

SOCIAL SCIENCE RESEARCH WITHIN NOAA: REVIEW AND RECOMMENDATIONS

**FINAL REPORT TO THE NOAA SCIENCE ADVISORY BOARD
BY THE SOCIAL SCIENCE REVIEW PANEL**

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PREFACE

The mission of the National Oceanic and Atmospheric Administration (NOAA) is to describe and predict changes in the Earth's environment, and conserve and manage wisely the Nation's coastal and marine resources to ensure sustainable economic opportunities. The NOAA Science Advisory Board (SAB), in recognition of the critical role of humans in achieving NOAA's mission, requested that an External Review Panel be formed to evaluate the adequacy of NOAA's social science in understanding the human dimensions of sustainability.

In its 18 month effort the Panel reviewed a large amount of information representing research, data, staffing, budgets, education, and management philosophies within the five line offices and the Office of the Chief Economist of NOAA. It conducted extensive interviews of the Assistant Administrators and the NOAA Chief Economist.

The Panel expresses its appreciation to the Assistant Administrators and to the NOAA Chief Economist for their generous participation in the interviews and thoughtful dialogue about the role of social science in their line offices:

Gregory W. Withee: National Environmental Satellite, Data, and Information Service

William T. Hogarth: National Marine Fisheries Service

Margaret A. Davidson: National Ocean Service

John J. Kelly, Jr.: National Weather Service

David L. Evans: Office of Oceanic and Atmospheric Research

Rodney F. Weiher: Office of the NOAA Chief Economist

We also thank the staffs of the line offices for their extensive efforts in providing detailed information about social science research, staffing and data.

As Panel Chair, I extend my thanks to Panel members for their creative and insightful contributions to the review and the report. Particular thanks are due to Sean Conley for his extremely competent and thorough staffing of this exercise. Following acceptance of this report by the NOAA SAB, the Panel will be disbanded.

Susan Hanna, Ph.D.
Member, NOAA Science Advisory Board
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18 March 2003

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EXECUTIVE SUMMARY

In its evaluation of social science within NOAA, the Panel reviewed a large amount of information representing research, data, staffing, budgets, education, and management philosophies within the five line offices and the Office of the Chief Economist of NOAA. Extensive discussions of this information within the context of the Panel charge resulted in a general understanding among Panel members of the position of social science within NOAA.

The Assistant Administrators were receptive to discussing the role of social science within their line offices. These discussions revealed that the full potential for social science is not being realized throughout NOAA. While social science is sometimes applied to calculate the value of scientific plans and programs, it is less often used to help identify the scope and content of science plans and programs, to evaluate the degree to which NOAA products and services are satisfying constituent needs, or to develop a more informed and participatory constituency through education and outreach programs.

NOAA is a large and complicated organization with a complex mission portfolio. While there are many types of social science research that NOAA could profitably undertake, two categories are especially relevant.

- Programmatic: mission-driven social science research focusing on questions that provide background and operational information that will help NOAA define and effectively carry out the mandates of each line office.
- Organizational: institutional social science research focusing on providing information related to how NOAA and each of the line offices should be organized to enhance the ability to perform required services and produce necessary outputs.

The Panel concludes that the position of social science within NOAA is weak. The line office budgets for social science research, education and staffing do not seem comparable to the social science budgets at other agencies with environmental assessment and stewardship responsibilities such as US Forest Service, the Environmental Protection Agency, or the US Fish and Wildlife Service. The limited understanding of social science within NOAA leads to an inadequate investment in social science with respect to the NOAA mission that in turn hinders the contribution of social science to those missions. The panel arrived at two general findings and nine areas of specific findings and recommendations.

GENERAL FINDINGS

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

Assistant Administrators are responsive to discussing opportunities for an enhanced role for social science within their line offices.

SPECIFIC FINDINGS AND RECOMMENDATIONS

1. Social Science Literacy

Finding: Throughout NOAA, there is a lack of formal understanding of what social science is and what its contributions can be, leading to an organizational culture that is not conducive to social science research.

Recommendation 1: To improve the literacy and competency of NOAA leadership in social science, NOAA Assistant Administrators and senior management should initiate this process by participating in a workshop/retreat to review the scope of social science and to address the potential contribution of social science to NOAA missions. Through the use of university and external expertise to advise and inform, participants can collaboratively learn about social science in a non-threatening workshop environment. These workshops could also make good use of the wide range of relevant reports from the National Research Council relating to social science (e.g. on risk, human dimensions of global change, sustainability etc.)

Recommendation 2: NOAA leadership should establish goals and objectives for achieving social science literacy within the agency, including establishment of short courses, case studies, workshops and seminars. NOAA should develop a social science literacy project including curriculum development and workshops to address the general lack of social science literacy among the work force.

2. Social Science Research

Finding: Two general categories of social science research are critical to the accomplishment of NOAA's mission: programmatic (mission-driven) and organizational (institutional).

Finding: Overall, NOAA's social science research effort is small and unbalanced across disciplines.

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

Finding: Cost-benefit analyses of programs may meet short-term political needs, but a longer-term focus on social science would enhance NOAA's processes for prioritizing research and effectively connecting the results of that research with its stakeholders.

Recommendation 3: NOAA should acknowledge the need to have social science fulfill missing mission-driven and institutional research by having each line office and Headquarters develop a social science research plan that identifies research (including goals, objectives and outcomes) needed to support the NOAA mission and a strategy (cost, schedule performance) to implement it.

Recommendation 4: NOAA should document its agency-wide expenditures on external cost-benefit analyses conducted to justify programs and evaluate the degree to which such expenditures serve as a substitute for broader social science.

Finding: With one or two exceptions, there are no programmatic opportunities that target internal or external social science research.

Recommendation 5: Line offices should establish specific targets for social science research through reprogramming and new initiatives. Line offices should experiment with earmarking people and other resources to focus on social science research related to their missions, with a review of accomplishments after a period of five years.

Recommendation 6: The National Sea Grant College Program should accept a larger role in supporting social science research with the dual objectives of enlarging basic and applied social science knowledge and targeting mission-driven social science research needed by the line offices. This could be accomplished through set-asides of National Sea Grant themes and targets. In addition, Sea Grant should expand efforts to develop curricula and specific university programs to train additional social scientists in areas relevant to NOAA's mission.

3. Social Science Data

Finding: The lack of appropriate data limits the contribution of social science to NOAA.

- There is insufficient investment in ongoing collection and management of social science time series data including that collected outside NOAA but relevant to NOAA mission and operations.
- Few social science data are catalogued and archived in digital, retrievable and geo-referenced form
- Prohibitions on collecting economic data restrict regulatory analyses in fisheries

Recommendation 7: Within the next 12 months NOAA should inventory, document with meta data and formally archive its economic data holdings to ensure their integrity and easy access by government and public researchers and analysts. The Environmental Protection Agency (EPA) Office of Environmental Economics is in the process of archiving its economic data, an effort with which NOAA line offices could benefit from coordination.

Recommendation 8: NOAA Administrators should seek congressional support to rescind the prohibition on collecting economic data under the current MSFCMA Sections 303(b)(7) and 402(a).

4. Social Science Staffing

Finding: NOAA's social science staffing is insufficient to meet the mission of each of the line offices.

- Small numbers and isolation of social scientists lead to fragmentation and prevent achieving critical mass. With few social scientists, mentoring, peer collaboration and intellectual stimulation are lacking.
- Social science expertise within NOAA is not of sufficient magnitude to influence the long-term research agenda.
- The impact of social science is diluted by the fact that staff are often hired, mentored, supervised and promoted by non-social scientists.
- There is no established career path for social scientists in NOAA and career advancement and professional development opportunities for social science staff are currently extremely limited.

Recommendation 9: Headquarters and each line office should evaluate the adequacy of its social science staffing relative to its mission and overall organizational needs similar to what NMFS has done.

Recommendation 10: Headquarters and each line office should jointly develop a plan to build core social science capacity that includes an implementation strategy, including evaluation of options to create social science centers of excellence to address the resolution of critical mass and isolation issues.

Recommendation 11: Headquarters and each line office should investigate opportunities for improving planning, communication and networking among its existing social scientists within and across line offices.

5. Senior Representation

Finding: There are several social scientists at senior levels of administration. However, neither Headquarters nor the line offices have functional representation of social science in the Directorate in the form of a dedicated social scientist position.

Recommendation 12: Because of the remedial need to integrate social science throughout NOAA, NOAA should create a chief social scientist position in each line office with the explicit responsibility for developing, advocating and overseeing social science research that meets the mission-driven and institutional needs of the line office.

6. Education and Outreach

Finding: NOAA Assistant Administrators recognize the need to better define and understand their constituents and communicate with them.

Recommendation 13: To enhance their efforts in public education and outreach, NOAA line offices should carefully evaluate their needs and identify existing programs in both government and the private sector where expertise in public outreach and education have proven successful, with which NOAA could collaborate to help meet those needs.

Finding: The lack of expertise in social science survey methodology and perceived obstacles to conducting surveys limits NOAAs ability to understand and communicate with constituents.

Recommendation 14: NOAA should organize a center of excellence in survey research, composed of social scientists trained in survey methodology, including on-line techniques. The unit would design, process and administer constituent surveys.

7. Strategic Planning

Finding: With the exception of NMFS, social science objectives represented in line office strategic plans do not track into a long-term research agenda influenced by the social sciences.

Recommendation 15: In each line office, the new chief social scientist and the directorate should be responsible for incorporating explicit social science data, staffing and research objectives and performance measures in their line office strategic plans and annual operating plans.

Finding: Although line office strategic plans contain economic and social elements, with the exception of OGP and NMFS there is almost no long-term strategic planning for social science at NOAA.

Recommendation 16: Each line office should develop a social science research plan and ensure that it is integrated into the NOAA strategic plan through explicit as well as implicit social science goals, plans and outcomes.

8. Performance Evaluation

Finding: The application of social science is a necessary component of outcome-based program effectiveness measurement and monitoring in the FY2003-FY2008 Strategic Plan.

Recommendation 17: Use social scientists to lead the development of performance metrics or indicators of success in evaluating outcome effectiveness.

9. Budgets

Finding: In an agency with the size and complexity of NOAAs mission, and given the recommendations and research agenda suggested in this report, it is reasonable to expect that NOAA could easily justify over the next 5 years an increase of \$100 million over the current \$3.3 billion budget to improve the competency and contribution of social science to achieving mission objectives. To initiate this necessary improvement, NOAAs FY05 budget would need to include approximately \$21 million investment in new social science data, staff and research to start a multiyear social science program expansion.

Recommendation 18: Social Science Capacity: For line offices that do not have a social science research plan, 10 percent of the first year of this budget initiative should focus on

obtaining a core competency of up to 10 senior social scientists across the line offices to assist them in the development of their social science data and research requirements and subsequent implementation. These scientists trained in the social science disciplines would complete a nucleus of senior advisors and planning capacity that, in association with contracts or cooperative agreements with universities and other agencies, would develop a NOAA-wide implementation strategy for social science program development and workforce analyses.

Subsequent to the development of the strategy this group would be responsible for carrying out the strategy with the expected outcome of integrated line office research that will contribute social science perspectives to policy decisions through existing institutions such as the NOAA Research Council and NOAA Executive Council. Of most immediate benefit would be a more organized and accurate assessment of the baseline social science data and research that exists today, with new requirements identified by this gap analysis used to immediately lay the foundation for satisfying more specialized research goals in out-year budgets.

For line offices that have already identified their requirements using existing funding, the majority of the balance of funds (\$15 million) should be directed at implementation of their social science research plans. This would satisfy the \$13 million social science requirement identified by NMFS, and significantly improve the rigor and capabilities in the Office of Global Programs-Human Dimensions program. Remaining funds should be used as an incentive to seed program development in other line offices.

Recommendation 19: Center for Economic Valuation: To promote consistency and coordination across the line offices, \$2 million should be invested in a virtual NOAA Center for Economic Valuation that would coordinate, sponsor and disseminate research, data collection, survey methods, and derive and apply analytical models of the market and non-market values associated with environmental assessment and environmental stewardship policies. This effort would be organized and led by a partnership of NMFS, NOS, OAR and NWS. The virtual Center would capitalize on existing expertise and would provide a uniform focus, enable coordination across line offices and mission goals, and foster the transfer of knowledge, information and techniques to improve the economic literacy of NOAA. The Center would use expertise in economic valuation drawn from the economics profession as well as from other social sciences such as geography, anthropology and psychology. This investment would close a huge knowledge gap and vulnerability revealed by our findings. It would enhance NOAA's ability to have economics contribute to the policy decisions of the agency by evaluating benefits and costs of alternative policy choices in a scientifically credible manner, and examining the risks and distribution of the impacts of these alternatives. This investment ideally should be managed as a matrix program to be in conformity with recent trends in NOAA organizational structure. It directly addresses the mission driven social science research questions to support regulation as well as institutional research described in this section.

Recommendation 20: Performance Measurement: Recognizing recent advances in out-year planning and the new NOAA Strategic Plan's focus on accountability and performance management, \$2 million should be invested in strengthening NOAA's ability to measure economic and social benefits and costs associated with program implementation and

performance. This would include the development of performance metrics for major programs where none exist, and provide training in their use for program analysis and evaluation. This directly addresses the mission driven social science institutional research and research questions to facilitate routine activities described in this section.

I. INTRODUCTION

In 2000 the NOAA Science Advisory Board (SAB) requested that NOAA provide a list of all social science research projects funded by each of the five line offices and the Office of the Chief Economist. After reviewing the list, the SAB acknowledged the difficulty of identifying the social science component of many of the research project descriptions provided and concluding that there appeared to be a general lack of direction and focus to NOAAs social science research. Accordingly, the SAB passed a motion on 5 April 2000 summarizing its impression of social science research within NOAA and recommending that:

A. NOAA convene a panel of experts to:

- (i) Conduct an in-depth examination of the types and level of social science research funded by NOAA, using the following definition of social science research - the process of describing, explaining, and predicting human behavior as practiced by individuals and groups;
- (ii) Demonstrate the necessity of process-oriented research in understanding the mechanics by which human decisions interact with NOAAs larger goals of environmental assessment and stewardship;
- (iii) Recommend a short term social science research agenda that is focused on a manageable number of research questions that relate directly to NOAAs mission; and
- (iv) Define a long-term research agenda that includes the social science research needed to address NOAAs mission, develop realistic funding estimates, and identify priority research programs.

B. This panel of experts should consist primarily of social scientists in the environmental field, including representatives from inside and outside of NOAA. The panel will be appointed by the Chair of the Science Advisory Board upon consultation with the Board.

C. The panel should present its findings by January 1, 2002.

Panel Membership

The Panel was appointed in Summer 2001. Delay in appointments resulted in an extension of the report deadline until March 2003. The Panel included both NOAA social scientists and social science academics from outside NOAA.

Lee G. Anderson
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Diana Liverman
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Richard Bishop
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Bonnie J. McCay
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Margaret Davidson
NOAA NOS

Edward L. Miles
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Susan Hanna (Chair)
Oregon State University

Roger Pielke, Jr.
University of Colorado

Mark Holliday
NOAA NMFS

Roger Pulwarty
NOAA OAR OGP CDC

Judith Kildow
University of Southern California

The panel met three times: October 2001, January 2002 and March 2002. Preliminary findings and recommendations were developed at the March 2002 meeting.

Information Sources

The panel used four sources of information in its review:

1. Presentations by each line office and the NOAA chief economist of their missions and the use of social science in meeting those missions.
2. Information provided by each line office on social science staffing, budgets, data and information.
3. Interviews with Line Office Assistant Administrators (AAs) and the NOAA chief economist on the use of social science in the context of line office organization, process and structure.
4. NOAA and other federal agency reports on program performance, environmental data, and the use of social sciences within NOAA.

Report Structure

The report is divided into five major sections following the Introduction: *II. Social Science*: the definition of social science, examples of social science disciplines and the types of social science research most applicable to NOAA; *III. The Status of Social Science within NOAA: Findings and Recommendations*. Section III includes general findings, as well as discussion, findings and recommendations for nine specific aspects of social science: literacy, research, data, capacity, senior representation, education and outreach, strategic planning, performance evaluation, and funding; *IV. A Research Agenda for Social Science*, including a recommended social science research agenda; *V. Budget Recommendations* to address issues of social science capacity and applications; *VI. References*, including those cited in the report as well as supplemental references; *VII. Appendices* of line office information summaries, interviews with line office Assistant Administrators, and data and interview forms.

II. SOCIAL SCIENCE

SOCIAL SCIENCE DEFINED

The panel used the following definitions in its review:

Social Science

Social science is the process of describing, explaining and predicting human behavior and institutional structure in interaction with their environments. For this report, social science includes the fields of anthropology, demography, economics, geography, law, political science, psychology and sociology.

