

# **Putting Ecosystem Science to Work**

**PICES 14<sup>th</sup> Annual Meeting**

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# Putting Ecosystem Science to Work

## Abstract

The dialogue between scientists and the makers of decisions about how the ecosystem affects human activities and is affected by human activities is a key justification for investment in and prioritization of research. Investigation of how scientific perspectives are being used to inform decisions is one means of assessing gaps in North Pacific ecosystem science and research. This study focuses on the Alaska region [BSAI, GOA] to examine the current use of ecosystem information in decision-making by selected federal and state institutions, compares this usage with the content of the PICES Marine Ecosystems of the North Pacific Report and identifies possible gaps in coverage that could be considered in prioritization of future research. This research also identifies barriers and bridges to the use of ecosystem science to inform decision-making

# **Outline of Talk**

- **Introduction**
- **Context - Alaska**
- **Approaches to Assessment**
- **Observations**

# **Marine Ecosystems of the North Pacific [PICES 2004]**

- **Descriptive [Climate, Ocean Productivity, Living Marine Resources]**
- **Major Eco-region Focus**
- **Synthesis of Existing Information**
- **Status and Trends**
- **Not Catalogue or Encyclopedia**
- **Decision Support Document?**

# **Marine Ecosystems of the North Pacific [PICES 2004] cont.**

- **Attractive**
- **Well-written**
- **Easy to Use**

**Generally well-received and  
complimented by those in limited  
scientific ambit of PICES but nearly  
unknown outside of that circle of  
recipients**

# **PICES Advisory Report Fisheries & Ecosystem Responses**

**Insightful**

**Concise**

**Clear**

**Easy to read**

**Attractive**

# CAVEATS

- THIS PRESENTATION IS EXPLORATORY AND POSSIBLY PREMATURE
- DISCUSSION IS NOT AN EXPLICIT OR INPLICIT CRITIQUE OF THIS REPORT
- PRESENTATION IS BASED PRIMARILY ON THE AUTHOR'S EXPERIENCE
- IT WOULD BE BETTER TO HAVE MULTIPLE PERSPECTIVES ON UTILIZATION OF THE PICES REPORT – PLEASE ASSIST
- SOURCES OF INFORMATION ARE LARGELY ANECDOTAL AND QUALITATIVE

# **Context - Alaska**

- 1. Demands for Increase Use of Ecosystem Science in Alaska Fishery Arena**
- 2. Ecosystem Approach to Management**
- 3. Science Process in NPFMC/NMFS**





**Groundfish TAC “Cap” for BSAI = 2 million tons**

# **Demands for Ecosystem Science in Alaska Fishery Arena**

- **Council/NMFS Regulatory Program Needs**
- **Addressing Environmental Impact Assessments**
- **Dealing with Endangered Species Act Listings and Biological Opinions**
- **Environmental NGO Interests and Activity**
- **National Level Recommendations**
- **NOAA Reorganization – Ecosystem Goal**

# U.S. Oceans Commission Recommendations

- 1. Base Decisions on Sound Science**
- 2. Strengthen Fishery Governance**
- 3. End the 'Race for Fish'**
- 4. Improve Fisheries Enforcement**
- 5. Move Towards Ecosystem-based Management**
- 6. Improve International Fisheries Management**

