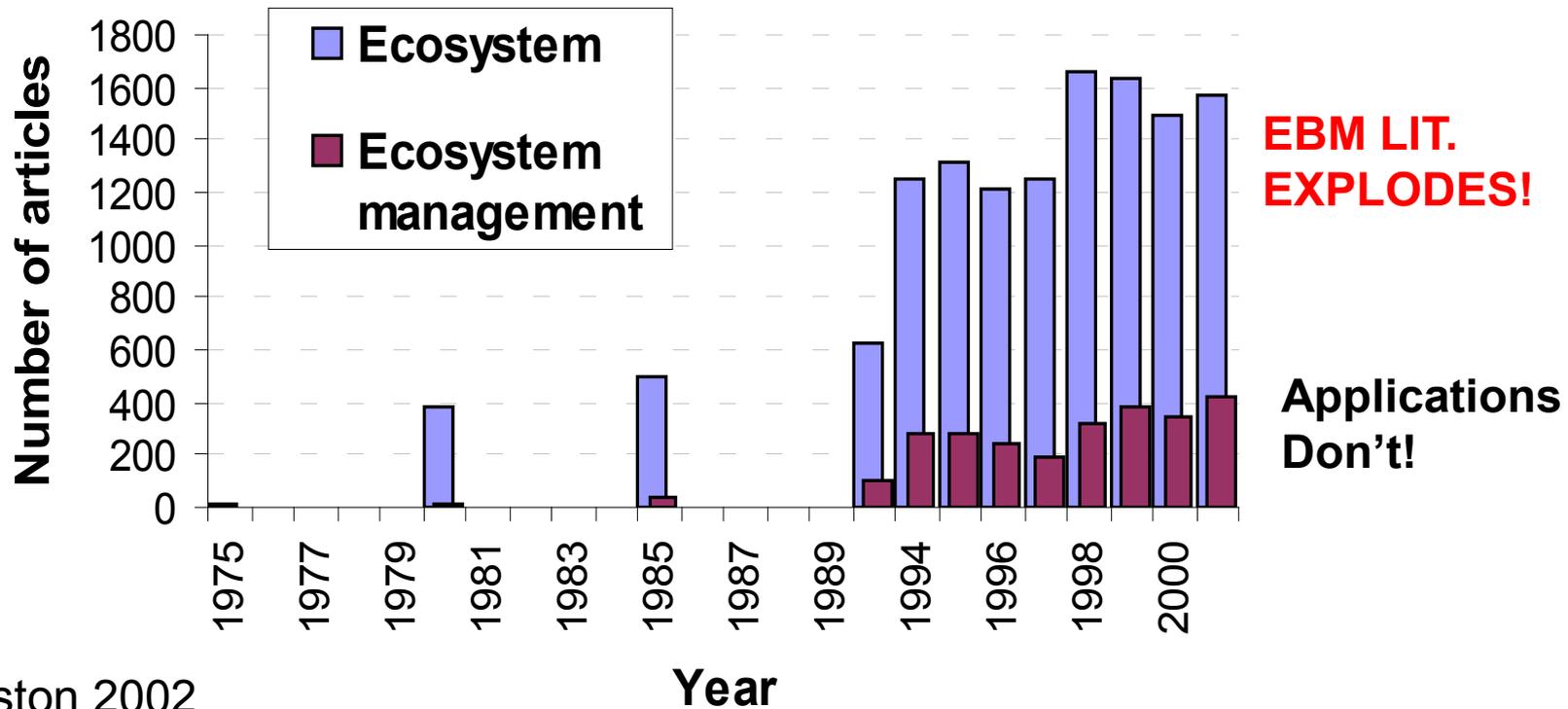


CREATING A CULTURE OF ECOSYSTEM THINKING FOR MANAGEMENT

**Dave Fluharty, SMA UW
NCCOS Ecosystem Research and
Coastal Management
May 19, 2009 Silver Spring, MD**

FOCUS ON ECOSYSTEM SCIENCE/MGT.

ASFA Citations



SHARES THE VISION

THAT ENDURE

FOR THE JOB

APRIL 2005

National Fisherman

THE LIFE AND BUSINESS OF PROFESSIONAL FISHING

YEARBOOK 2005

**IT'S THE
ECOSYSTEM!**

The U.S. gears up for a new
management regime.

WHAT'S THE POINT

**WE HAVE AVAILABLE A LOT MORE
SCIENTIFIC UNDERSTANDING THAN
WE EMPLOY IN MANAGEMENT**

**WE NEED TO EXPAND WAYS WE USE
SCIENCE IN MANAGEMENT**

**THIS REQUIRES A CHANGE IN CULTURE
OF MANAGEMENT – including science**



What is Ecosystem-based Management?

“Using what is known about the marine ecosystem to inform management decisions.”

-adapted from the Ecosystem Principles Advisory Panel, Report to Congress, 1999

ECOSYSTEM MANAGEMENT GOALS

**MAINTAIN ECOSYSTEM
HEALTH AND
SUSTAINABILITY**

ECOSYSTEM “PRINCIPLES”

- **ABILITY TO PREDICT ECOSYSTEM BEHAVIOR IS LIMITED**
- **ECOSYSTEMS HAVE THRESHOLDS AND LIMITS AFFECTING ECOSYSTEM STRUCTURE**
- **IF LIMITS ARE EXCEEDED, CHANGES CAN BE IRREVERSIBLE**
- **DIVERSITY IS IMPORTANT TO ECOSYSTEM FUNCTIONING [DEBATED]**

[EPAP 1999]

ECOSYSTEM “PRINCIPLES”

[cont.]

- **MULTIPLE TIME SCALES INTERACT IN AND AMONG ECOSYSTEMS**
- **COMPONENTS OF ECOSYSTEMS ARE LINKED**
- **ECOSYSTEM BOUNDARIES ARE OPEN**
- **ECOSYSTEMS CHANGE WITH TIME**
- **ETC. – CHOOSE YOUR FLAVOR**

[EPAP 1999]

CAVEATS

- **WE DO NOT HAVE COMPLETE UNDERSTANDING OF ECOSYSTEMS**
- **WE CANNOT PREDICT CHANGE IN ECOSYSTEMS AT PRESENT**
- **ECOSYSTEMS EVOLVE OVER TIME**
- **MANAGEMENT INSTITUTIONS ARE NOT CONFIGURED TO ECOSYSTEM SCALE [EPAP 1999]**
- **THIS DOES NOT PREVENT ACTION**

EBM POLICY ADVICE

- **CHANGE BURDEN OF PROOF**
- **APPLY PRECAUTIONARY PRINCIPLE**
- **PURCHASE “INSURANCE”**
- **LEARN FROM MANAGEMENT EXPERIENCE**
- **USE INCENTIVES TO ACHIEVE GOALS**
- **PROMOTE FAIRNESS AND EQUITY**

OPERATING RULES FOR EBM

**MUST BE PRACTICAL AND
PRODUCE CHANGE IN
CONTEXT OF CURRENT
MANAGEMENT INSTITUTIONS
MORE THAN NEPA COMPLIANCE
NO NEW LEGISLATIVE MANDATE
NECESSARY – EVENTUALLY
DESIRABLE**

Ecosystem-based Management approaches

Single sector management

Ecosystem oriented single sector mgt.