Social Science Data

Social science data categories include economic, demographic, legal/regulatory, political/institutional and social/cultural.

Social Science Disciplines and Focus Areas

Anthropology: the study of the origin of the physical, social and cultural development and behavior of humans.

Demography: the study of human populations, including their size, growth, density, and distribution, as well as statistics regarding birth, marriage, migration, disease, and death.

Economics: the study of the allocation of scarce resources among competing ends to understand how individuals, groups and governments, faced with limited resources, choose to produce, distribute and consume goods and services.

Geography: the study of the spatial distribution of human activity and the distribution of human interactions with the environment, including the use of an area's economic and cultural resources.

Law: the study of law and law-related subjects in private as well as public law, such as property, environmental law, maritime law, international agreements, and jurisprudence.

Political Science: the study of political organizations and institutions, especially governments.

Psychology: Social psychology is the study of how people think about, influence, and relate to one another. Cognitive psychology is the study of the mind, including mental processes in response to stimuli that influence responses and the processing of information.

Sociology: the study of the origin, development, and structure of human societies and the behavior of individuals, groups and institutions in society.

TYPES OF SOCIAL SCIENCE RESEARCH APPLICABLE TO NOAA

NOAA is a large and complicated organization with a complex mission portfolio. While there are many types of social science research that NOAA could profitably undertake, two categories are especially relevant.

- Programmatic: mission-driven social science research focusing on questions that provide background and operational information that will help NOAA define and effectively carry out the mandates of each line office.
- Organizational: institutional social science research focusing on providing information related to how NOAA and each of the line offices should be organized to enhance the ability to perform required services and produce necessary outputs.

Programmatic Mission-Driven Research

The line offices of NOAA can be divided into two general categories on the basis of the functions they perform.

The first category of functions is the provision of information to facilitate routine activities (e.g., navigational charts; satellite imagery), and to assist in decision-making (e.g., climatology, weather forecasting). The main emphasis of mission-driven social science research for line offices in this category should be assessments of the value and usefulness of the information they provide and mechanisms for enhancing that value. These assessments would evaluate actual and potential benefits that may accrue because people are empowered to make decisions and take actions based on the information. Ancillary to this emphasis is the determination of the cost-effectiveness of alternatives for providing information.

The NOAA line offices that fit into the information provision category are:

- National Environmental Satellite, Data, and Information Service (NESDIS)
- National Weather Service (NWS)
- Oceanic and Atmospheric Research (OAR)
- National Ocean Service (NOS): navigation and coastal hazard branches

The second category of functions is to regulate (or to assist other levels of government to regulate) human activities that affect marine and coastal resources. The rationale for the regulation is driven by statutory mandates (MSFCMA, ESA, MMPA, CZMA) for stewardship. For living marine resources, decisions absent regulation tend to result in misuse of these resources. The regulatory process also requires the provision of information on the current state and likely changes in various aspects of marine and coastal resources and the people and economic entities that use them.

The main emphasis of mission-driven social science research for line offices in this category should be to describe, assess and predict behavior of individuals, groups, and organizations that use or manage marine and coastal resources. Research should evaluate behavior under different regulatory and governance regimes and assess how this behavior will affect environmental, social, and economic variables. Further it should provide a means of ranking various policy alternatives on the basis of their potential to meet the mandates of applicable laws with respect to the environmental, social, and economic variables.

The NOAA line offices that fit into the regulation category are:

- National Marine Fisheries Service (NMFS)
- National Ocean Service (NOS): coastal community and habitat branches

Institutional (Organizational) Research

The performance of any organization, large or small, government or private, depends to a large degree on how it is organized. Who reports to whom? Who provides planning and feedback information, who receives information, who sets priorities and who makes decisions? Key to performance is whether incentives and motivations for members of the organization are compatible with achieving the organization's goals. What are the performance expectations for the organization and how are they measured?

Social science research on these and related questions can clarify relationships within and among organizations. It can contribute to management decisions within line offices through increased understanding of the constraints and opportunities facing NOAA. Social science research can also help administrators evaluate choices in making decisions about the allocation of scarce resources. It can provide insight into issues that permeate organizational operations, such as investment options, scale and scope of operations, returns on investments, evaluation of alternative mission strategies, performance outcomes, optimization, and influence factors (metrics for decisions).

III. STATUS OF SOCIAL SCIENCE IN NOAA: FINDINGS AND RECOMMENDATIONS

This section addresses the status of social science within NOAA, presenting two general findings as well as discussion, findings and recommendations for eight specific aspects of social science: literacy, research, data, staffing, senior representation, education and outreach, strategic planning and performance evaluation. Summaries of line office information and AA interviews are found in Appendices 1 and 2. Data and interview forms are in Appendices 3 and 4.

GENERAL FINDINGS

The Panel reviewed a large amount of information representing research, data, staffing, budgets, education, and management philosophies within the five line offices and the Office of the Chief Economist of NOAA. Extensive discussions of this information in the

context of the Panel charge resulted in a general understanding among Panel members of the position of social science within NOAA.

Although the AAs were receptive to discussing the role of social science within their line offices, many of the examples they gave of the present or potential application of social science within line offices lie outside the realm of social science. The answers revealed that AAs are sometimes not clear about where social science begins and ends, and are sometimes not capitalizing on opportunities for improved use of social science data. Social science may be considered to be anything related to people, including public relations, or to program justification, including accounting costs.

Social science can do more than simply calculate the value of scientific plans and programs, for example the frequently mentioned need for cost-benefit information. More fundamentally, social science can produce research results that help to identify the scope and content of science plans and programs. Instead of public relations and marketing, social science can contribute to enhancing a more informed and participatory constituency with education and outreach programs on constituent needs and expectations. Social science can also evaluate the degree to which NOAA products and services are satisfying constituent needs.

The Panel concludes that the position of social science within NOAA is weak. The line office budgets for social science research, education and staffing do not seem comparable to the social science budgets at other agencies with environmental assessment and stewardship responsibilities such as the US Forest Service, the Environmental Protection Agency, or the US Fish and Wildlife Service. The limited understanding of social science within NOAA leads to an inadequate investment in social science with respect to the NOAA mission that in turn hinders the contribution of social science to those missions. The panel arrived at two general findings.

General Finding 1: The capacity of NOAA to meet its mandates and mission is diminished by the under-representation and under-utilization of social science.

General Finding 2: Assistant Administrators are responsive to discussing opportunities for an enhanced role for social science within their line offices.

SPECIFIC FINDING 1: SOCIAL SCIENCE LITERACY

Discussion

The Panel used the line office data and AA interviews to assess the knowledge, depth of understanding and the potential contribution to line office missions of social science.

The line offices vary in the extent to which they are knowledgeable about social science disciplines or the utility of social science research and education, but in general, literacy about social science disciplines, their tools and methods and potential contribution to line office missions appears low across NOAA. It is common to equate social science

with sociology rather than to understand the term as inclusive of many disciplines pertaining to the study of human behavior and institutional performance. There appears to be more familiarity with the fields of anthropology, economics, geography and sociology than with demography, political science or psychology.

However, in the particulars, the line offices each identified areas in which application of social science research would contribute to decision-making. NMFS, charged with implementing legal mandates that have explicit economic and now social requirements, is well aware of the utility of social science research and education. Other line offices may not have working familiarity with the scope of individual social science disciplines but are aware of their need to have more effective communication of technical information, explicitly address risk, evaluate costs and benefits of new products, and understand cultural differences in processing information. Most also understand the utility of social science to their operations in the larger political arena.

Research on risk perception and behavioral responses, non-monetary valuation, effective communication, and interpretation of geographical information are social science areas that the AAs felt they needed. Additionally, the AAs recognize the importance of understanding their constituent base, being able to identify their needs and predict their responses. Stakeholder meetings are frequently used to assess constituent needs, but some AAs indicated that having more formal methods of obtaining stakeholder input and evaluation available to them would be helpful, as would a contact list of people with appropriate research expertise.

The AAs expressed in various ways the potential for social science to contribute to a more systematic evaluation of policy. Some mentioned experience with cost-benefit analyses of policy options but expressed skepticism about the utility and general acceptance of this methodology. Policy analysis is a rapidly evolving and growing area of research that takes a broader approach and can be conducted by interdisciplinary teams of anthropologists, economists, geographers, political scientists and sociologists.

Finding: Throughout NOAA, there is a lack of formal understanding of what social science is and what its contributions can be, leading to an organizational culture that is not conducive to social science research.

Recommendation 1: To improve the literacy and competency of NOAA leadership in social science, NOAA Assistant Administrators and senior management should initiate this process by participating in a workshop/retreat to review the scope of social science and to address the potential contribution of social science to NOAA missions. Through the use of university and external expertise to advise and inform, participants can collaboratively learn about social science in a non-threatening workshop environment. These workshops could also make good use of the wide range of relevant reports from the National Research Council relating to social science (e.g. on risk, human dimensions of global change, sustainability etc.)

Recommendation 2: NOAA leadership should establish goals and objectives for achieving social science literacy within the agency, including establishment of short courses, case studies, workshops and seminars. NOAA should develop a social science literacy project including curriculum development and workshops to address the general lack of social science literacy among the work force.

SPECIFIC FINDING 2: SOCIAL SCIENCE RESEARCH

Discussion

The Panel asked the line offices for information on annual expenditures for internal social science research and external grants and contracts in 2001. Additionally, in interviews with the AAs we asked about the types of social science used in their line offices, adequacy of existing social science information, and types of social science needed.

Expenditures

Internal funding of social science research in NOAA is small, ranging from .5 – 4.1 percent of total research budgets across line offices. Social science research accounts for a slightly larger share of budgets for external grants and contracts, ranging from <1 – 6.7 percent. Some units conduct social science research solely through outside contracting, for example, the Office of Global Programs (OGP)/Climate and Societal Interactions Program (CSIP) in OAR, which funds 25-30 social scientists annually, most receiving partial support and a few (3-5 post-doctoral fellows) receiving full support. Some such as NMFS do a mix of internal and external grants and contracts. A few projects considered external to a line office have been conducted through the office of the Chief Economist, for example an internal assessment of the economic benefit of improved El Niño forecasting funded by NOS, NWS and NESDIS (Weiher 1999).

It is the Panel's understanding that some line offices of NOAA have relied on cost-benefit studies conducted by external contractors to provide justification in the federal budget process in support of particular programs and technologies. We were not provided specific information on these projects as part of externally funded research. To the extent that NOAA relies on such contractor studies to "demonstrate" benefits in lieu of rigorous social science research that would lead to a better understanding of the conditions under which NOAA might more systematically connect its research with its stakeholders, the ability of social scientists to develop a systematic body of useful knowledge (e.g., via peer reviewed research) will be constrained.

Social Science Research Needs

In interviews, each of the AAs identified types of social science research used by their line offices, which varies according to the mission of the line offices. NESDIS identified a need for cost-benefit analyses, policy analysis, and market assessments of predictive capabilities. NMFS cited needs for regulatory analyses, as well as research to better understand human behavior, institutional and community structure, and the basic economics of commercial and recreational fisheries. NOS indicated a need for better

understanding of perceptions, attitudes and behavior, cultural differences in language, and expertise in survey instrument design. NWS cited a need for improved communication methods and more systematic assessments of user needs. OAR identified a need for cost-benefit analyses, for better understanding of how people use climate information, and knowledge about indigenous people's understanding of the arctic physical climate system.

Adequacy of Existing Social Science Research

When asked about the availability of social science to them, AAs indicated that the needed social science research was frequently unavailable within NOAA. For example, NESDIS would like to know the value of increasing the precision of weather forecasts, NWS would like to know how to improve communication of hazard information through better graphics, and NMFS would like more information on community effects of coral reef management in the Western Pacific. All line offices expressed the need for better understanding and communication with their constituents and for better tools to assess the value of their activities.

The constituent and regulatory context in which the line offices function make it apparent that social science should be extremely important to enhancing NOAA's organization. This context is characterized by increased demands for public participation in decision-making, by the challenge of effectively communicating findings that carry high degrees of both risk and uncertainty, and by legislative mandates such as the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA), and the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).

Position of Social Science Research in the Line Office

With the exception of OGP and NMFS, NOAA social science research is grafted onto physical and biological research agendas in ways that have both positive and negative implications. On the positive side, the close association between the physical, biological and social sciences may be conducive to genuine efforts to do interdisciplinary work on problems that are inherently interdisciplinary. On the negative side, the embedding of social science research within larger research agendas may mean that social science research is conceptualized and initiated by physical and biological scientists in ways that reflect their visions of the questions that social scientists ought to address and the methods to be used. Defining the scope of social science research in this way increases the likelihood of missed opportunities for productive social science research. Social science may also receive inadequate resources in a budget-constrained interdisciplinary environment managed by physical and biological scientists.

Multidisciplinary planning of research initiatives, developed by social scientists in collaboration with physical and biological scientists, could best identify crosscutting research issues with appropriate disciplinary involvement. It would be useful to have social scientists routinely involved in the planning of research initiatives to identify social

science opportunities early in the planning stages.

Finding: Two general categories of social science research are critical to the accomplishment of NOAA's mission: mission-driven and institutional (organizational).

Finding: Overall, NOAA's social science research effort is small and unbalanced across disciplines.

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

Finding: Cost-benefit studies of programs may meet short-term political needs, but a longer-term focus on social science would enhance NOAA's processes for prioritizing research and effectively connecting the results of that research with its stakeholders.

Recommendation 3: NOAA should acknowledge the need to have social science fulfill missing mission-driven and institutional research by having each line office and Headquarters develop a social science research plan that identifies research (including goals, objectives and outcomes) needed to support the NOAA mission and a strategy (cost, schedule performance) to implement it.

Recommendation 4: NOAA should document its agency-wide expenditures on external cost-benefit analyses conducted to justify programs and evaluate the degree to which such expenditures serve as a substitute for broader social science.

Finding: With one or two exceptions, there are no programmatic opportunities that target internal or external social science research.

Recommendation 5: Line offices should establish specific targets for social science research through reprogramming and new initiatives. Line offices should experiment with earmarking people and other resources to focus on social science research related to their missions, with a review of accomplishments after a period of five years.

Recommendation 6: The National Sea Grant College Program should accept a larger role in supporting social science research with the dual objectives of enlarging basic and applied social science knowledge and targeting mission-driven social science research needed by the line offices. This could be accomplished through set-asides of National Sea Grant themes and targets. In addition, Sea Grant should expand efforts to develop curricula and specific university programs to train additional social scientists in areas relevant to NOAA's mission.

SPECIFIC FINDING 3: SOCIAL SCIENCE DATA

Discussion

The Panel requested information from line offices on several aspects of social science data: expenditures, data characteristics, archiving methods, availability to researchers within and outside NOAA, opportunities for improved data use, and whether plans for collecting social science data existed.

Expenditures

It is difficult to derive more than a rough estimate of expenditures for social science data collection and management across the line offices. Social science data, with the exception of specific data sets within NMFS and some NOS and NWS projects, are embedded within larger data collection efforts and do not receive separate accounting. In addition, these larger data collection activities are further embedded in research project budgets.

For social science data collection and management that could be identified as separate activities, expenditures ranged from 2–7 percent of total data collection and management budgets.

Across the line offices, social science data holdings are diverse in coverage, frequency, quality, form of archiving, and type of access. The scale of data collection varies widely and not all data are geo-referenced.

Data Characteristics

NESDIS archives a range of environmental data suitable to support social science research. Two climate indices for the economy (the Crop Moisture Stress Index and the Residential Energy Demand Temperature Index) provide a time series of crop yield and energy usage. Indicators of world population distribution developed through observation of nocturnal lighting have potential application to a number of social science research questions. Data and information on laws, policies and markets for commercial remote sensing satellites are also held but not archived.

NMFS collects, manages and disseminates a variety of social science data to support a wide range of fishery management and protected species functions. These include data on fishery supply; trade; processing and wholesaling; cold storage; price and market information; demographics; community profiles; per capita consumption and usage; recreational participation and expenditures; attitudes and preferences; and employment. The largest recent systematic data collection has been cost-earning data from commercial fisheries and valuation and expenditure data on recreational fisheries. NMFS analysts also obtain secondary data from the Customs Service, Bureau of Census, Bureau of Labor Statistics and U.S. Coast Guard. Together these activities comprise a larger ongoing effort to improve the coverage and frequency of data collection and establish an integrated Web-enabled social science database.

NOS holds a wide range of social science data generated by various projects in natural resource damage assessments, changing uses of coastal ecosystems, public attitudes, demand for coastal recreation, submerged cultural resources, and marine sanctuary management. These data include geo-referenced demographic data on population, income, and housing, survey data on attitudes and beliefs, recreational trip expenditures, artifact location, socioeconomic uses of marine sanctuaries. NOS also sponsors an ongoing effort to archive economic data on the coastal and ocean economy and marine resources.