**Also: Establish National Ocean Council and  
Regional Ocean Councils; Reorganize NOAA.**

# Ecosystem Delineation

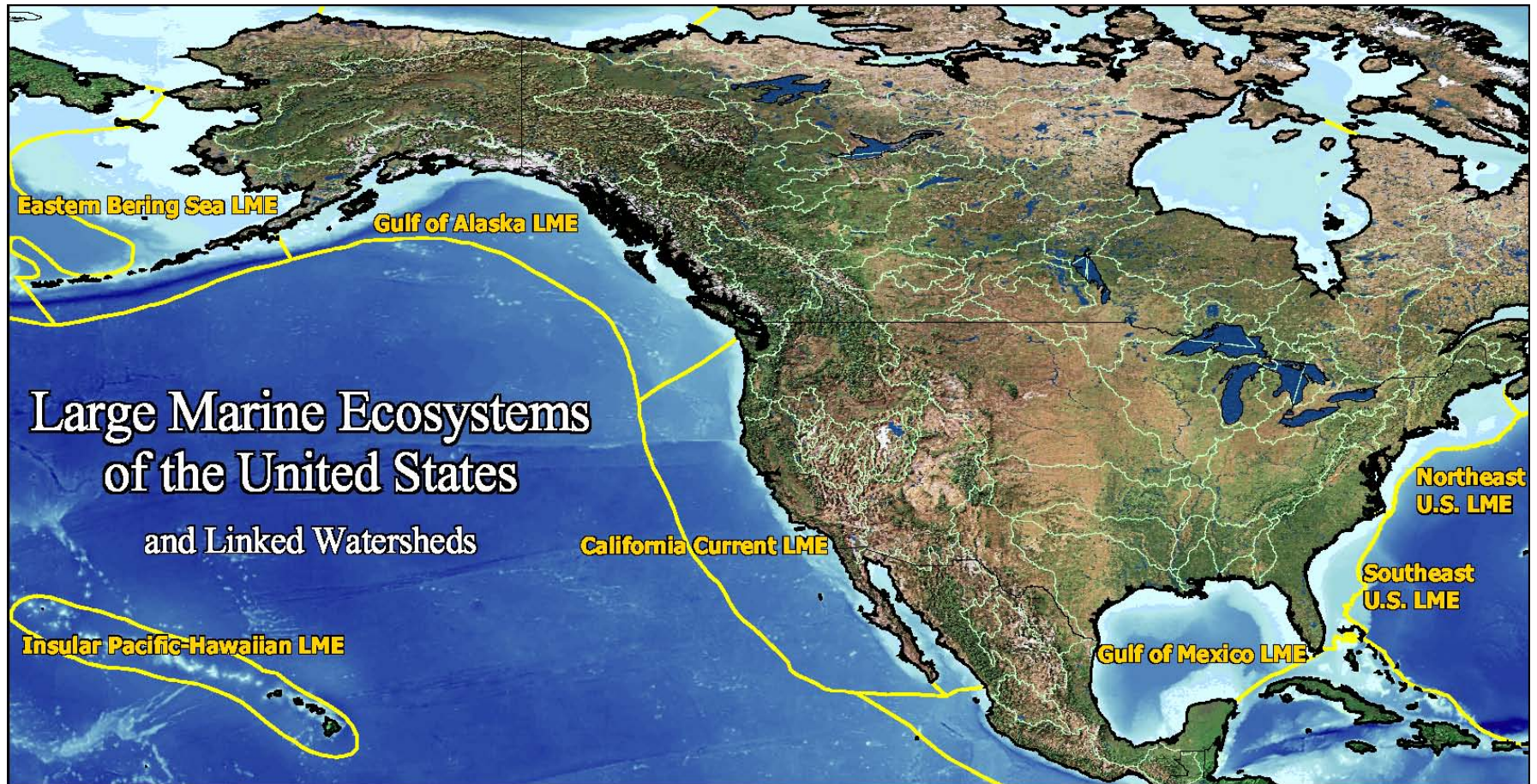
## Options:

- (1) boundaries associated with Large Marine Ecosystems (LMEs) (as used by NOAA, IUCN, IOC)**
- (2) biogeographic regions of the National Estuarine Research Reserves**
- (3) North American Marine Eco-regions of the North American Commission on Environmental Cooperation (CEC)**
- (4) boundaries established by The Nature Conservancy's (TNC) Marine Initiative Program**
- (5) boundaries established by the eight regional fishery management councils**
- (6) regional ocean information program areas suggested in the Preliminary Report of the USCOP**
- (7) proposed regions of the Integrated Ocean Observing System,**
- (8) boundaries established by NOAA's National Climatic Data Center**
- (9) political boundaries used by federal agencies (e.g., NMFS, USFWS, EPA).**