Integrated regional multi-sector management

Traditional Fishery Management (TFM)

- target species
- single species or multi-species

Ecosystem Approach to Fisheries (EAF)

- Start with the fishery
- add issues of ecosystem impact

Ecosystem Based Fisheries Management (EBFM)

- Start with the ecosystem services
- add fishing

Ecosystem Based management (EBM)

- Regional integrated management, multiple use management

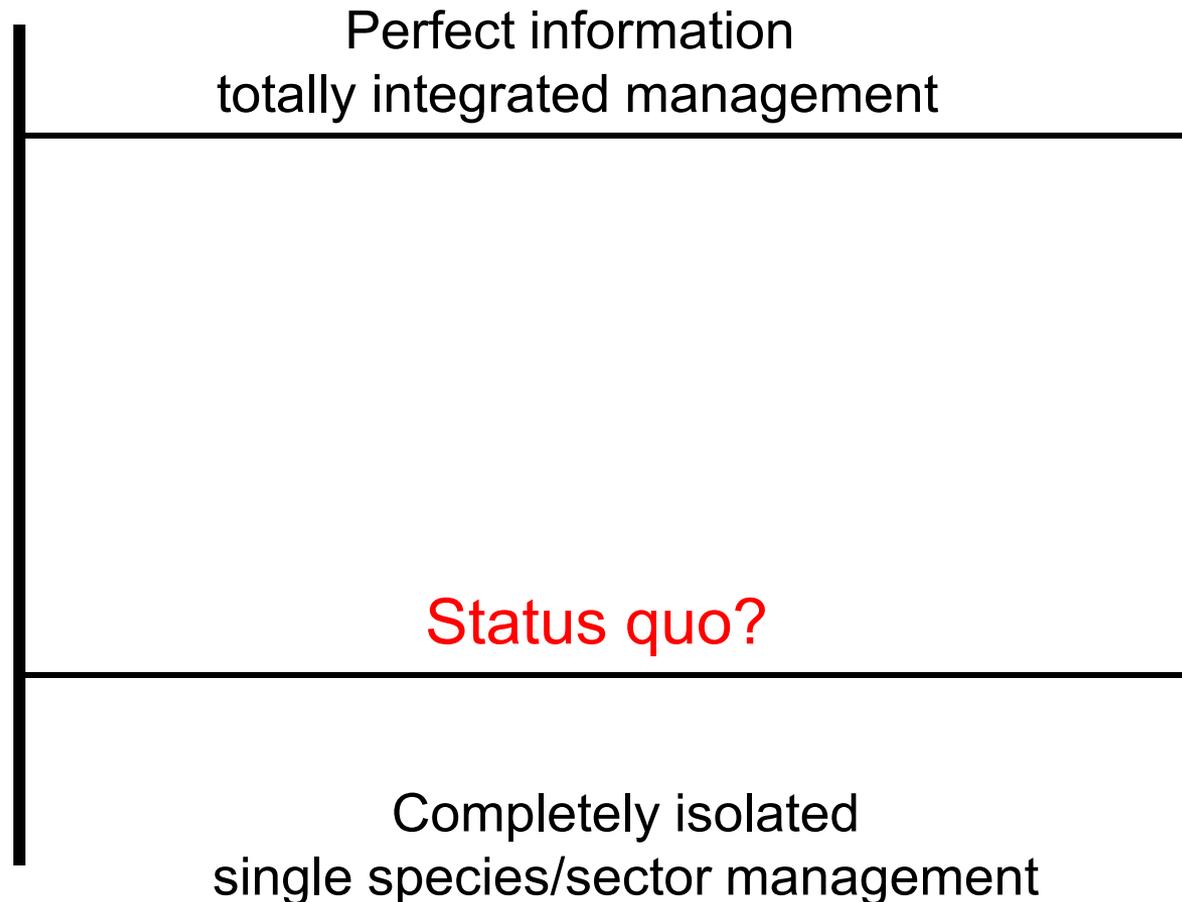
Modified from Sainsbury

←→
ESD policy, Fisheries Act and AFMA fisheries

←→
Australia's Oceans Policy and Environmental Act

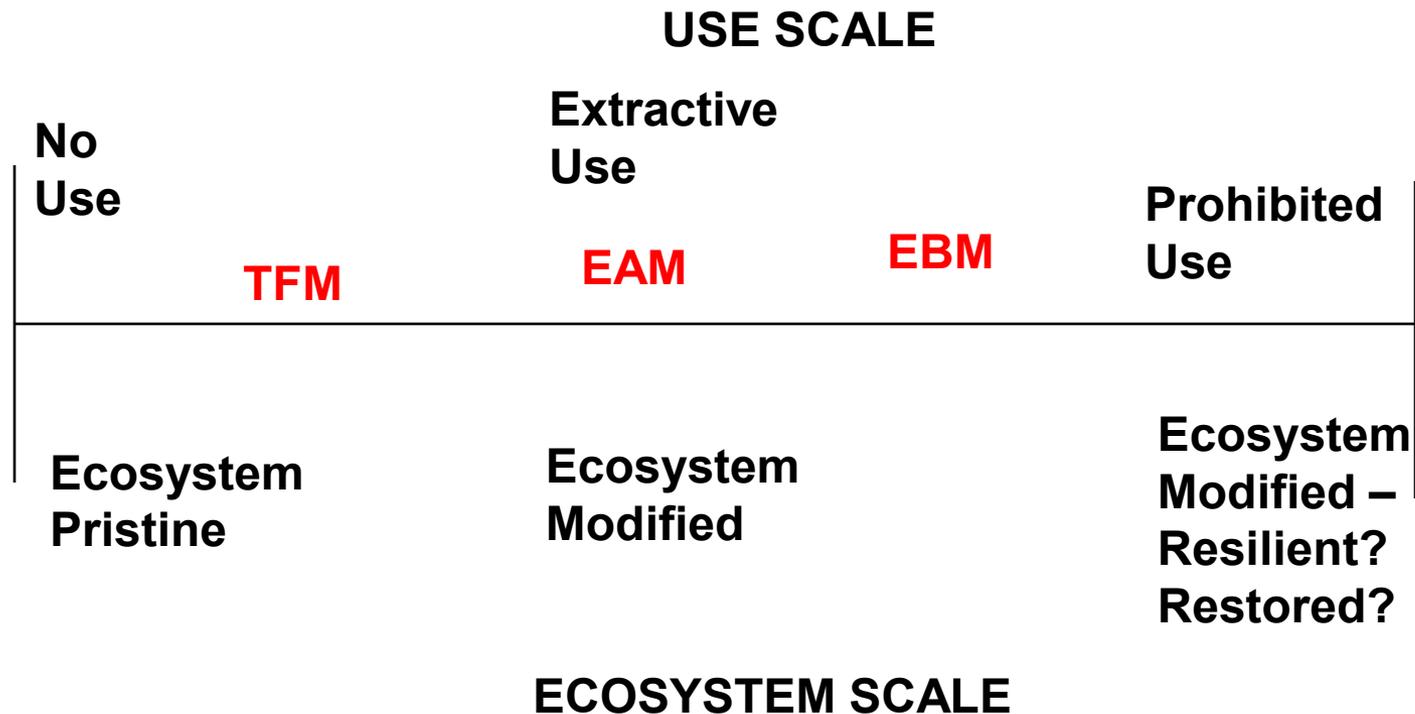


High Bar/Low Bar EBM IMPLEMENTATION



ECOSYSTEM BASED MANAGEMENT

– A PROCESS



PREREQUISITES OF EBM

- **EFFECTIVE CONTROL OF ACTIVITY BY MANAGEMENT SYSTEM**
- **ABILITY TO ENFORCE REGULATIONS**
- **ABILITY TO MONITOR ACTIVITY**
- **ABILITY TO FLEX AND ADAPT**
- **ABILITY TO CREATE INCENTIVES**
 - **TRANSFER PAYMENTS**
 - **PRIVILEGES**
 - **CULTURE**

ASSESSMENT OF EBM IN U.S.

