

**REALIZING EBM THROUGH
IEA AND REGIONAL
COLLABORATION IN THE US**

**David Fluharty
FIS/MEQ WORKSHOP
PICES XVI October 26, 2007
Victoria, BC CANADA**

CONTEXT FOR NOAA ECOSYSTEM SCIENCE ENTERPRISE

- EXISTING MANDATES**
- ECOSYSTEM GOAL TEAM**
- NATIONAL LEVEL COMMISSIONS**
- COUNCIL ON OCEAN POLICY [ETC.]**

JSOST

SIMOR

NOAA SCIENCE ADVISORY BOARD

US Legislation Relevant to Fisheries

National
Environmental
Protection
Act
1969

MARPOL

Administrative
Procedures Act

Marine Mammal
Protection Act
1972

Coastal Zone
Management Act
1972

Magnuson-Stevens Fishery
Conservation and
Management Act
1976 as amended/
latest 2006

Marine Research
and
Sanctuaries Act
1972

Endangered
Species Act
1973

Clean Water
Act
1972

Coral Reef
Protection Act
2004

Modified from Livingston 2002

US COMMISSION ON OCEAN POLICY 2004

- **DEVELOP AN ECOSYSTEM
APPROACH TO MANAGEMENT OF THE
US OCEANS**
- **BROADER APPROACH THAN
FISHERIES MANAGEMENT NEEDED**

INTRODUCTION

- **NOAA RESEACH REVIEW TEAM
RECOMMENDED 2003**

“..NOAA should establish an external Task Team to evaluate and strengthen the structure and function of ecosystem research in, and sponsored by, NMFS, NOS AND OAR”

EXTERNAL ECOSYSTEM TASK TEAM TERMS OF REFERENCE

**TWO KEY QUESTIONS WERE POSED TO THE
EETT BY NOAA**

- **Is the mix of science activities conducted by / sponsored by NOAA appropriate to its mission needs and regulatory requirements?**
- **How should NOAA organize its ecosystem research and science enterprise?**

