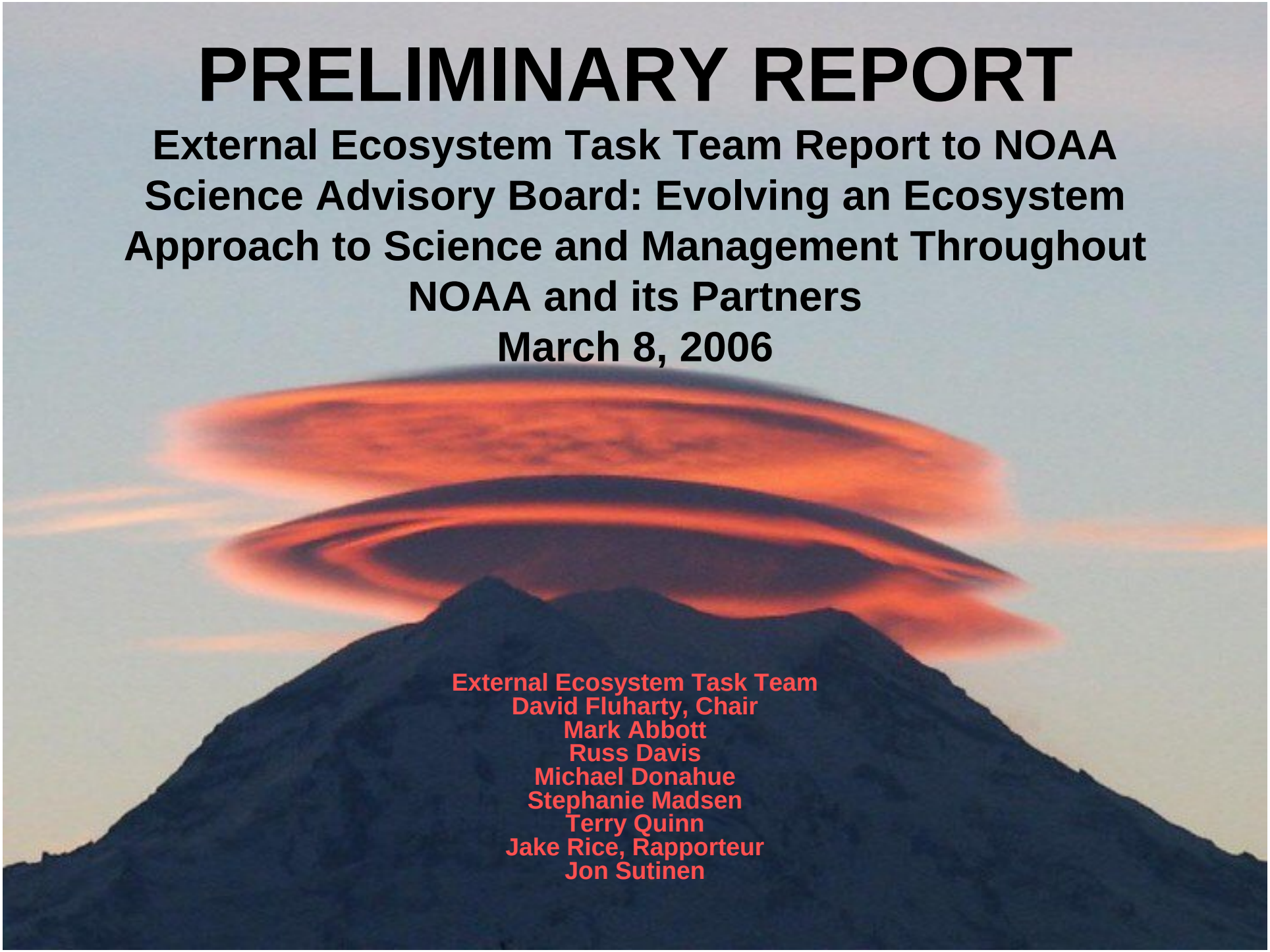
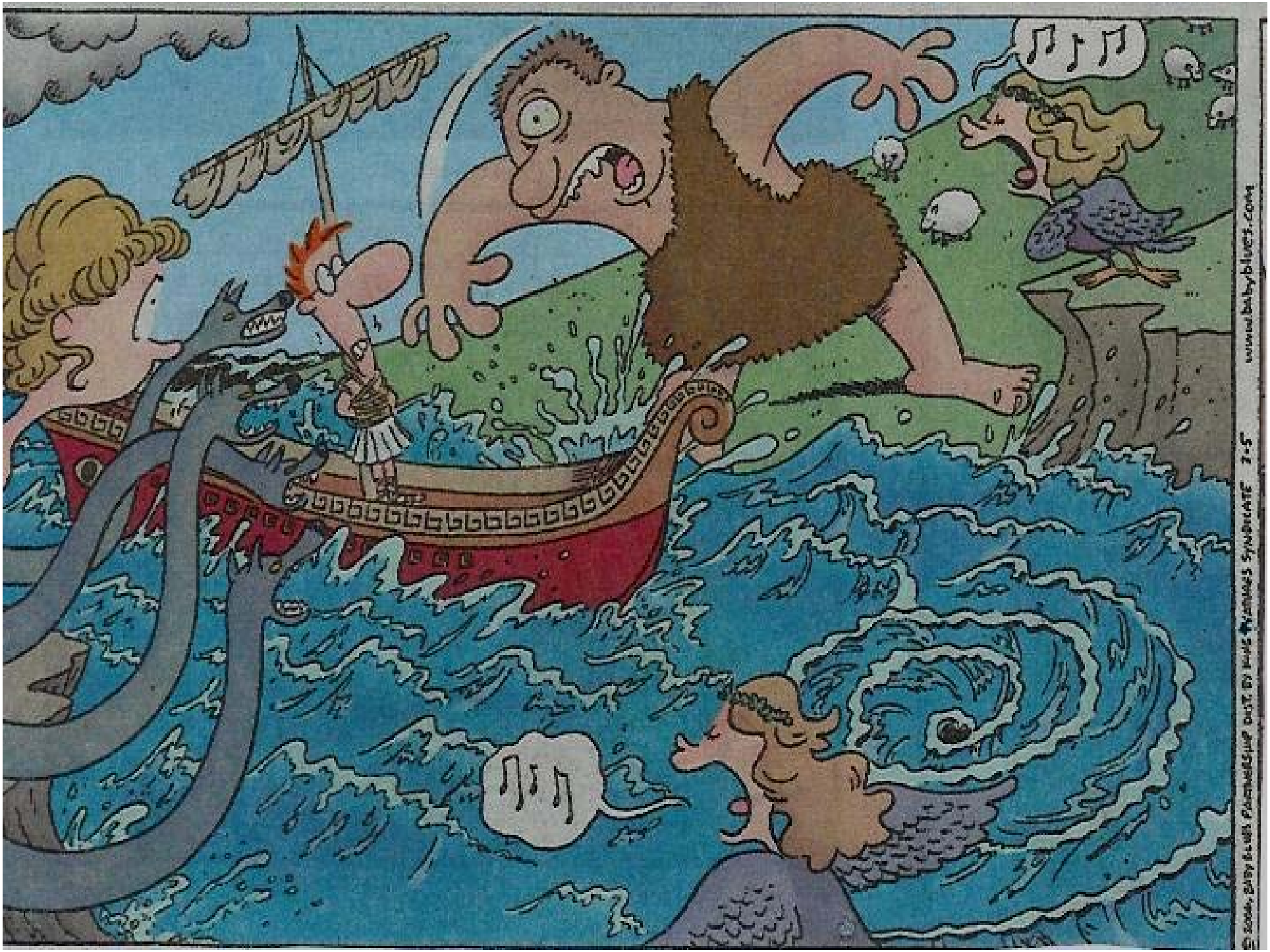


PRELIMINARY REPORT

External Ecosystem Task Team Report to NOAA Science Advisory Board: Evolving an Ecosystem Approach to Science and Management Throughout NOAA and its Partners

