Presented by
Phillip Levin
Senior Scientist
NOAA Fisheries
Northwest Fisheries Science Center

Why?

At “Managing our Nations Fisheries 3” and In subsequent congressional testimony, Councils identified

- a need to advance ecosystem-based decision-making, and
- overcome impediments to ecosystem-based fisheries management.

Task Force

- Tim Essington, Chair, UW
- Phillip Levin, Co-Chair, NOAA Fisheries
- Kristin Marshall, Project Manager, UW
- Laura Koehn, UW Graduate Student

- **Lee Anderson, U Delaware, MAFMC**
- Alida Bundy, DFO Canada
- **Courtney Caruthers, U AK**
- Felicia Coleman , FSU
- Leah Gerber, ASU
- Jonanthan Grabowski, Northeastern Univ
- Ed Houde , U MD
- Olaf Jensen, Rutgers
- Christian Möllmann, U Hamburg, Germany
- Kenny Rose, LSU
- **Jim Sanchirico, UC Davis**
- Tony Smith CSIRO

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Social Scientists

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Members of the 1999 Ecosystem Principles Advisory Panel

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Non-U.S.

Advisory Panel

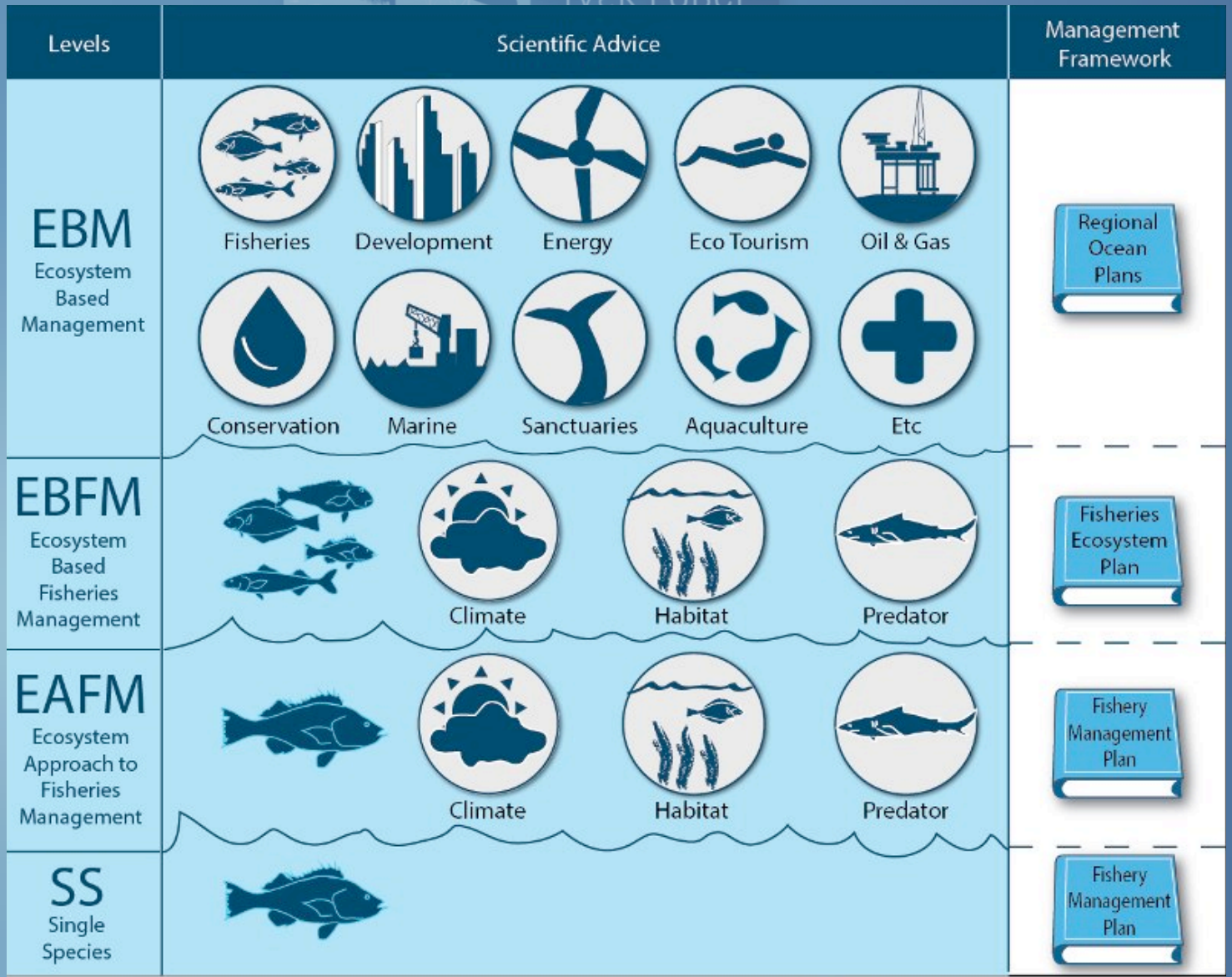
- Phillip Levin, Chair, NOAA Fisheries
- Michele Culver, PFMC
- Mark Dickey-Collas, ICES
- Michelle Duval, SAFMC
- Mike Fogarty, NOAA Fisheries
- William Tweit, NPFMC
- Peter Kendall, NEFMC
- Julie Morris, New College of FL, GCFMC (ret.)
- Galen Tromble, NOAA Fisheries