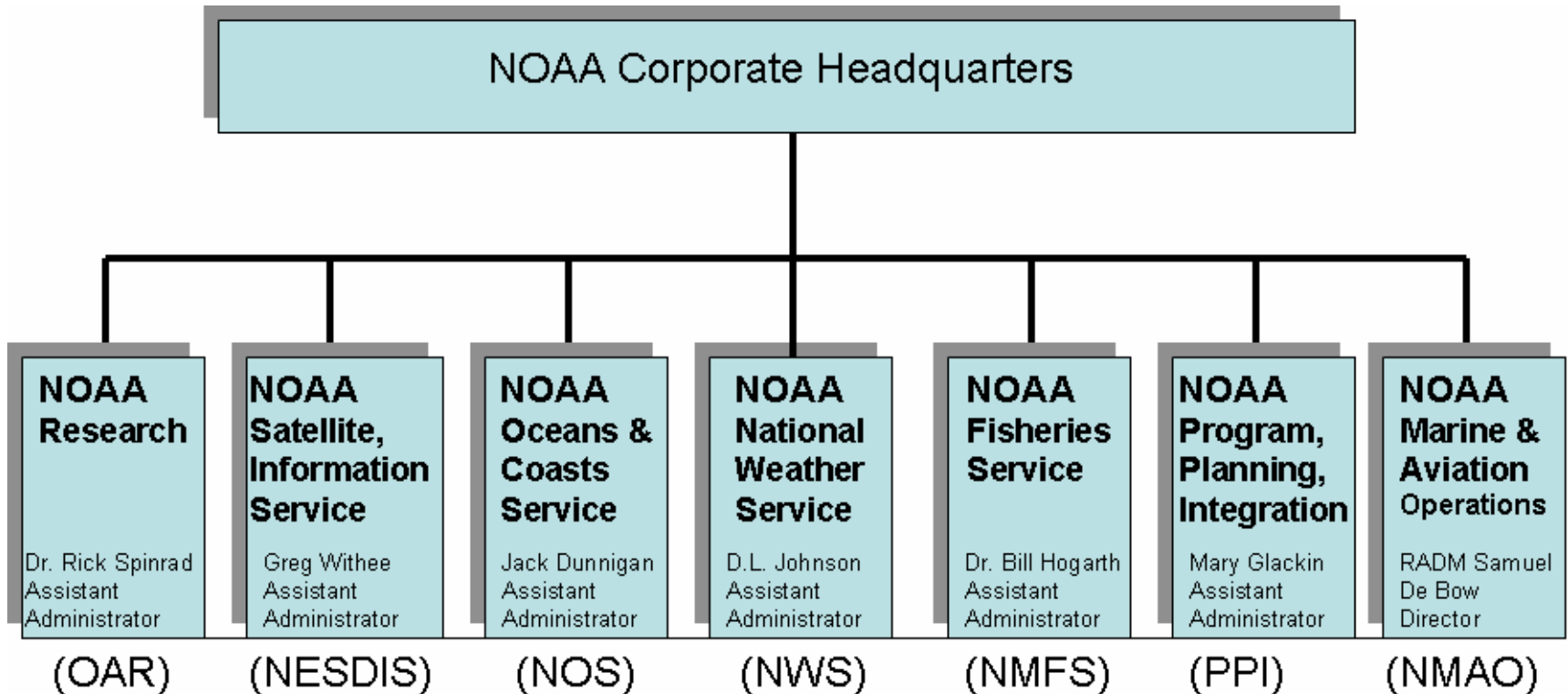
EETT APPROACH

- 1. COMMISSION WHITE PAPERS FROM NOAA AND INTERVIEW PERSONS INTERNAL AND EXTERNAL TO NOAA**
- 2. INVENTORY NOAA'S ECOSYSTEM STRUCTURE**
- 3. ATTEND MEETINGS/CONFERENCES**
- 4. READ REPORTS/ LITERATURE**
- 5. RECEIVE AND RESPOND TO PUBLIC COMMENTS**

EETT RECOMMENDATION - INTEGRATED ECOSYSTEM ASSESSMENTS

Regionally based Integrated Ecosystem Assessments (IEAs), conveying information on the status of ecosystem health and evaluating the impacts of current and proposed human activities should be the central products of NOAA ecosystem science.

WHAT IS NOAA?



At present the ecosystem science portfolio undertaken by NOAA is primarily developed by the individual LOs to address responsibilities under their assigned missions, with the Ecosystem Goal Team (EGT) intended to provide coordination across LOs.

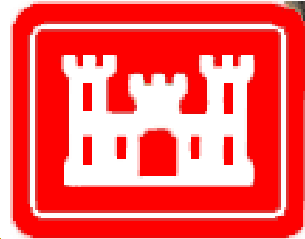
NOAA PARTNERS

- **OTHER FEDERAL AGENCIES**
- **STATE AGENCIES**
- **TRIBES**
- **USER AND ENVIRONMENTAL NON GOVERNMENTAL ORGANIZATIONS**
- **GENERAL PUBLIC**



United States Coast Guard

Semper Paratus



The Office of Governor Frank Murkowski



WHAT IS BEING DONE?

What is an IEA?

... A synthesis and quantitative analysis of information on relevant physical, chemical, ecological, and human processes in relation to specified ecosystem management objectives

NOAA, Boreman 2007

In other words:

An IEA contains the information necessary to understand the inter-relationship between resource management decisions and the changing state of an ecosystem

Modified from Boreman 2007

Steps in an IEA

- 1. Identify major factors affecting the ecosystem (human and natural), and the scale at which the ecosystem will be assessed**

2006 NOAA WORKSHOP ON DEFINING REGIONAL ECOSYSTEMS

- **SELECTED 8 REGIONAL ECOSYSTEMS
ROUGHLY COMPARABLE TO REGIONAL
FISHERY MANAGEMENT COUNCIL
BOUNDARIES AND NOAA ADMINISTRATIVE
BOUNDARIES**
- **FORMS BASIS FOR REGIONAL
COLLABORATIONS**
- **REGIONAL APPROACHES MAY FURTHER
DEFINE RELEVANT SUB-ECOSYSTEMS AND
NESTED ECOSYSTEM SCALES**

