

# Marine Protected Areas Federal Advisory Committee

May 3, 2010

Dr. Jane Lubchenco  
Under Secretary of Commerce for Oceans and Atmosphere, and  
NOAA Administrator  
Department of Commerce  
1401 Constitution Avenue, NW, Rm 5810  
Washington, DC 20230

Mr. Thomas Strickland  
Assistant Secretary for Fish and Wildlife and Parks  
Department of the Interior  
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Re: Recommendations of Marine Protected Areas Federal Advisory Committee on

- 1) Climate Change in the Oceans
- 2) Cultural Heritage Vision for the National System of Marine Protected Areas

Dear Under Secretary Lubchenco and Assistant Secretary Strickland:

As the newly elected Chair of the Marine Protected Areas Federal Advisory Committee (Committee), I am pleased to transmit these recommendations from the Committee, approved at our recent meeting of April 20-22 in Charleston, South Carolina. I am honored to lead this diverse Committee, made up of representatives from many different stakeholder groups across the country, along with my Vice Chair, Ms. Lori Arguelles.

At our Charleston meeting, the Committee completed its work on “Climate Change in the Ocean: Implications and Recommendations for the National System of Marine Protected Areas.” These recommendations describe how the National System of Marine Protected Areas (MPAs) can help foster ecological resilience to climate change impacts. They focus on: 1) designing MPA sites, MPA networks and the national system of MPAs to be ecologically resilient to the impacts of climate change; and 2) evaluating and adaptively managing MPA sites, MPA networks and the national system in response to climate change. The Committee concludes that the National System of MPAs is a valuable tool with considerable potential to reduce climate change impacts to marine resources.

I am also pleased to enclose the Committee’s recommendations on a “Vision for the Cultural Heritage Resources Goal of the National System of MPAs.” The conservation and management of cultural heritage resources is one of the three goals of the national

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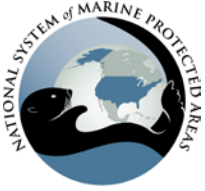
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# Marine Protected Areas Federal Advisory Committee

system, but has not been well developed due to a lack of expertise on the Committee. This situation has now been remedied by the recent formation of the Committee's Cultural Heritage Resources Workgroup, made up of 17 members representing federal, state, tribal and private organizations with expertise on marine archeology, cultural resource management, and perspectives from tribes and other indigenous people.

As you know, the Committee is currently undergoing a transition, bidding farewell to 14 members who have served since 2003, and welcoming 14 new members who will be appointed soon. I wish to acknowledge the Committee's deep appreciation for the service of its outgoing members, and in particular for the leadership of Dr. Mark Hixon and Robert Zales II, the outgoing Chair and Vice Chair. I look forward to working with you as the Committee begins work on its new charge, addressing timely and critical issues, such as the role of MPAs within coastal and marine spatial planning, how MPAs can help foster healthy communities, effective management of land/sea interactions within MPAs, and strengthening the cultural resource management role of the national system.

Sincerely,

A handwritten signature in blue ink, appearing to read "E. Piñeiro-Soler".

Eugenio Piñeiro-Soler  
Chair

**Marine Protected Areas Federal Advisory Committee**  
**April 2010**

**CLIMATE CHANGE IN THE OCEAN: IMPLICATIONS AND RECOMMENDATIONS  
FOR THE NATIONAL SYSTEM OF MARINE PROTECTED AREAS**

There is abundant scientific evidence that marine ecosystems<sup>1</sup> are undergoing substantial changes -- physically, chemically and biologically -- due to the direct and indirect effects of changes in climate and atmospheric composition.<sup>2</sup> These changes, which we will refer to as *climate change in the ocean*,<sup>3</sup> will have local, regional and national implications, including warming water, sea level rise, altered weather patterns, changes in ocean chemistry, altered currents, melting sea ice, and ocean acidification.<sup>4</sup> Climate change in the ocean is, therefore, a growing challenge to the management of MPAs, networks of MPAs,<sup>5</sup> and the National System of MPAs.

As the U.S. Departments of Commerce and Interior undertake the development of both the National System of MPAs and the government's response to climate change, we offer two primary recommendations to be implemented by the appropriate managing authorities:

- I. design MPAs, MPA networks and the National System of MPAs to be as ecologically resilient as practicable to the impacts of climate change; and
- II. evaluate and adaptively manage MPAs, MPA networks and the National System of MPAs in response to climate change.

Implementing these recommendations will better position the nation to meet the important need of managing the National System of MPAs in the context of present and future impacts of climate change in the ocean. Furthermore, following these recommendations in a manner that balances the types and levels of MPA protections and is science-based and stakeholder-informed, will help to meet the nation's goals for conserving natural heritage and cultural heritage and achieving sustainable production.<sup>6</sup>

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<sup>1</sup> The use here of the broad term '*marine ecosystems*' is intended to refer to ocean, marine and coastal ecosystems (including the Great Lakes) and their components (e.g., habitats, species, populations, and other living resources such as fish stocks).

<sup>2</sup> Barnett *et al.* 2005, IPCC 2007, Orr *et al.* 2005.