NMFS Liaisons

- Jason Link, NOAA Fisheries Senior Ecosystem Scientist
- Doug Lipton, NOAA Fisheries Senior Social Scientist
- Rick Methot, NOAA Fisheries Senior Stock Assessment Scientist

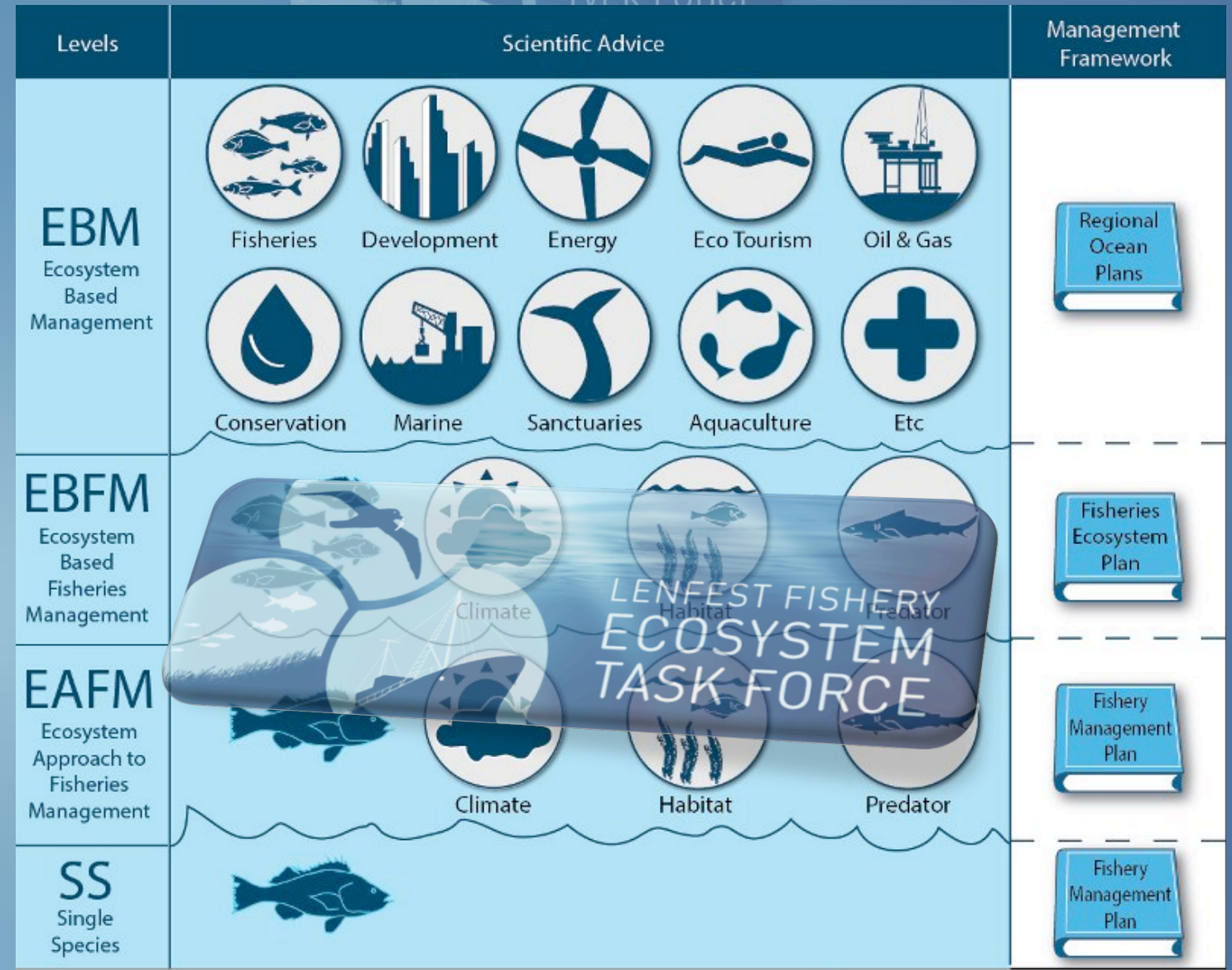
What?