NWS collects data on storm impacts that are rough estimates of direct physical damage to property, crops, and public infrastructure. As estimates, the data do not represent an accurate accounting of actual costs, nor do they include all of the losses that might be attributable to flooding, but with augmentation and additional analysis they can be appropriate to social science research [www.flooddamagedata.org]. Also held is a twenty-year time series of data on estimated benefits and costs of hydrologic forecasting to various forecast uses such as water management, flood control, navigation and hydropower.

OAR holds no centralized social science data. These data remain held and archived within individual research projects. Metadata do not exist.

The Office of the Chief Economist arranges the collection of social science data through individual projects and contracts. Data held in this office include national survey data on uses and willingness to pay for weather information.

Archiving:

NESDIS archives, with some metadata, the climate indices, satellite imagery, and regulatory information. A large effort to convert all climate data to electronic form is underway. Although not social science data, they could be used by social scientists in research related to the human dimensions of climate.

NMFS is just beginning to develop a nationwide Fisheries Information System (FIS) to link existing and future databases maintained in regional, state and federal data warehouses, and to provide a common standardized format for future data collections. Using new start-up funds received in FY 2002, this effort is also intended to create relational links to non-social science data holdings to produce an integrated multidisciplinary source of fishery-dependent data. Commercial fishery databases are presently archived within each region, while recreational fishery databases are archived in NMFS Headquarters. For most data, metadata are just now being created as part of the FIS implementation.

NOS uses a variety of archiving methods: ranging from the National Data Center to CD-ROM at site offices, websites and Administrative Records. Metadata are available for some of the sanctuary databases.

NWS archives its social science data in report form, without metadata.

OAR does not archive social science data.

As a general rule social science data are not catalogued in the NOAA Data Directory. In contrast to the natural sciences, where sponsored research often requires submission of data for archiving, no such mandate exists in NOAA-sponsored social science. Therefore it is not surprising to find NOAA lacking a coordinated archive of its various social science databases. The absence of such an archive has limited the application of existing social science data.

Data Availability

In general, social science data held by the line offices are freely available to researchers within and outside NOAA. There are specific exceptions to open data access. NESDIS holds proprietary commercial satellite information that is restricted to within-government use. NMFS holds some proprietary fishing business data, with access governed by regulation. NOS holds some marine sanctuary data as confidential either for proprietary business reasons or for protection of cultural resources. Damage assessment data is held confidential during litigation.

NESDIS manages the National Virtual Data System portal as an access point to the three NESDIS Data Centers. Data are available as free downloads or for a nominal handling fee. NMFS provides access to centralized data holdings through its website and to regional holdings via contact with the holding unit. Outside the exceptions noted above, NOS data are available through the holding units. No access restrictions apply to NWS and OAR data.

Although the scientific value of social science data is enhanced when geo-referenced and collected at fine scales (e.g. the individual, household, or firm), social science researchers and government agencies have ethical and legal obligations to protect the privacy and rights of human subjects. Where data are collected at fine scales and fully geo-referenced, analyses must ensure the protection of privacy and the release of data at aggregate levels.

Improved Use of Social Science Data

The line offices were asked about opportunities to make better use of social science data.

The NESDIS mission is to make environmental data accessible, relying on researchers to add value to those data through research, for example in the growing field of risk assessment. The NESDIS effort to archive data is designed to improve access and availability to add value through research. Better use of the social science data is prevented in some cases by legal restrictions, such as restrictions on access to proprietary data that prevent the construction of metadata. There is some concern that OMB Section 515 regulations on data quality may restrict data availability.

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554) directs the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies." Within one year after OMB issues these guidelines, agencies must issue their own implementing guidelines that include "administrative mechanisms allowing affected persons to seek and obtain correction of information maintained and disseminated by the agency" that does not comply with the OMB guidelines.

NMFS identifies needed improvements in data coverage, both geographic and sectoral, that should be remedied through the implementation of its long-term comprehensive data collection plan. However, specific legal prohibitions to the collection of proprietary commercial or financial information economic data from fishery sectors contained in the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) have hindered NMFS' ability to perform the complete analyses needed for effective fishery management.

NOS indicates that close interactions with constituencies provide a means to identify areas of improving the use of social science data. NOS provides an example of the utility of having social scientists on staff who can identify opportunities to use existing data to address social and economic questions. Some uses of data are prohibited, for example, proprietary data within marine sanctuaries or data collected for damage assessments while litigation is ongoing.

NWS and OAR identify no particular opportunities for improved use of social science data or restrictions preventing better use of data.

For all the line offices, funding constraints and a lack of social science staff limit the better use of social science data, including data produced outside of NOAA (e.g. Bureau of the Census, Department of Agriculture, and international agencies). Areas in which improved use of social science data would be most immediately beneficial are in the capability to make improved policy choices by evaluating the tradeoffs in economic and social benefits of alternatives. This includes an expanded capacity to refute legal and political challenges and generate the support for key decisions regarding legislative initiatives, regulations, and new program initiatives. Additionally, the collection and archiving of more social science data is necessary to address current inadequacies in the ability to fully meet legislative mandates, such as socio-economic impact assessments, or performance assessments of NOAA programs. Performance outcomes, now being required of all Federal agencies, logically should include social science data. Geo-referenced social science data can be effectively linked to natural and biological data within geographical information systems to facilitate analysis of relationships and communication of information to stakeholders.

Social Science Data Plans

Of the five line offices, only NMFS has a formal social science data collection plan.

Finding: The lack of appropriate data limits the contribution of social science to NOAA.

- There is insufficient investment in ongoing collection and management of social science time series data including that collected outside NOAA but relevant to NOAA mission and operations.
- Few social science data are catalogued and archived in digital, retrievable and geo-referenced form
- Prohibitions on collecting economic data restrict regulatory analyses in fisheries

Recommendation 7: Within the next 12 months NOAA should inventory, document with meta data and formally archive its economic data holdings to ensure their integrity and easy access by government and public researchers and analysts. The Environmental Protection Agency (EPA) Office of Environmental Economics is in the process of archiving its economic data, an effort with which NOAA line offices could benefit from coordination.

Recommendation 8: NOAA Administrators should seek congressional support to rescind the prohibition on collecting economic data under the current MSFCMA Sections 303(b)(7) and 402(a).

SPECIFIC FINDING 4: SOCIAL SCIENCE STAFFING

Discussion

The Panel asked the line offices and AAs to provide information on existing social science staff, position responsibilities and staffing trends

Social Science Staff

Information provided by line offices shows the numbers of employees with social science expertise to range from 3-46. The social science proportion of total labor budgets or FTE is reported to range from .06 –7.4 percent. Some positions and areas of expertise identified by the line offices as social scientists fall outside standard definition of social science disciplines, for example librarians, public information officers and budget analysts.

Position Responsibilities

The responsibilities of those identified as social scientists include research, policy and planning, coordinating interagency projects, overseeing external contracts, program management, strategic planning and policy initiatives. Many are in management positions and do not directly participate in research, education or outreach. Accordingly, more people are identified as social scientists than are actually engaged in social science research and education.

Staffing Trends

With the exception of the Office of the Chief Economist, where the number of FTE has declined from 4 to 1 in the past 5 years, the trend in social science staffing is upward, although increases are small. A positive exception to the small numbers of social science staff is the National Marine Fisheries Service (NMFS).

NMFS developed a social science research plan in 1999 that included an assessment of the staff, data and research needed to fulfill its social science requirements. After several years of difficult effort, NMFS received some new funding to augment its social science workforce by 22% in FY01 and if additional funds become available expects to continue growth in social science staffing through FY09, with a goal of reaching 140 social science FTEs. NMFS is the exception in NOAA in having identified the need for additional social science expertise, developed a strategic plan to fill staff positions, secured appropriations, and begun to fill the needs.

Plans to Obtain Social Science Staffing

Each of the Assistant Administrators recognized a need for social science capacity and identified particular skill areas that contribute to their mission. The approach to obtaining additional social science capacity varied from enhancing in-house staffing to contracting with social scientists for specific tasks as needed.

External contracting for social science research requires a critical mass of internal social science expertise and competency to identify research needs, oversee research grants and contracts, promote application of research results and provide institutional memory.

To recruit social scientists to the workforce NMFS, in cooperation with Sea Grant, has developed a targeted scholarship program for PhD social scientists, developed MOUs with 5 leading universities in resource economics, and established National Research Council post-doctoral opportunities in economics. NESDIS has used the Presidential Management Intern Program as a means of recruiting social scientists.

Impediments to Obtaining Needed Social Science Staffing

Some impediments to obtaining needed social science staffing include reluctance to consider hiring social scientists, difficulties in recruitment and retention, and funding.

Having small numbers of social science staff in line offices has direct implications for professional development and retention. At the outset, a lack of in-house social science expertise to conduct the search, evaluation and decision process of filling social science positions can lead to suboptimal hiring. Once hired, social science staff may feel isolated in the line office without a critical mass for productive professional interactions. Social scientists are mentored and supervised and evaluated by non-social scientists who lack specific knowledge of performance standards or the contribution potential of social science disciplines. Additionally, much of NOAA's mission-driven social science is applied work and top-flight researchers are difficult to draw from universities since little cutting edge social science research is currently practiced in NOAA. One solution is to

use the model applied by some NWS and NMFS offices of co-locating social scientists or social science teams on or adjacent to university campuses.

Finding: NOAA's social science staffing is insufficient to meet the mission of each of the line offices.

- Small numbers and isolation of social scientists lead to fragmentation and prevent achieving critical mass. With few social scientists, mentoring, peer collaboration and intellectual stimulation are lacking.
- Social science expertise within NOAA is not of sufficient magnitude to influence the long-term research agenda.
- The impact of social science is diluted by the fact that staff are often hired, mentored, supervised and promoted by non-social scientists.
- There is no established career path for social scientists in NOAA and career advancement and professional development opportunities for social science staff are currently extremely limited.

Recommendation 9: Headquarters and each line office should evaluate the adequacy of its social science staffing relative to its mission and overall organizational needs similar to what NMFS has done.

Recommendation 10: Headquarters and each line office should jointly develop a plan to build core social science capacity that includes an implementation strategy, including evaluation of options to create social science centers of excellence to address the resolution of critical mass and isolation issues.

Recommendation 11: Headquarters and each line office should investigate opportunities for improving planning, communication and networking among its existing social scientists within and across line offices.

SPECIFIC FINDING 5: SENIOR REPRESENTATION

Discussion

The Panel asked the AAs whether their line offices had formal social science representation in the Directorates, whether social scientists had access to the directorate, and the extent to which social science contributes to the formation and evaluation of long-run goals and objectives.

Social Science Representation in the Directorate

None of the AAs indicated that they had a senior social scientist direct report in their Directorate with the function to represent social science perspectives. At the same time, each indicated that they had access to senior social scientists somewhere in their organization. All felt that the social science perspective was an important perspective in framing or shaping major decisions.

Whether social science was explicitly recognized as a criterion for evaluating new

initiatives, each of the line offices indicated an awareness of the social, economic and political context of their decisions. Many observed that explicitly and implicitly, decisions about new initiatives are framed in terms of their likelihood to contribute to social and economic welfare as expressed in line office missions and political forces. Despite how these decisions were framed, however, there was little evidence that actual quantitative social science data or analyses were available or used to assist in reaching their decisions.

As noted earlier, many people with social science training are not conducting social science but performing administrative and management functions. Although a disadvantage of this placement is that scarce social science expertise is not applied directly to research and education, there are also advantages to having social scientists in positions where their disciplinary perspectives can enter administrative decisions. However, without social science data or the time or responsibility to produce models and analyses, this social science expertise in the organization seems unlikely to contribute significant social science perspective to policy decisions.

Social Science Contribution to Long-Run Goals and Objectives

The extent to which social science contributes to the formation and measurement of long-run goals and objectives varies across line offices, but in general it plays a minor role. Some line offices are explicit about the minimal role for social science in long-range planning, while others see that social and economic components are embedded in their missions and focus areas.

Whereas social science may add little value to some issues, it contributes importantly to many others, and it adds a different way of framing questions. The perspective of social science contributes to the culture of the organization, which has been shaped by the preponderance of natural and physical scientists in senior line positions. The accessibility of social scientists backed by data and model analyses for advice and counsel lends importance to having social scientists at upper levels of administration as well as at levels where management and research functions are combined, as found in NOS and NMFS.

Finding: There are several social scientists at senior levels of administration. However, neither Headquarters nor the line offices have functional representation of social science in the Directorate in the form of a dedicated social scientist position.

Recommendation 12: Because of this remedial need to integrate social science throughout NOAA, NOAA should create a chief social scientist position in each line office with the explicit responsibility for developing, advocating and overseeing social science research that meets the mission-driven and institutional needs of the line office.

SPECIFIC FINDING 6: EDUCATION AND OUTREACH

Discussion

The panel asked AAs about the importance of knowing their constituents and the extent to which they can predict and measure constituent reactions.

Knowing the Constituents

Each of the AAs indicates that knowledge of their line office's constituency is critically important to achieving their missions. AAs consider this knowledge to be fundamental to understanding the diverse components of a constituent base, the regulatory and political context, the distribution of regulatory impacts, the definition of constituent demand for products, and the potential for value-added products.

Knowledge about constituents is generated in three general ways: direct contacts between staff and constituent groups, as in the case of NMFS, OAR and NOS, scoping workshops and public hearings, as in the case of NMFS and NOS, and surveys, as conducted by NESDIS, NWS, NMFS and NOS. Most of the AAs felt that despite these efforts, more information on constituents is needed.

Predicting and Measuring Constituent Reactions

Understanding constituents well enough to effectively predict or measure their reactions is an area in which, in general, capability is lacking. In the absence of systematic methods of measuring and predicting constituent reactions, a variety of methods are used to develop informal qualitative predictions. These range from unstructured constituent feedback to public meetings, advisory boards, regional office feedback, program reviews, and monitoring levels of regulatory compliance.

Although constituent surveys are used in some cases, two constraints on their effective implementation are worth noting. These are insufficient survey expertise and restrictions on government implemented surveys. To generate usable information, surveys require careful sampling design and instrument implementation. Over all the line offices, expertise in these methods is limited and identified by most AAs as a need. Conditions on the use of surveys arise from requirements under the Paperwork Reduction Act. These requirements were identified as cumbersome and a factor limiting the use of surveys. Within NMFS, all requests for such surveys have eventually been approved, but many there and elsewhere in NOAA continue to view the requirements as an impediment to social analysis. Additionally, surveys conducted through NOAA-funded university research require human subjects approval by university compliance offices, which can also be a lengthy and complex process.

Electronic surveys of those who access NOAA data and information via the internet and World Wide Web offer potential as a tool for identifying user needs, perceptions, and valuation of NOAA services.

While acknowledging the value of constituent surveys, public outreach and education

involves more than surveys. Outreach education is a process of effecting change in individuals, groups or organizations through the use of science-based information. A good example within NOAA is the Sea Grant Extension Program funded under OAR and implemented through a national network of 30 university-based programs conducting extension educational programming throughout the coastal and Great Lakes States.

Finding: NOAA Assistant Administrators recognize the need to better define and understand their constituents and communicate with them.

Recommendation 13: To enhance their efforts in public education and outreach, NOAA line offices should carefully evaluate their needs and identify existing programs in both government and the private sector where expertise in public outreach and education have proven successful, with which NOAA could collaborate to help meet those needs.

Finding: The lack of expertise in social science survey methodology and perceived obstacles to conducting surveys limits NOAA's ability to understand and communicate with constituents.

Recommendation 14: NOAA should organize a center of excellence in survey research, composed of social scientists trained in survey methodology, including on-line techniques. The unit would design, process and administer constituent surveys.

SPECIFIC FINDING 7: STRATEGIC PLANNING

Discussion:

The Panel asked the AAs about the existence of explicit social science goals and objectives in line office strategic planning. The Panel also reviewed each strategic plan to identify social science implicit in a line office's goals and objectives.

Explicit Social Science Goals and Objectives

Of the five line offices, NMFS is the only one to have developed a comprehensive, long-term plan for social science that provides an agency-wide framework for development and identifies targets for social science research, data and staffing. Social science is also embedded in the NOAA Fisheries Strategic Plan, where one objective is to increase long-term economic and social benefits to the nation from living marine resources.

Within other line offices, social science planning has only occurred within individual programs. The most significant program planning was observed in the Office of Global Programs (OGP) within OAR. Within OGP an Economics and Human Dimensions Program is directed at improving understanding of how social and economic systems are currently influenced by fluctuations in short-term climate, and how human behavior may be affected by information about variability in the climate system.

