

# Massachusetts Ocean Partnership

## Comprehensive Ocean Management Workshop Wednesday, November 12, 2008 Boston Fish Exchange

This meeting summary is provided as a service to our Partners who could not attend. Each main workshop presentation is represented by a brief abstract which is followed by the related question/answer session.

Time	Presentation/Activity
9:30am	<b>The Ocean Management Act—Where it came from where it's going</b> <i>Susan Tierney, Chair, Ocean Advisory Commission</i>
9:40am	<b>The Massachusetts Ocean Partnership (MOP) Planning Framework Effort</b> <i>Stephanie Moura, Executive Director, MOP</i> <i>Rich Delaney, MOP Board Chair</i>
9:50am	<b>Ocean Law and Policy in Massachusetts</b> <i>John Duff, J.D., L.L.M., UMass Boston, Environmental, Earth &amp; Ocean Sciences Department</i>
10:55am	<b>Ecological Science to Inform Integrated Multiple Use Management</b> <i>Heather Leslie, Ph.D., Assistant Professor of Environmental Studies, Center for Environmental Studies, Brown University</i>
11:45am	<b>Marine Spatial Planning-theories and applications</b> <i>Jack Wiggin, Director, Urban Harbors Institute, UMass Boston,</i>
1:15pm	<b>The Marine Economy and Environment in Massachusetts</b> <i>Porter Hoagland, Ph.D., Marine Policy Center, Woods Hole, Oceanographic Institution</i>
2:00pm	<b>Compatibility Determination and Decision Support Tools</b> <i>Tracey Dalton, Ph.D., Associate Professor of Marine Affairs, University of Rhode Island</i> <i>Ward Feurt, Refuge Manager, USFWS Rachel Carson NWR</i> <i>Ben Cowie-Haskell, Deputy Superintendent Stellwagen Bank NMS</i>
3:15pm	<b>Moderated Discussion among OAC and SAC Members</b>
4:30pm	Adjourn

### Ocean Law and Policy in Massachusetts

John Duff, J.D., LL.M.

Assistant Professor

Environmental, Earth and Ocean Sciences Department, University of Massachusetts Boston

The use and development of Massachusetts's offshore space and resources plays a vital role in the lives and livelihoods of the people who call the Commonwealth their home.

That reality is evident from the earliest statements of Massachusetts when it joined a chorus of voices in declaring independence from England and claiming the oceans off North America as "our" own. Much more recently, the Commonwealth engaged in an effort to examine the manner in which our ocean resources were being employed and to



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consider how increasing pressure on those resources might be handled. The state's Ocean Management Task Force identified a need for comprehensive ocean planning in 2004 and the legislature acted in creating the Ocean Act of 2008. That law calls for the development of an ocean management plan by the end of 2009 and requires that such a plan be based upon public trust principles that require the Commonwealth to manage the state's ocean waters for the benefit of its people. Some pessimists have criticized the act for failing to extend its jurisdiction to nearshore waters (it excludes certain harbors and approximately the first 1/3 mile of waters adjacent to other areas) or to fisheries. Optimists highlight the fact that the law, while limited in those ways, is one of the first in the nation designed to move toward integrated multiple use management.

The 2008 act also calls on the state to employ a variety of considerations in ocean planning, noting that any plan must, among other things: consider existing uses; foster sustainable uses; engage the public; identify important habitat; value biodiversity and ecosystems; and identify suitable locations for particular activities. And the act contemplates (and state ocean resource managers understand) that any ocean plan developed will not be drafted on a blank slate. A wide range of international, federal, state and local interests currently influence the manner in which offshore activities take place. As a result, considerable attention ought to be applied to the requirement of the Act that calls on any plan to be implemented in conjunction with a coordination process with existing sectoral and jurisdictional authorities. Examples of coordinated ocean authority that are informative (even if not directly applicable) include the delegated authority of national fisheries jurisdiction to the Commonwealth for the federal waters of Nantucket Sound; the consistency provision of the Coastal Zone Management Act, resource sharing provisions of the Outer Continental Shelf Lands Act and "veto" provisions considered by Congress and afforded to states regarding the use of proximate federal submerged lands and waters for aquaculture and/or oil and gas development.

## Questions for Dr. John Duff—

**Question:** (John Bullard) My perspective on the second to last slide, where pressure to use land or resources is increasing, is that high pressure creates need, but makes it difficult to control. There is a need to anticipate what's going to happen (what might become the pressure) and also anticipate the appropriate management action. By the time you realize you need control, it's impossible to get them in place.

**Answer:** Yes - While there is little pressure, you should explore who is/will be using the resource, and think about how you might prepare to manage that use.

**Q:** (Carlton Hunt) You address the overlap between Federal and State jurisdictions and management, but what about state-to-state interactions with regards to ocean management decisions that might impact a neighboring state? Is there a special section of the management plan that addresses this as another step in the process?

**A:** The Consistency provision of Coastal Zone Management Act (CZMA) allows states to have say in other state's actions if it meets criteria to do so (such that one state impacts what is happening in another for a federal activity). Ex: A decision made for VA coastal water resources would impact NC waters. Though the activity was in VA, NC (via CZMA) was allowed to comment on VA's act as it relates to NC consistency. When CZMA is not applicable and there is no federal involvement, it becomes a matter of the states being willing to cooperate. In that case states must engage in cooperative relationships or agreements.

**Q:** (Carlton Hunt) How does a Special Area Management Plan (SAMP) apply to the MA planning effort?

**A:** Portions of the Act suggest that something like a SAMP might be possible – certainly there should be places that receive special protection. Special Area Management Plans (SAMPs) may be part of the foundation in OMA 2008, and we'll be moving in the direction to which you're alluding.

