh. Now is an excellent time to get all parties educated and thinking about how aquaculture will fit into the wider community of ocean users and how i-MSP can help.

Although different stages of the process may gain greater emphasis in different locations, at its best i-MSP includes everything from setting high-level policy goals, issuing guidance documents for planners, conducting spatial assessments of the ecosystem and human uses, engaging stakeholders, creating plans based on scenario analyses and negotiation, drawing detailed maps with assignments of zones (whether single or multiple use, optional or mandatory), issuing regulations, and then following up with appropriate monitoring and enforcement. Each step in the process is valuable in its own right, as well
as contributing to a desirable end result, as discussed in the next section. Virtually every advocate for i-MSP also includes evaluation and adaptation as critical elements to ensure that plans perform as desired and make appropriate modifications when they do not. (However, see Box 6 for a discussion of the challenges associated with making i-MSP adaptive).

Because ocean activities vary widely in their spatial characteristics, several types of zones can be created. Some ocean uses, such as the preservation of a historic shipwreck or protection of a unique habitat, are confined to very specific areas. For other activities, such as wind energy, oil and gas extraction, and certain fisheries, the resource is more widespread and offers some flexibility in spatial allocations. Finally there are activities, such as navigation, recreational boating, and certain open ocean fisheries, that are not inextricably tied to specific locations, although participants in these sectors may still express strong spatial preferences. It is also important to remember that global climate change is likely to have profound impacts on the spatial distribution of all ocean features in decades to come.

While many people view i-MSP with some apprehension, seeing it as a significant departure from previous practice, it is important to note that many “zones” have already been created over time in the ocean (see Box 4). However, because each one was created with a single problem or sector in mind, they fail to add up to a coherent plan or advance higher level objectives.

There are a handful of countries where i-MSP is already being actively pursued, notably Belgium, the Netherlands, Canada, Germany, Australia, and China. A report on priorities within New Zealand’s 200-mile EEZ (New Zealand Ministry for the Environment, 2001) laid the foundation for comprehensive zoning of that nation’s waters, although development of an Oceans Policy was recently put on hold by their government. The United Kingdom is exploring marine planning legislation but efforts there have also been slowed by national political changes. The European Union is attempting to merge and build on the experiences of its member nations, realizing that national borders rarely match up with ecosystem boundaries. For example, marine management plans are being created separately in Belgium, the Netherlands, and Germany, although the ecosystems that constitute these nations’ waters recognize no national authorities. In theory, an MPA designated in one EU member country’s waters could directly adjoin another country’s industrial zone. A range of international i-MSP programs is being documented and

### Box 4 Examples of Existing Ocean Zones

- Vessel traffic routes, separation zones, and precautionary zones
- Anchoring and no-anchoring areas
- Security zones in ports and waterways
- Oil & gas lease or concession areas
- Wind or wave energy lease or concession areas
- Military operation or training zones
- Sand and gravel extraction areas
- Dredging sites
- Dredged material dumping zones
- Pipeline rights-of-way
- Submerged communications cable and transmission line rights-of-way
- Fishery closure or no-trawl areas (permanent or seasonal)
- Critical habitat designations
- Marine protected areas and reserves
- Protected historic or archeological sites
- Scientific reference sites

(adapted from Visions for a Sea Change, 2007)
analyzed through UNESCO’s marine spatial planning effort (see www.unesco-ioc-marinesp.be).

Australia has often been thought of as a leader in marine planning because of its creation and management of the Great Barrier Reef Marine Park (GBRMP). Although the GBRMP is a huge accomplishment, the underlying process was actually quite different from the i-MSP model since its stated purpose was to establish a large protected area, with multiple use zones as practical compromises rather than goals in themselves. A separate process is underway now in several regions of Australia to do genuine i-MSP, building on the experience gained and stakeholder relationships built during development of the GBRMP.

To convey a sense of the practical realities behind i-MSP, and the real world challenges that can arise, Box 5 describes a recent exercise in marine planning on Canada’s Eastern Scotian Shelf in greater detail.

B. Advantages of i-MSP

Because i-MSP is a concept still in the earliest stages of implementation in relatively few places, there is not yet any quantitative documentation of its value, as measured by specific, pre-determined performance benchmarks. Nevertheless, a number of experienced scientists, managers, and policy experts have analyzed the process and goals of i-MSP, compared it to existing management approaches, and identified a number of i-MSP’s best features (e.g., English Nature, 2006; GHK Consulting, 2004; IOC, 2007; Norse, 2005).

Of course, the perceived value of any policy proposal depends on the values of the individual doing the assessment. The literature reviewed and stakeholder interviews conducted as background for this paper illustrate this very clearly. When i-MSP is perceived as a mechanism for siting new ocean uses, business people get excited and environmental NGOs get nervous. But when i-MSP is seen as tilting toward the creation of MPAs and closure of large areas of the ocean, many users balk while environmental groups smile. To realize the potential benefits of i-MSP and create workable plans, these perspectives must be balanced and solutions must be proposed that meet the needs of all parties, even if they do not satisfy everyone’s deepest wishes. The multiple objectives of i-MSP (as discussed in the previous section) must be acknowledged and all stakeholders must be taken seriously during the planning process.

The benefits associated with i-MSP can be grouped into three categories: (i) benefits of the planning process itself, (ii) tangible economic and social gains, and (iii) environmental improvements. In addition, Box 6 discusses the issue of adaptive management and explains how it can be seen as either an advantage or disadvantage for i-MSP.
Box 5 ESSIM: Rich Process, Uncertain Results

The Strategic Plan for Canada’s Eastern Scotian Shelf Integrated Ocean Management (ESSIM) project (Fisheries and Oceans Canada, 2007) provides an excellent illustration of the principles of i-MSP and should be studied by anyone contemplating a similar exercise. Although implementation of the plan has been hindered recently by a number of factors (discussed below), there is much to be learned from the ESSIM process itself.

Although the level and variety of offshore uses was low to moderate at the time the 1996 Canada Oceans Act was passed, policymakers recognized that traditional uses would continue to grow and that new uses would be coming online. This prediction has been borne out in the decade since: a variety of ocean-based renewable energy facilities have been proposed, liquefied natural gas (LNG) terminals are being sited, offshore aquaculture tests continue, new fisheries are being pursued, and container ships are increasingly stopping in Canada’s eastern provinces rather than traveling up the St. Lawrence River Seaway. As in the U.S., each of these activities is subject to different permitting regimes at different agencies, and space is being allocated without any broader vision of the future.

The Oceans Act, as implemented through the 2002 Oceans Strategy and the 2005 Oceans Action Plan, calls for regional planning for Canada’s coastal and ocean waters. Without changing any existing authorities, the Act directs government agencies to cooperate in several regional pilot planning efforts and then pursue their regulatory activities in keeping with these plans.

The ESSIM project, which was formally announced in 1998 and picked up speed through the early 2000s, is built on a highly collaborative, consensus-based planning process, involving several levels of advisory and decision-making bodies. Enormous attention was paid to creating an atmosphere of openness and cooperation, which allowed the project to overcome difficulties as they arose along the way. ESSIM’s operating principles for collaborative planning included:

1) Jurisdiction: Management authorities and jurisdiction of government departments and agencies is acknowledged and affirmed.
2) Inclusion: All stakeholders are included.
3) Consensus: Decisions and recommendations are made by consensus and the process includes mechanisms for dispute resolution.
4) Accountability: Accountability is expected of and demonstrated by all parties.
5) Evolution: The process is designed to permit and support evolution and will be monitored and evaluated to support shared learning and adaptation.
6) Networking: The process will continue to work through a network of stakeholders.
7) Transparency: Decisions and recommendations are made openly, with information and results shared with all stakeholders.
8) Efficiency: Issues are addressed in a timely manner.
9) Knowledge-based: Decisions and recommendations are based on best available information.

The next step was to articulate the project’s purposes, which were boiled down to three high-level goals:

1) Collaborative Governance and Integrated Management (which addresses the problems of sector specific, uncoordinated ocean management);
2) Sustainable Human Use (which acknowledges the long term economic value of the ocean); and
3) Healthy Ecosystems (which ensures conservation and restoration of ocean ecosystems).

Over the course of the planning exercise, each of the three high-level goals was broken down into sub-goals (or elements), to be achieved through Strategic Objectives and implemented through Management Strategies and Actions. Table 1 shows how one of the three goals, Sustainable Human Use, was broken down into elements, objectives, and strategies. The more specific Management Actions needed to implement each strategy are being developed now.

TABLE 1: Breakdown of ESSIM’s Goal 2 for Sustainable Human Use

<table>
<thead>
<tr>
<th>Element</th>
<th>Objective</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social and cultural well-being</td>
<td>Communities are sustainable.</td>
<td>• Identify and characterize communities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Identify community assets related to the ESSIM Initiative.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote and maintain access to sustainable livelihoods from ocean-related activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enhance ocean-related education, training and awareness.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support ocean-related services and infrastructure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improve government capacity (including fiscal) to implement social programs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Involve Aboriginal peoples in planning and development decisions.</td>
</tr>
</tbody>
</table>
Another necessary precursor to zoning was a regional assessment to document ecosystem status and trends and human uses and impacts. This baseline assessment was also needed to facilitate adaptive management and ensure accountability over time. Each Management Action will be evaluated according to specific, publicly-reported Outcome Indicators (which have yet to be finalized), followed by revision or adaptation of the plan as needed.

Although this proliferation of process may seem daunting and complicated, it serves a vital purpose. By moving forward one step at a time, in an extremely deliberate way, a diverse group of participants could gain trust in each other and feel confident their views would be heard, before even beginning to talk about allocating specific uses to zones on a map.

**Behind the Curtain**

As might be expected, the reality behind the scenes proved far more complicated than the description above might imply. To start, the call for planning in the 1996 Oceans Act was not accompanied by new funding, forcing the Department of Fisheries and Oceans to borrow money and staff from other programs to initiate pilot projects. Although some core funding came in 2002 with the Oceans Strategy, ESSIM has been chronically underfunded compared to its task. Then, in 2006, the national government changed hands, having been led by the Liberal Party for twelve years. The new Conservative Party leadership had little investment in integrated ocean planning concepts. As in the U.S., the general public tended to be focused on economic problems and had little understanding of ocean issues, making it even harder
for ESSIM planners to gain broad political support.

Additional problems arose when some of the participating agencies, despite having been fully involved in the planning process and having signed off on the result, pursued actions that were not consistent with the plan. The fishing industry, in particular, tended to go directly to the relevant Minister (the equivalent of a U.S. Cabinet Member) to get support for their desired actions. (Recent pressure to gain MSC certification for Maritime fisheries has brought some fishing interests back to the table as they seek help to demonstrate sustainability.) One of the surrounding provinces objected to the boundaries of the planning area. Even managers charged with implementation of a national MPA network complained that the integrated planning process might be a hindrance to their more specific ecosystem protection goals. (CPAWS, 2008).

Those familiar with the ESSIM process cite several “lessons learned.” First, politicians must accept that good planning takes time, professional expertise, and money, including funds dedicated to public education and capacity building among agencies, users, and the public. Second, no matter how thorough the process or how much good will is developed, some kind of high-level referee is needed to ensure compliance by disparate agencies. The suggestion was made that an inter-ministerial board (similar to the U.S. Committee on Ocean Policy) might fill that role, although this approach has not been adopted.

Despite these frustrations and shortcomings, the ESSIM process has advanced ocean management in significant ways. Regional leaders believed in the process and were determined to make it happen. They were backed by a law (the Oceans Act), not just an executive action. The staff who led the effort were deeply committed and had expertise and prior experience in planning. Despite some setbacks, the Eastern Scotian Shelf planning process is far ahead of the other Canadian regions (British Columbia, the Beaufort Sea, and the Gulf of St. Lawrence) that were supposed to undertake similar multiple-use ocean planning. Most important, agencies, users, and NGOs came together to an extent previously unheard of to forge a common vision for the future of their ocean.

(i) Benefits of the integrated planning process

**Identifying a vision and objectives for human use of the ocean**

Rather than the traditional piecemeal, first-come, first-served approach to ocean space, i-MSP involves local and regional interests in reviewing a variety of scenarios for the future, based on available economic and environmental forecasts. Participants can then articulate a shared vision embodied in a set of environmental, economic and social objectives for their ocean space. As stated in one interview, “[i-MSP] has the potential to truly include and balance human needs, where traditional EBM seems to focus primarily on ecosystem protection.”