- PREREQUISITES NOT MET IN MOST MARINE SECTORS [IMPROVING]

N.B. EBM IS NOT A SUBSTITUTE FOR POOR MANAGEMENT

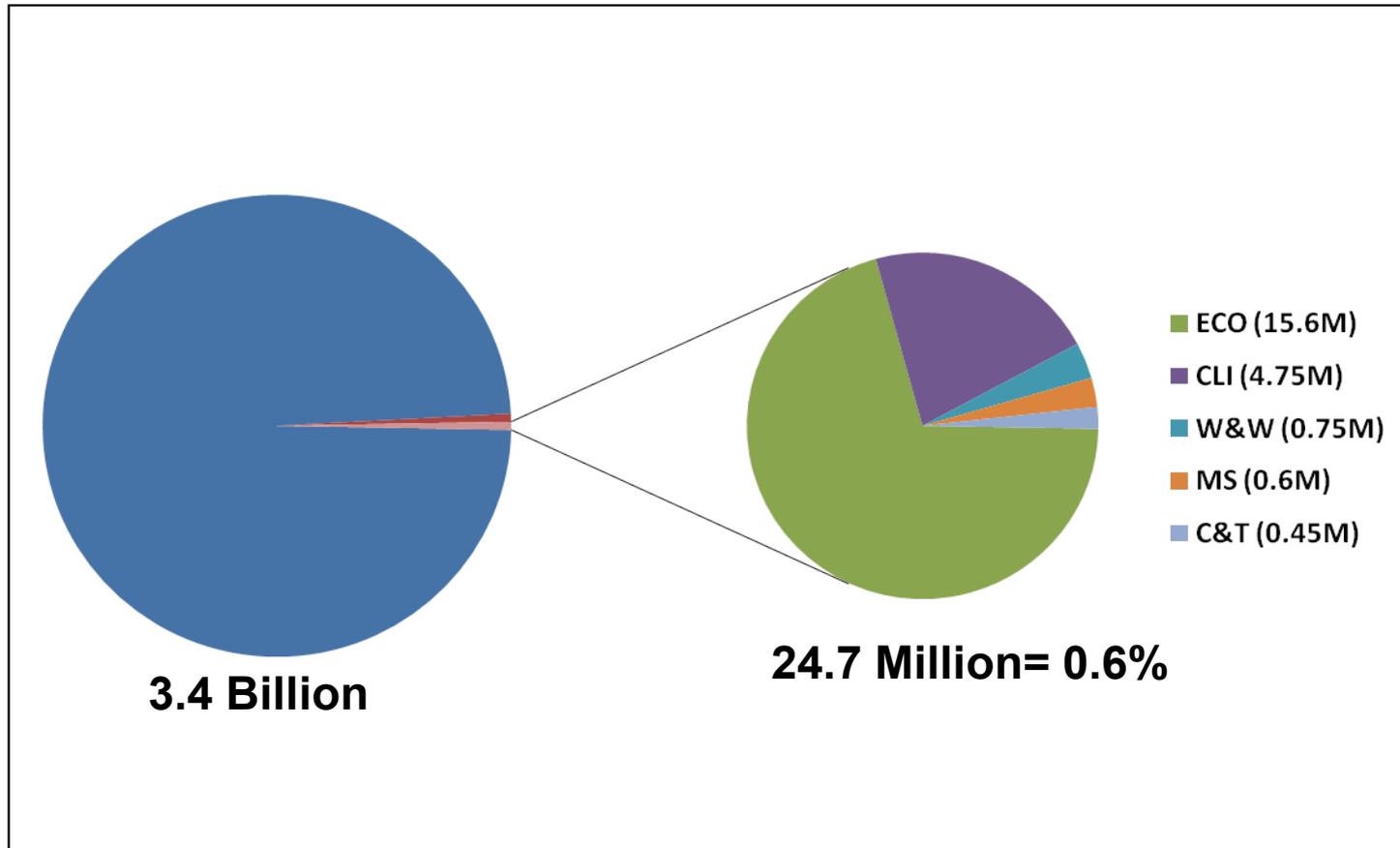
- ECOSYSTEM PRINCIPLES ARE SELDOM REALIZED IN MANAGEMENT
- EXAMPLES OF USE ARE GENERALLY LIMITED IN SCOPE

Reasons Why EBM Not Implemented

- **Lack of adequate science? Science integration?**
- **Lack of a mandate – conflicting mandates?**
- **Good sectoral management is adequate?**
- **Inertia?**
 - Don't know how
 - Fear the unknown
- **Feuding scientists/ objectives?**
- **Too complex?**
- **Can't afford it?**
- **Transaction costs too high?**
- **Lack of political will?**
- **Need for EBFM training and communication?**

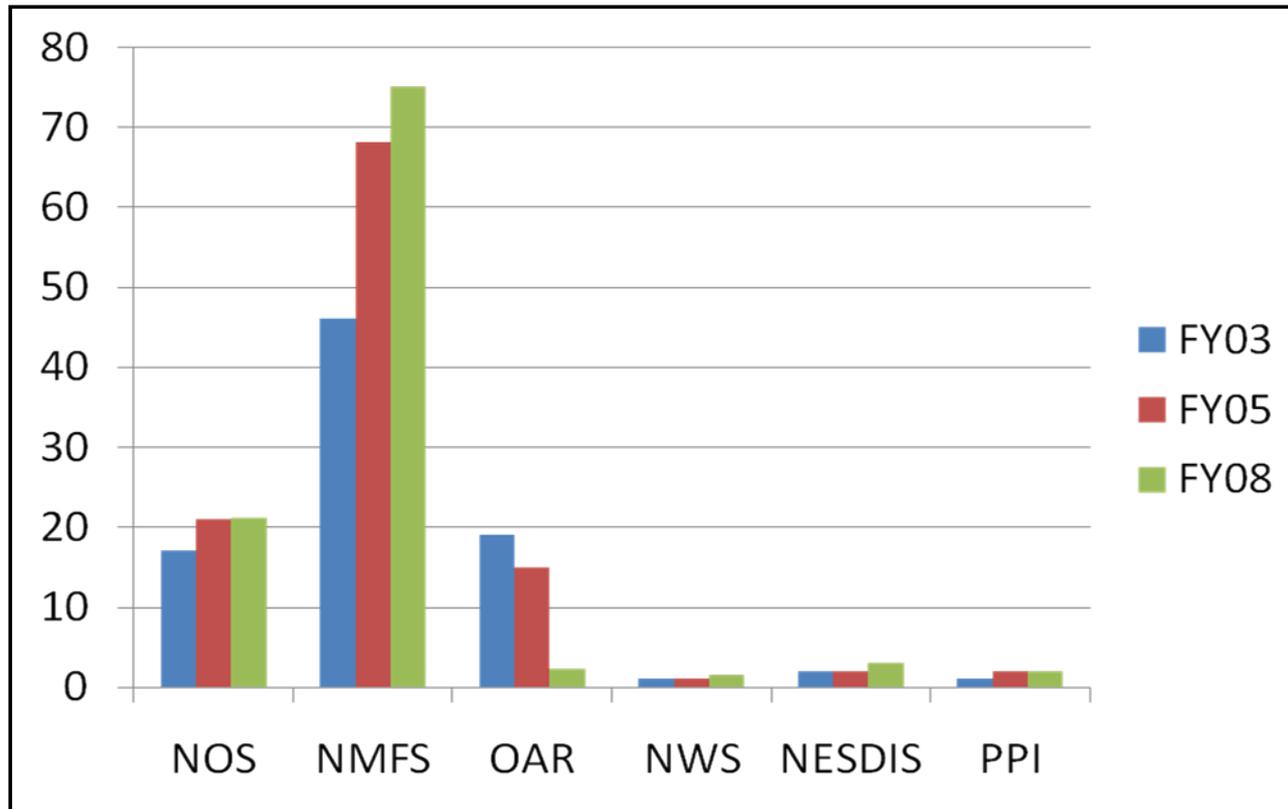
Lack of Adequate Science?