March 8, 2006

External Ecosystem Task Team
David Fluharty, Chair
Mark Abbott
Russ Davis
Michael Donahue
Stephanie Madsen
Terry Quinn
Jake Rice, Rapporteur
Jon Sutinen


www.bibyblicht.com

OUTLINE

- **INTRODUCTION**
- **CONTEXT**
- **GUIDELINES**
- **PRELIMINARY FINDINGS & RECOMMENDATIONS**
- **RESPONSE TO NOAA QUESTIONS**
- **TIMELINE FOR COMPLETION**

ORIGINS

- **NOAA RESEACH REVIEW TEAM RECOMMENDED**

“..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”

eETT TERMS OF REFERENCE

- **Is the mix off 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 and iETT

David Fluharty, Chair
Jake Rice, Rapporteur
Mark Abbott
Russ Davis
Michael Donahue
Stephanie Madsen
Terry Quinn
Jon Sutinen

Steve Murawski, Chair
Peter Ortner, Vice Chair
Gary Matlock – NOS
Kristen Koch – OAR
Mark Holliday – NMFS
Mel Gelman – NWS
Erik Cornellier – PA&E
Mike Ford – PPI

Staff: Kirsten Larsen NMFS Laura Bozzi, SAB

eETT APPROACH

- COMMISSION WHITE PAPERS FROM NOAA
- INTERVIEWS INTERNAL AND EXTERNAL TO NOAA
- INVENTORY NOAA'S ECOSYSTEM STRUCTURE
- ATTEND MEETINGS /
- READ REPORTS/ LITERATURE

WHITE PAPERS

- **Ecosystem Responses to Climate Variability**
- **Management of Living Marine Resources in an Ecosystem Context**
- **Freshwater Issues**
- **Marine Zoning and Coastal Zone Management**
- **Ecological Forecasting**
- **Science Requirements to Identify and Balance Societal Objectives**

INTERVIEWS INTERNAL TO NOAA

- **GOAL TEAM LEADS**
- **SENIOR LEADERSHIP**
- **SCIENTISTS**
- **SENIOR STAFF MEETING NOS, NMFS [OAR PENDING]**
- **PHYSICAL AND SOCIAL SCIENCE TASK TEAM LEAD**

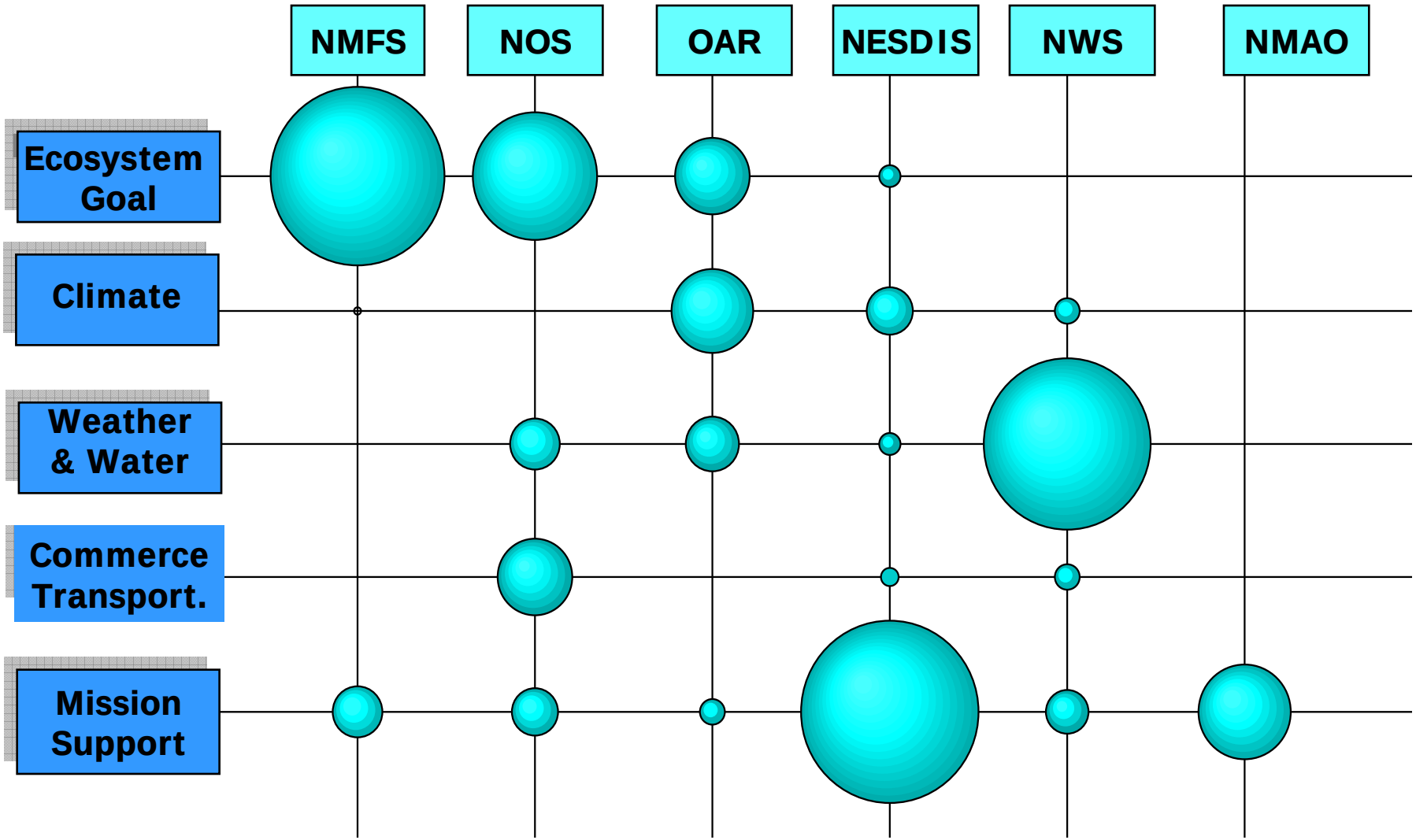
INTERVIEWS EXTERNAL TO NOAA

- **OTHER AGENCY PERSONNEL**
- **OCEAN STUDIES BOARD**
- **OFFICE OF MANAGEMENT AND BUDGET**
- **CONGRESS – HOUSE STAFF**
- **US OCEAN COMMISSION MEMBERS**
- **ACADEMICS**
- **STAKEHOLDERS**
- **INTERNATIONAL SCIENCE COMMUNITY**

BASELINE INVENTORY OF NOAA ECOSYSTEM

- **DIAGRAM ORGANIZATIONAL STRUCTURE**
- **MAP LOCATION OF NOAA FACILITIES IN ECOSYSTEM GOAL**
- **UNDERSTAND PPBES PROCESS**

Figure II.C.2. NOAA's matrix structure integrating line offices and goal teams.



symbol area proportional to 2005 budget

Figure II.C.4. Location of NOAA offices in the continental USA, by line office. Symbols are size-scaled by number of employees. NFA refers to NOAA Financial and Administrative Centers. Boundaries of the large marine ecosystems are given.