An illuminating example of the value of scenario development can be found in planning documents for the GAUFRE project in Belgium’s North Sea waters (GAUFRE, 2005). Building on painstaking analyses of the area’s oceanography, ecology, and uses, project managers illustrate how different objectives will result in different futures for the ocean, from the “Natural Sea” (where ecosystem protection is the overriding goal) to the “Rich Sea” (where economic development dominates), with a number of options in between. This process forces participants to acknowledge the consequences of hitherto unquestioned assumptions and choices.

**Bringing all stakeholders to the table**

By providing a transparent and structured mechanism in which different interests can be heard and reconciled, i-MSP helps minimize conflicts and search for synergies. It also increases awareness and ownership of marine conservation issues, particularly among users and regulators. The dialogue is made easier by ensuring that all stakeholders have a common base of understandable information. In the words of several interviewees:
“Fishermen will come to the table if there are dependable, honest partners, engaged in respectful, open dialogue, and they stand to gain something, not just give more up.”

“The oil and gas sector has certainly had conflicts with MPAs and fishermen, but things sometimes go well, and even achieve synergies, when there’s good dialogue and planning.”

“[i-MSP] may prove to be the kind of paradigm shifting tool that marine conservationists have dreamed of.”

**Focusing on interactions between all sectors**

An integrated planning process helps articulate links between different objectives, evaluate interactions among sectors (including “the environment” as one sector), clarify cumulative impacts, make choices and tradeoffs, and present outcomes within a spatial framework. The planning process also integrates socio-economic and biophysical issues in a way that is rarely attempted under existing management regimes.

Here again, the Belgian GAUFRE (2005) project presents an excellent case study. For each existing or planned ocean use, planners systematically documented its projected spatial needs, regulatory requirements, compatibility with other contemplated uses, and impacts on (or benefits to) the environment. For example, the analysis of wind energy highlights its compatibility with recreational fishing, diving, and certain kinds of aquaculture, incompatibility with shipping lanes and aggregate extraction, and potential impacts on birds and marine mammals. Other cases of possible inter-sector synergies include shipping lanes with sand extraction, fishing near protected areas, ecotourism in MPAs, and coastal protection with recreation. The tables of cross-sector interactions that resulted from the GAUFRE

**Box 6 Adaptive Management: Boon or Burden for i-MSP?**

Monitoring, evaluation, and adaptive management are widely recognized as valuable additions to any management scheme. Wherever managers must cope with limited information and significant levels of uncertainty, monitoring and adaptive management can help determine whether objectives are being met, identify shortfalls, promote accountability, and enable ongoing modification of management actions, priorities, and resource requirements. In the ocean environment, change is a constant, with shifting shorelines and currents, ecological regime shifts, and the still unknown effects of climate change. Perhaps because i-MSP is relatively new and its proponents are familiar with past lessons of environmental management, adaptive management is always included as a key element of i-MSP.

Ocean planners wishing to pursue i-MSP are advised by proponents to identify clear management objectives/desired outcomes; choose relevant, measurable indicators for each objective; monitor for changes in the indicators; assess results; and adjust management actions as necessary. Because of the complex nature of i-MSP, the objectives and corresponding indicators will include environmental, social, economic, and governance elements.

However in interviews, ocean users repeatedly raised concerns about the adaptive aspects of i-MSP:

“Both agencies and users hate change. Everyone wants to move on after a decision is made.”

“When monitoring reveals a failure to reach objectives, managers are open to criticism and funding cuts.”

“How can we do adaptive management once there are structures in the water? The level of investment involved [in building offshore energy facilities] precludes frequent review, adaptation, or changes in location.”

“Monitoring is expensive and lacks political support.”

“Because [i-MSP] is new and untested, managers would be very conservative (precautionary) upfront. They would need to set very stringent requirements and then ease up over time.”

Problems arise when one attempts to compare the costs and benefits of i-MSP, assuming it includes monitoring and adaptive management, with the status quo. Despite the recognition of its importance, very few existing ocean management schemes are actually required to set objectives, monitor performance, and adapt accordingly. Even where such evaluations are included, they tend to look at biological and physical endpoints, rather than the complex and less familiar social and economic elements.

This puts i-MSP in an awkward situation. To overcome fear of a new approach, maintain flexibility as we learn, cope with a changing ocean, and leave room for new uses to emerge, i-MSP advocates stress the importance of adaptive management. But adaptive management also raises fears of uncertainty and ever-changing regulations, a deal breaker for many participants in the process, particularly those who must make significant capital investments.
analyses were key to the subsequent process of creating an assortment of zoning maps.

**Unifying and streamlining government actions**

One coastal manager referred to interactions between federal agencies as “internecine warfare.” Users frequently complain that a lack of agency coordination leads to confusion, delays, and unexpected project changes, all of which cost money. By bringing all ocean interests—and the agencies that oversee, promote, or regulate them—to the table, such roadblocks can be avoided and efficiency improved.

Oil industry representatives pointed out that they must deal with MMS for leases, the Department Of Transportation (DOT) for pipelines, the Environmental Protection Agency (EPA) for air and water discharges, the Coast Guard for safety, nearby states to resolve coastal zone management and consistency concerns, NOAA for marine mammal interactions, and Immigration and Customs Enforcement (ICE) when anything is moved to or from an offshore platform. They supported the need for broader planning for ocean waters and submerged lands, including the designation of appropriate protected areas, but preferred that such planning be modeled after the MMS system of baseline resource assessments followed by 5-year plans with development targets, the approach most familiar to them.

A unified planning process would strengthen integration across economic sectors and agencies, and between national policy and regional implementation. Better communication can help streamline long, consecutive federal approval processes. Most important, i-MSP results in greater predictability for all parties, including the critical financial sector.

**(ii) Economic and social gains**

As remarked by one coastal manager:

“As the saying goes, ‘It’s the economy, stupid.’ Many coastal communities have suffered economic losses in traditional sectors such as timber, fishing, and manufacturing. The public wants to know whether new ocean activities, or ocean management schemes, will help or hurt their pocketbooks. Once that question is answered, environmental protection is a bonus.”

By maximizing efficient use of space and resources, minimizing conflicts, and searching for synergy, i-MSP promotes the sustainable development of a variety of economic activities in the ocean, enhancing income and employment over the long term. Most companies rely on some form of long-range planning to guide their investment decisions and there is reason to believe that ocean businesses such as fishing, renewable energy, and aquaculture would also benefit from improved long-term planning based on increased regulatory certainty. By integrating the full range of ocean activities, while leaving space for new and emerging uses, i-MSP also promotes local economic stability through diversity of income streams.
The i-MSP focus on conservation of marine ecosystems supports economic sectors that depend directly on environmental quality, such as tourism, recreation, and fishing. Equally important, by stressing ecosystem health and sustainability, i-MSP helps maintain the very real value of ecosystem services such as shoreline protection, human health, clean water, and global climate control. These benefits should not be underestimated, but greater efforts will be needed to quantify them and communicate their value to the public.

As documented in a number of reports (e.g., National Research Council, 2004), there are significant efficiencies to be realized through more coordinated environmental assessments and data collection. i-MSP facilitates cross-sector and cross-agency comparisons of data holdings, needs, and plans, thereby improving information collection, reducing duplication of effort, and allowing for cost savings. Some of the more lucrative ocean sectors, such as oil and gas, appear quite willing to help pay for assessments if they are allowed to be part of the broader planning conversation.

Finally, total regulatory and compliance costs should be lower under i-MSP due to better information exchange between agencies and a more predictable setting in which to make business and regulatory decisions.

(iii) Environmental improvement

Although facilitating additional uses of the ocean may seem antithetical to conservation goals, many analysts believe that i-MSP could actually advance the long-term protection of ocean health. In addition to existing environmental laws, regulations, and best practices governing specific activities, i-MSP places environmental commitments at the heart of planning and management and ensures that some portion of ocean space is allocated for ecosystem preservation. In a sector-by-sector approach, every proposed MPA becomes a battle in which conservation interests appear to be pitted against other users. But i-MSP puts conservation interests at the table with others as equal (or sometimes dominant) players. It also requires consideration of cumulative impacts from all sources in a region, a critical step which has been frequently neglected in traditional management.

In the Belgian, North Sea, and Eastern Scotian Shelf marine plans, which are among the most fully developed to date, conservation concerns were at center stage during deliberations. Planners documented the impacts of each proposed use and participants debated where and how many MPAs should be sited, not whether they were legitimate. Similarly, in the Rhode Island Special Area Management Plan process, the first step will be to locate sensitive ecosystems to be protected, with other uses sharing the remaining space under suitable regulatory regimes. As discussed above, the establishment and management of the Great Barrier Reef Marine Park in Australia did not follow a true i-MSP process, but a similar stakeholder-driven procedure demonstrated that environmental protection can co-exist, and even flourish, along with ocean uses.
It is too soon—and too few marine spatial plans have been fully implemented and assessed—to know how well long-term conservation goals will be realized in the water under i-MSP. Several remaining concerns on this score are laid out in the next section.

C. Concerns about i-MSP

Most of the available literature on i-MSP sets out to demonstrate its value and discusses how it should be implemented. However some writers have raised red flags about this approach, and many worries were expressed in the course of the personal interviews. The following section presents the main themes behind these concerns and some of the counter-arguments against them.

(i) “It’s not practical.”

Interviews confirmed that many people, primarily managers, remain worried about the trouble involved in taking on i-MSP and skeptical that the significant effort required will bring commensurate benefits. These concerns were often vague, but some typical quotes include:

“[i-MSP] is too complex, too abstruse; there aren’t enough conflicts or perceived problems to justify the time and money.”

“Ocean zoning would never get public or political support.” (Note that this same commenter saw great value in, and support for, zoning on land)

“People say there’ll be synergies, but that’s not really practical because each user will be too concerned about protecting their turf and capital investments.”

“[i-MSP] would require fundamental changes in the way people and organizations behave; even new legislation can’t accomplish that in a hurry.”

“It was incredibly hard navigating the [Marine Life Protection Act] process in California, where we were just negotiating with the fishing community. Trying to include all the other users would make it impossible!”

“Some states remain uncomfortable with ‘zoning.’ It sounds too top-down, deterministic, and simplistic.”

“It’s too expensive and will become an unfunded mandate.”

“Users must perceive conflicts to come to the table, so this will only work in crowded areas.” And, by contrast, “This might be easier where there are few activities [but not in my crowded area].”

(ii) “It’s really hard and we don’t know enough yet.”

A bit more accepting than those who ruled i-MSP out as impractical were those who saw the value of the concept, but felt that the current state of knowledge (about ecosystems, human behavior, economics, etc.) and the availability of data were too limited to move forward. In their words:
“It’s too soon for [i-MSP] because new uses are too untested. For example, it will be years until offshore renewable energy is ready to come online. We don’t want to be ‘locked in’ to certain areas when technologies are still so new.”
“[The oil and gas industry] would be unwilling to see zones designated since they’ve been prevented from doing basic exploration for years and don’t know what’s out there.”

“We don’t know how to draw and enforce meaningful lines in the water.”
“How can we reconcile the scale of ecosystems (e.g., LMEs) with the smaller scale needed for planning and stakeholder involvement?”
“Planning in nearshore areas will be especially challenging because of socio-economic issues that we don’t fully understand.”
“It’s better to proceed incrementally: ‘evolution not revolution.’ Try doing sector-specific EBM before going for big changes.”
“There just isn’t enough information. In our state, seafloor mapping covers only 5% of state waters and we would need at least $6 million to complete it.”
“[The oil and gas industry] would be unwilling to see zones designated since they’ve been prevented from doing basic exploration for years and don’t know what’s out there.”

(iii) “They [the agencies, or users, or NGOs] will never cooperate.”

