Strengthening Science for Fisheries Management

Paul A. Sandifer, Ph.D.
Senior Science Advisor to the Administrator
National Oceanic and Atmospheric Administration | NOAA
Duke Fisheries Forum, Beaufort, NC
May 11-13, 2010

Outline:

Getting the best available science to Councils

Implementation of Ecosystem Approach to Management

New scientific methods: Stock Assessments and IEAs

Cooperative research: strengthening science and acceptance of science

Overall Strengthening Science of NOAA Science

Getting The Best Available Science To Councils

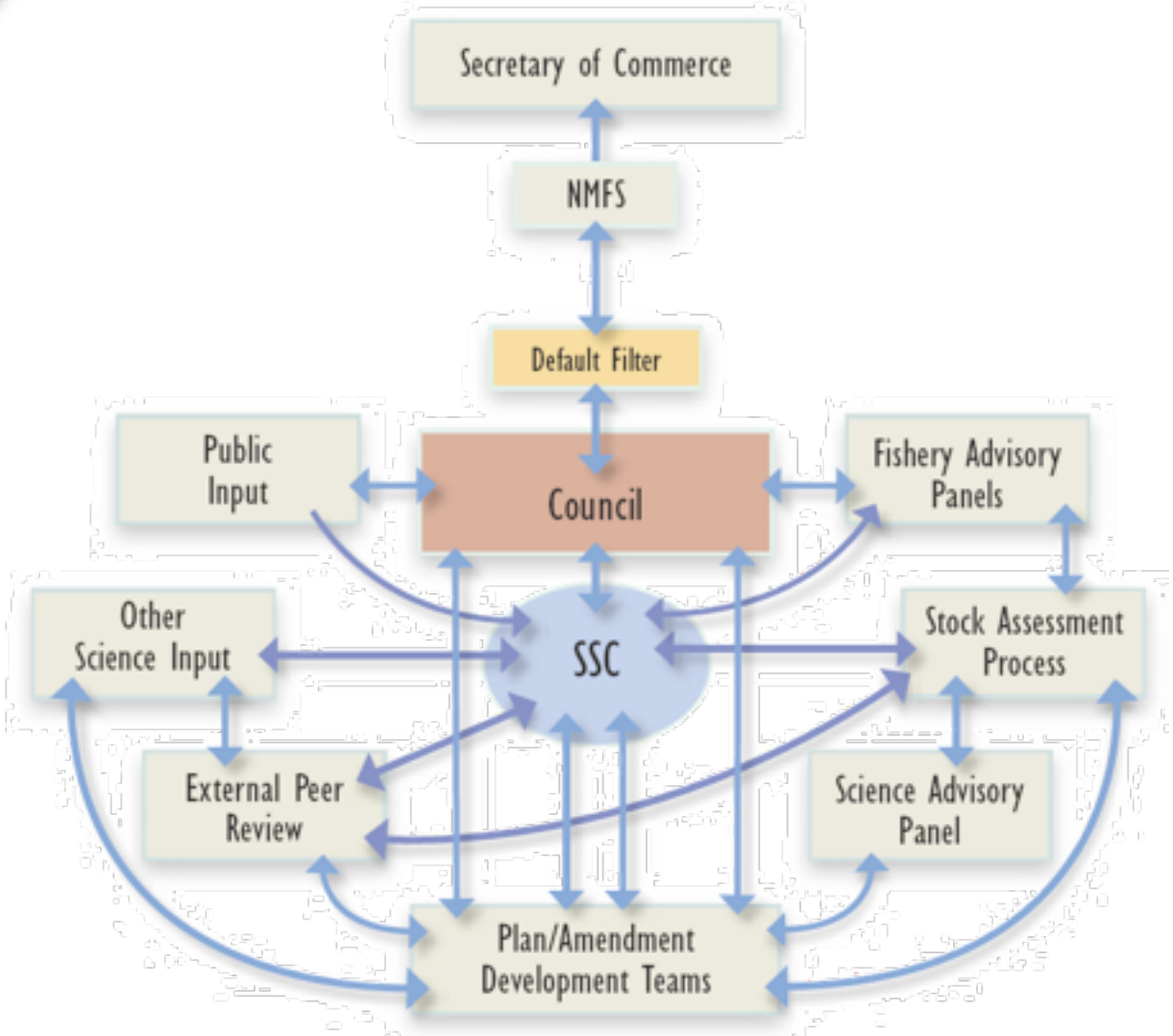
Accurate, reliable scientific information is the bedrock foundation required for sustainable management of fisheries.

Information must be obtained, analyzed, peer-reviewed, updated and incorporated into fisheries assessments and FMPs.

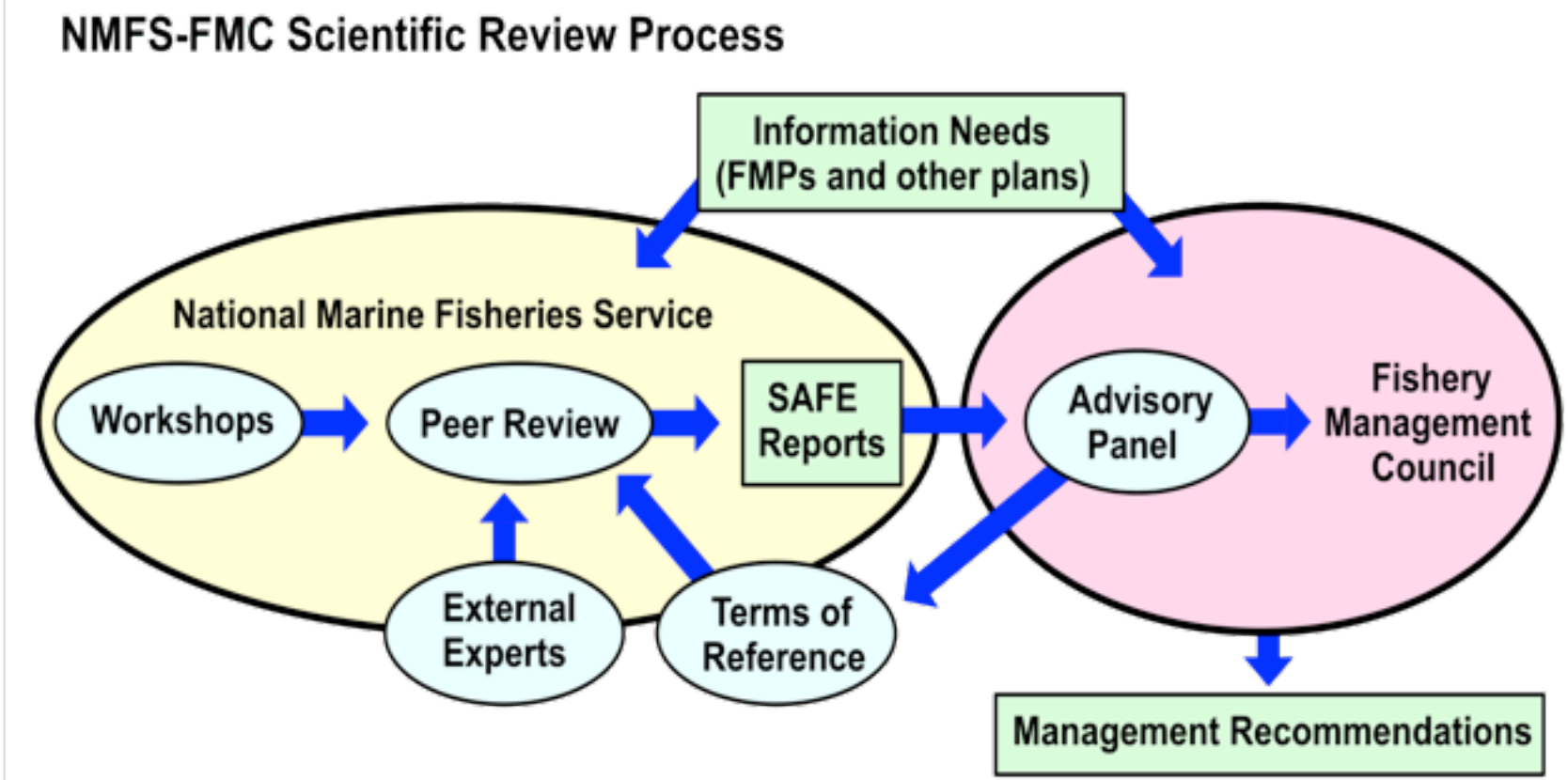
Most importantly, the scientific information must be understood and used in decision-making.

