# The Saltonstall-Kennedy Grant Program: Fisheries Research and Development

## REPORT
## 1999

**August 1, 1999**

**U.S. DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
National Marine Fisheries Service

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# I. INTRODUCTION

This report to Congress on the Saltonstall-Kennedy (S-K) Grant Program, administered by the National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, covers fiscal year (FY) 1999. The report contains information on the S-K Program regarding its legislative authority, the application solicitation and grant selection process, recipients, and funding information.

A notice was published in the *Federal Register* on March 2, 1998, to solicit applications contingent on the FY 1999 allocation. The application review process was initiated in FY 1998, and 28 grants totaling $3.07 million were awarded in FY 1999.

Appendix I contains addresses of NMFS Headquarters and Regional Offices from which information regarding the S-K Program may be obtained. Appendix II contains the *Federal Register* notice soliciting applications for the FY 1999 program. Appendix III contains a list of applications approved for funding from the FY 1999 S-K solicitation, and Appendix IV contains a list of applications disapproved.

This report is submitted pursuant to the S-K Act, as amended, which requires that the following information be submitted annually to Congress:

1. A description of all pending fisheries research and development projects (Page 4)

2. A list of those applications approved and those disapproved and the total amount of grants made for the current fiscal year (Appendices III and IV)

3. A statement of the extent to which available funds were not obligated or expended by the Secretary for grants during the current fiscal year (Page 3)

4. An assessment of each project that was completed in the preceding fiscal year regarding the extent to which objectives of the project were attained and the project contributed to fishery development (Page 79)

5. The fisheries development goals and funding priorities for a national program of research and development for the next fiscal year (Page 2)

# II. BACKGROUND

The S-K Act, as amended (15 U.S.C. 713c-3), provides that a fund (known as the S-K fund) will be used to provide grants for research and development projects addressed to any aspect of U.S. fisheries including, but not limited to, harvesting, processing, marketing, and associated infrastructures. Under this authority, grants and cooperative agreements are made annually on a competitive basis, to assist in carrying out projects related to U.S. commercial and recreational fisheries.

The S-K Grant Program funding priorities are based on the NOAA Strategic Plan, which was developed in consultation with the public. The funding priorities and the NOAA Strategic Plan are consistent with the goals and objectives of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The objective of the S-K Grant Program is to address the needs of fishing communities (as defined in the Magnuson-Stevens Act) in optimizing economic benefits within the context of rebuilding and maintaining sustainable fisheries, and in dealing with the impacts of conservation and management measures. The solicitation for proposals under the Grant Program, including funding priorities, application requirements, and proposal evaluation criteria, is published each year in the *Federal Register* (Appendix II).

Proposals received in response to the notice are evaluated by appropriate private and public sector experts for their technical merit. Comments are then solicited from representatives of various fisheries constituencies selected by the NOAA Assistant Administrator for Fisheries. These individual panelists rank proposals in terms of importance of the problem or need for funding, and provide recommendations on the level of funding. After proposals have been evaluated and ranked, recommendations for funding are developed and submitted to the Assistant Administrator, who determines the projects to be funded.

In addition, 15 U.S.C. 713c-3(d) provides authority for the Secretary of Commerce to carry out a national program of research and development (National Program) to address aspects of U.S. fisheries that are not adequately addressed by projects assisted under the Grant Program. NMFS expects to fund two awards under the National Program from the FY 1999 allocation, dealing with shellfish safety education and sustainable fisheries, as directed by Congress. For FY 2000, NMFS plans to make funds available only under the competitive Grant Program, unless otherwise directed. Therefore, the National Program is not expected to be implemented in FY 2000, and so funding priorities for such a program have not been identified.

The S-K fund is capitalized through annual transfers by the Secretary of Agriculture to the Secretary of Commerce of amounts equal to 30 percent of the gross receipts collected under the customs laws on imports of fish and fish

products. The following table indicates the total duties collected on fishery products; the total receipts in the S-K fund for FY 1999; the amount appropriated to offset some of NOAA's costs related to operations, research, and facilities (ORF); and the amount allocated for the S-K Program, including the competitive Grant Program, the National Program, and program administrative costs. In FY 1999, the S-K allocation was $3.05 million. However, an additional $1.13 million was available for use from uncommitted carryover funds, which included unanticipated prior year recoveries. In FY 1999, approximately $207,000 of S-K funds will not be obligated.

**Fiscal Year 1999**
**($ in millions)**

| | | |
|---|---|---|
| Total Duties Collected on Fishery Products | $221.42 | |
| Total S-K Transfer | 66.43 | |
| ORF Offset | (63.38) | |
| S-K Allocation | | 3.05 |
| Uncommitted Carryover* | | 1.13 |
| Total Amount Available for S-K | | 4.18 |
| S-K Program Obligations/Commitments | | |
| Grant Program | | 3.07 |
| National Program** | | 0.40 |
| Program Administration | | 0.50 |
| Estimated Unobligated Balance*** | | 0.21 |
| Total | | 4.18 |

*Includes unanticipated prior year recoveries and FY 1998 balances not previously committed.

**Includes $250,000 to Interstate Shellfish Sanitation Conference for *V. vulnificus* education and $150,000 for the Alaska Fisheries Development Foundation for activities related to sustainable fisheries (awards pending).

***Unobligated balances will be returned to the S-K Program for use in FY 2000.

## III. PENDING GRANT PROGRAM PROJECTS

The following section contains a description of all pending (ongoing) projects under the S-K Grant Program, along with the name of the grantee, grant number, project title, federal funding level, recipient funding level (i.e., cost share), and the NMFS contact, addresses of whom are in Appendix I. The projects are listed by grantee within each subject area.

### Fisheries Utilization

Grantee: Alaska Food Group, Juneau, AK

Grant No.: NA76FD0041 NMFS Contact: F/AKO

Project Title: Dried Fish Asian Market Investigation and Analysis and an Industry Demonstration Project to Produce Dried Fishery Products from Underutilized Salmon and Bycatch Species

Funding: Federal: $189,935 Recipient: $89,935

Description: To study, develop, and produce dried fish prototypes, conduct a selected international market analysis, and provide an industry demonstration project that will produce dried, dried salted, dried seasoned, and dried smoked fishery products from underutilized Alaskan salmon and trawl-caught bycatch species.

Grantee: University of Alaska, Fairbanks, AK

Grant No.: NA76FD0034 NMFS Contact: F/AKO

Project Title: Utilization of Giant Grenadier (*Albatrossia pectoralis*) - Year 2: Production of Stabilized Mince and Development of a Promotional/Marketing Study

Funding: Federal: $ 86,543 Recipient: $17,308

Description: To develop a stabilized minced or flaked product from giant grenadier, an underutilized species. Modification to produce acceptable texture will be accomplished by removing moisture through physical means or binding moisture using food additives. Shelf life and end user evaluation of stabilized mince will follow product development. A targeted promotional effort and marketing study will introduce product forms to buyers and sellers of Alaska seafood and provide a financial feasibility study to determine economic viability of utilizing giant grenadier.

Grantee: Oregon State University, Astoria, OR

Grant No.: NA76FD0212 NMFS Contact: F/NWO

Project Title: Production of a Carnosine and Anserine-Containing Antioxidant Extract from Surimi Wash Water

Funding: Federal: $71,070 Recipient: $11,081

Description: To extract two natural antioxidants, carnosine and anserine, from surimi wash water and determine their usefulness in preventing lipid oxidation in seafood products. Researchers will evaluate microfiltration and heat coagulation processes in removing large proteins from the wash water. The extracted antioxidants will be applied to minced mackerel in an attempt to inhibit oxidative rancidity, and to red rockfish to reduce color loss.

Grantee: Oregon State University, Corvallis, OR

Grant No.: NA90AAHSK138 NMFS Contact: F/NWO

Project Title: Role of Pacific Groundfish in International Groundfish Trade - Year 2

Funding: Federal: $74,744 Recipient: $25,296

Description: To continue research to estimate existing and potential sources of world groundfish supplies, including estimates of production; determine trade flows for groundfish, including demand factors, national economic indicators, international trade factors, and characteristics of distribution networks; and determine the role that Pacific groundfish may play in the international trade arena.

Grantee: Coastal Enterprises, Inc., Portland, ME

Grant No.: NA86FD0106 NMFS Contact: F/NEO

Project Title: Maximizing the Value of the Northeast's Marine Harvest, A Resource Guide to Secondary and Byproduct Markets

Funding: Federal: $99,708 Recipient: $22,500

Description: To investigate domestic and export markets for secondary products and byproducts of species typically harvested in the Northeast. Specifically, this project will catalogue byproduct market opportunities; investigate byproduct markets through a survey and interviews; conduct technical evaluations of products; and conduct an economic analysis of price, quantity, packaging, and distribution. Results of the investigation will be made available in a resource guide.

Grantee: University of Massachusetts, Amherst, MA

Grant No.: NA86FD0107 NMFS Contact: F/NEO

Project Title: Bioconversion of Mackerel Byproducts into Value-Added Products for the Nursery and Plant Propagation Industry

Funding: Federal: $62,215 Recipient: $18,708

Description: To incorporate mackerel waste hydrolysates into a growth medium for efficient clonal propagation of high value nursery and horticultural crops and a microbial inoculant formulation to stimulate growth of all agricultural and horticultural plants. The success of this project will result in an immediate value-added technology for the utilization of all components of mackerel wastes, including unhydrolyzed debris and bone chips.

Grantee: University of Massachusetts, Amherst, MA

Grant No.: NA76FD0109 NMFS Contact: F/NEO

Project Title: Commercialization of an Ultrasonic Device for Measuring Fat Content of Mackerel

Funding: Federal: $68,758 Recipient: $0

Description: To adapt an ultrasonic technique so that it can be manufactured as a commercial device which can be purchased by the fish processing industry. The device will be used as a rapid and precise method of non-destructively grading the fat content of mackerel, thereby opening up new markets for this underutilized species.

Grantee: University of Massachusetts, Dartmouth, MA

Grant No.: NA76FD0108 NMFS Contact: F/NEO

Project Title: Investigate the Impact of Reduced Fresh Groundfish Supply on Processors and Wholesalers

Funding: Federal: $28,896 Recipient: $11,641

Description: To (1) describe the current New England groundfish processing and wholesaling sectors, including the number and types of activity--primary, secondary, wholesaling, processing, and transport; (2) provide an estimate of income, employment, and output of these sectors in detail and of what products are co-processed with fresh groundfish; (3) estimate the impact on the processing and wholesaling sectors of an 80% reduction in groundfishing effort phased in over a two-year period in the harvest sector; (4) identify important trade issues facing the processing and wholesaling sectors over the next ten years; and (5) outline the outlook for processors and wholesalers of the development of international markets for underutilized New England species.

Grantee: University of Maine, Orono, ME

Grant No.: NA76FD0100 NMFS Contact: F/NEO

Project Title: Determination of Aeration Rates, End-Product Quality, and Economic Analysis of In-Vessel Composting Systems for Crab Waste Products

Funding: Federal: $86,172 Recipient: $13,788

Description: To explore if crab processing waste could be economically recycled into a useful, value-added product which could be used commercially in landscaping and the nursery industry. Currently, crab processing waste is collected and hauled off-site to a landfill, a costly and environmentally unsound solution. In-vessel composting systems can overcome the problems of odor and vermin and help accelerate the breakdown of the organic components. The goal of this project is to determine the aeration rate which will accelerate the breakdown in an in-vessel system. The end-product compost will be analyzed for quality parameters, and an economic analysis will be conducted to indicate the potential practicality of the compost system for seafood processors.

Grantee: Rhode Island Seafood Council, Wakefield, RI

Grant No.: NA66FD0016 NMFS Contact: F/NEO

Project Title: Commercial Utilization of Atlantic Mackerel: Technology, Production, and Marketing

Funding: Federal: $198,082 Recipient: $51,250

Description: To design a high-speed cutting system, adaptable to existing skinning machines, which can remove dark flesh and pin bones from Atlantic mackerel to produce boneless light meat fillet and mince blocks for further processing by industry. This is an integral step in the successful completion of a prior S-K grant to produce mackerel nuggets. The researchers will also analyze the quality parameters of fresh and frozen fillets and cryostabilization of fillets and mince blocks which are free of dark flesh. There will be commercial testing of the cutting system, as well as evaluation of the new mackerel forms. An economic analysis of production costs and a marketing analysis to assess the potential demand for these products will be completed, and a waste management plan will be developed.

## Marine Recreational Fisheries

Grantee: Palau Conservation Society, Koror, Palau

Grant No.: NA77FD0043 NMFS Contact: F/SWO

Project Title: Sustainable Sport Fishery Development for Palau: Demonstration Project

Funding: Federal: $103,284 Recipient: $10,000

Description: To evaluate the local sport fishery system with the involvement and assistance of the tourist sport fishermen, and to implement national and state management systems designed to support the sport fishery system. This project is the successor to an earlier S-K project which established the viability of small-scale sport fishing in Palau.

Grantee: MBC Applied Environmental Sciences, Costa Mesa, CA

Grant No.: NA76FD0050 NMFS Contact: F/SWO

Project Title: Southern California Commercial Sportfish Catch Database

Funding: Federal: $93,755 Recipient: $88,383

Description: To complete the computer entry of 29 years of California sport catch data to form a database spanning 36 years. Fishery managers, industry, researchers, and the public will have direct access to the information resource presented by this project.