**Q:** (Frank Muller-Karger ) You didn't talk much about the Land/Ocean Boundary, but actions on land certainly affect what

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happens in the ocean and vice versa. How do we address the ocean/land boundary (especially considering the fact that the Act's boundary doesn't reach land)?

**A:** This gets back to the idea of the glass half empty/full. Eco-analysis steps into the waterlines. Many would have liked to see the Act's planning area be extended to the coast or even into the watersheds. While boundary lines exist for the planning area though, the reference to other agencies and the need to coordinate is included in the Act through the coordination Principle. Refer to coordination between the uplands and the lowlands. OMP could say "we will engage in cooperative plans." The state can't just reach up onto private land outside of an equitable process.

**Q:** (Greg McGregor) The state is setting precedents in energy, ownership, education, sponsorship events. The law often lags science and policy. Will the efforts of the state, not only delegate who does what, but what relationships need to be established between which entities? Is there a Home Rule?

**A:** Only the State can say how they will likely proceed; but coordination is essential. Law and policy development related to this law is not limited just to ocean related laws. Tax law, etc. will have impacts on the ocean (use, etc.)

**Q:** (Andrew Vorce) How do the Federal Laws differ from State Laws with respect to water, and how will we coordinate the two (including the Minerals Management Service)? It is important for community to understand how coordination will happen.

**A:** The federal government has the ability to delegate authority, but also actual assets, or title to space. One way to coordinate things is to employ congressional delegations at federal level on behalf of the States. Congress often reaches out to the Territorial Seas line of 12 nautical miles, but it typically fails. How these will be coordinated is still to be determined, but clearly this is an issue.

## **Ecological Science to Inform Integrated Multiple Use Management**

Heather Leslie, Ph.D.

Assistant Professor of Environmental Studies and Biology  
Brown University

The three key messages of this presentation are:

1. Ecosystem services provide a clear link between ecosystem functioning and human well being,
2. Ecology can contribute knowledge of ecosystem functioning, and strategies for monitoring ecosystem change & management success, and
3. Evaluating effects of management requires an integrated monitoring program that includes ecological, institutional, economic and social elements.

Massachusetts' coastal and marine ecosystems generate many important benefits or ecosystem services for the residents of the Commonwealth. Scientists classify ecosystem services into one of several types, including provisioning services like fresh seafood; regulating services like water purification and protection from coastal storms; cultural services like tourism and education; and supporting services like nutrient cycling. However, the diverse array of activities in state waters – as well beyond - has contributed to degradation of marine ecosystems and the services they provide to a greater degree and a broader extent than ever before (Millennium Ecosystem Assessment 2005, Halpern et al. 2008). Moreover, overlapping and often conflicting government mandates, conflicts among resource users, and the lack of clear legal framework to enable forward-thinking, equitable and science-based management hamstrings effective stewardship of coastal and marine systems (Leslie and McLeod 2007, Leslie et al. 2008).

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Integrated multiple use ocean management addresses the full range of human uses across sectors; is supported by credible science; incorporates public and user-group input, is adaptable to changing needs, and supports sustainable marine industries and resilience ecosystems (Massachusetts Ocean Partnership 2008). Key elements of integrated multiple use management include recognizing humans as part of rather than isolated from ecosystems; place-based approaches; consideration of the interaction and cumulative effects of human activities; a focus on ecosystem services as targets for management action and explicit articulation of trade offs among key services and activities; and adaptive management of human-marine environment interactions.

While many areas of natural and social science are needed in order to develop an integrated multiple use management plan, ecological science in particular can contribute knowledge of ecosystem functioning; monitoring and assessment of management success; and data integration and decision support tools. Prof. Dalton and colleagues discussed the last area; in my presentation, I focused on the first two elements.

Key aspects of marine ecosystem knowledge for the Massachusetts ocean planning process include consideration of how the Massachusetts Planning Area is linked to the terrestrial, coastal, and open ocean environments in the region, and of how ecosystem functioning and human use patterns vary on multiple temporal scales, from seasonally-based fishing and recreation activities to multi-decadal climatic variability like the North Atlantic Oscillation.

Ecology also can contribute information and methodologies for assessing the success of an integrated management strategy, once the Plan has been implemented. A broader array of ecological indicators will be needed in order to assess how ecosystem health and resilience respond to integrated management strategies. While many relevant data are already being collected by state and federal agencies in Massachusetts' waters, further attention to monitoring and evaluation will be key. Moreover, adaptive management and assessing progress towards integrated management will require broad engagement of natural and social scientists.

## *References:*

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## **Questions for Dr. Heather Leslie—**

**Q:** What is the role of prey species? How important are the forage species? – In terms of ecosystem health and functioning?

**A:** We're recognizing the importance of forage fisheries and their increased use; and the Gulf of Maine, NOAA, and WHOI are doing modeling and gathering info on prey species. We don't need to monitor or measure everything. Once goals are clear, thinking strategically and focusing on a few important species is key.

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**Q:** (Katherine Ford) What is the definition of “vulnerable” in this context [habitats]? What literature should I look for?

**A:** Ben Halpern and colleagues are a good resource for cumulative impacts on ecosystems “Global Maps of Human Impacts on Marine Ecosystems.” Think too about how you are defining “vulnerable” – in terms of abundance? recovery? etc. The EPA has also done work related to this. There should be a systematic, not *ad hoc* approach.