Implicit Social Science Goals and Objectives

In other strategic plans social science is implicit in goals and objectives that have obvious social and economic implications, for example the suite of National Weather Service goals to improve the accessibility of weather, water and climate information, develop integrated fire-weather products and services, integrate space weather forecasts into other services, and improve customer service. NESDIS lists a goal of improving understanding through outreach, with an associated program theme of saving lives and property through hazards support. OAR includes goals to enhance scientific information to promote effective environmental and economic decision-making, to create tools, technologies, and applications for societal and economic gains, to better characterize the human and natural influences on climate and assess risks on regional and global scales, and to foresee and characterize environmental changes that lead to global security issues.

NOS also lists goals that have economic and social components. These include to enhance the preservation and restoration of coastal and ocean environments through improved management, reduce the costs and risks to people, the economy, and natural resources from both natural and human-induced hazards, expand and improve navigation products and services, and to increase coastal communities' ability to adapt to changing conditions, resulting in a balance of environmental and economic benefits.

Whether explicit or implicit, there is social science content in each line office strategic plan that could serve as the basis for more specific social science planning activities that would fit the individual pieces of social science into the line office mission and into a matrix of social and natural science across line offices. Opportunity exists to do both broader planning for social science NOAA-wide, and more narrow specific planning for social science data and research within each line office.

Finding: With the exception of NMFS, social science objectives represented in line office strategic plans do not track into a long-term research agenda influenced by the social sciences.

Recommendation 15: In each line office, the new chief social scientist and the directorate should be responsible for incorporating explicit social science data, staffing and research objectives and performance measures in their line office strategic plans and annual operating plans.

Finding: Although line office strategic plans contain economic and social elements, with the exception of OGP and NMFS there is almost no long-term strategic planning for social science at NOAA.

Recommendation 16: Each line office should develop a social science research plan and ensure that it is integrated into the NOAA strategic plan through explicit as well as implicit social science goals, plans and outcomes.

SPECIFIC FINDING 8: PERFORMANCE EVALUATION

Discussion:

The Panel asked the AAs how performance is assessed in their line offices. The Panel also reviewed the Draft FY2003-2008 NOAA Strategic Plan to identify performance measures with social science content.

Requirement for Performance Evaluation

NOAA, like all federal agencies, is required by the Government Performance and Results Act of 1993 to measure its performance before it can submit its budget. Performance measures fall into three categories: 1) measures of effort; 2) measures of accomplishment in terms of output or outcomes; 3) measures relating effort to outputs or outcomes.

Each line office lists performance measures as part of its strategic plan and its annual operating plan. Many of these are expressed in terms of outputs, rather than outcomes, for example the number of fish stocks assessed (NMFS) or the products delivered within a designated time frame and quality standard (NESDIS). Some outcomes are assessed informally through constituent workshops (NWS) (NOS), through survey evaluations of user satisfaction (NOS) and through external program review, a method used frequently within OAR.

NOAA Goals

NOAA's draft FY03-08 Strategic Plan (January 2003) lists four Mission goals:

- Protect, restore and manage the use of coastal and ocean resources through ecosystem management approaches
- Understand climate variability and change to enhance society's ability to plan and respond
- Serve society's needs for weather and water information
- Support the Nation's commerce with information for safe and efficient transportation

Social Science Performance Measures Associated with NOAA Goals

Each goal is associated with performance measures expressed in terms of outcomes, many of which are social and economic, as the following example list of outcome measures illustrates.

Goal 1

- Increased socioeconomic value of the marine environment and resources (e.g., seafood, recreation, and tourism).
- Increased number of managed species that are at optimum levels.

Goal 2

- Increased use and effectiveness of climate information for decision makers and managers.

- Increased use of the knowledge of how climate variability and change affect commerce.

Goal 3

- Increased satisfaction with and benefits from NOAA information and warning services, as determined by surveys and analysis of emergency managers, first responders, resource managers, industry, government and the public.

Goal 4

- Increased use and effectiveness of environmental information for planning for marine, air, and surface transportation systems.
- Reduced number of and harm from navigation-related accidents due to grounding and allisions (hitting fixed objects)
- Increased number of ports where the environmental consequences of port development and operations are minimized.
- Increased number of ports with an improved vessel cargo carriage capacity due to use of NOAA's marine navigation information products and services.

The social sciences are necessary contributors to the measurement and assessment of these performance outcomes.

Finding: The application of social science is a necessary component of outcome-based program effectiveness measurement and monitoring in the FY2003-FY2008 Strategic Plan.

Recommendation 17: Use social scientists to lead the development of performance metrics or indicators of success in evaluating outcome effectiveness.

IV. A RESEARCH AGENDA FOR SOCIAL SCIENCE

The following social science research agenda is divided into the two basic categories of research identified as most applicable to NOAA. Mission-driven social science research focuses on questions that provide background and operational information that will help NOAA define and effectively carry out the mandates of each Line Office. Institutional social science research focuses on providing information on how NOAA as a whole and each of the Line Offices should be organized so as to increase the ability to perform the required services and produce the necessary outputs. These agendas are starting points for consideration in the creation of the Line Office social science research plans called for in recommendation #3. It is anticipated that in-house and contracted social science experts can turn these generic statements of need into specific line office implementation strategies and program initiatives.

MISSION-DRIVEN SOCIAL SCIENCE RESEARCH QUESTIONS

Research to Facilitate Routine Activities and Services

With respect to the information provision missions, the basic goal of social science research should be to ascertain the actual and potential value of the information they provide. This is measured in terms of the benefits that accrue because people can take actions or change their activities based on the information. The following summarizes the types of questions that will have to be answered to meet this goal.

1. Who are the current and potential users of the information?
2. What are the attributes of the information that are important (scale, timing, accuracy, etc.): for example, are there leverage points that appear to be most effective with different kinds of warnings?
3. How do people and organizations respond to the provision of information?
4. What are the implications of weather and climate forecasts for all sectors of the national economy and what is the relative value by sector of those forecasts?
5. What is the best way to package and transmit information so that it can be most easily understood and used by constituents?
6. Given the existing attributes of the information collection system, what benefits would result if some aspect were improved?
7. What types of education programs can change the way people and organizations respond such that program benefits are increased?
8. Being both a producer and procurer of products and services, how do your public sector operations differ from those in the private sector? Are there things to be learned from the private sector regarding marketing, product development, dealing with constituents, etc?
9. With respect to extreme events such as weather or high levels of variability such as fish populations, what sorts of advanced planning and understanding of vulnerability and adaptation can reduce uncertainty and expected damages?

Research to Support Regulation

With respect to regulation missions, the basic goal of social science research should be:

- to better predict how individuals, groups, and organizations that use or manage affected marine or coastal resources will behave in the absence of specific regulations, under different regulatory regimes, and specific regulations
- to trace how this behavior will affect environmental, social, and economic variables;
- to provide a means of ranking various regimes and regulations according to how they change behavior so as to meet the mandates of applicable laws with respect to the environmental, social, and economic variables.

The following summarizes the types of questions that will have to be answered to meet this goal.

1. What cultural, social, and economic factors determine the behavior of users of marine and coastal resources?
2. What is the value of market and non-market goods and services generated as users interact with marine and coastal resources and how are they distributed?
3. What effects will changes in user behavior have on the value and distribution of goods and services generated as well as on the resources, employment levels, value of output, costs of enforcement, etc.?
4. How does the behavior of different users directly affect the resource in question and what are the direct and indirect interrelationships between different users and different resources?
5. What sorts of behavioral and institutional changes are required to achieve desired improvements in the status of the resources and in overall resource utilization?
6. What types of regulations are best suited to accomplish the required behavioral changes, especially considering implementation and enforcement costs?
7. Taking into account the stochastic nature of the changes in marine resources, the limited understanding of and existing data on these resources, and the likely changes in user behavior under various regulatory and enforcement regimes, how can the use of risk analysis and procedures for decision making under uncertainty assist in developing regulation strategies?

8. What sorts of processes and institutional structures are most likely to develop regulations that will lead to required changes in user behavior?

Baseline Research

There are a large number of research projects that would help lay the groundwork to accomplish these more general research goals. Cross-line research offers potential benefits in many areas, for example the climate and water resources interaction. Of primary importance is the identification of the social and economic data necessary to answer the above questions (e.g., prices, demand, supply, consumer surplus, producer surplus, profits, employment, etc.), as well as methods for their collection, storage and retrieval.

Examples of other profitable research include:

1. What types of cultural ties and traditions do communities associate with marine resources, weather, and climate information: for example, fishing, boating, seafood consumption, self-employment life style, agricultural calendars, risk, or leisure planning?
2. What are the costs, benefits and potential mechanisms for preserving the cultural heritage and way of life of coastal and other communities that depend on healthy coastal resources and longstanding community adaptation to weather and climate variability?
3. What perceptions and beliefs do residents of coastal communities hold with regard to coastal resource health and federal, state and local coastal management policies?
4. What perceptions and beliefs do people hold about weather and climate information that affect their attitudes and behavior toward management and disaster response alternatives?
5. How do people perceive the effects of coastal and climate change on the natural environment?
6. What special places should be considered for conservation or protection in coastal areas?
7. Given the trends in the spatial distribution of U.S. population relative to the coasts, what land use regulations would best balance values of conservation vs. development in the next two decades? How might we control coastal and weather hazards as well as land-based pollution of the coastal ocean and global atmosphere?

INSTITUTIONAL (ORGANIZATIONAL) RESEARCH

In addition to mission-driven social science research, NOAA would be well served to apply social science research to the relationships among institutional constraints, organizational structure, and the requirements for effective task performance.

Institutions are systems of rules, decision-making procedures, and programs that give rise to social practices, assign roles to participants in these practices, and guide interactions among the occupants of the relevant roles (IDGEC 1999).

Organizations are concrete components of institutions which function simultaneously as actors and arenas wherein policies are made and implemented as a result of a wide variety of competing interests and motivations of the occupants who fill the roles referred to above.

Such a perspective suggests the following research questions where the dependent variable must be defined operationally to facilitate measurement.

1. How much of the variance in NOAA program outcomes is due to governing institutions vs. organizational design and functions?
2. Are there major disconnects between design and performance that suggest the need for significant efforts to re-arrange institutional structure or organizational design, or both?
3. What conditions appear to differentiate and explain those areas and functions in which NOAA performance is effective or ineffective? What policy options would be available for increasing the quotient of effective performance?
4. The large number of lawsuits that NOAA faces related to fisheries management suggests the existence of a basic pathology in the system. Where are the primary sources of difficulties and what alternative policy pathways might be identified to improve the situation (NAPA 2002; NRC 2002)?
5. What synergistic outcomes might be possible if all agencies in NOAA were to be more collaborative?
6. What design criteria does the analytic perspective outlined above suggest for creating a national climate service within NOAA?
7. What are the major institutional issues to be expected over the next two decades relative to the design and creation of the whole suite of NESDIS data products?

8. What barriers to the use of environmental data can be predicted? What combination of incentives can be devised to overcome these barriers? What types of educational programs could most effectively result in increasing social utility and actual use of NESDIS output?
9. How do the elements of the political infrastructure, including existing, sometimes conflicting, legislation affects the agency's ability to successfully accomplish its mission objectives. If problems are identified, can potential solutions be suggested?
10. What is the most effective balance of in-house versus contracted out research and operations?

V. BUDGET RECOMMENDATIONS

Given that the findings of this report reveal many unrealized opportunities where social science could contribute to NOAA's mission, and the willingness expressed in interviews of the Assistant Administrators to remedy these social science shortcomings, it is logical to present some budgetary implications of our recommendations. The following discussion, however, is no more than an approximation of the resources needed since with rare exception an assessment of the scale and scope of specific underlying research strategies and initiatives has not even begun to be undertaken by the line offices.

Nonetheless, based on Panel member knowledge of costs associated with research analogous to the recommendation contained in the research agenda, creation of a rough order of magnitude investment is possible. This profile is also influenced by knowledge of the relative magnitude of social science investments being made by other government agencies with environmental assessment and stewardship responsibilities. In an agency with the size and complexity of NOAA's mission, and given the recommendations and research agenda suggested in this report, it is reasonable to expect that NOAA could easily justify over the next 5 years an increase of \$100 million over the current \$3.3 billion budget to improve the competency and contribution of social science to achieving mission objectives.

To initiate this necessary improvement, NOAA's FY05 budget would need to include approximately \$21 million investment in new social science data, staff and research to start a multiyear social science program expansion.

Recommendation 18: Social Science Capacity: For line offices that do not have a social science research plan, 10 percent of the first year of this budget initiative should focus on obtaining a core competency of up to 10 senior social scientists across the line offices to assist them in the development of their social science data and research requirements and subsequent implementation. These scientists trained in the social

science disciplines would complete a nucleus of senior advisors and planning capacity that, in association with contracts or cooperative agreements with universities and other agencies, would develop a NOAA-wide implementation strategy for social science program development and workforce analyses.

Subsequent to the development of the strategy this group would be responsible for carrying out the strategy with the expected outcome of integrated line office research that will contribute social science perspectives to policy decisions through existing institutions such as the NOAA Research Council and NOAA Executive Council. Of most immediate benefit would be a more organized and accurate assessment of the baseline social science data and research that exists today, with new requirements identified by this gap analysis used to immediately lay the foundation for satisfying more specialized research goals in out-year budgets.

For Line Offices that have already identified their requirements using existing funding, the majority of the balance of funds (\$15 million) should be directed at implementation of their social science research plans. This would satisfy the \$13 million social science requirement identified by NMFS, and significantly improve the rigor and capabilities in the Office of Global Programs-Human Dimensions program. Remaining funds should be used as an incentive to seed program development in other line offices.

Recommendation 19: Center for Economic Valuation: To promote consistency and coordination across the line offices, \$2 million should be invested in a virtual NOAA Center for Economic Valuation that would coordinate, sponsor and disseminate research, data collection, survey methods, and derive and apply analytical models of the market and non-market values associated with environmental assessment and environmental stewardship policies. This effort would be organized and led by a partnership of NMFS, NOS, OAR and NWS. The virtual Center would capitalize on existing expertise and would provide a uniform focus, enable coordination across line offices and mission goals, and foster the transfer of knowledge, information and techniques to improve the economic literacy of NOAA. The Center would use expertise in economic valuation drawn from the economics profession as well as from other social sciences such as geography, anthropology and psychology. This investment would close a huge knowledge gap and vulnerability revealed by our findings. It would enhance NOAA's ability to have economics contribute to the policy decisions of the agency by evaluating benefits and costs of alternative policy choices in a scientifically credible manner, and examining the risks and distribution of the impacts of these alternatives. This investment ideally should be managed as a matrix program to be in conformity with recent trends in NOAA organizational structure. It directly addresses the mission driven social science research questions to support regulation as well as institutional research described in this section.

Recommendation 20: Performance Measurement: Recognizing recent advances in out-year planning and the new NOAA Strategic Plan's focus on accountability and performance management, \$2 million should be invested in strengthening NOAA's

ability to measure economic and social benefits and costs associated with program implementation and performance. This would include the development of performance metrics for major programs where none exist, and provide training in their use for program analysis and evaluation. This directly addresses the mission driven social science institutional research and research questions to facilitate routine activities described in this section.

VI. REFERENCES (not all cited in text)

Colgan, C. S. and T. Teisberg. 2002. *Using Economics in NOAA Performance Measures*. Unpublished report of the Office of the NOAA Chief Economist, April.

Extension Sea Grant. 2000. *Fundamentals of a Sea Grant Extension Program*. National Sea Grant College Program, Silver Spring, Maryland.

Hendricks, B. 2000. *Stewardship and Analysis: Preserving Nature and Communities*. Unpublished report to the Secretary of Commerce's Policy Office, January 6.

IDGEC (Institutional Dimensions of Global Environmental Change).1999. *Science Plan*, IHDP Report No.9, April. Bonn, Germany.

NAPA (National Academy of Public Administration). 2002. *Courts, Congress and Constituencies: Managing Fisheries by Default*. A report by a panel of the National Academy of Public Administration for the Congress and the U.S. Department of Commerce National Marine Fisheries Service. July. National Academy of Public Administration, Washington, D.C.

NRC (National Research Council). 1999. *Evaluating Federal Research Programs: Research and the Government Performance and Results Act*. National Academy Press, Washington, D.C.

NRC (National Research Council). 2001. *Implementing the Government Performance and Results Act for Research: A Status Report*. National Academy Press, Washington, D.C.

NRC (National Research Council). 2002. *Science and Its Role in the National Marine Fisheries Service*. National Academy Press, Washington, D.C.

NOAA, 2001. *The Nation's Environmental Data: Treasures at Risk*. Report to Congress on the Status and Challenges for NOAA's Environmental Data Systems, August.

NOAA. 2002. *NOAA Program Review Recommendations: Memorandum for the Honorable Donald L. Evans, Secretary of Commerce. Science, Service and Stewardship*. June

NOAA, 2003. *New Priorities for the 21st Century: NOAA's Strategic Plan for FY2003-FY2008 and Beyond* .