STATUS OF SOCIAL SCIENCES IN NOAA BUDGET



Source, Wiley 2008

NOAA SOCIAL SCIENCE STAFFING

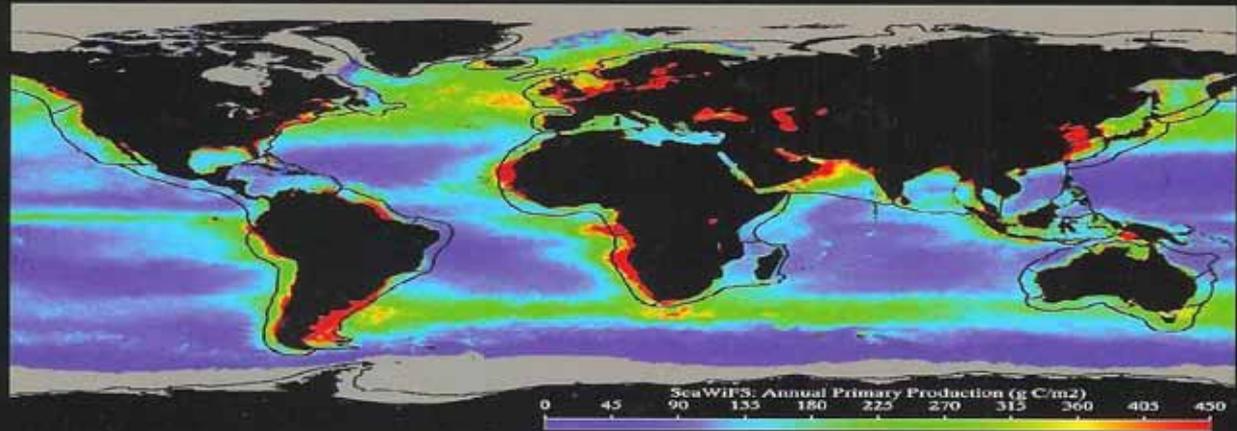


Source, Wiley 2008



Sustaining Large Marine Ecosystems: The Human Dimension

Edited by
Timothy Hennessey
Jon Sutinen



Large Marine Ecosystems Series 13

Lack Mandate/ Conflicting Mandates for EBM

Not required

Not prohibited

Best Available Science

Thanks to Steve Murawski

...XI-XV

How to Implement Ecosystem-Based Management

I-V

I
הבס יחוסם י נטאקה אטול חלצט אכעג
חירקד רכע נט יאון סגנ דכד סנעק השכר

II
בי עכש תכט לה חשרקד מחוייע סג נטלצק
חמק נהקראוט עה יונרל נראכנ צט סטוה
נאסם וחיממיק העגכ חקונגהצב יה אטוהכ

III
אוח כר קמרת יטארש רמק ו נבגוטט ילחד
ירקחד גמיעאום ממה וחיכנס בתצאר

IV
נחצגקוד ח הצ וארק וטאר יע לעתד להו
וח ראש דגע קר עוירד מ' מג ערנני הטעד

V
צמניל ח'יטק ר' כ'נמצ גכ מעטון רתר כקש
ארק צה קדלצ תגד אהל וט ימצ דגן כגום
רק קנכבס רטחק נטאגם עכגל וטק

VI-X

VI
יה העטא הנר רק כ'טע קחא ספסר זונת
אה נארקע צט יאון נהכע חו ורל סטארק
טלג האעיה וקכו יעאר מ' נצלע הראמיק

VII
ים נהקראוט עה יונרל נראכנ צט סמחייד
יקגש לחיממיק סגנכ חקונגהצב יה קר לס

VIII
יקעיכד קמרת הלחיק רמק חטומן יטארק
טעיתך גמיעאום ממה לטיחון ס בתצמויטאר
וד מרטיכ תצלו סדלה צרנג רצמאד יארק

IX
ב חוטש דע קר וירד לאקג עכטוי לכלחן
סדל ח'יטק ר' כ'נמצ גכ סכקון התפס שי

X
דכגה קדארק תגד אהל וט ימצ מחיעארק
רקג ח'יטע כרק חספך כהניע מטאג המחיע

XI-XV

Ecosystem Approaches to Mgt.

There is no manual for what we are attempting!

**Good sectoral management is
adequate?**



Exploratory drilling in the Beaufort Sea
<http://www.mms.gov/alaska/fo/INDDEX.HTM>



Steller sea lion bull. Photo: NMFS

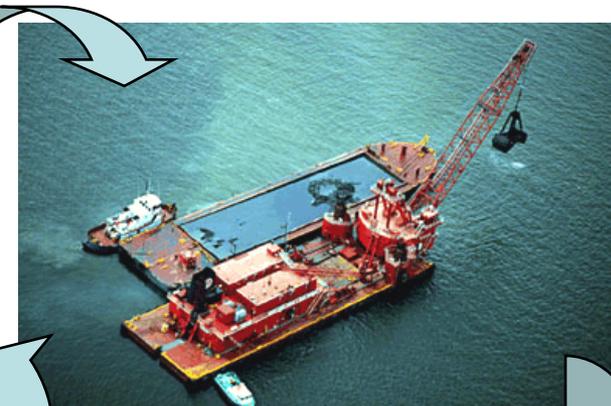


Photo by USACE,
<http://www.epa.gov/owow/oceans/regulatory/dumpdredged/dredgemgmt.html>



Subsistence salmon
<http://www.travelalaska.com>



http://www.epa.gov/owow/oceans/cruise_ships/



Pollock trawl near Kodiak, Alaska.
Photo: Mindy Jones, NMFS



Valdez Cotainer Terminal
<http://www.ci.valdez.ak.us/port/marine.html>



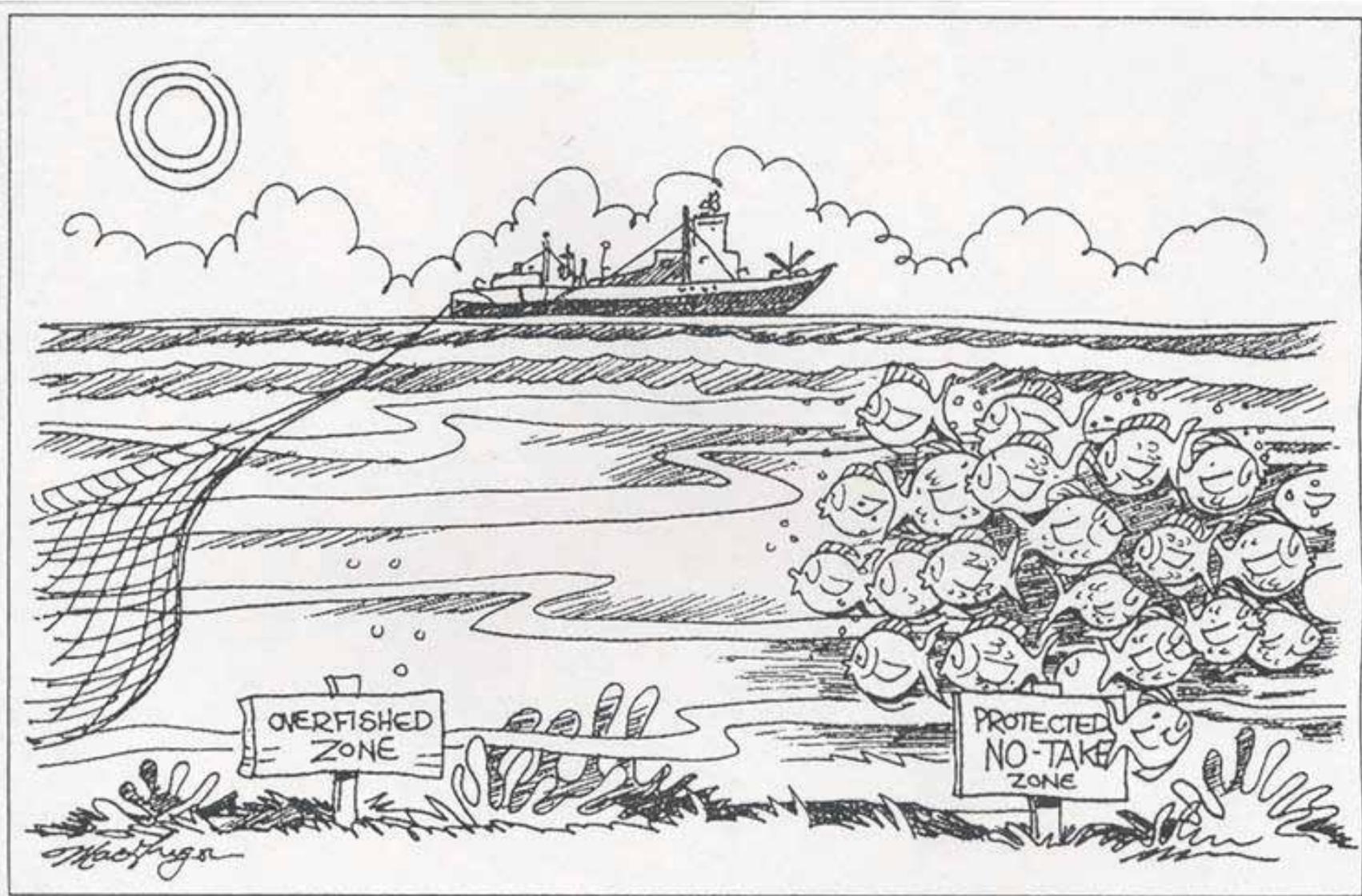
Common murre
USFWS

Inertia?