**Q:** (John Bullard) In describing IMUOM, you used the word “adaptive” and “experiment” – and noted that people don’t like to be experimented on. But there is a management system in place already – therefore there is ongoing experiment already. [Adaptive management is really just a continual experiment.] How do we improve the system, not just make a new experiment?

**A:** The question is how to learn from the past/existing experiment, and make improvements. Let’s monitor this experiment.

**Q:** (Carlton Hunt) What do you consider the poster child of integrated adaptive management (IMUOM)? Just don’t use Chesapeake Bay as an example.

**A:** What MA has set out to do is very hard, but is necessary. Small scale examples exist in Morro Bay, CA (brought together similar group but on smaller sound) and Puget Sound (private/public partnership) both have a clear vision; and the Dept. of Fisheries and Oceans in Canada offers a useful model. They focused on offshore waters with fewer institutions and actors though, so it’s not 100% comparable to MA where there are a lot of actors in the planning area.

**Q:** (Carlton Hunt) There are a number of scale issues. Hemispheric physical scales are also a major driver of things – such as wind change. Don’t we need to consider that scale?

**A:** All processes (i.e. The North Atlantic Oscillation, which is decadal) occur on multi-year time scale and impact productivity/functioning. You will need to study and adjust monitoring accordingly with goals/objectives in minds.

**Q:** (Dave Terkla) Are you familiar with any specific ecological models that incorporate human interactions as a part of the ecosystems?

**A:** That’s an area that is rapidly developing. See Tracey’s presentation where they will explore that sort of a model.

**Q:** (Audience) To what extent will adequate monitoring of the direct effect of resource use (i.e. overfishing) be separated from the overlaying effect of climate change?

**A:** There are existing studies (i.e. European Examples) on climate change effects from similar ecosystems; but separating the effects will require long term data on a large scale beyond that of the planning area. MA will need to build on those data sets as needed. NOAA has been doing some work further offshore, and others are also currently doing studies we can build upon.

**Q:** (Audience) “Biodiversity.” Are we at a point where science has advanced to give us all of the answers we need? What area has identified the importance of biodiversity and which has contributed most to the development of the plan? What about the fields of science, the economy, economics? Do we have any objective measures to achieve?

**A:** As an ecologist, I think that ecology plays an important role. Ecological science can certainly contribute to this plan’s development – it can speak to the interaction of species, services, etc.; but you also need oceanographers, economists, etc. Ecologists do a good job integrating across many pieces. Scientists are not in a position to say what the best course of action is – that’s a social decision; but scientists can tell us likely ecological outcomes of a set of management objectives.

**Q:** (Rob Moir) We like to deconstruct and pick out keystone species, but they change. How does one safeguard the metric making from the importance of redundancies to bring about resilience of a system? Is that a justification of diversity?

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**A:** We can manage for a condition that is more likely to be resilient to human action or perturbation without having to look at each species. There are likely to be some surprises, but we know enough to come up with a reasonable series of indicators likely to capture major elements of what we're trying to evaluate. We can employ a variety of management options to increase resiliency; but is what we want a resilient system? If so, the planning can proceed accordingly.

## **Marine Spatial Planning: Theories and Applications**

Jack Wiggin, Director

Urban Harbors Institute, University of Massachusetts Boston

Marine Spatial Planning (MSP) is a common element of efforts around the world to manage and protect the ocean environment. As defined by Charles Ehler in and Fannie Douvere in *Visions for a Sea Change*, MSP is the process of analyzing and allocating parts of three-dimensional marine spaces (ecosystems) to specific uses to achieve ecological, economic, and social objectives that are usually specified through a political process." The increasing demand by traditional and emerging uses for ocean area and resources necessitates an approach that can reconcile economic, social and environmental needs with the ocean's capacity to accommodate the demand. As such, MSP is one of the practical means for operationalizing the concept of ecosystem-based management.

Key characteristics of MSP are its comprehensiveness (consideration of all uses and resources), integration of all sectors, allocation of space to avoid incompatibilities between uses and resources and between different uses; its ability to assess cumulative impacts, and its plan-based approach of identifying areas suitable for protection, development and/or multiple uses.

While MSP is relatively new, its land use planning lineage is widely practiced. The earliest examples of MSP are from Marine Protected Areas, such as the Great Barrier Reef Park, which focus largely on resource protection. Most comprehensive efforts date only to the early years of this decade with examples in all parts of the world.

### **Questions for Jack Wiggin—**

**Q:** (John Bullard) What's the inshore boundary of most of the plans you looked at?

**A:** It varied. It's typically (in Massachusetts) the mean low water mark, but jurisdictions may be split, where the land was extended directly from territorial land use.

**Observation:** (Anamarija Frankic)

(1) In order to develop a plan, you need to prioritize uses. That was an issue in Belgium, where there were more than 20 uses. (2) Also, there is a choice between three "goals" of social aspects, economic issues and ecosystem resiliency. Often we make choices based on the first two, but it's the last (environmental) that sets the limits on economic and social opportunities/uses; and we should therefore really form the State's approach with the environment at the forefront.

**Response:** Yes, those value decisions will have to come into play. The process starts as an analytic exercise and then becomes a matter of public decision.

**Q:** (Carlton Hunt) The MSPs you looked at were largely based on uses, regulations, and laws. How do you judge the impact on those pieces? Were any of the studies looking at the impact? What were those criteria?

**A:** The presentation focused on the marine spatial planning (MSP) aspect; but there are criteria for developing impacts that would take place with or without spatial planning. We're looking at one way of looking at it. Not the end, but the beginning of the process. There are criteria for acceptable levels of impact.

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**Observation:** (Carlton Hunt) First one needs to establish criteria for siting something, then you can set your criteria.

