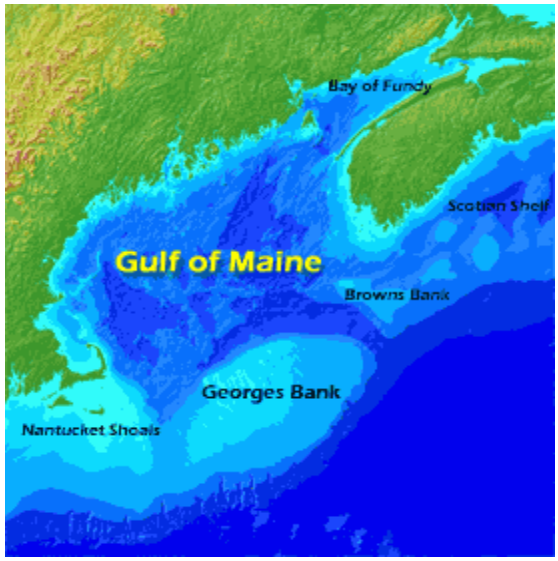
Ocean Zoning for the Gulf of Maine: A Background Paper

Prepared for the Gulf of Maine Council for the Marine Environment



by
Fara Courtney, Principal
Good Harbor Consulting
and
Jack Wiggin, Associate Director
Urban Harbors Institute
University of Massachusetts: Boston

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Preface

Coastal and ocean management is a constantly evolving practice. For at least two decades, coastal communities around the world have been experimenting with new ways to control a multitude of activities in their urban and rural harbors. The number and diversity of Marine Protected Areas are growing, with an increasing focus on protecting integrated biological communities, rather than individual species of concern. The United States and Canada are each developing new, comprehensive ocean polices, looking to better integrate management functions at all levels of government.

All of these initiatives – from local to national - reflect some common truths about the state of the marine environment worldwide: the intensity of human disturbance in coastal and ocean resources is increasing. Fifty to 80% of the global population lives within 50 miles of the coast. Fisheries are in decline, while recreational boating, shipping, undersea cables, energy development and mineral extraction are on the rise. Science is slowly unraveling the complexities of marine ecosystem functioning, while on a parallel track technology is allowing exploitation of ocean resources further offshore, and in deeper waters, extending the reach of human impacts.

In response to these pressures, ocean managers worldwide are investigating new methods for equitably allocating the use of limited marine resources while protecting the integrity of the ocean ecosystem. Within this context, the Gulf of Maine Council for the Marine Environment sponsored an *Ocean Zoning Forum* in December 2002, to explore the current practice and new approaches to spatially explicit ocean use management.

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The initial purpose of this paper was to provide background and context for panelists at the *Gulf of Maine Ocean Zoning Forum*, sponsored by the Gulf of Maine Council on the Marine Environment. The objective of the forum was to consider the question*:* ***To what extent can ocean zoning further the Council's marine sustainability goals?***

The authors[1] were asked to:

- present an overview of how the concept of zoning, as understood from its genesis as a land-use management tool, is applied in the marine context;
- provide a range of examples of ocean zoning, drawn from U.S., Canadian and international sources, to illustrate the application of spatial management techniques offshore - for a variety of purposes and at different scales and levels of complexity;
- outline offshore jurisdictions and authorities in the Gulf of Maine;

[1] Fara Courtney, Principal - Good Harbor Consulting & Jack Wiggin, Associate Director - Urban Harbors Institute, University of Massachusetts: Boston

- highlight the challenges and opportunities presented by efforts to manage rights-of-use, protect habitat and conserve biodiversity in the marine environment;
- describe current policy initiatives and emerging issues, at the national level in the U.S. and Canada, and within the Gulf of Maine region, which may support an expansion in the application of ocean zoning approaches.
- following the Forum, summarize participants' recommendations and observations as expressed in the closing discussion session.

This paper does not represent a comprehensive cataloging of ocean zoning initiatives; nor does it reflect critical analysis of any of the examples cited. The intent is rather to offer a baseline of information, to highlight key questions in the area of spatial management in the marine environment and present sources for further investigation.

I. Introduction

Ocean zoning is a term and concept considered a means to guide human uses of the ocean to optimize utilization of marine resources and to provide protection of marine ecosystems. Proponents of ocean zoning view it as a way to simplify or coordinate management and to add a measure of predictability to the existing management or regulatory system. Zoning is a way of reducing user conflicts by separating incompatible activities, and allocating or distributing uses based on a determination of an area's suitability for those uses, in relation to specific planning goals.

What is meant by ocean zoning?

Conceptually, it is simple. Ocean zoning refers to a scheme for dividing a marine area into districts and within those districts regulating uses to achieve specified purposes. It has two components. One, a map that depicts the zones and two, a set of regulations or standards applicable to each type of zone created. For some zones the regulations might be very protective of marine resources or habitat by allowing a very few compatible uses, and excluding any use that would undermine the goal of resource protection. In other zones where resource protection is less of a priority, more intensive use might be allowed based, presumably, on the suitability of the area for such uses. The term and concept are borrowed from the regulation of land use, where zoning is the most common land use control.

Ocean managers in the Gulf of Maine are not unacquainted with this type of system. There is a myriad of federal and provincial/state statutes authorizing management of various ocean areas or ocean resources and a number of these initiatives are specifically fixed to a defined geographic area. Further, within these statutorily defined areas the management authority has in some instances used a zoning scheme as the basis for management. Other programs applicable to entire marine regions employ zoning as one of several tools for managing the resource, for example, no-take reserves established by fishery managers.

Land-based zoning as antecedent and model

Zoning is the most common system of land use control in Canada and the U.S. and has well defined characteristics. Several of those are relevant to a consideration of applying the technique to the ocean.

First, zoning is a *regulatory tool for implementation* of a plan. The plan may be nothing more than a desire to reinforce existing patterns of uses, a general notion about separating incompatible uses or, ideally, a comprehensive plan for desired future conditions based on an understanding of the value and carrying capacity of natural resources, economic trends, growth projections, societal needs, capacity of infrastructure, interrelationships among uses and activities, etc.

The second basic feature of zoning is the division of a community into uniform districts or zones. Third, within each zone certain uses are permitted and others are not. This is the essence of zoning: the segregation of incompatible uses so that different uses do not have an adverse affect on each other.

As the tools of zoning have matured, regulations now often allow a mix of uses within a zone, under specified criteria designed to ensure compatibility and coexistence. In addition, a number of refinements to conventional zoning have been developed to improve the protection of natural resources or better accommodate multiple management priorities. An example is the application of *overlay districts*, which may be used either to impose additional restrictions on uses or provide greater flexibility within the underlying zones.

A fourth characteristic is that all property within a zone is subject to the same set of regulations governing three principal factors: use, dimensions, and density. If a proposed use conforms to the regulations, a permit is issued. In more and more land-use zoning systems, the process of determining compliance requires a review of the proposal against a set of approval criteria that seek to ensure that the use is compatible with existing uses and has minimal impact on its surroundings. All zoning regulations include some manner of permitting.

Finally, land use zoning is comprehensive, though this is a relatively recent development. The precursors of contemporary zoning were limited to separating a few specific uses from the rest of the community. Now, almost universally, zoning covers entire jurisdictions and the complete range of uses and circumstances likely to be encountered. Zoning is relatively stable, but not static or inflexible. It can be and is changed to accommodate new objectives of the community or respond to new information.

