NOAA Social Science

Implementing Recommendations of the Science Advisory Board: Status and Next Steps

A Briefing to the NOAA Science Advisory Board by

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Outline

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   - Needs and corporate objectives for social science
   - Social scientists and social science capabilities
   - Status of social science at NOAA
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Purpose

Purpose is informational and twofold...

1. Report to SAB on the state of social science in NOAA and implementation of the SAB Social Science Review Panel's 2003 recommendations.
2. Identify key challenges and next steps.

Issue

What is the current state of social science at NOAA with respect to SAB recommendations and NOAA's own corporate objectives? How can it be improved?

What are the most achievable targets for social science development in the near-term (i.e. 2 years) to advance NOAA's corporate objectives and strategies?

Background

SAB's Major Finding (March 2003):

"NOAA's capacity to meet its mandates and mission is diminished by the under-representation and under utilization of social science."

SAB's Major Recommendations:

- Improve social science literacy at all levels in NOAA.
- Develop and support research strategies, plans, and programs.
- Integrate into NOAA's management structure.

NOAA senior management accepted recommendations

- Research Council tasked to oversee their implementation.
- PPI asked to coordinate and lead implementation effort.

Background
(continued)

Similar finding and recommendations from draft NOAA Physical and Social Science Task Team (PSTT) report:

In-house social science expertise required to:

- Manage external social science research
- Provide independent analysis of products and services
- Understand NOAA's organizational structures and forces from within

PSTT draft report recommends action:

"Research Council assure social science is formally integrated into R&D portfolios of each Goal Team..."

Background
(continued)

Similar finding and recommendations from draft NOAA External Ecosystems Task Team (eETT) report:

Most impacts on marine ecosystems from human activities.

Ecosystem change directly affects commerce **and** the public's interest in environmental values.

However, little consistent effort to observe, monitor, analyze and forecast interactions of human activities with natural ecosystems.

Thus, NOAA should strengthen its social science to:

- Monitor human use of ecosystem resources and services, the effect of human activities on ecosystem change and the effect of ecosystem change on human activities.
- Assess market, non-market, socio-cultural values and analyze costs & benefits of protection and restoration efforts.

Discussion

- What is social science (within a NOAA context)?
- Does NOAA need social science? Which corporate objectives demand social science?
- What do social scientists do at NOAA? What are NOAA's social science capabilities?
- What is the status of social science at NOAA? Do NOAA's social science capabilities satisfy the SAB Social Science Review Panel's major Recommendations and NOAA's corporate objectives?

Social Science

Our analysis assumed that NOAA social science is…

1. "The process of describing, explaining and predicting human behavior and institutional structure in interaction with their environments" (SAB definition).
2. Anthropology, demography, economics, geography, political science, psychology and sociology (SAB list).
3. Applied research and analysis to support NOAA programs and operations

NOAA Needs Social Science

Social Science contributes to improved decision-making in each Mission Goal by:

1. Articulating and demonstrating benefits of NOAA programs.
   - Impacts on people, regions, industries
   - Benefits of current and planned programs
2. Improving NOAA's understanding of its user base.
   - Size, composition
   - Customer attitudes, perceptions, needs and decision processes
3. Analyzing resource management.
   - Roles of population and economic structures on ecosystems
   - Incentives to improve regulation
4. Developing supporting techniques and databases.
   - Data and methods to measure size, value, perceptions, performance
   - Measure changes attributable to programs

Corporate Objectives

NOAA's Vision

"An informed society that uses a comprehensive understanding of the role of oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions."

NOAA's Mission

"To understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs."

NOAA's Cross-Cutting Priority to Ensure Sound, State-of-the-Art Research

"A strong economic and social science capability is needed to analyze and understand user requirements, priorities, and benefits services, and products."

"Long-term, visionary research to recognize emerging issues and opportunities and for managing future environmental and societal needs."

Corporate Objectives
(continued)

Two Strategies of Mission Support Goal Team

"Employ PPBES to enhance NOAA's capabilities and to guarantee effective delivery of needed products and services."

"Improve efficiency, accountability, and transparency of programs and services through process optimization and customer satisfaction assessment."

Numerous Legislative Requirements Drivers, including:

- Magnuson Stevens Fishery Conservation and Management Act
- Harmful Algal Bloom and Hypoxia Research Control Act
- National Environmental Protection Act
- National Marine Sanctuaries Act
- Estuary (Estuarine) Protection Act
- Chief Human Capital Officers Act
- Global Change Research Act

Corporate Objectives
(continued)

Ecosystems Approach To Management (EAM)

"Ecosystems" Include Humans:

EAM Considers the entire ecosystem, including humans.

EAM Maintains ecosystems in a healthy, productive and resilient condition to provide the services humans want and need.

EAM differs from current approaches that usually focus on a single species, sector, activity or concern.

EAM considers the cumulative impacts of different sectors.

EAM integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependences.