Grantee: Florida Atlantic University, Boca Raton, FL

Grant No.: NA77FD0075 NMFS Contact: F/SEO

Project Title: Production and Testing of Immunoassay Kits for the Identification of Billfish Species

Funding: Federal: $18,000 Recipient: $1,530

Description: To produce and assemble 100 kits for in-field evaluation and identification of sailfish species, and provide these kits to NMFS scientists. In addition, a blue marlin specific monoclonal antibody will be evaluated and incorporated into a bead assay format already developed. Several monoclonal antibody-secreting hybridomas will be secured and the utility of an anti-billfish clone and a clone secreting antibody that recognizes billfish antibodies will be evaluated.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA

Grant No.: NA77FD0073 NMFS Contact: F/SEO

Project Title: Analysis of the Genetic Stock Structure of the Atlantic Sailfish Using Restriction Fragment Length Polymorphism Analysis of Both Mitochondrial DNA and PCR Amplified Nuclear DNA

Funding: Federal: $62,713 Recipient: $12,859

Description: To use molecular genetic techniques to evaluate hypotheses of stock structure of the sailfish within the Atlantic Ocean. Currently, the International Commission for the Conservation of Atlantic Tunas assumes that Atlantic sailfish comprise discrete eastern Atlantic and western Atlantic stocks. This hypothesis and alternative hypotheses using restriction fragment length polymorphism analysis of mitochondrial and nuclear DNA will be evaluated.

## Management Alternatives and Fisheries User Conflicts

Grantee: University of Alaska, Fairbanks, AK

Grant No.: NA96FD0054 NMFS Contact: F/AKO

Project Title: Population Structure of Rougheye, Shortraker, and Northern Rockfish Based on Analysis of Mitochondrial DNA Variation in Microsatellites

Funding: Federal: $151,018 Recipient: $25,783

Description: To use mitochondrial DNA (mtDNA) and microsatellite variation to characterize the population structure of rougheye and shortraker rockfish, and conduct a preliminary survey of northern rockfish. Primers will be developed to amplify unanalyzed rockfish mtDNA regions and to analyze variation at microsatellite loci. With S-K funding (in part), the Principal Investigator has developed polymerase chain reaction-based techniques for analysis of variation in rockfish mtDNA. Preliminary analysis of north Pacific rougheye rockfish revealed strong genetic heterogeneity among collections of fish in the Gulf of Alaska and Aleutian Islands, indicating a population structure most likely resulting from reproductive isolation. An examination of shortraker rockfish revealed little variation, providing no basis for conclusions. Northern rockfish have been sampled, but not yet analyzed. An increased number of collections and individuals and the addition of microsatelite analysis will provide improved information to more clearly delineate the stock structure of these species in the Gulf of Alaska and Aleutian Islands.

Grantee: University of Alaska Fairbanks, Fairbanks, AK

Grant No.: NA76FD0032 NMFS Contact: F/AKO

Project Title: Comparison of Three Genetic Methodologies for Stock Identification of Pink, Chum, and Sockeye Salmon in the North Pacific - Phase 2

Funding: Federal: $156,604 Recipient: $28,567

Description: To determine the relative discrimination ability of three different types of genetic data which are used or being developed for salmonid stock identification. The genetic methods to be compared are protein electrophoresis, mitochondrial DNA restriction fragment length polymorphism analysis, and single-locus micro-satellite DNA analysis. The study will compare estimates of variations within and among populations revealed by each method on collections of chum, sockeye, and both even and odd year pink salmon from nine populations sampled across the north Pacific.

Grantee: University of Alaska, Fairbanks, AK

Grant No.: NA66FD0043 NMFS Contact: F/AKO

Project Title: Availability of Commercial Fish Species as Food for Marine Mammals - Year 2

Funding: Federal: $135,545 Recipient: $23,172

Description: To investigate the abundance of commercial fish species as a food supply for marine mammals. Various gear types will be used to determine distribution, abundance, and inter-annual fluctuations of juvenile and sub-adult stages of commercially and non-commercially important fishes found within foraging range of sea lion rookeries in the Gulf of Alaska.

Grantee: University of Washington, Seattle, WA

Grant No.: NA96FD0055 NMFS Contact: F/AKO

Project Title: The Effects of Fishery-Induced Directional Selection on Run Timing in Sockeye Salmon

Funding: Federal: $80,903 Recipient: $8,467

Description: To (1) quantify selection pressure on run timing by comparing the temporal pattern of escapement with that of the total run (catch plus escapement) in five fishing districts for the last 35-40 years; (2) examine whether the selective pressure on run timing increases with the systems by compiling the data on total run and compare predicted change to absolute change per system; (3) estimate the heritability of run timing within these populations; and (4) measure the potential correlated effects of selection for run timing on selection for spawning time through two related field studies.

Grantee: Alaska Department of Fish and Game, Kodiak, AK

Grant No.: NA86FD0077 NMFS Contact: F/AKO

Project Title: Bottom Trawl Assessment of Seasonal Distribution of Tanner Crab, Pacific Cod, and Shallow-Water Flatfish in Marmot Bay, Alaska

Funding: Federal: $129,563 Recipient: $113,972

Description: To conduct four systematic summer bottom trawl surveys in the Kodiak Island (Marmot Bay area) and Alaska Peninsula areas to develop population estimates of crabs and standardized population indices of groundfish. These four surveys, coupled with routine annual surveys conducted outside the scope of this project, will provide needed information on seasonal changes in distribution of Tanner crab, Pacific cod, and shallow-water flatfish occurring in the area. Expected benefits to marine resource management include: clarification of the relationship between summer survey data and winter Tanner crab fishery data; answers to stock biology questions related to development of the Alaska state waters Pacific cod fishery; and information on seasonal co-occurrence of species to help reduce bycatch.

Grantee: Alaska Department of Fish & Game, Kodiak, AK

Grant No.: NA76FD0039 NMFS Contact: F/AKO

Project Title: Development of an Expert Computer-Based Imaging System to Enhance Fisheries Management of Crab and Groundfish Fisheries

Funding: Federal: $93,695 Recipient: $13,624

Description: To develop a rugged, compact, computer-based crab and groundfish identification and measuring system for use by commercial fishers and field biologists. This will be accomplished by making adaptations to existing computer-based crab imaging system technology and by developing new technology. The system will facilitate the wiser, more profitable use of Alaska's fisheries resources and allow further resource utilization, bycatch reduction, and improvement of assessment techniques.

Grantee: Squaxin Island Tribe, Shelton, WA

Grant No.: NA96FD0130 NMFS Contact: F/NWO

Project Title: Rebuilding Naturally Spawning Coho Salmon Stocks--An Assessment of Bycatch Reduction Measures and Spawning Escapement Stock Composition in the Southern Puget Sound (Fishery Management Area 13 D-K)

Funding: Federal: $141,768 Recipient: $141,768

Description: To estimate the stock composition and the abundance and distribution of hatchery and naturally-spawned coho salmon contributions to the Tribal commercial coho salmon fishery. The Squaxin Tribe will sample 100% of the fishery in 1999 and 2000. All salmon will be examined for marks and coded wire tags. Scale samples will be collected. Adult sampling weirs will be installed on Skookum Creek and Mill Creek, which feed Area 13 D-K. Fish caught in the weirs will be examined to assess the straying rate of hatchery-origin coho salmon in Area 13 D-K creeks to estimate the stock composition of the spawning escapement. In addition to collecting mark, tag, and scale data at the weirs, other selected creeks in Area 13 D-K will be surveyed to recover coho carcasses. Those fish will be examined for marks and coded wire tags. Scale samples will be collected to determine origin.

Grantee: Northwest Indian Fisheries Commission, Olympia, WA

Grant No.: NA76FD0405 NMFS Contact: F/NWO

Project Title: Estimation of the Stock Composition of Chum Salmon Fisheries in Puget Sound, Washington: An Improved Technical Basis for Fisheries Management - Year 3

Funding: Federal: $134,856 Recipient: $33,413

Description: To collect tissue samples from chum salmon fisheries in various fisheries in Puget Sound, Washington, which will be subjected to genetics based stock identification analyses to determine stock composition. These data will aid in describing migration timing and distribution of contributing Puget Sound chum stocks, and provide improved in-season and post-season estimates of stock abundance. This study will quantify the extent to which non-local stocks contribute to the terminal fisheries.

Grantee: University of Washington, Seattle, WA

Grant No.: NA76FD0299 NMFS Contact: F/NWO

Project Title: Development of a Semi-Automated Microsatellite Based Genotyping System for Kinship Analysis of Chinook Salmon

Funding: Federal: $80,145 Recipient: $11,089

Description: To develop and test a sensitive genetic tool for accurate, large scale kinship analyses of chinook salmon. This tool will permit the critical evaluation of chinook salmon restoration projects, and provide the technology needed to monitor pedigrees and avoid inbreeding in captive broodstocks. Evaluations of the system utility will be carried out at the Dungeness River Chinook Salmon Rebuilding Project.

Grantee: Washington Department of Fish and Wildlife, Olympia, WA

Grant No.: NA76FD0213 NMFS Contact: F/NWO

Project Title: Pacific Salmon Captive Broodstocks: Comparison of Reproductive Performance of Full-Siblings Reared in Fresh and Saltwater

Funding: Federal: $47,964 Recipient: $26,023

Description: To compare and analyze the effects of freshwater and saltwater captive broodstock rearing on reproductive performance of chinook salmon. Full-sibling adults and their progeny will be raised, with one-half raised in saltwater and the other half in a freshwater environment. The researchers will isolate important factors such as broodstock weight and size, progeny survival, and fertilization rates to determine optimum rearing methodology.

Grantee: Commonwealth of the Northern Mariana Islands

Grant No.: NA96FD0094 NMFS Contact: F/SWO

Project Title: Economic Assessment of the Domestic Fisheries Development Potential in the Commonwealth of the Northern Mariana Islands (CNMI)

Funding: Federal: $40,068 Recipient: $4,795

Description: To determine why domestic fisheries have not developed to fully utilize the pelagic fishery resources of the CNMI and to determine ways to further develop domestic fisheries. The ultimate goal is to identify methods to expand capacity, reduce production costs, expand or identify markets, and promote feasible value-added processing of fishery products. These goals will be addressed through the following objectives: (1) development of focus groups of domestic fishermen; (2) development of domestic capacity database; (3) analysis of vessel production costs; (4) analysis of labor-leisure choice decisions made by fishermen; (5) identification of market constraints; (6) investigation of infrastructure constraints; (7) finance and legal constraint investigation; and (8) report of findings.

Grantee: Regents of the University of California, Santa Barbara, CA

Grant No.: NA96FD0208 NMFS Contact: F/SWO

Project Title: Restoration of the White Abalone in Southern California: Population Assessment, Brood Stock Collection, and Development of Husbandry Technology

Funding: Federal: $244,806 Recipient: $105,841

Description: To develop the basic husbandry and culture techniques and a biological habitat model for white abalone. The study will include a field work component and a laboratory/culture component. In the field work component, live, individual broodstock abalone will be located using a manned submersible and collected by hand using scuba divers. Existing bathymetry data will be entered into a geographic information system to generate a map identifying optimal search areas for white abalone habitat. The bathymetry data and flora and fauna data collected during the survey will be used to develop the habitat model to help researchers identify optimal areas for future white abalone outplanting and restoration work. The husbandry and culture techniques will be developed in the laboratory/culture component. These techniques may help establish white abalone as an important aquaculture food product for the current abalone aquaculture industry, and provide individuals for use in restoration.

Grantee: Regents of the University of California, Santa Barbara, CA

Grant No.: NA86FD0070 NMFS Contact: F/SWO

Project Title: Evaluation of the Sustainability of the Sea Cucumber Fishery in California

Funding: Federal: $93,124 Recipient: $43,376

Description: To provide a biological basis for the management of a sustainable sea cucumber fishery in the northeast Pacific, especially in California. This will be achieved by documenting historical changes in standing stocks of *Parastichopus californicus* and *P. parvimensis* and estimating the effects of the fishery on the standing stocks; characterizing the size structure of populations of both species; and collecting data on demographic and population parameters crucial to fishery management.

Grantee: The Regents of the University of California, Berkeley, CA

Grant No.: NA76FD0053 NMFS Contact: F/SWO

Funding: Federal: $88,400 Recipient: $0

Project Title: Sportfish in California Waters: Seasonal and Interannual Distribution and Dependence on Oceanic Temperature

Description: To construct a database that can be used to determine the migrations and anomalies of sportfish species and determine their relationships with sea surface temperature. This objective is important for fisheries management and potential predictive models. Sportfishing logbook data for the period 1936 through 1979 will be digitized and entered into a comprehensive database which already contains sportfishing logbook data from 1980 to the present.

Grantee: Hui Malama O Mo'omomi, Kaunakakai, Molokai, HI

Grant No: NA67FD0051 NMFS Contact: F/SWO

Project Title: Education in Subsistence Fishing Methods and Values: Mo'omomi Community Subsistence Fishing Area, Island of Molokai, Hawaii

Funding: Federal: $80,275 Recipient: $57,700

Description: To design and implement an education program to initiate novice fishermen in subsistence fishing methods and values and to facilitate exchange of resource knowledge between subsistence fishermen and scientifically trained fishery managers.