Moving to the marine environment

In considering the transferability of landside zoning techniques to the ocean, it is important to begin by recognizing important differences in terms of ownership and sources of authority, as well as in physical characteristics.

Landside zoning is the regulation of private property. It is the exercise of the government's police power to protect the health, safety, and general welfare of the public. This power is fettered by constitutional protections such as those pertaining to private landowners' property rights. As a consequence, land-based zoning is not able to preclude all use of property in the interest of protecting natural resources nor can it necessarily prescribe what use is made of a property; however, it does establish the parameters for rights-of-use of the property owner.

In contrast, with some rare exceptions, the ocean is a publicly-owned resource; governments hold title to and own the lands under the territorial sea and its resources (subject to some specific rights reserved by the federal government) and the federal government has proprietary rights in the seas beyond that to the seaward extent of the

Exclusive Economic Zone (EEZ)[2]. All regulatory, management, or resource utilization decisions of the state/provincial and federal governments are made in the interest of the public. The governments' responsibilities and actions are circumscribed by laws-state/provincial, federal and international-and in some areas by the Public Trust Doctrine[3]. While lacking the standing of a property owner, traditional users of ocean resources are certainly able to exert influence on the development of program policies and management strategies.

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

Establishing and delineating the boundaries of ocean zones presents additional challenges. First, there needs to be adequate information and understanding of the resources, natural functions, and the requirements of economic users as the basis for creating the zones. Then there has to be a method for delineating the zones so they can be represented on maps and located in the field (OPIS, 1999). Even zoning boundaries on land - which has distinguishable physical features, is readily accessible, and easily measured - are sometimes the subject of dispute. The literature on ocean jurisdictions presents the difficulties associated with determining and mapping offshore boundaries (Sutherland, 2002). Briefly, they include:

- the lack of consistent spatial data;
- the multi-dimensional (physical and legal) nature of the marine environment;
- the lack of accurate, complete and up-to-date information on the resources;
- the importance of an objective scientific system in setting boundaries;
- accessibility by local, state, or federal government agencies and users.

Another difficulty with establishing ocean zones is that while designated zones are meant to be static, some of the living resources that may be the subject of a zoning scheme are highly mobile (Naug, 2000). A change in environmental conditions can also alter the suitability of an area to function as habitat, causing target species to migrate out of the protected zone in response (Sanchirico, 2000). Establishing a system for monitoring the effectiveness of marine zoning in achieving management objectives over time is an important element of the planning process.

Finally, zoning, whether of land or the ocean, is an implementation tool, and typically one of many used concurrently for management. Zoning is one tool for implementing a

[2] Defined as*: the area extending from the outer boundary of the territorial sea, out to 200 nautical miles (370 km) from the coast baseline"*

[3] While narrowly defined in inter-tidal property where land is often privately held, the scope of public trust rights seaward of the line of private ownership to the limits of state jurisdiction is more expansive and open to broad interpretation.

plan which is itself based on information about the resources, their ecological importance, natural functions and economic values, and adopted policies and objectives reflecting societies' values. Determining and prioritizing those values in the marine environment is one of the greatest management challenges.

Just as on land, zoning's strength in an ocean application lies in its utility to allow and proscribe uses in specific areas. It can exclude uses solely for purposes of protecting natural resources or to reduce or eliminate conflicts among competing uses. The uses allowed (or prohibited) in a zone will be a function of the capabilities and constraints of the natural environment as well as a reflection of societies' needs and interests in exploiting resources.

Public Lands Management

For reasons described above, a look at federal public lands might provide another useful model for ocean management. Federal lands share with the ocean several important characteristics: public ownership, high natural resource and economic value including recreation; policy debate over resource conservation versus economic utilization, multiplicity of agencies and laws; and a significance to local, regional and national interests. About 30 percent of the land area in the U.S. is managed by the federal government. All public land is in one of five major classifications, some of which allow various degrees of multiple use and resource consumption while others are dedicated to recreational use and preservation (Bryner, 1998). This might be viewed as a type of zoning at the largest scale and has relevance when thinking of the ocean. The individual units of property are managed by the responsible federal agency with a variety of techniques including management plans that designate areas (zoning) for private uses, by leases, and by use permits.

Land use zoning provides a useful starting point and touchstone for considering the benefits and challenges of spatial management in the offshore context. However, the legal and physical differences between zoning on land and ocean zoning make a point-for-point comparison too limiting a framework for discussion. Therefore, this paper takes a broad approach, considering any spatially explicit system for organizing activities in the marine environment to be an application of *ocean zoning*.

II. Ocean Zoning Approaches: Examples and Emerging Issues

Spatial management of ocean uses, as a method of articulating priorities in specific marine areas, is not a new concept – there are numerous examples of areas designated for particular activities, in which other uses are excluded or restricted in order to eliminate conflicts.

Historically these include, among many others, navigation channels, dredged material disposal areas, fisheries closure areas, and oil and gas drilling leases with associated exclusion areas. These "zones" are established through a variety of mechanisms under different authorities, typically lacking inter-departmental planning and coordination (OCMD, 2002).

The designation of offshore conservation areas is more recent phenomenon. The term *Marine Protected Areas* (MPAs) encompasses a wide range of coastal and ocean areas managed according to specific regulations. There is no single definition of an MPA but that used by The World Conservation Union (IUCN) is the basis for most others: "any area of inter-tidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical, and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment." The U.S. government defines an MPA as "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." (Executive Order 13158, 2000).

While the primary emphasis of MPAs is the protection and conservation of biological diversity, habitat, and natural resources, the designations vary widely in the type, size and level of protection and the range of human uses that may be accommodated.

The establishment of large-scale MPAs has led to the development of more comprehensive marine zoning schemes marine (within the boundaries of the MPA), usually under special legislative authority. MPAs are also a type of zone unto themselves, within the vast undesignated ocean environment.

The following examples, from the Gulf of Maine and elsewhere, illustrate a range of purposes, scales, authorities and levels of complexity within which ocean zoning schemes have been applied. These are not comprehensive case studies, but rather snap-shots emphasizing particular features for purposes of discussion.

Local and State/Provincial Near Shore Initiatives

Edgartown, Massachusetts Surface Water District

This local by-law is an unusual example of a community extending its state-conferred local land-use zoning authority[4] to control both construction in and use of its adjacent waterways. It creates a zoning district which, in general, includes all waters seaward of Mean High Water (MHW) within the town's harbors and coves.

The bylaw's purpose is to "…encourage appropriate water-dependent uses of the Town's harbors, bays and ponds; to protect and enhance the environmental quality of those waters; to minimize potential adverse effects on marine flora and fauna and wildlife habitat; to promote the safety of navigation on said waters and to minimize flooding and other storm-related hazards". Permitted uses, and uses allowed by Special Permit, are specified; with few minor exceptions, non-water-dependent uses are not allowed. The implementing authority is the Edgartown Planning Board, with recommendation from the authorities typically associated with managing marine water use at the local level – i.e.

[4] *Massachusetts General Law Chapter 40A*

the Harbormaster, Conservation Commission, Shellfish Committee, Marine Advisory Committee.