Global Earth Observation System of Systems (GEOSS)

Meets Nine Societal Needs:

Improve Weather Forecasting

Reduce Loss of Life and Property from Disasters

Protect and Monitor Our Ocean Resource

Understand, Assess, Predict, Mitigate and Adapt to Climate Variability and Change

Support Sustainable Agriculture and Forestry and Combat Land Degradation

Understand the Effect of Environmental Factors on Human Health and Well-Being

Develop the Capacity to Make Ecological Forecasts

Protect and Monitor Water Resources

Monitor and Manage Energy Resources

Both are NOAA-wide, organizationally-integrated, and socially-justified.

Social Scientists

What do NOAA social scientists do (by discipline)?

Economics

- Value Benefits of Programs
- Cost Benefit Analysis to determine payoffs
- Estimate and forecast demand for products

Sociology and Anthropology

- Tailor resource management to cultural environments
- Design community participation and governance structures for resource management

Demography & Geography

- Assess population pressures on coastal resources
- Define ecosystem boundaries and interactions
- Develop GIS applications

Social Scientists
(continued)

What do NOAA social scientists do (by application)?

"Programmatic Research," focused on NOAA's Mission Goals:

- Provides background and operational information that will help NOAA define and effectively carry out the mandates of each line office.
- Facilitates operational activities, assists in decision-making and regulation of human use of marine and coastal resources.

"Organizational Research," focused on NOAA as an Institution

- Provides information related to how NOAA and each of the line offices should be organized and operated to enhance the ability to perform required services and produce necessary outputs.
- Clarifies relationships and informs investment options, scale and scope of operations, performance evaluations.

Capabilities

Examples of Social Science supporting NOAA Programs

Fishery Management

- Socioeconomic surveys in commercially important fisheries
- Evaluate costs and benefits of proposed management actions (regulatory, market-based, etc.)

Coastal Management

- Socioeconomic analysis of alternative sanctuary management plans
- National survey of recreation activities in marine environment

Climate Assessments and Services

- Regional Integrated Sciences & Assessments: researches climate sensitive issues, supports decision-makers at a regional level.
- Sector Applications Research Program: builds interdisciplinary knowledge base to support applications in different social, economic sectors.

Capabilities
(continued)

Examples of Social Science supporting NOAA Programs

Weather, Water and Climate Forecasts

- Benefits from US household value of current and improved daily weather forecasts
- Benefits from WSR-88D radars and reduced tornado mortality
- Benefits from Daily temperature forecasts in electricity markets

Observation and Information Infrastructure

- Civil benefits of NPOESS
- Cost-benefit analysis of TOGA
- Users, uses and quantity benefits of GOOS

Capabilities
(continued)

Potential Contribution of Organizational Research

Programming and Planning

- Prioritization of finite resources
- Public-private-academic partnerships
- Concept of Operations for integrated product/service delivery
- Technology trends, technology transfer
- Rapidly evolving workforce

Ecosystems Approach to Management

- Characterize relationships between Programs and users, capabilities and applications in Large Marine Ecosystems.
- Support investment decisions of Ecosystems Goal Team by detailing programmatic trade-offs and resultant consequences to capabilities and applications.

Global Earth Observation System of Systems

- Characterize relationships between NOAA and partners, observations and modeling and research communities.
- Support investment decisions for observations and information technology infrastructure
- Optimize the integration of scientific & technical expertise across the system of systems

SAB Recommendation Status

SAB recommendations to strengthen NOAA social science fell into 8 major categories (see appendix for details):

Literacy	**Constrained**
Research Planning	**Satisfactory**
Data Management	**Satisfactory**
Staffing	**Constrained**
Senior Representation	**Unsupported**
Education and Outreach	**Constrained**
Performance Evaluation	**Constrained**
Budgets	**Constrained**

The State of NOAA Social Science

Progress is Being Made…

- NMFS fully implementing its social science plan.
- NOS developed a comprehensive plan & planning process; Coastal Services Center building SS capacity.
- C&T embraced economic and social science as program foci.
- W&W funds NCAR's Societal Impacts Program, which compliments NOAA efforts.
- Social science increasingly considered in NOAA Strategic and Research Planning and PPBES.
- NOAA programs often approach staff to integrate social science into their programs, rather than vice versa.

The State of NOAA Social Science
(continued)

But Challenges Remain.

- Need to sustain existing capacities while developing an enhanced, Goal-wide Ecosystems Approach to Management.
- Social science not integrated into Goal Teams' and Councils' analyses to determine priorities.
- Social science still a low budgetary priority in most Programs and the Agency.
- While social science supports certain management actions, the agency still views it as a tool to **justify what** NOAA produces rather than **improve how** we produce it.

The State of NOAA Social Science
(continued)

General Conclusions:

NOAA has a strong and growing capability to support the management of numerous, specific ecosystems resources through economic research and analysis.

NOAA building sustained capability to support external decision-making through the integration of social science into climate research.

Other social science research & analytic capabilities exist (e.g. forecast valuation studies), but are opportunistic and not sustained.

