

MAFAC Commerce Subcommittee – Budget Prioritization

Data collection, research and surveys

- A. Fisheries Research and Management Programs (Ecosystem Assessment Programs *only*)
- B. Expand Annual Stock Assessments
- C. Economics and Social Sciences Research
- D. Fisheries Statistics
- E. Fisheries Information Networks
- F. Survey and Monitoring Projects
- G. Fisheries Oceanography
- H. National Standard
- I. Observers & Training
- J. Antarctic Research
- K. Climate Regimes & Ecosystem Productivity
- L. Cooperative Research
- M. Information Analyses & Dissemination
- N. Marine Resources Monitoring, Assessment & Prediction Program
- O. Regional Studies

Please rank the relative importance of the follow:

Prioritization Table

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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Scale: 1 – Extremely; 2 – Very; 3 – Strongly; 4 – Moderately; 5 – Equal; 6 – Moderately Less; 7 – Strongly Less; 8 – Very Less; 9 – Extremely Less

MAFAC Priority Subject Area Crosscut – NMFS FY 2008-2012

Data collection, research and surveys

Fisheries Research and Management Programs*: Under the authority of the Magnuson-Stevens Act (MSA), and other fisheries legislation, the Fisheries Research and Management Program budget line supports activities and staff working on eliminating overfishing and rebuilding overfished stocks. This is essential to ensuring biological sustainability and to increasing long-term economic and social sustainability of fisheries. The funds are used to coordinate with other NOAA programs to deliver products and services, including basic and applied science for the analysis and decision-making that support ecosystem approaches to fisheries management and enforcement to ensure compliance with regulations. ***Although the Fisheries Research and Management includes Fisheries Research and Management Programs, National Catch Share Program, Expand Annual Stock Assessments - Improve Data Collection, Economics & Social Sciences Research, Salmon Management Activities, Regional Councils and Fisheries Commissions, Fisheries Statistics, Fish Information Networks, Survey and Monitoring Projects, Fisheries Oceanography, American Fisheries Act, Interjurisdictional Fisheries Grants, National Standard 8, Reduce Fishing Impacts on Essential Fish Habitat (EFH), Reducing Bycatch, and Product Quality and Safety, this exercise is based on the Ecosystem Assessment Program's (EAP) portion of the Fisheries Research and Management Programs.***

Fisheries Oceanography: NMFS' resource management focuses on the connectivity of managed living resources with their predators and their prey, their habitats, and the effects of environmental variation within a determined ecosystem. Humans are also considered to be part of these ecosystems. The ecosystem approach to management relies upon research and analyses that integrate biological, socioeconomic, environmental, and oceanographic data into predictive models that improve the Nation's forecasting capabilities for resource management. NMFS's use of an ecosystems approach increases the ability to make scientifically sound management decisions that are less prone to risk and more likely to succeed. Improved scientific analyses ensure that constituents receive the most accurate and complete analyses, thereby fostering a constructive public stewardship process. The Fisheries Oceanography line includes two programs: Integrated Ecosystem Assessment (IEA) and Fisheries and the Environment (FATE).

- **Fisheries and the Environment:** FATE is a research program to advance the understanding of environmental impacts on living marine resources in order to improve information available to stock and ecosystem assessments. FATE projects analyze the response of living marine resources to environmental change, including the development of ecosystem indicators, construction of new forecasting models, and development of techniques to incorporate ecosystem indicators into stock or ecosystem assessments.

- **Integrated Ecosystem Assessments:** The IEA program offers a mechanism to enhance advice to better manage the Nation's resources to achieve economic and societal objectives. Building upon research conducted under other programs, like FATE, IEAs are a dynamic, iterative, and adaptive process that includes the analysis of diverse ecosystem information to manage and conserve essential parts of an ecosystem and ecosystem processes. Through a multi-step approach that includes scoping of specific management issues and objectives with stakeholders; use of indicators to assess ecosystem status and monitor trends; and ecosystem modeling to evaluate management alternatives, IEA's provide a sound scientific basis for ecosystem-based approaches to the management of living marine resources. The resulting

analysis and Management Strategy Evaluations provide resource managers with information to make more cost-effective and informed management decisions in an ecosystem context.

