

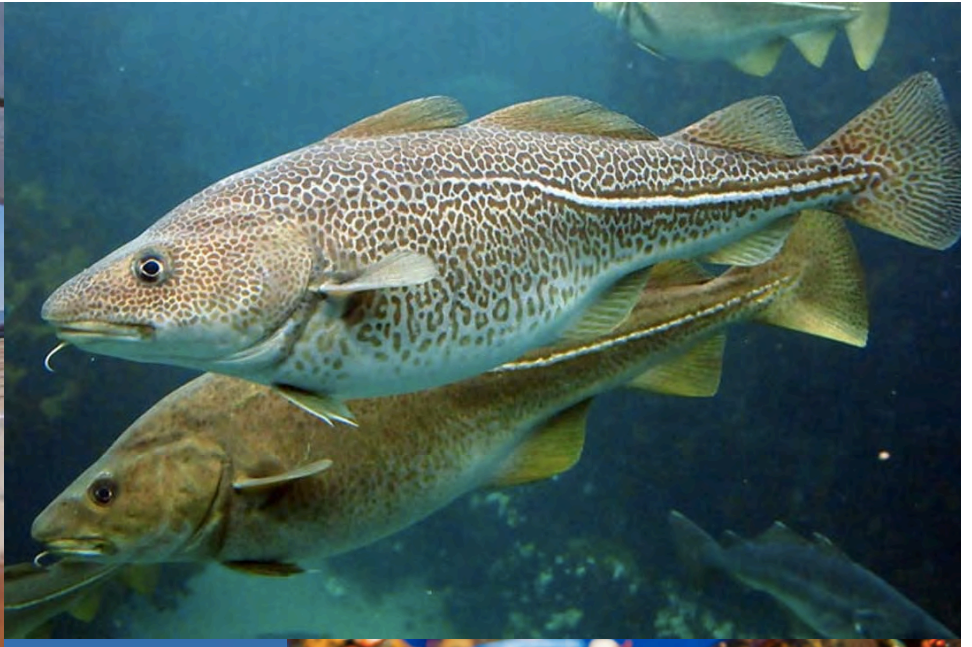
Ecosystem services and sustaining coupled marine systems



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Darling Marine Center & School of Marine Sciences







Mike Sleeper, Duxbury Beach







Northeast Regional Ocean Council's mission is to provide a voluntary forum for states and federal partners to coordinate on regional approaches to support balanced uses and conservation of the Northeast region's ocean and coastal resources.

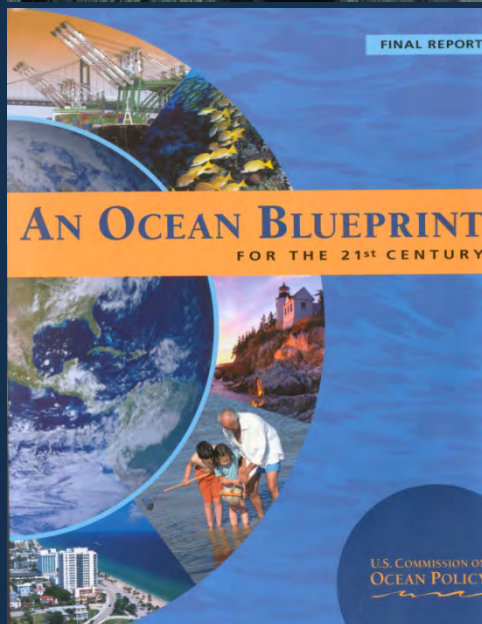
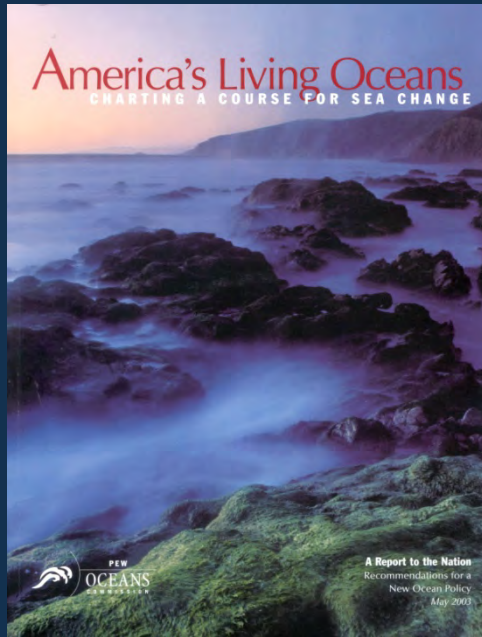
<http://northeastoceancouncil.org/>



“The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need.”