DeMaster and Sandifer 2006



Alaska Ecosystem Complex

Great Lakes

Northeast Shelf

Southeast Shelf

California Current

Gulf of Mexico

Caribbean Sea

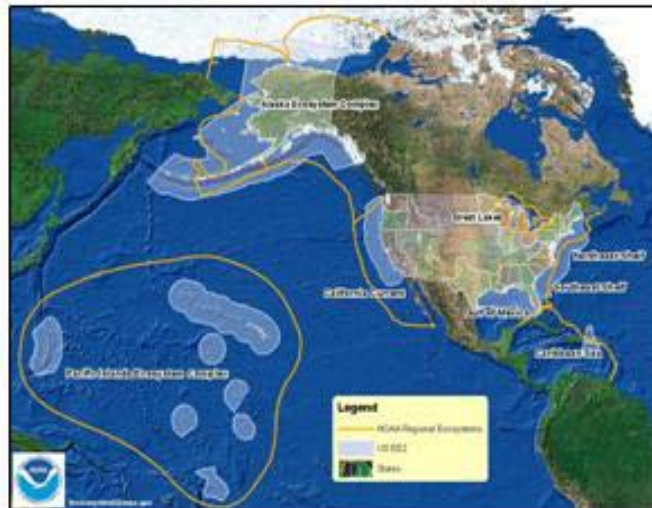
Pacific Islands Ecosystem Complex

Legend

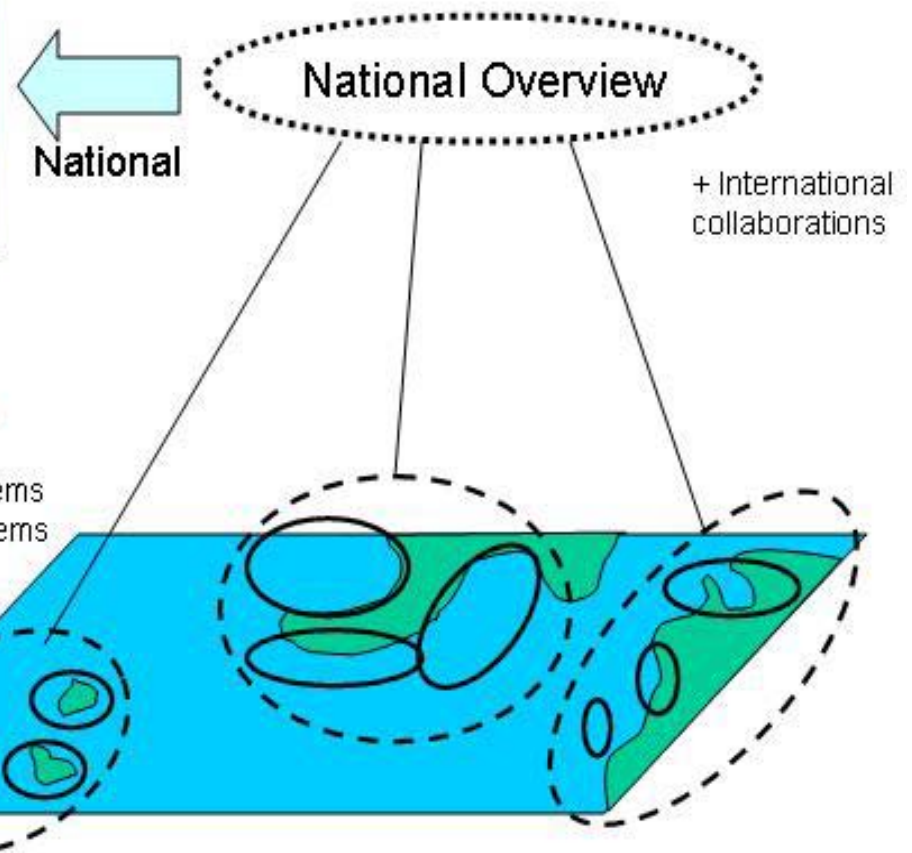
- NOAA Regional Ecosystems
- US EEZ
- States



What are the appropriate geographical scales for IEAs?



Assessing the Status of Ocean and Coastal Ecosystems of the United States



Hierarchical Structure of IEAs

Regional

- Large Marine Ecosystems
- Sub-Regional Ecosystems (as appropriate)

Local

- Place based (e.g., sanctuaries, NERRs)
- Bays, Harbors, Estuaries

The Alaskan Ocean Ecosystem





Exploratory drilling in the Beaufort Sea
<http://www.mms.gov/alaska/fo/INDEX.HTM>



Steller sea lion bull. Photo: NMFS



Photo by USACE,
<http://www.epa.gov/owow/oceans/regulatory/dumpdredged/dredgemgmt.html>