US Commission on Ocean Policy, 2004

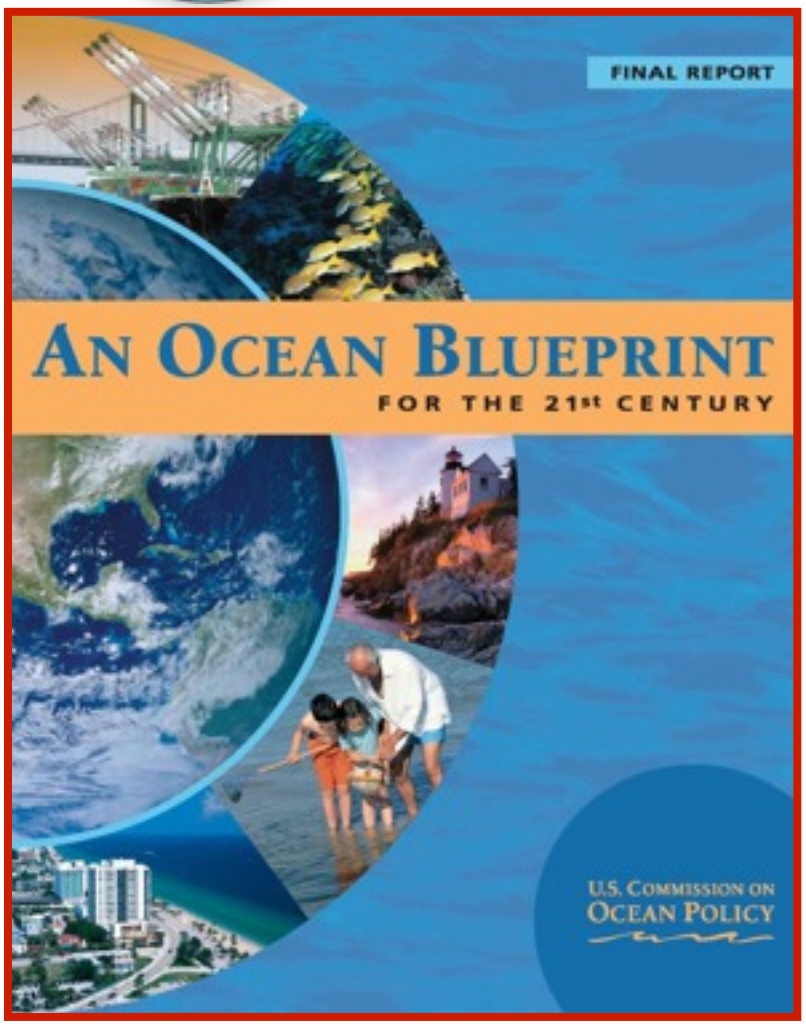
Idealized Process Flow
(from Sandifer & Rosenberg, 2005)