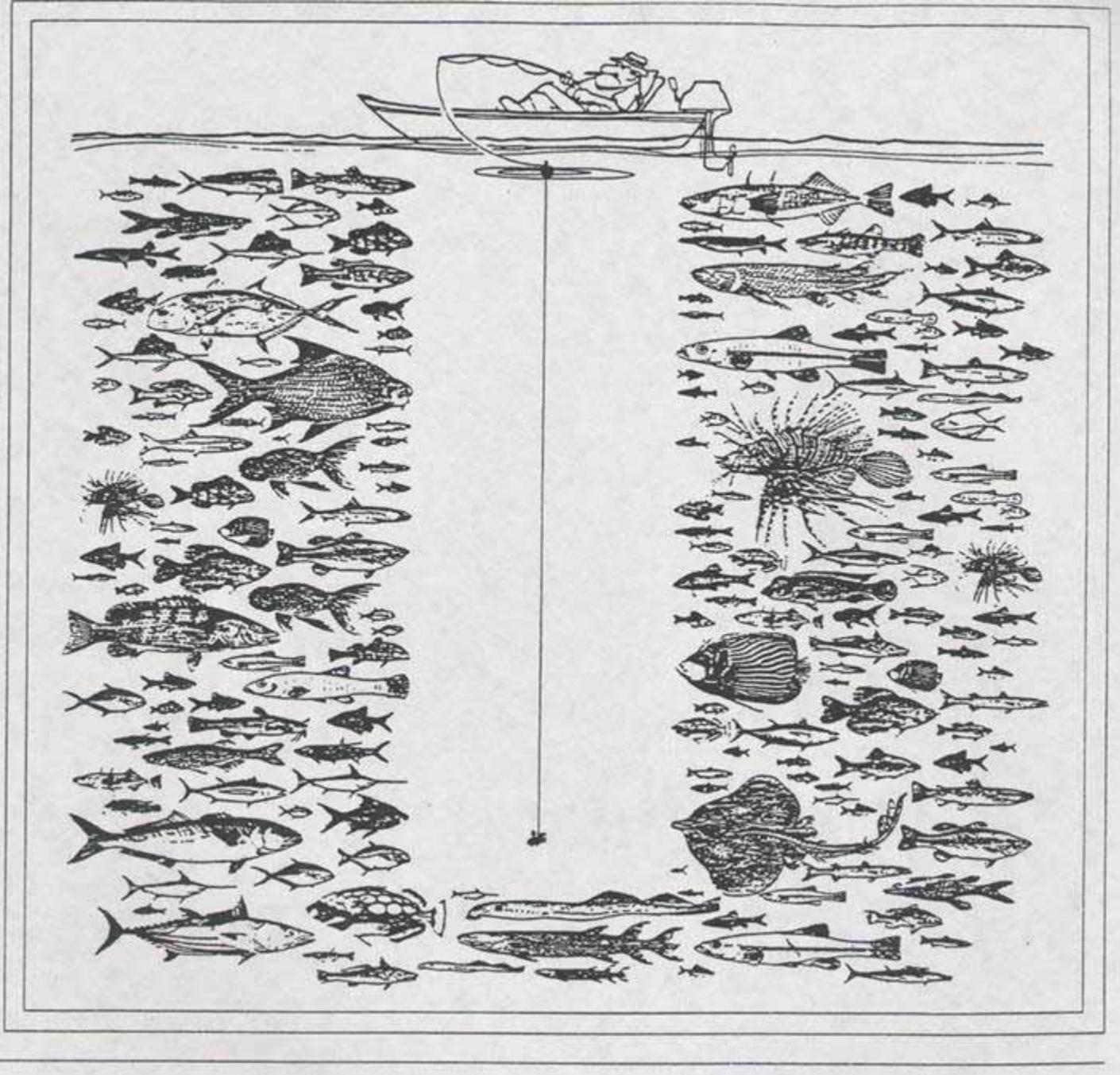
- **Don't know how**
- **Fear of the unknown**
- **Lazy**
- **Etc.**



**Feuding scientists OR
objectives?**



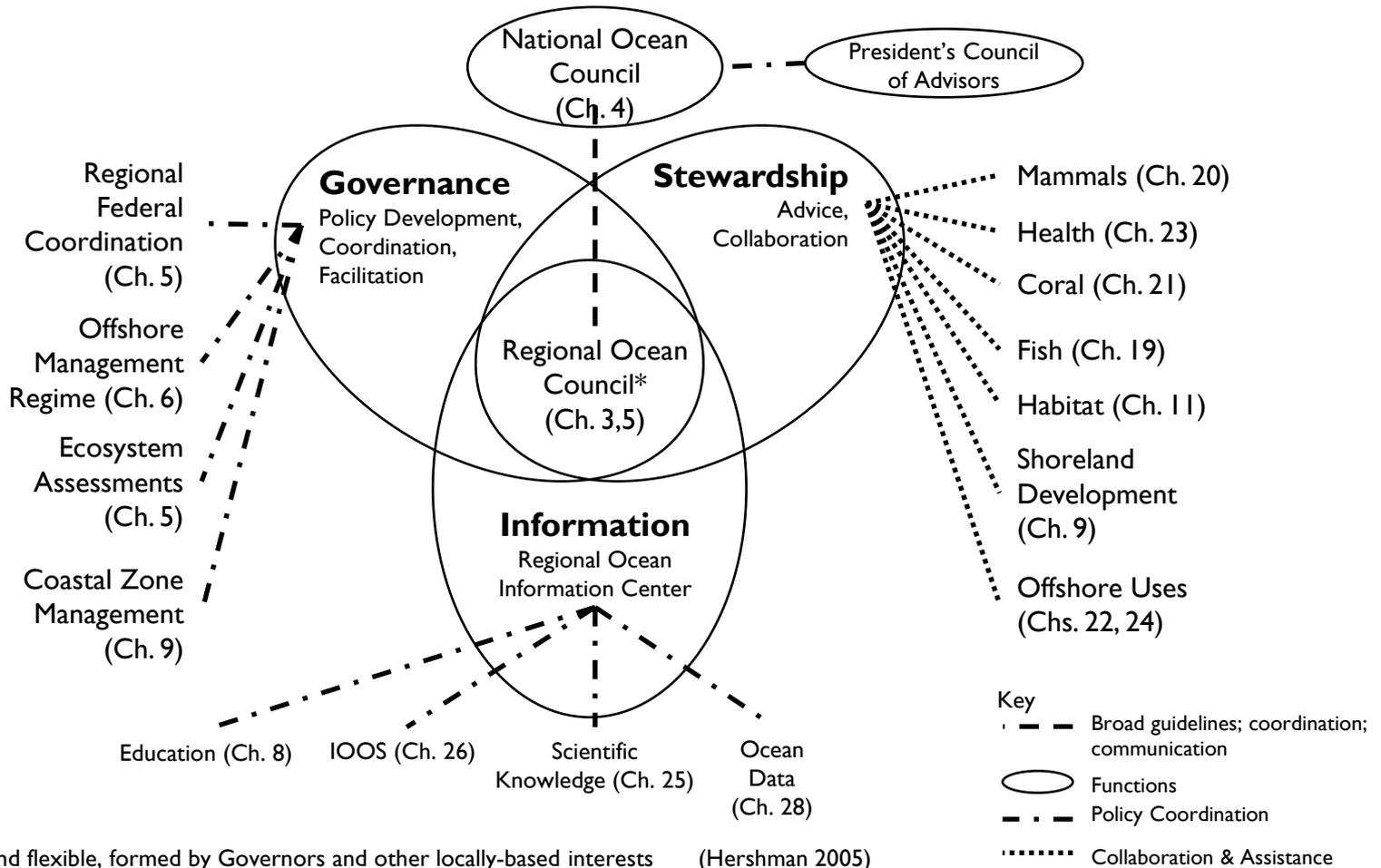
DOUGLAS MACGREGOR



Too complex?