LENFEST FISHERY ECOSYSTEM TASK FORCE



What?

LENFEST FISHERY ECOSYSTEM TASK FORCE



LENFEST FISHERY ECOSYSTEM TASK FORCE

INTEGRATED ECOSYSTEM ASSESSMENT

W h a t ?

Our Charge

- *How can regional fisheries bodies better incorporate ecosystem principles into management and develop Fishery Ecosystem Plans?*

This compels us to address four key questions:

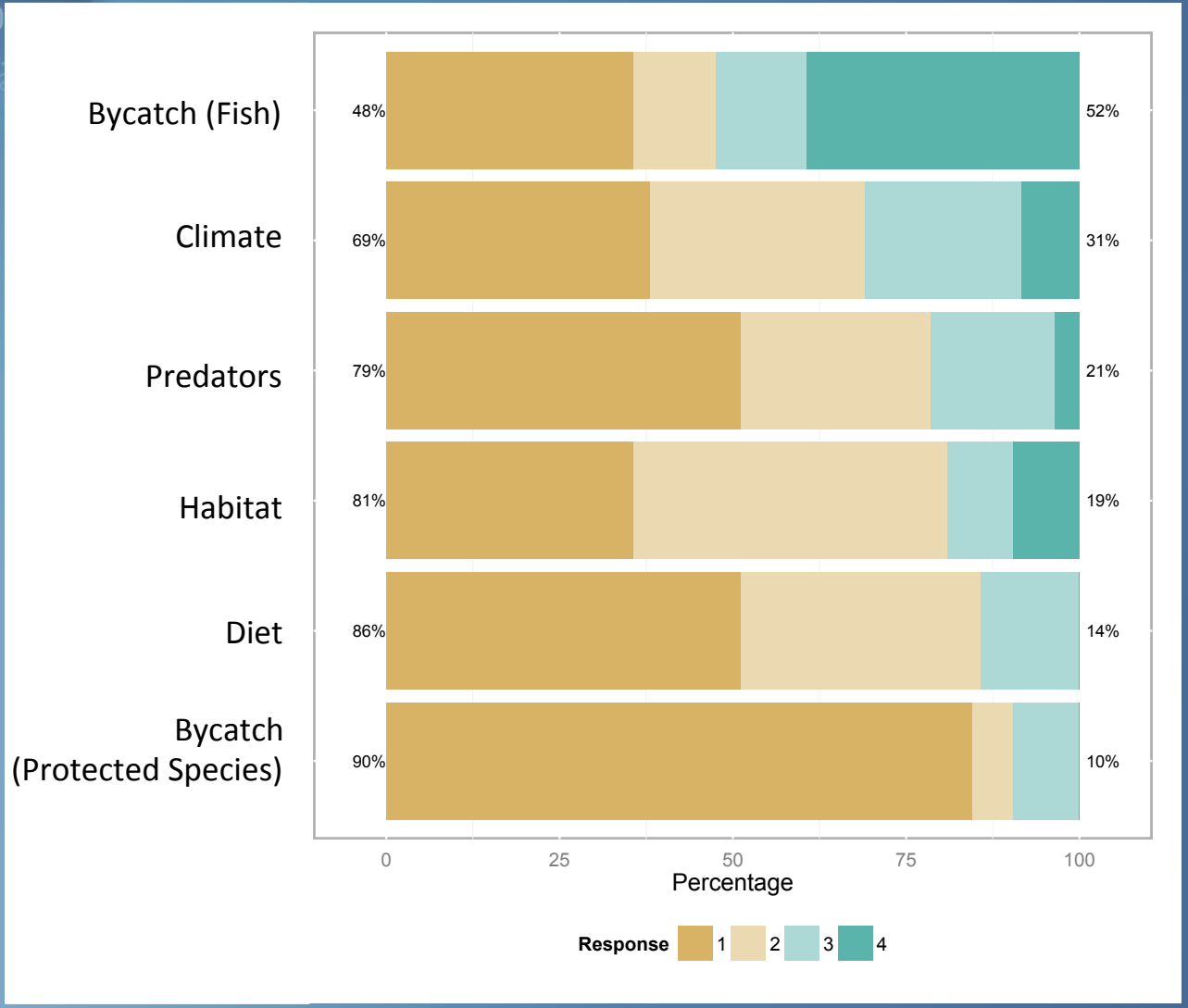
- What are the key principles of EBFM that should be included in a fisheries ecosystem plan,
- What is the current status of fisheries management that incorporates these principles?
- What are the gaps between ecosystem knowledge and fishery ecosystem planning?
- What are new approaches that can be used to fill these gaps?