Grantee: Community Economic Development Center of Southeastern Massachusetts, New Bedford, MA

Grant No.: NA96FD0080 NMFS Contact: F/NEO

Project Title: Fishing Industry Cooperative Enterprises Co-Production Training Program

Funding: Federal: $103,202 Recipient: $94,344

Description: To develop an innovative training program for the transition of displaced fishers to aquaculture, hydroponics, and other related professions, while promoting hybrid striped bass aquaculture. This three stage comprehensive training program will be implemented on a continuous basis, with each stage lasting three months. The stages will be presented in the following sequence: (1) basic concepts (12 students); (2) apprenticeship (8 students); and (3) internship (4 students). Bristol Community College will provide education assistance and aquaculture courses. Eastern Fish Farms, Inc. will provide both the hydroponics/aquaculture training program and facility supervision. The demonstration facility will be constructed coincidental to program start-up with funds from the Hitachi Foundation.

Grantee: University of Delaware, Lewes, DE

Grant No.: NA96FD0079 NMFS Contact: F/NEO

Project Title: Genetic Monitoring of Oyster Stock Enhancement in the Chesapeake Bay

Funding: Federal: $68,835 Recipient: $24,819

Description: To use a genetic marker to distinguish Louisiana oyster seed outplanted in the Choptank River from resident oysters. Oyster seed of Louisiana origin were planted in the Choptank River at several defined sites in 1997. The survival and reproductive success of outplanted oyster seed will be evaluated in 1999 and 2000. This is a unique opportunity to capitalize on an ongoing stock enhancement program, and will provide direct information on its efficacy. The information obtained will be of immediate regional relevance and will highlight the value of genetic monitoring in shellfish and finfish enhancement.

Grantee: University of Delaware, Lewes, DE

Grant No.: NA46FD0329 NMFS Contact: F/NEO

Project Title: Rapid Detection of Genetic Variation for Fisheries Stock Identification

Funding: Federal: $91,284 Recipient: $12,388

Description: To develop a simple and rapid procedure for quantifying DNA sequence variation in regions of mitochondrial and nuclear genomes. This screening method will allow for efficient selection of genes for amplification and efficient selection of individuals for further examination by restriction fragment length polymorphism analysis or direct DNA sequencing.

Grantee: Rhode Island Lobstermen's Association, Wakefield, RI

Grant No.: NA96FD0074 NMFS Contact: F/NEO

Project Title: Tagging Study to Improve Biological Information Concerning the Overfished Status of the American Lobster

Funding: Federal: $70,508 Recipient: $37,500

Description: To enhance data collection for American lobster stock assessment purposes. Fishermen will tag and v-notch sublegal and legal female lobsters (60,000) during the year. Upon recapture, information concerning growth, movement, molting probability, and egging frequency will be collected. Biologists from the University of Rhode Island and the Rhode Island Department of Environmental Management will analyze the data and provide biological information to the Atlantic States Marine Fisheries Commission Lobster Technical Committee. The data will be used in the eggs per recruit model for Area 2 and may also prove useful for Areas 3 and 6.

Grantee: University of Maryland, Cambridge, MD

Grant No.: NA96FD0076 NMFS Contact: F/NEO

Project Title: Density-Dependent Growth and Reproduction of Chesapeake Bay Striped Bass

Funding: Federal: $88,702 Recipient: $23,404

Description: To estimate the age and year class-specific growth rates of Chesapeake Bay striped bass juveniles, pre-migrant sub-adults, and migratory females. Evidence for density dependence in growth will also be examined. In addition, fecundity and age at first maturation for females of year classes varying in initial abundance will be estimated, and the density effects on these rates will be tested. Finally, the importance of these density-dependent effects in calculating biological reference points and overfishing thresholds will be evaluated.

Grantee: University of Maryland, Cambridge, MD

Grant No.: NA96FD0073 NMFS Contact: F/NEO

Project Title: Recruitment Dynamics of Northern Shrimp (*Pandalus borealis)*

Funding: Federal: $92,789 Recipient: $21,871

Description: To investigate the influence of physical factors, excluding temperature, on northern shrimp recruitment. The match-mismatch hypothesis in relation to shrimp recruitment will also be investigated. A stock-recruitment model, incorporating the effects of significant environmental and ecological variables, will be developed. In addition, potential overfishing definitions of northern shrimp, with explicit consideration of the impact of environmental and ecological variation, will be explored.

Grantee: University of Maryland, Cambridge, MD

Grant No.: NA96FD0071 NMFS Contact: F/NEO

Project Title: Test of Two Stock Hypotheses for Atlantic Bluefin Tuna Using Otolith Elemental Fingerprints

Funding: Federal: $88,374 Recipient: $22,207

Description: To determine the spatial and temporal stability of elemental fingerprints classified for Mediterranean and western Atlantic bluefin tuna nurseries using results from a previous year S-K project on otolith miscroconstituent analysis. Juvenile otoliths collected over two years and among several sites within each nursery will be analyzed. Inductively coupled plasma mass spectrometry will also be evaluated to determine the elemental fingerprints associated with the first year of life.

Grantee: University of Maryland, Cambridge, MD

Grant No.: NA86FD0110 NMFS Contact: F/NEO

Project Title: Inter-Laboratory Investigation of the Feasibility of Otolith Microconstituent Analysis to Characterize Atlantic Bluefin Tuna Stock Structure

Funding: Federal: $105,548 Recipient: $27,371

Description: To address whether inductively coupled mass spectrometry (ICPMS)-based otolith microconstituent analysis can resolve Atlantic bluefin tuna stock structure issues. Protocol and standardization procedures will be developed. In a double blind test between two ICPMS laboratories, compositional differences between western Atlantic and Mediterranean bluefin tuna otoliths will be tested.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA

Grant No.: NA76FD0148 NMFS Contact: F/NEO

Project Title: Mortality and Pathophysiology Studies of Blue Crabs Infected with the Parasitic Dinoflagellate *Hematodinium perezi*

Funding: Federal: $117,868 Recipient: $13,511

Description: To examine host mortality from *Hematodinium perezi*, an internal parasite of the blue crab, and to estimate the potential loss of infected crabs to the fishery. The parasite presumably kills any blue crab that it infects. Consequently, the pathophysiological mechanisms underlying crab mortalities will be investigated. This information may be useful for management plans in estimating the mortalities in blue crab populations.

Grantee: New York University Medical Center, Tuxedo, NY

Grant No.: NA76FD0144 NMFS Contact: F/NEO

Project Title: Mixed Stock Analysis of Wintertime Aggregations of Striped Bass Along the Mid-Atlantic Coast

Funding: Federal: $80,016 Recipient: $35,901

Description: To aid in the design of stock-specific management plans for Atlantic coastal striped bass. Wintertime aggregations of adult striped bass will be sampled off the North Carolina coast, in the mouth of Delaware Bay, and along the New Jersey coast. Mitochondrial DNA and nuclear DNA genotype frequency data in a mixed stock model will be used to determine the relative contributions of the Hudson River and Chesapeake Bay stocks to these wintertime aggregations of striped bass.

Grantee: Dana L. Morse, Narragansett, RI

Project Title: The Effects of Bottom Ground Gear on Flatfish Catches in the Southern New England Whiting Industry

Grant No.: NA76FD0141 NMFS Contact: F/NEO

Funding: Federal: $65,339 Recipient: $2,250

Description: To make trawl fishing more selective through conservation engineering. Specific goals are (1) to reduce the catch of flounder in whiting trawls to as low a level as possible, while retaining the ability of the gear to catch target species -- ideally, a bycatch of less than 5% of the total haul weight will be achieved; (2) to provide the information from this study to the commercial industry, via popular literature, reports, conferences, etc., in order to provide alternatives to boost a troubled economic situation; and (3) to contribute to the overall understanding of the relationship between fishes and trawls, advancing the possibility of more highly selective fishing gear.

Grantee: Gloucester Fishermen's Wives Development Programs, Inc.

Grant No.: NA76FD0112 NMFS Contact: F/NEO

Project Title: Oral History Project to Collect Traditional Ecological Knowledge (Including Spawning Area Data) and Develop an Historical Record of Fishermen/Scientists Interactions

Funding: Federal: $54,203 Recipient: $4,750

Description: To interview fishermen to build a database of traditional spawning areas using a Geographic Information System; to secure a series of oral histories of fishermen's experiences at sea; and to document joint efforts between fishermen and scientists.

Grantee: Marine Biological Laboratory, Woods Hole, MA

Grant No.: NA76FD0111 NMFS Contact: F/NEO

Project Title: Determination of Spawning Success and Female Fecundity to Assess the New England Squid Fishery

Funding: Federal: $89,021 Recipient: $47,049

Description: To answer a basic biological question regarding the number of young produced by female squid. Adult *Loligo* (long-finned) squid will be caught and brought to the laboratory where spawning behavior will be observed and recorded on videotape. The number of young per egg pod will then be determined. The results will provide direct measurements of squid fecundity, rather than relying on estimates, and this information will improve fisheries management by allowing more accurate stock descriptions.

Grantee: University of New Hampshire, Durham, NH

Grant No.: NA76FD0103 NMFS Contact: F/NEO

Project Title: Collaborative Decision Making Workshops

Funding: Federal: $ 25,800 Recipient: $0

Description: To provide instruction in collaborative decision making to a minimum of 200 fisheries management stakeholders from New England. Of those 200, it is hoped that within one year at least 50 will become actively involved in the fisheries management process, capitalizing on these newly learned skills.

Grantee: University of South Carolina, Columbia, SC

Grant No.: NA97FD0064 NMFS Contact: F/SEO

Project Title: Spatial and Temporal Analyses of Genetic Variability in Bigeye and Yellowfin Tuna Larvae

Funding: Federal: $80,000 Recipient: $13,120

Description: To assess samples of larval tuna obtained from the Gulf of Guinea for genetic variation at both mitochondrial and nuclear DNA loci. Nuclear markers will include both restriction fragment length polymorphisms and microsatellite loci. The resulting data will be analyzed to determine whether the genetic variation observed in single samples is representative of that found in the adult population. Also, samples obtained at different seasons or in successive years will be compared to determine seasonal and temporal variation. Ultimately, these results will be used to develop a monitoring scheme for the assessment of tuna reproduction in the Gulf of Guinea, off the west coast of Africa. In addition, the data will be useful for establishing monitoring schemes for other tuna spawning areas for other large pelagic fish.

Grantee: South Carolina Department of Natural Resources, Charleston, SC

Grant No.: NA97FD0066 NMFS Contact: F/SEO

Project Title: Sampling and Evaluation of White Spot and IHHN Virus in Commercially Important South Atlantic Penaeid Shrimp Stocks

Funding: Federal: $136,931 Recipient: $42,494

Description: To screen samples of native shrimp for white spot and infectious hypodermal and hematopoietic necrosis (IHHN) viruses. Based on statistically rigorous protocol, shrimp samples will be collected during existing sampling cruises and archived. All samples will undergo an initial screen for the viruses by polymerase chain reaction, a technique successfully used by these researchers to identify viruses in local crustacean stocks. Suspect samples will be further analyzed by histopathology. Viral identification and pathogenicity will be confirmed in controlled bioassay studies. All data will be entered into an existing inventory relational database and analyzed statistically to evaluate incidence and distribution. Results summarizing the viral disease status of indigenous stocks will be disseminated in presentations, reports, and publications.

Grantee: University of Puerto Rico, San Juan, PR

Grant No.: NA97FD0069 NMFS Contact: F/SEO

Project Title: Management of the Red Hind Fishery in Western Puerto Rico through a Regional Demographic Analysis

Funding: Federal: $144,100 Recipient: $91,364

Description: To develop and parameterize a population model for managing red hind (*Epinephelus guttatus*) in western Puerto Rico (PR). Red hind are one of the most commercially important species of the Caribbean, the Bahamas, and Bermuda. Increasing fishing pressure has caused substantial reduction in size and structure of the stock that threatens to collapse the fishery. The University of Puerto Rico researchers will work cooperatively with the State Fisheries Laboratory to develop a scientifically based management plan for this fishery. Information from adult demography, larval settlement patterns, and the genetic structure of adults and settling larvae will be combined into a single cohesive management framework. This project, which relies heavily on local fishermen, will furnish government managers and lawmakers with data to chart stock recovery and evaluate location, numbers, and size of proposed Marine Fishery Reserves across PR. Since red hind share a suite of life history characteristics with other large serranids, the demographic information and management strategies generated in this project can be easily extended to other threatened grouper fisheries.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA

Grant No.: NA97FD0063 NMFS Contact: F/SEO

Project Title: Development of Hypervariable, Nuclear-DNA Markers for Population Structure Analysis of Atlantic Bluefin Tuna

Funding: Federal: $125,866 Recipient: $21,539

Description: To develop a minimum of ten single-copy-nuclear (scn) DNA loci and 20 microsatellite DNA loci specific for Atlantic bluefin tuna using procedures developed previously by the grantee. For scnDNA loci, a bluefin tuna genomic library will used to generate fragments 0.5-2.0 kilobase pairs in length. Appropriately sized, single-copy fragments will be sequenced to develop primer pairs for amplification using the polymerase chain reaction (PCR). Amplified loci will be digested with a suite of restriction endonucleases to identify polymorphic locus/enzyme combination. For microsatellite DNA loci, radiolabeled tri-and tetra-nucleotide probes will be used to identify candidate loci from a genomic DNA library. Candidate loci will be sequenced to identify PCR primer pairs, and amplification with individual primer pairs will be optimized. For both types of DNA markers, 20-30 individuals sampled from the western Atlantic Ocean and Mediterranean Sea will be screened to document polymorphism and identify allelic variants.