**Reply:** The overall idea is to set spatial areas where activity is suitable and has less harm than it might have elsewhere. Then you would need to evaluate and actually site it. There would be criteria for acceptable levels of impact.

**Q:** Most maps are static, but the currents change with seasons and time, etc. How are we moving toward a dynamic set of maps? Are we ready for these dynamic maps? Ocean observing system, etc. could change maps minute by minute.

**A:** Dynamic maps are handled in few places, but those types of maps were not readily visible in anything reviewed for the presentation. A lot of attention was paid to monitoring and adaptation. This might be one of the reasons why there aren't more examples of MSP with maps – the dynamic nature of the environment makes it difficult to plan. Also, these exercises aren't always undertaken with the goal to create a final map of uses/non uses. [Belgian analysis may not have intended to have a "final map" of everything, never a static map, but input maps which are continually changed and updated.] In some cases, people are looking for information on how to make a decision, so they might create and update input maps, but never make one final map.

**Q:** (Priscilla Brooks) What is the difference between ocean zoning and marine spatial planning? Does a MSP become zoning when it is regulated? Can you implement a MSP through means other than ocean zoning?

**A:** Only a few places have transferred an MSP to zoning. Most use MSP for decision making or permitting, or infrastructure capital investments, and other mechanisms that help determine what sorts of uses take place. An MSP falls into the category of guidance.

**Q:** (Deerin Babb-Brott ) Do you think the language in the Act provides sufficient authority to justify MSP?

**A:** There is spatial and regional language in the Act (in the principles of the Act). If you're going to be making decisions about uses, there will be a spatial element. More specifically, the terms of "identifying sensitive areas " and "appropriate" and "considering habitat use", and other ideas mentioned in the principles provide a strong basis for MSP. The real test will be whether a particular approach you want to employ butts up against existing laws. This will require some reaching out to see how far you can go. The principles in the Act are ambiguous enough to allow for discretion, while being specific enough to give direction.

## The Massachusetts Marine Economy

Porter Hoagland, Ph.D.

Senior Research Specialist

Marine Policy Center, Woods Hole Oceanographic Institution

This presentation is divided into two parts. In the first part, we review briefly the results of a recent study that characterizes the size of broadly defined coastal and marine industry sectors in Massachusetts and their connectedness to the larger Massachusetts economy. In the second part, we focus on the utility of economic analysis in understanding the relevant tradeoffs when implementing integrated multi-use ocean management (IMUOM).

A 2004 input-output model of the Massachusetts economy was utilized to describe the importance of coastal and ocean related sectors (Donohue Institute 2006). Direct output impacts (sales) in Massachusetts marine economic sectors total nearly \$9 million, representing about three percent of the state's economy. Importantly, coastal and marine tourism

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accounts for well over 50 percent of direct output impacts in the marine economy. The marine science and technology sector exhibits the largest economic multiplier, implying that it is connected more deeply than other sectors to the economy. A similar pattern exists in the employment data.

The authors of the study draw a number of conclusions. Among these conclusions, business conditions are stable and generally positive. (The effects of the impending recession on the coastal and marine sectors are unknown.) The authors find that the costs of real estate are by far the most significant issue facing marine and coastal tourism businesses. Further, the availability of land suitable for expansion is seen as a problem by firms in this sector.

While land costs may be viewed as restricting the industrial growth of coastal and ocean related sectors, their existence is evidence of a market at work. Other participants in the coastal land market, primarily homeowners, compete for this scarce resource, which tends to drive up the price. The market is an institution for making tradeoffs involving a scarce resource: coastal land. Unfortunately, we do not have such an institution for allocating ocean resources. We must rely more heavily, therefore, on planning and governance tools, such as IMUOM.

In the context of ocean planning for Massachusetts, many experts have referred to the need to make *tradeoffs* among ocean uses (or non-uses, such as preservation). Unfortunately, little light has been shed on just how tradeoffs are to be implemented. In an important paper on sustainable development that touches upon the idea of tradeoffs, MIT Professor Robert Solow has pointed out that “[y]es-or-no lends itself to stalemate and confrontation; more-or-less lends itself to trade-offs” (Solow 1993). IMUOM surely involves evaluating more of some ocean activities and less of others. This kind of evaluation is difficult unless activities can be compared using a common metric. Economics provides both the methodology and the metric, dollars, to facilitate tradeoffs. Even if decisions ultimately must be made on the basis of equity or are subject to existing policy constraints, economic analysis plays an important role in clarifying how much society gains or loses from tradeoffs.

Tradeoffs necessarily involve opportunity costs, which are measures of what must be given up in order to undertake an exclusive activity in an area of the ocean. Economic analysis may be used to evaluate these costs, and we review some appropriate methodologies. For example, decisions to site non-transitory facilities may involve the exclusion of certain kinds of transitory uses, such as commercial fishing. Consequently, we need to assess the opportunity costs of siting decisions, in terms of lost consumer and producer surpluses arising from seafood production.

It is important to recognize that, in cases in which we treat the ocean environment or its resources as an unpriced input in the production of economic goods or services, the degradation of the environment or the overuse of its resources are the likely consequences. When this happens, the economic values of the environment or resources are lessened. As a result, the opportunity costs of non-transitory siting decisions are reduced, making it more likely that such uses would prevail in an assessment of economic tradeoffs. We review two cases where sitings of non-transitory facilities in the coastal ocean, deep-water ports for LNG deliveries and wind farms, are compared to the potential value of poorly managed fisheries.