At this moment in the history of U.S. ocean management, with few exceptions, the level of trust between stakeholders appears to be quite low. Since i-MSP depends on the willing participation of many players representing all sectors and all agencies, its success will require a major effort to bring people together, build relationships, and instill confidence. California’s Marine Life Protection Act (MLPA) stakeholder process may provide one useful model. Many of the papers reviewed and people interviewed saw problems in getting “those other folks” to play fairly:

“We’ve seen it before: fishermen will never share their data. It’s all self-reported anyway, so it’s totally unreliable. And fishermen will never place their activities on a map.”
“Agencies will run to Congress, OMB, or the White House to get what they want. It would take someone with a baseball bat to make everyone work together. Only top-down orders and pressure can change that.”
“The environmental community is always looking for ways to tie everything in knots, using MMPA, ESA, MSFCA, NEPA, etc.”
“Allowing wind farms in the ocean will lead to massive area closures, ostensibly for security reasons, then structures and cables will be abandoned and get in the way forever. It’s just a quick tax break for industry.”
“Environmental groups blame everything on fishing, which leads to bad feelings. [They] went too far in pushing MPAs as an excuse to stop fishing, just like the spotted owl was an excuse to stop the timber industry.”
“Without a legal requirement, people just won’t take [i-MSP] seriously.”
“People are hiding behind doubts about the science and process to mask their self-interest in the status quo.”
“Fishermen are afraid that [i-MSP] is just a Trojan horse for more MPAs.”
“[Environmentalists] have a hard time appreciating the societal value of ocean-based businesses; mostly they just see them as annoying but unavoidable threats to the environment.”

“[i-MSP] could add work through the planning exercise, but then not remove any existing steps. [We] need to eliminate, replace, or consolidate existing NEPA or other permitting requirements to make [the i-MSP process] attractive.”

“Current users, especially fishermen, or at least their official representatives, have come to view use of the entire ocean as their right. That makes it difficult to compromise.”

(iv) “The environment will lose if it has to compete with users.”

Environmental advocates are worried that they may give up more than they gain by coming to the table with powerful economic interests. Based in part on experiences with public lands (discussed in greater detail in Section III), they fear that the prospect of fees and royalties coming to state budgets from growing ocean uses will outweigh public concerns about environmental protection. Having experienced some success with traditional environmental laws, economic tools, and MPA designations in recent years—despite intense opposition and major investments of funds and staff time—some environmental NGOs would rather stick with “the devil they know” than take a chance with one they don’t. (These arguments carry less weight in light of the abject and continued failure to protect ecosystems under existing management regimes.) As they see it:

“[i-MSP] doesn’t guarantee ecosystem protection; unless there are specific, legal requirements for protected areas, resource users will keep chipping away at ocean space.”

“It’s easy to put lines on maps [designating protected areas], but political will can always thwart implementation.”

“The MMS offshore leasing program was supposed to include environmental protection, and their Environmental Studies Program spent lots of money to appease the research community, but it never led to real ecosystem protection.”

“Generally, tradeoff processes undervalue conservation. Look at the Sanctuaries program, Forest Service, BLM.”

“Ocean zoning is just a backdoor way to put the ocean under private control.”

“[i-MSP] could be a tool to help get to EBM, but it doesn’t have to be and we shouldn’t confuse the two.”

“Complete multi-use optimization is obviously too complicated; we should start by optimizing ecosystem protection, and then fit other uses around that.”

“The top priority should be to get more refugia in place (using climate change as the excuse…I mean justification). This will raise public awareness of oceans in general and then we can do more sophisticated planning.”

Although the concerns outlined above raise legitimate questions and are deeply felt, none is irresolvable. Most of the same concerns were initially raised, and then assuaged, in the few places that have engaged in some form of ocean planning. Such concerns can be answered in several ways: highlight the problems that are occurring in the absence of
planning; demonstrate the likely benefits of planning for different sectors (as explained in the previous section); show that i-MSP is already being pursued in many places and get planners and managers from those places to share their experiences; and sponsor engaging simulation exercises that make i-MSP concepts more familiar and accessible and help build trust among different stakeholders.

The fact that one hears similar arguments in many quarters does confirm the need for continued strategizing, dialogue, education, and negotiation before we are likely to see widespread adoption of i-MSP in the U.S.

III. Lessons from the Land

A. Land use planning and zoning

(i) Background

In explaining i-MSP to unfamiliar or skeptical audiences, proponents frequently use the analogy of urban land use planning (LUP) and zoning (e.g., Sivas and Caldwell, 2008; Tyldesley and Hunt, 2003). This can provide an “Aha!” moment, since most people are already comfortable with the idea that government and citizens should think about their vision for the future of a city and then create plans that allow for economic development while maintaining attractive areas to live and play. But does the analogy have value beyond a simple narrative device? A quick review of the history of urban planning reveals many differences compared to the ocean context (Box 7) while yielding several useful lessons.

States hold the power to regulate the use of land, but this responsibility has generally been delegated to local (and sometimes county) governments in acknowledgment of the intimate connection between land use and residents’ sense of community. Some states set broad policies, goals, and standards and reserve the authority to regulate certain land uses. Some specify elements to be included in local plans, processes to be followed, the extent to which a plan must be implemented and adhered to, the frequency of required updates, etc. Other states, notably Texas, defer almost completely to local control. In all cases, the authority to plan and zone is limited to jurisdictional limits, in other words, townships can only zone within their own township, cities within their city, etc. In this way, decision makers remain accountable to residents—and voters—within their districts.

The first U.S. zoning ordinance was passed in New York City in 1916 to move noxious industrial uses away from increasingly crowded neighborhoods. Then, in the 1920s, a Commerce Department team led by Herbert Hoover drafted a model land use planning law (the 1924 Standard Zoning Enabling Act) which was widely adopted by the states and has formed the backbone of LUP ever since. The legitimacy of zoning was solidified further by the U.S. Supreme Court in Village of Euclid, Ohio v. Ambler Realty (1926). In that decision, the justices said Euclid could promote “the health and safety of the
community” by protecting residential areas from the “danger of fire, contagion and disorder, which attach … to the location of stores, shops or factories.”

Box 7 Some Important Differences between Terrestrial and Marine Planning

Ownership - The seabed and ocean space are held in trust by the government for the benefit of the public, whereas land can be either publicly or privately owned. The problem of parcel-by-parcel fragmentation of ownership, and thus the recurrent need to purchase private lands to protect intact ecosystems, does not arise in the ocean (although fragmentation of authorities remains a problem, as we have seen). Note: The Public Trust Doctrine is the basis for state control over waters within the 3-mile coastal zone. It remains unclear how this applies to federal authorities in the EEZ.

Mobility of Activities and Ecosystems – Activities, species, and processes in the ocean are typically highly mobile, moving from area to area according to prevailing conditions and circumstances. Pollution can spread more quickly than on land, and notable seabed features (such as sand-banks, sea grass beds, and other undersea elements) and harvested species are highly dynamic. Land-based uses tend to be more static, with seasonal variations in intensity rather than type of use. The more stable distribution of habitats on land also makes it easier to identify places where vulnerable species might be found and protected.

Three-dimensionality - The marine environment is highly variable across latitude and longitude coordinates and through depth. Land use planning generally sticks to a two-dimensional grid, although implementing regulations sometimes address sub-surface uses or building heights. In the ocean, different uses can be carried out on the surface, in the water column, and on or beneath the seabed.

Maps, Information, and Understanding - There is much less known about the marine environment and its functioning than about the terrestrial environment. Virtually every square meter of the land surface has been surveyed (by land, air, or satellite) and mapped, but less than five percent of the ocean bottom has been similarly charted (National Research Council, 2003). Even in coastal areas, complete GIS-based mapping of bottom topography and ecosystem features is the exception rather than the rule. The sea has been drastically under-sampled and understudied until quite recently.

Buildings and Infrastructure - Land use is frequently determined by the nature of existing fixed assets, such as buildings and related infrastructure, which do not change significantly from year to year. For now at least, these factors are less influential at sea.

Transportation - On land, linear routes tend to be set aside exclusively for transportation. By contrast, vessels can generally travel widely across the surface of the sea for many different purposes.

International Dimensions - Many activities at sea are subject to international regulation, law, or convention. This is less true (although not entirely absent) for land-based activities.

(adapted from Tyldesley and Hunt, 2003)

LUP establishes a framework and guidelines for public and private development, starting with the drafting of a Comprehensive, or Master, Plan. Consistent with the Plan, zoning scheme then delineates areas for agricultural, residential, commercial, industrial, and mixed uses on a map, in keeping, indicating areas of different intensities and issuing regulations that guide the review of subdivision and building permits within each zone. This last step in the process is sometimes underemphasized: the process is not done when zones are created. To be effective, LUP (and i-MSP) must be able to regulate the form, scale, intensity and conditions of development, not merely its location.

The LUP process typically provides opportunities for stakeholder input through open meeting requirements, public comment periods, and similar venues. But the result does not attempt to reflect community consensus. The process relies on career professionals to devise the plan and zoning maps, with guidance and approval from elected officials who
can then be held accountable at the ballot box. Local input tends to have a greater influence on specific permit reviews.

(ii) Combining land use planning with conservation

When city managers first started regulating land use, their interest was in the uses, not the land. The goal of achieving sustainable development was not discussed and an emphasis on protecting natural areas seemed unnecessary. This has changed over time, although provisions for conservation are still often treated as add-ons to the traditional planning process.

Just as states differ in their level of delegation to local planners, they also differ widely in their requirements to provide for “open space,” “wildlife habitat,” or “critical (or sensitive) areas” in LUPs. By now, virtually all local LUPs include some conservation elements (although there is disagreement about whether to count general green space, such as parks, toward conservation goals). Permits are routinely denied or significantly altered to protect natural areas, often in response to local pressure. Nevertheless, limited resources typically push more proactive environmental policies, such as land acquisition, to the bottom of the list. A few states, notably Vermont, Maryland, and Oregon, have made more profound changes to their LUP laws to emphasize growth management and conservation over development.

For many people, nature-sensitive urban planning is associated with the Smart Growth movement. (In fact, the concept dates back to the 1960s, while the term “Smart Growth” has only been in common use for the last ten years and includes a broader set of community development principles.) Smart Growth ideas grew out of EPA’s efforts to improve urban air and water quality and clean up contaminated urban “brownfields” for re-use. It became clear that better planning could alleviate, and may have helped prevent, these problems. In the late 1990s, three important events took place: the American Planning Association released a draft of its “Growing Smart Legislative Guidebook;” the Natural Resources Defense Council and Surface Transportation Policy Project published “The Tool Kit for Smart Growth”; and Maryland passed its Smart Growth and Neighborhood Conservation Act. This three-pronged endorsement propelled the concept into the public realm.

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* This is a very rough sketch of a complex and variable process. It should be adequate for the purposes intended here, with apologies to land use planning professionals who may chafe at its oversimplification.
As Box 8 shows, the Smart Growth movement is oriented toward promoting “livable communities” which will also have lower environmental impacts and be sustainable over time. Because there are no comparable human communities at sea, it may be hard to see the applicability of some of these principles to ocean planning. However, the EPA defines Smart Growth as “development that serves the economy, the community, and the environment. It changes the terms of the development debate away from the traditional growth/no growth question to how and where new development should be accommodated.” This sounds very much like a credo for i-MSP.

Box 8. Principles of Smart Growth

- Create a Range of Housing Opportunities and Choices for All Income Levels
- Create Walkable Neighborhoods
- Encourage Community and Stakeholder Collaboration
- Foster Distinctive, Attractive Communities with a Strong Sense of Place
- Make Development Decisions Predictable, Fair and Cost Effective
- Mix and Integrate Land Uses Where Possible
- Preserve Open Space, Farmland, Natural Beauty and Critical Environmental Areas
- Provide a Variety of Transportation Choices
- Strengthen and Direct Development Towards Existing Communities
- Take Advantage of Compact Building and Neighborhood Design

(from www.SmartGrowth.org)

(iii) Lessons from land use planning

After almost a century of experience, practitioners and observers of LUP have accumulated many lessons about what works. Many of these are not directly relevant to the marine context because they involve the purchase and control of privately-owned land. But a few lessons, particularly those pertaining to the decision-making process itself and the balancing of conservation and development, may be helpful in avoiding pitfalls as i-MSP moves forward.