Subsistence salmon
<http://www.travelalaska.com>



http://www.epa.gov/owow/oceans/cruise_ships/



Pollock trawl near Kodiak, Alaska.
Photo: Mindy Jones, NMFS



Valdez Container Terminal
<http://www.ci.valdez.ak.us/port/marine.html>



Common murre
USFWS

Steps in an IEA

- 2. Organize existing [relevant] information and develop indicators of ecosystem status**

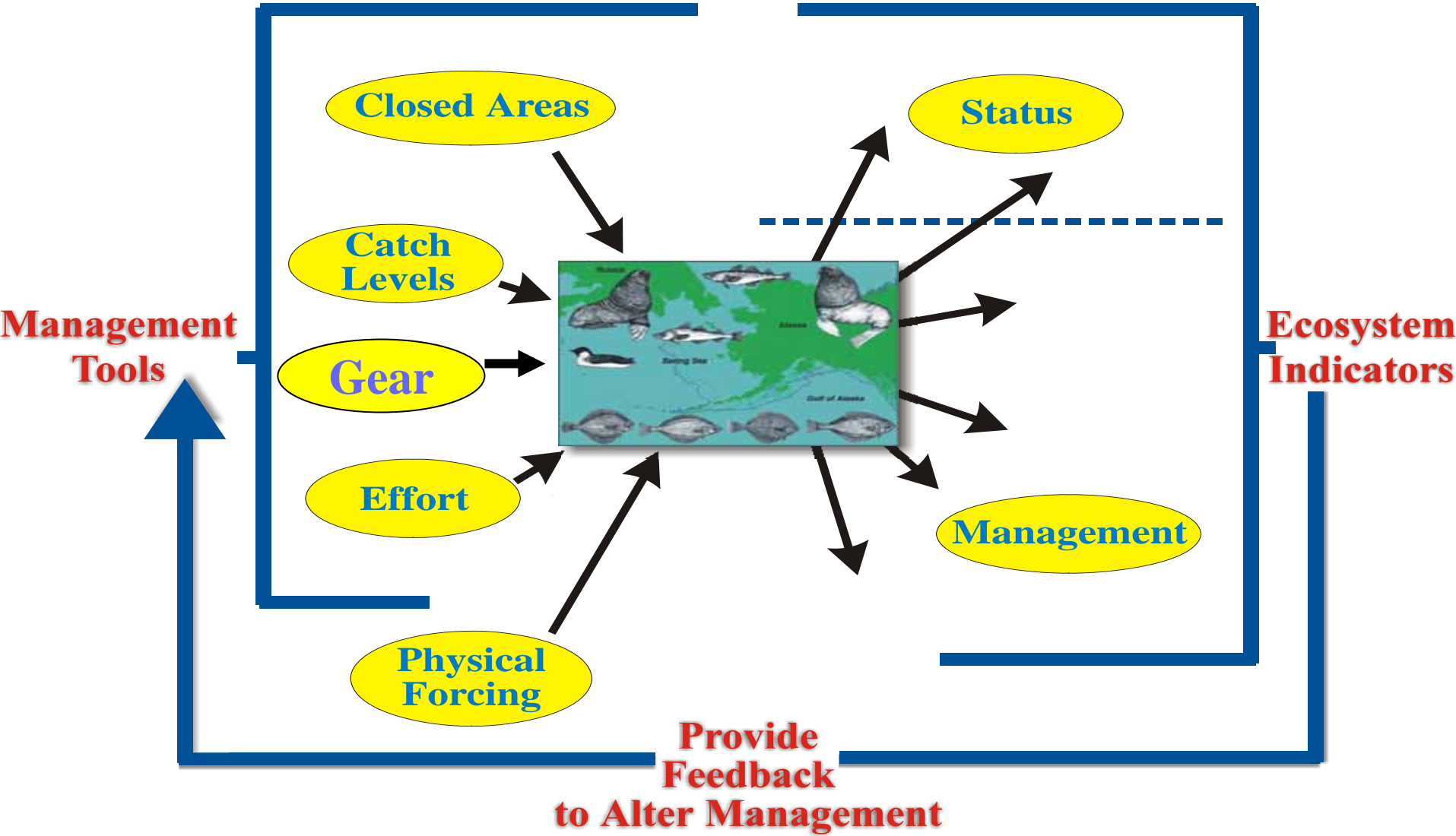
[This recommendation implements on a national basis the NPFMC Ecosystem Considerations chapter of the SAFE annual document done since 1994] .