NMFS - SSC - Council



USCOP and EBM

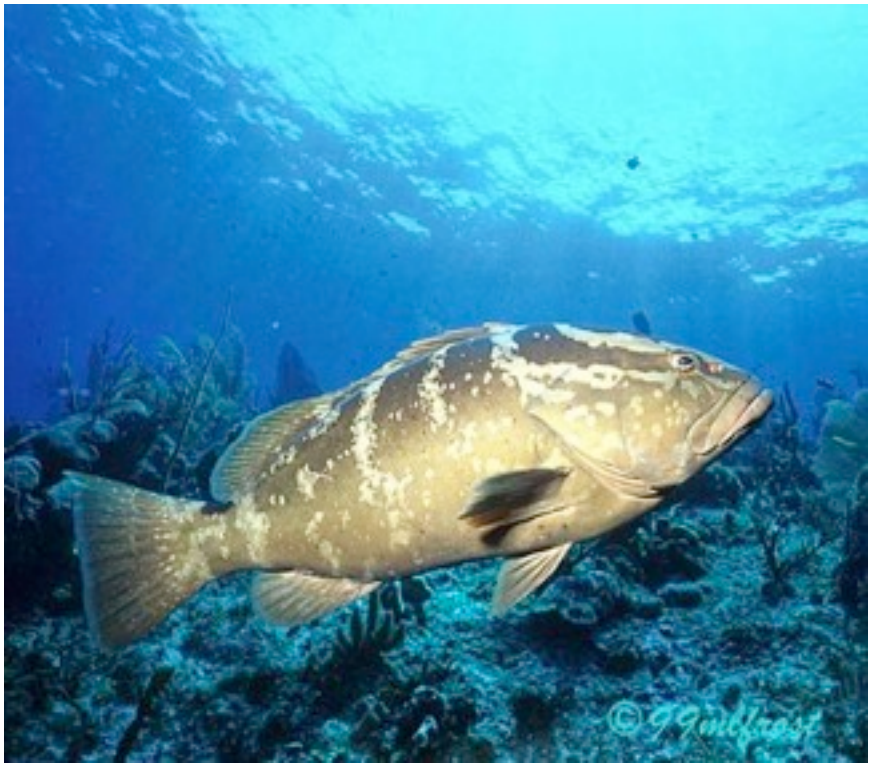


Ecosystem-based Management

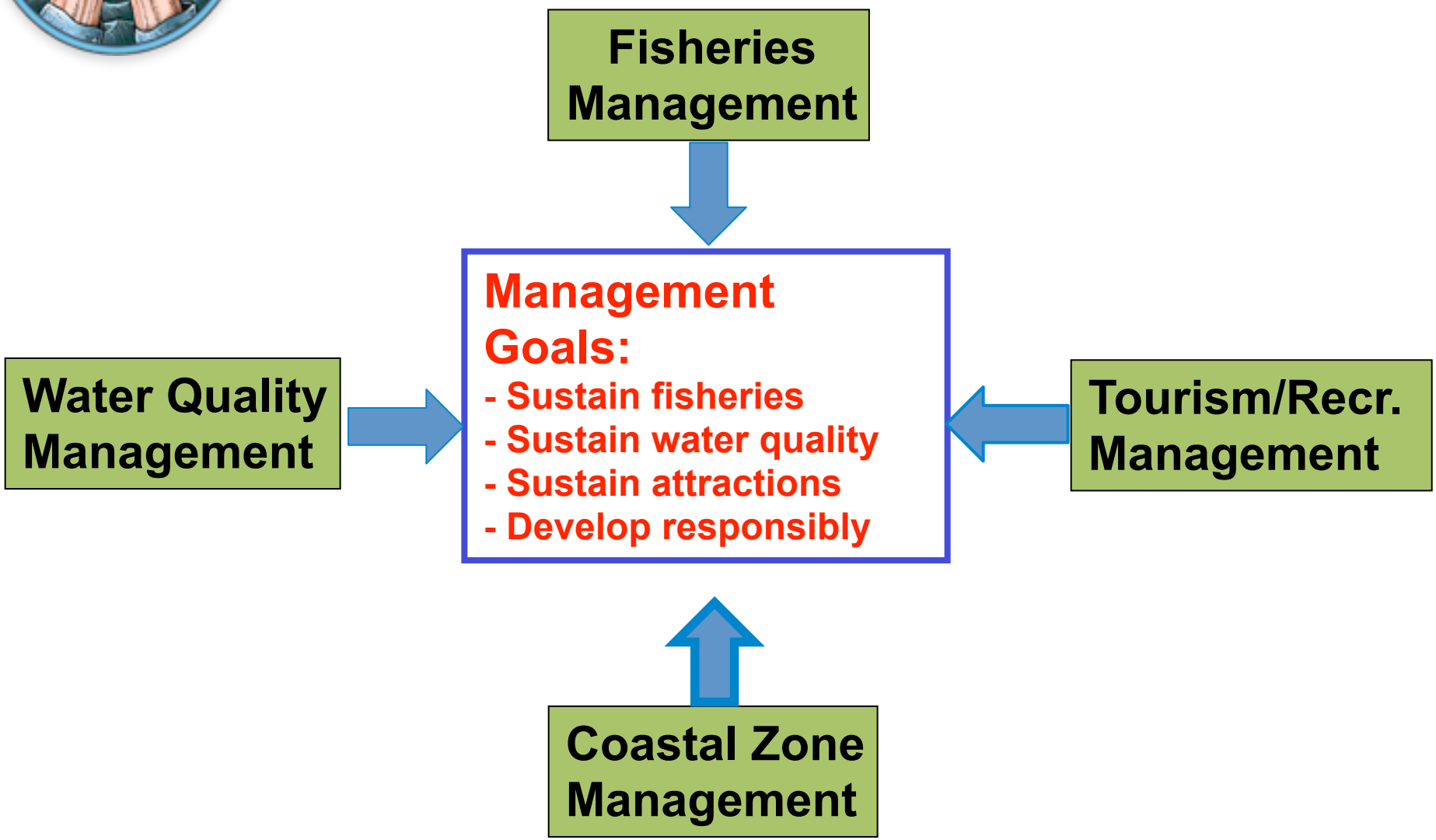
- **More Effective Governance**
- **Improved Science for Decision Making**
- **Strengthened Educational Programs**

Snapper-Grouper Fishery: Example of EBM

The snapper-grouper complex is comprised of 73 highly habitat dependent species. The SAFMC is developing a Fishery Ecosystem Plan to provide for more comprehensive, ecosystem-based, multiple species management. Immediate steps include seven deepwater MPAs and other regulations.



EBM Conceptual Framework



EBM Conceptual Framework

EBM Conceptual Framework

Regional Ocean Governance

EBM Conceptual Framework

Regional Ocean Governance

Regional Science Advisory Body

Challenges In Stock Assessments

Currently we quantitatively assess 140/230 “FSSI stocks”; about ¼ of the Marine Mammal Stocks and only 2 of 9 Sea Turtle Stocks (particularly difficult) – the “Known-Knowns”

Insufficient ship capacity within NOAA to provide high quality fishery-independent data – need to augment with cooperative research & new technologies

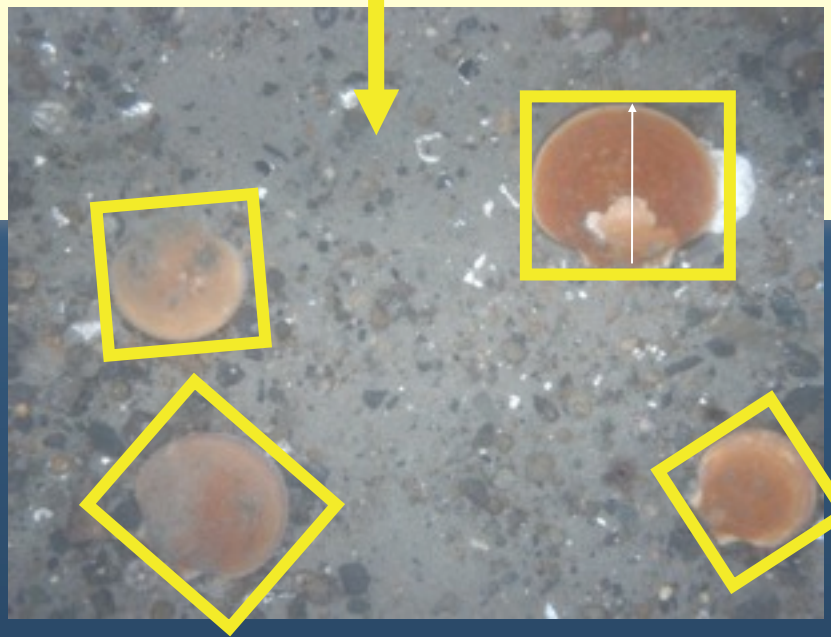
Management wants more timely, more precise and more spatially resolved information to manage closer to limit reference points and enable Coastal and Marine Spatial Planning (CMSP)

“Counting fish is like counting trees…….
…except you can’t see them and they move around.
John Gulland – Famous Fishery Mathematician

Incorporating New Technology: More Credible, Faster, Cheaper?