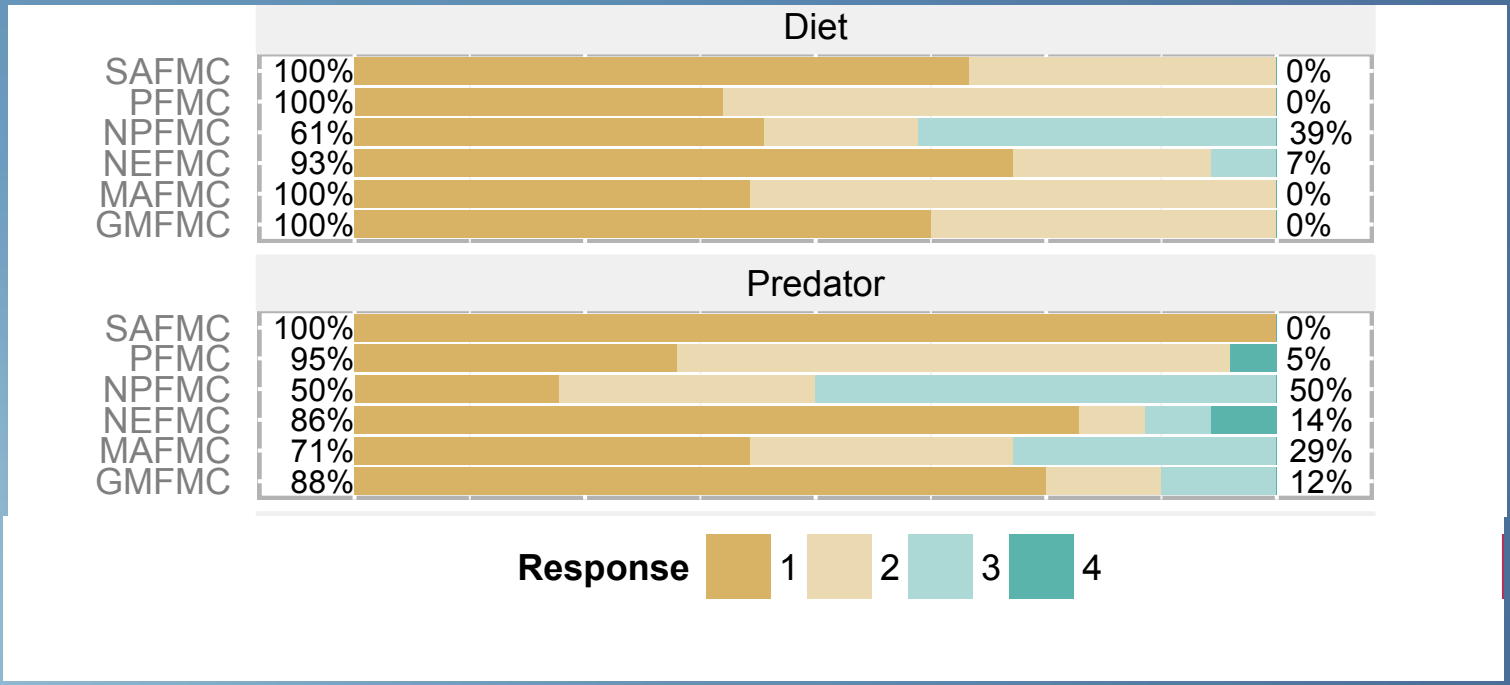
Key principles of EBFM and gap analysis

Key Principles of Ecosystem-based Fisheries Management

- A review of the social and natural science literature
- Analysis of the content provided by invited speakers at Task Force Meetings
- A review of existing FEPs, ecosystem information included in stock assessments
- An evaluation of a series of U.S. and global case studies of fisheries where EBFM would benefit decision making

Ecosystem information in stock assessments




Diet
SAFMC 100% 0%
PFMC 100% 0%
NPFMC 61% 39%
NEFMC 93% 7%
MAFMC 100% 0%
GMFMC 100% 0%
Predator
SAFMC 100% 0%
PFMC 95% 5%
NPFMC 50% 50%
NEFMC 86% 14%
MAFMC 71% 29%
GMFMC 88% 12%
Response 1 2 3 4