New Jersey Marine Conservation Zoning

In 2001, New Jersey designated its first Marine Conservation Zone, by granting new site-specific jurisdictional authority to that state's land management agencies to control activities in the inter-tidal zone, in order to protect a critical wildlife habitat and cultural resource area.

The 600-acre Sedge Islands, at the Southern end of Island Beach State Park, are managed by the Department of Environmental Protection's Park Service and Fish and Wildlife agency for passive recreation, fly fishing, crabbing, clamming and educational programs. Adjacent areas of Barnegate Bay are heavily used for recreational boating. Increasing use of personal watercraft (jetskiis) in the shallow waters adjacent to this area became a management concern due to wetlands impacts, disturbance to feeding shorebirds and noise impacts on the public use of the conservation area. The Sedge Island Marine Conservation Zone, which encompasses the riparian areas of the Sedge Islands, from Mean High Water (MHW) out to 300 ft., was established to reduce watercraft conflicts in the critical habitat areas of Sedge Island, while not restricting watercraft activities in other parts of Barnegate Bay.

Boating regulations in New Jersey do not consider natural resources issues like damage to wetlands from boat wakes, and concepts like *soundscape* and user experience are not covered by any regulatory body, but are of central importance to the environmental health and appropriate public enjoyment of this conservation area, which is also protected as an historic site (NJ DEP News Release, 2001).

By extending the landside jurisdiction of the Park and Wildlife management authorities, which in all other places terminates at MHW, these agencies are now able to more effectively address both the natural resource priorities and the passive recreational values in this area. The key regulatory provision is the banning of motorized vessels within the Marine Conservation Zone, in order to prevent damage to wetlands and noise impacts on both wildlife and recreational use of the Sedge Islands. Due the shallow water depths in this intertidal area, jet-skis were the only type of vessel using the area previously. (Auermuller, 2002).

National Marine Sanctuaries/Marine Parks

Marine Parks and Marine Sanctuaries in general are designated to protect critical marine and cultural resources and allow sustainable use (Canadian Marine Conservation Areas Act, 2002; Great Barrier Reef Marine Park Act, 1975; U.S. National Marine Sanctuaries Act, 1972). They usually have some form of overall management authority, granted through specific legislation, which may supercede other authorities or provide a coordinating function.

Defined by ecological and/or cultural attributes, these areas allow activities that are consistent with their primary conservation objectives, including activities of economic importance. Allowed uses are typically open access (sometimes by permit) such as fishing, boating, diving – including tourist operations - rather than exclusive private enterprises (e.g. mineral mining, oil and gas drilling, aquaculture development).

Since Marine Sanctuaries and Parks are new designations in areas with existing activities, there is a need to work closely with stakeholders, particularly traditional users with economic interests, in order to develop acceptable management schemes. Sanctuaries and Parks often include one or more heavily protected *no take zones*, in which are prohibited all extractive activities, including fishing. In the two cases below, the use of zoning is part of multi-faceted management approach that includes a variety of authorities and tools.

The Great Barrier Reef Marine Park

The Great Barrier Reef Marine Park (GBRMP) encompasses 2904 catalogued reefs, globally significant populations of endangered species, as well as significant habitat types such as sea grass beds and mangrove forests.

The Great Barrier Reef Marine Park Act, passed in 1975, defined the boundaries of the park, which covers an area of approximately 345,000 km2 offshore - almost the size of California. The Commonwealth (federal) Government was given management responsibility through the Great Barrier Reef Marine Park Authority. The Park supports a major part of Australia's economy, with tourism values at A$700 million annually, commercial fishing around A$250 million, and recreational fishing and boating contributing A$270 million a year (Day, 2002).

The Commonwealth and State governments have had a joint management agreement since 1979 (Day, 2002). Field-based day-to-day management of the marine park is jointly funded and conducted primarily by Queensland (state) agencies, within programs and guidelines approved by the Authority. While most activities on adjacent mainland areas or islands outside the park boundaries are not within direct jurisdiction of the Authority, the enabling legislation does have an important provision allowing the Authority to regulate certain activities outside the limits of the Park, when it is determined these might have adverse impacts on the health or use of the Park (Day, 2002).

The Park's zoning scheme is the basic framework for all other management activities. The purpose is to separate conflicting uses, and to protect natural resources of global significance while allowing important economic activity to occur. The entire park area is managed as an integrated whole – not just a series of isolated protected areas surrounded by unmanaged activities. All of the zoning designations contribute to conservation, while meeting the standard of allowing "reasonable use" as required by the designating legislation (Day, 2002).

There are seven zoning designations, ranging from the least restrictive *General Use Zone A*, which allows uses including shipping and trawling (mining, oil drilling, commercial spear fishing and spear fishing with SCUBA are prohibited); to the most restrictive Preservation Zone, which prohibits all entry except for permitted scientific research which cannot be conducted elsewhere (GBRMPA website, 2002).

The current Park zoning plan (for the most part developed decades ago) focuses primarily on protecting coral reef habitats. Concern has been raised recently that the existing highly protected areas may not adequately preserve the range of biodiversity that research over the years has revealed within the Park boundaries. In response, the Authority is undertaking a Representative Areas Program (RAP) – essentially a review and potential updating of the zoning system that will reflect a new understanding of ecosystem connectivity and incorporate a network of no take areas that will include all habitat types and communities (Day, 2002).

According to the World Wildlife Fund (WWF), at this time only 4.5% of the Park is fully protected from all extractive activities including fishing. WWF estimates that this highest level of protection should be extended to encompass between 20% and 50% of each of the Park's 70 bioregions in order to adequately ensure the overall health of the ecosystem (WWF, 2002). Others point out that 4.5% of the Park constitutes 16,000 km2, a no-take area exceeding by a significant margin the total area of fully-protected MPAs in any other country, and that trawling – the most damaging fishing practice – is prohibited in a full 50% of the Park (Kelleher, 2002).

Monterey Bay National Marine Sanctuary

Designated through federal legislation in 1992, the Monterey Bay National Marine Sanctuary (MBNMS) is the largest marine protected area in the US, spanning nearly 300 miles of California coastline and encompassing over 5,300 sq. mi, extending an average of 30 miles from shore (MBNMS website, 2002).

Its natural resources include the largest kelp forest in the US and one of the largest underwater canyons, as well as one of the closest-to-shore deep-ocean environments in North America. This ecosystem supports 33 species of marine mammals, 94 species of seabirds and 345 species of fish, as well as a rich diversity of plants and invertebrates (MBNMS website, 2002).

These natural features are coupled with high-intensity human activity. The scenic coastline, including beaches, cliffs and rolling hills, is a magnet for the state's tourism industry. Diverse and extensive recreational and commercial water based activities – including shipping, fishing, dredged material disposal and military operations - occur within the Sanctuary boundaries, along with extensive marine biological and oceanic research (MBNMS website, 2002).

The Sanctuary is managed by the federal government, through the Sanctuaries Division of the National Oceanic and Atmospheric Administration (NOAA), with input from the

legislatively mandated 19-member Sanctuary Management Council (U.S. Dept. of Commerce, 2001).