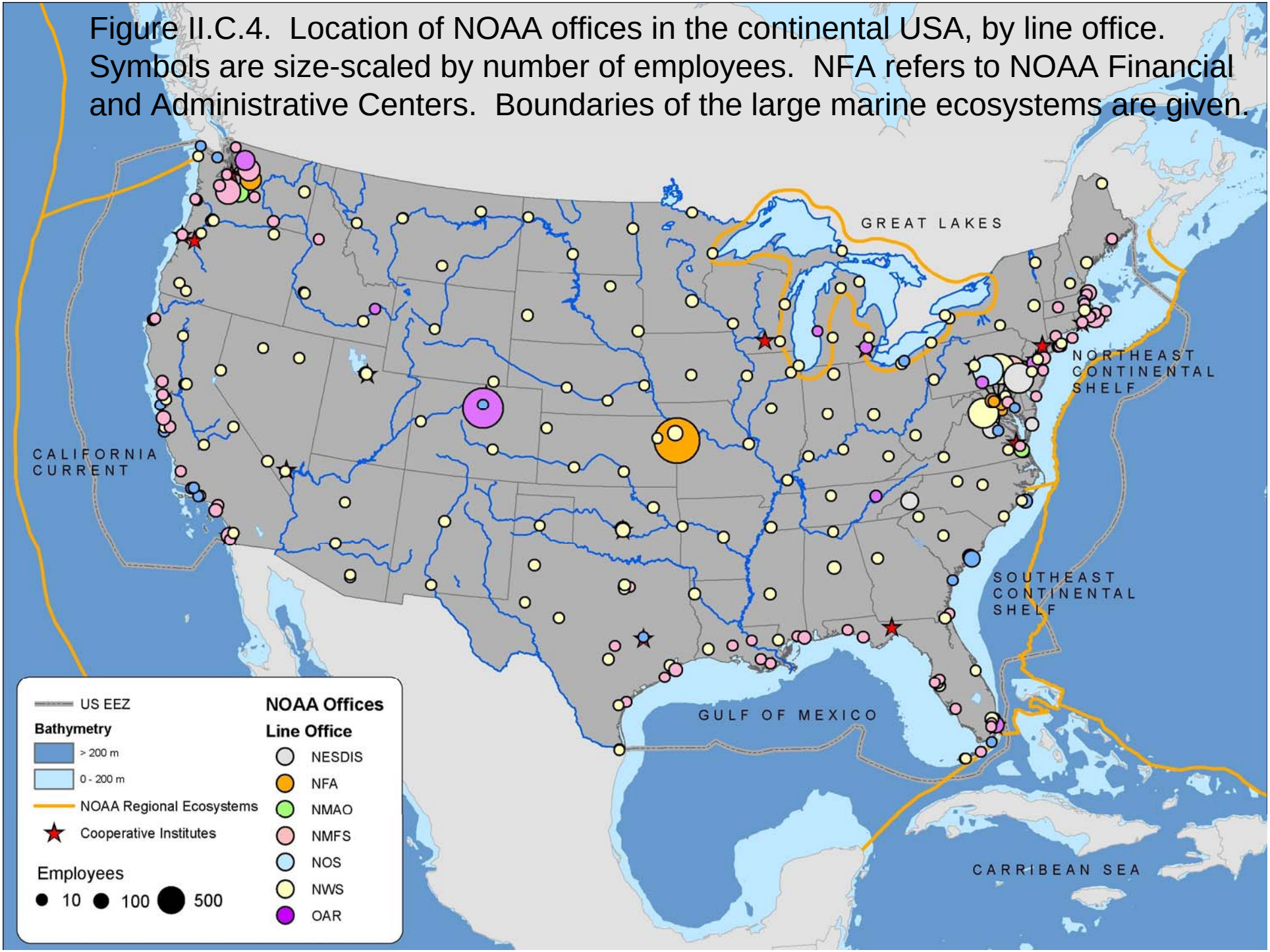
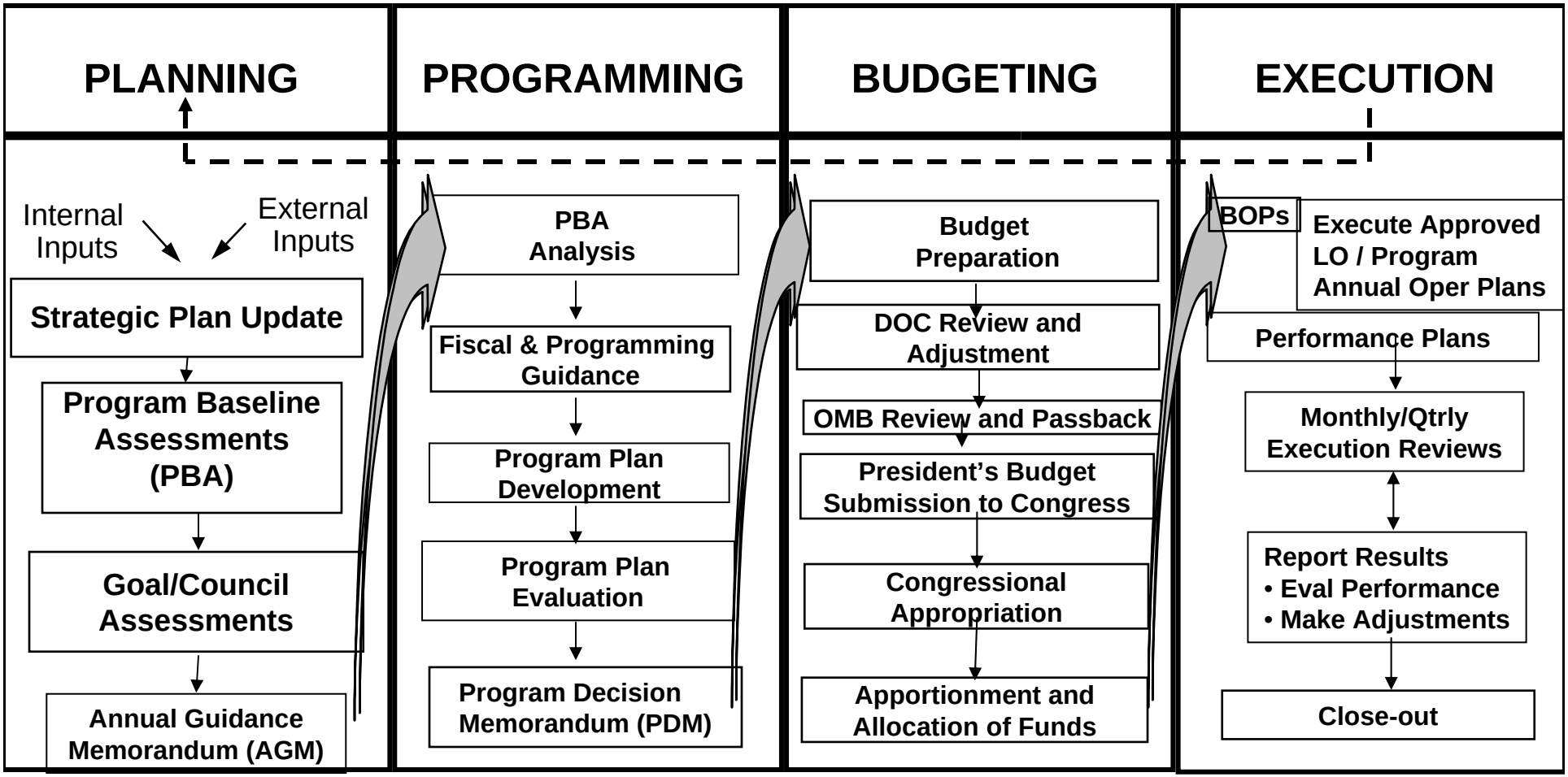