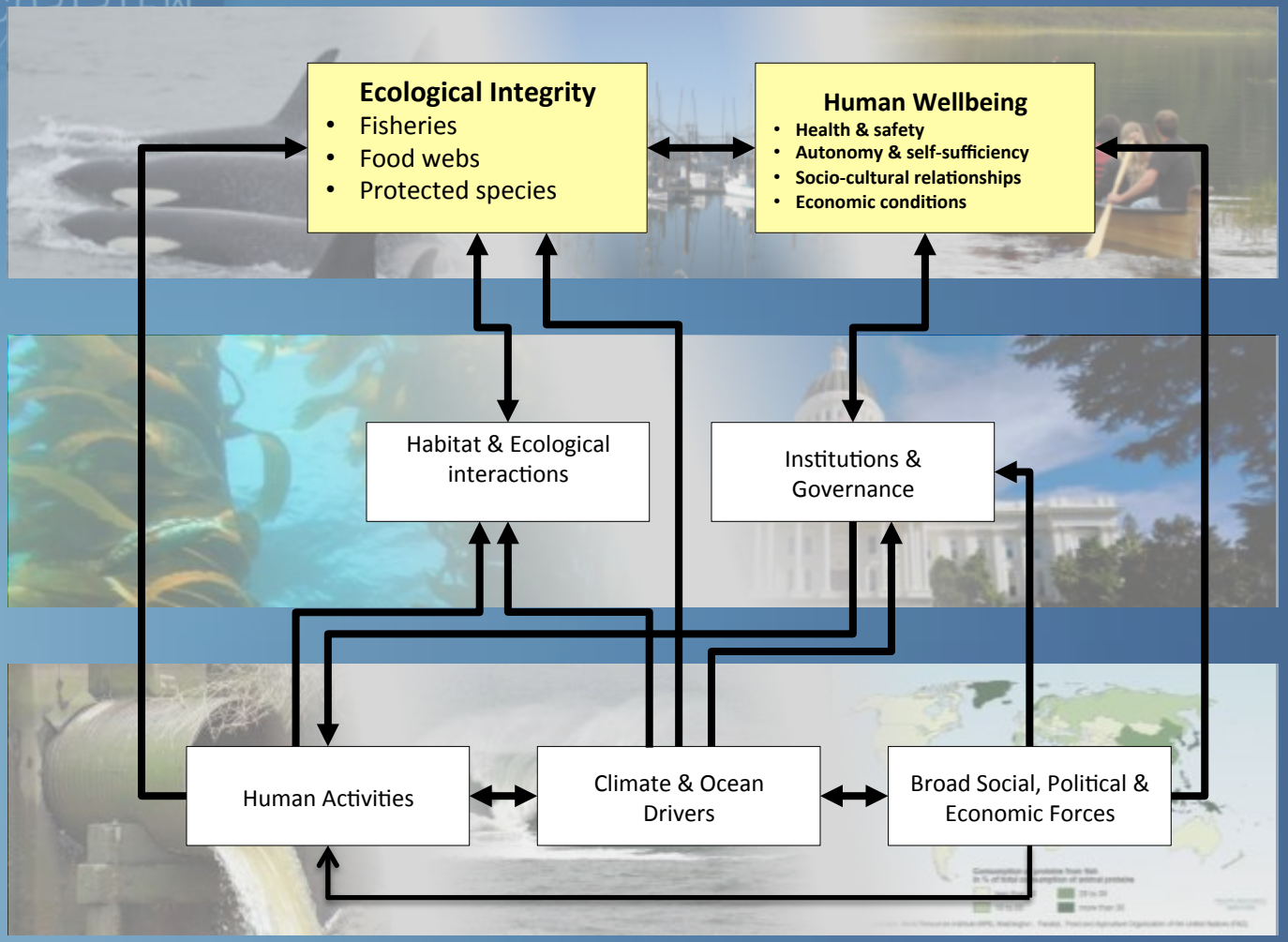
LENFEST FISHERY ECOSYSTEM TASK FORCE

Gaps between ecosystem knowledge and fishery ecosystem planning

Focal Ecosystem Components

Mediating Components

Drivers and Pressures



Gaps in fishery ecosystem planning

Mash-up of the structure of (global) FEPs

- Purpose of the plan
  - What does the Council want to achieve with the plan? What are the broad scale goals of an FEP/EBFM in the region?
- Operational goals and objectives
  - Specific goals and objectives that link to the vision statement that are measurable.
  - Time-line for achieving each objective
- Activities to achieve objectives
  - Create conceptual model of the system with causal links
    - Include both biological and social components of the system
  - Identify the activities (tools & approaches) that are required to meet the stated objectives
- Resources
  - Identify the resources required to do the required activities to meet the objectives
  - Could force prioritization
- Evaluation & Adaptation

Case Studies (so far)