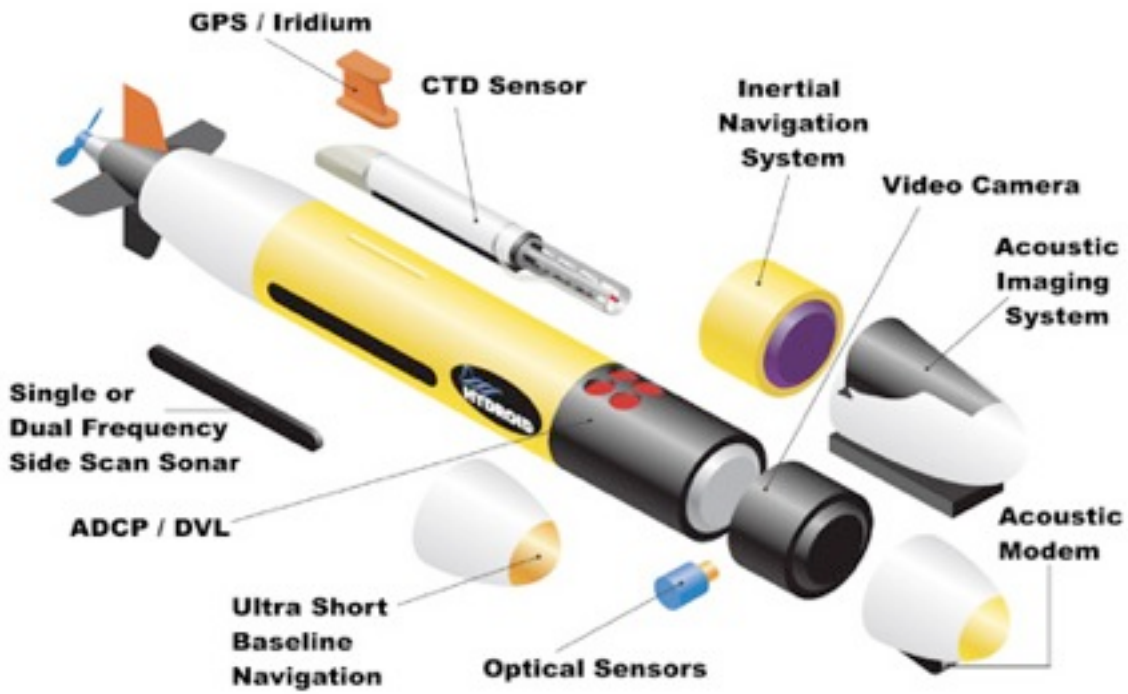
Atlantic Sea Scallop

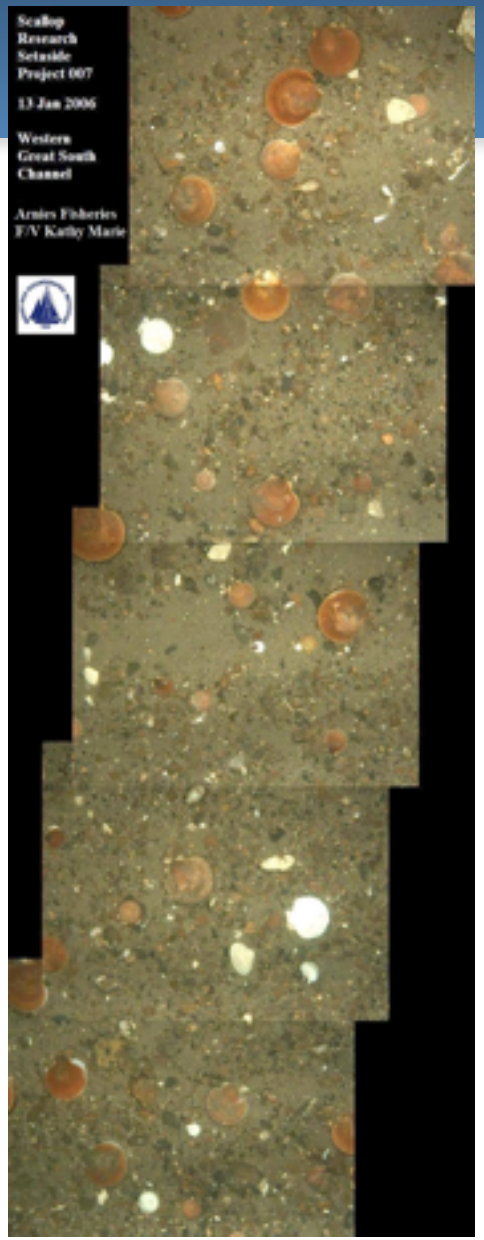
the most valuable USA FMC Fishery



NEFSC AUV Scallop Project

- Improve abundance estimates of scallops
- using acoustical and optical technologies





NMFS AUV Rockfish Survey

Improved abundance estimates of rockfish in untrawlable habitat

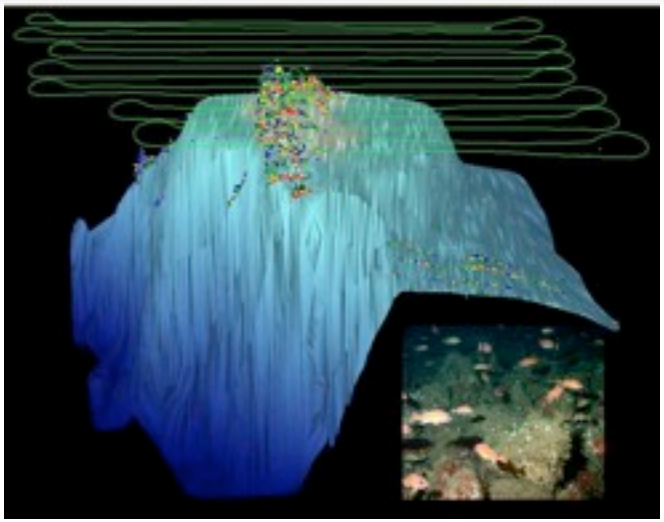
Compare to ship-based survey (COAST 2007)