<sup>3</sup> The phrase '*climate change in the ocean*' is intended to refer to all of the primary, secondary and tertiary effects of climate change in and on the ocean (e.g., warming, melting ice, sea-level rise, altered upwelling and currents, coastal erosion, changing weather patterns, salinity changes) and ocean acidification.

<sup>4</sup> Harley *et al.* 2006, Hays *et al.* 2005, Perry *et al.* 2005, Roessig *et al.* 2004.

<sup>5</sup> Graham *et al.* 2008, Hoffman 2004, McLeod *et al.* 2009.

<sup>6</sup> National MPA Center 2008, pg 7.

## I. Designing MPAs and Networks of MPAs for Ecological Resilience

### Ecological Resilience<sup>7</sup>

MPAs, networks of MPAs and the National System of MPAs have an important role in addressing the increased uncertainty regarding the responses of organisms and changes to ecosystems resulting from the effects of climate change in the ocean. In the face of climate change, MPAs can help to maintain and restore ecological resilience and the capacity to provide ecological goods and services.<sup>8</sup> Degraded marine ecosystems have a compromised capacity to provide the ecological goods and services we require and desire, and they may have reduced resilience to climate change in the ocean. When MPAs are judged by the relevant management authorities to be appropriate management measures, they can be used alone or as part of an integrated suite of measures to achieve one or more of the following objectives:<sup>9</sup>

- **Reducing non-climate stresses** – To increase ecosystem integrity and resilience, reduce those human-caused stresses on marine ecosystems that exacerbate or interact negatively with climate change, which should improve the capacity of ecosystems to resist and recover from the impacts of climate change in the ocean.
- **Protecting the least exposed** – Protect those ecosystems that are least exposed to climate change in the ocean by siting MPAs where the effects of climate change are expected to be less severe due to local conditions.
- **Protecting the most resistant<sup>10</sup> and adaptable** – Protect ecosystems affected by climate change by selectively siting MPAs where organisms are expected to be naturally more resistant or adaptable to climate change impacts.
- **Protecting the most valuable** – Protect those resources at risk from climate change that are especially valuable by siting MPAs to contain those resources. Such resources include those that are unique or rare, or those that are ecologically, culturally, historically, socially or economically important.
- **Protecting resilient populations** – Ensure replenishment, viability and genetic diversity of populations by designing MPAs and MPA networks to protect sufficiently large effective population sizes to achieve these goals and, thereby, increase the chance of population persistence.
- **Making MPAs dynamic** – Site, design, and modify MPAs and MPA networks to maintain protection of populations in anticipation of potential habitat or species range shifts in response to climate change.

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<sup>7</sup> MPA FAC 2009.

<sup>8</sup> Babcock *et al.* 2010, Lafferty 2003, Mumby *et al.* 2010.

<sup>9</sup> Based on McLeod *et al.* 2009.

<sup>10</sup> Ecological resilience represents the ability of an ecosystem to recover from change; resistance in this sense refers to the ability of an ecosystem to withstand change.

- **Maintaining connectivity** – Site and design MPAs to create ecologically connected and functional networks that take into account the range shifts of populations and the movements of individuals and genes in response to climate change.
- **Spreading risk** – Site and design MPA networks to spread the risk of catastrophic loss due to the more extreme impacts of climate change by protecting a range of habitats and replicating sites that include those habitat types.

In light of climate-change impacts that have the potential to drive large numbers of species to extinction, reshuffle biological communities, significantly alter habitats, and degrade ecosystems, application of the approaches above will create MPAs and networks of MPAs that have the potential to become climate-change refugia and ecological buffers to uncertainty in a rapidly changing ocean.<sup>11</sup>

## II. Evaluating and Adaptively Managing the National System of MPAs

Time is of the essence in developing the capacity of MPA managers to anticipate, detect and respond to the impacts of climate change on marine ecosystems. Impacts of climate change in the ocean are occurring now and are expected to become increasingly severe in the coming decades, and climate change is necessarily altering the nature of our approach to environmental and natural resource management. Climate change is increasing environmental variability, pushing environmental patterns into unexplored realms, creating new situations and patterns, increasing gaps in scientific understanding, and exacerbating limitations on our capacity to predict future environmental conditions, all of which will affect the manner in which we manage individual MPAs, networks of MPAs, and the National System of MPAs.

The following recommendations are focused on building capacity in MPA monitoring, evaluation, scientific knowledge, ecosystem characterization, and flexible governance to provide MPA managers with the capacity to modify MPAs adaptively in the physical and governance realms to address climate change impacts that have already occurred or are predicted to occur:<sup>12</sup>

- **Monitoring and Evaluation** – Build and enhance capacity to monitor and evaluate the physical and chemical effects of climate change on MPAs and their impacts on the biological systems protected by those MPAs.