Grantee: North Carolina State University, Raleigh, NC

Grant No.: NA87FD0100 NMFS Contact: F/SEO

Project Title: Reproduction of Bluefin: Assessing Maturity Using Sex-Specific Compounds

Funding: Federal: $128,145 Recipient: $23,066

Description: To develop the means to biochemically identify the sex and maturational status of individual bluefin tuna, using routine immunoassay of sex-specific hormones and proteins present in blood and muscle tissue samples. These substances vary seasonally with sex and maturation in all teleost fish studied to date, and can serve as indicators for age at maturity and sex ratio in a population. An antiserum and immunoassay for bluefin vitellogenin, the egg-yolk protein precursor specific to maturing female fish, will be created. Muscle and plasma samples will be analyzed for estradiol-17B and vitellogenin to identify mature females, and testosterone and 11-ketotestosterone to identify mature males. Detailed histological examination of the gonads will be conducted to definitively identify the sex and state of maturation of individual fish. The hormone and vitellogenin profiles of these fish will be used to identify levels of these substances characteristic of each specific stage of maturation, and to develop a length-based maturity schedule.

Grantee: University of South Alabama, Mobile, AL

Grant No.: NA77FD0077 NMFS Contact: F/SEO

Project Title: Monitoring the Socio-Economic Impacts of Federal Regulations on Gulf of Mexico Commercial Shrimp Fishermen

Funding: Federal: $68,750 Recipient: $70,785

Description: To provide regulatory agencies with information for evaluating the effects of policy changes on user groups. The project will monitor the effects of regulations on shrimp fishermen by noting the changes in five key areas: social; economic; occupational; physical; and psychological well-being.

Grantee: University of Georgia, Athens, GA

Grant No.: NA77FD0061 NMFS Contact: F/SEO

Project Title: Assessment of Ark Populations in Whelk and Calico Scallop Fishing Grounds off the Coasts of Georgia and Florida to Determine Distribution, Abundance, and Potential Commercial Fishery Development of the Cut-Ribbed Ark (*A. floridana*) and Other Promising Ark Species

Funding: Federal: $49,521 Recipient: $23,489

Description: To determine if sufficient stocks of the cut-ribbed ark or other ark species are present in the scallop grounds off Cape Canaveral, Florida or in the commercial whelk harvesting areas of Georgia.

Grantee: Florida Department of Environmental Protection

Grant No.: NA77FD0069 NMFS Contact: F/SEO

Project Title: Assessing Status and Trends of Florida's Halfbeak Fishery

Funding: Federal: $64,899 Recipient: $19,900

Description: To assess the status and trends of the halfbeak fishery based on catch rates, fishing effort, species composition, and size-structure. The secondary goal is to investigate the reproductive biology of both halfbeak species using both gonadal-somatic ratios and histological preparations of gonads.

Grantee: Gulf & South Atlantic Fisheries Development Foundation, Tampa, FL

Grant No.: NA77FD0068 NMFS Contact: F/SEO

Project Title: Continuation of an Observer Program to Characterize and Compare Regional Efforts in the Directed Commercial Shark Fishery in the Eastern Gulf of Mexico and South Atlantic

Funding: Federal: $180,238 Recipient: $0

Description: To continue an important observer program that has been identified as a specific need for the better management of the shark resources of the U.S. Atlantic coast. Three observers are allocated 72 days each to monitor the shark fishing fleet in three different geographic areas which comprise the majority of the fishery landings: North Carolina, Atlantic Florida, and Gulf of Mexico Florida. Descriptive fishery statistics will be kept concerning fishing effort.

Grantee: Skidaway Institute of Oceanography, Savannah, GA

Grant No.: NA77FD0066 NMFS Contact: F/SEO

Project Title: Use of Genetic Probes and Artificial Recruit Collectors to Monitor and Enhance the Success of Bay Scallop Reseeding Programs

Funding: Federal: $60,393 Recipient: $27,191

Description: To enhance the success of bay scallop reseeding efforts in depleted estuaries by understanding the larval ecology and improving larval recruitment of seeded populations.

Grantee: Louisiana State University, Baton Rouge, LA

Grant No.: NA57FD0070 NMFS Contact: F/SEO

Project Title: An Economic Analysis of the U.S. Shrimp Market and Impacts of Management Measures

Funding: Federal: $96,776 Recipient: $32,378

Description: To provide a current economic assessment of the U.S. shrimp fishery to assess gains/losses in economic surplus from alternative management measures. A seasonal econometric model of the U.S. shrimp marketing and harvesting sector will be developed and used to analyze various regulatory options, such as closures and gear.

## Fisheries Bycatch

Grantee: University of Washington, Seattle, WA

Grant No.: NA96FD0120 NMFS Contact: F/AKO

Project Title: Reducing Seabird Bycatch in the North Pacific Longline Fisheries

Funding: Federal: $180,000 Recipient: $49,200

Description: To establish an industry-university collaboration to test a subset of required seabird bycatch mitigation devices on active commercial longline vessels using specially trained fishery observers. This work will be conducted in two fisheries during the 1999 and 2000 fishing seasons: The Individual Transferrable Quota sablefish and halibut longline fisheries operating in the Gulf of Alaska; and the Pacific cod fishery operating in the Bering Sea/Aleutian Islands area. Two required mitigation devices will be compared to a control in each fishery. The data collection and analysis strategy focuses on linking seabird abundance and behavior data during gear deployment to observed hooking rates. In addition, the species-specific interactions of seabirds with longline fishing gear on active fishing vessels will be characterized. The investigators will work with the industry and resource management agencies in developing recommendations for specific seabird bycatch avoidance regulations and performance standards based on project results. Recommendations for future research projects and research protocols will also be developed.

Grantee: University of Alaska Fairbanks, Fairbanks, AK

Grant No.: NA76FD0037 NMFS Contact: F/AKO

Project Title: Quantitative Evaluation of Species Specific Flatfish Behavior: Basis for Bycatch Reduction and Selective Trawl Development

Funding: Federal: $62,076 Recipient: $12,415

Description: To analyze existing videotapes of fish capture archived at the University of Alaska Fishery Industrial Technology Center, to quantify species-specific flatfish behavior. This information will provide a more comprehensive understanding of how individual flatfish species are captured and how the capture process can be adapted to separate flatfish species.

Grantee: Alaska Department of Fish and Game, Anchorage, AK

Grant No.: NA46FD0356 NMFS Contact: F/AKO

Project Title: Genetic Stock Identification of Alaska Chinook Salmon

Funding: Federal: $144,951 Recipient: $31,235

Description: To evaluate the use of genetic data to identify stock components of trawl bycatch in the Bering Sea, Aleutian Islands, and Gulf of Alaska.

Grantee: Alaska Fisheries Development Foundation, Inc., Anchorage, AK

Grant No. NA36FD0149 NMFS Contact: F/AKO

Project Title: Trawl Cod-End Mesh Size and Shape Investigations to Reduce Catch and Discard of Undersized Pollock

Funding: Federal: $675,000 Recipient: $0

Description: To develop and test experimental cod-ends (square mesh vs. diamond mesh) designed to reduce the catch of small pollock. In addition, the short-term and long-term effects of the experimental cod-ends on the harvest, economics, and status of the pollock stocks will be estimated.

Grantee: Arete Associates, Inc., Tucson, AZ

Grant No.: NA77FD0045 NMFS Contact: F/SWO

Project Title: Demonstration and Evaluation of the Streak Tube Imaging LIDAR for Use in Bycatch Reduction

Funding: Federal: $139,131 Recipient: $42,399

Description: To conduct an airborne demonstration of Streak Tube Imaging LIDAR, a type of sensor system, for use in surveillance to find tuna not associated with dolphin. Data gathered from in-flight tests will be analyzed and a summary of research findings will be prepared.

Grantee: Massachusetts Division of Marine Fisheries, Boston, MA

Grant No.: NA96FD0072 NMFS Contact: F/NEO

Project Title: Developing a Low Impact Sea Scallop Dredge

Funding: Federal: $35,388 Recipient: $10,994

Description: To verify whether bay scallops and sea scallops respond to certain acoustic stimuli, and ascertain if a dredge could be developed that would take advantage of this behavior. Observations of bay scallops *in situ* have shown that they react to certain acoustic stimulation and will swim vertically off the sea bottom. The dredge would be of a type that lightly skims over the sea bottom, thus reducing impact to the benthos which would, if associated with bay scallop harvesting, include eel grass.

Grantee: National Fisheries Institute, Inc., Arlington, VA

Grant No.: NA86FD0113 NMFS Contact: F/NEO

Project Title: Bycatch in Pelagic Longline Fisheries: Temporal, Spatial, Gear, and Operational Characteristics for Longline Sets North of 35° North Latitude

Funding: Federal: $35,173 Recipient: $11,618

Description: To quantitatively summarize U.S. longline observer data in terms of both catch and bycatch disposition. For the Mid-Atlantic Bight, Georges Bank, and Grand Banks regions, seasonal patterns in catch rates for priority bycatch species will be investigated. Temporal, spatial, gear, and operational factors will be evaluated in terms of their influence on catch rates of priority species. Commercial fishermen will be solicited for practical options to reduce bycatch. A report describing data, analysis, and practical suggestions for minimizing bycatch will be prepared and distributed to permitted Atlantic longline fishermen, fishery managers, and members of advisory panels involved in the management of Atlantic highly migratory species.

Grantee: New England Aquarium Corporation, Boston, MA

Grant No.: NA86FD0108 NMFS Contact: F/NE0

Project Title: Increasing Survival of Juvenile Atlantic Cod (*Gadus morhua*) and Haddock (*Melanogrammus aeglefinus*) in the Northwest Atlantic Demersal Longline Fishery

Funding: Federal: $163,244 Recipient: $127,386

Description: To build upon the selectivity work already conducted and investigate how different hauling strategies might affect wound size and juvenile groundfish survivability. Preliminary survival statistics from current longline work suggest that survival of juvenile bycatch is correlated to hooking wound magnitude and that effective selectivity against juveniles can be accomplished using modified circle hooks.

Grantee: New England Aquarium Corporation, Boston, MA

Grant No.: NA77FD0105 NMFS Contact: F/NEO

Project Title: Leatherback Turtle Movements in Relation to New England Pelagic Fisheries

Funding: Federal: $81,225 Recipient: $0

Description: To identify whether fishing practices can be modified to reduce incidental capture of leatherback turtles. Satellite tags will be placed on leatherback sea turtles on the New England pelagic fishing grounds. The tags will be used to follow the turtles' movements, diving patterns, and interactions with pelagic swordfish longline and drift gillnet fishing activities, in relation to oceanographic conditions.

Grantee: Manomet Observatory for Conservation Science, Manomet, MA

Grant No.: NA76FD0110 NMFS Contact: F/NEO

Project Title: Bycatch Reduction Project

Funding: Federal: $266,139 Recipient: $254,288

Description: To develop selective trawls and lay the foundation for their use in the industry. Activities include reviewing the literature on fishing gear experiments, creating an industry advisory group, using underwater video and other electronics to analyze fish behavior with regard to standard fishing gear and gear which has been modified to increase selectivity. Modified gear will be compared with controls using paired tows, producing videos of the results. The new technology developed will be made available to the industry.

Grantee: Atlantic Gillnet Supply, Inc., Gloucester, MA

Grant No.: NA76FD0107 NMFS Contact: F/NEO

Project Title: Effectiveness of Acoustically Reflective Gillnet in Reducing/ Eliminating Marine Mammal Bycatch

Funding: Federal: $170,860 Recipient: $79,700

Description: To prepare a monofilament gillnet enhanced with acoustically reflective material and test its efficiency during sea trials, both alone and in combination with pingers, to determine whether marine mammal bycatch can be avoided.

Grantee: Maine Department of Marine Resources, Augusta, ME

Grant No.: NA76FD0101 NMFS Contact: F/NEO

Project Title: Using Observers to Monitor Status of Atlantic Herring Spawning Stocks and Groundfish Bycatch in the Gulf of Maine

Funding: Federal: $ 71,220 Recipient: $ 5,332

Description: To sample the extent of bycatch associated with mid-water trawling and surface purse seining for herring to see if groundfish constitute more than 5% of the catch, the current regulatory limit established by the New England Fishery Management Council. Observers will take 20 trips to sea of at least 5 consecutive days on a single fishing vessel, subsampling the catch and counting and weighing all species other than herring. The resulting data will be statistically analyzed to determine the percent bycatch.

Grantee: Maine Department of Marine Resources, Augusta, ME

Grant No.: NA46FD0324 NMFS Contact: F/NEO

Project Title: Lessening the Impact of the Northern Shrimp Fishery on Juvenile Groundfish in the Western Gulf of Maine

Funding: Federal: $99,240 Recipient: $46,419

Description: To provide a careful definition of the physical habitat and prey species of juvenile groundfish. In addition, the project will assess how the use of square mesh in the cod-end effects the performance of shrimp fishing gear; assess the effect of the Nordmore grate and square mesh on the mesh selection curve for northern shrimp; and to further characterize the interaction between juvenile groundfish and northern shrimp.

Grantee: University of Rhode Island, Kingston, RI

Grant No.: NA46FD0325 NMFS Contact: F/NEO

Project Title: Reduction of Flatfish Bycatch in the Small Mesh Bottom Trawls Used in the New England Whiting Fishery: An Investigation of Fish Behavior and an Evaluation of Separator Trawl Technologies

Funding: Federal: $84,232 Recipient: $57,550

Description: To investigate fish behavior in relation to bottom trawls using a low-light video camera system, and to develop hypotheses on species- or species group-specific behavioral patterns based on the video data. The results of these behavioral analyses will be used to design innovative techniques for separating flatfish from groundfish in small mesh trawls. Alternate-paired tow comparisons aboard fishing vessels will be conducted to evaluate a separator trawl design.