In contrast to the case of the Great Barrier Reef Marine Park, much of the zoning in the MBMS pre-existed the establishment of the Sanctuary, and was therefore not the product of comprehensive planning and analysis. Individual zones were established for discrete purposes, either for 1) siting/managing particular uses (e.g. Dredged Material Disposal Zones, Vessel Traffic Zones); or 2) identifying and protecting sensitive or critical resources (e.g. Marine Life Refuges). Some zones overlap or extend beyond the Sanctuary boundaries. A number of new zones have been added since the Sanctuary was established (e.g. Motorized Personal Watercraft Zones). There are a total of 72 zones, of 13 zone-types. Sixty of the zones include coastal areas and adjacent waters, while 12 encompass offshore activities managed by various federal agencies (U.S. Dept. of Commerce, 2001)

The Sanctuary managers have initiated a review of the pre-existing and evolving set of zones, to determine how they interact collectively to protect the Sanctuary's resources and meet its management goals. One concern noted is that many of the zones – in particular the no take zones or marine reserves - do not have a clearly stated goal, scientifically based boundary designation or measurable set of ecological indicators, and are therefore difficult to assess (US Department of Commerce, 2001).

The Monterey Bay National Marine Sanctuary functions like an overlay zone, adding a range of allowed and restricted uses within the Sanctuary as a whole, while not super-ceding the authority and function of the pre-existing designations. The Sanctuary staff, in cooperation with a Sanctuary Advisory Council, provides a coordinating role among local, state and federal programs that control uses in different areas of the Sanctuary (MBNMS website, 2002).

Siting, Protecting and Promoting Specific Uses Offshore

The application of comprehensive or coordinated zoning schemes within defined marine regions like sanctuaries is becoming more common; however, the vast majority of offshore use-designations currently in place came about as a result of consideration for a particular activity, rather than a process of planning holistically for a geographic region. These existing zones are created under many separate jurisdictions, and serve a variety of purposes; however, regardless of the designating authority, any zone establishes a priority of use for that area. There is typically little if any recognition of the underlying ecological system in these existing sector-based use-designation areas.

In the case of shipping lanes, for example, the designation organizes potentially conflicting water sheet uses and recognizes the public investment in infrastructure (dredged channels) to accommodate deep draft vessels, while directing other uses, like smaller boat traffic and fishing, to different areas.

In addition to zones that give priority to general rights-of-use for particular activities (shipping, fishing, dredged material disposal), there are leasing and permitting programs that confer rights for private, exclusive use of public offshore resources. These are uses that require access to particular types of marine resources that are spatially limited (e.g. mineral deposits).

This section reviews examples of the following 1) uses that already have a planning approach in place that in effect identifies a zone for controlling or encouraging a general or a private use, or 2) emerging issues for which permitting is currently done on a case-by-case basis and for which it has been suggested that some kind of zoning approach which does not currently exist might be beneficial.

Existing Use-Designation Programs

US Outer Continental Shelf Oil and Gas Leasing Program

The Outer Continental Shelf Lands Act (OCSLA - 43 U.S.C. §§ 1331 et seq.) gives the Secretary of the Department of the Interior (DOI) responsibility for administering mineral exploration and development on the outer continental shelf[5]. The Minerals Management Service (MMS) is the agency within DOI responsible for leasing these submerged lands for oil and gas production, and for the supervision of offshore operations after a lease is issued.

The purpose of the OCSLA is to promote the exploitation of offshore resources, and in the course of doing so to protect the natural and human environment, to ensure that the public is properly compensated (e.g. through lease fees and royalties) for the private use of public resources, and to maintain free enterprise competition in conferring private rights to oil and gas resources (43 U.S.C. §§ 1331 et. seq.).

MMS is charged with determining which areas to open for leasing for oil and gas exploration and drilling, and for developing 5-year plans to govern the process, which includes competitive bid procedures.

Over the years, Congress has intervened in the lease sale process by issuing moratoria for specific areas based on potential conflicts, particularly with regard to impacts on fisheries. The entire North Atlantic Planning area, extending from Maine to New Jersey, was withdrawn from the lease sale planning process in 1990, and will remain inactive through June 30, 2012. In addition, all areas designated as Marine Sanctuaries (including Stellwagen Bank Marine Sanctuary, which is located within the North Atlantic Planning Area) are now permanently excluded from consideration for oil and gas development.

Fisheries Management Closure Areas

[5] defined as: "*the submerged lands and seabed lying between the seaward extent of the states' jurisdiction (typically three nautical miles) and the seaward extent of federal jurisdiction, as defined under accepted principals of international law (200-mile Exclusive Economic Zone)*

Fisheries managers in both the US and Canada use a variety of tools to achieve their general management goal of ensuring the sustainability of fish stocks and equitable access to those fisheries. These include gear restrictions, limiting the number of vessels in a particular fishery, regulating the size of catch, as well as controlling where effort on particular species can be targeted through the application of *area closures*.

These *de facto* ocean zoning designations are applied for a variety of purposes, including to:

- avoid conflicts among different types of fishing gear (e.g. fixed vs. mobile gear);
- prevent impacts to important fisheries habitat areas;
- protect spawning areas or concentrations of juvenile fish or shellfish; and to
- rebuild critical fish stocks

Depending on the objective of the management closure, an area may be put off limits permanently or on a seasonal basis; closed to all commercial fishing; or closed to gear that can target or incidentally take a particular species, while remaining open to other types of fishing effort. Areas can also be closed to particular types of fishing activity for reasons unrelated to fisheries management, for instance, gill netting is precluded from certain areas to prevent entanglement by protected marine mammals (Pelczarski, 2002).

Emerging Issues

The expanding use of ocean resources for a variety of purposes – some already existing, some new, proposed or anticipated – is prompting consideration of new applications of zoning techniques in the marine environment. The goal is to rationalize the process of siting activities, to sort-out conflicts and in some cases to prioritize the multitude of values represented by offshore waters and submerged lands.

The growth in the following sectors has led industry advocates, resources managers and the public to call for an improved process of allocating ocean space.

<u>Submarine Fiber-Optic Cabling and Pipelines</u>

The particular spatial conflicts associated with linear utility development have led to proposals for establishing "corridors" or "safety zones" which would concentrate the ecosystem impacts and inter-sectoral conflicts associated with offshore pipelines and/or communications cables (OCMD, 2002, Ogden, 2002). The fishing industry has expressed concerns about interactions with submarine cables off the Nova Scotia coast – particularly the loss of fishing area where the industry typically demands a 500 meter or more exclusion area to avoid inadvertent snares of unburied cables, as well as financial liability should cables be damaged (OCMD, 2002).

Nova Scotia's 2001 Energy Strategy commits the Province to working to avoid the situation in the waters off the coast of the United Kingdom and in the Gulf of Mexico, where the extensive network of oil and gas pipelines have created a significant barrier to certain types of fishing. The proposed approach is to develop a system for channeling oil

and gas pipeline development into a limited number of corridors (OCMD, 2002). The policy also suggests the possibility that these same corridors should become the preferred route for undersea telecommunications cables as well.

Similarly, in southeast Florida, the state's Department of Environmental Protection is hoping to localize the habitat damage that often results from the process of installing fiber optics, by targeting new cables to corridors designated where cables already exist (Ogden, 2002).