DeMaster and Sandifer 2005



# Spatial Scales & Boundaries



# **ECOSYSTEM APPROACH – OLD IDEA**

**Spencer Baird, the first Commissioner of the  
U.S. Commission of Fish and Fisheries  
advised:**

**Studying only the fish, “.... would not be  
complete without a thorough knowledge of  
their associated in the sea, especially of  
such a s prey upon them or constitute their  
food...”**

**U.S Fish Commission 1<sup>st</sup> Annual Report 1873.**

# **[An] Ecosystem Approach to Management-- Definition**

**An ecosystem approach to management is one that 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.”**

**(NOAA Strategic Plan, 2004)**

# **AN ACTION-ORIENTED ECOSYSTEM DEFINITION**

**USING WHAT IS KNOWN  
ABOUT THE ECOSYSTEM  
TO MANAGE HUMAN  
ACTIVITIES**

**Fluharty 2005 MEPS 300: 242-296**



# **Ecosystem Science in Alaska Fisheries Arena**

- **Incremental and Cumulative Process of Research to Understand Ecosystem**
- **Ecosystem Considerations Part of Annual Stock Assessment Fisheries Evaluation [SAFE] Process [1995 –**
- **Real Time Scientific Peer Review by Scientific and Statistical Committee**
- **Ecosystem Committee to Established [Work Shops, Speakers] 1996 --**

# **ALASKA REGION ASSESSMENTS**

**Witherell, D., C. Pautzke and D. Fluharty.  
2000. An ecosystem-based approach  
for Alaska groundfish fisheries. *ICES  
Journal of Marine Science*, 57:771-777.**