Grantee: Gulf and South Atlantic Fisheries Development Foundation, Inc., Tampa, FL

Grant No.: NA87FD0099 NMFS Contact: F/SEO

Project Title: Enhancing Industry Contributions Toward Bycatch Reduction in the Shrimp Fisheries of the Gulf of Mexico and South Atlantic

Funding: Federal: $486,342 Recipient: $54,500

Description: To address the bycatch issue in the southeastern shrimp trawl fishery by working cooperatively with the shrimp industry to enhance their contribution to the development, evaluation, or modification of existing or new bycatch reduction devices (BRDs). With BRD regulations being drafted and/or implemented, only now are the gears being used extensively. The day-to-day knowledge and experience of commercial fishers can provide valuable insights towards addressing current inadequacies of available BRDs. To support industry contribution in the development of the most efficient BRDs, the Foundation will solicit proposals from industry representatives to develop or modify BRDs, and will work with the successful applicants to complete tests and evaluations of modified BRDs or new designs.

Grantee: Gulf and South Atlantic Fisheries Development Foundation, Inc., Tampa, FL

Grant No.: NA77FD0067 NMFS Contact: F/SEO

Project Title: Continued Efforts to Reduce Bycatch in the Gulf of Mexico and South Atlantic Shrimp Fisheries and Disseminate Such Information to the Fishing Industry

Funding: Federal: $560,740 Recipient: $0

Description: To address the issue of bycatch in the shrimp trawl fishery of the southeast U.S. by (1) continuing observer coverage aboard commercial shrimp vessels to evaluate the efficiency of bycatch reduction devices (BRDs); (2) providing support for additional industry contribution to the development, evaluation, or modification of existing or new BRDs; and (3) disseminating programmatic results to the most directly affected group, the commercial shrimp fishers, through a series of workshops.

Grantee: Mote Marine Laboratory, Sarasota, FL

Grant No.: NA57FD0031 NMFS Contact: F/SEO

Project Title: Reduction of Bluefin Tuna and Undersize Swordfish Bycatch in Atlantic Longline Fisheries

Funding: Federal: $128,438 Recipient: $13,804

Description: To evaluate information about depth, temperature, time, location, and other factors associated with capture of bluefin tuna, swordfish, yellowfin tuna, and other species, using hook timers and depth-time recorders on operating gear aboard commercial longliners. This information will allow fishermen to more precisely set longline gear to avoid bycatch and maximize landings of target species. A “weak link” of lighter test monofilament will also be tested to reduce giant bluefin tuna catches.

## Product Quality and Safety

Grantee: University of Alaska, Fairbanks, AK

Grant No.: NA96FD0053 NMFS Contact: F/AKO

Project Title: Seafood HACCP Validation Using the ATP Bioluminescent Assay

Funding: Federal: $63,133 Recipient: $7,939

Description: To (1) compare adenosine triphosphate (ATP) bioluminescent assays to aerobic plate count methods to determine surface contamination levels on processing lines, equipment surfaces, and utensils after sanitation by plant personnel; (2) compare contamination load on surfaces after different processing and sanitation shifts and correlate residual sanitizer (chlorine and quaternary ammonium compounds) concentration on surfaces with ATP bioluminescence levels; (3) determine if the ATP bioluminescent assay distinguishes microbial contamination of raw materials from non-microbial ATP for use as a control point at receiving; and (4) conduct in-plant workshops and demonstrations of the ATP bioluminescent assay and determine if microbial quality of raw products improves after training of plant personnel.

Grantee: University of Alaska, Fairbanks, AK

Grant No.: NA96FD0052 NMFS Contact: F/AKO

Project Title: Evaluation of Ozone for Ready to Eat Seafoods

Funding: Federal: $80,715 Recipient: $16,143

Description: To (1) determine ozone concentrations necessary for inactivating microbial biofilms on seafood equipment and reducing microbial counts on raw material used for ready to eat (RTE) production; (2) evaluate the effect of ozone on *Listeria monocytogenes* inoculated seafoods; (3) measure shelf life characteristics of ozone treated RTE seafoods; and (4) compare ozone and chlorine treatments for RTE production in a commercial operation.

Grantee: University of Washington, Seattle, WA

Grant No. NA86FD0393 NMFS Contact: F/NWO

Project Title: Harmful Algal Blooms and their Impacts on Shellfisheries and Finfisheries in Western Washington

Funding: Federal: $216,551 Recipient: $38,668

Description: To provide approaches to the study and mitigation of harmful algal blooms. A field guide to the common phytoplankton in western Washington waters will be developed and published. The guide will contain light microscope and scanning electron microscope photographs of many phytoplankton species and short descriptions of characteristics. The guide will include many harmful species and serve as a guide for health managers who are examining water samples on site. Also, the researchers will continue their monitoring program for harmful algal species on Washington coastal beaches and the Puget Sound Basin. This data will allow researchers to better understand the temporal and spatial variability of various harmful species in the region.

Grantee: University of Washington, Seattle, WA

Grant No.: NA66FD0113 NMFS Contact: F/NWO

Project Title: Domoic Acid, Diatoms, and the Shellfish Industry in Western Washington/ Harmful Phytoplankton Blooms and their Impacts on the Shellfish and Finfish Fisheries in Western Washington

| | | | | |
|---|---|---|---|---|
| Funding: | Federal: | $165,569 Year 1 | Recipient: | $0 Year 1 |
| | | $173,888 Year 2 | | $0 Year 2 |

Description: To determine which species of algae produce domoic acid in Washington coastal waters; determine the environmental conditions that enhance or control toxin production in those species; identify factors controlling the distribution of the domoic acid-producing species; and elucidate the role of domoic acid on the phytoplankton themselves. Domoic acid has been found in Dungeness crab and other shellfish and presents a severe health hazard to humans. Results from this work may provide needed information that will allow for an early warning of potential blooms.

Grantee: University of Washington, Seattle, WA

Grant No.: NA66FD0103 NMFS Contact: F/NWO

Project Title: *Heterosigma carterae*: Laboratory Induction of Toxin Production/Target Marine Species - Year 2

Funding: Federal: $106,098 Recipient: $7,522

Description: To utilize a *Heterosigma* isolate in determining the environmental factors that induce bloom formation and maximize toxin production. Further, the susceptibility of both vertebrate and invertebrate marine species to *Heterosigma* toxin will be analyzed. *Heterosigma* is a toxic alga known to cause mass mortalities in farmed salmon and other finfish.

Grantee: PacMar, Inc., Honolulu, HI

Grant No.: NA86FD0067 NMFS Contact: F/SWO

Project Title: Development of a HAACP-Based Strategy for the Control of Histamine for the Fresh Tuna Industry

Funding: Federal: $199,513 Recipient: $34,622

Description: To develop a Hazard Analysis Critical Control Point (HACCP)-based approach to the problem of histamine formation in fresh tuna which integrates the industry linkages (fishing vessel/processor/distributor) in an effective, efficient, and practical system capable of ensuring public safety and compliance with FDA seafood regulations. This will be achieved by (1) evaluating epidemiological data on histamine toxicity in Hawaii; (2) developing fishing fleet profiles in terms of fishing methods, post-harvest handling methods, and potential risk of histamine production; (3) verifying the post-harvest handling procedures by using temperature loggers deployed at sea to record the temperature history of fish aboard fishing vessels; and (4) determining the importance of gear type, post-handling methods, and fresh tuna quality grades as indicators of histamine concentration.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA

Grant No.: NA76FD0052 NMFS Contact: F/SWO

Funding: Federal: $118,213 Recipient: $11,993

Project Title: The Therapeutic Treatment of Abalone Infected with the Putative Agent of Abalone Withering Syndrome

Description: To test and evaluate the efficacy of several different antibiotics for the treatment of withering syndrome in abalone. Withering syndrome is a serious and, thus far, incurable disease which has decimated some populations of abalone in southern and central California waters.

Grantee: Monterey Bay Aquarium Research Institute, Moss Landing, CA

Grant No.: NA76FD0051 NMFS Contact: F/SWO

Project Title: Rapid Detection of Harmful Algal Species and their Associated Toxins Using DNA Probes and a Receptor Binding Assay

Funding: Federal: $128,578 Recipient: $33,673

Description: To test sea water for the presence of *Pseudonitzschia* diatoms using a probe developed from a previous grant. If successful, a method to identify and even predict the presence of domoic acid will have been perfected. Domoic acid is a dangerous toxin that infects fish who eat the host diatoms, and in turn, poisons humans who eat infected fish.

Grantee: The Regents of the University of California, Berkeley, CA

Grant No.: NA76FD0046 NMFS Contact: F/SWO

Project Title: Investigation of the Role of Rickettsiales-Like Procaryotes in Withering Syndrome of Black Abalone: Koch's Postulates and Molecular Probes

Funding: Federal: $55,040 Recipient: $37,099

Description: To continue the ongoing investigations of the possible causes of withering syndrome, a disease that has infected and decimated abalone populations along the coast of California.

Grantee: Woods Hole Oceanographic Institution, Woods Hole, MA

Grant No.: NA57FD0012 NMFS Contact: F/SWO

Project Title: A Predictive Index for Paralytic Shellfish Poisoning Events on the Northern California Coast

Funding: Federal: $42,007 Recipient: $0

Description: To investigate whether a predictive index developed for paralytic shellfish poisoning (PSP) in northwest Spain can be applied to northern California. In addition, the hypothesis that the onset of PSP in northern California is linked to the relaxation of upwelling, and the transport of established blooms to the shore with warm stratified offshore waters, will be tested.

Grantee: University of Rhode Island, Kingston, RI

Grant No.: NA76FD0142 NMFS Contact: F/NEO

Project Title: Technology Development for Flavor Production from Seafood Processing Wastes

Funding: Federal: $108,123 Recipient: $28,134

Description: To refine the current enzyme hydrolysis technique for seafood flavor manufacturing and to optimize purification and concentration procedures for commercial scale-up. The overall goal is to help create a seafood flavor manufacturing industry while improving the current flavor manufacturing process.

Grantee: University of Rhode Island, Kingston, RI

Grant No.: NA76FD0140 NMFS Contact: F/NEO

Project Title: Standardization of the Ammonia Electrode Method for the Evaluation of Seafood Quality by Correlation to Sensory Analysis

Funding: Federal: $77,780 Recipient: $6,298

Description: To design and implement a valid sensory and analytical protocol for correlation with results obtained with an ammonia ion selective electrode (ISE) for seafood quality. The anticipated benefits will be a simple rapid procedure for screening seafood quality.

Grantee: Louisiana State University Medical Center, New Orleans, LA

Grant No.: NA97FD0062 NMFS Contact: F/SEO

Project Title: Reduction in the *Vibrio vulnificus* Load in Oysters by a Novel Short-Term Combination Biodepuration Treatment

Funding: Federal: $173,111 Recipient: $133,283

Description: To conduct studies on oysters naturally contaminated with *Vibrio vulnificus* and undergoing biodepuration on a pilot scale. Pooled bacteriophage specific for *V. vulnificus* and anti-*V. vulnificus* protein will be used to reduce the microbial burden to levels deemed safe when such oysters are eaten raw. Prior investigations have resulted in the isolation of nine bacteriophage specific for *V. vulnificus*. Pools of these phage have successfully reduced *V. vulnificus* populations *in vitro* and *in vivo* among live oysters artificially contaminated with the organisms. These data suggest that pooled phage could be successfully used in the biodepuration of oysters destined for raw consumption. A protein has also been isolated from oyster tissue. This protein specifically acts against *V. vulnificus*, significantly reducing its populations both *in vitro*, and *in vivo* with oysters artificially contaminated with the organism. The protein has been partially characterized and at least three fragments have been sequenced. Populations of *V. vulnificus* were found to be markedly reduced when this protein was jointly used with pooled phage in the biodepuration of oysters artificially contaminated with *V. vulnificus*.

Grantee: University of Southern Mississippi, Hattiesburg, MS

Grant No.: NA97FD0067 NMFS Contact: F/SEO

Project Title: A Histamine Dipstick Test for Spoilage in Fisheries Products

Funding: Federal: $52,875 Recipient: $22,207

Description: To further develop a sensitive, accurate, rapid, and convenient dipstick for determining histamine levels in seafood products and make it commercially feasible. The researchers have developed and published such a dipstick test. Before this dipstick can be produced on a large scale in a form suitable for widespread use, however, the histamine-specific enzyme component must be produced in large quantities and optimized for the currently allowed Food and Drug Administration levels for histamine. Scombroid poisoning occurs when consumers ingest spoiled tuna and related fish. It is typically associated with high levels of histamine produced by the bacterial decomposition of these fish. Since odor and appearance do not reliably indicate this type of spoilage, a simple test of histamine for use in widespread quality control testing of fisheries products is needed.

Grantee: Mote Marine Laboratory, Sarasota, FL

Grant No.: NA77FD0081 NMFS Contact: F/SEO

Project Title: Utilization of Molecular Biomarkers to Provide an Assay for Shellfish Exposure to Polyether Toxins from Harmful Algal Blooms

Funding: Federal: $212,883 Recipient: $68,910

Description: To determine the sensitivity and selectivity of protein biomarkers for toxin exposure. Clams will be exposed to known concentrations of *G. breve* at Mote Marine Laboratory. Extracts of select tissue will be analyzed for brevetoxin content by high performance liquid chromatography and by receptor binding assay. An aliquot of the extracts will be assayed by one-dimensional electrophoresis to determine the time course of expression and extinction of the protein biomarkers relative to toxin content and annual testing.