Where the ocean environment has been degraded or its resources overused, a plea to use the potential value of undegraded environments or well-managed resources in tradeoff assessments can be justified only if we can demonstrate the ability to maintain a healthy ecosystem or to manage our resources rationally. Unfortunately there is little evidence in Massachusetts for rational fisheries management; there may more evidence for ecosystem improvements through reductions in waste disposal.

## References:

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## Questions for Dr. Porter Hoagland

**Q:** Doesn't a highly regulated area/activity (like waste disposal where waste is highly treated first, area under the Clean Water Act) involve spending money – thus internalizing what might otherwise be an external cost? **A:** This might not be the most efficient way of managing the resources; and there may be overuse of a resource (too much pollution getting into the environment, etc.)

**Q:** (John Bullard) While a resource can be over used, he rejects the idea that we haven't priced the access correctly (ex: fisheries). He does not accept the thought that one major way to manage the ocean is to charge people more for the right to fish. It's more management plans, etc. Does "pricing" really regulate things? **A:** The presentation was highlighting significant barriers to ocean management. The implicit subsidy of not charging to fish can lead to ruined fishery. Issue needs to be addressed. Managers should know the net value of LNG, wind, etc. vs. fisheries – they might favor the other uses from an economic standpoint.

**Q:** (Nancy Wheatley) Did you consider that with the MWRA treatment plant, there is now greater biodiversity (e.g. new species)? The 'return (of development and people) to the waterfront' is another benefit that would not be here if Boston harbor water quality was still poor. Has this economic benefit of the cleanup been considered? **A:** Some documents for cleanup did look at the economics. Rates for waste disposal may have been properly changed.

**Q:** With regard to property rights in the ocean: How does the conflict of giving property rights to fisheries impact compatible/incompatible uses? Would your giving the fishers these rights eliminate them from others? **A:** If you assign property rights, they give fishermen a right to a particular location. In New Zealand, ITQs give fishers the right to a space in the ocean (because of the location of the fish). If you use ITQs, you need to figure out how you trade that off with other uses.

**Q:** Do you have any way of valuing the fisheries once the fish have returned? Have you considered the value of recreational fishing? **A:** This is a political question of whether we can manage fisheries efficiently. So far, we haven't been able to do that. It's possible to develop bio-economic models to understand the optimal level of fisheries and then calculate the value of that fishery.

**Q:** (Polly Bradley) We should make restoration of fisheries a goal of this plan rather than look at it as if the destruction of the fishery lowers the value of the ocean. [Shouldn't we value restoration as a pure goal of the project, rather than valuation?] **A:** Economists look at it as maximum economic yield

**A2:** To reiterate, to the degree that we don't properly manage the resource, as pure conservation doesn't stand a chance against all other use values.

**Comment:** (Frank Muller-Karger) Regarding cooperation between management agencies, all of these have a land connection. Access, nutrient, energy, tourism, etc. have a land connection. It is important that we include this in the permitting process.

**Comment:** (David Terkla) To the degree that we don't properly manage the fishery, they don't stand a chance against other more lucrative uses. We want to manage the fisheries in a way that they can compete with other uses.

## Compatibility Determination & Decision Support Tools

Tracey Dalton, Ph.D.

Marine Affairs Department, University of Rhode Island

Human activities and environmental features continually interact across space and time in coastal and ocean waters. To better understand the consequences of these interactions, planners, decision makers and others involved in ocean resource management can use a process known as compatibility determination (CD). CD is a process that leads to a determination about what activities and environmental features *should* be allowed to occur in a particular space and time. There are at

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least seven factors that should be considered in the CD process: (1) policies that are already in place to manage human-environment interactions; (2) designated authorities for implementing final determinations; (3) stated goals and objectives that will be used to guide the determination; (4) relevant stakeholders to involve in the CD process and forums for stakeholder deliberation; (5) geographic scope and timeframe, since activities and environmental features vary in space and time; (6) available information, including social and natural science data as well as anecdotal information; and (7) available decision support tools for analyzing information (e.g., economic impact analysis, benefit-cost analysis, spatial analysis, spatial optimization algorithms, multi-criteria decision analysis, many more).

Output of a compatibility determination generally consists of maps and narratives describing what activities and environmental features (or categories of activities and environmental features) should be allowed to occur in a particular space and time. A use-resource matrix, where each grid cell indicates a relationship between a use (or activity) and another use or environmental feature, can be used to *guide* the CD process, but it is important to recognize that the information provided in these matrices can be overly simplistic, generally ignoring spatial and temporal heterogeneity, different levels and types of use, and cumulative impacts of multiple activities.

The CD process for the Massachusetts (MA) Ocean Management Planning Area will be guided by the integrated ocean management plan. The plan can specify goals and objectives that prioritize activities and environmental features for the planning area (or sub-units of the planning area) and outline a structure for the CD process, directing how CD will be carried out in the planning area. Or the plan can be less specific about the goals and objectives and the process structure, essentially delegating these tasks to existing authorities. As plan developers consider how the CD process will be carried out in the MA Ocean Management Planning Area, they can build on CD processes developed for other management areas (e.g., National Wildlife Refuges, Stellwagen Bank National Marine Sanctuary, U.S. Forests), but the process for determining compatibility in Massachusetts coastal waters must be tailored to the unique social and environmental conditions of the MA Ocean Management Planning Area.

## Questions for Dr. Tracey Dalton—

**Comment:** (John Duff) All 3 presentations can be helpful. Keep in mind that when Ward engages in a Compatibility Determination (CD) process, the statue backs him up – he just administers it. Where will MA provide the discretion regarding compatibility? At the statutory level (limits) or at another level that allows discretion at the management level – in which case you open it up to more political/legal perspective? Where should discretion reside?