Expand Annual Stock Assessment (EASA): One of NMFS's core functions within the Agency is to provide accurate fish and shellfish stock assessments with timely updates, which are also a critical foundation for successful catch shares programs. This activity is used to determine the changes in abundance of fishery stocks in response to fishing and to forecast future trends of stock abundance and sustainable fishery yield. These assessments provide the technical basis for fishery management decisions, such as setting ACLs to achieve optimum yield from the fishery while avoiding overfishing and ecosystem harm.

Major data collection efforts include catch and biological data collected directly from the fisheries, fishery-independent surveys conducted on chartered vessels or NOAA Fishery Survey Vessels, and processing of biological samples to determine fish age and growth. Typically, the fishery catch monitoring is a year-round continuous activity to monitor the total fishery catch and the fishery-independent surveys are conducted annually to track changes in the abundance, distribution and biological characteristics of the fish stocks. Collectively, these activities allow NMFS to update or initiate approximately 75 fish stock assessments each year. The program achieves efficiency through increased standardization of methods and establishment of protocols as well as an objective and transparent process to prioritize stocks based on established criteria. Examples include: national working groups to share development efforts among all regions; widespread adoption of consistent assessment modeling software; and well-defined review processes to shorten time lag between assessment completion and management action.

Economics and Social Science Research: This activity maintains programs for the collection and analysis of socioeconomic data. This capability includes a broad range of economic and social science data, research, modeling tools, and improved social science literacy. The FTEs supported by this program design and manage economic and social data collections on commercial and recreational fisheries, other recreational uses of living marine resources and their habit, marine-related sectors, and fishing communities. Furthermore, social scientists evaluate the economic and social impacts of management measures on fishery participants, businesses, others who benefit from consumptive and non-consumptive uses of living marine resources, and communities, including the effects of catch share and other rights-based management programs. They also conduct research to support marine spatial planning that includes assessing public values for alternative marine managed area sites and allowed uses. This program also provides vital scientific support for ecosystem-based management by developing economic models that enable the evaluation of trade-offs based upon potential risks and perturbations to the marine ecosystem. These programs contribute to NMFS efforts to assess, manage, and promote the conservation of living marine resources by providing scientific support including the assessment of social and economic impacts on commercial and recreational fisheries and coastal communities for a wide variety of management actions.

Fisheries Statistics: Funds are used to manage and conduct data collection, data processing, statistical analysis, information management, and statistical reporting activities for commercial and recreational fisheries. Accurate data and reliable statistics on fishing effort and catch are essential for assessing fishing impacts on fish stocks, as well as for monitoring fishing performance relative to fishery management targets. The majority of these funds are used to support NMFS statisticians, fishery biologists, economists, social scientists, and information technology specialists in the regional science centers, regional offices, and headquarters offices. Funds also support: (1) the collection of biological data on commercial and recreational

fishery catches in all regions through well-designed survey sampling programs, and (2) the continued development of electronic reporting systems that will deliver more timely landings data for commercial and for-hire fisheries.

The Marine Recreational Information Program (MRIP) uses base funds (1) to continue development of the National Saltwater Angler Registry needed for conducting more accurate and efficient future telephone or mail surveys of recreational fishing activities, and (2) to continue development, testing, and implementation of improved survey designs for the monitoring and assessment of marine recreational fishing participation, fishing effort, and catch. Upgrading NMFS' data collection efforts for monitoring recreational fisheries impacts is important for improving relations with the recreational fishing community and improving Federal fisheries management.

Fish Information Networks: This base supports a number of different state-Federal cooperative programs that work to coordinate data collection, data management, and information management activities that are essential for accurate monitoring of commercial and recreational fishing impacts in each region. These programs collect data and manage information on fishing participation, fishing effort, and catch. They also help to collect fishery-dependent biological data that are needed for stock assessments, as well as some economic data that are essential for use in economic impact and valuation assessments for recreational fisheries.