Lessons about process

Everyone who has ever practiced or observed LUP seems to agree that process matters. A successful planning process collects information about what’s there and projections of what’s coming; sets high-level goals before looking at maps; encourages broad public participation; explains the process and ground rules up front; is open, transparent, and fair to all participants; results in reasonably predictable decisions; and includes provisions for review and revision.

These principles have become almost cliché, but that doesn’t mean they are easy to achieve. No two participants are likely to agree about what level of openness is enough or how many rounds of public input are appropriate. Some unavoidable tradeoffs include: local control vs. national, regional, or state guidelines; timely results vs. thorough consultation; voluntary compliance vs. centralized enforcement; innovation and adaptation vs. certainty and consistency. A well-managed planning process should even the playing field between disparate interests and decrease conflicts, while increasing efficiency and certainty (Eagle, 2008).
Nevertheless, no matter how well-conceived the process, it still requires leadership—and is never immune from politics. As one planner said, “The rules and process do matter, but the people making decisions matter more.” In the world of land use planning, local legislative bodies always retain final responsibility for approving master plans (whether actively or through default provisions) and can be held accountable by their constituents. Many observers believe this is essential and should be emulated by budding marine planners (Eagle, 2008). They argue that government agencies are inherently ill-suited to make tough choices, as they tend to shy away from controversy and prefer to keep all options open for the future. Elected officials have the legitimacy and accountability to stand behind decisions that will inevitably not please everyone.

Since zoning regulations do not cover pre-existing uses on private land, planners often struggle to incorporate grandfathered uses into the goals and framework of a Master Plan. Typical strategies involve concentrating similar uses around existing sites, constructing real or virtual barriers around problematic uses, purchasing land outright, or just waiting it out. For i-MSP, this may be less of a legal problem than a political one. Longstanding users, like fishermen, have no property-based right to ocean space, but they have tradition and strong political support behind them.

Experiences with enforcement of zoning laws may also be instructive. On land, there are never enough inspectors to keep up with all new building activity. As a result, the enforcement of zoning and building regulations is often initiated after the fact by unhappy neighbors or competitors. The problem of enforcement is likely to be even more severe at sea.

**Lessons about balancing conservation and development**

On land as at sea, there are clear economic benefits, both direct (e.g., tourism) and indirect (e.g., ecosystem services, land values), to be gained from preservation of natural ecosystems. But communities must document these benefits and then communicate them clearly to the public to balance the inevitable pro-development arguments.

A number of Smart Growth principles address conservation goals: preserve open space, farmland, natural beauty and critical environmental areas; direct development toward existing communities; take advantage of compact building and neighborhood design. These principles are aimed at limiting sprawl, which is inefficient and consumes natural lands. At first glance they may not seem as relevant to the less crowded ocean context. But then, they may not have seemed relevant on land fifty years ago, when they could have been implemented with less pain and may have prevented some of the negative impacts we are now trying to undo. These are precisely the kinds of lessons we should be heeding as we move forward with marine planning.

A detailed examination of communities across the country that have successfully incorporated conservation into LUP (Duerksen and Snyder, 2003) identified a number of common elements in their approaches, many of which overlap with the more general principles already discussed:
leadership (both political and agency level);
good program structure (adequate staff and funding, solid partnerships);
solid planning (good inventories, maps, tools);
innovation (recognize and embrace new ideas);
social justice (avoid disparate impacts);
land acquisition;
strong regulations (EIAs, economic analyses, use regulations);
restoration of habitats where needed;
measurable results (metrics, performance assessments); and
education (to build citizen involvement and support).

Equally important, the study found that the best results were achieved where a variety of approaches were combined, echoing the growing belief among ecologists, economists, and many other social scientists that diversity—whether of species, investments, or tactics—is almost always a good thing. (Note: Although land acquisition is not directly applicable in the ocean, government programs that use direct economic intervention to achieve an environmental goal, such as boat buybacks and publicly-funded removal of outdated structures, serve similar functions.)

One complicated topic that has generated a wide range of opinions concerns the optimum level of separation of land uses. Some argue that effective zoning requires single use areas that are relatively hard to rezone, with variances as the exception (Eagle, 2006). They see this as the surest way to minimize conflict and guarantee a place for everything, including no-use conservation areas. Others (e.g., Elliott, 2008) have concluded that areas should be integrated as much as possible, with more mixed use districts, more flexible definitions of permitted land uses, and regular review and revision of zoning rules. This approach can promote greater cohesiveness by forcing different constituencies to interact and negotiate with each other and creates efficiencies through shared infrastructure and services. The translation of such LUP ideas to the ocean context may require new ways of thinking about “ocean communities” that include both marine ecosystems and the people who use, visit, capture, benefit from, or work among them (see Shackeroff et al, 2008 and recent work by Kevin St. Martin).

One final lesson from land use planning: not everyone likes it! A large majority of the people I spoke with embraced the i-MSP/LUP analogy, particularly the emphasis on creating a shared vision and goals. But one federal manager said, “Zoning doesn’t even work well on land so I’m not convinced it will help in the ocean,” and several people pointed out that planning is neither required, nor widely practiced in Texas: “Texans don’t trust government interference and don’t like hindrances to development.” To gain support in the face of this attitude, it will be important to stress that, unlike on land, ocean space belongs to all citizens and the government has a duty to manage it for the benefit of all.
B. Public lands management

Although comparisons with urban land use planning have the advantage of being familiar to a broad audience, the conservation and use of ocean space actually has more in common with the management of publicly-owned lands. The following sections review the broad history of federal lands management and identify a few more “lessons learned” that may inform the development of i-MSP.

(i) Background

Historically, public lands were managed to facilitate resource use and early laws, as far back as the 1872 Mining Law, assumed users would have the primary say in setting the rules. Broadly speaking, the Forest Service (USFS) promoted timber harvesting, the Fish and Wildlife Service (FWS) looked out for hunters and fishermen, the Bureau of Land Management (BLM) took care of grazing and mining, the Minerals Management Service (MMS) supported energy development, and even the Park Service (NPS) saw its role as encouraging recreation and tourism. Not surprisingly with such different “clients,” over time the agencies developed different styles and cultures which became self-reinforcing.

In each realm, a relatively small group of legislators, agency managers, and user groups worked together to set policy regarding distribution of a public resource, with relatively little national attention. As one writer noted, “The history of public land law created a number of private privileges, which morphed into expectations, and became a sense of entitlement among commodity users.” (Nie, 2008) Typically, local communities were also accommodated in some way, with extra opportunities for review of proposed uses and, perhaps more important, with a share of the fees or royalties raised on nearby federal lands. (This picture is somewhat analogous to the current ocean situation, where NMFS advances fisheries, MMS works closely with the oil and gas industry and more recently with the offshore renewable energy sector, NOAA’s Aquaculture and Sea Grant offices promote aquaculture, etc.)

Through the 1960s and ‘70s, environmental groups advocated increasingly loudly for the public’s interest in environmental values on public land. During the same period, OMB started realizing that the government was not getting a very good return on the use of public resources by private businesses. Revised authorizing laws for public lands agencies (e.g., the 1960 Multiple Use and Sustained Yield Act for USFS, the Wilderness Act, and many others), accompanied by a new suite of environmental laws (the Clean Air Act, Clean Water Act, RCRA, etc.), substantially changed the goals and process for land management, raised fees (although usually nowhere near fair market value), and asserted the value of wild, unexploited lands. These changes greatly increased the number of interested parties, including many new Congressional committees and the national media. For better and for worse, the cozy cliques could no longer operate behind closed doors and management decisions were fought out in very public and often acrimonious ways. The fight over management of old-growth forests in the Pacific Northwest (which degenerated into divisive slogans such as “owls vs. jobs”) is a classic example.
At the same time these transformations were taking place, local and regional economies in the West were also migrating from a focus on resource extraction and traditional industrial development to a desire for sustainable, recreation- and amenity-based economies. In the ‘90s, President Clinton’s Secretary of the Interior, Bruce Babbitt, introduced the relatively new concept of “ecosystem management” as a guiding principle for the use of public land, over the vociferous objections of users and many politicians from Western states, and quieter grumbling from agency staff who were simply not sure how to do it. (One agency staff person told me that under the current administration “ecosystem management” has become a forbidden term within DOI.)

After decades of tension and controversy, proposals are being advanced for balancing multiple objectives on public lands in a less adversarial way, some of which have been implemented at a small scale or as pilot projects. The following section attempts to summarize some lessons that can be incorporated into the marine context.

(ii) Lessons from public lands management

The level of conflict and antagonism that has built up around federal land management does not yet exist in the ocean context. By learning from experience, perhaps it can be avoided. Many analysts have examined how conflicts over public lands become so intractable and considered how we could do better. Not surprisingly, no silver bullet has been uncovered, but a number of ideas are worth taking to heart.

The Platonic ideal of impartial natural resource professionals administering a range of land uses, based on objective analyses of good data and science, with helpful input from stakeholders, remains a mirage. The root problems have been traced to many sources, many of which will also be present in ocean space:

- limited supplies of space, resources, and money;
- scientific uncertainty;
- imprecise, complex, and conflicting laws;
- elevation of emotional symbols (“owls” or “salmon”) above real, complex problems (the goals of forest and watershed management);
- differing views about the scale and meaning of “community”;
- posturing and polarization associated with electoral politics;
- fragmentation of responsibility and authority;
- the news media’s focus on controversies over problem-solving;
- the adversarial nature of legal proceedings;
- and, at the root of it all, common human foibles such as short-term thinking, competition, self-interest, incomplete understanding, reliance on oversimplified narratives or frames, and the tendency to advance extreme positions in the hope of skewing later compromise.

In light of this daunting list of challenges, what seems to help?
Distinguish between political leadership, agency expertise, and stakeholder desires

Each of these elements has value, but they play different roles in the process. Elected politicians should write laws that reflect clear policy choices. As discussed above in the context of urban land use planning, only elected officials have the legitimacy to make value choices, the power to enshrine those choices into law, and the ability to be held accountable if those choices fail to reflect popular will. Vague laws with too much delegation actually politicize the entire process by forcing agency staff to make policy decisions, either explicitly or implicitly. For example, laws that called for “multiple-use” land management never specified what weight, if any, should be given to the impacts of decisions on local community stability, an omission that led to huge trouble for the agencies. “Broad discretion makes a politician out of a bureaucrat” (Nie, 2008).

Career agency staffs are in a better position to do the heavy lifting involved in sifting through technical analyses and assessing alternative scenarios. They also have the time and access to hear from a broad variety of stakeholders—democracy with a small “d.” In addition, if new findings emerge, it is much easier to revise and adapt regulations than to amend legislation.

Members of the public also have important roles to fulfill. First and foremost, they have the responsibility to elect thoughtful, competent public officials and hold them accountable. Second, they should engage in rulemaking processes by staying informed, offering testimony, and responding to draft documents, whether individually or through appropriate associations or NGOs. Last, constituencies have an obligation to listen to each other and engage in constructive dialogue. “The tragedy of the commons can be avoided if users can communicate and develop trust” (National Research Council, 2002).

It would be hard to find an individual who opposes good jobs, a healthy environment, and vibrant communities. But that common ground gets quickly buried under a barrage of slogans and accusations. Collaborative, stakeholder-driven processes can be perfect venues to iron out issue- or site-specific disagreements, but they are not the appropriate venue for making broad policy choices. In fact, a number of experts believe that any agreement reached through negotiation should subsequently be enshrined in law to have staying power and legitimacy. (Nie, 2008)

Separate funding from decision-making

Money is always in short supply for federal, state and local agencies. This can become particularly insidious when government-supplied budgets are supplemented by income from regulated industries. Historically, agencies and local communities have received a portion of the revenues generated from the private use of public lands, putting them in a bind as they grow dependent on the funding and jobs created by industry. Consciously or not, environmental goals can be shortchanged under these circumstances. This is not to say that government should forego the collection of fair returns on the use of public space and resources. Rather, those revenues should be pooled in a larger fund, along with general tax revenues, and distributed to agencies and affected communities according to budget requirements, to decouple funding from decision making. (Brick and Cawley, 1996)
Avoid excessive fragmentation
One of the mistakes made on federally-controlled lands, and one that is just beginning to be remedied, is fragmentation of space. More than 100 years ago, a checkerboard pattern of lots interspersed with federal lands was given to private landholders and states based on the belief that this intermingling would be beneficial to all. Instead, it has exacerbated conflicts between users with different goals and made it difficult to preserve intact ecosystems at a meaningful scale. Over the last few decades, government agencies and private organizations like The Nature Conservancy have been trying to buy back some of these lands to consolidate protected areas. There is still time to avoid this kind of harmful fragmentation in the ocean by planning ahead.