Figure II.C.3. Phases of NOAA's PPBES process – annual cycle

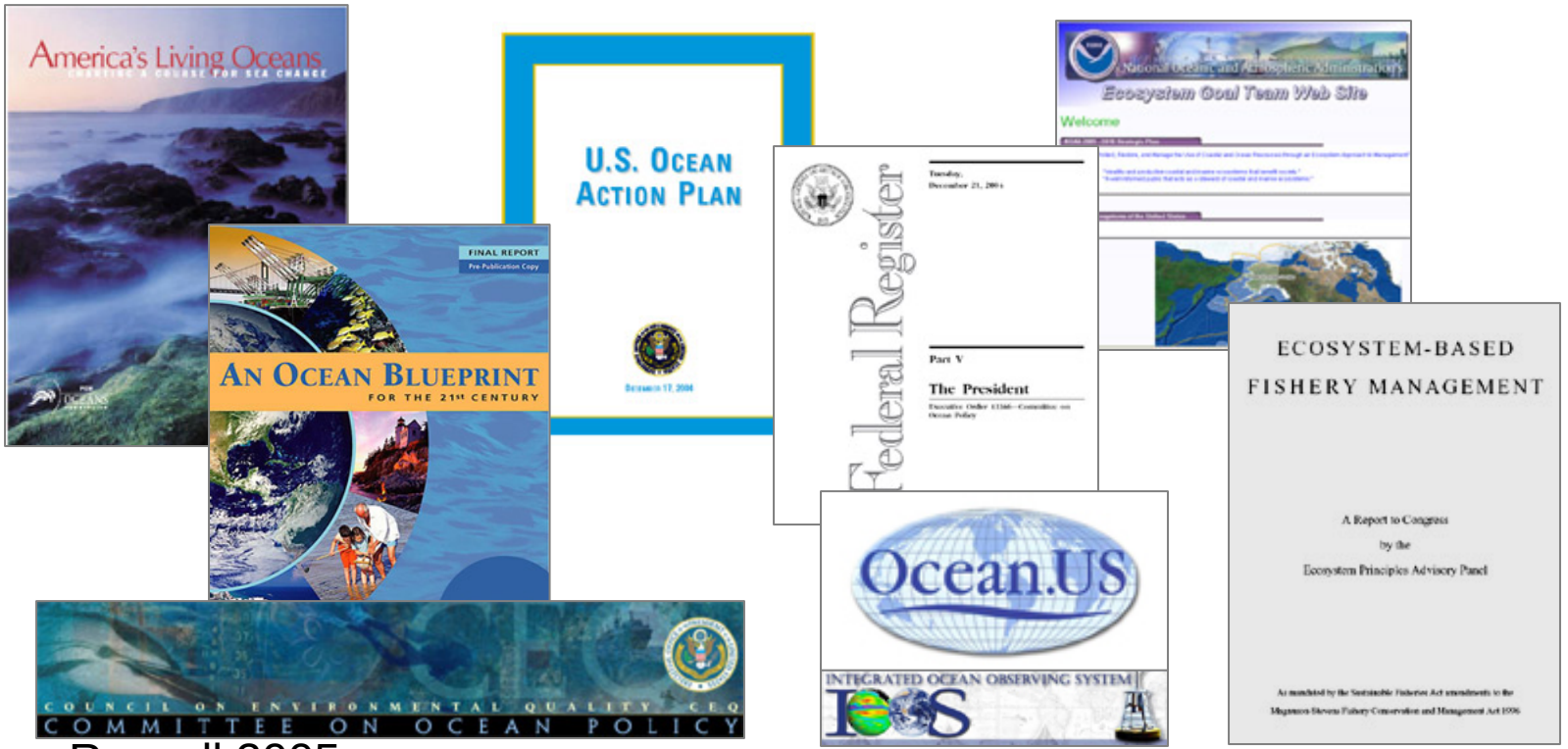


ATTEND MEETINGS

- **Coastal Zone 05, New Orleans 2005**
- **American Fisheries Society, Anchorage, 2005**
- **NPFMC Ecosystem Committee, Scientific and Statistical Committee**
- **NAS Ocean Studies Board Meeting, Woods Hole, 2005**
- **NMFS Science Board, Pacific Grove 2005**
- **NMFS Fishery Science Laboratory Deputy Directors, Seattle 2005**
- **PICES Ecosystem Working Group, Vladivostok 2005**
- **NMSP/NCCOS Research Planning Meeting, Monterey 2005**
- **NOAA Science Advisory Board, June, August, November 2005**
- **NOAA SAB RRT NOAA's Response [multiple] 2005**
- **Fish Expo, Seattle 2005**

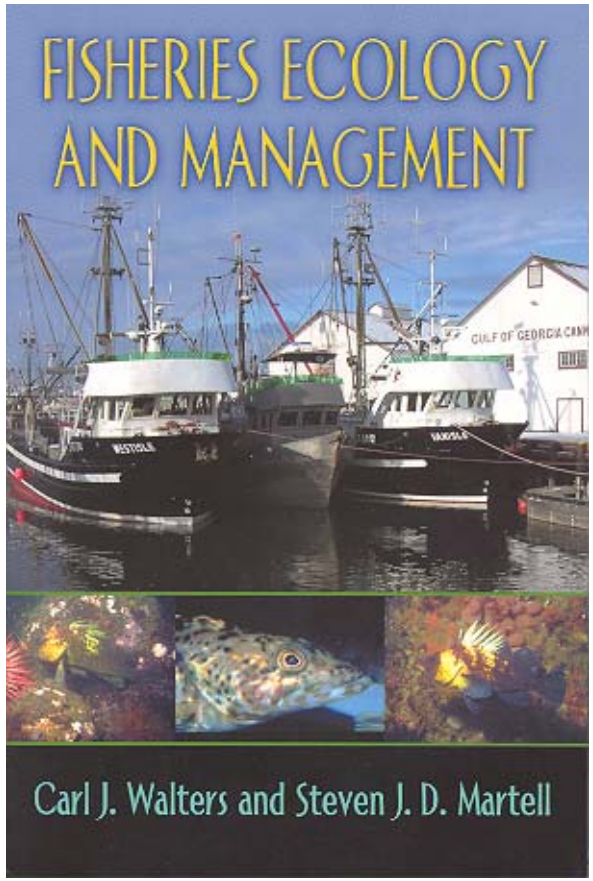
National Activity

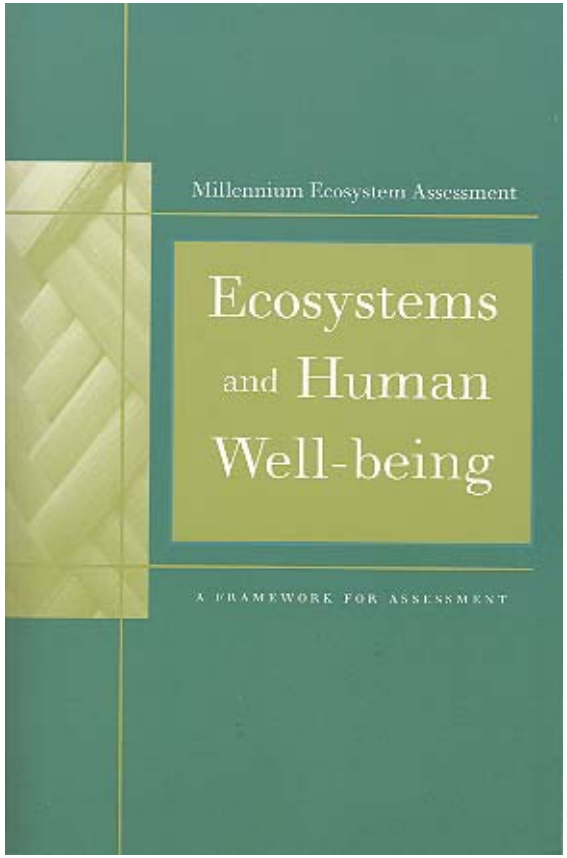
Regional Governance Approaches Discussed