NOAA social science research & analysis could better support “One NOAA” objectives – such as PPBES, EAM and GEOSS – with more organizational research.

Additional Efforts

While sustaining existing capacities, we could focus on four additional efforts over the next two years:

1) **Incorporate more social science into 5-Year Plan and 20-Year Research Vision.**

2) **Support an enhanced Ecosystems social science effort (consistent with eETT findings) to further integrate the natural & social sciences at the Goal Level.**

3) **Further integration of social sciences into Planning and Programming.**

4) **Explore an internal and external social science Training and Education program.**

(Note: Resource requirements would be reviewed though NOAA management process, e.g. CFO, NEP, NEC)

(1) Incorporate more social science into 5-Year Research Plan, 20-Year Vision

Who: Research Council, Goal Teams

Why: NOAA Cross-Cutting Priority to Ensure Sound, State-of-the-Art Research:

"A strong economic and social science capability needed to analyze and understand evolving user requirements, priorities, and benefits of our information, services, and products."

"Long-term, visionary research will be critical to recognizing emerging issues and opportunities and for managing future environmental, ecological and societal needs."

How: Make social science an integral part of this year's revision of 5 year Research Plan, seeking input from SAB social scientists.

Develop NSF partnerships on critical issues, e.g. fundamental rather than applied social science aspects of hurricane research.

(2) Support an Enhanced Ecosystems Social Science Effort

Who: Ecosystems Goal, Research Council, NOAA Social Scientists, eETT

Why: Accelerate progress toward a successful EAM.

NOAA and other agencies confront the issue of how to integrate natural and social science into models of ecosystems functions and services.

Near-term priority: developing the economic and demographic data collection and delivery systems essential for regional decision making.

How: Formalize NOAA's social science working group to enhance integration of social science across the Ecosystems Goal.

Plan an operational, national backbone system for economic and demographic data collection and delivery to support:

a) regional resource management
b) special analyses (e.g. Katrina damages)
c) key state partnerships

Transition information to regional resource managers by providing necessary training & assistance.

(3) Further Integrate Social Science in Planning and Programming

Who: PPI, working with PA&E, CFO, Goal Teams

Why: "PPBES to enhance NOAA's capabilities to guarantee effective delivery of needed products and services."

PPBES is strengthened using the tools of social science to analyze alternative investments, tradeoffs, strategies.

Social Science adds insights to NOAA's research enterprise (e.g. identifying potential benefits, expected payoffs).

How: Incorporate decision tools (cost-benefit, risk assessment, ROI analysis, etc.) into development of Strategic Plan, AGM, PDM, and into text of the NOAA Business Operations Manual.

Goal Teams develop quantitative economic outcome-based performance measures.

(4) Explore an Internal & External Social Science Training & Education Program

Who: Human Capital Council, Communications Office, NOAA & academic social scientists.

Why: Understanding how NOAA products and services create economic benefits & tradeoffs involved is critical to program design; public and Congressional support.

How: Develop training and education workshops, short-courses, etc. for management's understanding of:

- Information product supply chains
- Organizational structures and business models
- Tools of economics for budget and investment analysis

Develop training module for groups critical to NOAA's mission, e.g.

- Meteorological and oceanographic community
- State/ local coastal & marine managers

NOAA Coordination & Council Views

Informal NOAA Social Science Working Group assisted in preparation of briefing.

NOAA Research Council brief, September 2005

NOAA Executive Panel brief, October 2005

Assistant Secretary review, December 2005

NOAA Executive Council brief, February 2006

Desired Outputs

Continued use and growth of: a) **programmatic research & analysis** to support specific requirements and to demonstrate value, and b) **organizational research & analysis** to inform corporate planning and programming decisions to **improve how** NOAA meets corporate objectives