**Comment:** In social sciences, you often look for decision making at local level, but you need an overarching control. This conversation ties into the need for flexibility and biodiversity where if you have a process controlled by a legal fiat, you don't have the flexibility to build in the local concerns as deemed necessary by the changing circumstances.

**Comment:** (Jack Wiggin) Decisions could also be made at the management plan level – or zoning plan level. It could be made at the plan level when you determine which uses can/can't go in an area. There is a possibility that, if a use isn't listed, it could still come in under a permitting process if it is compatible.

**Q:** (Porter Hoagland) There are a number of different methods for doing CD – the outcomes might not agree depending on which model you use. How do you present the information to decision makers?

**A:** The answer to that question feeds into what type of process you're going to have when making your decision. You need to consider who's involved and should be part of the process. The tools may not always give consistent or clear answers, in which case you need to have a procedure to come up with a decision.

**Comment:** In favor of the National Wildlife Reserve model – protecting the environment should be a priority of the plan. The restoration of the buffalo in NWR is a good example of how management can bring a resource (like fishery) back.

## MODERATED DISCUSSION

William Schwab – Planning based on Ecosystems – how do we manage on ecosystems? Need to understand the geospatial framework, hydrologic, oceanographic, etc. Once you define them on a static standpoint, you can then begin to define the ecosystem. We don't know many of those things, so it will be difficult to manage at the ecosystem level

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Katherine Ford – The Belgian and Netherlands examples both stressed ecological value, and she will look to those reports to help define ecological value – especially when you don't have a specific use in mind. Many terms aren't quantifiable (biodiversity, vulnerability, etc.)

- John Duff comment: Suggests looking at Chesapeake Bay program where scientists have collected data and need to report on health of ecosystem. The report provided a lot of information, but no one could say that the ecosystem is healthy. How do you combine the metrics in a way that speaks to the health of the ecosystem? It's a bit subjective in terms of picking your metrics.

Heather Leslie – Existing information is an essential first step. It is a tall order to pull together what we do know/what we could know without knowing what the objectives are. Scientists can be more helpful if they know the objectives.

Todd Callahan – Many existing efforts to manage ocean areas can be divided into 2 groups – protection and minimizing incompatibility. It would be good to figure out which direction MA is moving in. The language of the act speaks to both. That will also help understand how to evaluate the plan. How do we establish good metrics for evaluating the plan? We need to know the goals in order to develop those measurements of success. Also, some things that are not habitat now are not excluded from becoming good habitat in the future. With regard to Porter's talk, we need to think in the same way as he did with fisheries - that the resource could return. Just because they aren't highly valued now doesn't mean they won't be in the future (which might require a management change).

Stacey Justice – Thankful for all of the information – leaving with more questions than came in with. Coming to understand that they're not heading toward ocean zoning, though that's what she thought at first. The Marine Spatial Planning talk was helpful -- especially the GBR activity guide that listed "okay", "not okay" and "permitted". Is this where MA is headed? We will not be able to zone ocean in next year. Maybe we could develop an activity guide with permits and then establish the permit guidelines and standards. She wanted to know:

- What the science council and workgroups are doing? Maybe people on science council are doing Compatibility Determination?
  - ◇ The science advisory council is not doing a CD (Per Deerin). They're currently gathering information. Workgroups are collecting, analyzing, and describing data. They're also doing public meetings and issues meetings with the stakeholders. CMZ is going to use stakeholder info to develop the draft planning principles (or objectives/strategies) – will help set up social and political material which will be combined with science materials to develop plan.
  - ◇ When we look at planning product (UHI) for the utility to MA, we will be able to see which best reflects/represents the MA approach. That will go to OAC. They will say which approaches they like.
  - ◇ The way this process was structured, things should build upon each other.
- Fisheries – How does that come into play? How much fisheries can be dealt with/how can you avoid it?
  - ◇ Regarding fisheries, the Act will not address it; but fisheries is a key component of the landscape so they need to know what matters to the industry so that if CD is done, they can understand the impact of decision.
- Who is going to implement the Plan ultimately? CZM? Knowing who will implement will help the team develop ideas in a way that can be implemented.
  - ◇ EEA writes it. Then there will be public hearings, and legislative review. Implementation will happen via licensing, etc. of activities through existing agencies.

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Carlton Hunt– What are the types of decisions we'll have to make? The holistic approach including uses, the economy, and the environment must be brought in. He likes the overlay process. The science side can't get totally engaged until we know the goals and objectives. Also, use of assessment criteria is important. Will identify activities down the road.

Ward Fuert– Heather and Porter's talks about ecosystem services were helpful. He didn't hear "global climate change" at all. There are some methods to assign values to non-valued things. It's not well defined. The ecosystem services are paramount. ALSO, in NWR, wildlife comes first. It's in the law. So if you have that kind of bright line, then it's helpful in determining compatibility. That directive improves their ability to make choices.

Priscilla Brooks- Some of the MSP models were especially helpful in terms of seeing how they might actually do the plan. What parameters have been set for committee by the Act? The list of 15 principles in the Act are more mandates than they are principles. Some are specific and some are broad – making interpretation important. She wants to understand more specific parameters before looking at MSP. Also, the discussion of CD was interesting and something that they have to do as they identify locations for activities. At the same time, the SAC is charged with ensuring that permits are consistent with ocean plan, so consistency is key. How you marry consistency with CD will be interesting to think about.