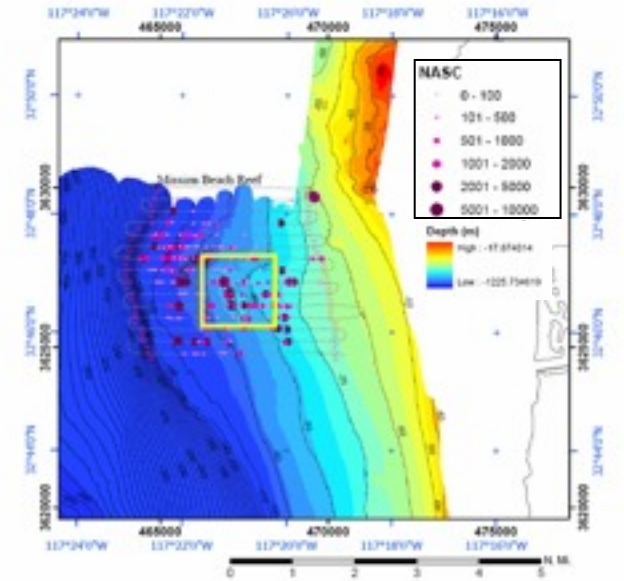
Map and classify seafloor habitat

Multi-range detection and target strength estimation

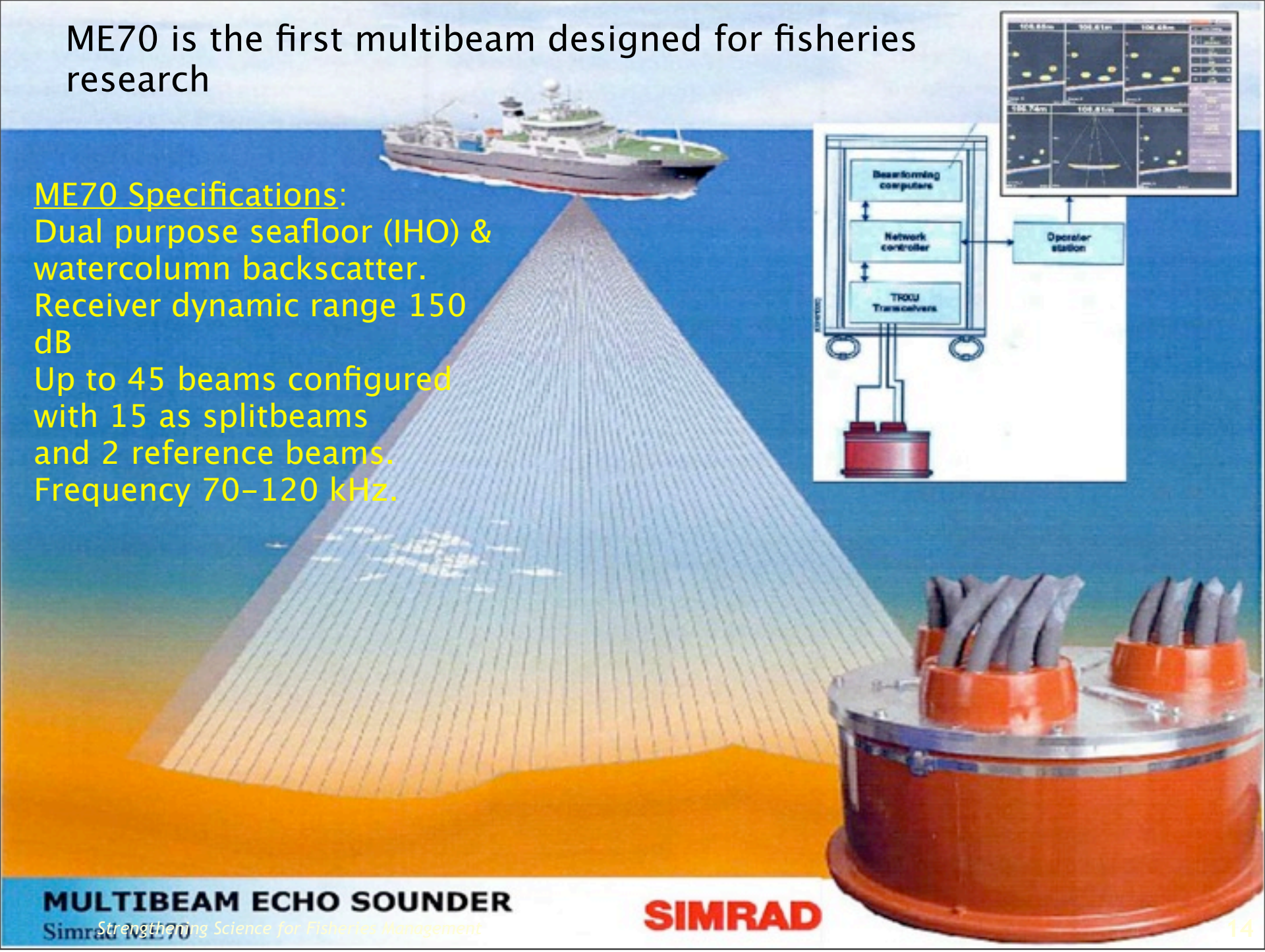
Automatically-respond to rockfish aggregations

Identify & measure rockfish using stereo imagery





ME70 is the first multibeam designed for fisheries research

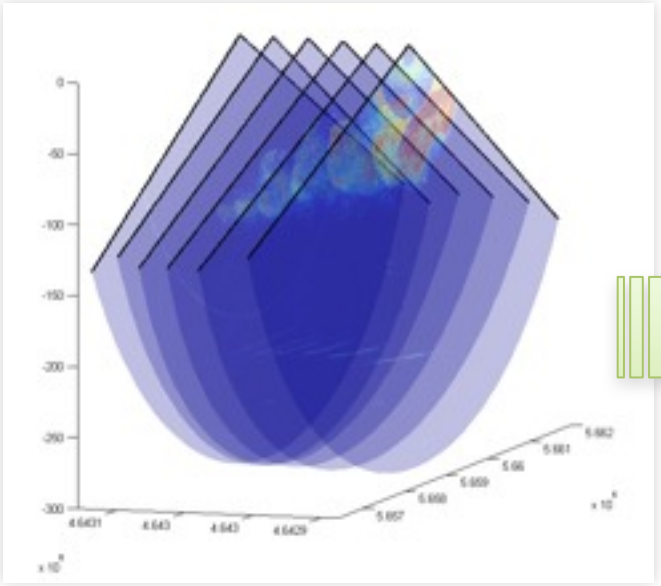


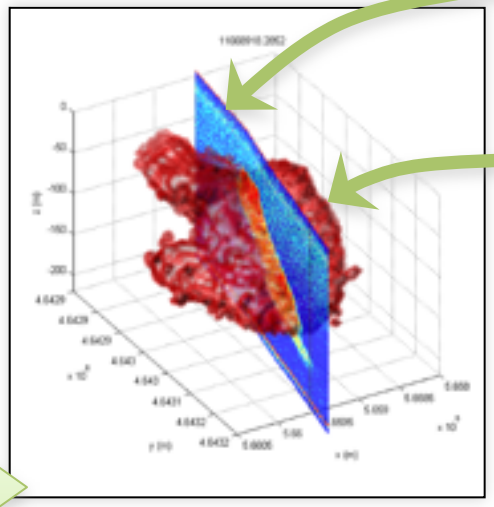
Georges Bank:
Atlantic Herring Survey

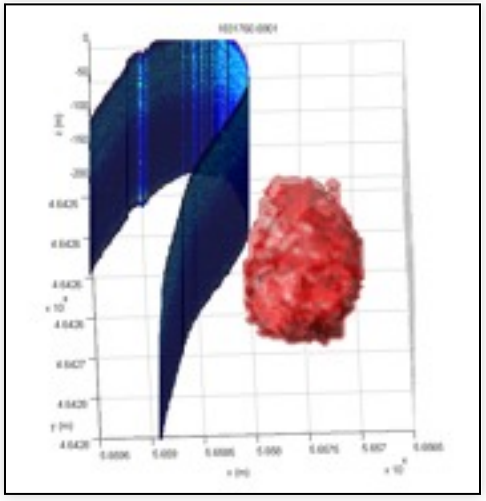
EK60 Raw Data (single beam)

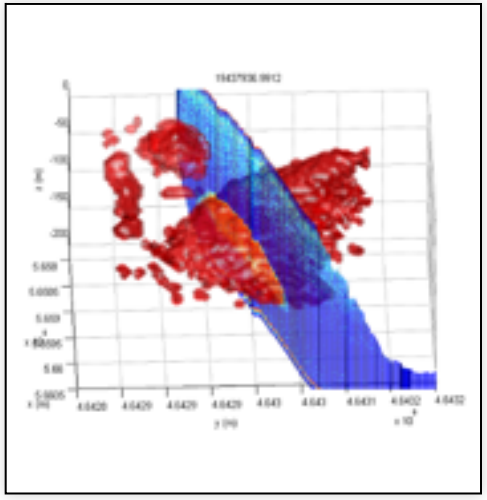
Processed Multibeam Data

Raw Multibeam Data









Cooperative Research

What is cooperative

- Scientific activity involving two or more partners
- Must have some level of participation by fishermen
- Gain more collectively than separately
- Shared research goal
- Varying levels of participation

Potential partners:

- Fishery scientists and managers
- Commercial fishermen and fishing industry
- Recreational fishermen and fishing industry
- NGO's
- State fisheries management agencies
- Universities

NOAA Fisheries Service
FY10 Cooperative Research Projects

Alaska Region
- Fishing technology and conservation engineering to reduce trawl bycatch and damage to seafloor animals
- Northern fur seals and climate effects study
- Archival tagging of snow crab
- Longline survey of groundfish species
- Acoustic survey of nearshore critical habitat
- Sablefish logbook program

Northeast Region
- NE Study Fleet
- Specialized sampling on winter flounder, dogfish, and skates
- Competitive grants for cooperative conservation engineering and stock assessment projects

Northwest Region
- Cooperative industry survey
- Southern California hook and Line survey
- West Coast groundfish testing of new
- Sensors on commercial fishing boats

Headquarters
- National Cooperative Research Program Coordination

Southwest Region
- Spatial variability in growth and fecundity studies on rockfish
- Biological sampling of large pelagics
- Longline survey of pre-recruit common thresher sharks
- Abalone survey
- Albacore research

Southeast Region
- Competitive grants for cooperative conservation engineering and stock assessment projects
- Longline/sea turtle research
- Billfish tagging program