Ecosystem Measures and Influences

Influences

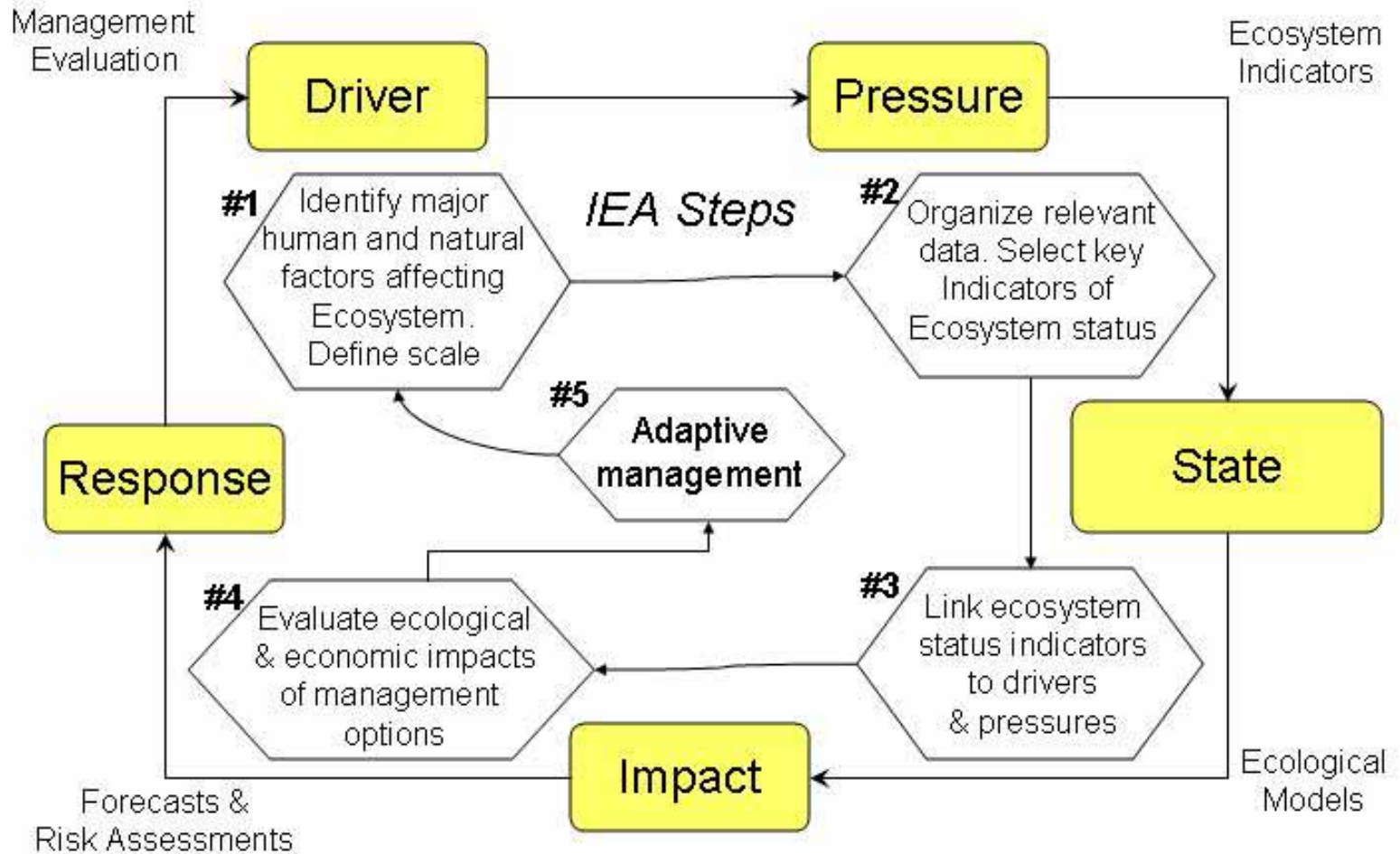
Outcomes



Steps in an IEA

- 3. Link the ecosystem status indicators to human and natural pressures that drive change.**

IMPLEMENTING THE DPSIR APPROACH IN US CONTEXT



Boreman 2007

Steps in an IEA

- 4. Evaluate the social economic and ecological impacts of management options, consistent with statutory responsibilities**

