



Ecosystem Approaches to Management

Ecosystem Goal's
Presentation to NWS Corporate Board
June 30, 2004



NOAA Definitions



What is an ecosystem?

- An *ecosystem* is a geographically specified system of organisms (including humans), the environment, and the processes that control its dynamics.
- The *environment* comprises the biological, chemical, physical, and social conditions that surround organisms. Therefore, when appropriate, the term environment should be qualified as biological, chemical, physical, and/or social.

What is an ecosystem approach to management?

- An *ecosystem approach to management* is geographically specified, adaptive, takes account of ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse societal objectives. Implementation will need to be incremental and collaborative.



Ecosystem Approach



Ecosystem approach to management strategies:

- Expand consideration of ecosystem effects under existing management programs through
 - expanded NEPA ,
 - expanded Socio-Economic Analysis of Regulatory Decisions.
- Develop whole new management orientation to implement place-based management of coastal and marine resources.

Desired end state/outcomes to an ecosystem approach:

- Healthy ecosystems (including living marine resources and habitat).
- Increased social/economic value of marine environment and resources (including productive fisheries and beneficial coastal development).
- Well informed public that trusts NOAA.



Ecosystem Approach to Management



- NOAA's ecosystem approach to management is consistent with the precautionary approach and the definition of the U.S. Ocean Commission:
 - “To keep every cog and wheel is the first precaution of intelligent tinkering” (*Aldo Leopold 1966*)
 - Ecosystem-based Management: U.S. ocean and coastal resources should be managed to reflect the relationships among all ecosystem components, including human and nonhuman species and the environments in which they live. (*US Commission on Ocean Policy: Preliminary Report 2004*)



Ecosystem Goal's Draft Strategies



- Manage uses of ecosystems by applying scientifically sound observations, assessments, and research findings to ensure the sustainable use of resources and to balance competing uses of coastal and marine ecosystems.
- Advance our understanding of ecosystems and develop ecosystem models that simulate and predict the effects of multiple natural and anthropogenic influences to improve our management of complex ecosystems.
- Build and advance the capabilities of an integrated, NOAA Ecological Observing System to monitor, assess, and predict national and regional ecosystem health, as well as to gather information consistent with established social and economic indicators.



Ecosystem Goal's Draft Strategies, continued



- Engage and collaborate with our partners to achieve regional objectives by delineating regional ecosystems, forming regional ecosystem councils, and implementing cooperative strategies to improve regional ecosystem health.
- Develop outreach and education plans and products to advance public understanding and involvement in stewardship of coastal and marine ecosystems and monitor our success.
- Engage in technological and scientific exchange with our international partners to protect, restore, and manage marine resources within and beyond the Nation's borders.



Ecosystem Mission Goal Programs



Ecosystem Research Program
- NURP
- Ocean Exploration
- AOML & GLERL
Manager: Leon Cammen, Acting

Ecosystem Observations Program
without COTS
- NODC
Manager: Bill Fox

Protected Species Program
Manager: Laurie Allen

Fisheries Management Program
Manager: Jack Dunnigan

Aquaculture Program
Manager: Linda Chaves

Enforcement Program
- NMSP Enforcement
Manager: Dale Jones

matrix programs

Coastal & Marine Resources Program
- CRM
- NMSP, NERRS, MPA Center
- Ecological Forecasting (e.g., HABs)
- Place-based Approaches
Manager: Doug Brown

Habitat Program
- Habitat Conservation
- Essential Fish Habitat
- Invasive Species
Manager: Rolland Schmitt