Take chances with new ideas
When the old ways aren't working, try something different. This has historically been very difficult for government, but there are ways to make it more palatable. Pilot programs and small-scale tests, linked to measurable goals, pre-determined indicators, regular monitoring, and review can decrease the risk involved in adopting new approaches. (On a cautionary note, one expert notes that so-called “pilot programs” often develop a cadre of beneficiaries and evade the kind of rigorous review that should lead to either wider adoption or cancellation.) One new idea in public land management involves shifting some functions from government regulation and enforcement to market-based mechanisms. For example, proposals have been made to require all forestry on public lands to meet third party certification standards. This approach could be helpful in the ocean as well, where independent organizations could develop standards for sustainable practices.

Wrestle with the tradeoffs between centralization and diversification of authority
For many of the issues discussed above, there appears to be fairly widespread agreement about better ways to move forward. But on one question, opinions are both divergent and strongly held: Is it better to have one agency administer a range of uses in a unified way or to assign an oversight agency for each use, with some mechanism for coordination?

The Joint Ocean Commission Initiative is advancing the unified, multiple-use model, advocating a stronger role for NOAA, plus Regional Ocean Councils that would oversee the full range of ocean uses. This is consistent with the holistic vision put forward by EBM and would help counteract historic fragmentation.

However, Josh Eagle (2006) makes a case for the opposing model of agency diversity. Based on an analysis of public lands management, he concludes that having a variety of agencies, each with a narrow mandate, (such as USFS, FWS, NPS) actually achieves better ecosystem results than a comprehensive, multi-use agency (such as BLM). Eagle finds that multiple-use agencies become overly influenced by organized economic interests, at the expense of less wealthy users and especially conservation advocates. The dispute about unified vs. dispersed management approaches is related to the earlier discussion about whether i-MSP should create single or multiple use zones. Eagle argues that the creation of single use zones, each with a corresponding regulatory agency, is the
best way to level the playing field between all users and ensure that someone is looking out for conservation. “Agency diversity divides interests, clarifying and legitimizing perspectives and concerns, to help those interests conquer their differences.”

He suggests that either (1) the mandates of existing land agencies should be broadened into ocean space or (2) an agency should be assigned for each ocean use, to be carried out in a specific, segregated ocean zone, as designated through a public process, and ratified by Congress. (Note: A third alternative put forth by Eagle is to create exclusive conservation zones, i.e., marine reserves, managed by one agency, and then let all other users find their places within the remaining multi-use zone, but he admits this is unlikely to gain broad support.)

Eagle’s cautions should be heeded even if a multiple-use, unified management approach is pursued, by including provisions to prevent undue influence by specific industries and ensure sufficient provisions for protected areas.

IV. Bringing i-MSP to U.S. Waters

If we conclude from the preceding analyses that i-MSP may bring significant benefits in U.S. waters, how might it be achieved? The most foolproof approach would be to pass a federal statute that sets out goals (presumably some combination of conservation and economic development) and guiding principles (such as sustainability, transparency, stakeholder input, and adaptability), creates national guidelines for the process, and designates a responsible agency (or agencies). Based on that directive interagency bodies, probably at the regional level, would define the precise scope of the planning exercise (what areas and activities are included), and the procedures and timeline to be followed. Stakeholder and scientific advisory bodies would provide input along the way. Master Plans, zoning maps, and implementing regulations would be issued for each zone or activity, and all relevant authorities at the local state and federal levels would conform their actions to that plan. Unfortunately, “[in] public policy, there is often an inverse relationship between potential effectiveness and political feasibility” (Nie, 2008).

Given the huge political hurdles in achieving a comprehensive, national mandate for i-MSP, we will most likely need to pursue a variety of strategies—top-down, bottom-up, and sideways—to reach a similar endpoint. All the avenues that have been used to influence public policy on the land also exist for the ocean. At the federal level, the President and Executive Branch can exert control through appointments, Executive Orders, agency reorganization, regulations, studies, and planning. Congress’s muscle comes from its ability to pass laws, confirm political nominees, oversee agency conduct, authorize budgets, and appropriate funds (including earmarks for pet projects and backdoor policy provisions). The Courts get to interpret the law through resolution of specific disputes. Each state has a parallel executive, legislative, and judicial system. Thus there are many ways for interested parties and the general public to influence policy at every stage of the process.
Outlined below are several options for advancing i-MSP in U.S. waters over the next five years, with comments on their strengths and limitations.

**A. National legislation**

Strong national legislation, including clear assignments of authority and an allocation of resources, would certainly be the most direct way to put i-MSP in place. As one agency manager said, “Without a legal requirement, agencies won’t take [i-MSP] seriously.” The governments of Australia, Canada, and Germany have required some form of marine planning, and Great Britain has similar legislation pending. But this approach is likely to be extremely difficult in a U.S. Congress where budgets are tight, a war is ongoing, climate change is the environmental issue of the day, and the level of interest in ocean issues is slim. One impetus for action could be the pressure to develop new sources of renewable energy offshore. Unfortunately, the intense controversy about the Cape Wind project off Nantucket forced quick, targeted action on that issue (as an amendment to the 2005 Energy Policy Act) without any debate about the broader problem of planning for all offshore uses. However, because of the continued need for Congress to resolve jurisdictional disputes between FERC and MMS concerning offshore renewables (see Box 3), another opportunity may arise to require integrated planning and inter-agency coordination.

For now, the main legislative vehicle for ocean governance reform is OCEANS21 (HR21) which is being actively promoted by the Pew Environment Program in coalition with NRDC, Oceana, WWF, Ocean Conservancy, and Ocean Champions. The bill was voted out of subcommittee in the summer of 2008, but stands little chance of moving farther this year. Although spatial planning is not mentioned explicitly in HR21, its proponents believe it will help advance that issue by establishing the principles of EBM in law. They argue that the practical implementation of EBM will then, inevitably, lead to calls for i-MSP.

Unfortunately, my interviews found little support for, and substantial antagonism toward, HR21 among users and managers:

“HR21 is a non-starter.”

“HR21 is too command & control oriented. It has too much baggage and a bad history with users and states.”

“They need to start fresh, with broader participation from the start.”

“HR21 will just be used to stop things. It gives NOAA too much control and new responsibilities that it’s not up to.”

“The idea of regional dialogue is good, but creating a new “box” with another layer of sign-off won’t help. Folks will get together where there’s a “community of practice” [i.e., common needs] and then small successes can catch fire. You can’t try to force that.”

Many of these perceptions reflect misimpressions about the current bill language as amended this session, but it appears to be too late to change these biases.
Other national legislative options were suggested by various interviewees, although none of them has been translated into specific bill language. Ocean industries like the idea of creating a clearinghouse to streamline all federal permitting for offshore activities. Representatives of state governments would like to get more federal support for their ocean and coastal activities, both in the form of dollars and help with data collection, but are reluctant to accept intervention or national standards in return: “The feds must accept that each state program will look different because of different approaches and authorities.”

Several people noted that it would be helpful to find ways to piggyback on Congress’s interest in climate change legislation. One such approach, being pursued by several environmental NGOs, is to get ocean and coastal ecosystems included in language about adaptation to climate change and eligible for use of possible “cap and trade” revenues.

In Great Britain (English Nature, 2006) planners have suggested that Parliament issue unified national ocean policy objectives (e.g., specific renewable energy targets, fishing and/or aquaculture quotas, etc.) which could then be implemented regionally. Although this would facilitate i-MSP by clarifying goals and prioritizing uses upfront, such centralized, top-down decision-making would be less useful in the U.S. and probably unacceptable politically. Unlike the small countries of Europe, U.S. waters vary widely from one coastal state to the next in their bathymetry, their coastal population density, and their political landscapes. As discussed previously, stakeholder involvement will be key in setting regional goals for i-MSP in the U.S. and ensuring support from all participants.

One ocean-related bill under active discussion is reauthorization of the Coastal Zone Management Act (CZMA). Suggestions have been made that EBM concepts could be incorporated into that Act, with language that would encourage state and regional ecosystem assessments, goal setting, planning, and performance standards. One state manager felt that some of their most positive interactions with federal agencies have centered on CZMA implementation and these relationships could be the springboard for broader cooperation. Others, including some environmental NGOs, are strongly opposed to this approach, believing that CZMA is not a suitable vehicle for fundamental reform of ocean governance and fearing that it would distract lawmakers from the central debate about HR21. Any broadening of CZMA’s scope also runs the risk of getting bogged down in additional Congressional committees. All things considered, it would be a mistake to ignore any ocean-related legislative opportunity. CZMA reauthorization will move ahead in the next Congress: those who support i-MSP should make sure the concept of long-term, multiple-use spatial planning is included in any discussion about coastal management. The Coastal States Organization would be a logical partner in this effort since CZMA is a high priority for them and they have also expressed interest in marine planning.

Another possible target for Congressional action is agency reorganization. (Although elements of reorganization can be achieved through Executive Orders, it is seen as more credible and longer lasting when it comes from Congress.) Merging, streamlining and
clarifying various agency authorities could make implementation of i-MSP much easier, even without specific legislation requiring such planning. Suggestions for agency improvements include clarifying NOAA’s mandate and getting rid of its current line office structure. One user thought that NOAA would be better off in the Department of the Interior “where they understand resource management,” and a DOI staff person echoed that by suggesting that “all fisheries, wildlife, and other resource management should be together under one roof.” However, an oft-repeated (if perhaps overly cynical) reaction to such suggestions is that the creation of the Department of Homeland Security—and its rocky performance—depleted Congress’s interest in any further agency reorganization so this approach would probably not be fruitful right now.

As one experienced observer noted, “To get anywhere with Congress, politicians need to know precisely what problem is being fixed, what it will cost, who benefits or loses, and when results will be seen.” Equally important, they must hear these facts from constituents they care about and trust. Based on my research, and the work of many others, I believe we can begin to make a solid case for i-MSP. But credible spokespeople are in short supply. Now is the time to start building broad support for a new ocean governance bill that includes i-MSP, to be introduced in a new Congress, preferably representing consensus language from a “coalition of the unlike” (see section above on Lessons Learned from Public Lands Management). The need for coalition building is discussed further below.

### B. Reinterpretation of existing authorities

A number of experts believe that substantial progress can be made toward i-MSP based on existing laws, management mechanisms, and programs. Options include issuance of Executive Orders or other administrative actions (the Dutch approach), enhanced cooperation between existing agencies (as done in Belgium), and more expansive interpretation of current laws, forced through litigation if necessary.

Creative state and local efforts that involve elements of spatial planning but fall short of true i-MSP—such as the MLPA process in California, fish and wildlife plans for marine areas in Florida, essential fish habitat planning processes under the MSA, or the eco-regional assessments and planning being spearheaded by The Nature Conservancy—provide a wealth of experience on which we can build.

A recent thorough review of existing laws and their adaptability to EBM and ocean zoning identified many promising opportunities (Parenteau et al, 2008). The authors conclude that EBM can be implemented now in the U.S. through determined and better coordinated application of existing agency authorities (including the Marine Mammal Protection Act, Endangered Species Act, Magnuson-Stevens Fisheries Conservation and Management Act, Outer Continental Shelf Lands Act, Coastal Zone Management Act, Clean Water Act, Clean Air Act, National Marine Sanctuaries Act, and National Environmental Protection Act). The main missing element has been Executive branch commitment and leadership. The authors suggest that an Executive Order could make a huge difference, simply by directing all federal agencies to use the full extent of their
authorities and resources to advance EBM and to prohibit actions that impede it. An inter-agency body under the Council on Environmental Quality (similar in structure to the current Committee on Ocean Policy) could oversee development of spatial plans for each LME, working with stakeholders through regional councils. Then each agency would exert its existing authorities in keeping with the plan. A number of the agency managers I spoke with agreed that much more could be done under current law if they received support from their political leaders. A cautionary note was raised by one interviewee noting that if individual agencies continue to regulate different activities, even within designated zones, overall impacts will need to be monitored and controlled. Similar to the TMDL concept, broader area-based environmental standards will be needed, and a mechanism created for agencies to work together to achieve them.