Offshore Wind Farm Development

The first offshore wind farm proposed in North America is currently under review by the U.S. Army Corps of Engineers (ACOE). The 170-turbine facility, proposed by Cape Wind Associates, is being lauded by some as a significant source of clean renewable energy, but its location, 4.5 miles off the coast of Cape Cod in Nantucket Sound, Massachusetts - a heavily-used recreation area and migratory bird flyway - is raising serious concerns as well (Durand, 2002). At this time, five additional offshore sites along the Massachusetts coast - some further offshore than the Cape Wind proposal and others as close as 1.5 miles to shore - are being considered for wind energy development by another company - Winergy, LLC (Arnold, 2002).

The Cape Wind project as designed would be spread across a 28-sq. mile area of the outer continental shelf, outside of Massachusetts' three-mile limit of jurisdiction[6]. The ACOE is taking the lead at the federal level in developing a comprehensive Environmental Impact Statement (EIS) for the project.

There is currently no planning or compensation process in place for private projects (other than oil & gas development) proposed in federal waters[7]. Some opponents of the wind farm project are calling for a moratorium on the review of all proposals until a comprehensive assessment of potential offshore wind development sites is conducted, and an appropriate regulatory program established with public input (Reilly, 2002). On the other hand, a number of conservation organizations and renewable energy advocates cite the risks from global warming and the urgent need to reduce dependence on fossil fuels through development of renewable energy sources. These interests counter that the existing permitting process is adequate and should proceed without delay; however, they acknowledge that a new, proactive management regime will be necessary to address multiple offshore uses in the future (CLF et al, 2002).

[6] Although state permitting is limited to the submerged electrical cables which will cross state waters to connect the facility to landside transmission lines, CZM's Federal Consistency authority does apply to activities in federal waters with potential to affect Massachusetts coastal resources.

[7] the licensing of facilities or plantships for converting thermal gradients in the ocean into electricity is governed by the Ocean Thermal Energy Conversion Act of 1980 (42 U.S.C. §§ 9101 et. seq.), administered by NOAA. Unlike oil and gas leasing procedures, OTEC provides for the review of individual proposals through a non-competitive process and assesses no royalty payments or leasing fees. No projects have been developed, nor applications filed, pursuant to this statute.

Overall, this proposal to construct a commercial-scale wind farm in Nantucket Sound has heightened interest in ocean use planning, particularly outside state waters: the growing consensus is that the opportunities, conflicts and jurisdictional uncertainties in the EEZ should be proactively evaluated and resolved, prior to extending opportunities for new kinds of private development.

One legislative approach that has been suggested would give the Minerals Management Service of the Department of the Interior, (the same agency responsible for oil and gas leasing on the outer continental shelf), authority to establish regulations, develop a leasing process and set compensation parameters for renewable energy development offshore (H.R. 5156).

Offshore Aquaculture Development

The development of the offshore aquaculture industry in the U.S. has been limited by the lack of consistent standards and a process for identifying and evaluating appropriate sites: the requirements and procedures vary from state to state (Fletcher, 2002). The Canadian Aquaculture Act established a federal licensing process through the Minister of Fisheries, with the Provinces controlling the specific criteria for site development plans and leasing procedures. While this system is more clear and coherent than the more fragmented situation at present in the U.S., growth of the industry has been the result of many separate decisions, rather than a comprehensive, planned approach (Fletcher, 2002).

The State of Hawaii recently granted its first offshore aquaculture authorization - a15-yr lease for a 28-acre patch of ocean for the commercial production of fish in offshore cages, two miles off 'Ewe Beach (Fletcher, 2002). This lease will include rights to the ocean floor, a column of water above it and the corresponding surface area, with a 10-year option to extend the lease. The state of Hawaii has declined to designate specific aquaculture development zones; however, if this initial project is successful, it is anticipated that the likely increase in lease applicants may lead the state take a more proactive siting approach (Fletcher, 2002).

Optimal sites for offshore aquaculture are limited, and industry advocates argue that a zoning process that identifies these sites proactively through a public process will ensure appropriate areas are accessible for commercial development (Fletcher, 2002). By concentrating aquaculture in particular areas, conflicting uses such as boating can be excluded, decreasing liability and minimizing theft and vandalism. However, while concentrating and segregating aquaculture operations will prevent one set of conflicts, issues of build-out and concentration of potential water quality impacts will have to be considered.

III. Challenges and Opportunities in Ocean Zoning

Ocean use zoning, like its land-use counterpart, will be effective in accomplishing management objectives to the extent that: 1) those objectives are clearly articulated; 2)

its application is based on good data; and 3) all stakeholder interests have been considered and incorporated.

As the preceding examples illustrate, many of the challenges that confront land-side zoning initiatives are present in efforts to allocate space, organize private uses and protect public resources and rights in the offshore environment: the issues are scientific and technical, as well as political and social.

Understanding of marine ecosystems is evolving, as research continues to reveal the complex relationships among physical and biological features over time, and the impact of human interactions within these systems.

Paralleling the direction in land conservation, marine management is trending away from small-scale protection through simply isolating specific critical resources or individual species, and towards an ecosystem approach that focuses on issues of habitat protection and the concept of connectivity among distinct natural communities comprising a larger functioning system (Day, 2002).

In the marine context, however, *the resources in need of protection are often not as readily apparent* as they are on land – much of the oceans of the U.S. and Canada remain unexplored; there is no comprehensive mapping or habitat classification system to underpin large-scale ocean zoning efforts. While progress is being made in the field of marine ecosystem dynamics, new information gained tends to expose what remains to be learned. The limits to physical access to the beauty and riches of the marine environment can also make constituency building difficult: people find it hard to appropriately value resources they cannot see.

Unlike zoning on land, where one of the primary functions is setting parameters for the use of private property, *ocean zoning serves to govern access to areas that are held in common.*

The oceans are a public resource - yet one that is subject to increasing demand for a wide range of uses, many of which are private enterprises that are considered to have public value: food production, energy production, communications and transportation, to name a few. Not least in this list the legitimate *use* of targeted areas for biodiversity conservation: many organizations are calling for a greater management emphasis on fully protected marine reserves.

The issue of *perceived rights of existing users* of marine resources adds complexity, when new priorities, increased demand, public needs or scientific understanding call for changes in traditional patterns of use. Maritime industry plays a central role in the culture and economy of many communities: research is needed to better understand the distribution of socio-economic costs and benefits of different schemes for allocating access to ocean resources. *The costs and benefits of any resource management scheme are not usually distributed evenly across all user groups* (Sanchirico, 2000*);* however, the

more transparent and objective the decision-making process, the greater the likelihood of acceptance.

The process leading up to designation of the Tortugas Ecological Reserve, within the Florida Keys National Marine Sanctuary, is an excellent illustration of the importance of effective stakeholder involvement and credible science in ocean use planning. The Sanctuary staff developed the initial plan for this new no-take reserve internally. Proposed in 1995, the location was soundly rejected by fishing interests for cutting off their access to sheltered water during storms, and for being in the wrong place from a resource protection standpoint.

When the reserve concept was resurrected two years later[8], the Sanctuary managers committed to a design process that would fully involve both scientists and traditional users in establishing the reserve's boundaries. Economists conducted confidential interviews with 95 of the 110 license-holders fishing the Tortugas, in order to learn specifics about how the area is used and the value of the catch. They then mapped the data. These easy-to-understand products provided an important baseline of information that held up to the scrutiny of the users, and helped build a sense of trust in the process (Haskell, 2002).