Modified from Boreman 2007

IMPLEMENTING SOCIAL/ ECONOMIC CONSIDERATIONS

- **REQUIRED IN ENVIRONMENTAL ASSESSMENT PROCESS [NEPA]**
- **COMMUNITY RIGHTS OF NATIVE PEOPLES**
- **ACHIEVING ECONOMIC OBJECTIVES**

Steps in an IEA

- 5. Use the IEA as a science tool supporting an adaptive approach to ecosystem-based management, to achieve target levels for management goals without exceeding the threshold for undesirable ecosystem conditions.**

US Pilot Studies

- **Three regional ecosystems will be used to test drive IEAs:**
 - **California Current**
 - **Alaska**
 - **Northeast US**
- **Lessons learned will be applied to create a comprehensive set of IEAs for the nation**

Critical Outcomes of IEAs

- 1. A more complete picture of threats and benefits posed by human activities**
- 2. A forum for engaging all federal, tribal and state agencies in an integrated approach to ecosystem-based management**
- 3. Routine and comprehensive IEAs done on a ~quadrennial basis; dynamic web-based IEA capability**

WHAT CAPABILITIES ARE NEEDED?

Core capabilities are needed in three areas:

- **Monitoring:** The Region has the competence and capacity to collect reliable information using state-of-the-art tools.
- **Analysis:** The Region has the competence and capacity to apply, adapt, and interpret state-of-the-art analytical methods.
- **Integration:** The Region has the competence and capacity to analyze and interpret relationships among ecosystem components and between human activities and natural ecosystem components, and to develop and apply models of those relationships.

GUIDING CONSIDERATIONS

Transitioning from the current set of programs and mandates to an integrated ecosystem science enterprise should be guided by the following considerations:

- It is essential to account for environmental forcing in dynamics of ecosystem components and relationships;**
- It is essential to understanding how humans take benefits from marine ecosystems and their components, and how those uses alter the ecosystems;**
- It is essential to integrate ecosystem science information when applying it to policy and management, and to account for how different policies and human uses of the sea interact with each other.**

Vision

The eventual production of routine IEAs will be a forward-looking leadership opportunity for NOAA in addressing ocean and coastal resource management issues.

IEAs are based on collaboration with regional partners at the federal, tribal, state and local levels.

Modified from Boreman 2007

THANK YOU FOR YOUR
ATTENTION

QUESTIONS OR COMMENTS?

EXTRA SLIDES

IEAs RECOMMENDATIONS

- **RECOMMENDATION 1.** NOAA should develop an explicit description, of what it sees as adequately “ecosystem rich” assessments and advice for the current products of its ecosystem science enterprise.
- **RECOMMENDATION 2.** NOAA should prepare “ecosystem development plans” for its assessment and advisory activities within each Region. These plans would lay out the major incremental steps foreseen for increasing the ecosystem content of these activities, and the expected timelines, in a proactive but not proscriptive manner.
- **RECOMMENDATION 3:** When the regional “ecosystem development plans” are completed, they should be assembled into an overall vision of where NOAA ecosystem services and science are going nationally.

Regional Recommendations

RECOMMENDATION 4: NOAA's Ecosystem Goal Team should lead and participate in the development of Integrated Ecosystem Assessments (IEAs) for all ecosystems in which NOAA has a statutory or trust responsibility.

RECOMMENDATION 5: NOAA leadership should commit to supplying ecosystem-science support on a regional basis.

RECOMMENDATION 6: NOAA should specify that the eight regional Ecosystems it has defined should be the starting points for coordinating regional ecosystem science and assessments.

ENSURING CORE CAPABILITIES

1

RECOMMENDATION 7: NOAA must formally structure those partnerships that are important to the science capability to perform integrated regional assessments, in order to ensure all partners are accountable for their contributions to the assessments, and that the integrity of the science content is assured.

RECOMMENDATION 8: The Ecosystem Goal Team should lead all Line Offices and Goal Teams in developing a national plan for an expanded regional ecosystem monitoring capability.

ENSURING CORE CAPABILITIES

2

- RECOMMENDATION 9: The NOAA social science plan should specify more comprehensively what social science monitoring data are required for managing human activities that affect or depend on the use of marine ecosystems, and develop a strategy to ensure such data are available.
- RECOMMENDATION 10: NOAA should develop a national plan to archive, organize, and distribute all the types of data needed to track, forecast and understand change in regional ecosystems.
- RECOMMENDATION 11: The capabilities to analyze status and trends in populations, habitats, and human activities need to be sustained and expanded at the regional scale.

