RECIPES FOR ADAPTATION: MARINE MANAGEMENT UNDER CLIMATE CHANGE AND OCEAN ACIDIFICATION.

WORKSHOP AGENDA

Dates: 18-19 May, 2009

Venue: Conservation International Offices
5th Floor
2011 Crystal Dr, Arlington VA 22202

Additional Information:
http://www.whoi.edu/sites/marine_adaptation_meeting

WORKSHOP OBJECTIVES

1. **Summarize the effectiveness of current marine management approaches in addressing the impacts of climate change and ocean acidification**, including
   - Marine Spatial Management (including MPAs)
   - Fisheries Management (Population based management)
   - Restoration Methods
   - Coastal zoning and development policy

2. **Identify existing climate change models and research that can be rapidly integrated into management and describe how that integration will occur**. Models to include:
   - Population models (eg fisheries, not spatially explicit)
   - Niche Envelope models (fisheries and other species)
   - Global climate, ocean and ocean acidification models, and regional downscaling, regionally nested models
   - Impact models (linking oceanography, climate and ecology eg spatially explicit models of ecosystem service dynamics)
   - Multi species trophic models
   - Socio-economic models

3. **Describe illustrative case studies**

4. **Define the gaps and future directions needed in marine management, modeling, research and the integration of management and research.** For example:
   - Developing new management tools and strategies for adaptation (what might work? What are the obstacles?)
   - Informing modeling community of real management needs
   - Establish communication between stakeholders (policy makers, managers, users) and modelers (Science to Action, COMPASS?)

WORKSHOP PRODUCTS

Audience	Product
Research Community	Policy Review in Science Special edition of *Environmental Research Letters*
Marine Managers	Paper in Fisheries Journal Brief summary paper
Funding / Program managers	Summary document
Users / Stakeholders / Public	Outreach to Policymakers and media (potential partnership with COMPASS) AAAS session

DAY 1 - MONDAY 18th May, 2009
AGENDA

9:00 Introduction and Welcome

9:10 **Presentation: Climate Change and Ocean Acidification**
Scott Doney, Woods Hole Oceanographic Institution

9:50 **Presentation: Case Study – Bering Sea Fisheries**
Anne Hollowed, National Marine Fisheries Service

10:30 Break

10:50 **Presentation: Case Study – Great Barrier Reef**
Paul Marshall, Great Barrier Reef Marine Park Authority

11:30 **Breakout groups: Current marine management, Climate Change and Ocean Acidification: Where are we on marine climate change adaptation? (with working lunch)**

1) *High latitude Fisheries and Ecosystems* (Moderator: Jon Hare, NOAA)
2) *Eastern Tropical Pacific* (Moderator: Carlos Drews, WWF)
3) *Tropical Pacific Reefs* (Moderator: Rusty Brainard, NOAA)

Examine current state-of-management for the groups specific region

- Are climate change and ocean acidification impacts being integrated into management? Give specific examples. How effectively? What are the obvious omissions?
- What existing models and research should be integrated in management?
- Can existing management approaches incorporate climate change and ocean acidification impacts? What are the dominant management structures used in the region? How can existing climate change and ocean acidification models and research be integrated into management? Give specific examples.
- What are the obstacles to addressing climate change and ocean acidification? Are the limitations of models understood by management? How do we match biological and physical scales to management scales?

3:30 Break

4:00 **Presentation: Green house gases and coral reefs - the prospects for resilience?**
Nancy Knowlton, Sant Chair for Marine Science, Smithsonian Institution

5:00 Close

DAY 2 - TUESDAY 19th May, 2009
AGENDA

9:00 **Overview of Day One: Reports from working group and plenary discussion**

9:30 **Presentation: Response of Marine Systems and Management to Climate Change and Ocean Acidification**

Les Kaufman, Boston University / Conservation International

10:10 Break

10:30 **Breakout groups: Writing the recipes: Getting from Current to Future Marine Management (including working lunch)**

1) *High latitude Fisheries and Ecosystems*
2) *Eastern Tropical Pacific*
3) *Tropical Pacific Reefs*

Design an implementable marine adaptation plan for the specific region for the following time horizons:

1. *Tomorrow* – Consider existing management and immediately available solutions
2. *5 year time horizon* (work within current governance structure)
    a. What new science will/should be available?
    b. What new management structures should be developed and tested?
3. *10-15 year time horizon*
    a. What is science will be needed to support marine management irrespective of the governance structures that might exist?

Consider:

- What are the essential new needs for management with Climate Change and Ocean Acidification? Give specific examples. How do we move from the current model of marine management (figure 1) to including climate change and ocean acidification (figure 2)?
- What new models and research is on horizon that needs to be adopted soon?
- Do we need new management structures with the impacts of climate change? What new ideas are needed eg. Adaptive and restorative engineering? Assisted migration? Geo engineering?
- What does the marine management need from the climate community? Monitoring? Models? Specific details such as number of warm SST days? Extreme events?

Current Management Processes

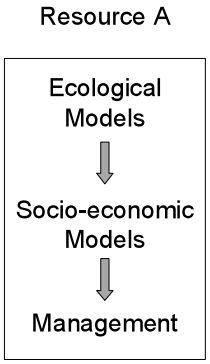

Figure 1

Future Management Processes

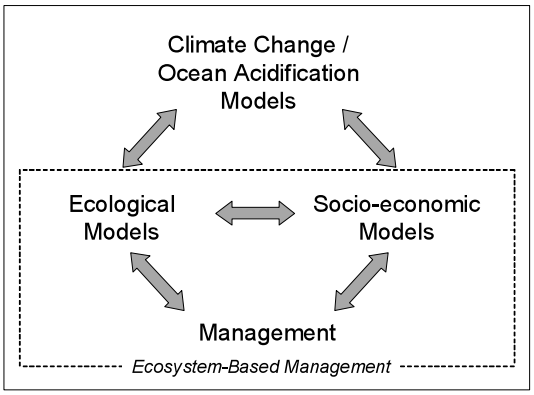

Figure 2

2:30 Break

3:00 **Plenary Wrap-up**

Review working group outputs
Identify common needs and approaches
Review products and next steps

4:30pm Close