An extensive public education program incorporated scientific information on the Tortugas ecology; traditional knowledge based on the experience of fishermen; and socio-economic data on the value of the area to the local economy. Finally, through the use of satellite-tracked drifters, researchers were able to demonstrate the connectivity between the proposed protected areas and the rest of the system: the users were able to see, through credible data, that protecting key spawning sites would directly benefit them by enhancing fish populations throughout the larger system. With user groups and scientists working together to map the boundaries, the 518 km2 Tortugas Ecological Reserve[9] was designated in 2001 (Haskell, 2002).

According to Sanctuary managers involved in both attempts to design this new protected area, the success of the latter process can be attributed to several factors: 1) overlapping goals for the ecosystem among stakeholders; 2) development of a shared baseline of information as a starting point; 3) the presentation of that information in an understandable format recognizable to all parties (GIS maps); and 4) integrating the best available science with the participation of traditional users (Haskell, 2002).

New Technologies, Tools and Approaches

Ocean resources are heavily exploited, yet planners and managers typically lack the data necessary to understand the physical dimensions – the seascape – of areas under consideration for various kinds of spatially explicit management approaches. Likewise, limited understanding of complex biological relationships within an ecosystem makes it

[8] This collaborative process, called *Tortugas 2000*, led to the designation of the Tortugas Ecological Reserve. See http://www.fknms.nos.noaa.gov/tortugas/welcome.html .
[9] The reserve is actually comprised of two sections: Tortugas North at 312 km2 and Tortugas South at 206 km 2

difficult to anticipate the impact of use restrictions in particular areas. The ability to establish the right zone boundaries to achieve the intended purpose, and then to communicate those boundaries to resource users, is essential to effective monitoring and enforcement.

There are scientific, policy and implementation advances needed in the area of ocean zoning; however, experience and new technologies are adding important tools to the practice of managing offshore resources.

A sampling of mapping and analytic tools to support the boundary-setting process include:

Sea-Floor Mapping: *Multi-beam sonar* creates detailed and accurate seafloor maps by sending out a fan of sound energy - from equipment mounted on a ship's hull – towards the sea floor, and recording the reflected sound. The maps include both bathymetric data and information about the composition of the seafloor. In addition to providing critical data, the compelling images created by multi-beam sonar are a powerful tool for educating stakeholders about the complexity of the natural systems beneath the physical surface of the ocean (MPA News, 2002).

Web-based GIS: In the case of the proposed Musquash MPA in New Brunswick, web-based GIS technology is allowing stakeholders at many levels to share spatial data – including cartographic, socio-economic and administrative data sets – to visually integrate boundary information in near-real time. Cost effective programs are available that do not require participants to change the way they store and maintain data. The ability to combine the resources of a variety of stakeholders via the internet supports effective decision-making, as data developed under different mandates is over-laid in the form of interactive maps (Sutherland, 2002).

Spatial Multi-Criteria Analysis: As experience with MPAs grows, interest is being expressed in developing objective, systematic and consistent approaches to designing protected area boundaries. In the case of the Asinara Island National Marine Reserve in Italy, researchers enhanced a widely-used process of multi-criteria analysis by adding a spatially-explicit component that allowed the results of the analysis to be expressed visually through maps (Villa, 2001). This mathematics-based analytic approach was applied to assess the potential effectiveness of different planning scenarios incorporating zones with various levels of use restriction, in relationship to values expressed numerically by stakeholders, and helped to objectively define an optimal spatial arrangement of different protection levels (Villa, 2002).

Ecosystem-Based Predictive Modeling: ECOSPACE is a spatially-explicit, ecosystem-modeling approach used to test how multi-use buffer zone placement, size and intensity of harvest restriction would alter species composition within the Gwaii Haana National Marine Conservation Area (NMCA) in British Columbia (Salomon, 2002). The analysis underscores the importance of anticipating trophic effects both inside and outside "no take" reserve boundaries, as well as the implications of increased fishing effort at the

boundaries on the species distribution within the reserve. Although ECOSPACE cannot provide quantitative predictions, it can be an important tool to help managers screen alternative MPA design scenarios and generate alternatives to experiment with in the field (Salomon, 2002). The lack of research into the dynamics of *no-take* reserves in temperate marine waters makes this type of modeling potentially useful for assessing protected area design options in the Gulf of Maine region.

It is important to note that all the tools described above serve a dual purpose: advancing the technical understanding of the management area under discussion; and improving the manager's ability to effectively engage stakeholders in the process of assessment and decision making. When affected parties have confidence in the information provided and are given the opportunity to meaningfully contribute to exploring the implications of a proposed management structure, the chance of acceptance and eventual compliance are greatly enhanced.

IV. The Gulf of Maine Context

There are broad initiatives in both the U.S. and in Canada, as well efforts focused on the Gulf of Maine region, which are directing, inspiring or supporting consideration of extending zoning approaches within the ocean environment.

Canada's Ocean Strategy

Canada's Ocean Strategy, developed in response to passage of Canada's Ocean Act in 1997, defines the principles and policy objectives for the management of the nation's estuarine, coastal and marine ecosystems. It articulates several principles and approaches that will provide the underpinnings for a new oceans governance process, including: ecosystem-based management, a precautionary approach to developing and managing coastal and ocean resources; sustainable economic development; collaboration among agencies and levels of government, and greater participation in the governance process on the part of citizens and interests affected by decision making (DFO, 2002).

The framework envisions this being accomplished with a specific geographic focus - through collaboration among governmental and non-governmental representatives with interests in a given area of ocean space (DFO, 2002).

The Eastern Scotian Shelf Integrated Management Initiative (ESSIM) is an example of this strategy in action in the Gulf of Maine. The DFO selected this area for development of an integrated management plan for several reasons: 1) the presence of important living and non-living marine resources that are used by multiple industries or sectors and regulated by two levels of government; 2) it is an area of high biological diversity and productivity; and 3) the multiple-use and multiple regulation of the area had led to a number of existing and potential user and resource conflicts (OCMD, 2001).

This initiative is considering a variety of spatial management issues, including the establishment of corridors for fiber optic cables (as discussed earlier in this paper), and

the development of a systematic and comprehensive plan for the selection and prioritization of MPA's within the region (OCMD, 2001).

U.S Commission on Ocean Policy

The U.S. Oceans Act of 2000 sets the stage for development of a new National Oceans Policy for the United States.

The Act establishes a 16-member Commission to conduct a detailed review of existing and planned U.S. ocean and coastal programs and activities. The Commission will provide recommendations for a coordinated and comprehensive policy on a broad range of issues, ranging from the stewardship of marine resources and pollution prevention to enhancing and supporting marine science, commerce, and transportation (U.S. Commission on Ocean Policy, 2002).