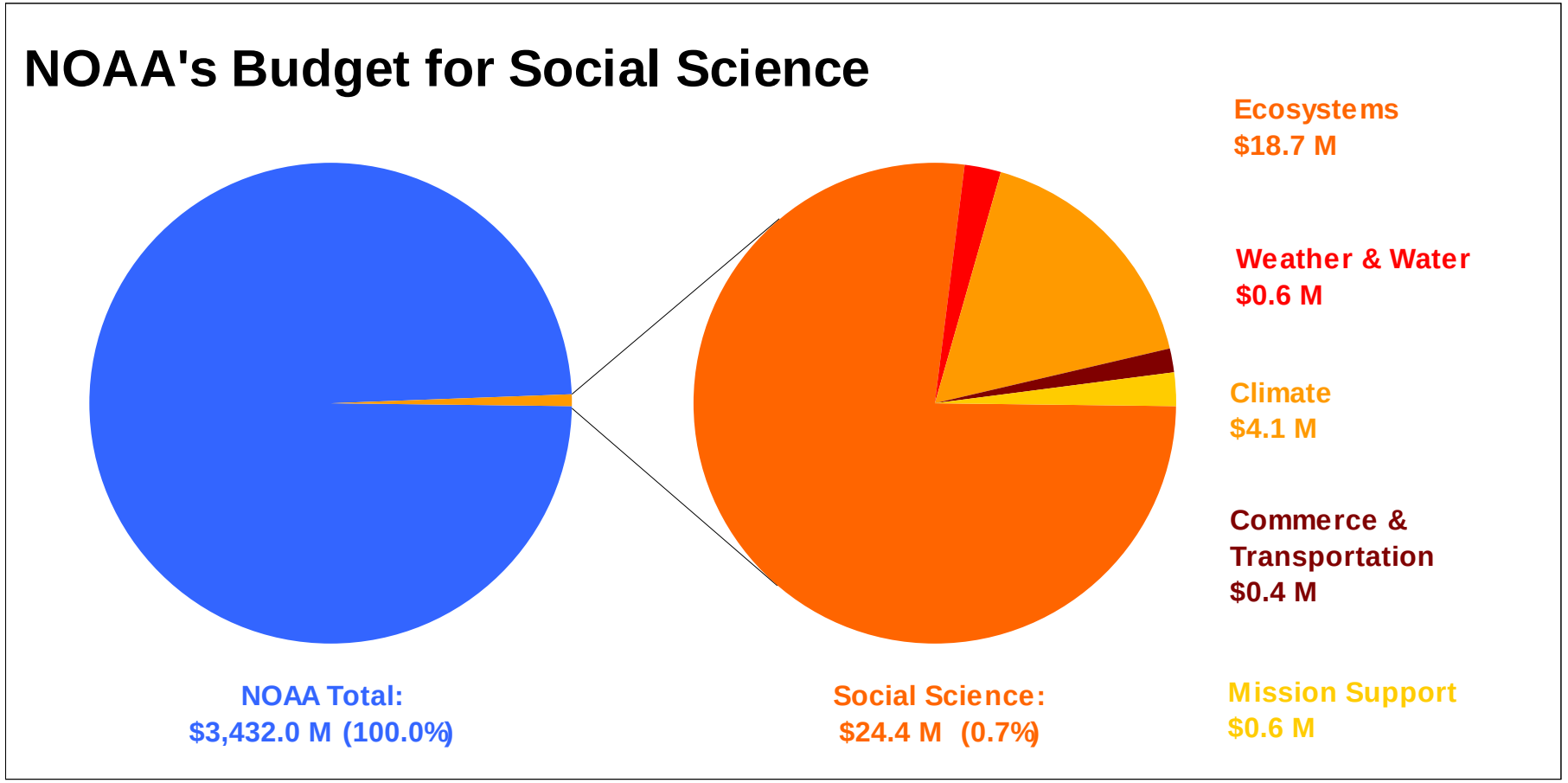
SAB feedback on:

- Social science progress since SAB recommendations (March 2003)
- Proposed additional efforts (p.23)

Questions or Comments?