Corals Program
with Cold Water Corals
Manager: Dave Kennedy

9 Programs, 7 Matrix



Actionable Plan for Ecosystem Integration



- Establish NOAA Ecosystem Goal Team Office to oversee plan for place-based regional ecosystem planning and coordination -- by 1 April 2004.
- Initiate interagency planning for Regional Ecosystem Councils -- by 1 June 2004.
- Agree on delineation of regional ecosystems -- by 1 October 2004.
- Designate NOAA regional ecosystem coordinators and begin coordinating NOAA regional ecosystem activity – by 1 October 2004.
- Realign data to determine ecological and socio-economic baselines of regional ecosystems
- Establish formal operational steps for an ecosystem approach -- by 1 January 2005.
- Initially convene the Regional Ecosystem Councils – by 1 April 2005.
- Begin implementing priority steps through the Regional Ecosystem Councils – by 1 October 2006.
- Complete and implement all regional ecosystem plans – by 30 September 2010.
- Maintain Regional Ecosystem Councils to monitor outcomes and adapt ecosystem plans – 1 October 2010 and beyond.



NOAA Delineation of Regional Ecosystems

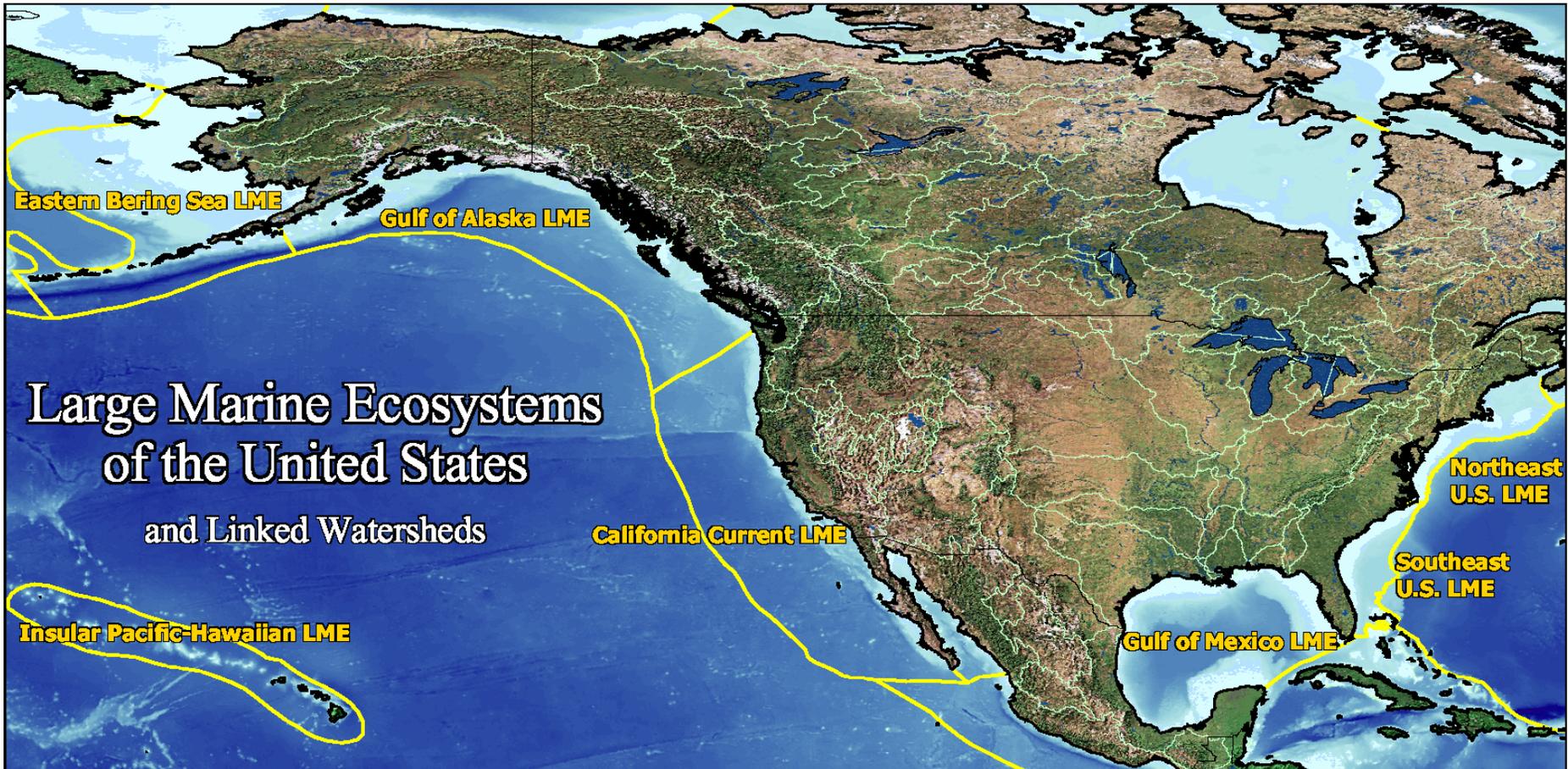


Process for Regional Ecosystem Delineation

- NOAA Regional Ecosystem Delineation Workgroup May- Sept.
 - Composed of NOAA Scientists to develop Report on existing regional ecosystems being used by NOAA and elsewhere
 - Develop Regional Ecosystem Web Page / GIS mapping of existing regional ecosystems