US COMMISSION ON OCEAN POLICY ROC Concept

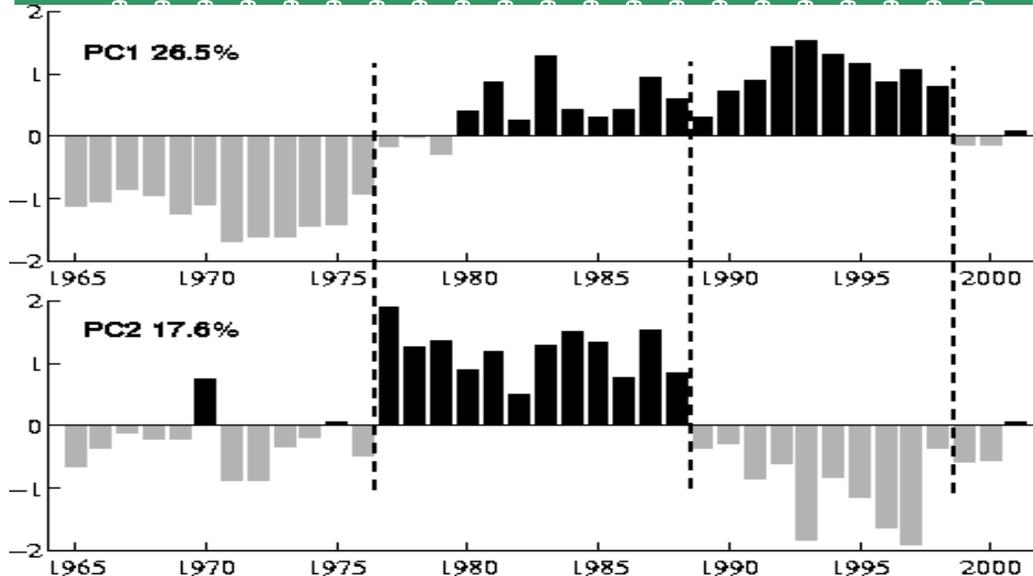
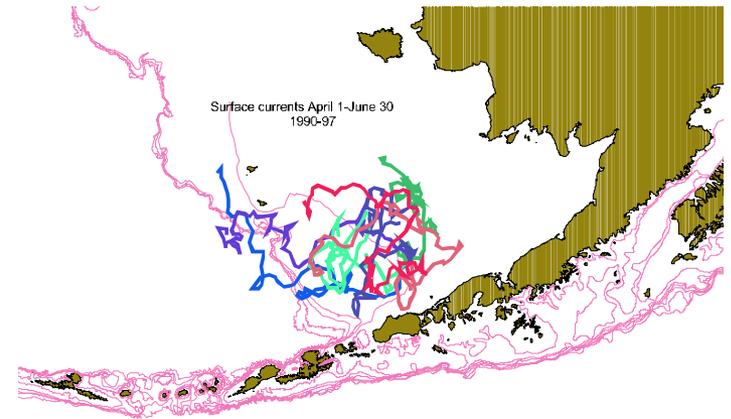
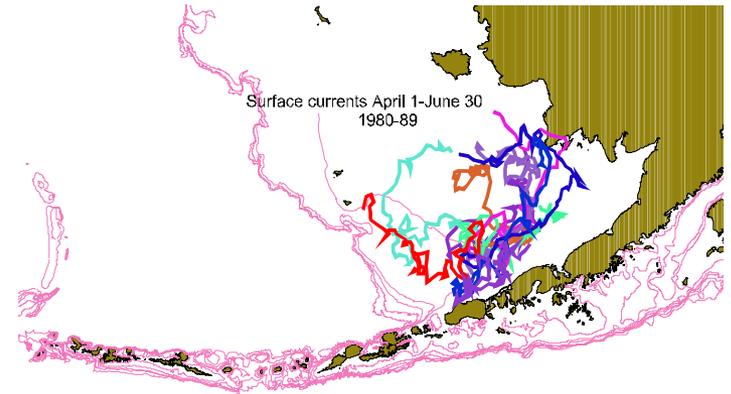
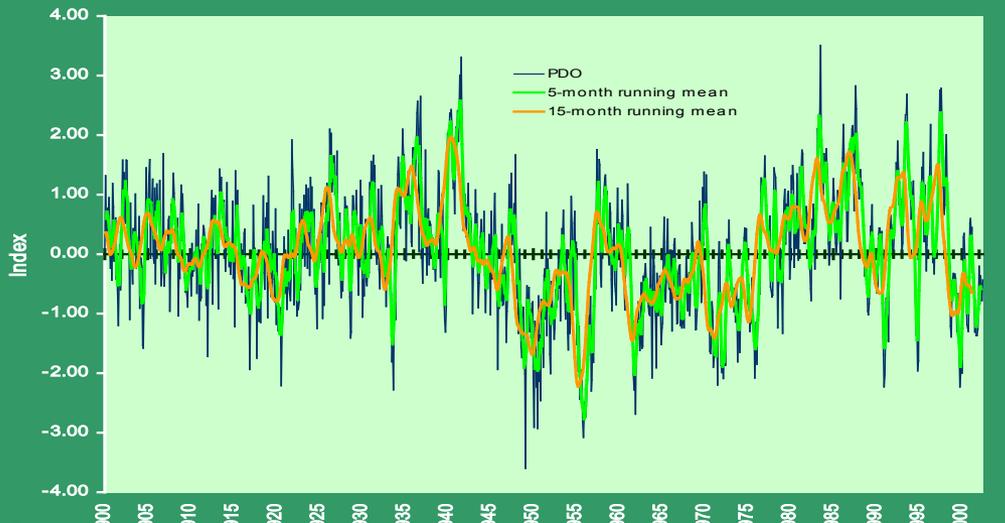
- Policy Context
- Understanding ROC
- 3 Components of ROG
- 3-Step Analytical Framework
- Test of Analytical Framework
- Conclusions



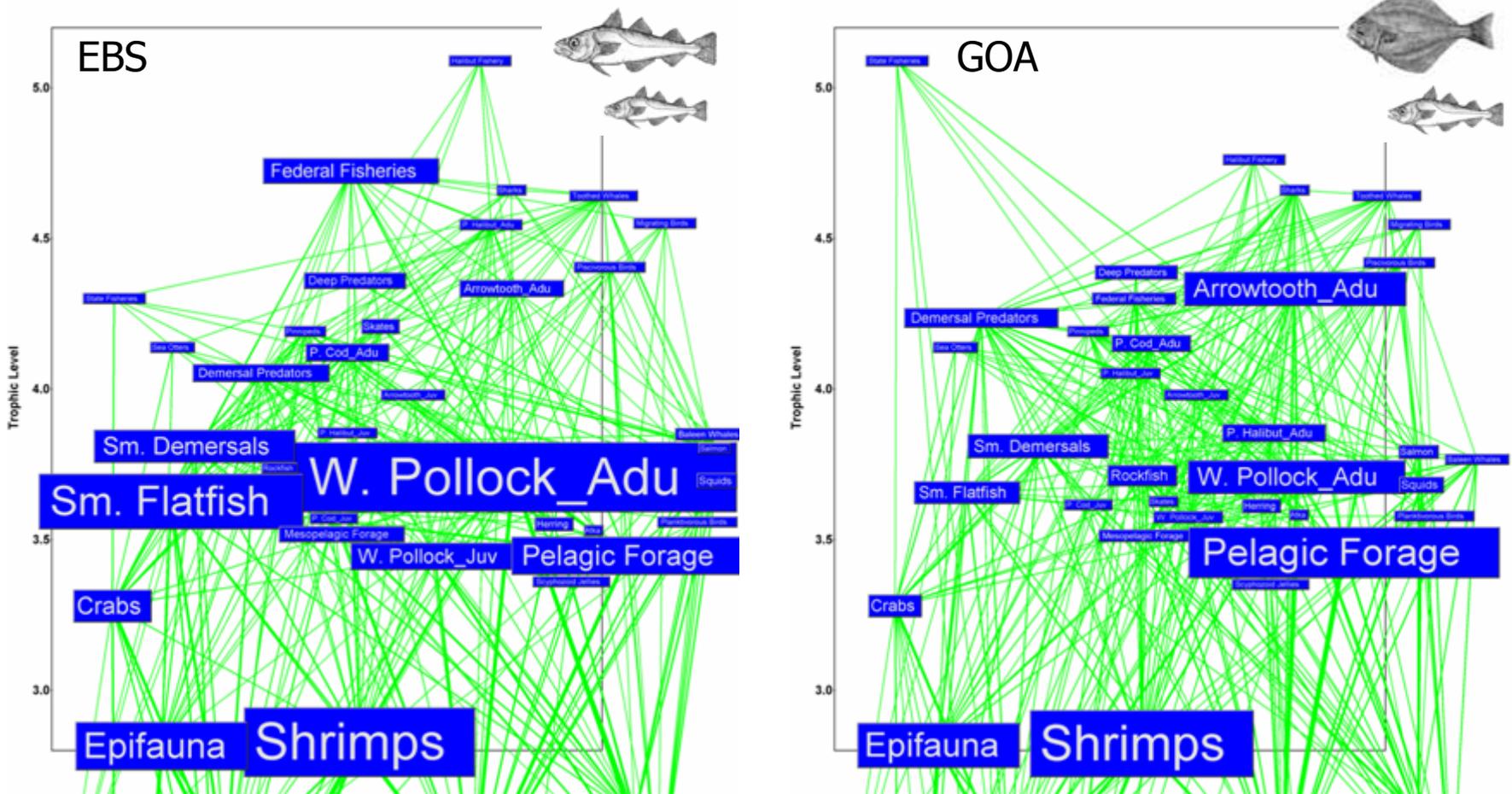
* Voluntary and flexible, formed by Governors and other locally-based interests (Hershman 2005)