John Duff – If we back up from moving toward MSP and zoning and look more at terrestrial history, the Act is similar to federal public land management. There are few private property rights out in the ocean, so this is public ocean management. We can't engage in zoning until we withdraw certain areas from certain activities (after we had been letting anyone do what they want). The Sanctuary idea is a good example of how to withdraw uses – which seems to put natural resources at forefront. Then you can develop maps which should have accompanying text to explain decisions. The withdrawal and preservation process has already helped move toward CD at a higher level.

Anamarija Frankic – The European models used ecosystem and environmentally suitability criteria. Imagine coming to the ocean where no one is using it yet – first look at what the resource is; then develop ideal protocols for use. Then you can identify the missing data needed to site uses.

Tracey Dalton – You need to think about cultural issues. You need to understand the goals and objectives of activities themselves as well as environmental issues.

Ben Cowie-Haskell– With regard to the principles, you need to work on the 15 mandates, reducing them to a set of principles that will guide future actions and shorten the process behind the rest of the work. Also don't forget that many citizens assume they will, or would like to see the waters undisturbed.

David Terkla – Reiterates the principles need. They need to be policy-accessible (what is the implication?) People are on the frontiers of making ecological models that include human uses/activities. The models will be better in 5 years, but the initial work is good. The MSP is good. The dynamics of issues involved is good for MSP. Heather's example of habitat restoration is a good reminder that this Plan needs to be flexible. Also, we can't be restricted in vision to the planning area; otherwise you'd end up with something like the example Ben showed where SBNMS is managed, as is state water, so all activity is taking place in the middle triangle where many uses are now flocking because of lack of management.

Jack Clarke – The date of 7 months makes him concerned. The plan will include a policy framework. They will have to do a lot more work over the next several years. Regarding fisheries – the plan does say that fisheries plans will be integrated into this Plan. The consistency of the Secretary's decisions will require that it is consistent with the plan. Also, with regard to the ocean zoning piece "Now too shall the tuna have to go to the zoning board for a permit" – suggests that legislature might not be too interested in more lines on the map. Also, with regard to principles, the ocean task force appointed David O'Conner to chair the principles subcommittee which formed the 15 in the act.

Stephanie Moura – MOP has been working daily with the EEA planning team to figure out how to support processes and support the commission and council's work (like this workshop). For commissioners and councilors, if there are other helpful things (technical assistance, etc.) please let EEA know and they will see if MOP can help accommodate those needs. For example, maybe stakeholders want a webinar on how to use the MORRIS system to access information used in the baseline assessment.

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John Bullard – We are never going to have enough data to make us comfortable enough to set up a Plan. The status quo is not where we should be, so he applauds the timeline. He also agrees with nature of fish issue – there should be a more robust discussion of how fishing fits into the plan. Also, economic models, the CD matrix, and other tools have been useful, but the Plan will never be bulletproof. There is a legitimate role of politics and stakeholder input/response that doesn't allow you really to feel bulletproof. For stakeholders, knowing what you can/can't do has advantage with regard to making decisions. Or are we just overlaying another layer of review with this Plan? (It would be a failure if so.) We shouldn't go from allowing everything, to not allowing anything. The ecological services presentation was helpful. What are the many things you want, and where should you put them? For this effort to be good/worthwhile, this has to be management, and not just a plan. If we're not restricting/permitting human behavior in a way we can't do right now, it's probably not worth all of the work. Stellwagen Bank NMS didn't provide a single way to reduce the threats. We need to be able to reduce the threats/increase the opportunity for beneficial use.

John Duff – His earlier comments suggested that the historical model was that land was frontier land. We've already taken that approach in the ocean, which led to the current efforts (sanctuaries, acts, etc.) Now we need to identify what can/can't happen. For those areas that are ecologically important, there could be guidance from land management. A national park area is a public space but within it might be commercial uses and rules on how you use certain areas. Should withdraw and reserve areas of the ocean.

Rob Moir – Developing a narrative before maps is an important point, as is developing MSP before zoning. People are going to wait for you to put something forward then attack, so you need to work out the narrative before putting anything forward. Be very careful about the words you use.

Greg McGregor – Law will be the easiest part – you're well along in pulling together stakeholders and legislators. You're also going to have to reach out to polluters and tax payers. They're an untapped constituency who has been paying to clean their water.

Audience – There is a shared idealist interpretation of zoning. In reality, you also need to consider conditional uses and variances allowed in zoning. How are you going to make decisions to allow conditional uses? What are special circumstances for which variances should be allowed? There should be a reasonable and standard process for making variances. Also, if you want to accomplish something within time frame, you're going to have to focus on the issues John Bullard raised – what was the political purpose of the legislation? – Tie that to practical use – how is it going to be used and how in the short term? Stressed areas or areas with existing conflicts might be relieved now as a first stab from the plan – reduce those uses or lower stressors. Another practical purpose should be to streamline the political process – streamline permitting processes. Both are practical and useful in the short term.

Concluding thoughts/next steps from Stephanie Moura –

All materials will be online on the MOP website calendar (11/12/08). Howard will send participants and invitees a link to materials.

Next Partners event is Jan 29<sup>th</sup> – with the purpose of linking the event to where the state is with their planning process

Deerin Babb-Brott closing comments: Thank you.