Grantee: Baylor College of Medicine, Houston, TX

Grant No.: NA77FD0080 NMFS Contact: F/SEO

Project Title: Molecular Assessment of Public Health Suitability of Shellfish for Human Consumption

Funding: Federal: $183,680 Recipient: $0

Description: To develop methods for the detection of potentially infectious human caliciviruses to improve shellfish safety and provide the tools needed to better understand the epidemiology and transmission of these viruses.

Grantee: University of Florida, Gainesville, FL

Grant No.: NA67FD0037 NMFS Contact: F/SEO

Project Title: Moisture Content in Penaeid Shrimp Destined for U.S. Consumption

Funding: Federal: $65,395 Recipient: $30,206

Description: To authenticate the moisture content for penaeid shrimp in an effort to address good manufacturing practices, regulatory compliance, and consumer expectations. All data will be based on authentic, verified sampling plans and analytical procedures for four domestic wild species and one primary cultured species of foreign origin. Also, natural (non-processed) moisture levels will be established, while considering all processing steps, freezing methods, thawing, refreezing, use of phosphates, and cooking.

Grantee: North Carolina State University, Raleigh, NC

Grant No.: NA67FD0500 NMFS Contact: F/SF2

Project Title: A New Toxic Dinoflagellate Affecting Cultured and Wild Estuarine Fish -Year 2

Funding: Federal: $149,953 Recipient: $38,932

Description: To characterize the ecological distribution, algal physiology, disease effects, and toxin of a new toxic dinoflagellate recently discovered in the Albemarle-Pamlico Estuary. The data will provide critical information needed to assess the impact of this toxic dinoflagellate on wild and cultured fish populations.

Grantee: Regents of the University of California, Berkeley, CA

Grant No: NA47FD0416 NMFS Contact: F/SF2

Project Title: Microbial Safety: Rapid Methods for Shellfish and Seawater-Injured *E. coli*

Funding: Federal: $72,209 Recipient: $29,034

Description: To complete the final development of a rapid, sensitive, and more simplified test for the detection of *E. coli* in shellfish. The method will reduce by 50% the time and labor required for current routine microbiological screening of molluscan shellfish. It will also increase the sensitivity, making it easier to investigate whether low concentrations of *E. coli* correlate well with other indicators of possible hazards. The new test will make *E. coli* enumeration simple enough to incorporate into HACCP plans and seafood microbiological standards.

Grantee: University of North Carolina, Charlotte, NC

Grant No: NA36FD0271 NMFS Contact: F/SF2

Project Title: Detection and Enumeration of Viable but Nonculturable *Vibrio vulnificus*

Funding: Federal: $108,808 Recipient: $0

Description: To develop methods for the differentiation and enumeration of *Vibrio vulnificus* cells present in the environment in the “viable but nonculturable” state.

## Aquaculture

Grantee: University of Alaska Southeast, Juneau, AK

Grant No.: NA76FD0035 NMFS Contact: F/AKO

Project Title: Nori Cultivation: Physiological Ecology of Native Alaskan *Porphyra* Species - Year 3

Funding: Federal: $151,351 Recipient: $33,149

Description: To determine the physiological and ecological conditions for the successful cultivation of native *Porphyra* species in the state of Alaska. Laboratory experiments will determine or confirm the optimal culture conditions for growth and maturation of conchocelis and release of conchospores of up to four Alaskan species of *Porphyra* with commercial aquaculture potential.

Grantee: Qutecak Native Tribe, Seward, AK

Grant No.: NA66FD0045 NMFS Contact: F/AKO

Project Title: Broodstock Selection and Hatchery Development of Purple-Hinged Rock Scallops (*Crassodoma gigantea*) for Marine Aquaculture

Funding: Federal: $69,795 Recipient: $35,145

Description: To develop sources of purple-hinged rock scallop seedstock suitable for use in suspended culture and develop or demonstrate cost-effective approaches for advancing environmentally sound private aquaculture development.

Grantee: Pacific Shellfish Institute, Olympia, WA

Grant No. NA96FD0194 NMFS Contact: F/NWO

Project Title: Manila Clam Mortality and Health Evaluation

Funding: Federal: $168,111 Recipient: $32,410

Description: To initiate the establishment of production standards and a health baseline for intensive clam production on the west coast of the United States. These activities will form the basis of an integrated health management program for manila clam and support the production of healthy clams from all regions of the country. The baseline data on manila clam health will also be used to assist state and tribal shellfish biologists in assessments of public and tribal clam resources. The researchers will monitor clam growth, survival, yield, health, and environmental conditions at sites of intensive clam production. Adult and seed clams will be examined for the presence of infectious diseases, and experimental studies at a clam production facility will be conducted to expose clams to defined freezing and freshwater exposures. This latter study will allow growers to identify high-risk beds and manage them to reduce impacts of low temperature and excessive freshwater exposure. Finally, the recipient will set up a clam mortality response team to address grower concerns about clam morbidity and mortality and help identify the causes of such episodes. Completion of these tasks will enhance the competitiveness of adult clams and seed clam production in world markets, increase domestic supplies, and reduce the need for imported clams.

Grantee: Pacific Shellfish Institute, Olympia, WA

Grant No. NA86FD0262 NMFS Contact: F/NWO

Project Title: High Health Management of Pacific Oysters

Funding: Federal: $117,282 Recipient: $42,657

Description: To initiate and advance an integrated health management program for regional Pacific oyster health. This program will conduct a regional health assessment of adult Pacific oysters for infectious disease organisms in various hydrogeographic zones in Washington, Oregon, and California to meet Organization Internationale Epizooties standards. Also, a manual will be prepared on industry-wide Pacific oyster high health protocols and policies to initiate training and coordination among industry, researchers, and regulators. The manual provides the required documentation for USDA/APHIS export certification for industry.

Grantee: Washington State University, Pullman, WA

Grant No. NA76FD0300 NMFS Contact: F/NWO

Project Title: Optimal Design of a Water Recirculation System for Shellfish Depuration

Funding: Federal: $98,820 Recipient: $29,802

Description: To develop an optimal design of a water recirculation system for shellfish depuration and wet storage. The research will provide a guideline for determining the maximum carrying capacity for shellfish utilizing a certain biofilter. Researchers will investigate coliform disinfection effectiveness of UV technology under different turbidity; determine shellfish excretion rates as a function of water temperature; investigate nitrification efficiency and dynamics under different temperatures; and evaluate and document a depuration system in a commercial setting.

Grantee: Regents of the University of California, Davis, CA

Grant No.: NA96FD0206 NMFS Contact: F/SWO

Project Title: Life History of an Exotic Sabellid Polychaete Pest in Cultured Abalone in California

Funding: Federal: $112,064 Recipient: $25,945

Description: To describe the life history of the fan worm which infests cultured abalone. All life stages and reproductive ability at temperatures experienced in California will be identified. Life stages of fan worms reared *in situ* and *in vitro* will also be identified, as will the timing of each developmental stage and the reproductive potential. Generation times at several temperatures between 9 and 23°C will be determined. Using a combination of light and electron microscopy, and fertilization experiments, it will be determined whether the sabellid is capable of self and/or cross fertilization. The potential risk associated with the release of precompetent larval and embryonic stages will also be examined. In order to assess the possibility that infested abalone may have been outplanted, the researchers will survey several outplant sites for infested abalone and other gastropods. If found, mark and recapture studies will be conducted using initially uninfested gastropods to determine rates of fan worm transmission in the field. Based on the findings, changes will be recommended in abalone husbandry methods to aid in eradication of the fan worm from aquaculture facilities and reduce its potential establishment in the wild.

Grantee: Regents of the University of California, Oakland, CA

Grant No.: NA86FD0069 NMFS Contact: F/SWO

Project Title: Development of Rock Scallop Grow-Out Techniques

Funding: Federal: $48,088 Recipient: $6,815

Description: To develop recommendations on rock scallop grow-out methods by conducting laboratory experiments, dissections, and pilot field studies. Laboratory work will examine behavioral and developmental mechanisms responsible for final attachment. The field studies, to be done in collaboration with California aquaculturists, will further refine potential grow-out techniques identified in the laboratory for use in various culture systems.

Grantee: Coral Reef Foundation, Koror, Palau

Grant No.: NA86FD0068 NMFS Contact: F/SWO

Project Title: Culture of New Marine Invertebrates for the Home Aquarium Industry

Funding: Federal: $32,640 Recipient: $10,420

Description: To identify species of marine invertebrates, principally sponges and ascidians, and develop “low-tech” mariculture methods to raise these species for sale in the marine aquarium trade. It is anticipated that this work will encourage increased involvement of Pacific Islanders in this industry by expanding the number of species available for culture.

Grantee: Black Pearls, Inc., Holualoa, HI

Grant No.: NA76FD0054 NMFS Contact: F/SWO

Project Title: The Hawaiian Pearl Oyster Partnership: A Public-Private Initiative for Commercial Pearl Oyster Farming and a Test Case of Ocean Leasing Laws

Funding: Federal: $99,540 Recipient: $15,557

Description: To develop a public-private partnership between the State of Hawaii and private interests to establish ocean leasing for aquaculture in Hawaii. The grantee will attempt to obtain the first commercial aquaculture ocean lease and establish a farm/reproductive reserve for a species that was once abundant in the main Hawaiian Islands but is now considered rare.

Grantee: Hubbs-Sea World Research Institute, San Diego, CA

Grant No.: NA76FD0049 NMFS Contact: F/SWO

Project Title: Commercialization of White Seabass Aquaculture Pilot Program: Grow-Out to Market

Funding: Federal: $208,982 Recipient: $72,494

Description: To test the commercial feasibility of white seabass aquaculture from grow-out to market. Currently, white seabass are raised to small sizes for use only in stock enhancement. This project will grow the fish to a larger size and attempt to introduce the fish in the commercial market to test the technical and economic feasibility of a commercial white seabass aquaculture operation.

Grantee: Woods Hole Oceanographic Institution, Woods Hole, MA

Grant No.: NA96FD0078 NMFS Contact: F/NEO

Project Title: Aquaculture Regulation: Economic and Legal Models for the U.S. Exclusive Economic Zone

Funding: Federal: $92,935 Recipient: $26,107

Description: To develop a framework for analyzing access system design for ocean mariculture operations and to characterize an economically optimal access system. An economic analysis will be conducted to complement current efforts by academia, public interest groups, Federal agencies, and the U.S. Congress to develop laws and regulations governing ocean mariculture in the U.S. Exclusive Economic Zone.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA

Grant No.: NA96FD0075 NMFS Contact: F/NEO

Project Title: Influence of Host Genetic Origin and Geographic Location on QPX Disease in Hard Clams (*Mercenaria mercenaria*)

Funding: Federal: $212,998 Recipient: $68,120

Description: To examine variation in the expression and pathogenicity of QPX disease in relation to genetic origin and geographic location of hard clams. The research will focus on identifying a strain(s) of hard clams resistant to QPX disease. The main objectives of the project are to (1) compare clam growth (size), condition, survival, and QPX prevalence and severity in five hatchery-reared strains of hard clams at three regionally separated QPX endemic locations; (2) determine the significance of the effect of strain and region on hard clam growth, condition, survival, and QPX disease through time; and (3) determine the best strain for culture in QPX endemic areas, and recommend strains for future efforts to enhance resistance to QPX through selective breeding.

Grantee: Purdue University, West Lafayette, IN

Grant No.: NA76FD0149 NMFS Contact: F/NEO

Project Title: Toward Sustainable Aquacultural Production Systems: Promoting Optimum Media for Nitrifying Bacteria in Recirculating Aquaculture Systems

Funding: Federal: $120,700 Recipient: $0

Description: To explore the potential for establishing a selective or optimal medium for nitrifying bacteria in recirculating system aquaculture. Five minerals, critical for the bacteria but rarely added to diets for fish, will be the focus of this research. The results of this research may lead to the development of sustainable recirculating systems for the mass production of a variety of species.

Grantee: University of Maryland Biotechnology Institute, Baltimore, MD

Grant No.: NA76FD0145 NMFS Contact: F/NEO

Project Title: Optimization and Clearance Studies of a New Hormone-Based Spawning Induction Technology for Aquacultured Finfish

Funding: Federal: $132,546 Recipient: $77,826

Description: To optimize an efficient, reliable, and physiologically sound technology to induce ovulation, spawning, and sperm production in farmed fish using hybrid striped bass. This work will provide information to facilitate the regulatory approval of the technology, making it accessible to commercial hatcheries and finfish growers.

Grantee: University of Rhode Island, Kingston, RI

Grant No.: NA76FD0143 NMFS Contact: F/NEO

Project Title: Development of Commercial Aquaculture of Black Sea Bass

Funding: Federal: $99,385 Recipient: $15,246

Description: To evaluate the potential for raising black sea bass from eggs to juveniles as a commercial aquaculture endeavor. The researchers will collect broodstock, evaluate natural and artificial spawning, conduct photoperiod studies, and analyze the effects of salinity changes and various diets for black sea bass. Each phase of the investigations will follow procedures proven successful with other species. Eggs in excess of the study requirements will be provided to others interested in black sea bass aquaculture.