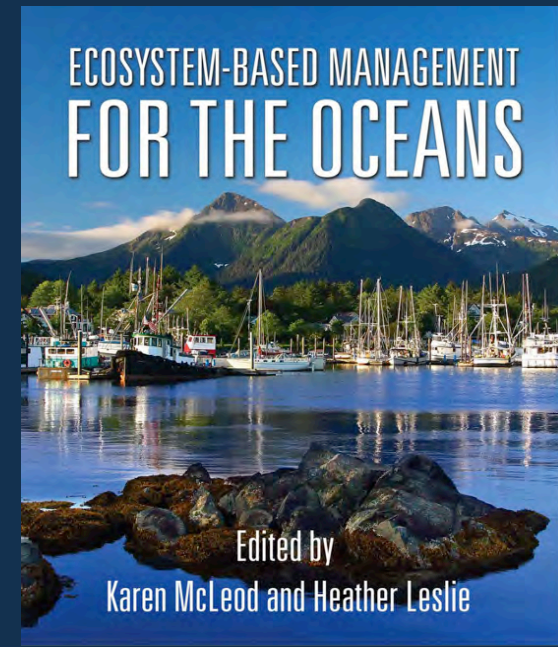
- Scientific Consensus Statement (McLeod et al. 2005)





Two US Ocean Commissions
called for ecosystem-based
management ...
but offered few details

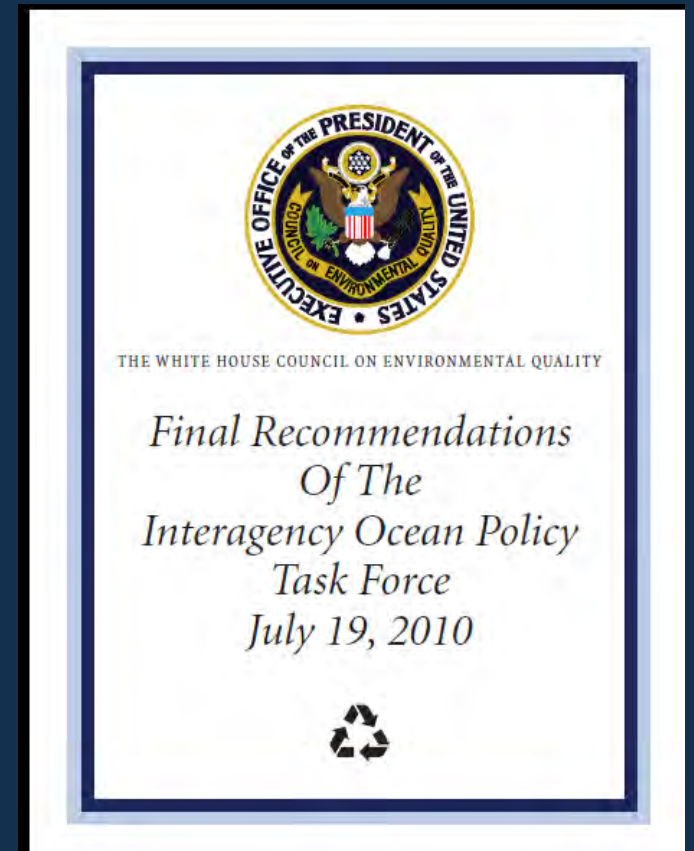
Core elements of ecosystem-based management



1. Place-based approach that considers the entire ecosystem, including people
2. Interactive and cumulative effects of human activities
3. Explicit tradeoffs so as to maintain a full suite of ecosystem services and meet multiple objectives

2010: First-ever US National Ocean Policy

- Maintain and restore coasts, oceans, and services through ecosystem-based management
- Management tools include:
 - Protected areas
 - Marine spatial planning
 - Habitat restoration
 - Watershed planning
 - Long-term monitoring



The Northeast Regional Planning Body embraced the mandate & developed the nation's first plan



Northeast Regional Planning Body

- Six States
- Six Tribes
- Nine Federal Agencies
- New England Fisheries Management Council
- *Plus* New York and Canada



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- Six States
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The Nation's first ocean plans were released yesterday!

National Ocean Council | The x Ocean Action Plan x

https://www.whitehouse.gov/administration/eop/oceans

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The ocean, our coasts, and the Great Lakes provide jobs, food, energy resources, ecological services, recreation, and tourism opportunities, and play critical roles in our Nation's transportation, economy, and trade, as well as the global mobility of our Armed Forces and the maintenance of international peace and security.

— President Barack Obama



Goals of the Northeast Ocean Plan

1. Healthy ocean and coastal ecosystems
2. Effective decision making
3. Compatibility among past, current, & future ocean uses



Northeast Ocean Plan

Path for achieving the plan goals, through

- public engagement,
- sound science, and
- adaptive, ecosystem-based management

NE Ocean Plan is available at <http://neoplan.org/plan/>

Northeast Ocean Plan

advancing an adaptive approach to managing the ocean ecosystem

04

CHAPTER 1 introduces the unified system of US and international ocean planning.