- Atlantic States Marine Fisheries Commission is used to help fund the Atlantic Coast Cooperative Statistics Program, which coordinates state and Federal fisheries statistics programs for the Atlantic coast.
- Gulf of Mexico Fisheries Information Network is used to coordinate state and Federal fisheries statistics programs for the Gulf of Mexico and the Atlantic coast of Florida.
- Alaska Fisheries Information Network supports the coordination of state and federal commercial fisheries statistics work in Alaska.
- Pacific Fisheries Information Network is used to coordinate state and Federal commercial fisheries statistics programs for both the Pacific and Western Pacific regions.
- Recreational Fisheries Information Network supplements cooperative recreational fisheries statistics and economics programs for the Atlantic, Gulf, and Pacific coasts.
- National Fisheries Information System is used to coordinate cross-regional communication and planning efforts that enhance development of the regional networks while supporting improved national gathering and reporting of statistics on the status of U.S. fisheries.
- Marine Fisheries Initiative (MARFIN) operates a competitive grant program that provides financial assistance for research and development projects that optimize the use of fisheries in the Southeast region.

Survey and Monitoring Projects: These fishery survey and monitoring activities are complementary to those conducted under the Expand Annual Stock Assessments (EASA) line. The fishery-independent survey and monitoring activities supported under this line include bluefin tuna tagging, red snapper monitoring, west coast groundfish surveys, Maine and New Hampshire inshore trawl surveys, Chesapeake Bay multi-species surveys and research, Bering

Sea Pollock Research, and Gulf of Maine groundfish surveys to name a few. These targeted surveys and biological investigations improve the information available to conduct accurate stock assessments and directly contribute to the Percentage of Fish Stocks with Adequate Population Assessments and Forecasts (GPRA) performance measure.

National Standard 8: The Magnuson-Stevens Act requires all fishery management plans (FMPs) include a fishery impact statement intended to assess, specify, and describe the likely effects of the measures on fishermen and fishing communities (§303(a)). When establishing any new regulations, the cultural and social framework relevant to the fishery and any affected fishing communities (§303(b)(6)) must be taken into account. Values obtained from analyses may also be used for assessing the costs and benefits derived from stock rebuilding programs, protected species recovery efforts and habitat restoration and recovery efforts.

Observers/Training: The goal of the Observer Program is to provide accurate and timely information and analyses on the biological, ecological, economic, and social aspects of the Nation's fisheries resources. Fisheries observer programs are a proven, unbiased, and valuable source of information on the Nation's fisheries, and are considered the most reliable and cost-effective means currently available to collect fishery-dependent data used for stock assessments, quota monitoring, and a variety of other purposes.

Antarctic Research: The Antarctic Ecosystem Research Division (AERD) conducts ecosystem-based research to fulfill NOAA's mandate of providing scientific advice in support of United States policy interests related to resource management by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), of which the U.S. is a member. This ecosystem research program, known as the U.S. Antarctic Marine Living Resources (AMLR) Program, is mandated by the U.S. AMLR Convention Act of 1984 and is NOAA's only dedicated, long-term "ecological presence" in the Antarctic, with observations extending over the last 25 years.

The objective of the U.S. AMLR Program is to understand the relative impacts of fishing, climate change, and other anthropogenic impacts on the Antarctic marine ecosystem. The program includes research to characterize oceanographic conditions (e.g., temperature and primary production) in the marine environment, estimate the biomasses of Antarctic krill and finfishes (species that have been or presently are the targets of commercial fisheries), and map the distributions of Vulnerable Marine Ecosystems (e.g., deep-water coral and sponge communities that can be destroyed by fishing gear). These aspects of the research program are conducted during annual research cruises.

The U.S. AMLR Program also includes research to monitor the reproductive successes (or failures) and foraging patterns of krill-dependent predators such as penguins and seals and to study how the production of these predators are, in turn, impacted by predation from higher-level predators such as leopard seals. These aspects of the research program are annually conducted from two field camps located in the vicinity of important krill fishing areas. Research to synthesize all field data occurs at the laboratory and includes efforts to build and implement ecosystem and stock-assessment models to advise on harvest strategies for Antarctic fisheries. Outputs from the U.S. AMLR Program include biomass estimates for commercially important species, peer-reviewed articles and other reports that increase knowledge about the Antarctic marine ecosystem and the impacts of fishing and climate change on that ecosystem, scientific advice to the U.S. delegation to CCAMLR, and representation of the U.S. to the CCAMLR Scientific Committee and its working groups.