Grantee: University of New Hampshire, Durham, NH

Grant No.: NA76FD0104 NMFS Contact: F/NEO

Project Title: Development of an Integrated Aquaculture and Sea Ranching System for the Green Sea Urchin (*Strongylocentrotus droebachiensis*) in the Gulf of Maine

Funding: Federal: $165,720 Recipient: $52,660

Description: To (1) manipulate the reproductive cycle to extend the period when ripe gametes for larval culture can be obtained; (2) standardize the rearing of larval and juvenile urchins for mass cultivation; (3) utilize a commercial diet to document the timing and economics of land-based grow-out versus field grow-out, and short-term bulking for maximum roe yield; (4) determine the optimum size and time of year for seeding urchins into a field site for sea ranching; and (5) integrate the various information obtained from the research and literature to produce a system for a sustainable urchin fishery.

Grantee: MER Assessment Corporation, South Harpswell, ME

Grant No.: NA76FD0096 NMFS Contact: F/NEO

Project Title: To Investigate Culture Technique to Rear Fingerling Size Atlantic Cod and Larval/Fingerling Sized Haddock for Use in Production Aquaculture and for Use in a Public Restoration Project to Study the Efficacy of Restoring Natural Cod Stocks in the Gulf of Maine

Funding: Federal: $477,773 Recipient: $46,068

Description: To transfer cod aquaculture techniques from a research project to a commercial enterprise. Experimental techniques developed at the University of Maine will be transferred to a production level at a commercial hatchery. The investigators will: (1) optimize brood fish handling and transport techniques; (2) improve successful laboratory larval cod rearing techniques; (3) investigate and demonstrate cost-effective juvenile cod feeding and rearing techniques at a production scale; (4) explore and mitigate causes of juvenile cod mortality; (5) document and transfer successful cod hatchery management techniques via the production of a management guide and training video; and (6) explore larval and juvenile haddock rearing techniques as a premise for future commercialization. In addition, this project will provide significant numbers of juvenile cod to the Maine Department of Marine Resources for restoration stocking experiments to enhance Gulf of Maine cod stocks.

Grantee: Ohio State University Research Foundation, Columbus, OH

Grant No.: NA66FD0029 NMFS Contact: F/NEO

Project Title: Domestication of Lake Whitefish (*Coregonus clupeaformis*): Production of Broodstock and Assessment of Gamete Quality

Funding: Federal: $101,005 Recipient: $6,526

Description: To determine the optimum diet formulation for lake whitefish broodstock by substituting analogs (mixtures of animal byproducts such as blood or feathers) for fish meal in diet formulation. Fish meal will be replaced by analog concentrations of 25, 50, or 75%. Gamete ripening and steroid hormone correlations in both sexes will be monitored during the yearly cycle. The researchers will examine female fecundity, biochemical composition of eggs, and survival of embryos and fry after different dietary treatments. Males will be examined for milt density, motility, and fertility after cryopreservation. The primary objective of the modified diet would be its lower cost, assuming no decline in the overall health and reproductive potential of the broodstock fish. This translates to greater profitability for the aquaculture operation.

Grantee: Bioshelters, Inc., Amherst, MA

Grant No.: NA66FD0017 NMFS Contact: F/NEO

Project Title: Renovation of Phosphorous and Other Aquacultural Wastes Using Constructed Wetlands with Planted Peat and Rockwool

Funding: Federal: $65,559 Recipient: $7,160

Description: To filter the discharge water from an aquaculture facility using an artificial wetland constructed from peat and rockwool, and planted with reed canary grass. The primary objective is to remove phosphorous. The experiment will evaluate the use of doping agents, lime, iron, and aluminum sulfate in removing phosphorous. The intent of the project is to create an inexpensive technique which the aquaculture industry will readily adopt, with widespread water quality benefits to the receiving waters downstream from aquaculture facilities.

Grantee: South Carolina Department of Natural Resources, Charleston, SC

Grant No.: NA77FD0078 NMFS Contact: F/SEO

Project Title: Hard Clam (*Mercenaria mercenaria*) Mariculture in U.S. Waters: Evaluating the Effects of Large-Scale Field Outgrowth Practices on Clam Growth, Nutrition, and Inshore Estuarine Creek Communities

Funding: Federal: $138,570 Recipient: $ 38,914

Description: To conduct several experimental field studies, in conjunction with a large-scale operating clam enterprise, to (1) experimentally evaluate the potential effects of food and flow on individual (seed) clam growth at various stocking densities within creeks and among seasons; (2) manipulate pen and clam densities and configurations to examine the direct and indirect effects of large-scale clam mariculture on inshore creek communities; and (3) utilize stable isotope ratios to provide insight into clam diets and food web structure.

Grantee: North Carolina State University, Raleigh, NC

Grant No.: NA97FD0068 NMFS Contact: F/SEO

Project Title: Flounder Sex Determination: Biotechnology for Controlled Breeding in Fishery Enhancement and Mariculture

Funding: Federal: $68,465 Recipient: $48,432

Description: To provide information and technologies critical to generating predictable sex ratios in flounder restocking efforts and producing monosex stocks of faster growing females for mariculture. The means to control sex determination in summer and southern flounders will be developed. In addition, markers and timing of sex determination in flounder will be determined to characterize the developmental periods during which temperature irreversibly exerts its effect.

Grantee: North Carolina State University, Raleigh, NC

Grant No.: NA67FD0131 NMFS Contact: F/SF2

Project Title: A Novel, Potent, Immunological Defense in Rainbow Trout

Funding: Federal: $136,550 Recipient: $41,862

Description: To characterize a novel, potent, antimicrobial polypeptide from rainbow trout (*Oncorkynchus mykiss*) using methods already developed to isolate it in a quantity that will allow it to be tested against selected fish pathogens. Also, to develop a rapid test for measuring the activity in tissue and determine if activity is inducible after “immunization.”

## Habitat Conservation

Grantee: University of Washington, Seattle, WA

Grant No.: NA76FD0036 NMFS Contact: F/AKO

Project Title: Recruitment Limitation in Alaska Red King Crab: The Importance of Early Life History Stages

Funding: Federal: $115,175 Recipient: $21,532

Description: To examine settlement behavior and habitat use of juvenile red king crab (*Paralithodes camtschaticus*) in order to quantify nursery habitat suitable for management and protection.

Grantee: New Jersey Marine Science Consortium

Grant No.: NA86FD0109 NMFS Contact: F/NEO

Project Title: The Role of Tidal Salt Marsh as Essential Habitat in Production of Juvenile Weakfish

Funding: Federal: $89,384 Recipient: $84,141

Description: To provide a direct test of the hypothesis that salt marshes support weakfish (*Cynoscion regalis*) production through trophic pathways, both *in situ*, and by the export of marsh products to the estuary. Weakfish are among a group of marine transient species that spawn in lower estuaries, or in the coastal zone, and whose young utilize estuarine habitats, including tidal salt marshes.

Grantee: Virginia Commonwealth University, Richmond, VA

Grant No.: NA76FD0147 NMFS Contact: F/NEO

Project Title: Critical Evaluation of Conservation Success in Restoration of James River and Ocean Run American Shad

Funding: Federal: $163,542 Recipient: $157,212

Description: To sample mitochondrial and satellite DNA from hatchery broodstock and fry and compare with wild fish to see if restoration procedures are maintaining natural biodiversity. Prior studies have shown the James River and other shad rivers to be quite diverse and genetically discrete from one river to another. The study will provide confidence to fisheries managers that restoration efforts using stocking will not adversely impact the wild stocks.

Grantee: Capt. Edward Boynton, Gloucester, MA

Grant No.: NA76FD0106 NMFS Contact: F/NEO

Project Title: Establishing the Food Web Links Between Estuaries and Near Shore Fisheries in New England

Funding: Federal: $93,866 Recipient: $0

Description: To determine nutrients, fish, and fauna present in the Parker River estuary by collecting samples at six stations on the ocean side of Parker Island in Ipswich Bay, Massachusetts. Sampling will be done by beam trawl on the bottom and at mid-depth. Fish will be measured and weighed, and water temperature and salinity will be recorded. In addition, chlorophyll-a levels will be determined from water samples on a monthly basis. Predictions of the relationships between these observations, as well as the interactions with other levels in the food web, will be made and the relative importance of the estuary to the species found will be described.

Grantee: The Research Foundation of the State University of New York, Stony Brook, NY

Grant No.: NA66FD0012 NMFS Contact: F/NEO

Project Title: Identification of Continental Shelf Groundfish Nursery Habitats in the New York Bight

Funding: Federal: $200,000 Recipient: $48,119

Description: To assess recruitment of marine organisms in relationship to habitat characteristics in the New York Bight, with a focus on groundfish. The researchers intend to identify critical settlement/nursery habitat and how requirements for this habitat change during the growth and development of the organisms. The investigators intend to encourage fishermen to be actively involved in the study, and to present their findings at regional Fishermen's Forums.

Grantee: University of Massachusetts, Boston, MA

Grant No.: NA97FD0070 NMFS Contact: F/SEO

Project Title: The Effect of Bank-Barrier Reef Lagoon Habitat Loss on Post-Settlement Juvenile and Sub-Adult Coral Reef Fishes

Funding: Federal: $85,790 Recipient: $43,261

Description: To (1) quantify the extent and patterns of lagoon habitat use by post-settlement and juvenile reef fishes; and (2) quantify the impacts of habitat loss on post-settlement and juvenile fishes in lagoon habitats and sub-adult fishes in adjacent coral reef habitats. Tropical marine near shore habitats, specifically bank-barrier reef lagoon habitats, are important nursery areas for coral reef fishes. These habitats are threatened by numerous activities, especially coastal development, which may cause habitat loss due to sedimentation. Resource managers must know which of these habitats are essential fish habitats so that appropriate conservation strategies can be formulated. There are two major theories on processes that control the total number of coral reef fishes; recruitment limitation and habitat limitation. The results will show which habitats are essential early life stage habitats for the observed species; i.e., whether the loss of lagoon habitats has an effect on sub-adult abundance on adjacent coral reefs. This information will be directly applicable to current fisheries management issues and useful to local and Federal agencies, commercial and recreational fishermen, and private citizens and citizen groups.

Grantee: University of Florida, Gainesville, FL

Grant No.: NA97FD0065 NMFS Contact: F/SEO

Project Title: Conserving and Enhancing Essential Fish Habitats by Differentiating the Specific Sources of Fecal Pollution in Estuarine Waters

Funding: Federal: $89,922 Recipient: $13,192

Description: To develop and test innovative methods to determine the specific type and extent of human and non-human fecal pollution, and produce tools to identify the specific animal sources of fecal pollution in estuarine waters. Estuarine waters are the habitat of numerous marine species, including molluscan shellfish. This habitat is increasingly impacted by fecal bacteria, signifying a decrease in water quality, and potential risk of human and resource disease. The researchers will expand on previous research showing that selected phenotypic and genotypic characteristics accurately discriminate between human and non-human sources of *E. coli*. The investigation involves: (1) isolating *E. coli* from predominant agriculture and wildlife species; (2) determining ribotype (DNA fingerprint), multiple antibiotic resistance, and serotype profile; (3) correlating specific profiles with animal source; and (4) defining the significant fecal pollution sources within the study site.

Grantee: Texas Parks and Wildlife Department, Austin, TX

Grant No.: NA77FD0072 NMFS Contact: F/SEO

Project Title: An Analytical Method for Predicting Potential Spread of Exotic Species from Aquaculture and Aquatic Research Facilities in Texas

Funding: Federal: $54,243 Recipient: $18,132

Description: To develop Geographic Information System maps for each of the river drainage basins in Texas; locate each aquaculture and aquatic research facility near the Texas coast that could contain exotic aquatic species; and develop analytical procedures to determine the potential impact of escapement of exotic species on Texas commercial and recreational fisheries industries for each facility, and for potential future sites within each basin.

## Other

Grantee: Boone Bait Co., Inc., Winter Park, FL

Grant No.: NA27FD0095 NMFS Contact: F/SF2

Project Title: Impact of EC92 on U.S. Fishing Tackle Sales

Funding: Federal: $79,000 Recipient: $45,000

Description: To analyze the new rules and regulations that will impact U.S. manufactured fishing tackle in Europe as a result of EC92, including tariffs, standards, labeling requirements, and non-tariff barriers, if any. In addition, tariff and non-tariff barriers that affect U.S. markets for fishing tackle in the Eastern Bloc countries will be identified.

# IV. PENDING NATIONAL PROGRAM PROJECTS

The following section contains a description of all pending (ongoing) projects under the S-K National Program, along with project number, project title, federal funding level, and the NMFS contact.

## Fisheries Utilization

Grantee: Alaska Fisheries Development Foundation, Anchorage, AK

Grant No.: NA86FD0580 NMFS Contact: F/AKO

Project Title: An Ocean of Answers

Funding: Federal: $150,000 Recipient: $0

Description: To investigate the development of a permanent endowment for the Alaska Fisheries Development Foundation to support the goals and objectives of the Magnuson-Stevens Fishery Conservation and Management Act by (1) conducting a feasibility study and donor survey; (2) designing a capital development campaign; (3) designing an educational outreach campaign; (4) creating an endowment instrument and a plan for perpetuity; and (5) exploring funding assistance available from state and local governments and other funding organizations.