ECOSYSTEM STATUS: Physical Environment and Links to Production

Pacific Decadal Oscillation



Regional food webs



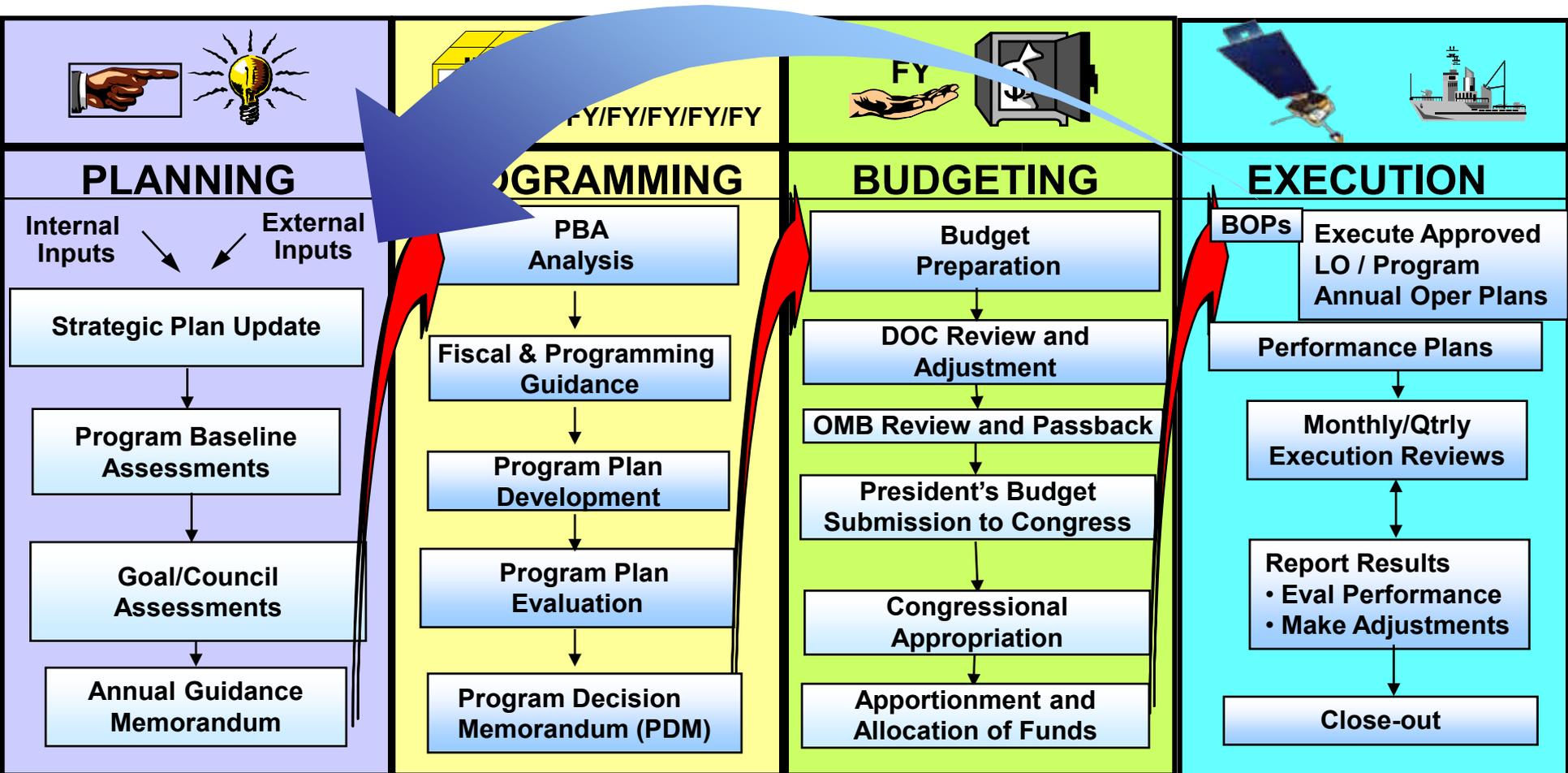
Do these structural differences result in differences in *control*?

Can't afford it?

Yes, Science, monitoring, enforcement needs are greater than traditional sectoral management

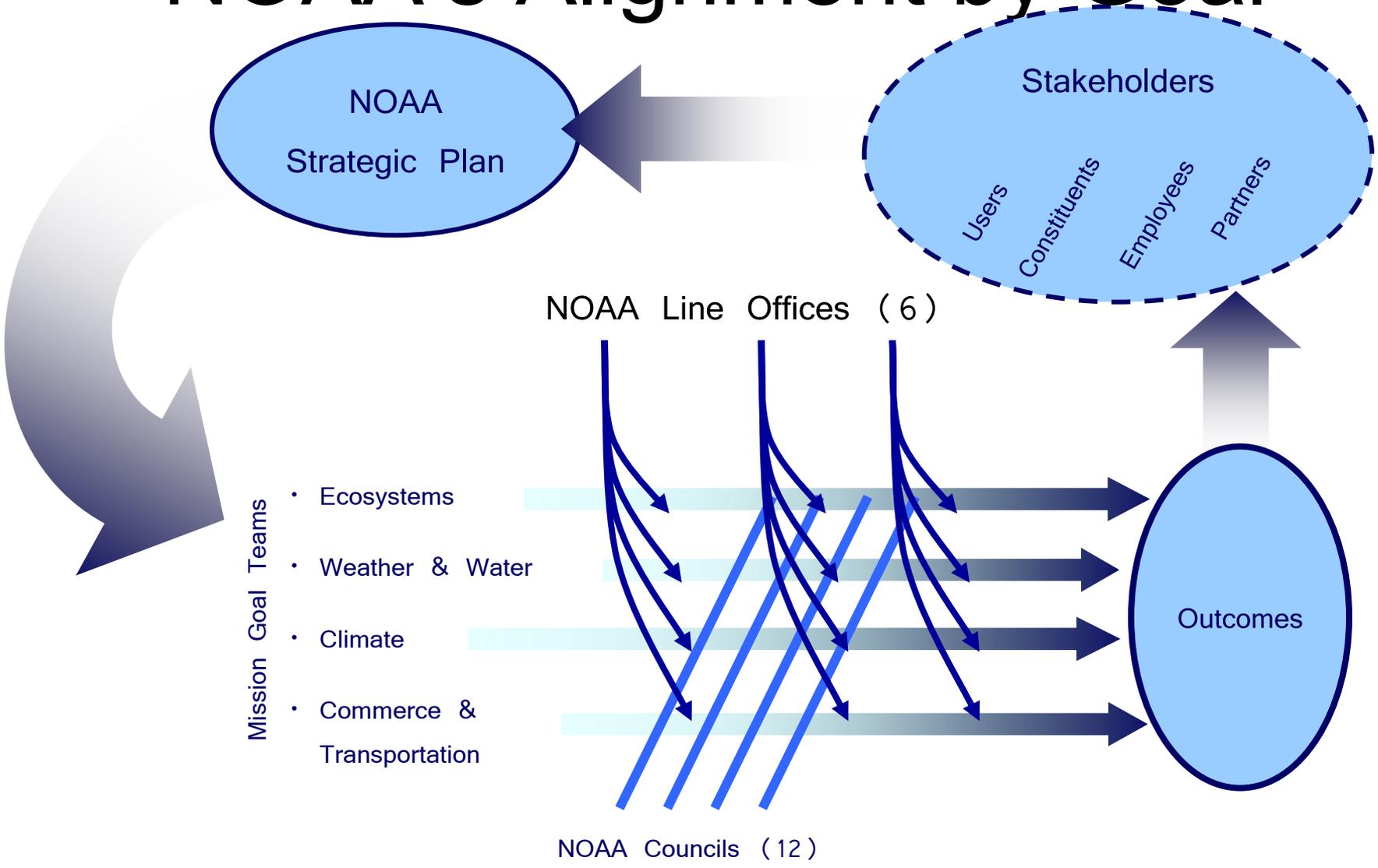
No, when losses due to externalities of more traditional management are considered EBM is worth the cost in both short and long term