The existing White House ocean coordinating mechanisms (the alphabet soup of COP, ICOSRMI, SIMOR, and JSOST†) are not viewed as being terribly effective. One insider noted that “high-level people don’t show up and there’s no clear agenda.” The subcommittees can be useful when several agencies share a specific common need, but they have not been drivers for change since they possess neither carrots nor sticks to offer reluctant agencies. More than one person commented that it would take a White House appointed “Ocean Czar” to reinvigorate the interagency structure. One agency manager familiar with the process thought that COP’s location in CEQ could at least give it a built-in mandate to improve NEPA implementation, including a greater emphasis on cumulative environmental impact assessments. It remains to be seen whether the new administration will maintain or strengthen this coordinating structure.

The National Marine Sanctuaries Program was mentioned by a number of respondents as a possible test bed for i-MSP, with statements such as “[The Sanctuaries Program] is the best, maybe the only, existing framework for doing EBM across state-federal boundaries,” and “sanctuaries could be a starting place for federal marine planning.” The related NOAA effort to create a national network of MPAs was also identified as a possible avenue for broader planning, “if it ever gets more funding or energy.” Although specific Sanctuaries could serve as interesting test sites for i-MSP, it is very unlikely that this small NOAA program, whose mission is to create and oversee protected areas, would be the best home for truly integrated i-MSP in the long run.

One provision of the Energy Act of 2005 created pilot projects within which agencies work together as a team under one lead agency to issue certain offshore oil and gas permits. So far, industry is pleased with this streamlined one-stop system, and suggests that the model could be extended for other uses, each with an appropriate lead agency. Such an approach does not constitute true i-MSP since it remains sector-based, but its acceptance may open the door for similar multi-agency test projects.

† The Committee on Ocean Policy (COP), the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI), the Subcommittee on Integrated Management of Ocean Resources (SIMOR), and the Joint Subcommittee on Ocean Science and Technology (JSOST).
In the waning days of the current administration, we are unlikely to see progress on any of these administrative options. But a new White House (including a raft of new agency heads) will take over soon, and both major party candidates have expressed a commitment to environmental issues. To get ahead of the game, proponents of i-MSP should use the next 6-12 months to become unified behind a few well-developed proposals that could be presented to the new leadership, including appointment of a high-level White House point person on oceans, a renewed commitment to the CEQ/OSTP interagency coordination process (including funds and a list of action items with deadlines), and specific direction to the agencies to work together on an i-MSP pilot, most likely off New England or the West Coast.

C. State and regional level strategies

In a country as large as the U.S., with 3.4 million square nautical miles of ocean space in its Exclusive Economic Zone, it would be almost impossible to implement i-MSP in all regions at once. Proceeding at smaller scales has the advantage of greater feasibility, lower cost, and an ability to test concepts that can inform subsequent national action or legislation. Fortunately, this experimentation is already taking place in a number of states and regions. If certain models prove successful, the states involved will be in a good position to pressure federal authorities to harmonize planning in the EEZ adjacent to state waters.

One existing authority which might be put to greater use at the state level is the Public Trust Doctrine, a legal principle derived from English Common Law and further interpreted by the U.S. courts. The essence of the doctrine holds that the tidal and navigable waters of each state are a public resource owned by and available to all citizens for the purposes of navigation, commerce, recreation, and fishing. In many places the doctrine has been expanded by the courts to include a broader state interest in protecting the environment. A report of the U.S National Project on the Public Trust Doctrine (cited in Bray, 1998) pointed out that, "area-wide management programs may be structured, using the public trust doctrine … to encourage comprehensive management over lands, waters and resources within the area, and thus avoid the limitations inherent in ad hoc permitting decisions."

Below is a brief roundup of some of the more interesting developments taking place at state and regional levels. (This is by no means a comprehensive review of all relevant state coastal and ocean management efforts.) There are many ways that GBMF and others can nurture these budding efforts, but one of the most important may be to help like-minded state managers and coalitions to learn from each other’s efforts. I was repeatedly surprised in my interviews at how little each state’s leaders and activists seemed to know about developments elsewhere. A success in one place can be hugely instructive and encouraging in less receptive political environments.
Massachusetts
Efforts to advance i-MSP in Massachusetts have been developing over several years. Finally, in May 2008, Massachusetts passed the Oceans Act, which calls for creation of an ocean management plan to guide development, including renewable energy, in state ocean waters. Advocates worked hard for passage of the bill and hope to stay closely involved in the planning process. Although fishing activities are exempt from both the planning effort and associated user fees, and several already-permitted LNG terminals will go ahead in advance of any planning, this bill still constitutes an important step forward for i-MSP in the U.S. As one state manager said, “For too long we’ve been reactive to proposals. Now we’re thinking ahead.”

As in many states, the need for legislation was made more urgent by active requests to site offshore renewable energy facilities, but the plan being created now (and due in draft form by late 2009) will address all existing and foreseen uses. Although there will be opportunities for stakeholder input, leaders in the Office of Coastal Zone Management make it clear that this will not be a consensus process—ultimately they are responsible for making decisions and designating zones. Ecosystem protection is an overarching theme in the legislation, so the agency intends to start by identifying areas in need of protection, and then locating other functions around them.

The Massachusetts Ocean Partnership is a multi-sector coalition that has been working for three years to build bridges among the state’s ocean constituencies, in anticipation of the legal mandate for comprehensive ocean planning. Their role in the next phase of activities is not yet clear. One interviewee complained that “MOP outcomes do not match up with management needs” and hoped that it would become more directly supportive of the state-led process.

Rhode Island
Although overshadowed by ocean activities in larger nearby states, RI is in the vanguard of ocean planning. The state’s Special Area Management Plans (SAMPs), which have been around for 30 years, are now being used to create a complete system of ocean zones. As part of RI’s CZMA planning in the 1980s, the state’s Coastal Resources Management Council (CRMC) first zoned all coastal ocean areas, ranging from Type 1 areas that received the highest level of protection to Type 6 areas designated for industry and transportation. As part of that original process, areas deeper than 500 feet were assigned as Type 4, for multi-purpose use. It is those areas that are now being re-assigned to more specific use designations.

Requests to site offshore wind energy farms were the primary impetus behind the new process—and that industry is paying for a large portion of the environmental assessments—but the zoning exercise will cover all existing and predicted uses and leave room for the future. The head of the CRMC, who is very supportive of the planning effort, told me that when political leaders push him to site wind energy facilities right away he responds: “That would be like trying to choose the best place for a shopping center in a vast undeveloped land parcel.” One advantage for marine planning in RI is that the CRMC serves as both the regulatory agency and the submerged lands agency,
with authority over coastal and ocean areas and the ability to regulate upstream activities that affect the coast. This consolidation eliminates the inter-agency conflicts present in some other states.

Another noteworthy aspect of RI’s effort is the explicit incorporation of climate change and its impacts: planners are assuming a sea level rise of 3-5 feet by 2100, probable ecosystem changes due to temperature increases, and the likelihood of more and stronger storms. The RI legislature has been generally supportive of long term, thoughtful planning, but budgets are tight and funding levels will determine the pace of progress.

**New York**

As evidence that competition and state pride can work as positive motivators, coastal managers in New York insist that they (not Massachusetts, Rhode Island, or Oregon) have “the only statutory charge in the nation to do multiple-use ocean management.” (One insider pointed out there is no specific legal requirement for comprehensive ocean planning, but was pleased to hear that the implementing agency is interpreting their mandate broadly.)

The Ocean and Great Lakes Ecosystem Conservation Act, passed in 2006, established a multi-agency Ocean Council, chaired by the Department of Environmental Conservation and staffed by the Department of State. For now, the Council is overseeing two pilot EBM projects (building on existing EBM projects initiated by The Nature Conservancy), creating a research and monitoring plan, assembling a coastal atlas, establishing statewide EBM guidelines, setting up internet-based “communities of practice,” and requiring every state agency with coastal or ocean responsibilities to review all its programs and provide lists of additional actions that the Executive branch could take to advance EBM over the next two years. Above all, the aim of the Council is to create a new culture of collaboration and change the decision making process. Here again, political pressure to advance alternative energy, particularly offshore wind power, provided the initial incentive for action.

Over the next two years a working group of the Council has been directed to draft a spatial plan, “from the watershed to the edge of the EEZ,” including specific goals and metrics. (Although the drafters realized that state authority is limited outside the state’s territorial waters, they were concerned about future growth in the EEZ and want to make their vision clear in advance of any action at the federal level.) The working group will also make recommendations about legislative or jurisdictional changes needed to implement the spatial plan.

**New Jersey**

Spurred on by permit applications for offshore wind farms and the actions of its neighbors, NJ is just beginning to look at offshore planning. The legislature established an ocean council to make recommendations about marine EBM, but participants and observers expect slow, cautious progress.
California
California’s state waters are already busy places and activities are increasing, with recent proposals for LNG terminals, desalination facilities, and wave energy turbines. However, integrated spatial planning is not being pursued, in part because the ongoing effort to site MPAs pursuant to the MLPA has been so time consuming. Several active participants in that process are adamantly opposed to looking at a broader spectrum of ocean uses until the network of protected areas is completed. Although the MLPA has been effective in protecting a number of sensitive marine ecosystems, an argument could be made that this limited approach is no different from FERC and MMS efforts to site offshore energy facilities without considering other priorities for ocean space (such as MPAs!). In the long run, a multiple use planning process could prove more economically and environmentally effective, as well as less adversarial.

A recent detailed legal analysis (Sivas and Caldwell, 2008) explores options for moving toward ecosystem-based ocean zoning in California waters. The authors are thorough, thoughtful, and creative, and their recommendations should be valuable to anyone thinking about i-MSP. However, it is worth noting that the article, particularly in its lists of desirable legislative attributes and good governance principles, conveys an unequivocal conservation perspective, with much less emphasis on the value of economic development. In general, similar ocean policy papers emerging from Europe strike a more balanced tone. California has traditionally been a test bed for innovative policy ideas and a move toward i-MSP there would be very influential nationally.

Oregon
Since 1973, Oregon has maintained an ambitious statewide program of land use planning. At the heart of that program are nineteen Statewide Planning Goals that express the state’s policies on land use and related topics, such as citizen involvement, housing, and natural resources. Most of the goals relate to land-based activities, but Goals 16-18 address estuaries, beaches, and shores, and Goal 19 calls for “[conservation of] marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations.”

The state’s Territorial Sea Plan (TSP) was originally issued in 1976 to implement Goal 19, and has been updated several times since under the auspices of an interagency Ocean Policy Council. Now the TSP is being significantly revised to address the coordination of growing offshore uses. The plan does not alter existing agency authorities, but all regulatory actions must be consistent with the plan. (Unlike RI, Oregon divides ocean responsibilities between the Department of State Lands, which controls the ocean bottom and regulates many offshore activities, and the Department of Land Conservation and Development, the planning agency. Fishing and boating are regulated separately, as in many states.)

Agency managers describe an interesting evolution in their approach to ocean management over the last few years. In the late ‘90s, then Governor Kitzhaber called for establishment of a network of MPAs off Oregon’s coast. The agencies were attempting to implement that mandate, in the face of heavy resistance from the fishing industry which
was reluctant to share spatial information about their activities. (One environmental NGO described the original MPA siting process as “unworkable.”) Several years later, with new Governor Kulongoski in office, FERC received a number of permit applications for wave energy facilities in state waters and proceeded to consider them, with little input from the state (see Box 3). That threat to their space prompted fishermen, and many other interested parties, to come back to the table in a more cooperative state of mind, asking the state to produce a coordinated ocean management plan (a revised TSP) in which renewable energy would be just one player. The state has now signed an MOU with FERC to allow time for the new TSP to be completed before any facilities are permitted.

The manager of the current process says that he “fully expects to produce actual maps, at least for MPAs, fisheries, and renewable energy, with room left for future uses.” But another state agency staffer expressed concern that “this process will take leadership and courage” fearing that, once uses are tentatively assigned to certain areas, conflicts will be perceived and opposition will solidify. The revised draft TSP is due to be issued in early 2009.