**Pat Livingston, Alaska Fisheries Science  
Center, Seattle, WA**

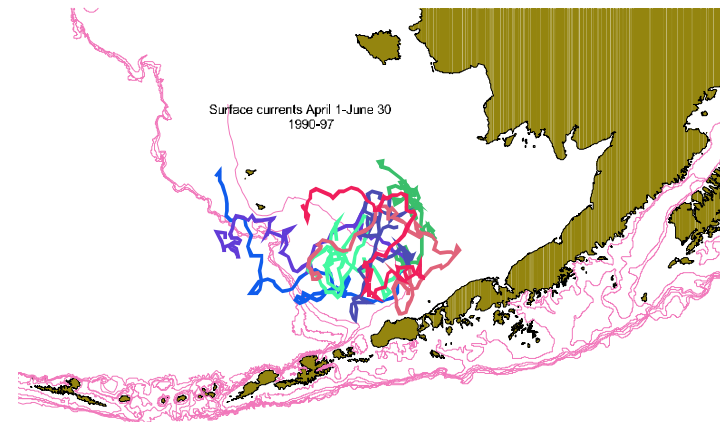
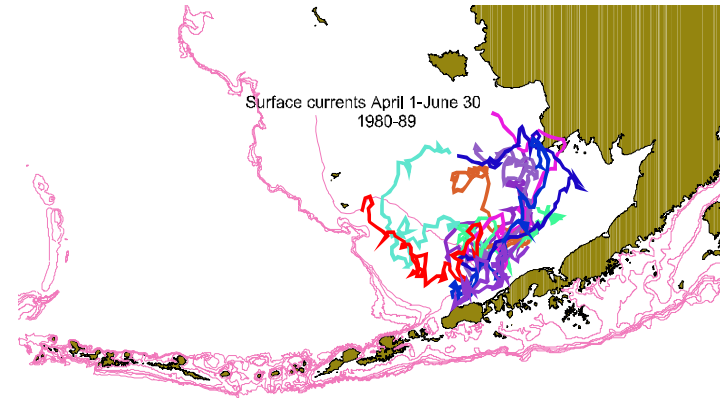
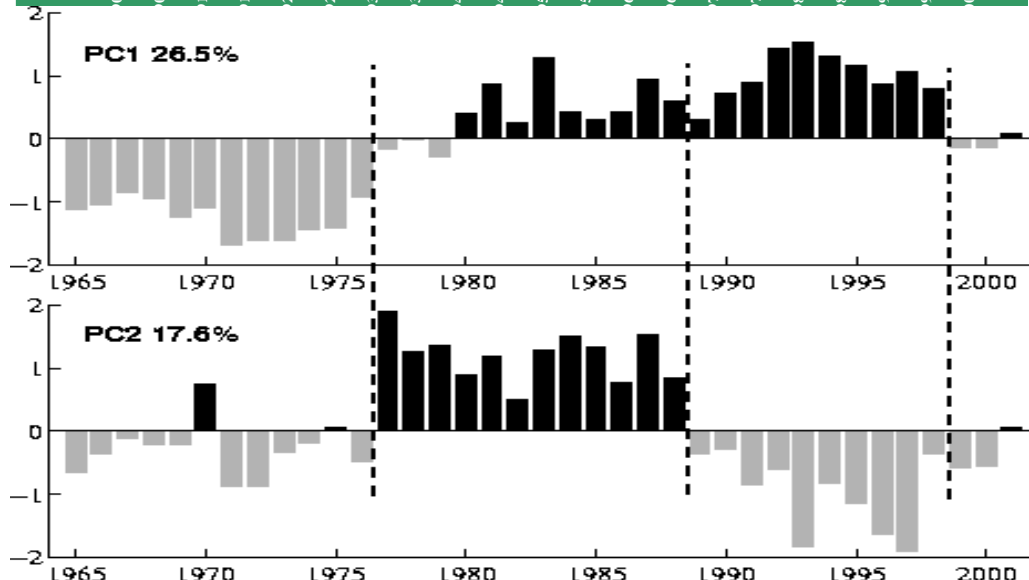
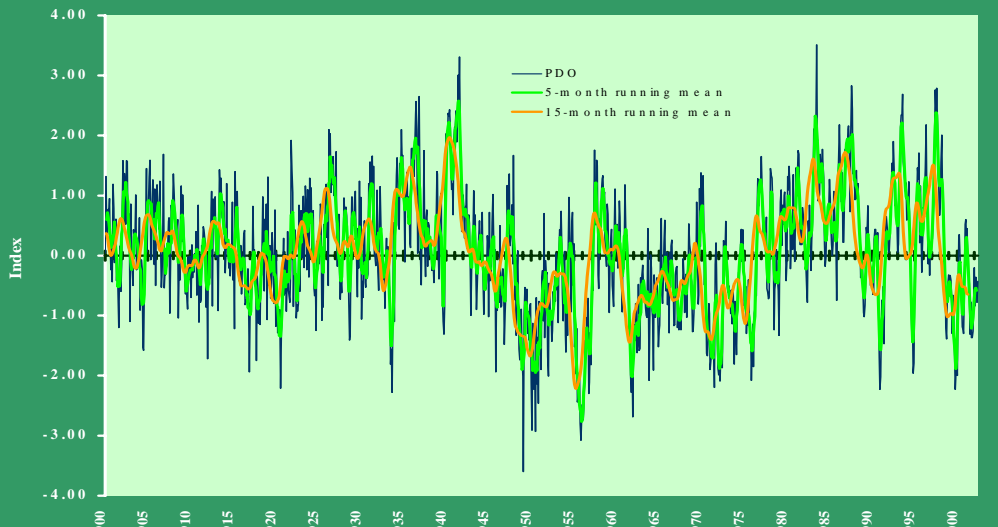
**Alaska Groundfish Programmatic SEIS**

# **ECOSYSTEM APPROACHES ALASKA “What’s Different?”**

- **INTEGRATION OF SCIENCE AND MANAGEMENT FOR CONSERVATION AND ALLOCATION/ SCIENCE-BASED MGT.**
- **ACTIVE CONSIDERATION OF ECOSYSTEM**
- **CAP ON TOTAL HARVESTS**
- **CONSERVATIVE CATCH LIMITS**
- **BYCATCH ACCOUNTING**
- **INDUSTRY FUNDED OBSERVER PROGRAM**
- **MARINE PROTECTED AREAS FOR FISHERY MANAGEMENT – Essential Fish Habitat**
- **BAN ON HARVEST OF FORAGE FISH**