Pacific Islands Region
- Main Hawaiian Islands bottomfish survey
- Main Hawaiian Islands bottomfish tagging program

Providing Analytical Support For Ecosystem Approaches To Management

Developing Integrated Ecosystem Assessments

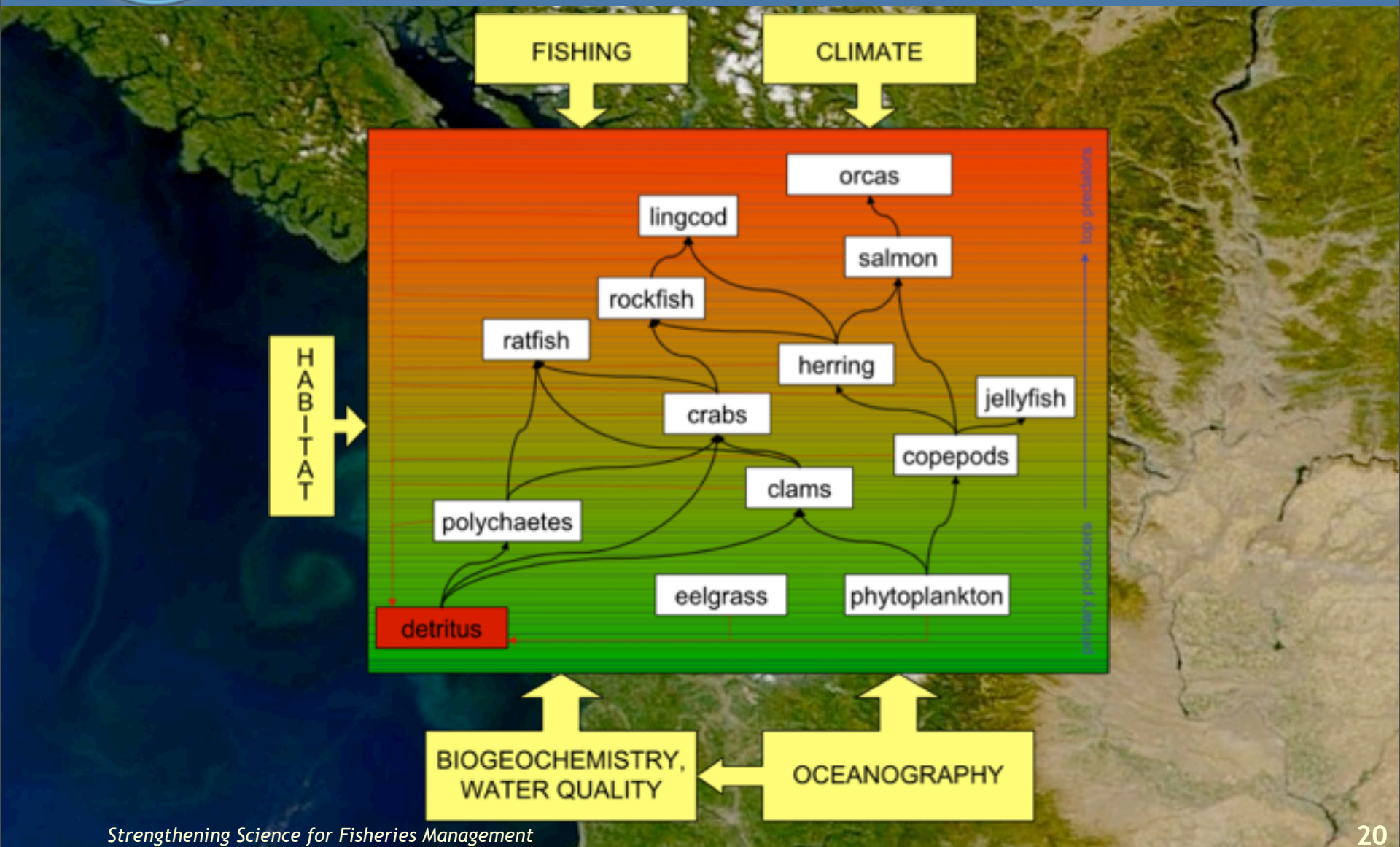
System models—opportunities and perils

Quantifying and valuing ecosystem services; assessing trade-offs

Learning from protection & restoration actions

Levin et al. 2009

Applying System Models In Puget Sound IEA

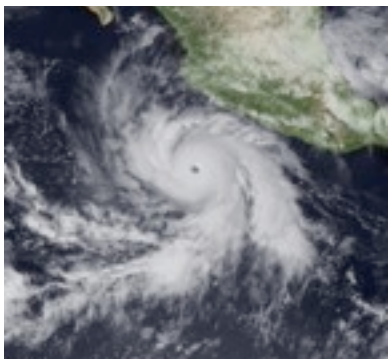


Strengthening NOAA Science

Science underpins all that NOAA does.

Strengthening NOAA science is a ***continuous process*** that involves engaging NOAA's scientists and science managers and our external partners to address four key questions:

1. What are the grand challenges for NOAA science?
2. What are the best practices for encouraging, promoting, and protecting healthy science at NOAA?
3. What is the optimal alignment to address those challenges?
4. How can NOAA ensure continual evaluation, enhancement, and celebration of its science?



Strengthening NOAA Science: Elements of the Process

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers
- Foster External Engagement, Collaboration, and Partnerships

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers
- Foster External Engagement, Collaboration, and Partnerships
- Continue Peer-Review of NOAA's Laboratories and Programs

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers
- Foster External Engagement, Collaboration, and Partnerships
- Continue Peer-Review of NOAA's Laboratories and Programs
- Monitor and Evaluate NOAA's Programs and Projects

Strengthening NOAA Science: Elements of the Process

- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers
- Foster External Engagement, Collaboration, and Partnerships
- Continue Peer-Review of NOAA's Laboratories and Programs
- Monitor and Evaluate NOAA's Programs and Projects
- Develop NOAA's Scientific Integrity Policy