Climate Regimes & Ecosystem Productivity: The Climate Regimes & Ecosystem Productivity Program (CREP) provides living marine resource managers with key information and predictions of how climate change and variability is impacting U.S. marine ecosystems and the resources and communities that depend on them. Currently focused in the Bering Sea and Gulf of Alaska, CREP work enhances NMFS' ability to track climate-related and other changes in these ecosystems through a network of in situ and remote observing systems. Information from the observing systems is then used in collaboration with partners to serve three key functions:

- Include climate change in ecosystem related models to improve fishery recruitment predictions and stock assessments used in fishery management decisions;
- Develop indices and assessments to track climate impacts on fisheries;
- Provide managers with information on climate-related impacts to improve management decisions for living marine resources (fisheries, protected species, habitats), and the communities that depend on them.

The CREP provides funding for the North Pacific Climate Regimes and Ecosystem Productivity (NPCREP) project. The NPCREP mission is to conduct research on climate variability and ecosystem response in the North Pacific, focusing on the productive waters of the eastern Bering Sea and western Gulf of Alaska. This program provides specific information and assessments for fishery and other decision makers including:

- Indices and assessment tools used by the North Pacific Fishery Management Council in required analyses and decisions regarding Total Allowable Catches in Alaskan marine fisheries;
- Indices for the North Pacific Marine Science Organization for use in the North Pacific Ecosystem Status Report;
- Information critical to development of climate-forced biological models that improve NMFS' recruitment predictions and stock assessments of Alaskan fisheries.

CREP also provides funds to monitor living marine resources in the Arctic and observe the impacts of Loss of Sea Ice (LOSI) on ice-dependent marine mammal in the Arctic.

- LOSI supports charter days to cover the expanded area of commercially fished stocks in the Bering Sea and surveys on ribbon seal distribution. This current program activity expands monitoring to encompass commercially important species that have shifted northward due to climate change, outside of currently NOAA surveyed areas in the Bering Sea. It is expected that this will provide for more accurate Bering Sea stock assessments, which optimize yield and revenue from fisheries in the long run.

Cooperative Research: Cooperative research enables commercial and recreational fishermen to become involved in collecting fundamental fisheries information to support the development and evaluation of management options. Through cooperative research, industry and other stakeholders can partner with NMFS and university scientists in all phases of the research program-- planning the survey/statistical design, conducting research, analyzing data, and communicating results.

Current cooperative research activities complement existing NOAA-NMFS monitoring programs nationwide by providing access to platforms (recreational and commercial fishing vessels)

widely distributed over a variety of habitats simultaneously, including areas that are not accessible to NOAA vessels. The information collected through cooperative research programs assists scientists and managers by supplementing the data currently collected through Federal research programs. This information improves the information base for single species, multi-species, and ecosystem assessment models and ultimately improves the evaluation of stock status and the management of fishery resources.

Cooperative research covers a wide range of study areas, including fishery-dependent data, species life history, conservation engineering, species abundance and distribution, habitat, and socioeconomic impacts. The agency's program selects high-level cooperative research projects nationwide through competitive grant and contract procurements, as well as cooperative agreements. The selection of these projects is done in consultation with the Councils, Commissions, and stakeholders and in accordance with research areas established in Section 318 of the reauthorized MSA.

Information Analysis and Dissemination: NMFS is mandated by the MSA to have staff with expertise in model development for population dynamics and economic trends, statistical data analyses for stock assessments, database development and data warehousing, development and data warehousing, and computer programming. In response to these mandates, the Information Analysis and Dissemination line provides the funds necessary to produce efficient tools critical to enable effective decision making.

This line supports NMFS activities to increase information quality, increase the accuracy of data analyses, increase the timeliness of information and the dissemination of those data, and increase the interoperability across data types and diverse data systems. Additionally, this line funds the maintenance of data management systems and policies that are critically needed to support Integrated Ocean Observing Systems (IOOS), Fisheries One Stop Shop (FOSS), Data Management and Communication (DMAC) throughout NMFS, Fisheries Information Systems (FIS) and NOAA Data Management Committee (DMC) requirements for data collection, processing, dissemination, and archiving.