# ECOSYSTEM STATUS: Physical Environment and Links to Production

Pacific Decadal Oscillation



# **Approaches to Assessment**

- **Examine “Marine Ecosystems of the North Pacific” in light of NPFMC Context**
- **Examine Advisory Report Fisheries and & Ecosystem Responses to Recent Regime Shifts in the North Pacific” in light of NPFMC Context**
- **Simple Questions – Complex Answers**

# **USEFUL BACKGROUND ABOUT PICES MENP REPORT**

- **Number printed and distributed 600**
- **Number of copies purchased by North Pacific Research Board 20**
- **Number of copies provided NPFMC 15**
- **Number of times cited in NPFMC Ecosystem Safe Document “0”**
- **Number of ICES publications cited “2”**
- **Number of times INPFC cited “1”**

# Observations

- **Content**
- **Audience**
- **Delivery**
- **Impact [preliminary]**

# **Content [MENP]**

- 1. Not surprisingly, a comprehensive look at marine ecosystems in the PICES area fills a gaping hole in the literature.**
- 2. It's regional focus gives information of practical interest to those managing marine environments there.**
- 3. The ocean-wide synthesis is important for comparative purposes.**



# **MENP Content re: Alaska**

- **Not surprisingly, there are many parallels between the Regional information in MENP and that in the Ecosystem SAFE document.**
- **Ecosystem SAFE could benefit from organizational and conceptual model.**
- **However, Ecosystem SAFE provides necessary sub regional and ecosystem component detail.**

# **MEPA Audience - Alaska**

- **Primary audience is scientific/academic**
- **Management is an audience but Alaska has developed its own protocols**
  - **Timing different from management calendar**
- **User groups and NGO Environmental Community mostly unaware**
- **Media not informed**

# **MEPA Delivery - Alaska**

- **Primarily to scientific research community**
- **Management**
- **Research funding entity**
- **Not users/ngos/media**

# **MENP Impact -- Alaska**

- **Not cited in chief ecosystem advisory document Ecosystem SAFE Report**
- **Not widely distributed – how many read all or part?**
- **Availability of report largely unknown**
- **Most likely use – synthesis, background information to take into account in management – region specific**

# **Useful Background About PICES Advisory Report – Regime Shifts**

- **Number printed and distributed ca.  
“2000”**
- **Number sent to Alaska region  
[NPFMC/NMFS, NPRB “boxes”**
- **Number of citations in Ecosystem  
Considerations NPFMC “0”**

# **PICES Advisory Report Fisheries & Ecosystem Responses**

## **PICES Advice:**

**Accept regime concept for marine  
ecosystems**

**Develop program to monitor climate  
effect**

**Develop climate indices**

**Use integrated stock assessments**

# **POSSIBLE APPLICATION OF EAM TO PICES**

- **ASSESS STATE OF ECOSYSTEM  
RELATIVE TO EXISTING FISHERIES**
- **DIAGNOSE THE HEALTH OF EXISTING  
FISHERIES AND TRENDS**
- **SET GOALS TO INCREASE SUCCESS  
OF MANAGEMENT**
- **ADVISE CHOICE OF MANAGEMENT  
SOLUTIONS TO MEET GOALS**

# POSSIBLE APPLICATION OF EAM TO PICES

- **HELP TO DETERMINE THE LEVEL OF PRECAUTION TO APPLY IN MANAGEMENT**
- **HELP DETERMINE WHEN BURDEN OF PROOF IS MET IN TERMS OF SCIENCE**
- **ASSIST TO PRIORITIZE RESEARCH ON ECOSYSTEMS FOR MANAGEMENT**
- **PROVIDE SCIENTIFIC BASIS FOR DELINEATION OF ECOSYSTEMS – RE: MONITORING, MANAGEMENT, AND DATA COORDINATION**



# Suggestions for Consideration

## Content:

Retain and update existing content with greater attention to synthesis of ocean-wide [global connections] on a periodic basis

Use Advisory Reports, as appropriate, to target specific requests, emerging issues, or problems