Strengthening NOAA Science: Elements of the Process

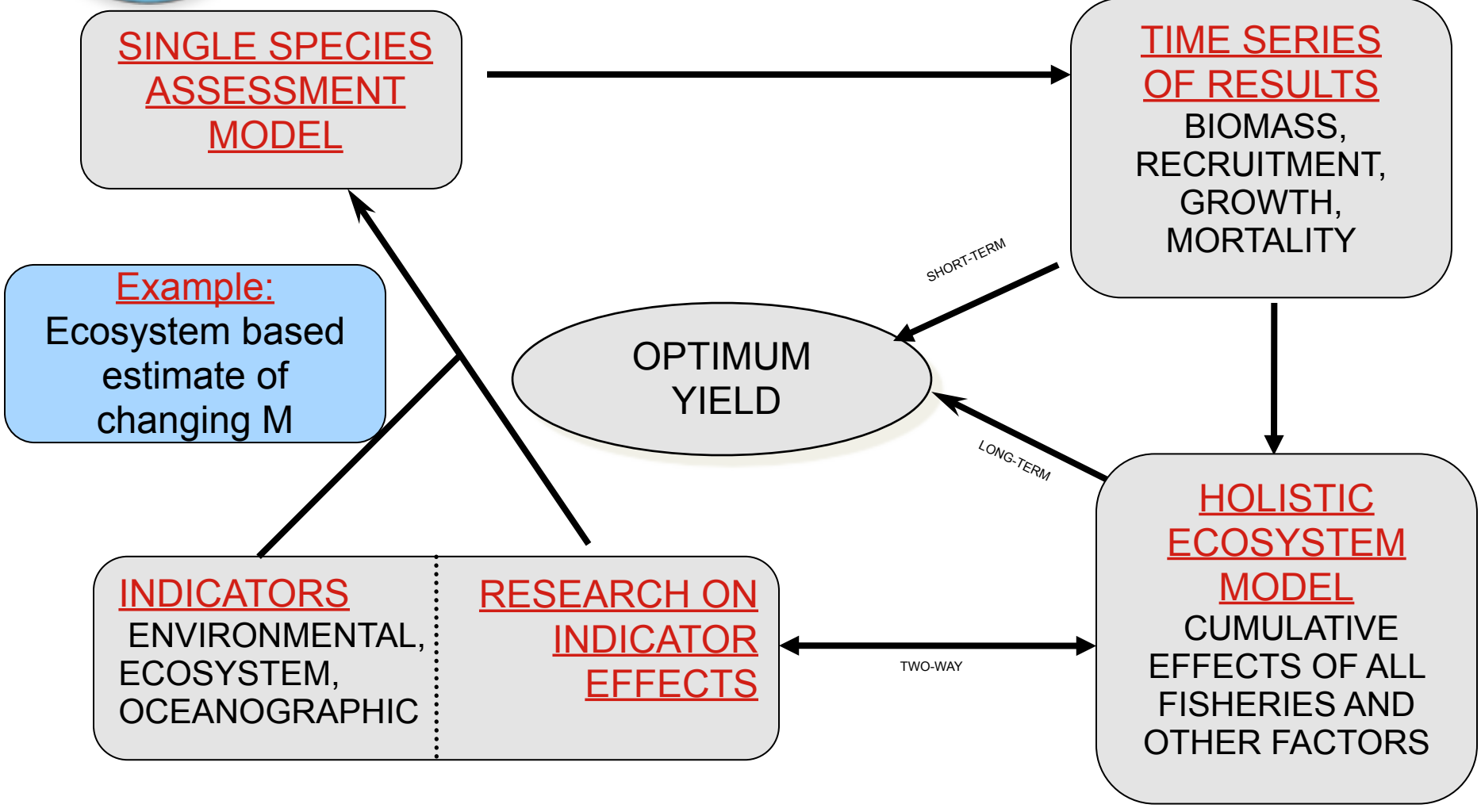
- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers
- Foster External Engagement, Collaboration, and Partnerships
- Continue Peer-Review of NOAA's Laboratories and Programs
- Monitor and Evaluate NOAA's Programs and Projects
- Develop NOAA's Scientific Integrity Policy
- Recruit, Retain, and Promote Exceptional Scientists

Strengthening NOAA Science: Elements of the Process

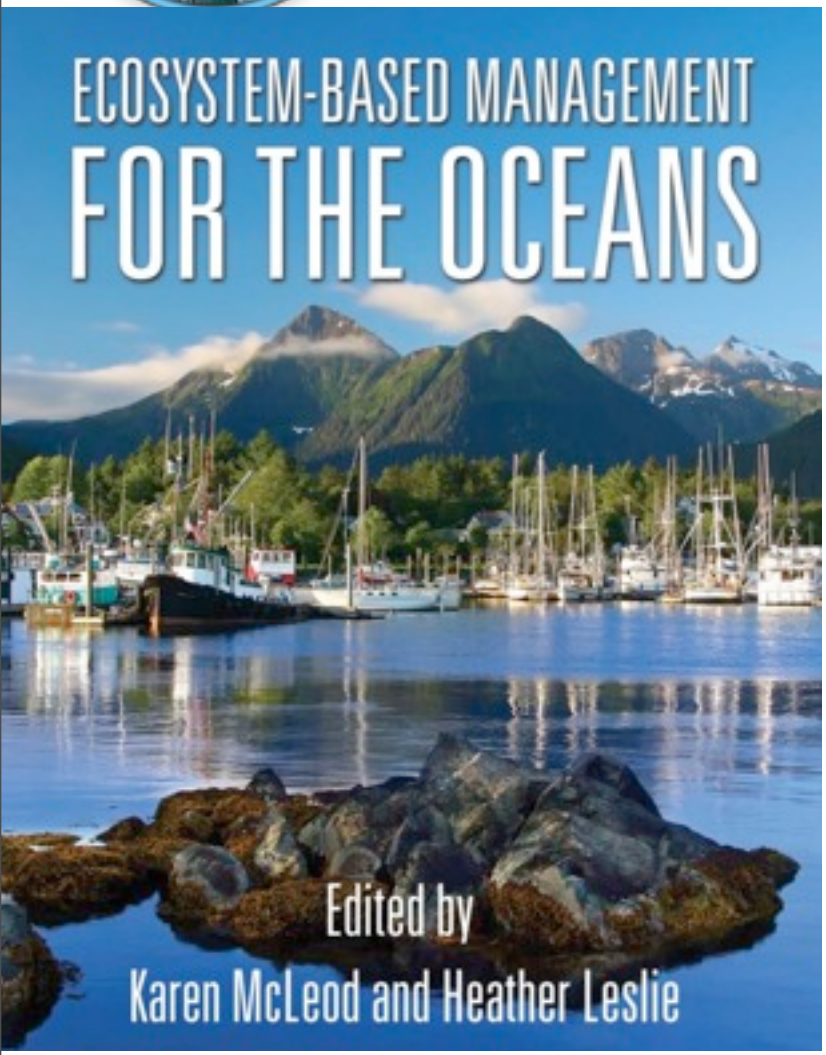
- Celebrate NOAA Scientists and NOAA Science
- Reinstitute & Elevate the NOAA Chief Scientist
- Enhance Collaboration Across NOAA's Scientific Enterprise
- Engage NOAA Scientists & Science Managers
- Strengthen NOAA Laboratories and Science Centers
- Foster External Engagement, Collaboration, and Partnerships
- Continue Peer-Review of NOAA's Laboratories and Programs
- Monitor and Evaluate NOAA's Programs and Projects
- Develop NOAA's Scientific Integrity Policy
- Recruit, Retain, and Promote Exceptional Scientists
- Evaluate Progress and Refresh Process