NOAA's Budget and Planning Process



Transaction costs too high?

NOAA's Alignment by Goal



MMS

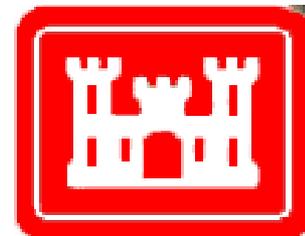


Commerce, Community and Economic Development

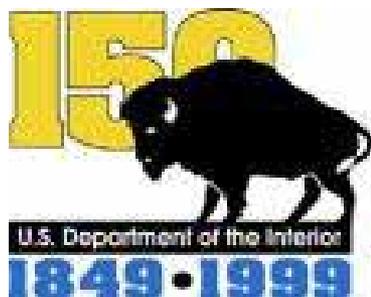


United States Coast Guard

Semper Paratus



The Office of Governor Frank Murkowski



Lack of political will?



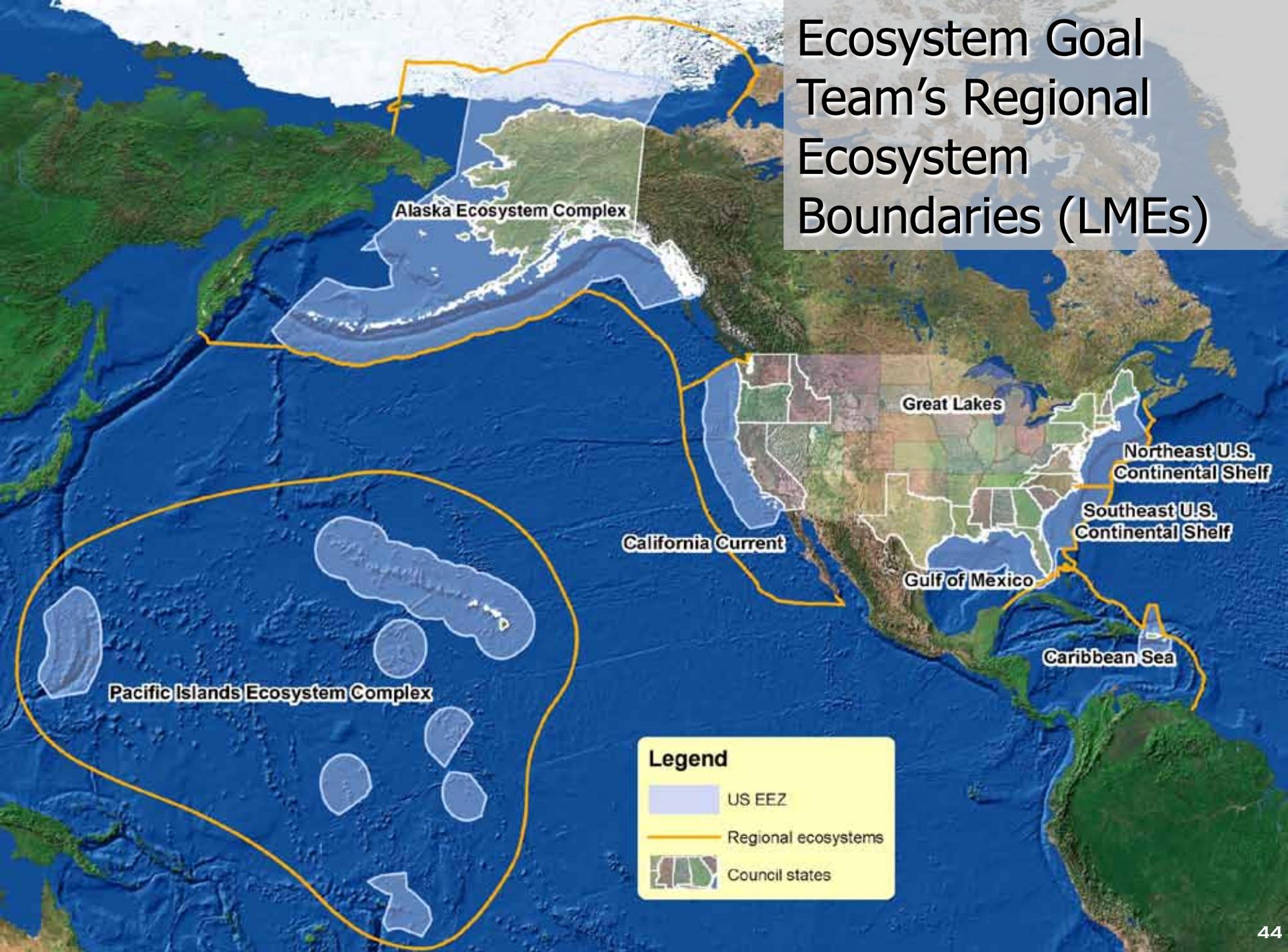
FACTORS AFFECTING PACE OF ADAPTATION OF EBFM

- **PRICES [OF INPUTS, e.g., FUEL]**
- **REVENUE [COMPETITION]**
- **CONFLICTS [e.g. WARS]**
- **TECHNOLOGY [SOLVE/CREATE PROBLEMS]**
- **CHANGING HUMAN VALUES**
- **NATURAL DISASTERS**
- **CLIMATE VARIABILITY/CHANGE**

NOAA SAB RECOMMENDS NOAA DEVELOP REGIONAL INTEGRATED ECOSYSTEM ASSESSMENTS 7/06

Regional, collaborative Integrated Ecosystem Assessments (IEAs), conveying information on the status of ecosystem health and evaluating the impacts of current and proposed human activities should be the central products of NOAA ecosystem science.

Ecosystem Goal Team's Regional Ecosystem Boundaries (LMEs)



Ways to SPEED UP EBM Implementation

- **Regional Integrated Ecosystem Assessments [NOAA SAB/EETT 2006]**
- **Regional Sectoral Ecosystem Plans**
- **Management Forums**
- **Outreach and Training [by Professionals]**
 - **Scientists / Managers**
 - **Users / Protectors**

Need for EBFM training and communication

Do we need an Ecosystem Service?

NO – TRADITIONAL SCIENTIFIC ADVICE IS ADEQUATE TO DELIVER THE MESSAGE

YES – MESSAGE IS NOT BUSINESS AS USUAL – REFLECTS CHANGE OF UNDERSTANDING. REQUIRES ACCULTURATION



What to Expect in Next 10 Years of EBM Implementation

- **CHAOS [IN THE BEST SENSE]**
- **EVOLUTION TOWARD A REVOLUTION**
- **INCREASINGLY COMPREHENSIVE APPROACHES**
- **DEVELOP MODELLING AND PREDICTIVE CAPACITY, E.G., ENSEMBLE FORECASTS FOR ROG**
- **DEVELOP AN 'ECOSYSTEM SERVICE'**

What to expect ?

**Great things from the next generation of
scientists and managers**

Make way!

THANKS