Weiher, R.F., ed. 1999. *Improving El Niño Forecasting: The Potential Economic Benefits*. NOAA Office of Policy and Strategic Planning.

VII. APPENDICES

APPENDIX I

LINE OFFICE SUMMARIES

APPENDIX I.A

NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE (NESDIS)

MISSION

To provide and ensure timely access to global environmental data from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment, and quality of life.

SOCIAL SCIENCE STAFFING

Numbers

In FY01, NESDIS identified 41 employees with social science expertise. Twenty-seven of these are librarians and budget/management analysts who would not ordinarily be considered to have social science expertise.

- Executive and Support Staff (3: chief of staff, constituent affairs, legal affairs)
- NODC Library (14: director, branch chief, librarians)
- Chief Financial Office/Chief Administrative Office (13: chief financial officer, chief budget officer, budget and management analysts)
- Office of International and Interagency Affairs (IIA) (11: office chief, branch chiefs, international relations specialists)

Responsibilities

- financial and administrative/management and operations
- policy and planning
- international and Interagency Affairs
- constituent Affairs
- public Affairs
- legal Affairs

Social scientists within NESDIS are largely administrators and managers with little direct research responsibilities. The percentage of time dedicated to social science research and education is negligible. The exception is the Office of International and Interagency Affairs (IIA), where specialists in international relations conduct some research on a case-by-case basis – roughly estimated at 3-5% of time.

Trends

In an effort to increase social science input into NESDIS, four Presidential Management Interns with international policy and economics backgrounds were hired between 2000-2001.

BUDGETS

Labor

\$3.9M for the 41 positions listed above, which is approximately 7.4% of the total labor budget.

Internal Research

Estimated for FY01 to be \$565K, approximately 4.1% of the total internal research budget of \$135.7M

Social science projects include:

- residential energy demand temperature Index;
- moisture stress index;
- nighttime lights of the world;
- education in social/scientific GIS; and
- economic analysis for the study of improved weather products
- benefits of improved satellite sensors

External Grants and Contracts

In FY01 the social science share of external grants and contracts was 1%, representing a \$160K cost-benefit analysis of improved weather products based on satellite data.

Data Collection and Management

Expenditures on social science data collection and management were not broken out of social science research expenditures listed above.

DATA AND INFORMATION

Characteristics

Some of the environmental data archived by NESDIS could support social science research and education.

- Climate indices for the economy: national indices for 48 contiguous states to enhance the understanding of the effect of weather and climate on vital sectors of the U.S. economy and society. Two indices represent crop yield and energy usage. The Crop Moisture Stress Index (CMSI) reflects the influence of severe drought and catastrophic wetness on annual crop yield for corn and soybean crops (1900 –present; one index time series for corn; one index time series for soybeans; one value per growing season). The Residential Energy Demand Temperature Index (REDTI) provides quantitative information on the impact of seasonal temperatures on residential energy demand (1895 –present; one index time series per month and season).

- Nighttime lights of the world: The Defense Meteorological Satellite Program provides a direct observation of a widespread human activity represented by nocturnal lighting. A variety of applications for nighttime lights data have been developed including: 1) improved spatial apportionment of population density, 2) independent estimation of electric power consumption and economic activity levels, 3) modeling impacts of development on terrestrial carbon dynamics, 4) monitoring heavily lit fishing boats (primarily squid fishing boats), 5) detection and mapping of fires, and 6) mapping the expansion of human settlements over time.
- Commercial satellite regulatory information: as the regulating authority for U.S. commercial remote sensing, NESDIS International and Interagency Affairs (IIA) maintains a variety of detailed information on: 1) commercial remote sensing satellite licensees (corporate structure, satellite system design and operations, business plans and market forecasts); 2) government laws, regulations, and policies for commercial remote sensing satellites; 3) the commercial remote sensing industry (market studies, policy risk assessments, news and journal articles, government-supported commercial remote sensing products and services).

Archives

Climate Indices for the Economy: The two indices, REDTI and MSI, are calculated and stored on a single Sun workstation. Data backups are on tape stored on and off-site.

DMSP imagery data have been archived on film (24x24) in a Federal records center in Boulder, CO.

The Climate Data Modernization Program (CDMP) is in the process of converting data archives to electronic format.

Commercial satellite regulatory data and information are stored in hard copy form on-site in NESDIS IIA. Digital files of many materials are also stored on a shared drive and on separate work stations.

Metadata

Metadata exist for some. There are 57 DMSP data descriptions currently in NOAA Server, and they are compliant with the FGDC standard. There are also descriptions for fisheries data.

Machine Readable Catalog (MARC) record entries exist for reports, CD-ROMS, and other products. The NOAA Central Library uses the MARC format to document their holdings. NESDIS is also planning to implement a cross FGDC-MARC metadata interface to ensure that MARC records are searchable via the NOAA Server.

The two climate indices for the economy meet FGDC requirements.

Access

Climate Indices for the Economy: no access restrictions. Indices are available via the web (www.ncdc.noaa.gov).

DMSP imagery: the National Virtual Data System (NVDS) (www.nvds.noaa.gov) is the current NESDIS portal to access holdings of the three NESDIS Data Centers. In general, all data holdings are available. Not all data holdings are available electronically, however, additional and new data are being added. Many data are available to the public as a free download. Other data are available for the cost of putting the data on appropriate media. For those data not electronically available, copies are made. Electronic access is not restricted with the exception of those countries currently on the Office of Foreign Asset Control (OFAC) list of sanctioned countries.

Commercial satellite regulatory information: much of this information is proprietary and may not be distributed outside the U.S. government. Access requests are made through NESDIS IIA=s Commercial Remote Sensing Licensing Team (713-2024 x.205).

NOAA Data Directory

The NOAA Server provides a distributed NOAA-wide facility for searching metadata that would point to data held across NOAA.

Criteria for Data Acquisition and Storage

A general criterion is to convert paper and other older media to meet current standards. A program addressing data conversion is the Climate Data Modernization Program (CDMP). The goal of CDMP is to take all of the NCDC hard copy resources and convert them into electronic format. DMSP alone is expected to take many years.

Acquisition of smaller data sets is on the basis of customer requirements, scientific needs, National Research Council recommendations and formal interagency agreements.

For the large array data sets, we are forming an interdisciplinary Science Advisory Panel to assist us in establishing priorities. We have requested the assistance of the NOAA Science Advisory Board.

There is no need at this time for prioritization of data acquisition and storage legal and regulatory information, given the limited amount of information and material generated to date.

Opportunities to Improve Use of Social Science Data

NESDIS' mission is to make environmental data accessible. We rely upon researchers in the academic community and private industry to perform "value-added" analyses of these data to address economic and social questions. NOAA's work toward an archive and access system is designed to improve the accessibility of data sets to the general public and to researchers. Examples of applications:

- The University of Delaware has combined NESDIS temperature and humidity measurements with hospital morbidity totals to develop a better heat index.
- After a major natural disaster, the National Weather Service sends a survey team to gather information and prepare a report. That team includes public health specialists, who combine NESDIS weather data with mortality and morbidity data from local hospitals.
- Researchers utilized AVHRR data and climate and health data to map the hanta virus in New Mexico in search of some predictive component for the onset of the virus. Data on variable soil moisture were used.

Other opportunities exist to make better use of data to address economic and social questions. The newly emerging field of risk management is beginning to use these data to help businesses mitigate the effects of weather and climate.

NESDIS IAA plans to support further technical and market studies for more informed regulatory decision-making.

Laws, Regulations or Policies Preventing Better Use of Data

Restrictions on proprietary fisheries data restrict the development of fisheries metadata.

OMB Section 515 deals with data quality for federal agencies. Concern has been expressed by the science community (e.g. NSF CODATA Committee) that the 515 regulations may inhibit the exchange of experimental data among researchers and may also cause undue burdens on agencies required to develop a process for estimating data quality.

Plans for Electronically Capturing Data in Paper Form

A program addressing data conversion is the Climate Data Modernization Program (CDMP). The goal of CDMP is to take all of the NCDC hard copy resources and convert them into electronic format. DMSP alone is expected to take many years.

Plans for Collecting Additional Needed Data

The National Environmental Data Index (NEDI) has as one of its searchable data types legislative information and technical reports; however, NEDI is a distributed metadata-based search system which does not in and of itself collect the actual data and information which are housed in various NOAA databases as well as multiple agencies outside of NOAA (<http://www.nedi.gov>).

There are and have been physical and resource limitations to collecting all environmental data information and products.

Cooperative Agreements

NOAA Funds were appropriated in FY 01 for work with Jackson State University to assist them in using weather and climate data and imagery to help state emergency managers manage the economic effects of severe weather. The project is ERAISA-Environmental Risks Assessment Integrative Systems Approach with GIS/RS.

Data Acquisition Plan

NESDIS does not have a formal data needs inventory.

APPENDIX I.B

NATIONAL MARINE FISHERIES SERVICE (NMFS)

MISSION

The mission of the NMFS is stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of their environment.

SOCIAL SCIENCE STAFFING

Numbers

In FY01, NMFS had approval for 46 social science FTEs: 39 economists; 7 sociologists/anthropologists.

Responsibilities

- management support
- analytical infrastructure development
- research
- professional services

Trends

In FY01 NMFS received approval to hire 10 additional social sciences staff. NMFS guidance was to hire one economist and one non-economist social scientist in each Science Center.

Prior to FY01, the Southwest, Alaska and Northeast Fisheries Science Centers added 1-2 staff positions each. Within NMFS Headquarters, six additional social science positions have been created (1 anthropologist, 5 economists) in the past five years.

Future planning for staff increases: the Agency has identified the need for a total of 140 social sciences staff (an increase of 96 FTEs over FY99 levels). These will be phased in over time, with an expected completion date of approximately FY01

BUDGETS

Labor

\$3.98M out of \$151.2M for the Agency as a whole: 2.6 %.

Internal Research

Percentage of internal research for social science relative to all science in NMFS is estimated to be $\leq 3\%$.

External Grants and Contracts

Estimated \$1.835M in external contracts out of an agency total of \$315.9M. This represents a share of $< 1\%$.

Data Collection and Management

FY01 expenditures on social science data collection and research were approximately \$1.25M: 2 % of total data collection and management expenditures

DATA AND INFORMATION**Characteristics**

- NMFS largest systematic data collection efforts of the past eight years focus on two primary areas: cost-earnings data collected from the commercial fisheries harvest sector, and valuation and expenditure data collected from the recreational fisheries harvest sector.
- For commercial fisheries, each NMFS region has conducted at least one cost-earnings survey (and some regions have surveyed several fisheries). The number of records and time period varies by survey. In addition, basic production and price data are recorded for commercial fisheries.
- The recreational fisheries economic data set includes socio-demographic data, valuation data, participation data, expenditure data, and conjoint data. The number of records and the time period of coverage vary by region
- Individual Science Centers and Regional Offices also have social science data sets ranging from community profile information to fuel prices at various ports to wholesale price information. These data bases are not centrally maintained or indexed.

Archives

For the commercial fisheries cost-earnings data, data are archived at the responsibility of the individual sponsor of the data collection and hence storage media and archive location varies from region to region. Implementation of the NMFS Fisheries Information System (FIS) will help to integrate copies of existing data bases and those collected in the future.

Recreational fisheries economic data bases are maintained in NMFS Division of Fisheries Statistics and Economics in Silver Spring. All data bases are created and stored in SAS and ORACLE format.

Metadata

Most data records are compliant with Federal Geographic Data Coordinating Committee (FGDCC) requirements or bridge to FGDC coding standards. For the most part, metadata do not exist for any of the NMFS social science databases.

Access

Data are generally available to other line offices and are obtained via personal contact with the original collector/sponsor of the data. The only restrictions that would apply to obtaining and using the data would be those dealing with confidential data, for which access processes are governed by statutory and administrative regulations and/or by NOAA Administrative Orders.

Data are generally available to individuals outside of NOAA. As with NOAA employees, access is through the individual data sponsor, and restrictions apply to confidentiality.

NOAA data directory

All data are not catalogued in the NOAA data directory.

Criteria for Data Acquisition and Storage

NMFS has put primary emphasis on the collection of commercial harvester socio-economic data since 1996. The majority of NMFS' social science is analysis for development of and amendments to fishery management plans, most of which involve commercial fisheries.

Recreational fisheries data have been funded from a Congressionally-mandated PPA. There have been insufficient funds to collect data beyond these two sectors in any systematic fashion. It is anticipated that in FY02, funds will be available to begin more systematic collection of community-level data to assist with National Standard 8 analysis (a relatively new requirement).

To date, no formal decision criteria have been used for social sciences data storage.

NMFS has not identified any significant social science data in paper form that would need to be rescued.

Opportunities to Improve Use of Social Science Data

Given current staff levels and available research time and funds, NMFS is making reasonable use of its existing data bases for the purposes of economic and social science analysis.

However, the databases are limited in geographic coverage, time frame (e.g., few time series of data exist) and sectors surveyed (e.g., mostly commercial harvest sector). As NMFS implements its long term plan to increase staff, data collection and research,

both the quantity and quality of social science analysis will improve to more thoroughly answer policy questions with social science implications.

Laws, Regulations or Policies Preventing Better Use of Data

The Magnuson-Stevens Fisheries Conservation and Management Act specifically restricts the collection of economic data at two points in the Act:

(1) Section 303b(7) states (emphasis added) “Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may ... require fish processors who first receive fish that are subject to the plan to submit data (*other than economic data*) which are necessary for the conservation and management of the fishery...”

(2) Section 402(a) states (emphasis added) “If a Council determines that additional information (*other than information that would disclose proprietary or confidential commercial or financial information regarding fishing operations or fish processing operations*) would be beneficial for developing, implementing, or revising a fishery management plan or for determining whether a fishery is in need of management, the Council may request that the Secretary implement an information collection program for the fishery which would provide the types of information (*other than information that would disclose proprietary or confidential commercial or financial information regarding fishing operations or fish processing operations*) specified by the Council...”

In other places, many types of data elements are listed as appropriate for collection for management purposes, but socio-economic variables are noticeably absent from the list. For example, Section 303(a)(5) states “Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, shall... specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors...”

These restrictions on socio-economic data collection have hampered NMFS' ability to effectively conduct complete analyses for management purposes, and have been discussed during Magnuson Act reauthorization meetings.

Plans for Collecting Additional Needed Data

NMFS has a comprehensive plan for data collection that spans the commercial and recreational fisheries harvest sector, the wholesale/processing sector, the retail/consumer sector and communities dependent on fishing and fishing-related activities.

Fully funded, the program will cost approximately \$5.5M. Management of the data will evolve as systems come online, but will be consistent with NMFS data management standards and quality assurance/quality control metrics.

Cooperative agreements

NMFS partners with several universities, institutes and fishery management commissions to conduct either social sciences data collection or research. These include:

Memoranda of Agreement:

- U. Maryland Agricultural and Resource Economics Department
- U. Delaware Graduate College of Marine Studies

Joint institutes:

- Joint Institute for Marine and Atmospheric Research: U. Hawaii
- Joint Institute for the Study of the Atmosphere and Ocean: U. Washington
- Cooperative Institute for Arctic Research: U. Alaska
- Joint Institute for Marine Observations: U. California

Cooperative Agreements:

- Gulf States Marine Fisheries Commission
- Pacific States Marine Fisheries Commission

In addition to these formal mechanisms, NMFS contracts regularly with members of the academic community to conduct research and analysis to meet social science analysis requirements. Most of the NMFS regions and Headquarters have strong ties with the universities located nearest them. Grants and contracts are routinely awarded to academics through programs such as Sea Grant, CMER and MARFIN.

NMFS and Sea Grant created a joint fellowship program in 1999 to support two Ph.D. economics students annually, for a two-year period. Fellows are expected to work with a NMFS social sciences mentor and use NMFS data to work on a dissertation topic of interest to NMFS. This not only exposes graduate students to NMFS but also usually engages their major professors in the work as well.

Data acquisition plan

Each NMFS region has prepared social science data needs documents over the past decade that serve to outline specific data needs by fishery or geographic region. NMFS HQ has summarized the costs of data needs by region in internal planning and budgeting documents and has published data needs at a general level in the technical memo *Our Living Oceans: The Economic Status of U.S. Fisheries, 1996*. In addition, some of the regional fishery management councils have prepared similar data needs documents that support collection of the same kinds of information.

APPENDIX I.C

NATIONAL OCEAN SERVICE (NOS)

MISSION

To be the Nation's principal advocate for coastal and ocean stewardship through partnerships at all levels. To support and provide the science information, management and leadership necessary to balance the environmental and economic well-being of the nation's coastal resources and communities.