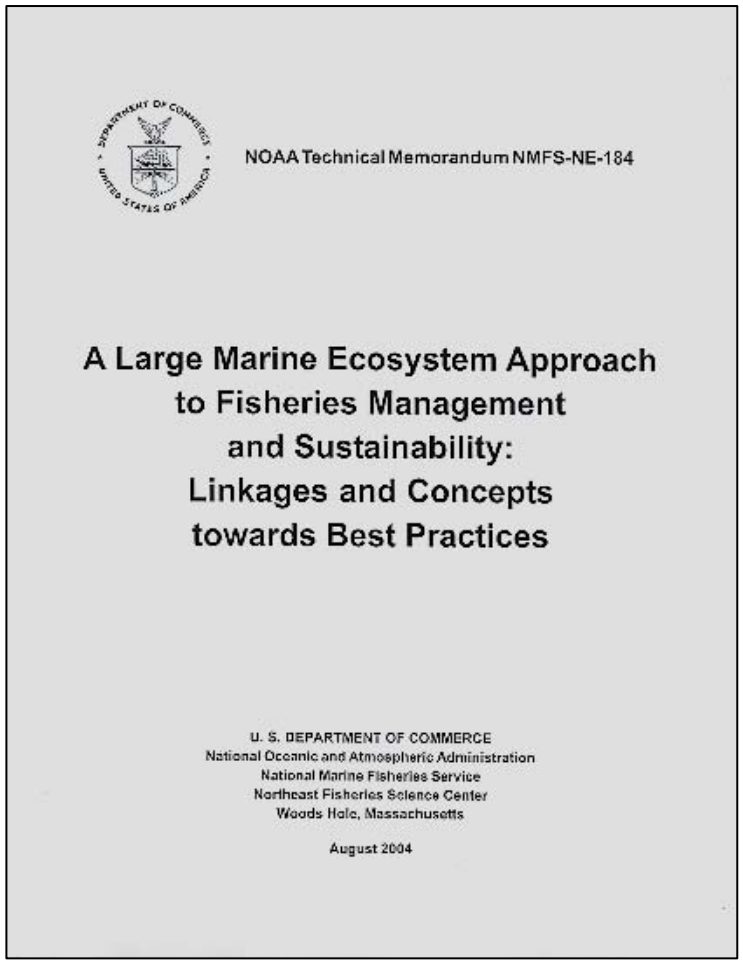
Russell 2005

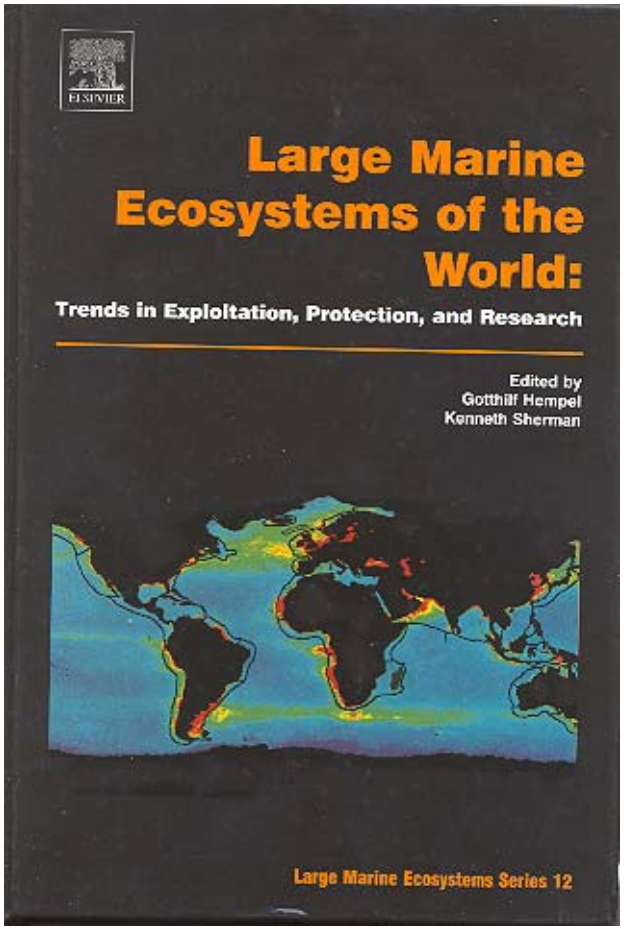
Read Reports/ Literature





Read Reports / Literature





Context of NOAA's Ecosystem Science and Research

- International Context
- Legal Context for NOAA's Science Activities - Mandates
- NOAA Today – NOAA's Ecosystem-related Activities
- Policy Trends and NOAA's Vision for the Future

Guiding Considerations

WHAT DOES NOAA'S ECOSYSTEM SCIENCE HAVE TO DO WELL?

- **Account for Environmental Forcing**
- **Understand Role and Guide Management of Human Actions**
- **Support Integrative and Scientifically Informed Decision Making**
- **Acknowledge Transition Realities**

eETT OUTPUT

- 80 page report
- 115 pages of appendices
- 195 total pages
- 68,755 words
- 13 conclusions
- 24(25) recommendations

HIGHLIGHTS FOLLOW

ECOSYSTEM APPROACH

AN ECOSYSTEM APPROACH IS NOT AN END IN ITSELF. IT IS A PROCESS OF INCREMENTAL ADAPTIVE CHANGE INFORMED BY SCIENCE AND RESPONSIVE TO SOCIETAL PRIORITIES

ECOSYSTEMS AND LOCATION

Ecosystem theme is fundamentally different than NOAA's physical science-advice responsibilities.

- **Ecosystem science must supply information that is simultaneously relevant to management & policy, and credible in the scientific community**
- **Ecosystem science activities spin off applied science benefits over lifetime of the science activity and not just at the end**

Thus, the eETT argues that "time to fruition" for scientific research is NOT an appropriate sole criterion to determine location of a specific ecosystem science capability in NOAA.

ALTERNATIVE WAYS TO ORGANIZE NOAA'S ECOSYSTEM

- **Re-organize LO activities into an Ecosystem Line Office, including science and management activities**
- **Re-align selected activities to reduce potential redundancies and enhance effectiveness**
- **Create regional ecosystem science coordination teams with:**
  - **Empowerment to coordinate across LOs**
  - **Focus on delivery of core capabilities**
  - **Guidance from EGT & PPBES processes**

Findings and Recommendations

- An Ecosystem Approach is Appropriate Now
- NOAA Must Provide Leadership for a Collaborative Approach
- An Expanded Scope for NOAA's Research Is Needed
- A Plan for Achieving an Ecosystem Approach is Needed
- Regional Coordination Across Line Offices is Needed
- Integrated Ecosystem Assessments are a Useful Framework for Coordination
- Integrated Assessments and Management Must Be Spatially Based [cont.]