Supported by a Science Advisory Panel and working groups focusing on Governance; Stewardship; Research, Development and Marine Operations; and Investment and Implementation; the Commission has been holding regional meetings to hear the concerns and suggestions of state and local officials, academia, industry, public interest groups and the general public. Testimony included strong statements from all sectors on the need for a more predictable and rational process for allocating space for marine uses, including areas set aside for conservation purposes. For example, at the Commission's July meeting in Boston, speakers urged the Commission to replace the isolated permitting of individual development projects in federal waters with comprehensive ocean-use planning for the EEZ, and to develop equitable structures for compensating the public for these private uses of submerged lands. In addition, there was support articulated for science and research to develop the data, including extensive seafloor mapping, necessary to inform ocean planning (U.S. Commission on Ocean Policy, 2002).

The commission will submit a final report and recommendations to the President and Congress in July 2003.

"Good Governance of Canada's Oceans: The Use and Value of Marine Boundary Information"

This initiative, funded by the Geomatics for Informed Decisions (GEOIDE) Research Network, is investigating issues surrounding boundary delimitation in a multidisciplinary framework. Researchers are looking at both offshore jurisdictional boundaries and ecosystem boundaries, through case studies representing typical coastal and offshore delimitation issues, all in the Gulf of Maine. The research objectives include: 1) understanding information requirements for governance; 2) modeling boundary uncertainty; and 3) using ocean mapping technologies to illustrate the delimitation issues (Sutherland, 2002). The intended outcomes of this project – improved administrative boundary information, progress in the delimitation of the Canadian continental shelf and the development of visualization technologies for ecosystem and jurisdictional

boundaries – will directly contribute to the effective application of zoning techniques in the marine environment.

Gulf of Maine Mapping Initiative (GOMMI)

The goal of GOMMI, a trans-boundary effort launched by the Gulf of Maine Council for the Marine Environment, is to map the entirety of the Gulf of Maine basin. This project will undertake extensive seafloor mapping utilizing a range of visualization tools, including multi-beam sonar and laser scanning technologies. Products will include digital maps illustrating seafloor topography in great detail, and backscatter maps showing the composition of the ocean bottom (gravel, coarse sand, mud, bedrock, etc) by recording the reflectivity of seabed materials. A suite of products that describe the maps and data to different audiences will also be developed.

Parts of the Gulf of Maine – about 15% of a total 168,000 km2 – have already been mapped by U.S. agencies, Canadian agencies and private sector interests, using multi-beam sonar. Completing the picture through the GOMMI is anticipated to take several years. The project will link the capabilities and expertise of the region's private and public sectors with the immediate needs of coastal managers, and will support efforts to appropriately site a wide variety of specific ocean uses, as well boundary-setting for MPAs and other planning initiatives.

V. Offshore Jurisdictions and Authorities in the Gulf of Maine

The complex jurisdictional and regulatory regime that establishes the current framework for ocean management has been reflected throughout this paper. Ocean zoning is a tool that can be implemented at many scales by any level of government to carry out specific management responsibilities. Consideration of new zoning approaches for managing offshore resources should begin with an understanding of jurisdictional authorities and existing regulatory frameworks.

The waters of the Gulf of Maine are within the political jurisdictions of the governments of Canada and the US. International conventions and national law define the extent of spatial jurisdictions as well as associated rights and responsibilities. There is also a multitude of federal and state/provincial laws, programs, and regulations with jurisdictions that include the waters of the Gulf of Maine administered by a host of federal and provincial/state agencies.

Political/Legal Jurisdictions

The federal governments of the U.S. and Canada, the states, and to some extent, the provincial governments share legal jurisdiction over the waters of the Gulf of Maine. The boundary between the two countries, known as the Hague Line, was established by the International Court of Justice in the Hague, the Netherlands.

Underlying all regulatory and management programs and decision making in the ocean are the ocean jurisdictional zones and associated rights and responsibilities for each. These ocean zones are defined by the Third United Nations Convention on the Law of the Sea (UNCLOS III).
Canada's Oceans Act of 1997 declared Canada's maritime zones in accordance with the provisions of UNCLOS. The US has not adopted UNCLOS, but federal law establishing the boundaries of offshore jurisdictions are consistent with the international convention. Canada's federal government claims sovereign rights to the seabed and subsoil in all of these zones from the baseline[10] to the limits of the continental shelf (DFO, 1997(1)).

The Oceans Act states that federal jurisdiction is not shared with the provinces; however, there are provincial laws that include considerable offshore areas within their jurisdictions, and unresolved constitutional issues remain.

The following identifies these legal jurisdictions in the Gulf of Maine and summarizes the rights and responsibilities of the sovereign governments (Christie, 1994):

Territorial Sea: For international purposes, the territorial sea is the waters, 12 nautical miles wide, adjacent to the coast, seaward of the baseline. The territorial sea is considered part of a country's sovereign territory meaning a country has sovereign rights to the economic resources, sea, and airspace. It is exercised subject to UNCLOS and other rules of international law relating to innocent passage, transit passage, and protection of the marine environment.

For the U.S., the 12-mile territorial sea was established by Presidential Proclamation 5928, on December 27, 1988. This proclamation was not intended to and did not change existing federal or state domestic laws or regulations, which are generally tied to the original three nautical mile definition of territorial sea as drafted in 1975.

The Submerged Lands Act (SLA) (43 U.S.C. §§ 1301 *et seq.*), granted states title to the natural resources (oil, gas, and all other minerals) located within three miles of their coastline. The Coastal Zone Management Act (CZMA) gives individual states jurisdictional rights out to three nautical miles with the remaining area between four and twelve miles designated as federal territorial sea, in which states have only the right to review activities (Klee, 1999).

The states manage the waters in their jurisdiction in accordance with the Public Trust Doctrine, which provides that lands, waters and living resources in a state are held by the state in trust for the benefit of all of the people. The doctrine establishes the responsibilities of the states in managing these public trust assets to preserve and continuously assure the public's ability to fully use and enjoy public trust lands, waters and resources for certain public uses. Specific implementing statutes and regulations vary from state to state (CSO, 1997).

[10] Baseline is defined as the mean low water line. It separates the inland or internal waters from the territorial waters and is the point from which offshore jurisdictions are measured.

Contiguous Zone: Extends 24 nautical miles from the baseline (or an additional 12 miles from the territorial sea), in accordance with international law, but not within the territorial sea of another nation. Within the contiguous zone a country may exercise the control needed over foreign vessels to prevent infringement of its customs, fiscal, immigration, sanitary and pollution laws and regulations. Presidential Proclamation 7219 of September 2, 1999 established the 24-mile contiguous zone for the U.S.

Exclusive Economic Zone: The EEZ extends from the outer boundary of the territorial sea to 200 nautical miles (370 km) from the coast baseline. Within its EEZ, the countries have sovereign rights over all living and non-living resources, e.g., fisheries and minerals. Other nations may exercise freedom of vessel navigation and over-flight. The U.S. 200-mile EEZ was established by Presidential Proclamation 5030 on March 10, 1983.

Continental Shelf: Extends a minimum of 200 nautical miles from the coastal baseline up to 350 nm in special circumstances. The country has exclusive jurisdiction over the mineral resources, including oil.

High Seas are the waters beyond national jurisdiction. No state has claim to sovereignty in the High Seas, which are open and freely available to all. The United Nations International Seabed Authority has jurisdiction over any mineral resources in the High Seas.

Programmatic Jurisdictions

There are a multitude of federal and state/provincial laws, programs, and regulations whose purposes are to manage marine resources and activities and whose jurisdictions include waters within the Gulf of Maine. These are administered by a host of federal and provincial/state agencies with goals of protecting, managing, and/or regulating access to living and nonliving resources.