**New England/Gulf of Maine**

The states and provinces bordering the Gulf of Maine have a long history of cooperation. The Gulf of Maine Council on the Marine Environment was established in 1989 by the Governments of Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts to foster cooperative actions within the Gulf watershed. Its mission is to “maintain and enhance environmental quality in the Gulf of Maine to allow for sustainable resource use by existing and future generations.” One of the Council’s projects is the Gulf of Maine Mapping Initiative, a partnership of government and non-governmental organizations conducting comprehensive seafloor imaging, mapping, and biological and geological surveys. The Initiative aims to produce maps of bottom type and topography throughout the Gulf basin.

The more recently formed Northeast Regional Ocean Council (NROC) is a partnership of six New England states (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and Vermont) with a similar aim, “to provide regional long term protection of ocean resources, balanced use of those resources for economic and ecological benefits, and a coordinated approach to finding and implementing solutions to our most pressing problems.” The Nature Conservancy’s ongoing marine regional assessment process should be helpful in bringing together data in an integrated manner across federal and state levels. NOAA and DOI serve as federal co-leads for NROC’s supporting Northeast federal interagency team, which includes ten SIMOR member agencies and receives praise from state-level managers. To date, NROC has focused primarily on cementing relationships and connections among the different players, but they hope to develop more concrete plans over time. With two NROC members, Massachusetts and Rhode Island, in the forefront of spatial planning in their state waters, this region should have a head start toward comprehensive i-MSP.
Mid-Atlantic Region
Monmouth University’s Urban Coast Institute has convened state managers and non-profit groups in the Mid-Atlantic region to promote EBM-oriented, multi-issue “regional governance” (adopting the Ocean Commission terminology). The organizers have not fully embraced the notion of i-MSP, but they believe that a lot can be accomplished simply through more proactive application of existing laws and improved coordination.

Gulf of Mexico
The Gulf of Mexico Alliance was established by the Governors of Alabama, Florida, Louisiana, Mississippi, and Texas in 2004, responding at least in part to recommendations from the U.S. Commission on Ocean Policy. In 2005, thirteen federal agencies coordinated by EPA and NOAA convened a corresponding Federal Workgroup to support and work with the Alliance. They have held several large meetings and issued an Action Plan that calls for coordinated science, improved Gulf water quality, and wetlands restoration but environmental NGOs in the region have generally been disappointed by the narrow agenda and limited progress.

The Harte Research Institute in Texas has played a significant role in encouraging and facilitating the Alliance. One professor there felt that the political climate in the Gulf States, which is generally pro-development and anti-government, would make it more difficult to advance i-MSP. In Texas, for example, the entire territorial sea (out to 10.3 miles) is now open for bids from offshore wind companies. This area overlaps with oil and gas leasing areas and the construction of wind farms could also have major effects on shrimp fisheries, but there has been no attempt so far to address these potential conflicts. Emphasizing the need for fairness among commercial users in the Gulf region is likely to be more effective than stressing the broader value of planning and regulation.

West Coast
The West Coast Governors’ Agreement on Ocean Health, signed in September 2006, establishes a regional mechanism to collectively advance the goals of: clean coastal waters and beaches; healthy ocean and coastal habitats; effective ecosystem-based management; reduced impacts of offshore development; increased ocean awareness and literacy among the region’s citizens; expanded ocean and coastal scientific information, research, and monitoring; and sustainable economic development of coastal communities.

A draft Action Plan, released in October 2007, set out specific actions needed to implement the goals. Although the Plan does not mention spatial planning or zoning, proponents of i-MSP could make a good case that a number of the items in the Action Plan would be well-served by such an approach, in particular:

- “Examine ongoing community-based efforts using ecosystem management principles in all three states and share lessons learned from these initiatives in order to encourage effective ecosystem-based management efforts across the West Coast;
- Explore the feasibility for offshore alternative ocean energy development and evaluate the potential environmental impacts of these technologies;
• Complete a seafloor map of the bathymetry and habitat of all state tidelands and submerged lands out to three miles; and
• Establish baselines for coastal economies and promote sustainable coastal community development.”

MMS is hosting a series of workshop on alternative ocean energy which was tagged as a critical element of the Governors’ Agreement. These will be excellent opportunities to raise questions about how offshore renewables will fit in with other proposed uses.

D. Stakeholder dialogues and public education

In the U.S., the concept of i-MSP is still virtually unknown outside a limited circle of ocean policy aficionados who talk to each other and read each other’s papers. As a necessary complement to any legislative, administrative, or state-level efforts, i-MSP proponents need to explain the value of i-MSP to a broader audience of managers, ocean users, and coastal communities. Even in countries that have legislative mandates in place, like Canada and Australia, planning is falling significantly behind schedule due to the absence of political or public pressure. In one state that is trying to implement ocean planning, the project manager said, “there are plenty of supporters for MPAs, funded by foundations, but we need credible folks to support the bigger idea of marine planning.”

i-MSP is probably not an appropriate topic for a major media campaign aimed at the general public, and no one would expect marine planning to become a daily subject on talk radio. Rather, a targeted, strategic communications plan should be designed that would speak to coastal and ocean managers, federal, state, and local politicians with an interest in ocean issues, coastal residents who are active in local and state politics, conservation groups, and the ocean industry and user community.

This campaign should be accompanied by focused stakeholder dialogues, conducted in small groups, with clear ground rules (including confidentiality) and professional facilitation. The purpose would be to air participants’ perspectives and concerns, identify trouble spots, and find areas of common ground. One potential participant in such a process suggested that dialogues would be most useful if they involved realistic planning exercises for some portion of ocean space: “Don’t let them devolve into a clash of ‘I wants’ among different sectors.” Another individual suggested that the relatively new regional ocean coordinating bodies (in New England, on the West Coast, and in the Gulf of Mexico) could be suitable hosts for these conversations.

Although a few non-profits and academic policy centers (e.g., NRDC, TNC, and the Nicholas Institute at Duke University) have shown an interest in i-MSP, and some are advancing spatial planning projects at international or state levels, no one has yet made it a signature national issue or devoted sustained resources to advancing it throughout U.S. waters. In fact, the very nature of i-MSP, with its emphasis on multi-stakeholder, mixed-use, economically and environmental sustainable planning makes it hard to see where its natural home would lie. The Joint Ocean Commission Initiative could be a suitable host because of its multi-sector composition, but to date it has focused primarily on regional
ocean governance, rather than i-MSP. The Coastal States Organization has expressed some issue in the issue but again, they represent just one of the many constituencies that need to be involved.

Another potentially intriguing new player is the World Ocean Council (WOC), which has been simmering for 12 years on the international scene and is poised to become more visible. According to its founder, WOC is a consortium of “ocean businesses who want to do the right thing,” including representatives from the shipping, oil and gas, fishing, aquaculture, and tourism industries who are committed to stewardship and sustainability. Its goals are to 1) determine shared ocean industry issues, 2) pursue dialogues to address conflicts within the private sector, 3) improve practices, standards, and certification programs for ocean industries, 4) foster better interactions with other ocean stakeholders. A partnership between the WOC and an environmental NGO could potentially break new ground.

E. Funding

In an era of tight government budgets, new programs struggle to find support. Every manager I spoke to who is attempting to implement some type of marine spatial planning complained of utterly inadequate funding. Most said they were “borrowing” funds and staff from other programs, applying for federal and private sources of support, getting pro bono help from universities, and pursuing whatever other tactics they could think of to move forward with their goals. Funding shortages are particularly acute for data collection, mapping, and ecological assessments. This situation leads to two questions: how much will it actually cost to support i-MSP, and where might those funds be found?

(i) The cost of i-MSP

Getting accurate estimates of the costs involved in a thorough marine planning and zoning process would be a major undertaking and was not included in the scope of this research effort. To get started, one would need to determine which elements to include in the cost estimate. Should i-MSP bear the costs of all coastal and seafloor mapping, environmental assessments, and stakeholder dialogues? And should the analysis assume that these elements will be carried out by agency staff, private contractors, non-profits, or universities? The answers to these questions will have huge impacts on the ultimate cost estimates. Moreover, each state or region is likely to be so different in its oceanography, user community, agency capacity, data holdings, and other factors, that the notion of estimating a “price per square mile zoned” is probably unrealistic.

In any case, it is safe to assume that a complete, well-run i-MSP process will cost more in the short term than the current piecemeal approach to ocean management. The tougher task, then, is to estimate the likely long-term benefits of i-MSP that justify the expense. Many of those benefits are outlined in an earlier section of this report, although it will be difficult to assign dollar values to items such as “reduced conflict.” Here again, it may be helpful to look to the history of public lands management which has struggled with similar issues of cost-benefit analysis.
(ii) Sources of funding

A major outstanding question that has not yet been thoroughly explored is whether, or how, i-MSP could be supported by revenues from the use of ocean space. The existing offshore oil and gas industry pays substantial royalties to the federal government, a portion of which is shared with nearby states. On the other hand, the commercial fishing industry does not pay any rent for its use of publicly-owned ocean space and resources. The U.S. Commission on Ocean Policy recommended that Congress establish “a policy that requires a reasonable portion of the resource rents derived from [offshore] activities to be returned to the public” and called for the creation of an Ocean Trust Fund that would receive such revenues (U.S. Commission on Ocean Policy, 2004). (A similar approach was attempted in 1965 with creation of the federal Land & Water Conservation Fund. That Fund was intended to use a portion of OCS revenues to support federal and state public land acquisition and conservation. Unfortunately, Congress has frequently diverted these funds for other purposes. Any legislation intended to fund i-MSP efforts would have to address this problem.)

Many mechanisms could be devised to compensate the public for private use of the commons, but no one seems to be suggesting a pure free-market approach where ocean space would be auctioned to the highest bidder, since that would almost certainly not meet broader policy objectives, especially the desire to conserve ocean ecosystems. MMS is looking at possible fee schedules for offshore renewable energy facilities under its new program, but said “royalties will probably not be keyed to fair market value, as they are for oil and gas.” Some states are considering similar fees for activities in state waters, although managers seemed very unsure about how they would determine a reasonable cost structure and how users would react. In Oregon, the owners of undersea fiber optic cables pay for 20-year leases, while royalties of 3-6% of net revenues are being considered for new wave energy installations. The new Massachusetts legislation creates an Ocean Trust Fund that receives the mitigation fees from ports and LNG terminals, but these will not be large amounts. No decision has been made about a broader structure of fees/royalties/or rents for offshore users in Massachusetts.

Looking back to lessons from land use planning, practitioners there found that the best way to attract increased public funding for conservation was to present a clear case for the value of healthy ecosystems to local economies. The same is likely to hold true in the ocean context. By collecting and disseminating information about the value of ocean resources and ecosystem services (including food, recreation, flood control, water quality, storm protection, etc.) and then showing how better planning can ensure the continued availability of these benefits, advocates can increase public support for i-MSP and create political pressure at budget time.
F. Tools and data

Ideally i-MSP should be accompanied by a thorough analysis of the relevant ocean region, including studies of its physical, chemical, and biological characteristics, an inventory of all the uses projected to take place in that region, an examination of how all the uses and ecosystems interact with each other, and an iterative process of testing out the results of different spatial allocations. Very little of that information is readily available to managers in most places, nor do they have the tools they need to process the information into useful scenarios and maps.

On the other hand, a number of managers made the point that agencies always operate with insufficient data and it would be a mistake to wait for complete information before attempting i-MSP. In fact, several supporters of i-MSP wondered whether it is being held to a higher standard (requiring extensive data collection, adaptive management, and broad stakeholder buy-in) than the status quo alternatives to which it is being compared.

(i) Data and Mapping

Ocean and coastal managers always wish for more complete three-dimensional, GIS-based data on ocean bathymetry, habitat type, species composition, and human factors, including ocean uses, relevant laws, economic impacts, and links to communities.