SOCIAL SCIENCE STAFFING

Numbers

In FY01, NOS had a total of 20 social science staff: 12 economists; 1 geographer; 4 archeologists; 1 international affairs; 1 program development; 1 program analyst working in the following units of NOS:

- Coastal Services Center (CSC): 2
- International Programs Office (IPO): 1
- National Centers for Coastal Oceans Science (NCCOS): 1
- National Marine Sanctuary Program (NMS): 6
- Office of Response and Restoration (ORR): 8
- Special Projects Office (SPO): 2

Responsibilities

- program development and coordination
- research
- external project management
- protected area monitoring program development
- submerged cultural resources surveys and assessments
- natural resource damage assessments
- mapping and spatial analysis

Most, but not all, social scientists in NOS are research managers and administrators, with no direct research responsibilities. The exception is SPO, where both social scientists have direct research responsibilities. Economists in ORR have data collection responsibilities for specific natural resource damage assessments.

Trends

In the past few years, 5 economists, 1 geographer, 1 program analyst and 1 international affairs specialist have been added

ORR's Damage Assessment Center (DAC) has increased the number of economists on staff, reflecting an increase in the number of natural resource damage assessments being conducted. It was reorganized into regional branches composed of teams of economists and physical scientists. DAC expects to have eight economists on staff during FY02.

BUDGETS

Labor

16.5 FTEs + 3 FTE contract economists. \$1.55M labor costs; approximately 4.2% of total labor costs for those units that have social scientists on staff.

Internal Research

Estimated at \$1.023M plus \$175K for policy analysis. share of total internal funds ranges across units from 0 to a high of 10% for the National Marine Sanctuary program.

External Grants and Contracts

Estimated \$3.21M in external contracts and cooperative agreements (plus a share of \$100M for to states for implementation and improvement of coastal management programs): share of total external funds ranges across units from 1-20%.

Data Collection and Management

FY01 expenditures on social science data collection and management were \$1.64M, ranging across units from 0-10% of total data collection and management expenditures

DATA AND INFORMATION

Characteristics

- Socioeconomic data from >100 natural resource damage assessments (varies across assessments, but examples are data on recreational beach use, valuation of habitats, valuation of coral reefs, etc.)
- Changing uses of coastal ecosystems: examples are North Carolina social and demographic data; Pacific Northwest economic trends data that includes surveys of coastal residents and visitors.
- Public attitudes: examples are media representation of marine protected areas (MPAs); socio-economic surveys of environmental attitudes, beliefs and behaviors, life styles, wilderness values, forest management issues
- Demand for recreation: data to support recreational trip demand modeling,
- Archaeological data on ship location, artifact location, socio-cultural history.

- Socio-economic impact: data on impacts of management plans in marine sanctuaries. Performance metrics for marine protected areas.
- Spatial patterns of socio-economic use: Georeferenced data on population, housing, personal income and earnings from 1970-2000. Georeferenced economic and usage data on use of areas considered as MPAs.

Archives

No active archives are maintained, but data are housed in CD-ROM, print, web databases, etc.

All data collected under NCCOS sponsorship, including derived models, are archived temporarily with each Coastal Ocean Program until being transferred to a permanent archive at the National Data Center.

Other data are archived in computers at HQ and site offices. Survey data are archived on CD-ROM. Coastal and ocean resource economics program data will be available through a website.

Economic data collected by the ORR Damage Assessment Center (DAC) is stored in a contract deliverables archive. Since most of the economic data DAC collects is in support of natural resource damage cases/litigation, files are maintained for all cases and all data relevant to a given case may be found in them. In some instances, the data are also placed in Administrative Records.

Geo-referenced data are archived as Dbase and ArcView Shape files.

Metadata

Compliance with the Federal Geographic Data Coordinating Committee (FGDCC) requirements and existence of Machine Readable Catalog (MARC) records varies across units.

Many of CSC's products contain social science data as an informative tool within a larger project. Whenever a CD-ROM or publication contains such data, the appropriate FGDCC compliant metadata is included. There are MARC records for all of CSC's products and publications.

The formation of the metadata base for NCCOS models of west coast estuary health as an interaction between physical environment, socio-economic system, and biological systems has been delayed.

Metadata are available for some of the NMS databases. For all new projects, metadata is included. NMS is not familiar with MARC requirements.

ORR does not maintain any metadata.

Metadata are available for all SPO databases. It is not known if metadata meets FGDCC requirements or MARC standards. Product numbers are assigned to all publications and CD-ROMS.

Access

Most data are available to other line offices without restrictions. Means of access generally depends upon the data form: eg on line, CD-ROM, etc.

Some exceptions exist. Some marine sanctuaries data are proprietary or require permits in order to protect artifacts or other resources. NCCOS provides investigators first use of data before data are placed in the public domain. Data restrictions on data collected through ORR apply if the data are relevant to an active natural resource damage case. Once a case is completed, then the data are made available through a website, through the administrative record for a given case, or in hard copy.

Conditions for public access are similar to those for NOAA employees. The exceptions to unrestricted access noted above apply to public access.

NOAA Data Directory

The extent to which data are catalogued in the NOAA data directory varies across the units that collect social science data.

- CSC: if data sets are created, they are catalogued.
- NCCOS: all data are cataloged in the NOAA data directory.
- NMS: most data are not cataloged in the NOAA data directory.
- ORR: not aware of the existence of the NOAA data directory.
- SPO: not aware of the existence of the NOAA data directory.

Criteria for Data Acquisition and Storage

All NCCOS sponsored project data are acquired and stored. Each NCCOS principal investigator is responsible for data quality control before submitting it to the data archive system.

NMS has never had a systematic method for prioritizing data acquisition and storage. Acquired data are stored according to criteria established by the principal investigator of the project.

ORR prioritizes data acquisition and storage according to the needs of its cases, which are based on litigation strategies defined by the facts of each case and the judgment of the case team and program managers.

SPO archives all its data. Information that could support additional analyses are given higher priority for distribution.

Opportunities to Improve Use of Social Science Data

CSC makes a practice of continuously improving products and services through its project development process and through interactions with its clients. Having two social

scientists on staff increases CSCs ability to recognize opportunities to use existing data to address economic and social questions.

IPO works indirectly with coastal management sites to assist with socio-economic work. For example, IPO is working with regional organizations in Southeast Asia and the Caribbean to develop socio-economic monitoring programs for coral reef management.

NCCOS already requires its funded researchers to fully analyze the social science data and integrate these findings into the project results.

NMS needs additional expertise in data systems and information management to improve its ability to use data.

ORR would suppose there are, but it has not thought about them or seen anything written about them.

SPO sees opportunities to make better use of data that it facilitates by sending copies of data and documentation to university researchers and private consultants.

Laws, Regulations or Policies Preventing Better Use of Data

ORR is restricted in the collection and distribution of data by laws and regulations governing the conduct of complex litigation. Some of SPOs data are proprietary, for example data on fishing locations within a marine sanctuary.

Plans for Electronically Capturing Data in Paper Form

CSC has recently completed cataloging the Coastal Zone Information Collection and is finalizing its on-line availability. Some of these publications include social science information.

NMS does not currently have a plan for data capture or rescue, but there may be some data on submerged cultural resources to be captured.

ORR does not have social science data archived in paper form to the best of its knowledge.

SPO has many reports in paper format for which electronic formats have become outdated or lost. SPO maintains and distributes paper copies, but has no plans for making them electronic.

Plans for Collecting Additional Needed Data

CSC does not anticipate that there is additional data or information that it should collect other than meeting routine requests for social science information,.

NMS sees use for additional data but cannot change the type of data and information collected with available resources.

NCCOS has no plans for changing the types of data and information collected and managed by its office.

ORR has no specific plans for changing the types of data and information collected and managed by its office.

SPO continues to enter new partnerships to collect and analyze new information and will expect to make data and results of analyses available to the public. Future plans are to provide data and documentation on the Web. SPO is also exploring the possibility of placing interactive economic models of beach valuation on the Web to assess beach closures and water quality changes.

Cooperative Agreements

Memoranda of Agreement

- US Geological Survey's Center for Science Policy
- U.S. Forest Service

Cooperative Agreements

- Southeast Asia - University of Philippines
- Caribbean - Caribbean Conservation Association.
- Woods Hole Oceanographic Institution
- University of Hawaii
- University of Oregon, University of Washington, and Oregon State University
- Association of Environmental and Resource Economists
- Santa Monica Bay Restoration Foundation
- Broward County, Florida

Data Acquisition Plan

CSC does not have a formal data needs inventory. In general, such needs are identified and developed in several connected planning and implementation activities including the CSC strategic plan, annual operating plan, contract oriented statements of work, and project-level implementation plans.

NCCOS has a Coastal Ocean Program data policy but does not yet have a data acquisition plan.

ORR does not maintain an inventory of social science data needs, as the data requirements for its cases are constantly changing as the legal strategies evolve.

SPO identifies data needs in several documents related to monitoring and management of marine sanctuaries.

APPENDIX 1.D.

NATIONAL WEATHER SERVICE (NWS)

MISSION

To provide weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy.

SOCIAL SCIENCE STAFFING

Numbers

Three staff members of the Strategic Planning and Policy (SPP) Office have significant social science backgrounds (including law, economics, planning).

Responsibilities

NWS social scientists provide a broad range of strategic planning and policy issues for the organization.

Trends

The three positions named above were added in the past five years

BUDGETS

Labor

Three FTEs (out of a total > 4800) are associated with social science: .06%

Internal Research

\$50K (Office of Chief Economist) (out of a total >\$10M). Percentage of internal research for social science relative to all science in NWS: .5%

External Grants and Contracts

Estimated \$20K in external contracts out of an agency total of \$1700k: 1.2%

Data Collection and Management

FY01 Expenditures on social science data collection and activities were 7% of Advanced Hydrologic Prediction Services (AHPS) funds.

DATA AND INFORMATION

Characteristics

NWS collects data on impacts (damages and deaths) of storms, a component of the NWS verification program. Storm data have also been used in social science research.

Also collected are data on the benefits and costs of hydrologic forecasting to water supply, flood management, navigation and hydropower generation. These data cover the time period 1981-2000.

Archives

Data and information are archived in report form.

Metadata

Metadata are not provided.

Access

Within-NOAA access to data is via a published report *Use and Benefits of National Weather Service River and Flood Forecasts*, by the National Hydrologic Warning Council. Outside NOAA access to data is through the contractor, the National Hydrologic Warning Council.

NOAA data directory

Data are not catalogued in the NOAA data directory.

Criteria for Data Acquisition and Storage

None used.

Opportunities to Improve Use of Social Science Data

NWS has a contract to finalize and publish the above-referenced report

Laws, Regulations or Policies Preventing Better Use of Data

None

Plans for Collecting Additional Needed Data

NWS has no plans to collect additional social science data

Cooperative agreements

NWS has no formal memoranda of agreements, joint institutes, or cooperative agreements for social science data collection or research. However, NWS conducted several cooperative activities in FY01 with social science components:

NWS Office of Hydrologic Development

- worked with the National Safety Council to provide public understanding of NWS mission
- worked with the National Hydrologic Warning Council to prepare an economic

- benefit analysis of river and flood forecasts
- hired a social scientist to work in NWS Central Region with NWS customers and recommend user friendly Advanced Hydrologic Prediction Service (AHPS) products

NWS Headquarters

- supports the US Weather Research Program (USWRP), which includes socio-economic research
- commissioned the National Research Council to conduct a study on public-private partnerships in the provision of weather and climate services
- supports the American Meteorological Society (AMS) Education Program
- NWS COMET Outreach Program has funded some socio-economic research on communicating weather information and improving the effectiveness of hurricane warnings.

NWS Field Offices

- conduct collaborative social science research with universities. Examples:
- Penn State University Geographic Visualization Science, Technology, and Applications (GeoVISTA) Center project to develop weather data visualization formats to make weather information easier for users to understand and interpret.
- NWS Tropical Prediction Center (TPC) working with the International Hurricane Center on the sociological aspects of tropical cyclones
- NWS Storm Prediction Center working with the University of Colorado to determine the public impact of false alarms of severe convective storms

Data acquisition plan

NWS has no formal social science data acquisition plan.

However, in FY01 NWS established a Strategic Planning and Policy (SPP) Office. The policy portfolio of SPP routinely involves issues related to economics, political science and law. Examples include: domestic and international policies relating to the use and sharing of public sector information, participating in AMS workshop on atmospheric policy, and recognizing the need to improve the rigor of NWS policy analysis and use social sciences (economics, law, political science) to help set policy directions.

APPENDIX I.E.

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH (OAR)

MISSION

To conduct research, develop products, and provide scientific information and leadership to foster NOAA's evolving environmental and economic mission.

SOCIAL SCIENCE STAFFING

Numbers

In FY01, OAR had a total of 18 people spending at least portion of their time performing functions related to social science working in the following units of OAR:

- NOAA Research Headquarters (2)
- National Sea Grant College Program (2)
- Office of Global Programs / Climate and Societal Interactions (CSI) (11)
- Climate Diagnostics Center (1)
- Ocean Exploration Program (1)
- Office of Climate Observation and Services (1)

With the exception of one archeologist in the Ocean Exploration Program, people applying social science expertise are all in the Office of Global Programs.

Responsibilities

- social science program management
 - catalyze intellectual interactions on climate information
 - establish forums for interaction
 - facilitate transfer of climate information technology;
 - produce reports and documentation
 - interact with research communities and stakeholder communities;
 - design and run workshops, conferences, and training programs.
- research trends in research
- develop policy initiatives
- coordinate program reviews.
- provide decision process support

The majority of social scientists in OAR are research managers or administrators. Two exceptions are the OGP senior economist – 75% and the CDC Geographer – 100%.

Trends

Social science positions have been added in the past five years. Four positions have been added in the Office of Global Programs: Human Dimensions program manager

(1); RISA program manager (1); Applications program manager (1); and the Climate Information Project manager (1). A geographer position was added to the Climate Diagnostics Center. Ocean Exploration will add a marine archeologist in FY02.

BUDGETS

Labor

\$535K out of a total \$66,972K = .08% of budget spent on federal labor associated with social science

Internal Research

<1%

External Grants and Contracts

\$14.1M out of a total of \$211.1M = 6.7%

This figure includes funds from reimbursable accounts OAR receives (e.g. other agency funding, earmarks, etc.) It also includes the funds to pay the CDC social scientist whose salary is paid from OGP external grants. It does not include matching funds (e.g. Sea Grant university matching funds).

Data Collection and Management

OAR data collection and management funds are embedded in overall research funds in ways that make this computation difficult. In NOAA Research, social science information is collected and managed almost exclusively within the context of research efforts and therefore most of it resides with investigators.

- Sea Grant: a copy of every Sea Grant-supported publication is archived in the Sea Grant library at the University of Rhode Island.
- NOAA Climate and Global Change (C&GC): activities focused on observing physical climate parameters and the development of data sets on the physical climate system.
- The social science component of research on the human dimensions of global change is a small portion of the broader human dimensions effort within the US Global Change Research Program. NOAA in collaboration with NSF has invested some resources into a project focused on developing protocols for data gathering and comparative research in the area of land use patterns and human vulnerability to climate.
- NOAA's Ocean Exploration Program spent approximately 5% of the \$275K spent in FY01 on social science research on data management (\$13.75K)

DATA AND INFORMATION

Characteristics

Social science information is collected and managed almost exclusively within the context of research efforts and therefore resides with investigators.

Archives

Archiving is done within the context of individual research projects. No archiving is done within OAR.

Metadata

Metadata do not exist.

Access

Data and information are available to NOAA line offices and to those outside NOAA through publications, the investigator, or on the Internet. No restrictions apply.

NOAA Data Directory

Social science data are not catalogued in the NOAA data directory

Criteria for Data Acquisition and Storage

Because most data reside with investigators, acquisition and storage criteria are not an issue. However, in recognition of the need to develop useful data for global change research, NOAA has collaborated with NSF to develop protocols for data gathering and comparative research on land use patterns and human vulnerability to climate.

Opportunities to Improve Use of Social Science Data

Sea Grant Extension is one potential avenue for improving the use of social science data in addressing economic and social questions. Extension programs are typically university-based educational programs that seek to apply knowledge and understanding gained through research to aid individuals and groups. Sea Grant Extension agents combine expertise in biology, sociology, economics, public policy, and engineering and work directly with people in coastal-related communities to solve specific problems.

Laws, Regulations or Policies Preventing Better Use of Data

None

Plans for Collecting Additional Needed Data

Socio-economic data produced through Sea Grant projects are usually captured for a given purpose on an ad-hoc basis. There are a limited number of databases that have been built up over time from which to draw for studies or analysis.

Cooperative Agreements

OGP uses cooperative agreements and joint institutes for implementing many of our projects.