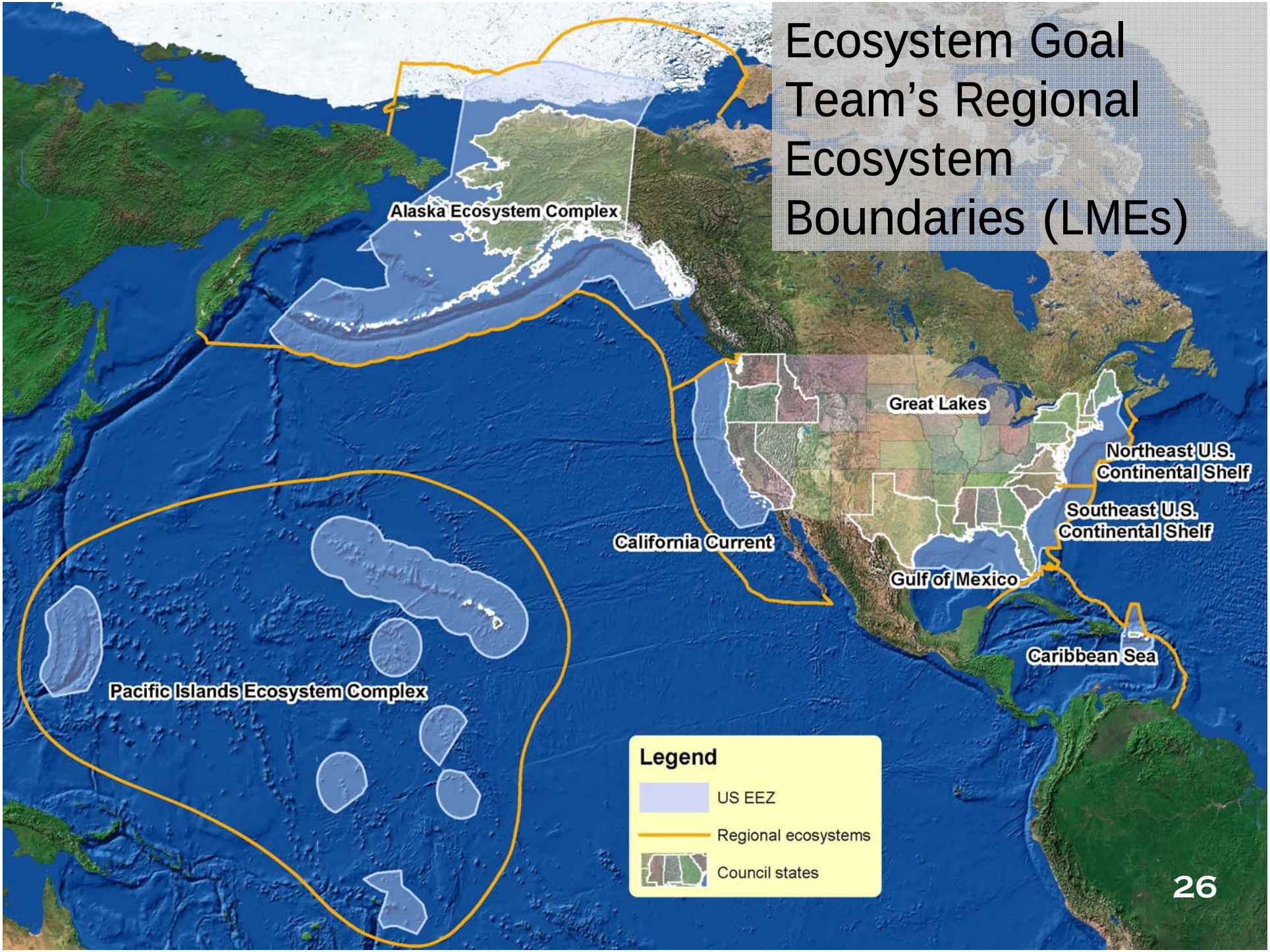
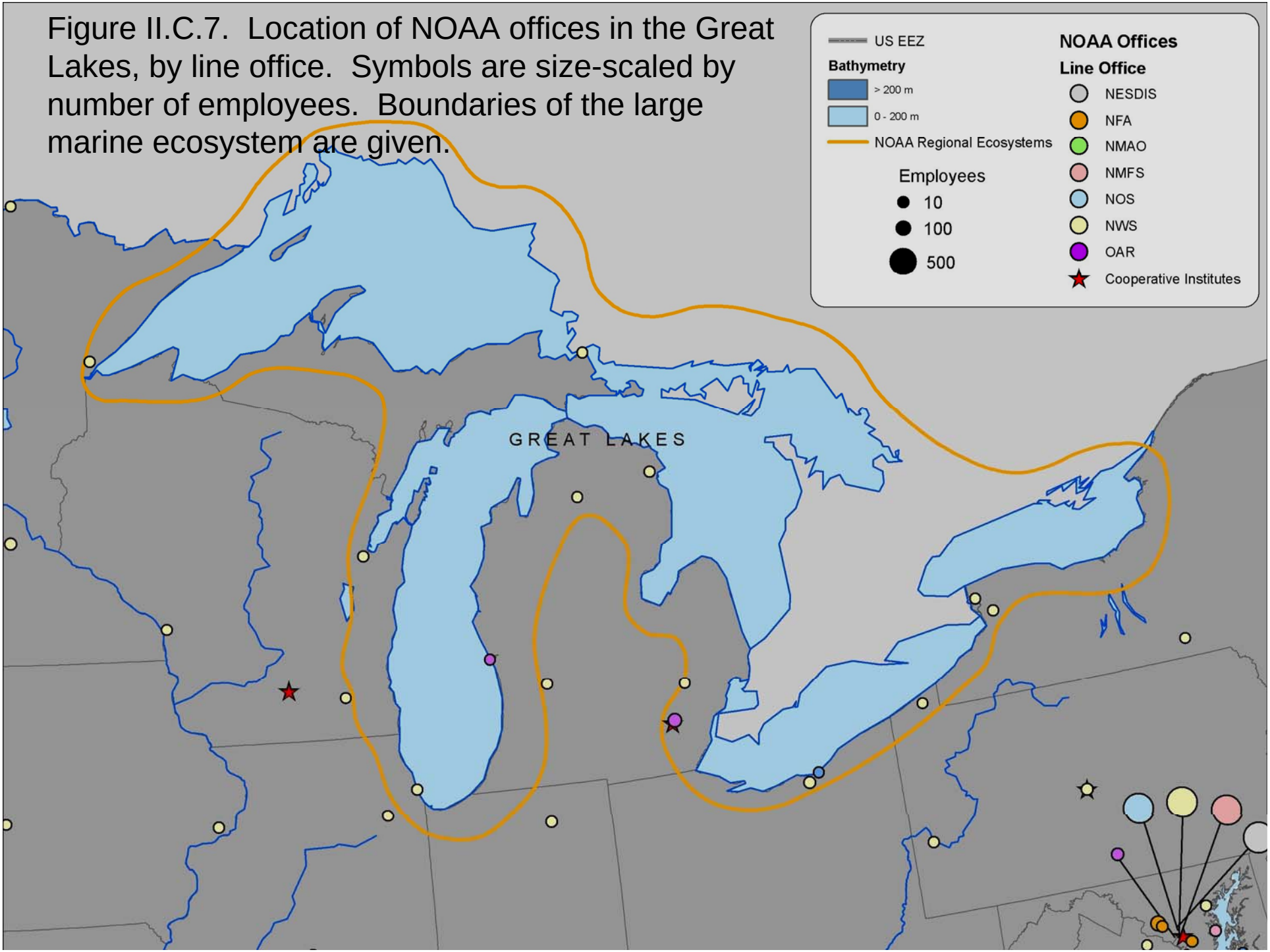

Ecosystem Goal Team's Regional Ecosystem Boundaries (LMEs)
Alaska Ecosystem Complex
Great Lakes
Northeast U.S. Continental Shelf
Southeast U.S. Continental Shelf
California Current
Gulf of Mexico
Caribbean Sea
Pacific Islands Ecosystem Complex
Legend
US EEZ
Regional ecosystems
Council states

Figure II.C.7. Location of NOAA offices in the Great Lakes, by line office. Symbols are size-scaled by number of employees. Boundaries of the large marine ecosystem are given.



Regional Ecosystem Science Coordination Groups

- **We recommend that NOAA develop regional ecosystem coordinating groups consistent with the eight national regional LMEs identified by the EGT plus the Antarctic.** Each of these regional groups would be chaired by an SES-level manager, and include formal representation by all line offices providing ecosystem sciences in that LME. Duties of these regional coordinating groups would include planning, coordinating and executing comprehensive plans of marine ecosystem science, and oversight for the production of integrated ecosystem assessments.
- A mechanism would be developed for national level exchange and coordination among these regional groups.

INTEGRATED ECOSYSTEM ASSESSMENTS

- **TOOLS FOR INTEGRATING NOAA ACTIVITY ON REGIONAL BASIS**
- **DECISION SUPPORT FOR MULTIPLE MANDATES**
- **SCIENTIFIC SERVICE TO PUBLIC**

WHAT IS AN IEA

An IEA would:

- **Compile and archive all relevant data sets for a defined ecosystem, e.g., physical, human use patterns, abundance and distribution of biological resources.**
- **Report on current conditions and trends in relevant data time series of physical, biological and human use information**
- **Synthesize time series information to link important ecological responses to changes in climate and human use drivers as a basis for forecasting**
- **Evaluate data time series to provide suites of key indicators of ecosystem state (status), and utilize time series data and modeling results to propose reference levels for the desired state of marine ecosystems**
- **Forecast the relationship between state indicators and pressure indicators (e.g., pollution, climate change, fishing-related removals, coastal development, etc.) in order to inform the development of management options for marine ecosystems.**
- **Provide periodic ecosystem assessment updates to inform the managers, stakeholders and the public on the state of marine ecosystems and management options to achieve societal goals and targets, including social science aspects relevant to decision making.**

Findings and Recommendations

- **Core Capabilities Required for Integrated Ecosystem Assessments**
  - **Sustained Observations**
  - **Analysis of Status and Trends in Space and Time**
  - **Integration and Forecasting**
  - **Human Activity**

[cont.]

CORE REGIONAL CAPACITIES

- To conduct integrated assessments, the following three "**core capabilities**" must exist in each region:

Monitoring:

Biodiversity, Oceanography, Human activities

Analysis of Status & Trends in Space & Time:

Population dynamics (e.g., stock assessment, population viability analyses, etc)

Habitat

Social and economic benefits and costs

Retrospective analysis of management actions.