14

CHAPTER 2 summarizes the ocean planning process to date, including the development of ocean goals, the National Ocean Data Plan, and the Northeast Ocean Plan.

30

CHAPTER 3 summarizes the regulatory framework for managing ocean and coastal resources. It then provides a depth look at the 10 ocean resources and activities for which this Plan will guide and inform decision-making:

- 38 Marine Life & Habitat
- 60 Cultural Resources
- 68 Marine Transportation
- 78 National Oceanic and Atmospheric Administration
- 86 Commercial Fishing
- 94 Energy & Infrastructure
- 104 Aquaculture
- 124 Offshore Sand Resources
- 134 Restoration

140

CHAPTER 4 describes how the Regional Planning Body (RPB) will implement the Plan. This discussion includes best practices for intergovernmental coordination and stakeholder engagement, Plan implementation and oversight responsibilities, and commitments to develop frameworks for monitoring and evaluating performance.

164

CHAPTER 5 identifies knowledge and information gaps and organizes those gaps under six primary science and research priorities. These data and information gaps were identified throughout the planning process by the stakeholders, and the Agencies' development and implementation of these gaps will be coordinated by the RPB and the community.

- 179 Endnotes
- 184 Appendices
- 197 Acronyms and Abbreviations
- 199 Acknowledgments

What's the system?

Planning process to date?

Which ecosystem services?

What are the next steps?

How can scientists help?

NE Ocean Plan is available at <http://neoplan.org/plan/>

Science & Research Priorities of the Northeast Ocean Plan

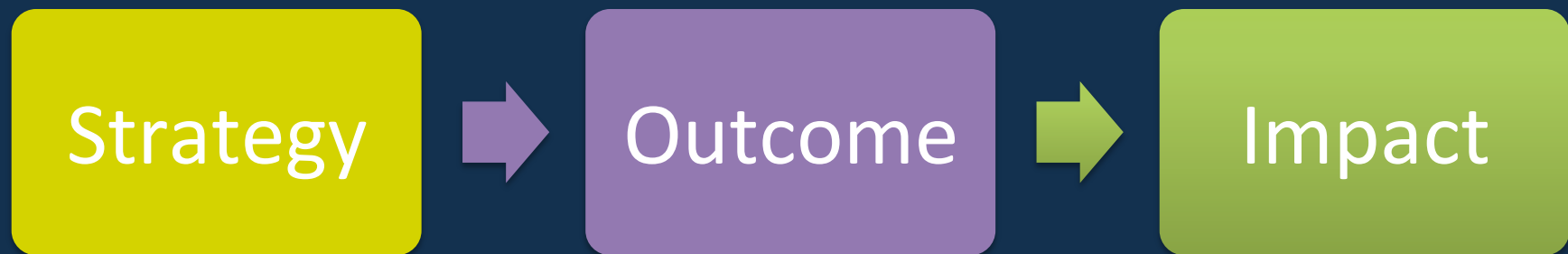
1. Improve understanding of marine life and habitats
2. Improve understanding of tribal cultural resources
3. Improve understanding of human activities, coastal communities, and interactions between uses
4. Characterize the vulnerability of marine resources
5. Characterize changing environmental conditions and resulting impacts to existing resources and uses
6. Advance ecosystem-based management by building on these priorities, and studying ecosystem services

<http://neoplan.org/plan/>

Ecosystem services research needs

1. Use existing data to characterize the spatial and temporal dimensions of ecosystem services.
2. Help users identify decisions that are optimal across sectors.
3. Explore how the ecosystem affects human use (i.e., ecosystem services and valuation) and how human use affects the ecosystem (including cumulative impacts).
4. Express outputs in biophysical, economic, and /or social terms.

Results chains (aka theories of change)
could help ground the science and
connect with what people care about