Cooperative Agreement

- University of Arizona. (Southwest Regional Integrated Sciences and Assessment (RISA))

Joint Institutes

- Joint Institute for the Study of the Atmosphere and Oceans (JISAO) (Pacific Northwest RISA)
- Rosenstiel School of Marine and Atmospheric Science (RSMAS) (Southeast RISA)
- Joint Institute for Marine Observations (JIMO) (California Applications Project)
- Cooperative Institute for Research in Environmental Sciences (CIRES) (Western Water Assessment RISA)

Data Acquisition Plan

OAR does not have a social science data needs inventory. For OGP, data needs are identified in the National Research Council report of *Making Climate Forecasts Matter*.

APPENDIX I.F.

OFFICE OF THE NOAA CHIEF ECONOMIST

SOCIAL SCIENCE STAFFING

Numbers

In FY01 the NOAA Chief Economist is the single social science position in the Undersecretary's (US) Office.

Responsibilities

- economic advice and analysis for the US, the Deputy US, the Assistant Secretary for Oceans and Atmosphere, and other staff office heads, including the Chief Financial Officer and Budget Director
- in-house consultant to the NOAA line offices for economic analysis, particularly analysis of the benefits of NOAA programs and cost-benefit analysis of proposed program
- initiatives.
- organize projects funded by NOAA line offices using academic and research economists to produce peer reviewed products

About 80% of the Chief Economist's time is devoted to economics.

Trends

In the past five years the staff numbers have declined from four (chief economist plus three senior economists) to one.

BUDGETS

Labor

Approximately \$170K

Internal Research

FY01 research funding from NOAA sources is \$610K, with funds obtained from line offices for the following projects:

- NWS: Benefits of Hurricane Forecasting (\$25k); Benefits of Heat Wave Warnings (\$25k)
- NESDIS (IPO): Benefits of Improved Weather Products (\$100k); Benefits of Improved Polar Satellite Sensors (\$ 50k)
- OAR (Sea Grant): Chesapeake Bay Economics (\$25k)
- NMFS: Chesapeake Bay Economics (\$25k)
- NOS: Chesapeake Bay Economics (\$25k)
- US (Sust Dev): Chesapeake Bay Economics (\$25k)
- NMFS: Economics to Improve Habitat Protection (\$85k)

- US (PSP): Benefits of Forecasts in Electric Utilities (\$25k); Economics to Improve Performance Measures (\$25k)
- US (Deputy US): Analysis of Significant Economic/Environmental/Social Science Trends for NOAA (\$200k)

External Grants and Contracts

In FY01 funds from outside NOAA total \$75K for the following projects:

- Inter-American Dev Bank : Cost Benefit Analysis of Latin American ENSO Warnings \$65k
- Navy (ONR): Benefits of Ocean Observing Systems \$10k

Data Collection and Management

No direct data collection outside of individual projects and contracts.

DATA AND INFORMATION

Characteristics

- national survey data of American households on uses of weather information and willingness to pay for improved weather products
- developing options for enhanced and focused economic research and analyses

APPENDIX 2

**ASSISTANT ADMINISTRATOR PERSPECTIVES
ON SOCIAL SCIENCE**

APPENDIX 2.A.

ASSISTANT ADMINISTRATOR PERSPECTIVE

NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE (NESDIS)

Gregory W. Withee

Senior Policy Advice and Counsel

Criteria used to evaluate new initiatives

- NOAA priorities
- technical feasibility
- costs, risks and benefits
- potential to add to social or economic welfare

Role of social science in major decisions

- assessment of costs and benefits to inform key policy decisions

Role of social science in long-run goals and objectives

- decisions framed in context of socio-economic impacts
- issues identified through discussions with administrators and other internal people, for example the International/Interagency group
- social science a component of all decisions, because of NESDIS' mission

Representation of social science in senior administration

- Chief Financial Officer
- Chief of Staff
- Chief of International and Interagency Affairs
- Legal staff

Access of social scientists to Directorate

- lawyers, CFO, Chief of Staff, and the International/Interagency group (including Presidential Management Interns who are social scientists) have direct access.

Resource Allocations

Criteria to evaluate new initiatives and reprogramming resources

- monies for large programs are very long-term investments not usually reprogrammed
- exciting new ideas encouraged by NOAA can be leveraged with smaller amounts of money; e.g. initiative on national hazards strategies.

Direction of new expenditures

- achievable goals/technical feasibility
- who is impacted
- who benefits
- costs, risks and benefits

Social sciences are not likely to be used directly in evaluation of options.

Factors used in decisions about resource allocations

- NOAA priorities
- costs and schedules
- decisions are often more qualitative than quantitative

Commitment to social science

- Process of trying to envision the future, and his needs for the future, and keep the staff that would help him get there.
- Social scientists would probably be very helpful in the future

Strategic & Research Planning

Social science goals or objectives in strategic plan

- meet customer requirements
- identify implications of climate change
- enhance environmental prediction and stewardship
- analyze economic value of information
- marketing goals
- data quality objectives

Role of Social Science in Agency Business Plan

- estimating the value of products, e.g. geostationary satellites
- better contract interface with users and better utilization of services.

Importance of social science knowledge of constituents

- very important
- the regulatory framework is shared with the commercial sector
- assessed through surveys
- need more input on coastal data issues
- need more information on constituents

Predicting constituent reactions

- no systematic or routine capability
- government surveys are difficult and cumbersome to implement
- public meetings to get input for predictions
- would like to develop predictive capabilities

Measuring constituent reactions

- questionnaire administered to users of products
- information compiled and fed back into services

Assessing program performance

- each contract or category of service has performance indicators (e.g. % products and services delivered within a certain time frame and with defined quality of delivery)
- Offices and Centers develop the performance indicators
- Chief Financial Officer leads the performance exercise.
- no outside review panels
- obstacles to external assessment include the process requirements of the Paperwork Reduction Act and the Federal Advisory Committee Act.

Availability of needed social science

- needed information sometimes unavailable; e.g. the value of increasing accuracy of weather prediction from one day to 10 days.

Social Science Capacity

Agency need for social science

- cost-benefit analyses
- policy studies to help prioritize areas
- market analysis for predictive capabilities.

Needed social science capacity

- political analysts
- economists
- lawyers
- social psychologists
- risk assessors
- contact list for assistance in these areas would be helpful

Impediments to obtaining social science expertise

- none specified

Targeted social science training programs.

- Presidential Management Interns process is being used to get more social scientists. A career path has been created to enhance the job opportunities to attract the best interns

Recent addition or deletion of social science positions

- added one PMI to the International Group (now have 3)

Social science milestones in operating plan

- no specific milestones, such as adding a certain number of social scientists, but there are goals and themes that require such additions for the strategic plan.

APPENDIX 2.B.
ASSISTANT ADMINISTRATOR PERSPECTIVE
NATIONAL MARINE FISHERIES SERVICE (NMFS)

William T. Hogarth

Senior Policy Advice and Counsel

Criteria used to evaluate new initiatives

- legal mandates
- regional council priorities
- external reviews

Role of Social Science in Major Decisions

- assessing distribution of impacts of fishery regulations
- fast response analysis to high profile issues
- potential benefits from more routine social science

Role of Social Science in Long-Run Goals and Objectives

- minimal
- resources used for immediate requirements
- long-range planning a luxury

Representation of Social Science in Senior Administration

- no formal social science representation in Directorate
- social science coordination at Directorate a possibility

Access of Social Scientists to Directorate

- no formal arrangement
- review of draft social science reports
- open door policy

Resource Allocations

Criteria to Evaluate New Initiatives

- urgent issues
- regulatory requirements
- legal mandates
- litigation needs

Direction of New Expenditures

- stock assessment capacity
- social science capacity
- fulfillment of NEPA requirements
- informal rather than formal needs assessment

Factors Used in Decisions About Resource Allocations

- identify weak areas
- identify potential benefit to management

Commitment to Social Science

agency mandates:

- improve measurement of fishing capacity
- describe community and social structure
- predict the effects of limited entry programs.

Strategic & Research Planning

Social Science Goals or Objectives in Strategic Plan

- NMFS Social Science Plan
- specify needed social science
- specify needed social science disciplines
- preliminary hiring schedule

Role of Social Science in Agency Business Plan

- implicit in improving preparation of EIS documents

Importance of Socioeconomic Knowledge of Constituents

- critically important
- allows assessment of differential impacts
- level of information is generally insufficient across fisheries

Predicting Constituent Reactions

- public hearings
- individual comments
- extrapolation from the past
- stakeholder meetings
- regional analyses

Measuring Constituent Reactions

- levels of compliance
- variability in compliance
- potential benefit of ombudsmen to get unfiltered information from constituents

Assessing Program Performance

- measure number of regulations implemented
- do not measure the results of regulations or to compare to predicted results

Availability of Needed Social Science

- frequently unavailable
- e.g. community effects of coral reef management in Hawaii
- e.g. effect on catch of reducing the shrimp fleet by 15%
- social science not a priority in the past

Social Science Capacity

Agency Need for Social Science

- regularly discussed at NMFS Leadership Council
- existing Social Science plan to increase expertise

Needed Social Science Capacity

- provide management support
- perform applied research
- understand human behavior
- understand institutional and community structure
- understand basic economics of the commercial and recreational fishing sectors.

Impediments to Obtaining Needed Social Science Capacity

- Congressional reluctance to fund
- ability of the market to supply enough individuals with appropriate training

Targeted Social Science Training Programs

- scholarship program for Ph.D. social scientists

Recent Addition or deletion of Social Science Positions

- addition of social science positions
- plan to add more social science positions

Social Science Milestones in Operating Plan

- yes

APPENDIX 2.C.

ASSISTANT ADMINISTRATOR PERSPECTIVE

NATIONAL OCEAN SERVICE (NOS)

Margaret A. Davidson

Senior Policy Advice and Counsel

Criteria used to evaluate new initiatives

- additive or synergistic effect.
- contribute across the NOS/NOAA mission, not socio-economic *per se*

Role of social science in major decisions

- updating management plans for marine sanctuaries
- non-fish ecosystem components
- sanctuaries vs fisheries

Role of social science in long-run goals and objectives

- minimal
- not used in the navigation and coastal stewardship portfolios
- trying to build coastal economics data into long-term objectives
- educational objectives influence long-term planning

Representation of social science in senior administration

- no formal social science representation in Directorate
- no one available to consult on socio-economic consequences

Access of social scientists to Directorate

- direct contact

Resource Allocations

Criteria to evaluate new initiatives

- potential for additive or synergistic effect
- potential to contribute across the NOS/NOAA mission

Direction of new expenditures

- cost-benefit analysis

Factors used in decisions about resource allocations

- mission objectives

- potential to foster collaboration
- the politics

Commitment to social science

- increase joint efforts
- foster a sustained effort between sanctuaries and coastal management
- contribute to urban waterfront revitalization

Strategic & Research Planning

Social science goals or objectives in strategic plan

- no specific social science goals or objectives

Role of Social Science in Agency Business Plan

- plan to hire professional facilitators
- GIS specialists
- studies: socio-economic study of reefs, beach valuation, market and non-market values, economic value of water quality changes

Importance of social science knowledge of constituents

- very important
- assessed through biennial NOS customer survey

Predicting constituent reactions

- advisory boards and technical committees
- scoping workshops
- customer orientation and feedback
- diverse feedback loops

Measuring constituent reactions

- unstructured feedback of constituent complaints
- listening to constituents

Assessing program performance

- workshop evaluations
- user satisfaction questionnaires on products
- assess states' view of federal performance
- developing performance metrics in cooperation with partners and clients
- ad hoc consultations

Availability of needed social science

- frequently unavailable

Social Science Capacity

Agency need for social science

- regularly discussed
- will be discussed more over the next year

Needed social science capacity

- sociologists and anthropologists
- understanding of perceptions, attitudes, and behaviors
- expertise in survey instrument design
- understanding cultural cues in language

Impediments to obtaining social science expertise

- reluctance of people to consider hiring
- difficulties in recruitment and retention

Targeted social science training programs.

- none

Recent addition or deletion of social science positions

- no set-asides for addition or deletion

Social science milestones in operating plan

- no

APPENDIX 2.D.
ASSISTANT ADMINISTRATOR PERSPECTIVE
NATIONAL WEATHER SERVICE (NWS)

John J. Kelly, Jr.

Senior Policy Advice and Counsel

Criteria used to evaluate new initiatives

- political criteria
- public perceptions
- regional advice

Role of Social Science in Major Decisions

- analysis of economic value of the Advanced Hydrologic Prediction System
- assessment of public and political concern over extreme flood events

Role of Social Science in Long-Run Goals and Objectives

- assessing the best balance of responsibilities between the government, universities, and private sector in providing information (NRC study)
- improving communication of information to users is a high priority (external research grants)

Representation of Social Science in Senior Administration

- no formal social science representation in Directorate

Access of Social Scientists to Directorate

- through the Office of Strategic Planning and Policy
- legal and policy advice on data issues is increasingly important.

Resource Allocations

Criteria to Evaluate New Initiatives

- An objective method to analyze policy options is lacking. Economic analyses are hindered by measurement problems, and some lack credibility.

Factors Used in Decisions About Resource Allocations

- cost
- data improvements
- skills enhancement
- political impact

- ease of management implementation
- power of the argument

Commitment to Social Science

- core forecasting mission has priority
- social science to support forecasting mission is important

Strategic & Research Planning

Social Science Goals or Objectives in Strategic Plan

- improving communication of information.

Role of Social Science in Agency Business Plan

- developing a customer satisfaction index
- improving graphical format and communication
- assessing workforce effectiveness and satisfaction

Importance of Socioeconomic Knowledge of Constituents

- critically important
- constituency becoming more diverse
- shift from weather to climate outlooks brings in different user needs

Predicting Constituent Reactions

- needs improvement
- no systematic way of gathering information other than surveying the user community, which involves waiting for OMB permission.

Measuring Constituent Reactions

- local offices, through the warning coordinator who keeps in close contact with users.

Assessing Program Performance

- informal feedback from regional offices
- regional and national workshops provide feedback from users of NWS services

Availability of Needed Social Science

- need improved understanding of new constituencies
- need improved communication of graphics, probabilities and decision strategies

Social Science Capacity

Agency Need for Social Science

- communication of information
- assessment of user needs

Needed Social Science Capacity

- people with skills in management, administration and education
- long-term grants and agreements with social scientists.

Impediments to Obtaining Needed Social Science Capacity

- none identified

Targeted Social Science Training Programs

- none identified

Recent Addition or deletion of Social Science Positions

- new positions in leadership training, distance education and organizational development will add social science expertise.

Social Science Milestones in Operating Plan

- none identified

APPENDIX 2.E.

ASSISTANT ADMINISTRATOR PERSPECTIVE

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH (OAR)

David L. Evans

Senior Policy Advice and Counsel

Criteria used to evaluate new initiatives

- suitability of research to meet missions of the service branches of NOAA.
- readiness: are the prospects good for successful applied research?

The guiding philosophy is that about half of what OAR does should be usable in the short run within the service-oriented parts of NOAA (internal customers). The other half should be building a foundation so that they will be able to meet the research needs of those same internal customers when they come to OAR five years in the future.

Role of social science in major decisions

- Decision to develop an energy sector initiative was motivated by understanding of the social and political context.
- OGP research on climate and social Interactions will be used to determine what climate information to provide and how to present it.

Role of social science in long-run goals and objectives

- social issues related to NOAAs mission drive the science agenda.
- social components of OARs three principle focus areas: weather and air quality, climate, and ocean and costal resources
- economic and needs analysis have had a large influence on planning the weather and climate program.

Representation of social science in senior administration

- six senior social scientists on staff provide advice as needed
- grants and contracts for social science research and coordination

Access of social scientists to Directorate

- some direct contact

Resource Allocations

Criteria to evaluate new initiatives

- suitability of research to meet missions of the service branches of NOAA.
- readiness: are the prospects good for successful applied research?

Direction of new expenditures

- social and political relevance of research programs (perceived need)
- prospects for scientific progress that would serve agency needs

Factors used in decisions about resource allocations

- qualitative intuition
- scientific feasibility
- NOAAs mission needs

Commitment to social science

- The commitment to work on climate-related topics has grown in recent years because OAR believes that knowing how people use information is an important part of knowing how to provide it.
- Funding has come mostly from reallocating existing money, not from new money. Under more limited budgets, would not foresee reducing such commitments disproportionately.

Strategic & Research Planning

Social science goals or objectives in strategic plan

- Goals are stated more in terms of social goals than scientific ones. Examples: “Enhance scientific information to promote effective national, state, and local environmental and economic decision-making.” “Foresee and characterize the environmental changes that lead to global security issues.” The research goals and objectives follow from there and include social sciences as needed.