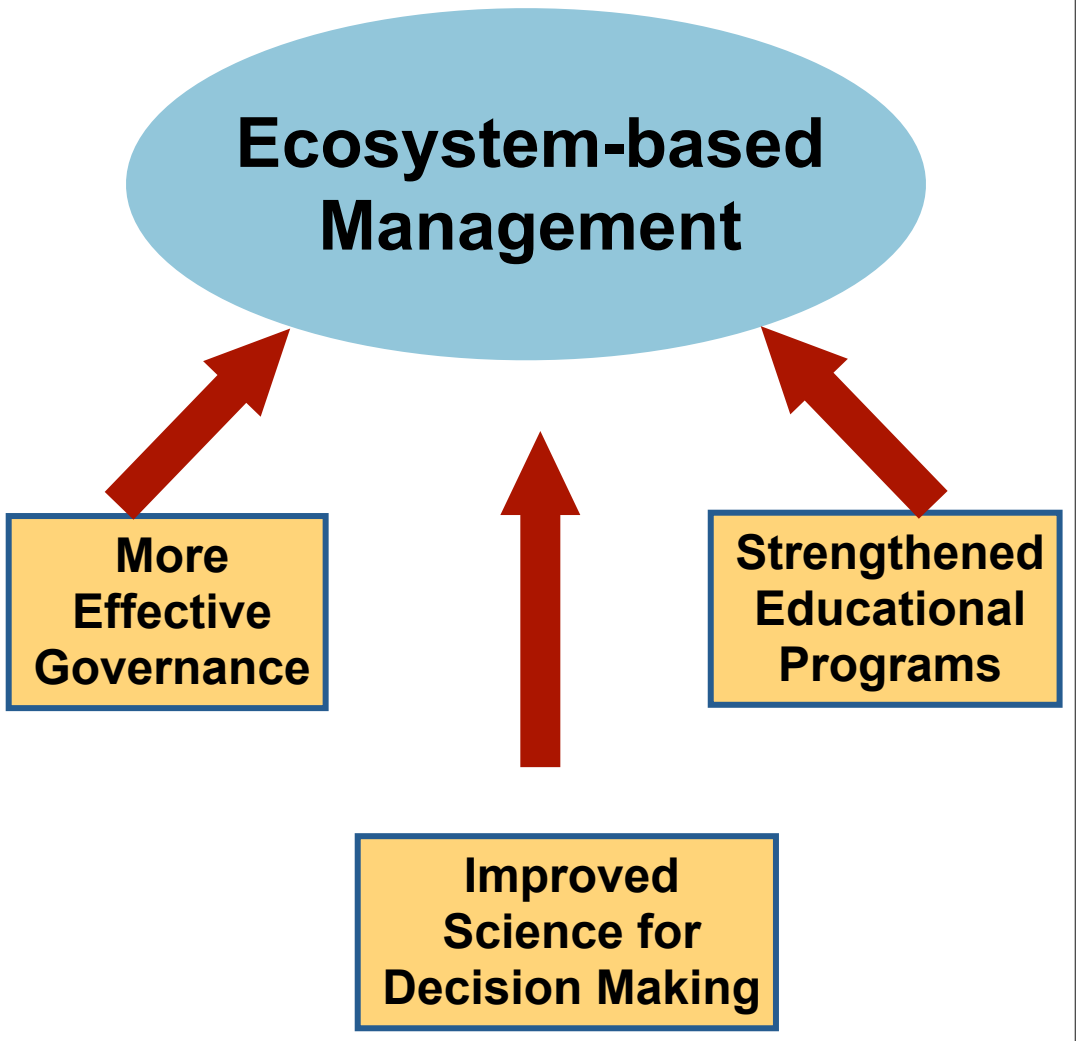
THANK YOU!

Stock Assessment - Ecosystem Connection

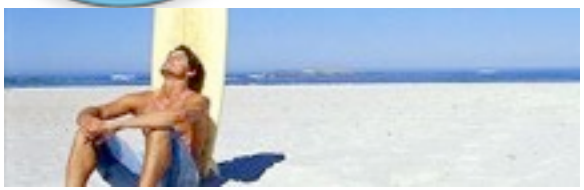


USCOP and EBM





Marine Ecosystem Services –Marine InVEST



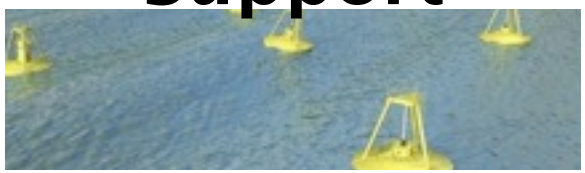
Recreation

Aquaculture

Fisheries

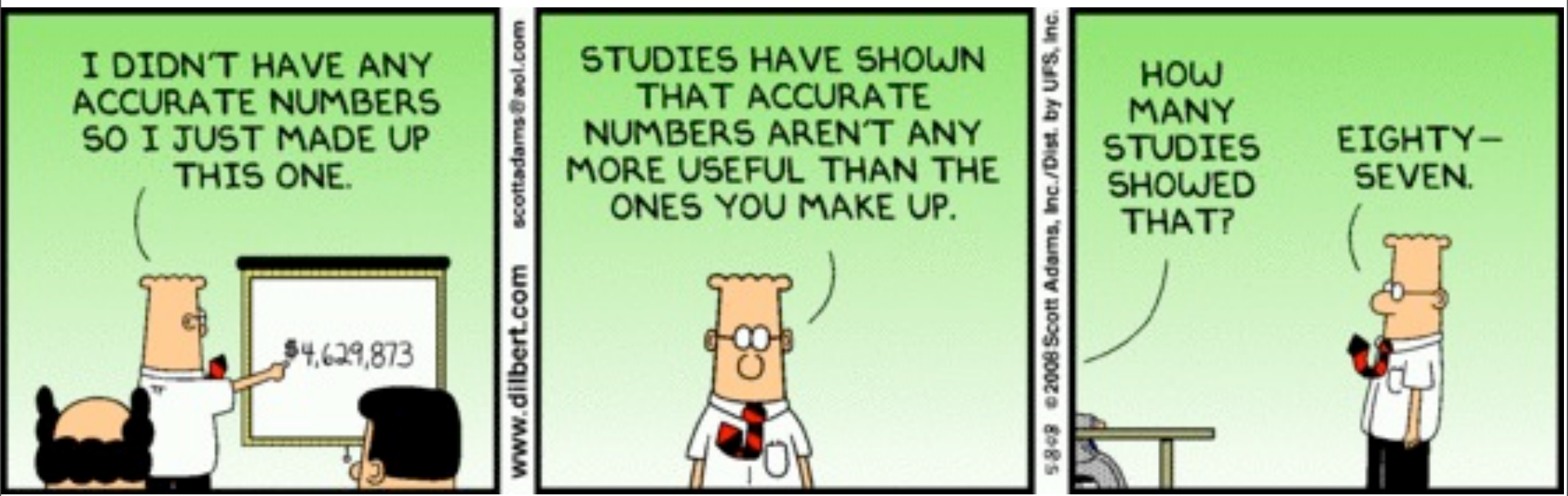
Coastal Protection

Nursery Support



Energy Generation

Transformation & Sequestration


I DIDN'T HAVE ANY ACCURATE NUMBERS SO I JUST MADE UP THIS ONE.
$4,629,873
www.dilbert.com scottadams@aol.com
STUDIES HAVE SHOWN THAT ACCURATE NUMBERS AREN'T ANY MORE USEFUL THAN THE ONES YOU MAKE UP.
5-8 ©2008 Scott Adams, Inc./Dist. by UFS, Inc.
HOW MANY STUDIES SHOWED THAT?
EIGHTY-SEVEN.

Proposed Rule For NS2

- Proposed rule published (FR Doc E9-29589, Filed 12-10-09).

  - Proposes revisions to NS2 (50 CFR 600.315) guidelines on
    - ✓ Best scientific information available (BSIA),
    - ✓ Peer review standards,
    - ✓ Role of SSC in the review of scientific information,
    - ✓ SAFE report requirements.

  - Public comments (n=391) received from 26 organizations (15 fisher constituents, 4 Councils, 4 NGOs, 3 agencies).

Available at: http://www.regulations.gov RIN 0648-AW62

SSC's Role In Scientific Review And Advice To Their Council

- MSA § 302(g)(1)(A) "Each Council shall establish, maintain, and appoint members of a [SSC] to assist in the development, collection, evaluation, and peer review …"
- MSA § 302(g)(1)(B) "Each [SSC] shall provide its Council ongoing scientific advice for fishery management decisions …"
- The Fishery Management Council Statement of Organization, Practices, and Procedures (SOPP) final rule will be published soon.
  - Requires SSC disclosure of financial conflicts of interest.