ENSURING CORE CAPABILITIES

3

- **RECOMMENDATION 12: NOAA should expand capacity in forecasting trajectories of ecosystem components under different hypotheses for environmental and anthropogenic forcing and link these forecasts to potential consequences for resource users, coastal residents, and management options.**

DEVELOPING OTHER CAPACITIES

RECOMMENDATION 13 NOAA and its partners in the ecosystem science enterprise should develop or designate Centers of Specialized Expertise, e.g.:

- to build new tools for modeling and forecasting, and new observation instruments
- to develop social science capacity for linking with ecosystems governance,
- to develop an understanding of society and its response to changing ecosystem components,
- to identify changes in ecosystem structure and function,
- to quantify effects of human activities on the ecosystem.

RECOMMENDATION 14. NOAA should consider whether consolidation of efforts should occur and should develop plans for efficient regional and inter-regional coordination in the following areas:

- technical analyses on contaminants and toxicology,
- biodiversity and taxonomy,
- data archiving and integration.

HOW TO MAKE THE TRANSITION

RECOMMENDATION 15. NOAA should develop a series of Regional Ecosystem Science Boards consistent with the eight national regional ecosystems identified by the EGT plus the Antarctic. Each of these regional boards should be chaired by an SES-level manager, and include formal representation by all Line Offices providing ecosystem sciences in that regional ecosystem. Duties of these Regional Ecosystem Science Boards should include planning, coordinating and executing comprehensive plans of marine ecosystem science, and oversight for the production of integrated ecosystem assessments.

TIMELINE – FAST TRACK

- **Start – after NOAA SAB approves report and submits to NOAA Administrator**
- **Preparatory Phase. Months 0-6. NOAA Administrator considers recommendations and modifies them if necessary. Appointment of SES RESB leads and initial members. NOAA EGT in consultation with RESBs takes leadership, outlines charter development (See VI B), and develops IEA guidelines. Preliminary meetings of RESBs. Notice to constituencies [internal and external] about possible changes in NOAA services.**
- **Launch Phase. Months 7-12. Planning research coordination and IEA scoping, e.g., identifying data and other region-specific information available to respond to EGT guidelines. With initial plans, priority data and information would be categorized to focus on 1) what NOAA can do well; 2) what NOAA can do relatively credibly and 3) what cannot be done or known now. This would involve NOAA constituencies.**
- **Initial Work Phase. Months 13-18. Get the data and information into comprehensive archives check for consistency [etc.]. NOAA constituencies would be kept informed.**
- **Integrated Analysis and Reporting Phase. Months 19-24.. Perform first integrated assessments and report on them. Communicate with constituencies and obtain feedback from them.**

PPBES ROLE

RECOMMENDATION 16: The PPBES process, supported by the EGT, should identify and adopt timelines for both annual and multi-year planning, considering particularly the sequencing of timeframes for planning and coordinating of scientific research across LOs within Regions.

RECOMMENDATION 17: NOAA should fund the preparation of the IEAs and other key ecosystem science products through a process that is competitive among teams of LOs and partners.

OVERALL CONCLUSION AND RECOMMENDATION

The EETT concluded that NOAA must make integrated assessment the normal mode of business for assessing the status of marine ecosystems and the components, and for evaluating options for human uses of ecosystems. The Integrated Ecosystem Assessments require structured, accountable collaboration among multiple LOs, with science partners and with clients of ecosystem products and services. Some parts of this transition in science and management are underway; some will require changes of emphasis; some even changes in direction. All require greater resources because of the greater demands for science support for ecosystem-based approaches to managing multiple activities.

EETT/IETT

<i>NOAA SAB- eETT Members</i>	<i>NOAA -iETT Members</i>
Dave Fluharty - chair	Steve Murawski - chair
Jake Rice - rapporteur	Peter Ortner – vice chair
Mark Abbott	Gary Matlock - NOS
Mike Donahue	Kristen Koch, - OAR
Russ Davis	Mark Holliday - NMFS
Stephanie Madsen	Mel Gelman - NWS
Jon Sutinen	Mike Ford – PPI
Terry Quinn	Erik Cornellier –PA&E