The most basic need, and one which could long ago have been met, is for accurate seafloor data. Available ship-based multi-beam sonar technology can produce detailed and accurate seafloor maps that include both bathymetric data and information about the composition of the seafloor. However, a 2004 report from the National Research Council found extremely uneven coverage of the country’s coastal areas and EEZ. At least 15 federal agencies are involved in coastal and ocean mapping activities, often with responsibilities shared among several divisions within the same agency. Many state and local agencies, academic institutions, and private companies also undertake mapping and other data collection efforts. As explained in Congressional testimony explaining the NRC report, “the result has been an inefficient and often chaotic collection of potentially overlapping, and often uncoordinated offshore mapping datasets and products that have been wasteful of resources and frustrating to users.” The U.S. Commission on Ocean Policy (2004) also recommended that federal agencies should “coordinate resource assessment, mapping, and charting activities with the goal of creating standardized, easily accessible national maps that incorporate living and nonliving marine resource data along with bathymetry, topography, and other natural features.”

In response to the NRC and Commission reports, the Federal Geographic Data Committee’s Marine and Coastal Subcommittee, along with the Office of Science and Technology Policy’s Interagency Working Group on Coastal and Ocean Mapping, are working to integrate and coordinate all federal marine data collection and mapping efforts. Unfortunately, a staff member at one of the agencies involved said that “coordinated assessments and mapping are very difficult and are not really happening. Each agency [USGS, MMS, and USACE] has different program needs, and there are
conflicts about who pays and who gets the credit.” One development that may help was a requirement in the 2005 Energy Act for the Departments of the Interior and Commerce and the Coast Guard to create a “multi-purpose marine cadastre” to support the MMS offshore renewable energy siting process. The agencies are using this mandate—and the money that accompanied it—to collect a range of data in both state and federal waters.

The methods of collecting ocean-related data (satellites, coastal radar, airplanes, ships, written and phone surveys, personal interviews, tax and business records) are as varied as the kinds of data needed. The two most pressing needs expressed by managers are for ecological information (species composition and habitat location) and spatially-linked socio-economic data. Certainly more funding is needed to fill in the blanks in our ecosystem maps, but the collection of socio-economic data is even trickier. Some of the most innovative work being done in the field of ocean mapping involves efforts to link activities in the ocean to related land-based communities and decision-making bodies (St. Martin, 2008).

Some suggestions for improved ocean data collection that emerged from the interviews include: making the Ocean Observing System (an expensive project being designed mainly for research purposes) include more management-oriented measurements; pushing NOAA’s regional science centers to undertake regular ecosystem assessments, not just commercial fish stock assessments; and encouraging more state/federal/private partnerships for ocean data collection. In a number of regions, The Nature Conservancy’s eco-regional assessment program has been able to gather much of the available information into one database, working closely with government agencies and others. The “Holy Grail” for ocean managers would be to have one unified, GIS-based, web-accessible database of features, uses, resources, and human factors throughout U.S. waters that could be depicted as different layers on a universal base map. That goal is unlikely to be reached anytime soon without significant investment by the federal government and/or ocean industries.

An artificial distinction is sometimes made between “data” and “maps.” A map is simply the visual representation of spatially-linked data. GIS-based mapping capabilities are well-developed and readily available (if not always entirely user-friendly). Technical mapping expertise is widely available (for example, at Lamont-Doherty Earth Observatory, the Center for Coastal and Ocean Mapping at the University of New Hampshire, the U.S. Geological Survey, Duke’s Marine Geospatial Ecology Lab, and NOAA’s Coastal Services Center) but maps are only as useful as the data that underpin them, which remain all too sparse as discussed above.

(ii) Analytic tools

A number of software tools have been developed to help managers and stakeholders analyze available data and compare different scenarios for the future. Up until now, this sort of spatially-explicit, multi-criteria analysis has been used primarily to site MPAs in a way that maximizes ecosystem protection while minimizing disruption to fishing and navigation. Of course, the task becomes much more complex when a multitude of ocean
uses is being accommodated and a larger set of objectives must be optimized. Figure 1 illustrates the main steps for managers wishing to undertake ecosystem based management or i-MSP and the tools needed at each stage.

Analytic tools can serve two purposes: improving decision makers’ understanding of the ocean area, uses, and impacts under discussion and helping to inform and engage stakeholders. As observed in the context of land use planning, when all affected parties are given good information and can readily see the implications of proposed management actions, the chances of acceptance and eventual compliance are greatly enhanced.

Managers interviewed expressed different views about the need for additional tools. Several felt there were plenty of analytic methods, but not enough underlying data to feed into them. Others seemed quite vague about how analytic tools could even help them. A survey conducted by the EBM Tools Network (www.ebmtools.org) identified four major problems for managers: insufficient funding and staff to acquire and effectively use tools, lack of consensus about which methods to use, insufficient cooperation between agencies supplying the underlying data, and lack of basic knowledge about the ecosystems being affected. The Network concluded that additional training is needed to help managers deploy decision-support and scenario visualization tools, analyze the socio-economic impacts of management, and better engage stakeholders.

One coastal manager, tasked with overseeing an ocean planning process, reacted with particular vehemence when asked about the availability of analytic tools. This person felt
they do not have what they need for trade-off modeling and scenario visualization. Instead, they are being forced to make do “with tools that were not designed for managers [such as The Nature Conservancy’s ecosystem assessment models] or to work with university-based researchers who don’t appreciate real-world deadlines.” This manager was clearly frustrated, and longed for increased funding that would allow managers to set their own specifications for tools and insist on timelines for their delivery.

The EBM Tools Network is a tremendous resource, including a database of hundreds of potentially useful software packages and a program of outreach and training for managers. But to make i-MSP less daunting, we will need to select a handful of proven modeling, scenario analysis, and visualization products (under guidance from real-world managers in the U.S. and abroad) that can be standardized, documented, and disseminated with clear training protocols. If i-MSP is to be widely implemented, we will need to graduate from the fascinating chaos of the academic world to the accessibility and universality associated with standardized business software packages.

V. Observations and Conclusions

The research and analysis outlined in this paper lead to a number of conclusions and raise some interesting questions. First and foremost, there is a growing body of evidence, from scholarly studies and a limited set of international examples showing that i-MSP can be an effective tool for managing burgeoning demands for ocean space. This section focuses on specific action items that might be pursued by the Moore Foundation and its grantees to refine i-MSP and advance its practice throughout U.S. waters.

Perhaps the most important observation, echoing lessons learned from management on land, is that there is no silver bullet. By pursuing multiple lines of attack, we can hedge against uncertainties and take advantage of the varied skills and personalities of i-MSP’s advocates to advance this approach in U.S. waters. Academics can refine concepts, GIS professionals can improve maps and other tools, NGOs can engage the public and advocate for change, and states can experiment with different approaches and share successes and challenges. The history of the environmental movement and other efforts at social change tells us that the best laid plans can encounter obstacles, while champions can emerge from unexpected places.

Many advocates for i-MSP have come to it as an extension of their interest in marine conservation and specifically EBM (e.g., Sivas and Caldwell, 2008). In some cases, i-MSP has been explicitly equated with the movement to control fishing and site more MPAs (Norse, 2005; Agardy, 2007). But the value of i-MSP is that it moves beyond a traditional “us vs. them” approach. It embodies the premise that marine protection is one “use” of ocean space, albeit a fundamental and extremely important one, but that economic development is also legitimate and valuable. If it’s wrong for fisheries, renewable energy, LNG terminals and other specific users to make end runs around a broader, integrated planning process, then it’s also problematic to advocate the creation of MPAs without placing them within a long-term vision that considers all users.
To date, EBM/ABM/i-MSP meetings in the U.S. have included primarily academic, government, and environmental group representatives. Even this project heard from only a limited set of ocean users (primarily fishing, oil & gas, renewable energy, and aquaculture). A broader range of perspectives must be brought in quickly to avoid allowing i-MSP to be branded as an academic concept or environmentalists’ strategy. One of the clearest lessons learned from land use planning and from the few i-MSP efforts already underway is that a clear, open, inclusive process has lasting value. One obvious next step then, is to begin to convene inter-sector and inter-agency dialogues, preferably assisted by user-friendly spatial planning and visualization tools, drawing from the full range of ocean stakeholders listed in Box 2. If a diverse group can articulate a shared, balanced vision for the future of their ocean region, the first step toward i-MSP will have been taken.

To draw new voices into the conversation, we will need to reach out actively to ocean industries, agency staff, and elected representatives at all levels with clear, accessible, consistent information about the goals and potential benefits of i-MSP. A small but diverse group of speakers carrying a consistent message would be extremely valuable in introducing new audiences to i-MSP and making them comfortable with the concept.

With a few exceptions, I found that analogies to the more familiar concept of land use planning can be very useful in raising people’s comfort levels and breaking down possible mistrust of i-MSP. In many coastal regions, the public and its elected leaders believe that land use planning has helped them create a shared vision of community and prevent unwanted sprawl. Making i-MSP an extension of this experience should ease the way. (Although we have seen that i-MSP bears a greater resemblance, legally and technically, to the management of public lands, that history does not evoke the same positive associations as city planning.)

One potentially controversial question will be whether to include the offshore oil and gas industry in stakeholder dialogues on i-MSP. Conservation groups and many states hold to the existing offshore drilling moratoria as hard-won and sacred victories. But realism and recent politics suggest that it would be better to invite this industry inside the i-MSP tent rather than let it focus only on its own goals. They bring money and clout to the table, and have the experience and resources to help conduct desperately needed offshore mapping and environmental assessments. With rising oil prices and growing calls for energy independence, it would be more prudent to acknowledge the likelihood of future offshore oil and gas development during the marine planning process than to have those activities trump everything else, quite possibly in an atmosphere of urgency and short-term need.

One surprising finding from the interviews I conducted was the lack of communication between states engaged in very similar ocean planning and management efforts. As described in Section IV. C. above, there is a lot going on at the state level, at different scales and under different names. With better sharing of practices, information, and tools, and improved synthesis of results, these individual state efforts could gain momentum
and put pressure on federal agencies to follow suit. The learning process can be enhanced by disseminating information about experiences in other countries and sponsoring exchanges between U.S. and foreign i-MSP practitioners.

In terms of specific legislative or regulatory strategies, HR21 is probably not the most straightforward way to advance i-MSP at this time, due to its indirect connection to marine planning and considerable political baggage. (HR21 may achieve other important marine conservation goals not specifically examined in this paper.) One useful task for a multi-sector working group would be to draft the kind of legislative language that could advance i-MSP, whether such language were introduced as a stand alone bill or as an amendment to other legislation. In any case, every ocean-related bill that comes up for debate in the next Congress (such as action on CZMA, climate change, aquaculture, renewable energy, or offshore oil drilling) should be scrutinized to see how it connects with broader ocean management needs. When a new administration is in place in 2009, its top appointees and advisers should be encouraged to reinvigorate the federal interagency ocean policy process, including giving specific instructions to the agencies to begin spatial planning in one or more regions, backed up by a mix of carrots and sticks to make it happen.

Obtaining integrated assessments of all U.S. coastal and ocean regions, including information about economic activities and their links back to coastal communities, will be a critical task. However, it will also be expensive, time consuming, and difficult. This task will undoubtedly require creative partnerships between government, industry, foundations, NGOs, and academia, an approach being pursued already in some areas (for example, see the discussion above about activities in New England). Data that document the economic benefits provided by healthy ocean ecosystems will be particularly helpful. Such information can help guide spatial planning and, equally important, help build broader public and political support. Although the initial steps of marine planning can get started without complete information (as has been done for all other management approaches), the results will be greatly improved over time with better information about the ecosystem and its users.

Although it seems like a small point, achieving consistent nomenclature remains a challenge (as seen in Box 1). I have used the term integrated marine spatial planning (i-MSP) in this paper because it incorporates what I consider to be key attributes. It could be criticized for referring to planning without the subsequent phases of zoning, regulation, and management, although I intend it to encompass those aspects. It will be hard to build a broader base of support for i-MSP when even its proponents aren’t quite sure what it includes or what to call it.

All of my research and interviews lead me to believe that some form of spatial planning will be necessary for the future of ocean management. Fortunately, this is an opportune moment to advance new approaches: offshore energy production, both from oil and renewable sources, is being actively promoted for the first time in years; the need to make wild fisheries sustainable seems to have finally sunk in; and discussions about the impacts of climate change have communities thinking about the future. The i-MSP
elements of consensus building, goal setting, and planning can be done carefully and thoughtfully now, while space is relatively plentiful and new uses are just being developed, or it will need to be done later as conflicts grow between entrenched interests.

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