Integration and Forecasting:

Among biological components

Biological-physical-chemical interactions

Human activity – biological interactions and effects

Findings and Recommendations

- **Additional Capabilities Needed in NOAA to Deliver Effective Ecosystem Science**

  Building New Tools - Modelling and Forecasting
  Develop Social Science Methods for Linking Ecosystem Science to Governance
  Develop an Understanding of Society and Its Response to Changing Ecosystem Components
  Ecosystem Structure and Function
  Technical Analyses (Contaminants, Toxicology, Etc.)
  Biodiversity and Taxonomy
  Data Archiving and Integration
  Ecosystem Impacts of Specific Human Activities

EVALUATION OF LOCATION FOR SPECIFIC AREAS

- **DEVELOP "CENTERS OF SPECIALIZED EXPERTISE" FOR "NON-CORE" BUT IMPORTANT ECOSYSTEM SCIENCE**

- **ANALYZE THE FOLLOWING ACTIVITIES FOR POTENTIAL GAINS IN TERMS OF CRITICAL MASS, SYNERGIES, EFFICIENCIES:**
  - **habitat programs**
  - **toxics, HABs, seafood safety analysis**
  - **oceanography (operational, modeling)**
  - **biodiversity measurement and monitoring (e.g., taxonomy, invasive species, etc.)**
  - **others?**

Findings and Recommendations

Provide Incentives for Ecosystem Research with a Competitive Grant Program

Enhance the Role of EGT and PPBES (central planning) to DELIVER Ecosystem Science Support to Management at Regional Scales.

Response to NOAA's Statement of Task for the eETT

A. Appropriate Mix of Research?

B. Organization of Research?

A. Appropriate Mix of Research?

- **Not optimal**
- **EGT documents deficits in every category**
- **Some opportunities to reorganize for efficiency [internally and with respect to client-based services]**
- **Clear need for additional resources to live up to mandates and to lead development of an ecosystem approach**

A. Distribution along continuum?

- **Ecosystem responses to physical and anthropogenic forcing are often non-linear (so no “right” time scale)**
- **Most ecosystem research is done at medium and long term scales to address time-scale of forcers and responses**
- **Much of the research is applied in an ON-GOING adaptive management process**

A. Internal vs. External Balance?

- **eETT cannot determine appropriate mix**
- **No reason why it is same in all regions**
- **If external partner is used to provide core capability, long term relationship must be secure**
- **External partners also likely to be used for specialized research on ad hoc basisb**

A. Links to International Science?

- **NOAA is a major force in international marine science with lead roles in developing integrated ocean observing systems as well as ecosystem approaches to management**

- **NOAA should continue to work with other agencies to develop scientific literacy and management capacity in developing countries**

B. Organization of Research?

- **eETT Recommends a regional focus around core capacities**

- **Regional cooperation among LOs in research planning and implementation as well as in development of Integrated Ecosystem Assessment**

B. Relationship to non-ecosystem science?

- **Weather and climate are clearly linked to ecosystem science**
- **Administrative separation serves efficiency functions we believe**
- **Key is to ensure productive cross Goal working relationships**

B. Line office distribution?

- **LO distribution largely a function of legislative mandates**
- **Absent wholesale legislative reform [as suggested by US COP] limited ability of NOAA to redesign**
- **Note that expansion of mandates and development of integrated assessments across LOs is occurring**

B. Program Structure?

- **Matrix management and PPBES has facilitated formal coordination and transparency in planning and budgeting processes**

- **eETT anticipates and encourages continued adaptation to take into account problems as they become apparent**

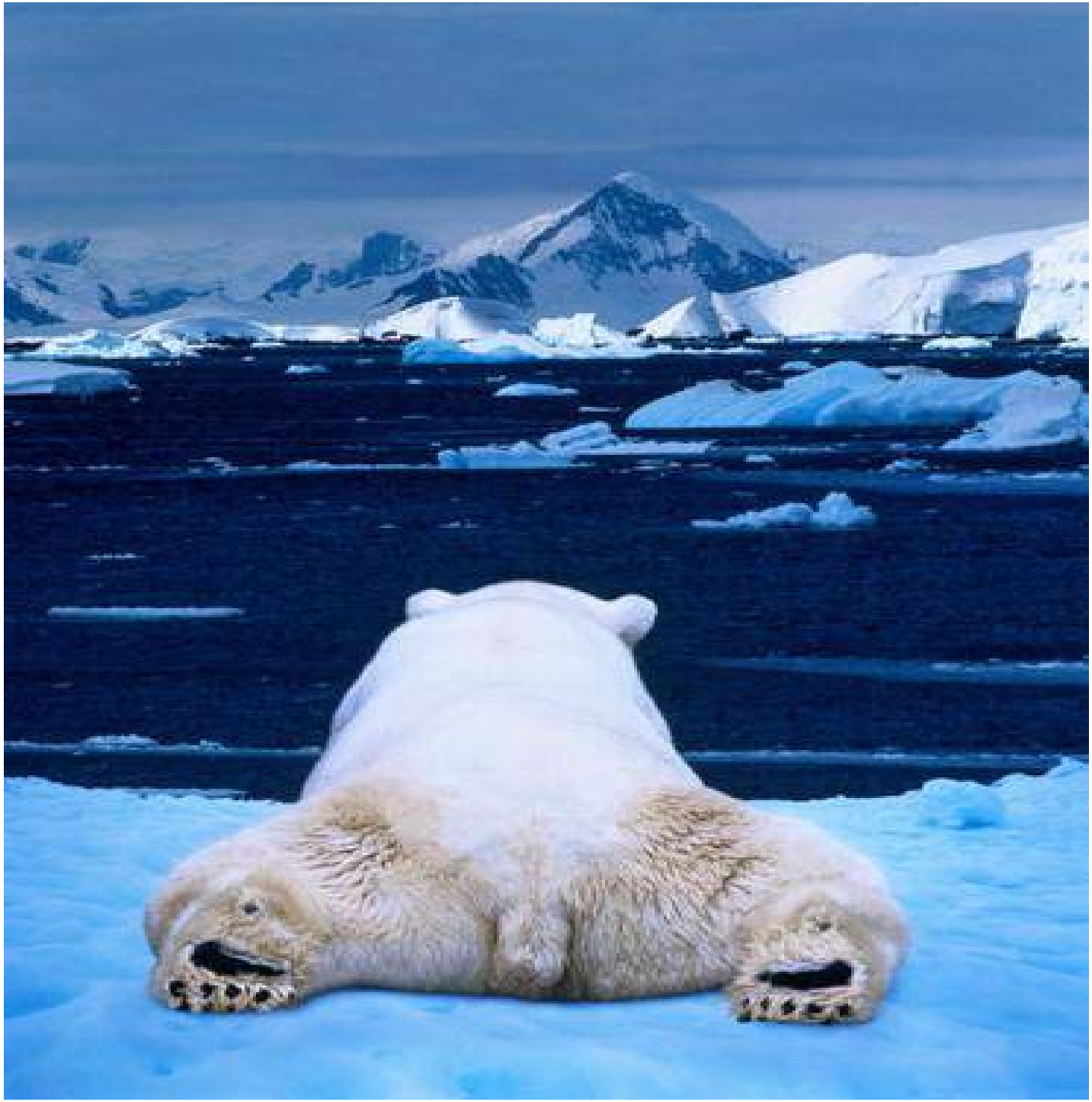
B. Other?