- External Expert Panel August 31- Sept 1
 - Co chaired by Paul Sandifer and Doug Demaster
 - Key Federal Agencies
 - Academics, States, NGOs, Others



Example of Regional Ecosystem: Large Marine Ecosystems





Example of Nested Ecosystems for Atlantic Region of the U.S.



NMS Locations

- * NERRS Locations
-

Marine Biogeographic Regions

- Subarctic Chuckchi
- Subarctic Laurentian Transition
- Acadian/Scotian
- Virginian Transition
- Carolinian
- Floridian/Caribbean
- Louisianian
- San Diegian Inner
- San Diegian Outer
- Montereyan Transition
- Oregonian
- West Coast Fjords Transition
- Aleutian/Alaskan Gulf
- Beringian Transition
- Insular Pacific

Source: NMSP

Coastal Biogeographic Regions

- Major Division
- Subgroup

NERRS Subgroups

- Northern Gulf of Maine
- Southern Gulf of Maine
- Southern New England
- Middle Atlantic
- Chesapeake Bay
- North Carolina
- South Atlantic
- East Florida
- Caribbean
- West Florida
- Panhandle Coast
- Mississippi Delta
- Western Gulf
- Southern California
- Central California
- San Francisco Bay
- Middle Pacific
- Washington Coast
- Puget Sound
- Lake Superior
- Lakes Michigan and Huron
- Lake Erie
- Lake Ontario
- Southern Alaska
- Aleutian Islands
- Northern Alaska
- Hawaiian Islands
- Eastern Pacific Islands
- Western Pacific Islands

Source: NERRS - Biogeographic Regions of the United States
15 CFR Ch. 1X (1-1-03 Ed.) Pt. 921, App. II