Marine Resources Monitoring, Assessment & Prediction Program: The Marine Resources Monitoring, Assessment, and Prediction (MARMAP) Program is a cooperative fisheries project of the South Carolina Marine Resources Research Institute (MRRI) and NOAA Fisheries. For thirty years, the MRRI has conducted fisheries-independent research on groundfish, reef fish, ichthyoplankton, and coastal pelagic fishes within the region between Cape Lookout, North Carolina and Cape Canaveral, Florida. The overall mission of the program has been to determine distribution, relative abundance, and critical habitat of economically and ecologically important fishes of the South Atlantic Bight (SAB) and to relate these features to environmental factors and exploitation activities. Research toward fulfilling these goals has included trawl surveys (from 6-350 m depth); ichthyoplankton surveys; location and mapping of reef habitat; sampling of reefs throughout the SAB; life history and population studies of priority species; tagging studies of commercially important species and special studies directed at specific management problems in the region. Survey work has also provided a monitoring program that has allowed the standardized sampling of fish populations over time, and development of an historical base for future comparisons of long-term trends.

Regional Studies: In FY 2009 Chesapeake Bay Studies and the Southeast Area Monitoring and Assessment Program (SEAMAP) were combined into the Regional Studies budget line. *SEAMAP:* The base funding for the SEAMAP supports the collection of fishery-independent data through state, Federal, and university partnerships. Partnership arrangements are set up through cooperative agreements with the states from North Carolina through Texas, as well as

the U.S. Virgin Islands and Puerto Rico. SEAMAP is composed of three components: the South Atlantic (North Carolina – Florida), the Gulf of Mexico (Florida – Texas) and the Caribbean (U.S. Virgin Islands and Puerto Rico). SEAMAP provides coordination of state and federal surveys for the collection, management and dissemination of fishery-independent data on marine resources. The data support the sustainable use of commercially and recreationally valuable finfish stocks in the southeastern United States.

State, Federal and university partners in the SEAMAP program conduct a variety of fishery-independent research surveys, including groundfish trawl surveys, plankton and larval fish surveys, shark and snapper longline surveys, and reef fish video surveys. These surveys provide a wide range of information to support regional stock assessment and management activities, including biological information on distribution, abundance, growth, mortality, and recruitment. In addition, all surveys collect environmental and habitat information that provides a broad-based ecosystem approach to survey methodology. These data are essential to support current species-specific and habitat fishery management plans, while supporting marine spatial planning and ecosystem-based management approaches.

The data provided by SEAMAP supports management activities in four Regional Fishery Management Councils; the Mid-Atlantic, South Atlantic, Gulf of Mexico and Caribbean Councils. SEAMAP data provide the basis for the majority of stock assessments conducted for managed species in these regions and is critical to current requirements to set Annual Catch Limits (ACL) for managed stocks. Data management activities include electronic data collection on all research surveys, centralization of SEAMAP data to improve accessibility, and coordination with the National Data Center to link SEAMAP data to additional environmental data such as satellite and buoy data. These activities will ensure that SEAMAP data are easily accessible to fishery managers, scientists and the general public.

342 *Chesapeake Bay Studies*: The base funding for Regional Studies–Chesapeake Bay studies supports the NOAA Chesapeake Bay Office (NCBO). NCBO is a focal point within NOAA for Chesapeake Bay initiatives and a conduit to apply NOAA's wide range of capabilities to help address the problems and challenges of natural resource management in the Bay region. NOAA has been charged by the President under Executive Order (EO) 13508 to begin a new era of shared federal leadership in protecting and restoring the Bay. NCBO is carrying out EO tasks through enhanced focus on four key topics, fisheries, habitats, observations, and education. Organized across the Office's three primary programs; Ecosystem Science, Coastal and Living Resource Management, and Environmental Literacy, NCBO serves as a model for regional collaboration by identifying and applying NOAA's full range of capabilities to address specific needs in the mid-Atlantic.