- **Not all eETT ideas are packaged into the Preliminary Report [e.g., GIS capabilities, education and training in ecosystem approaches internally and externally]**

- **We anticipate other ideas and concerns will be raised in the review process and we will attempt to address them**

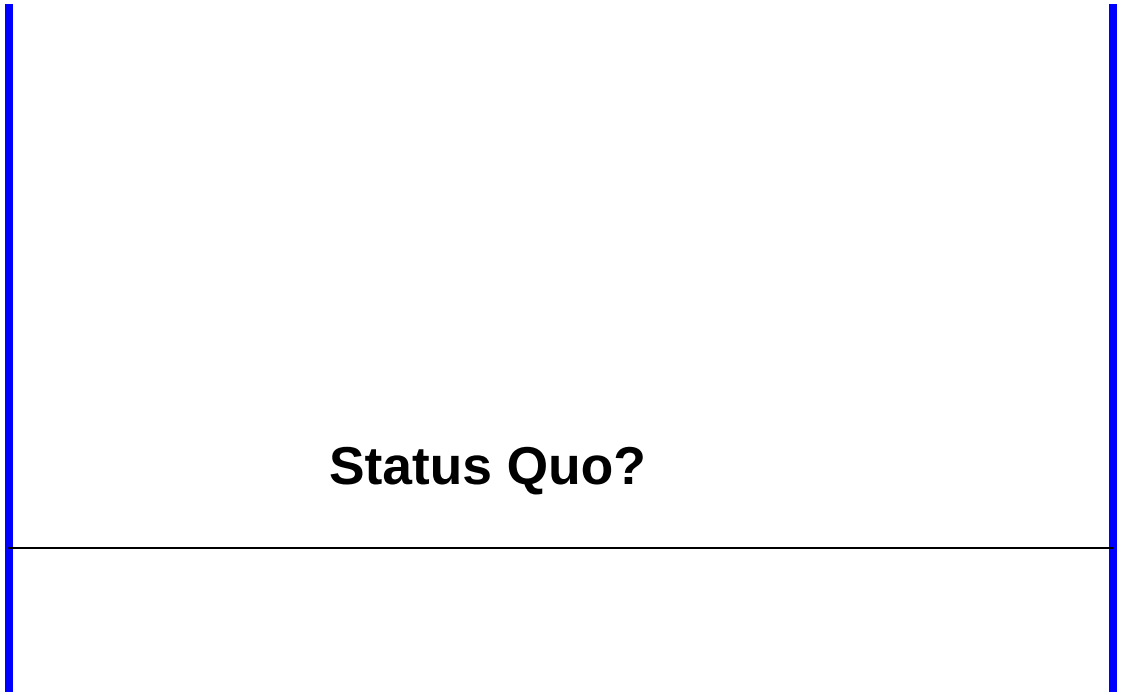
TIMELINE FOR COMPLETION

- **RECEIVE COMMENT FROM NOAA SAB**
- **POST PRELIMINARY REPORT FOR PUBLIC AND AGENCY COMMENT - MARCH**
- **eETT REVIEW AND RESPOND TO PUBLIC AND AGENCY COMMENT [THROUGH EMAIL OR MEETING] APRIL**
- **REVISE REPORT TO GENERATE FINAL EDITED VERSION MAY**
- **SUBMIT FINAL TO NOAA SAB IN JUNE FOR APPROVAL AT JULY MEETING**

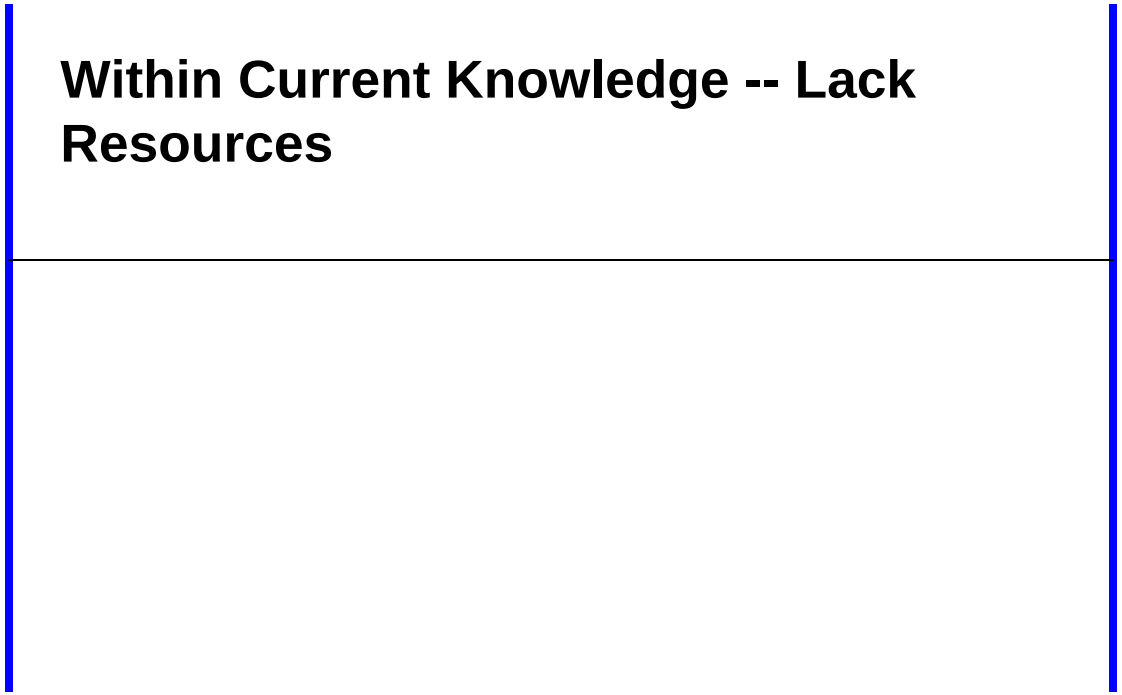


August 2005 Discussion Group on EAM

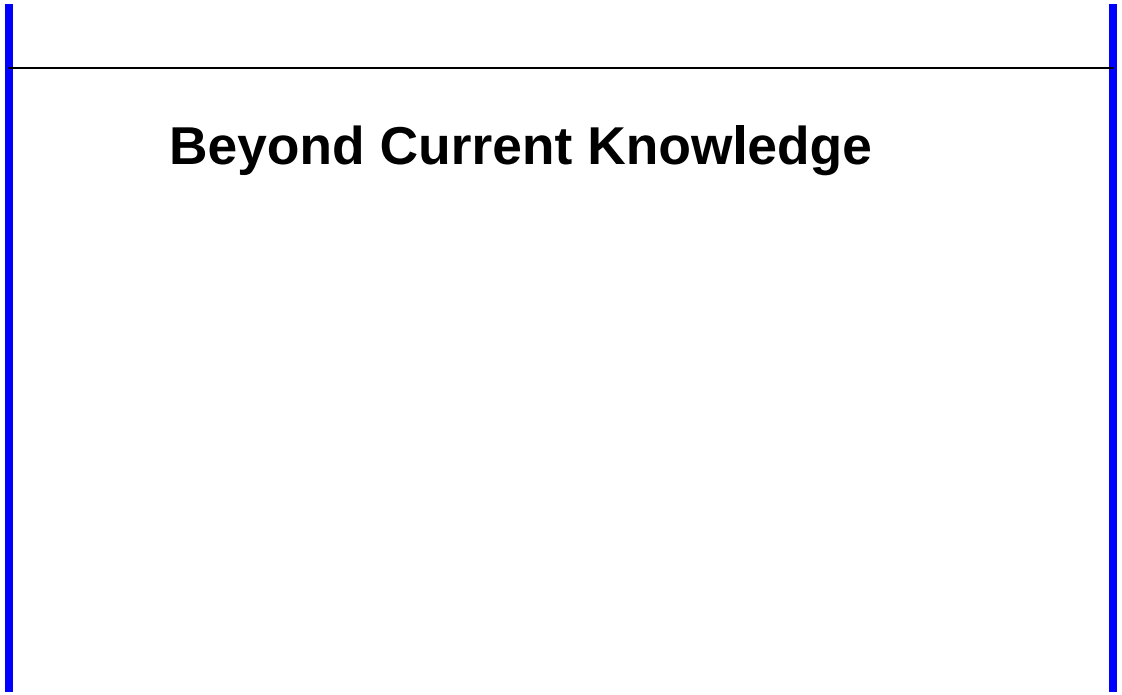
LEARNING HOW TO HIGH JUMP ANALOGY 1: LOW BAR DEFINITION – USING ECOSYSTEM INFORMATION IN MANAGEMENT N.B. NOT NO BAR



LEARNING HOW TO HIGH JUMP ANALOGY 2
MEDIUM BAR – ECOSYSTEM APPROACH DEFINED AS HAVING KEY ELEMENTS OR CHARACTERISTICS



LEARNING HOW TO HIGH JUMP ANALOGY 3
HIGH BAR – ECOSYSTEM APPOACH TO MANAGEMENT MEANS COMPREHENSIVE, INTEGRATED MANAGEMENT OF EVERYTHING



ECOSYSTEM APPROACH TO MANAGEMENT – A PROCESS