Putting Ecosystem Science to Work

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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

Large Marine Ecosystems of the United States
and Linked Watersheds
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 as prey upon them or constitute their food…”

U.S Fish Commission 1st Annual Report 1873.
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
- Real Time Scientific Peer Review by Scientific and Statistical Committee
- Ecosystem Committee to Established [Work Shops, Speakers] 1996 --
ALASKA REGION
ASSESSMENTS


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

PC1 26.5%

PC2 17.6%

Surface currents April 1-June 30 1983-89

Surface currents April 1-June 30 1996-97
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 to 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”
PICIES Advisory Report Fisheries & Ecosystem Responses

PICIES 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

Fluharty, PICES 12, Seoul, Korea
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

Fluharty, PICES 12, Seoul, Korea
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.