Role of Social Science in Agency Business Plan

- no explicit plan

Importance of social science knowledge of constituents

- direct contacts between NOAA staff and constituent groups to assess needs and opportunities
- social science expertise is brought to bear either from within the agency or through grants and contracts when the agency needs to go deeper into economic or social issues
- Examples of assessing constituent needs
 - working with Western water managers to better understand their needs; e.g. timing of snowmelt forecasts for dam managers
 - roundtable of energy sector CEOs to identify types of information that would be valuable
 - research on the value of El Niño forecasts in northeastern Brazil.

Predicting constituent reactions

- OAR involves constituents at the outset in deciding what sorts of new products or programs to pursue
- common sense approach used rather than social science

- some cost-benefit analyses are done but they are not very compelling
- environmental research choices are much more disaster driven

Measuring constituent reactions

- frequent reviews of research programs with attention to outputs and impacts
- involvement of constituents in reviews

Assessing program performance

- frequent external reviews of research programs with attention to outputs and impacts
- continual internal review of OAR products

Availability of needed social science

- more relevant to regulatory agencies.

Social Science Capacity

Agency need for social science

- leaders of specific projects look for expertise and data when needed
- scientists get social input by coordinating with affected interests
- social scientists are called in for specific tasks

Needed social science capacity

- economists: cost-benefit analysis
- sociologists and anthropologists: understanding use of climate information
- anthropologists: indigenous people understanding of arctic physical climate system and its history.

Impediments to obtaining social science expertise

- no impediments identified
- reluctance of people to consider hiring
- difficulties in recruitment and retention

Targeted social science training programs.

- none
- program managers obtain needed expertise

Social science milestones in operating plan

- Sea Grant has three specific milestones related to the social sciences.
- The climate program has specific milestones related to the social sciences

APPENDIX 2.F

CHIEF ECONOMIST PERSPECTIVE

Rodney F. Weiher

Project funding:

- funding for various projects secured primarily from the Line Offices (LOs)
- process: a LO may request help or a proposal may be submitted to a LO for how economics could help justify programs and budgets to DOC, OMB, and the Hill.

Administration Focus

The administration places a high priority on performance-based management. A project funded by Headquarters is looking at how economics can be used to improve NOAA's performance measures. Existing NOAA performance measures are generally well defined in terms of output measures, but output is not connected with the economic benefits of the program. Evaluation of whether the output is achieved in a cost-effective manner is lacking, since costs are generally not considered.

Increasing the Role and Visibility of Economics in NOAA

The NOAA Undersecretary wants to emphasize the role of economics, particularly economic benefits and cost benefit analysis, in NOAA programs and operations. In addition, there is overall receptivity throughout NOAA to the uses and role of economics that provides a window for increasing visibility of the field within NOAA.

Options include adding a new position at Headquarters, such a third deputy assistant secretary (Deputy Assistant Secretary for Environmental Economics) to increase and formalize the role for social science within NOAA. Such a position would eliminate the need to find people personally inclined to support social science and make visible to sister agencies that NOAA takes seriously the economic dimensions of its activities. This person could demonstrate the use of economics in advising the administrator in his dealings with Commerce and the other agencies such as EPA, DOI, NSF, and NASA

A headquarters economics staff presence, working with Line economists, could also promote uses of economics in NOAA for evaluating the benefits of a program upfront, for measuring program performance, and for budgeting.

Currently, there is a lack of economic assessment of new program initiatives being advanced during the budgeting allocation process. Proposed initiatives should include cost/benefit analyses, or at least considerations of costs and benefits, and a requirement that budgets have a socio-economic component as part of the normal NOAA initiative process. This may include meeting with the chief economist and other economists in the Line to sort out the economics in advance, well in advance (two

years) of the budget submission to NOAA, to ensure that analysis is actually integrated into the proposal. The line offices would probably be receptive to this since they are sensitive that they now generally lack any real cost-benefit calculations in their budget submissions.

There are three types of economic analysis most useful to NOAA:

- Value of information, particularly the benefits of improving weather, climate, and other environmental forecast systems.
- Environmental economics, particularly quantification of non-market values of NOAA stewardship resources for decision-making.
- Understanding the role of incentives (how people anticipate and react) to regulatory and other management initiatives.

Social Science Education

Educating the NOAA staff and state and local coastal and marine planners and managers, including NGOs, is useful and very well received. Examples done through the office of the chief economist:

- Seminars on environmental economics done for national CZM.
- Workshops on economic for NWS staff
- Workshops on environmental economics for Minority Serving Institutions
- Series of about 12 workshops around the country for state and local coastal and marine planners and managers introducing economics (willingness-to-pay, trade offs, cost-benefit, economic impact analysis, etc) and environmental valuation concepts and tools (travel cost, CV, etc) and how it could be used in coastal management. About 50-60 people attended each workshop.
- Series of regionally oriented projects. One with the Northeast-Midwest Institute, using leading university environmental and natural resource economists in the region, and with broad stakeholder participation, produced a book on the value of Great Lakes resources – a Handbook on Economic Valuation and Environmental Economics. Additional projects in South Florida, New England, the Chesapeake Bay and California are underway. NMFS, NOS, and Sea Grant have funded these regional efforts.

Building Economics and Social Science Capacity Within NOAA

Economics and social science capacity could be built within NOAA in different ways for different line offices:

NMFS: well underway building economics and social science capability, both in terms of budget and FTE

NOS: build a comparable in-house effort to NMFS: 10-12 FTE to focus on valuation of coastal environmental resources, economics in management plans for sanctuaries,

CZM operations, etc. FTEs would likely be most effective at the AA level to maintain visibility, cross agency capability, and critical mass. NOS needs basic databases on coastal resources, such as the National Center for Coastal and Marine Environmental Economics project, where people go for economic information on the coasts and fisheries.

EPA is building expertise at its National Center for Environmental Economics that should be done by NOAA

NWS, NESDIS, OAR: strengthen Headquarters economics staff to undertake and coordinate economics work for these line offices. It probably isn't efficient for these Line Offices to try to develop an in-line economics capability nor would such capabilities likely be visible or self-sustaining in the organization.

The chief economist should have a large enough staff to manage externally funded projects effectively, rather than build up a large (ERS-type) in-house staff to conduct the research. A lot of this work can and should be done by university researchers, as is currently the case. The reason for the focus on external researchers is to produce work of peer review able quality that has credibility in the field, as opposed to contracting with "Beltway Bandits". It also maintains the ability to respond to changing needs.

As the build-up of economics progresses, there will be a need to bring in social scientists of other disciplines, like people who do risk assessment. Within NMFS and NOS, there is a clear role for "other" (non-economics) social science. Within Headquarters the first priority is economics, to address the value of information, cost and benefits, and project evaluation.

Strengthening economics and other social sciences to a useful level would not require that NOAA become a large economics agency. It requires a relatively small amount of funding. The point can be made that this type of research is essential to what NOAA does.

APPENDIX 3
LINE OFFICE DATA REQUEST FORM

DATE:

TO:

FROM: Susan Hanna, Chair
The NOAA Social Science Review Panel

SUBJECT: Request for Information

The NOAA Social Science Review Panel, a working group of the NOAA Science Advisory Board, is now engaged in its review of social science within NOAA. The review consists of an examination of the types and level of social science research funded by NOAA, including social science staffing, budgets and data and information.

For purposes of this review, the panel is using the following definition of social science and social science data:

Social science: the process of describing, explaining and predicting human behavior and institutional structure and change in interaction with their environments. Includes the fields of economics, anthropology, sociology, geography, political science, social psychology, and law.

Social science data: economic, demographic, legal/regulatory and socio-cultural data.

At the first panel meeting on October 24, 2001, the five line offices presented overviews of their missions and the role of social science in meeting those missions. We are following up that overview presentation with a request to each line office for further information on social science staffing, social science budgets, and social science data and information.

We request that you direct the following questions to the appropriate person within your line office. In answering the questions, please use FY 2001 as the base year. It would also be helpful to note any significant changes expected for FY 2002.

Please address your reply in writing to my attention and forward it no later than December 31st to Sean Conley, Science Advisory Board Staff, SSMC 3, Room 10734. Mr. Conley can be contacted at (301) 713-9121, extension 137.

cc: Line Office Liaisons to the SAB

STAFFING

1. How many people in your line office have expertise in the social sciences? Please list their titles and position responsibilities.
2. What sorts of services do staff social scientists provide to your line office?
3. Has your unit added or deleted positions for people who have expertise in the social sciences in the last five years? If so, please specify the positions and numbers.

BUDGETS

We are interested in determining what current investments you are making in social science by understanding what part of your budget is dedicated to social science. We do not need to know this in great detail or with high precision, but we want to be able to answer the following questions:

- How much of your labor costs are associated with social science?
- What part of your internal research funds is dedicated to social science?
- What share of your external funds in contracts, grants, cooperative agreements are social science in nature?
- How much of the funding you currently spend on collecting and managing data is for social science?

We understand that asking for budget data is fraught with peril whenever the request asks for a crosscut where data are not organized in that fashion. Furthermore, we understand that the NOAA budget organizes expenditures into several major categories called object classes such as labor and benefits, contracts/grants/cooperative agreements, travel, etc. At a higher level of aggregation, budgets are summed across object classes into task codes, which define a particular unit or block of work. Further aggregation of task codes occurs to create line items, which we commonly see in public documents such as the NOAA Budget Blue Book and Congressional Appropriation Reports.

Thus, in the context of the definition of social science provided above, we'd like a best estimate of the total direct costs dedicated to/associated with NOAA social science by line item for each line office, broken out by these functions/purposes:

1. people (federal employees vs other, consistent with FTE request above);
2. external contracts/grants/cooperative agreements;
3. internal research;
4. policy analysis;
5. information collection and management.

DATA AND INFORMATION

1. What are the social science data and information holdings within your line office? Please describe the following for each social science data set:
 - data elements
 - data characteristics (# records, time period, geographic area/scope)
2. How are data and information archived? Please specify storage media and location of archive.
3. Do metadata exist? If so, are they compliant with Federal Geographic Data Coordinating Committee (FGDCC) requirements? Are there Machine Readable Catalog (MARC) record entries for reports, CD-ROMS, and other products?
4. Are data and information available to other line offices? What is the process for access? What restrictions apply?
5. Are data and information available to non-NOAA employees? What is the process for access? What restrictions apply?
6. Are all data catalogued in the NOAA data directory?
7. What criteria do you use for prioritizing information and data acquisition and storage?
8. Does your line office have historical NOAA social science data in paper form that needs to be captured/rescued? If yes, what is your plan to do this?
9. Are there opportunities to make better use of existing data to address economic and social questions? If so, how?

10. Are there existing laws, regulations or policies that prevent better use of the data? If so, what are they?
11. Are there any social science data or information sets not currently being collected that should be added to your data collection program? What are your plans, if any, for changing the types of data and information collected and how they are managed?
12. Do you have any Memoranda of Agreement, Memoranda of Understanding, Cooperative Agreements, Joint Institutes or other similar instruments between your line office and the university community in the areas of social science? Please provide a list.
13. Do you have an inventory of social science data needs or an equivalent document referencing social science data needs for your agency that outlines the information necessary to carry out your mission?

APPENDIX 4

ASSISTANT ADMINISTRATOR INTERVIEW FORM

NOAA Social Science Review Panel

Interview Questions for NOAA Assistant Administrators

December 2001

Through his introductory remarks to the NOAA Social Science Review Panel during the first Panel meeting on October 23, 2001, Scott Gudes indicated that social science is found throughout NOAA. The Panel is following up on the line office presentations made that day to help complete the environmental scan of the current role and use of social science in NOAA today.

Through this interview process, the Panel will be trying to obtain a better understanding of the NOAA organization and how social science is integrated into NOAA business decisions. What are the pressing social science issues being addressed today in the areas of data, research and decision making? How is social science utilized in determining senior policy advice and counsel, allocation of resources, and strategic and research planning? How does your line office assure necessary social science capacity and competency? Being aware of the answers to these questions, how might the NOAA organization of the future look or behave differently? Whereas the list of questions sent to you with the recent memorandum looks into the specific line office metrics such as FTE counts and budget numbers, the interview questions will focus on questions of social science in the larger context of line office organization, process and structure. Panel members will be interested in your thoughts and reflections about social science at NOAA, rather than having answers prepared by your staff.

For purposes of this interview, the Panel is using the following definition of social science:

Social science: the process of describing, explaining and predicting human behavior and institutional structure and change in interaction with their environments. Includes the fields of economics, anthropology, sociology, geography, political science, social psychology, and law. “

The panel has also distributed a separate questionnaire to research social science data and specific Line Office metrics such as FTE counts and specific budget numbers. However, in the interview process the panel will instead focus on questions of social science in the larger context of Line Office organization, process and structure.

A general outline of inquiry and specific interview questions follow. It is expected that the interview will take about two hours.

General Outline of Inquiry:

A. Senior Policy Advice and Counsel

B. Resource Allocations - existence/role of social science criteria?

1. Execution and allocation of annual budgets and FTEs

C. Strategic & Research Planning - how does social science influence?

1. Formulation of agency priorities
2. Creation and support of new initiatives – budget and FTEs
3. Performance measurement/metrics
 - a. Evaluating program effectiveness- program reviews & evaluations
 - b. Tools - Benefit cost analyses, Returns on Investment, policy analysis
 - c. Customer and product/service scans – needs and satisfaction levels

D. Social Science Capacity/Competency - is there an existing plan?

1. Recruitment/retention/incentives
2. University partnerships
3. Data
4. Social science consciousness

Specific Questions

A. Senior Policy Advice and Counsel

1. Choices are always being by senior managers to support or advance certain programs, projects or initiatives. What criteria do you generally use to evaluate the merits of new initiatives? Are the same criteria applied to requests for additional FTEs?
2. Can you tell me about some major decisions that have been made within your unit in the last six to 12 months? Did social sciences play any role in those decisions? If so, what information was used? Where and how was it obtained? If not, was this because there was inadequate social science information available, because the social sciences were irrelevant, or for another reason?
3. Administrators are often responsible for developing long-run visions that must balance multiple and sometimes competing objectives. What role does social science play in helping you craft and achieve your Agency's long-run goals and objectives? If that role is currently being filled, describe how? If it is not, describe any impediments you face preventing your envisioned role of social science.
4. Organizationally, how is social science advice and counsel obtained by the Line Office Directorate? Do you have senior-level social scientists either on staff or under contract? Are they available to you to consult with on the social/economic

consequences of Line Office policy decisions you routinely make? (for example, evaluating and approving new research agendas/programs; approving new product and service deployments; evaluating and approving new regulations)

5. Do the most senior social scientists in your Agency have direct access to the Directorate? Are they direct reports?

B. Resource Allocations - existence/role of social science criteria.

1. In evaluating the merits of new initiatives and how to support new products or services, what criteria are used in evaluating the option to reprogram existing resources to meet these new needs?
2. If you had \$1M to spend on one new program, and you were deliberating between three options, what factors would you use to evaluate the options and make your selection? Would you use social sciences in the process of evaluating your options?
3. If you had to list three factors you use most frequently to assist you in making decisions on a daily basis, what would they be? Are these factors usually measured quantitatively or qualitatively? Describe your Agency's capability to quantify these for you.
4. In a climate of more limited budgetary resources, would your unit be likely to increase or decrease its commitments to research and educational efforts in the social sciences? Can you say a little more about what sorts of criteria would come to bear in such a context?

C. Strategic & Research Planning - how does social science influence?

1. Does your strategic plan contain any specific social science goals or objectives coincident with your Agency's mission?
2. Does your Agency's 3-5 year implementation or business plan contain any strategies and/or activities for the contribution of social sciences to your agency's mission?
3. When developing new products, initiating new programs, or passing regulations, how important is it to you to understand the socio-demographic characteristics of your Agency's constituents and the economic implications of the decisions to be made? How much detailed information do you currently have on your constituents? What are your sources for such information? Do you feel you have enough information about them?
4. How do you predict your constituents' reactions to new products, new programs or new regulations? How do you use that information *before* taking action?

5. Do you measure your constituents' reactions and levels of satisfaction after implementation of your Agency's products and services, programs or policies/regulations? How do you use that information?
6. Does your Agency attempt to measure the performance of its programs and/or regulations? If so, how? Do social scientists (internal or external) serve as members of the review panels?
7. Have there been times when you asked for social science information to aid in making a decision and found that it was not available? What kind of information did you seek? Why was it not available?

D. Social Science Capacity/Competency – is there an existing plan?

1. Has a need for social scientists or social science data been discussed within your agency?
2. What disciplines of the social sciences do you think could help most in achieving your agency's mission? What are the major impediments to obtaining this expertise?
3. Are there targeted programs to recruit, train and/or retain social scientists in your Agency?
4. Has your agency added or deleted positions for people who have expertise in the social sciences in the last five years or so? If so, what criteria were applied in choosing to add or delete positions?"
5. Does your Agency's annual operating plan or equivalent currently have any specific social science milestones that are being tracked by your management?