Canada

In Canada, the federal government is responsible for all issues in waters below the mean high-water mark, except for aquaculture for which certain responsibilities are assigned to the provinces. Twenty-three federal departments and agencies are involved in the oceans through policies, programs, services, regulation and/or procurement (DFO, 1997). The Department of Fisheries and Oceans (DFO) has the principle role in oceans policies and programs and is leading the development of a national oceans management strategy under the Oceans Act of 1997. Provincial jurisdictions include provincial lands, shorelines, and freshwater resources, except navigable waters, inland fisheries, federal lands, and certain areas of the seabed. Federal and provincial jurisdictions overlap in matters of species and habitat conservation. Aboriginal governments are also involved in the management of human activities in marine environments (DFO, 1997(2)).

Canada's Oceans Act of 1997 establishes a legislative commitment to a comprehensive approach for the protection and development of oceans and coastal waters. Under the authority of the Act the Minister of Fisheries and Oceans is coordinating the development of Integrated Management plans for all of Canada's coastal, estuarine and marine waters. The process of preparing these plans encompasses: comprehensive planning and management of human activities to minimize the conflict among users; a collaborative approach; a planning process that respects existing divisions of constitutional and departmental authority; and no alteration of any existing Aboriginal or treaty rights.

Canada's Oceans Strategy and accompanying document, *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada*, sets out policy, concepts and principles guiding implementation of this new integrated management approach to oceans governance. The proposed Integrated Management planning framework will extend from the large to the small scale – from Large Ocean Management Areas to Coastal Management Areas. There will also be a range of connected and nested structures that provide options for different scales of response within this spectrum (Oceans Directorate, 2002).

United States

An even wider collection of federal and state government agencies and departments exercise programmatic, regulatory, and decision making authorities in the U.S. waters of the Gulf of Maine. At the federal level, the U.S. Army Corps of Engineers, various divisions of the National Oceanic and Atmospheric Administration (NOAA), the Environmental Protection Agency (EPA) and the Coast Guard all play a significant role in permitting or conditioning offshore activities. The nature and extent of agency jurisdictions and responsibilities are spelled out in federal and state laws and regulations. The need and benefits of comprehensive ecosystem-wide management and coordinated decision-making is recognized and understood, but issues of jurisdiction and programmatic interests have hindered meaningful efforts.

Most of the laws are applicable throughout the entire reach of state or federal waters, but a number are designed to apply to specifically identified geographic areas (generically, Marine Protected Areas) or, in a few cases, utilize zones as one component of an overall management strategy. The Ocean Conservancy, a U.S. based non-governmental conservation organization, recently identified over 300 protected areas of various types within just the U.S. portion of the Gulf of Maine and immediately adjacent land and water areas (Recchia, 2001). Further, certain areas of ocean waters and/or bottom are designated for specific uses, such as dredged material disposal, navigation, defense activities, and fisheries development.

VI. Summary

- Designating specific areas of the marine environment for particular uses, including conservation, is a fairly common component of coastal management in the Gulf of Maine.

- Zones for various purposes exist independently, under different authorities. There is no standard process for comprehensively assessing the combined impact of these designations on marine resources.

- Comprehensive ocean zoning requires good, spatially explicit data on ecosystem characteristics and offshore jurisdictions. This is not readily available for most areas, and can be expensive and time-consuming to collect.

- Ocean zoning establishes priorities among different uses of marine resources and may redistribute benefits and costs of management among different groups. Engaging stakeholders in the development and implementation of any new management structure is essential to effective implementation.

- Ocean zoning is a tool that can be applied at a variety of scales, and in combination with other management measures.

VII. Next steps for the Gulf of Maine Council

At the conclusion of the *Ocean Zoning Forum* held in Boston on December 4, 2002, participants were asked to suggest how the Gulf of Maine Council should think about integrating ocean zoning into their work plan. The comments fell into four broad categories:

1) Establish Existing Conditions:
   - This includes mapping existing zones, uses and jurisdictions within the Gulf of Maine;
   - Convene U.S. and Canadian federal government interests to discuss trans-boundary ocean management concerns;
   - Assess the effectiveness of existing management tools (laws, regulations and programs), to ensure they are being used effectively, before embarking on creating a new structure based on zoning.
2) Determine What Needs to Change or Be Protected:
   - Set sustainability goals for the Gulf of Maine;
   - Develop ecosystem indicators to track progress in achieving the goals;
   - Determine where spatial management approaches will best serve those goals.
3) Start Small:
   - Do pilot projects to experiment with different aspects of ocean zoning;
   - Focus on developing management schemes for areas known to be valuable and threatened.
4) Develop a Constituency:
   - Educate the public about risks to the marine environment and opportunities to improve stewardship through ocean zoning;
   - Develop better tools to assess sociological impacts
   - Use a zoning approach to bring predictability to infrastructure development in the marine environment (e.g. pipelines, cables)

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GULF OF MAINE OCEAN ZONING FORUM

Sponsored by

Gulf of Maine Council on the Marine Environment

John Joseph Moakley United States Courthouse • Boston, Massachusetts
Agenda • December 4, 2002

8:45 AM **Registration**

9:00 AM **Welcome and Introduction** – Tom Skinner, Massachusetts Office of Coastal Zone Management

9:10 AM **Keynote Speech –** Bob Durand, Secretary, Massachusetts Executive Office of Environmental Affairs

9:25 AM **Setting the Stage – Council Panel discussion on the need, status, and concerns about Ocean Zoning**
Kathleen Leyden, ME Coastal Program
Pete Colosi, National Marine Fisheries Service
Joe Arbour, Department of Fisheries and Oceans
Kim Hughes, NB Department of Environment and Local Government
Priscilla Brooks, Conservation Law Foundation

10:15 AM **Ocean Zoning – What is it, how does it work, and how does it compare with terrestrial zoning?**
John Duff, Marine Law Institute, University of Maine School of Law

11:00 AM **Break**

11:15 AM **Gulf of Maine Mapping Initiative (GOMMI)** – Overview of plan for coordinated mapping of Gulf of Maine seafloor, Susan Snow-Cotter, MCZM; Tom Noji, National Marine Fisheries Service

12:15 PM **Lunch** – On your own at onsite cafeteria

1:00 PM **Ocean Zoning at the Local and Nearshore level** - Edgartown Harbor, MA, Norman Rankow, Edgartown Harbor Committee

1:20 PM **Balancing the Use of the Florida Keys Marine Environment** – Billy Causey, Florida Keys National Marine Sanctuary

2:00 PM **Canadian and International Ocean Zoning Case Studies** - Art Hanson, Canada's Ocean Ambassador, International Institute for Sustainable Development

2:40 PM **Cape Wind Project Panel** – Could this type of project (and the review thereof) benefit from ocean zoning? Dennis Duffy, Cape Wind; Issac Rosen, Alliance to Protect Nantucket Sound; Maggie Geist, The Association to Preserve Cape Cod; Greg Watson, Massachusetts Technology Collaborative

3:40 PM **Break**
4:00 PM **Where do we go from here?** - Discussion, questions, and answers
5:00 PM **Adjourn**