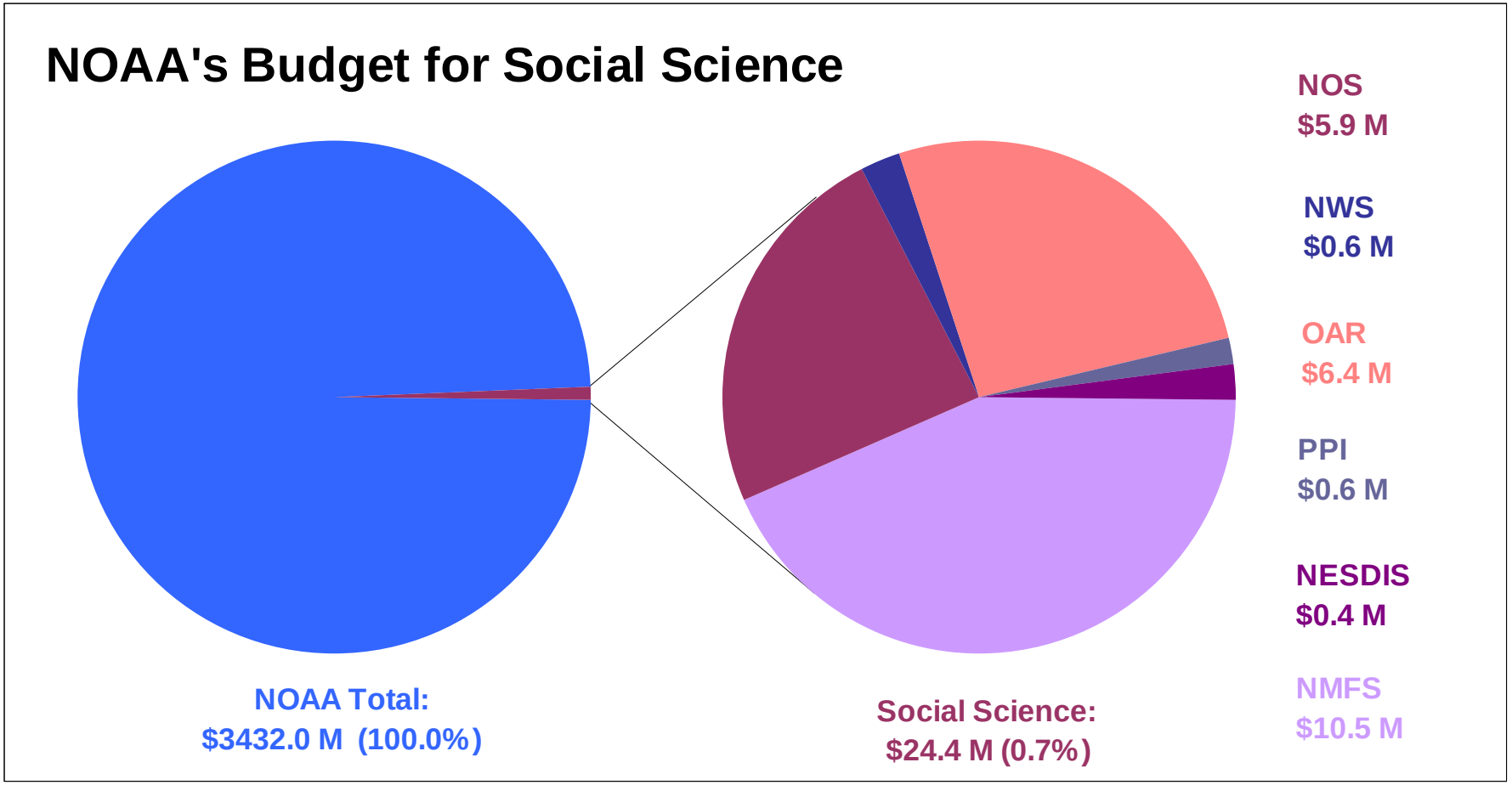
APPENDIX

Appendix:
Social Science Capabilities in FY '05

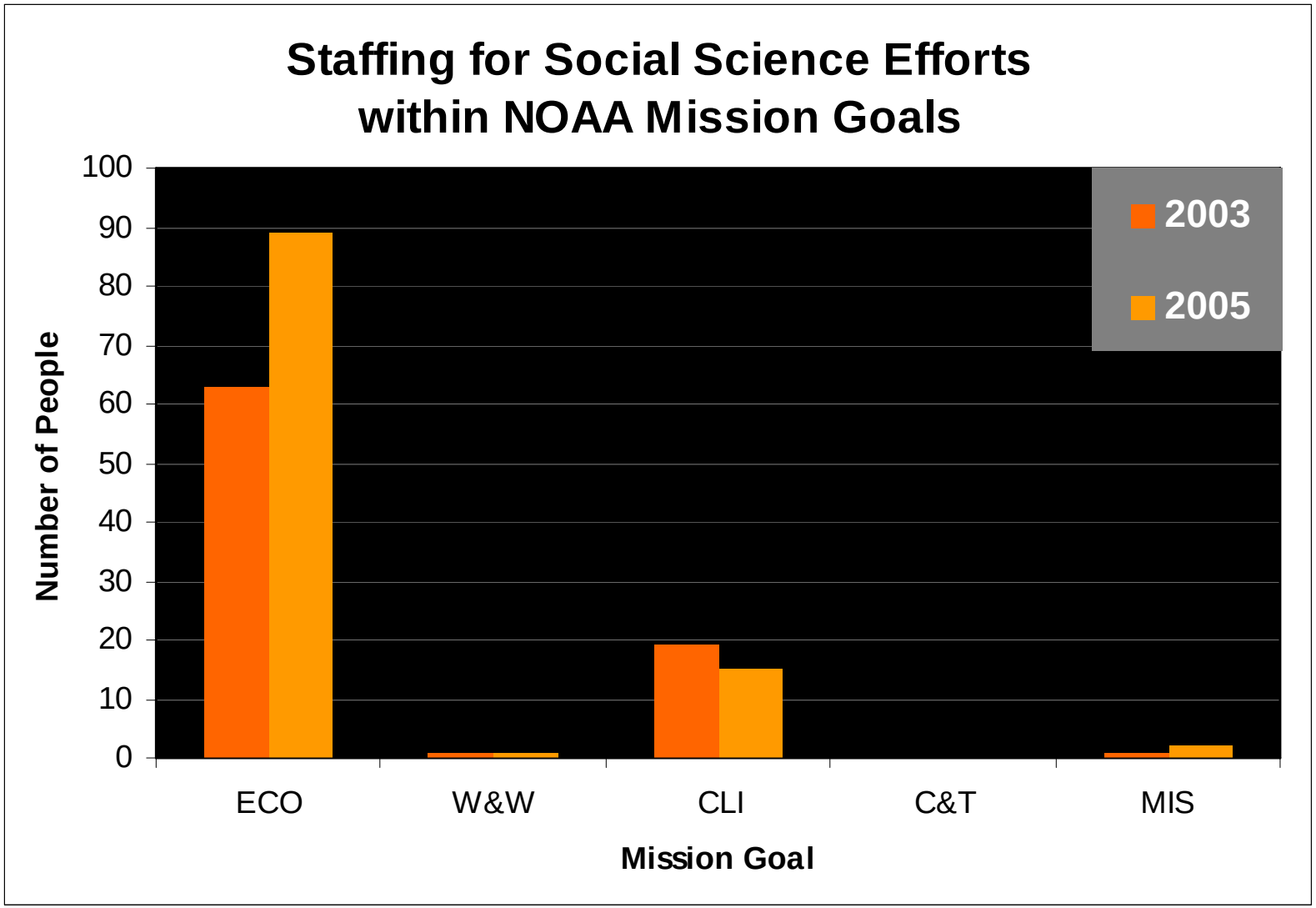