<sup>11</sup> Biswas *et al.* 2009, Brander 2010, Brander *et al.* 2007, Chan *et al.* 2008, Cheung *et al.* 2010, Cheung *et al.* 2009, Cooley and Doney 2009, Cooley *et al.* 2009, Doney *et al.* 2009, Edwards *et al.* 2004, Elsner *et al.* 2008, Fabry *et al.* 2008, Greene *et al.* 2007, Harley *et al.* 2006, Harvell *et al.* 1999, Hays *et al.* 2005, Helmuth *et al.* 2006, Keeling *et al.* 2010, Kuffner *et al.* 2007, Learmonth *et al.* 2006, Lehodey *et al.* 2006, MacLeod *et al.* 2009, McLeod *et al.* 2009, Miles 2009, Mueter *et al.* 2008, Muller *et al.* 2009, CDISSOAMRIA 2010, O’Shea *et al.* 2009, Perovich *et al.* 2009, Pratchett *et al.* 2008, Ranasinghe *et al.* 2009, Roessig *et al.* 2004, Scavia *et al.* 2002, Smith *et al.* 2008, Stachowicz *et al.* 2002, Veit *et al.* 1997, Veit *et al.* 1996, Vermeer *et al.* 2009, Whitehead *et al.* 2008, Wiig 2008, Wootton *et al.* 2008.

<sup>12</sup> These recommendations are in no particular order of importance.

- **Predictive Capabilities** – Foster the development of new ecosystem models that interface with climate change models to predict the impacts of climate change in the ocean on the National System of MPAs at appropriate regional and sub-regional scales.
- **Agency Coordination and Governance** – Promote a higher level of coordination among resource and environmental agencies, including consultation with interested stakeholders, to expedite the design and implementation of MPAs, in a way that meets the complex challenges that are likely to result from climate change in the ocean.
- **Education and Public Engagement** – Facilitate education and engagement with decision makers, managers, stakeholders, and the public in order to expand overall awareness and understanding of the relationships between climate change in the ocean and the National System of MPAs.
- **Policy Action Thresholds** – Identify ecological thresholds related to the effects and impacts of climate change that would trigger the implementation of MPA management actions to ensure timely and appropriate responses.
- **Ecosystem Characterization** – Support the ecological characterization of the National System of MPAs in order to promote the improved understanding of the impact of climate change on the structure, diversity and function of MPA ecosystems. The development and use of ocean observing systems, sensors, geospatial tools, marine spatial planning, and other predictive capabilities will all contribute to effective ecosystem characterization.
- **Targeted Scientific Research** – Support adaptive management of the National System of MPAs and networks of MPAs by closing critical gaps in scientific knowledge of climate change in the ocean. In particular, research should target understanding ecosystem structure and functioning.

## SUMMARY

Integration of the National System of MPAs with other climate change management efforts has considerable potential to reduce some of the impacts of climate change on our marine resources. With the proper management tools in place, MPA managers will be able to design and adaptively manage MPAs and networks of MPAs to promote ecological resilience as climate change impacts continue to grow. In addition to meeting the conservation goals of the National System of MPAs, implementation of these recommendations should not preclude “opportunities for appropriate access to and/or compatible use of marine resources consistent with conservation goals and objectives.”<sup>13</sup>

These recommendations are relevant to prioritization, funding and implementation of approaches for maximizing the effectiveness of our National System of MPAs.

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<sup>13</sup> National MPA Center 2008, pg 17.

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**Marine Protected Areas Federal Advisory Committee  
April 2010**

**CULTURAL HERITAGE RESOURCES IN THE  
NATIONAL SYSTEM OF MARINE PROTECTED AREAS**

*The following vision statement was developed by the Marine Protected Areas Federal Advisory Committee to guide the development of the National System of Marine Protected Areas with respect to its focus on cultural heritage resources. The vision represents the Committee's conception of what the national system should include and emphasize, and how the national system can benefit these resources.*

**Vision for Cultural Heritage Resources Goal of National System of MPAs:**

Achieving and maintaining healthy coastal and marine ecosystems requires a fundamental understanding of the relationships between people and the environment. Cultural heritage, which belongs to all people, emphasizes these connections, whether that heritage takes the material form of, for example, maritime resources (such as shipwrecks), natural resources (such as marine species and habitats), or sacred places. Through the national MPA system, cultural relationships among people and historic, natural, and place-based heritage resources are preserved and perpetuated in ways that recognize and share multiple cultural voices and knowledge systems for the benefit of all.

**Recommended Technical Corrections to Cultural Heritage Resources References in the *Framework for the National System of Marine Protected Areas of the United States of America***

*The Committee also recommended the following technical corrections to the Framework for the National System of Marine Protected Areas of the United States of America to reflect the broad scope of cultural heritage resources. Additions are show as underlined.*

*Modify National System Planning and Implementation Principles (Framework, p. 16):*

**National scope, ecosystem and regional scale** – Embraces regional, tribal, and ecosystem approaches to planning, participation, and implementation. Provides a mechanism for coordinating across regions, nationally, and where appropriate, internationally.

*Modify MPA Eligibility Criteria for the National System (Framework, p. 17)*

2. Have a management plan that includes cultural and natural resources, as appropriate.
4. Cultural heritage MPAs must conform to criteria included in the National Register of Historic Places, or be considered important by Indian Tribes, Native Alaskans, Native Hawaiians, and Pacific Islanders, or have the potential to provide information important to understanding cultural and natural heritage.