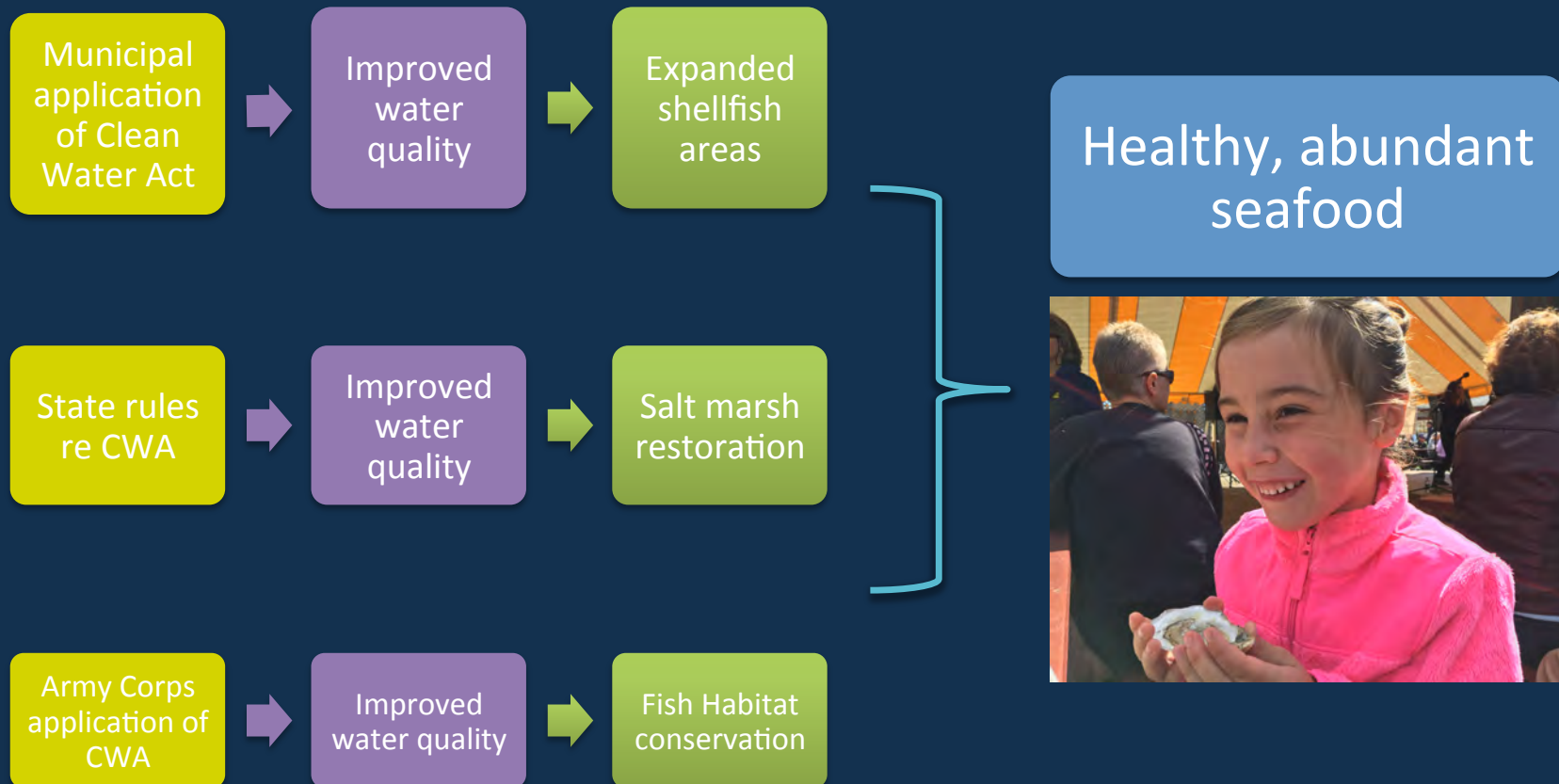


Credit: Heather Tallis, Lydia Oleander, Eddie Game, and many others.
See also <http://www.theoryofchange.org/>

Comparing theories of change...



... may identify synergies among management activities



Data Synthesis and Mapping: NE Ocean Data Portal



NORTHEAST OCEAN DATA

Maps and data for ocean planning in the northeastern United States

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DATA ▾

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DATA EXPLORER

Interact with any combination of data in the Data Explorer — Human Activities, Marine Life, and Environment

Human Activities



AQUACULTURE
Interactive Map



COMMERCIAL FISHING
Interactive Map



CULTURE
Interactive Map



ENERGY &
INFRASTRUCTURE
Interactive Map



MARINE TRANSPORTATION
Interactive Map



RECREATION
Interactive Map



NATIONAL SECURITY
Interactive Map

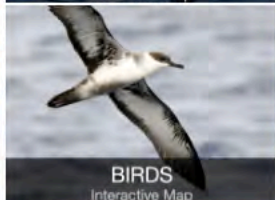
Marine Life



MAMMALS & TURTLES
Interactive Map



FISH
Interactive Map



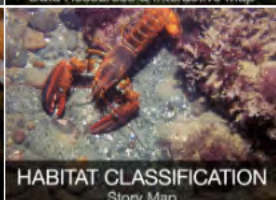
BIRDS
Interactive Map



EELGRASS
Data Resources & Interactive Map



HABITAT
Interactive Map



HABITAT CLASSIFICATION
Story Map

Environment



BATHYMETRY
Data Resources & Maps



WATER QUALITY
Interactive Map



RESTORATION
Interactive Map

<http://www.northeastoceandata.org/>

How can ecosystem services move the conversation forward in New England?

Ideas? Please email me @ heather.leslie@maine.edu