Note: Ecosystems' social science is conducted primarily in-house, others primarily extramurally.

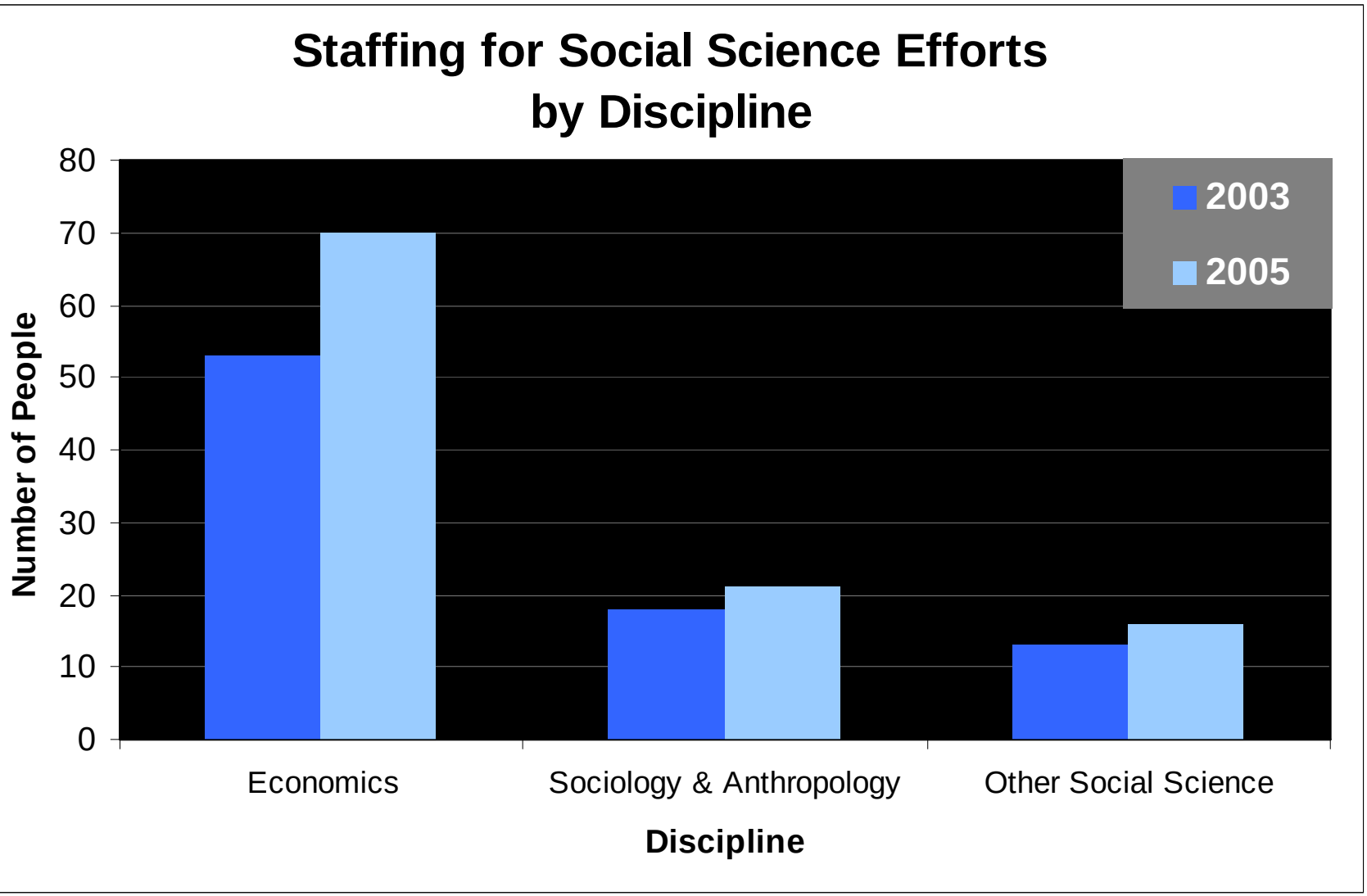
Appendix:
Social Science Capabilities in FY '05