[Meeting Adjourned]

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## Attendees

Deerin	<b>Babb-Brott</b>	<i>Executive Office of Energy and Environmental Affairs</i>	Dennis	<b>Leigh</b>	<i>Urban Harbors Institute</i>
Bob	<b>Boeri</b>	<i>MA Office of Coastal Zone Management</i>	Kathleen	<b>Leslie</b>	<i>Resident of Plymouth</i>
Matt	<b>Boger</b>	<i>MA Ocean Coalition</i>	Sanford	<b>Leslie</b>	<i>Resident of Plymouth</i>
Tricia	<b>Bonifacio</b>	<i>MA Ocean Partnership</i>	Heather	<b>Leslie</b>	<i>Brown University</i>
Peter	<b>Borelli</b>	<i>Nantucket Soundkeeper</i>	Leslie-Ann	<b>McGee</b>	<i>MA Office of Coastal Zone Management</i>
Polly	<b>Bradley</b>	<i>Nahant SWIM</i>	Greg	<b>McGreggor</b>	<i>McGregor and Associates</i>
Amy	<b>Breault</b>	<i>UMass Boston/MA Ocean Partnership</i>	John	<b>Miller</b>	<i>Advanced Technology and Manufacturing Center/Marine Renewable Energy Consortium</i>
Priscilla	<b>Brooks</b>	<i>Conservation Law Foundation</i>	Rob	<b>Moir</b>	<i>Ocean River Institute</i>
John	<b>Bullard</b>	<i>Sea Education Association</i>	Micaelah	<b>Morrill</b>	<i>Office of Senator Robert O'Leary</i>
Todd	<b>Callaghan</b>	<i>MA Office of Coastal Zone Management</i>	Stephanie	<b>Moura</b>	<i>MA Ocean Partnership</i>
Bruce	<b>Carlisle</b>	<i>MA Office of Coastal Zone Management</i>	Frank	<b>Muller-Karger</b>	<i>UMass Dartmouth</i>
Jack	<b>Clarke</b>	<i>Mass Audubon</i>	Nick	<b>Napoli</b>	<i>MA Ocean Partnership</i>
Lisa	<b>Conley</b>	<i>Office of Representative Frank Smizik</i>	Betsy	<b>Nicholson</b>	<i>National Oceanic and Atmospheric Administra-</i>
Fara	<b>Courtney</b>	<i>Good Harbor Consulting</i>	Sue	<b>Nickerson</b>	<i>Nantucket Soundkeeper</i>
Ben	<b>Cowie-Haskell</b>	<i>Stellwagen Bank National Marine Sanctuary</i>	Susan	<b>Olcott</b>	<i>Ocean Conservancy</i>
Zachary	<b>Crowley</b>	<i>Office of Representative Frank Smizik</i>	Robbin	<b>Peach</b>	<i>UMass Boston/MA Ocean Partnership</i>
Tracey	<b>Dalton</b>	<i>University of Rhode Island</i>	Martin	<b>Pillsbury</b>	<i>MA Association of Planning Commssions</i>
Stewart	<b>Dalzell</b>	<i>MA Port Authority</i>	Angela	<b>Sanfilippo</b>	<i>MA Fishermen's Partnership</i>
Rich	<b>Delaney</b>	<i>Provincetown Center for Coastal Studies</i>	Dan	<b>Sampson</b>	<i>MA Office of Coastal Zone Management</i>
Verna	<b>DeLauer</b>	<i>Communication Partnership for Science and the Sea</i>	Bill	<b>Schwab</b>	<i>U.S. Geologic Survey</i>
John	<b>Duff</b>	<i>UMass Boston</i>	Seth	<b>Sheldon</b>	<i>Urban Harbors Institute</i>
Ward	<b>Feurt</b>	<i>U.S. Fish and Wildlife Service</i>	Representative Frank	<b>Smizik</b>	<i>Commonwealth of Massachusetts</i>
Kathryn	<b>Ford</b>	<i>MA Division of Marine Fisheries</i>	Rachel	<b>Strader</b>	<i>Gordon and Betty Moore Foundation</i>
Anamarija	<b>Frankic</b>	<i>UMass Boston</i>	Jill	<b>Swasey</b>	<i>MRAG Americas</i>
Barry	<b>Gold</b>	<i>Gordon and Betty Moore Foundation</i>	David	<b>Terkla</b>	<i>UMass Boston</i>
Deb	<b>Hadden</b>	<i>MA Port Authority</i>	Kristin	<b>Uiterwyk</b>	<i>Urban Harbors Institute</i>
Jennie	<b>Harrington</b>	<i>MRAG Americas</i>	Prassede	<b>Vella</b>	<i>MA Coastal Zone Management</i>
Megan	<b>Higgins</b>	<i>Roger Williams University</i>	Andrew	<b>Vorce</b>	<i>Town and County of Nantucket</i>
Porter	<b>Hoagland</b>	<i>Woods Hole Oceanographic Institution</i>	Brad	<b>Washburn</b>	<i>MA Coastal Zone Management</i>
John	<b>Horgan</b>	<i>Office of Representative Demetrius Atsalis</i>	Greg	<b>Watson</b>	<i>MA Executive Office of Energy and Environ-mental Affairs</i>
Pat	<b>Hughes</b>	<i>Provincetown Center for Coastal Studies</i>	John	<b>Webber</b>	<i>Executive Office of Energy and Environmental</i>
Carlton	<b>Hunt</b>	<i>Battelle</i>	F. Bradley	<b>Wellock</b>	<i>MA Port Authority</i>
Stacey	<b>Justus</b>	<i>Cape Cod Commission</i>	Nancy	<b>Wheatley</b>	<i>CDM</i>
Jack	<b>Kent</b>	<i>MA Marine Trades Association</i>	Sandra	<b>Whitehouse</b>	<i>Ocean Conservancy</i>
Howard	<b>Krum</b>	<i>MA Ocean Partnership</i>	Joshua	<b>Wiersma</b>	<i>MA Fishermen's Partnership</i>
David	<b>Kubiak</b>	<i>MA Water Resources Authority</i>	Jack	<b>Wiggin</b>	<i>Urban Harbors Institute</i>