- New England - Three interacting/conflicting fisheries
- Menhaden – Forage fish with predator dependent M
- Mid-Atlantic – Bycatch of one species limiting fishery of another
- Gulf of Mexico – Externalities and red tide
- Pacific Sardine – Temperature varying harvest control
- Alaska Groundfish – Cap on total groundfish removal
- N.E. Pacific – Conservation of multiple, interacting protected species
- Scotian Shelf – Trophic interactions and interacting fisheries
- Baltic Sea – Social dynamics of multiple countries
- S.E. Australia – MSE for multiple species

SYNTHESIS: A BLUEPRINT FOR FISHERY ECOSYSTEM PLANNING

- Task Force and Advisory Panel meet in
  - Fall 2015, Baltimore MD
  - Spring 2016 Silver Spring
- Council presentations
- Final products
  - Spring 2016

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Making Models Matter

Phillip Levin & André Punt, Directors
Tessa Francis, Managing Director

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Advisory Board

- *Stephanie Hampton, Washington State University*
- *Kai Lee, David & Lucille Packard Foundation*
- *Salvador Lluch-Cota, CIBNOR*
- *Yvonne Walther, ICES*
- *Cisco Werner, NOAA Southwest Fisheries Science Center*

- *John Henderschedt just stepped down when he moved to NOAA and we will replace him with someone with ties to Fisheries Management Councils*

OMF | Ocean Modeling Forum

We foster collaborations, build networks and support a community of scientists

- The Ocean Modeling Forum supports working groups
- Teams meet over the course of 1-2 years to
  - define goals and outcomes,
  - identify opportunities for synergy among their models, and
  - provide cohesive, clear results from multi-model approaches
- Stakeholders, managers and decision-makers are involved from the beginning
- Working groups are intentionally diverse across geography and discipline

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Pilot Working Group 1

Ecosystem Consequences of Sardine Harvest

- **Objective**: develop an integrated modeling approach to evaluating harvest effects on the target stock, the fisheries that depend on this resource, and on the dynamics of the California Current Ecosystem

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Pilot Working Group 1

Ecosystem Consequences of Sardine Harvest

- Multiple models are used to assess the impacts of sardine harvest on:
  - the sardine stock, yield, revenue (and their spatial distribution)
  - sardine predators and prey (fisheries target and non-target species, protected resources)
  - Ecosystem structure and function

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Pilot Working Group 1

Ecosystem Consequences of Sardine Harvest

- Provide a basis to evaluate the ecosystem consequences the current control rule
- OMF work is NOT related to estimating the "distribution" term in the control rules and will NOT explore alternative control rules

Working Group Participants

- André Punt (Co-Chair), UW
- Phil Levin (Co-Chair), NWFSC
- Alec MacCall
- Bill Sydeman, Farallon Institute
- Enrique Curchitser, Rutgers
- Felipe Hurtado-Ferro, UW
- Isaac Kaplan, NWFSC
- Richard Parrish,
- Salvador Lluch Cota, CIBNOR
- Richard Carroll, Ilwaco Fish Company
- Kirk Lynn, CA DFW
- Martin Dorn, AFSC & SSC representative
- Lorna Wargo, WA DFW
- Francisco Chavez, MBARI
- Kirstin Holsman, AFSC
- Tessa Francis, University of Washington Tacoma
- Tim Essington, UW
- Kerry Griffin, Pacific Fisheries Management Council

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Pilot Case Study II
Herring Fisheries
Social-Ecological Systems

(Joint with DFO)

- Integration of archeological, historical and traditional/local ecological knowledge in quantitative fisheries and ecological assessments;
- The role of herring in social and cultural domains of social-ecological systems
- Uncertainties in and importance of stock structure of herring for social-ecological systems.

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NEXT STEPS

- Scoping the modeling and management community
- Building partnerships
- Funding

- Final Sardine Meeting June, 2015
  - Products should begin emerging in early fall.
- Herring working group begins in fall, 2015
- Next working group on topic TBD will begin in spring 2016

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