Appendix:
Social Science Capabilities in FY '05



Appendix:
Social Science Capabilities in FY '05



Appendix: Social Science Capabilities

Specific Conclusions from Data Call:

- **Ecosystems:** NMFS & NOS developed a comprehensive social science research plan as called for by SAB. NMFS accounts for nearly all of NOAA's 20% increase in staffing. NOS's Coastal Center showed particular growth in economics, sociology and anthropology.
- **Climate:** Support for socioeconomic research has eroded somewhat, but modest gains in cooperative institute research.
- **C&T:** FY '06 Funding efforts not successful (in Conference).
- **W&W:** Hydrology created new economic research activity in '06; Science & Tech (USWRP) initiated $450K NCAR social science program to compliment NOAA efforts.
- **PPI/HQ:** Not successful in gaining support in '06 budget cycle, but secured modest funding across NOAA, including HQ support.

Appendix:
SAB Recommendation Status

1. Social Science Literacy: **Constrained**

Senior Goal Team management to participate in workshops/retreats

- Presented 6 workshops to Mission Goals, Staff Offices, and Boulder staff on using/applying socioeconomic analysis in NOAA, case studies, near-term targets of opportunity.
- 200+ mid-Senior level managers participated. Presenters included academics, NOAA social scientists.

Leadership to Establish NOAA social science literacy goals

- See Next Steps # 3

Appendix:
SAB Recommendation Status

2. Social Science Research Planning: **Satisfactory**

Goals should develop social science research plans with specific targets

- Ecosystems (NMFS, NOS) have annually updated research plans.
- Climate's planning done by Climate Program Office.
- W&W, C&T plans currently led by PPI.

Sea Grant should accept a larger role in supporting social science research

- SG, as part of Ecosystems Research Program, has designed a multidisciplinary approach.
- NMFS/SG also established economic fellowships.
- Total funds for such programs have increased 10% since 2001 to $2.3 million.

Appendix:
SAB Recommendation Status

3. Social Science Data Management: **Satisfactory**

NOAA to inventory, document, and archive NOAA economic data

- NOAA's new Social Science website (www.economics.noaa.gov) archives and disseminates information; extensive links to, Federal agencies & universities.
- PPI produces *Economic Statistics for NOAA* annually.
- NOS site provides Census data in coastal assessment framework.
- National Ocean Economic Project (NOEP) provides extensive data on wages, employment, and output for ocean sectors and industries through opportunistic funding.
- NMFS websites provide information on over 100 NMFS-authored papers and NMFS-funded projects.

Appendix:
SAB Recommendation Status

4. Social Science Staffing: **Constrained**

Goals should evaluate the adequacy of social science staffing; plan to build core social science capacity

- Ecosystems and Climate Goal staffing plans are within PPBES process
- PPI works extensively with W&W and C&T.

Goals to investigate opportunities for improving planning, communication and networking

- Informal NOAA social science working group established and meets regularly.
- Working group will become more formalized in '06.

Appendix:
SAB Recommendation Status

5. Senior Representation: **Unsupported**

<u>NOAA to create a chief social scientist position in each Mission Goal</u>

- Consensus within NOAA management is to consider senior SS officer in context of LO-wide staffing requirements.
- However, NMFS has a central economics shop; NOS coordinated by Special Projects Office and PPI serves as lead for SS for W&W and C&T; Climate Program Office supports Climate goal.

Appendix:
SAB Recommendation Status

6. Education and Outreach: **Constrained**

Goals to evaluate needs and identify successful outreach

- PPI is currently exploring program options: see Next Step #3.

NOAA to organize a Center of excellence in Survey Research and Center for Economic Valuation

- NOAA supports in principle; will develop a concept and options paper during '06.

Appendix:
SAB Recommendation Status

7. Performance Evaluation: **Constrained**

NOAA social scientists should develop and strengthen performance metrics and measures with social science

- See Next Step #2

8. Budgets: **Constrained**

Goals to increase budget and staffing for social science capabilities

- Specific budget recommendations are considered in PPBES.

Appendix:
Line Office Status

NOS Staffing	2003	2005
Economics	12	10
Sociology & Anthropology	0	0
Other Social Science	5	11
Total	**17**	**21**

Functions: Damage assessment, database development; economic and demographic analysis; socioeconomic analysis & monitoring; spatial analysis.

Comment: Staffing emphasizes supports sanctuaries, damage assessment, coastal programs.

Appendix:
Line Office Status

NMFS Staffing	2003	2005
Economics	39	58
Sociology & Anthropology	7	10
Other Social Science	0	0
Total	**46**	**68**

Functions: Regulatory & management support, applied research, analytical infrastructure development, survey design and implementation.

Comment: Focus primarily on economics to support regulatory & management actions; sociology and anthropology staffing also emphasized.