CZM Program States

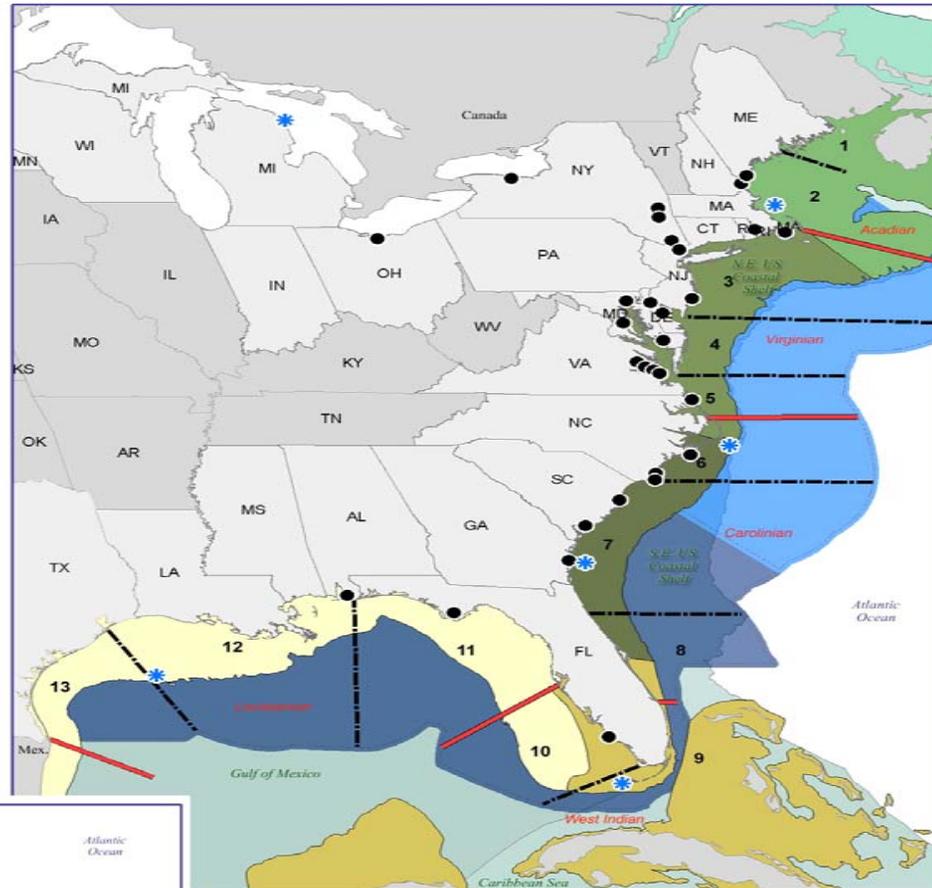
Fisheries Management Zones

- Northeast
- Southeast
- Southwest
- Northwest
- Alaska
- Pacific Islands

Large Marine Ecosystems

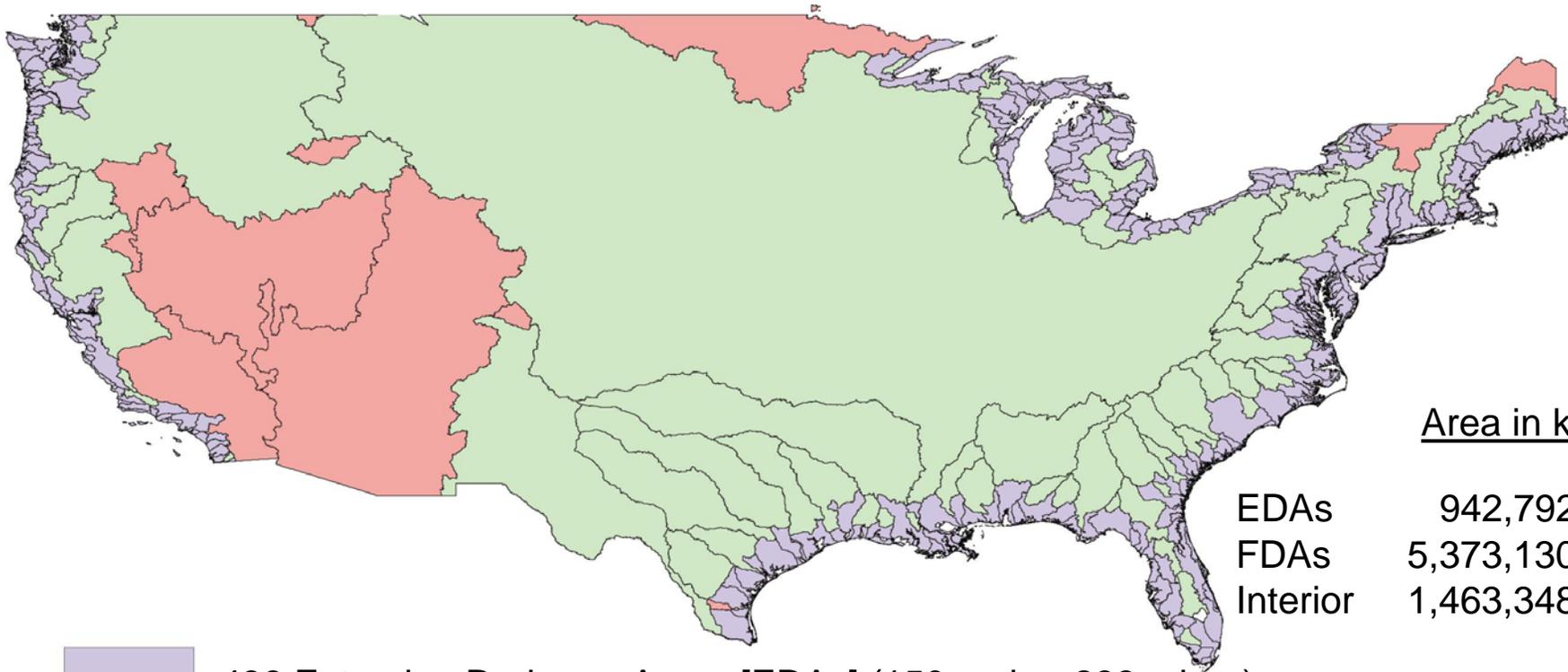
- Chukchi Sea
- East Bering Sea
- West Bering Sea
- Beaufort Sea
- Gulf of Alaska
- Insular Pacific-Hawaiian
- California Current
- Gulf of Mexico
- Caribbean Sea
- Southeast U.S. Continental Shelf
- Northeast U.S. Continental Shelf