Appendix:
Line Office Status

OAR Staffing	2003	2005
Economics	0	0
Sociology & Anthropology	11	11
Other Social Science	8	4
Total	**19**	**15**

Functions: Support human dimensions and RISA programs; program management and analysis at HQ.

Comment: Social science in the climate program reduced; cooperative institute research increased.

Appendix:
Line Office Status

NWS Staffing	2003	2005
Economics	1	1
Sociology & Anthropology	0	0
Other Social Science	0	0
Total	**1**	**1**

Functions: Support a range of strategic planning and policy analysis activities.

Comment: No change in permanent staffing; social science contractor support increased slightly in one region.

Appendix:
Line Office Status

NESDIS Staffing	2003	2005
Economics	0	0
Sociology & Anthropology	0	0
Other Social Science	2	2
Total	**0**	**0**

Functions: GIS application development supporting social science efforts via visualization techniques .

Comment: International relations: "Percentage of time dedicated to social science research and education is negligible."

Appendix:
Line Office Status

PPI Staffing	2003	2005
Economics	1	1
Sociology & Anthropology	0	0
Other Social Science	0	1
Total	**1**	**2**

Functions: Serve as NOAA Chief Economist; support to NWS and NESDIS, Mission Goal teams.

Comment: Measurable increase in development and administration of contacts for economic analysis across NOAA, although still relatively small.

Requirements Driver for MS-WMP

Chief Human Capital Officers Act of 2002

Requires setting workforce development strategy; assessing workforce characteristics and future needs based on mission and strategic plan; aligning human resources policies and programs with organization mission, strategic goals, and performance outcomes; developing and advocating a culture of continuous learning to attract and retain employees with superior abilities; identifying best practices and benchmarking studies, and applying methods for measuring intellectual capital and identifying links of that capital to organizational performance and growth.

Requirements Driver for MS-ITS

Clinger Cohen Act

This Act provides the driver for the Information Technology Services program by the establishment of the CIO will establish an effective and efficient capital planning process for selecting, managing, and evaluating the results of all of its major investments in information systems. This is to be integrated with the processes for making budget, financial, and program management decisions.

Requirements Driver for EC-EOP

Magnuson Stevens Fishery Conservation and Management Act

The Secretary shall initiate and maintain, in cooperation with the Councils, a comprehensive program of fishery research to carry out and further the purposes, policy, and provisions of this Act. Such program shall be designed to acquire knowledge and information, including statistics, on fishery conservation and management and on the economics and social characteristics of the fisheries.

Requirements Driver for EC-EOP

Endangered Species Act

Take into consideration the economic impact, and any other relevant impact, of specifying any area as critical habitat.

Marine Mammal Protection Act

Take into account fishery economics when designing Take Reduction Plans, which reduce the incidental mortality or serious injury of marine mammals incidentally taken in the course of commercial fishing

Regulatory Flexibility Act

Conduct a regulatory flexibility analysis, including analyzing the economic impact on small entities, for every proposed rulemaking and final rule

Requirements Driver for EC-ERP

Harmful Algal Bloom and Hypoxia Research Control Act

NOAA shall support a comprehensive effort to examine the causes and ecological and economic consequences of Harmful Algal Blooms (HABs) and hypoxia, and to describe the potential ecological and economic costs and benefits of policy and management actions to prevent, reduce, and control HABs and hypoxia.

National Marine Sanctuaries Act

Mandates NOAA to "prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man."

Requirements Driver for EC-ERP

The Estuary (Estuarine) Protection Act

The Act requires the Secretary of the Interior to work with the states and other Federal agencies in undertaking studies and inventories of the Nation's estuaries. These studies and inventories shall include the assessment of the wildlife and recreation potential of estuaries, their ecology, their value to the marine, anadromous and shell fisheries, and their aesthetic value; their importance to navigation and flood control and their mineral value their value for more intensive economic development.

Requirements Driver for EC-ERP and EC-EOP

The National Environmental Protection Act

The NEPA requires each federal agency to assess the impact of alternatives for their actions (including activities conducted, funded or permitted by the agency) on the human environment. The cumulative impacts of each activity in combination with other natural and anthropogenic phenomena are included among the analyses.

Requirements Driver for CL-CLF

Global Change Research Act of 1990

The Act makes reference to findings that include the observation of human activities that may lead to global changes and may adversely affect society. These include global warming and stratospheric ozone depletion. The Climate Forcing Program carries out research and assesses information in these areas.

What is ecosystem-based management for the oceans?*

Ecosystem-based management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors. Specifically, ecosystem-based management:

- emphasizes the protection of ecosystem structure, functioning, and key processes;
- is place-based in focusing on a specific ecosystem and the range of activities affecting it;
- explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;
- acknowledges interconnectedness among systems, such as between air, land and sea; and
- integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependences.

* The Communication Partnership for Science and the Sea (COMPASS) recently released this scientific consensus statement on ecosystem-based management signed by more than 200 scientists and policy experts. The statement was released on March 21, 2005, in Washington, D.C., at a House Oceans Caucus Luncheon.