Source: NMFS & Univ. R.I.





Coastal Assessment Framework (CAF)

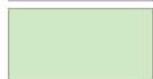


Area in km²

EDAs	942,792 (12%)
FDAs	5,373,130 (69%)
Interior	1,463,348 (19%)



438 Estuarine Drainage Areas [EDAs] (150 major, 288 minor)



67 Fluvial Drainage Areas [FDAs]



11 Interior watershed areas*

* self-contained, groundwater-contributing only, or watersheds draining to outside the U.S.



Mobile Bay Watershed



EDA = component of a watershed that drains directly to estuarine or ocean waters.

FDA = upstream component of a watershed (i.e., downstream boundary defined by head of tide).



Potential Cooperative Areas with National Weather Service



- Hydrology
 - fresh water flow into estuaries is a key factor of ecosystem health
 - salinity
 - water quality
- Air quality
 - atmospheric deposition into coastal waters
- Climate regime changes
 - water temperature
 - sea level rise
- Marine condition (seasonally, annually, and decadal)
 - tides
 - currents
 - waves
- Public surveys
- New analysis orientation will be internal and external influence on delineated regional ecosystems



Regional Ecosystem Delineation Backup Slides



Web site for more information:

<https://nightshark.nmfs.noaa.gov/mb/ecogoal/>
(use your e-mail address and password for entry)

Large Marine Ecosystems:

<http://www.edc.uri.edu/lme>



Eleven Steps to Implement Place-based Ecosystem Management after Delineation of Ecosystems



1. Identify stakeholders/ partner interests, concerns, and values and engage them in all steps below
2. Identify / develop necessary maps and tools of ecoregions and habitats
3. Formalize agreements on how the Regional Ecosystem Team/ Councils will operate
4. Determine major factors/ stresses that affect ecosystem health
5. Conduct ecological / socio-economic risk/benefit assessments
6. Establish objectives and targets for specific ecosystem health parameters
7. Establish strategies for achieving targets and performance measures
8. Determine research and information needs
9. Identify available resources (including partnerships) to accomplish strategies
10. Design ecosystem level systems for information and monitoring
11. Implement Plans/ Monitor/ Engage / Adapt