## Management Alternatives and Fisheries User Conflicts

Project No.: 97-AK-01 NMFS Contact: F/AKO

Project Title: ADF&G/NMFS Bottom Trawl Calibration Study

Funding: Federal: $134,800

Description: To conduct an experiment to detect fishing power differences between the net and vessel configuration used by NMFS during their Gulf of Alaska (GOA) triennial groundfish surveys and the net and vessel configuration used by the Alaska Department of Fish and Game (ADF&G) during their annual GOA crab survey. The results of this experiment will allow both NMFS and ADF&G to augment each survey by allowing direct comparisons of the respective databases. For example, being able to fully incorporate the ADF&G survey database into the annual status of stocks process would greatly enhance the management of important groundfish species such as walleye pollock, Pacific cod, and many flatfish species.

Project No.: 97-AK-02 NMFS Contact: F/AKO
NA77FD0164

Project Title: Monitoring and Evaluation of the Halibut and Sablefish Individual Fishing Quota (IFQ) System

Funding: Federal: $71,820 Recipient: $4,500

Description: To correlate existing NMFS Restricted Access Management Division and Alaska Department of Fish and Game/ Commercial Fisheries Entry Commission database information to provide a detailed analysis of changes in the distribution of quota shares in the Alaska halibut and sablefish IFQ program to fulfill the stewardship responsibilities of NMFS, and the statutory requirements of the Secretary of Commerce and the North Pacific Fishery Management Council.

Project No.: 97-AK-03 NMFS Contact: F/AKO

Project Title: Development of an Experimental Approach to Testing the Efficacy of Steller Sea Lion Fishery Exclusion Zones

Funding: Federal: $24,900

Description: To develop an experimental design for the evaluation of Steller sea lion fishery exclusion zones which, when implemented, will increase the likelihood of recovery of threatened Steller sea lion populations in Alaska, and reduce the conflicts between the fishing industry and the Steller sea lion recovery program.

Project No.: 97-AK-06 NMFS Contact: F/AKO

Project Title: IFQ/CDQ Program Research Support

Funding: Federal: $50,000

Description: To improve the automated systems that control permit issuance and transfer and management of fishery landings. Currently, these data systems are an inefficient means of retrieving the amount and detail level of information needed for information requests and for research purposes. This project will provide contractual assistance to structure and retrieve data so as to address these information needs. Tasks include: improving system documentation; developing reports and data summaries; and increasing the variety, amount, and detail of information available through NMFS Internet sites and computer bulletin boards.

Project No.: 97-NW-04 NMFS Contact: F/NWO

Project Title: Pinniped-Salmonid Co-Occurrence: Assessment of Potential Impacts of Pinnipeds on Salmonids in Selected Estuaries

Funding: Federal: $120,000

Description: To provide information needed by NMFS and the State of Oregon to determine where and if management actions are needed to reduce or eliminate pinniped predation impacts on west coast salmonids. Field observations on pinniped foraging will be conducted in Oregon estuaries during salmonid migration. Pinniped counts will be conducted on haul-outs and in-river locations. In addition, information on foraging behavior and observed prey consumption will be collected. Spawning escapement (run size) data will be obtained form the State and compared to pinniped occurrence and foraging behavior. Minimum estimates of pinniped predation on each salmonid run will be determined and compared to spawning escapements and preseason forecasts to assess impacts.

Project No.: 97-SW-04 NMFS Contact: F/SWC

Project Title: Reconstructing Time Series of Rockfish Abundances by Conventional and Molecular Techniques

Funding: Federal: $113,000

Description: To examine the California Cooperative Oceanic and Fisheries Investigations (CalCOFI) database from the perspective of rockfish management. Rockfish data will be summarized to provide fisheries managers with a time series on historical trends in rockfish abundances. Abundance and time series information will be assembled for familiar and newly identified rockfish species in the CalCOFI ichthyoplankton collections.

Project No.: 96-SW-02 NMFS Contact: F/SWC

Project Title: Develop and Test Pulsed-Power Devices

Funding: Federal: $300,000

Description: To construct a pulsed-power device that will deter California sea lions from interacting with commercial passenger fishing vessels (CPFV). A contractor will be competitively selected to (1) develop and construct the pulsed-power device; (2) establish safety zones for marine mammals; (3) conduct a transmission loss experiment to evaluate the appropriateness of the predicted safety zones; (4) design an experimental protocol to evaluate the effectiveness of the pulsed-power system in deterring California sea lions from interacting with CPFV operations, and the associated effect on angler catch rates; and (5) test the pulsed-power discharge system in waters off California.

Project No.: 97-NE-19 NMFS Contact: F/NEO

Project Title: Innovative Approach to Improve Fisheries Management

Funding: Federal: $150,000

Description: To analyze current technologies in “phone in” accounting systems for potential use in northeast regional fishery management programs. A consulting firm will be selected using a competitive bid process to (1) prepare a written assessment of available systems detailing features and prices; (2) present these findings to the New England Fishery Management Council and NMFS representatives; and (3) select and oversee a test project of the most optimal system.

Project No.: 97-SE-21 NMFS Contact: F/SEO

Project Title: Red Drum *(Sciaenops ocellatus)* Mark/Recapture and Age Composition Studies in the Northern Gulf of Mexico

Funding: Federal: $195,000

Description: To assess the status and determine the age structure of red drum stocks in the northern Gulf of Mexico. The proven and accepted estimation technique of mark and recapture will be used to assess the current size of the adult stock. Estimates indicate that if 10,000-20,000 red drum are tagged within a relatively short time, and then approximately 50,000 fish are examined for the presence of tags, a reasonably precise estimate of the adult red drum biomass can be developed for use in quota and resource allocation decisions. The goals are to improve red drum fishery management and optimize commercial and recreational utilization of the resource.

Project No.: 97-SF-01 NMFS Contact: F/SF

Project Title: The Federal Role in Subsidizing and Otherwise Influencing Harvesting Capacity in U.S. Fisheries

Funding: Federal: $190,953

Description: To contract for a study on the Federal government's role in subsidizing the expansion and contraction of fishing capacity in the U.S. fishing fleets and otherwise influencing the aggregate capital investments in fisheries. The study will analyze information on a number of Federal financial service programs administered by the Department of Commerce and other Federal agencies, as well as on other Federal programs and policies to determine what degree these initiatives have influenced investment in the fisheries harvesting sector. The information will be used to help determine effective approaches to address overcapitalization in the harvesting sector.

## Fisheries Bycatch

Project No.: 97-AK-13 NMFS Contact: F/AKO

Project Title: Bycatch of Halibut and Sablefish as an Impediment to Development of a Commercial Fishery for Arrowtooth Flounder

Funding: Federal: $200,000

Description: To develop approaches to minimize the bycatch of halibut and sablefish in a directed arrowtooth flounder fishery. In order to develop a commercial fishery for arrowtooth flounder, the bycatch issue must be addressed. The composition, distribution, annual cycle, and natural history of the species will be examined. Historical information available from NMFS surveys will be analyzed to develop predictive models for catch composition based on environmental factors, geographic location, and time. Windows of spatial distribution of fish stocks may allow arrowtooth flounder harvesting without significant bycatch of prohibited species.

Project No.: 97-NW-02 NMFS Contact: F/NWO

Project Title: Recreational Salmon Fishery Bycatch Assessment

Funding: Federal: $84,000

Description: To (1) provide information necessary for evaluating the effect of selective fisheries on natural-origin chinook and coho; (2) develop estimates of encounter rates for selected Washington coastal and Puget Sound fisheries; and (3) continue development of methods to efficiently monitor selective fisheries. Trained observers will be placed onboard recreational fishing vessels to collect information on the frequency and species of all fish encountered, including legal and sub-legal sized chinook and coho salmon. The same fisheries will be sampled simultaneously using shore-based observers to determine the efficacy of shore-based data collection. This determination is critical because of the prohibitive cost of routine onboard monitoring.

Project No.: 97-NW-14 NMFS Contact: F/NWO

Project Title: Bycatch Reduction in the West Coast Shrimp Trawl Fishery

Funding: Federal: $168,568

Description: To adapt finfish separator technology to the west coast pink shrimp trawl fishery. Finfish bycatch can impose a burden on shrimp trawlers by increasing the cost of catch sorting, damaging the shrimp in their catch, or forcing them to leave otherwise productive grounds. The research proposed here is aimed at reducing shrimp loss rates with various existing shrimp separator designs. Commercial shrimp trawlers operating under normal fishing conditions will be employed for these studies. From the results, guidelines for troubleshooting and improving the performance of separators will be developed and communicated to fishermen and gear manufacturers on the west coast.

Project No.: 97-SW-01 NMFS Contact: F/SWO

Project Title: Determination of Viable Technical and Operational Solutions for Reduction of Economic Discards in the Northwestern Hawaiian Islands Lobster Fishery

Funding: Federal: $99,000

Description: To identify commercially viable technical or operational measures to significantly reduce lobster bycatch (economic discards) and minimize bycatch mortality in the northwestern Hawaiian Islands lobster fishery.

Project No.: 97-NE-13 NMFS Contact: F/NEO

Project Title: Development of Solutions for the Problem of Entanglement of Right Whales with Fixed Fishing Gear

Funding: Federal: $60,000

Description: To develop solutions to the problem of right whale entanglement with the buoy lines of fixed fishing gear. This will be accomplished with a contract to design, develop, and test a weak link which will allow the surface buoy of fixed fishing gear to separate from the line when the buoy line is snagged. The contract will also include the development of a mechanism or means to replace knots and buoy attachments with smooth transitional devices which will not hang up on the baleen or appendages of right whales.

## Product Quality and Safety

Grantee: Interstate Shellfish Sanitation Conference, Columbia, SC

Grant No.: NA97FD0087 NMFS Contact: F/SF61

Project Title: Development of a National Education Program to Influence Consumption Behavior of High-Risk Individuals Regarding Raw Molluscan Shellfish

Funding: Federal: $250,000 Recipient: $52,500

Description: To minimize the number of illnesses and deaths resulting from the bacterial pathogen, *Vibrio vulnificus*, due to the consumption of raw oysters. This will be achieved by educating high-risk consumers to make an informed choice to modify their behavior, thus reducing the risk and, consequently, the number of cases. This education campaign will focus on both the target-specific content of the information and the dissemination process. Expanded assistance will be provided to states to enhance the national implementation of the program developed under an ongoing grant, and to assist other interested states in participating in the program.

## Aquaculture

Project No.: 96-NW-01 NMFS Contact: F/NWC

Project Title: Captive Broodstock Technology

Funding: Federal: $275,000

Description: To evaluate the adaptability of various marine finfish to captive rearing; select four species for broodstock spawning; diagnose and treat diseases associated with these projects; and develop larval and juvenile feeds that minimize environmental effects of marine aquaculture.

Project No.: 96-SW-01 NMFS Contact: F/SWR

Project Title: Evaluate Ultrasound Applications in Salmonid Conservation and Aquaculture

Funding: Federal: $30,000

Description: To refine techniques for using ultrasound to determine the maturation of fish prior to artificial spawning. This will ensure that artificial spawning is performed only during periods of peak spawning potential and will optimize spawning success by minimizing handling of fish. The technology developed for this project will be applied to the captive breeding program for endangered winter run chinook salmon. In addition, the applications developed for this project will also enhance our ability to successfully rear other species of fish for aquaculture.

Project No.: 96-SE-GA NMFS Contact: F/SEO

Project Title: Penaeid Aquaculture

Funding: Federal: $35,000

Description: To conduct further research on aquaculture of penaeids at the Galveston Laboratory, and to transfer resulting technology to the U.S. aquaculture industry.

Project No.: 96-SE-ML NMFS Contact: F/SEO

Project Title: Evaluation of Baseline Aquaculture Permitting Protocols

Funding: Federal: $20,000

Description: To research, codify, and determine feasibility of base guidelines for streamlining the aquaculture permitting process. A set of common protocols, arrived at by consensus of state and Federal regulatory units, applicable research personnel, and aquaculture operators, will be developed and evaluated for practical application. Information on presently utilized aquaculture permitting procedures will be collected and analyzed. A workshop will be held to develop a draft base permitting process.

Project No.: 96-SE-OX NMFS Contact: F/SEC

Project Title: Shellfish Disease and Pathology

Funding: Federal: $15,000

Description: To initiate a start-up program to focus on the effects of shellfish diseases and their pathology in aquaculture species.

Grantee: Auburn University, Auburn, AL

Grant No.: NA66RG0206 NMFS Contact: F/SF2

Project Title: Coastal Alabama Seafood Harvest

Funding: Federal: $990,000 Recipient: $139,836

Description: The various objectives of the project are to (1) identify the costs and benefits of maintaining oxygen saturation levels at 65, 45, and 25% in shrimp ponds; (2) determine operational efficiency of three types of commonly used aerators; and (3) publish and distribute the Alabama Aquaculture Guide. These objectives are being addressed over a three-year period with the annual federal share totaling $330,000 and the annual recipient share totaling $46,612.

## Habitat Conservation

Project No.: 97-SW-03 NMFS Contact: F/SWC

Project Title: Characterization of Hawaiian Monk Seal (*Monachus schauinslandi*) Pelagic Habitat, Home Range, and Diving Behavior

Funding: Federal: $153,280

Description: To characterize pelagic habitat use and foraging patterns of adult monk seals. This information will increase understanding of the critical habitat needs of the monk seal and improve integration of protective measures with fisheries regulations; ensuring monk seal conservation while maintaining sustainable fisheries.

# V. COMPLETED GRANT PROGRAM PROJECTS

The following section contains an assessment of each S-K Grant Program project completed during the period June 1, 1998 to May 31, 1999, regarding the extent to which the objectives of the project were attained and the project contributed to fishery development. The projects are listed by grantee within each subject area, along with the grant number, project title, federal funding level, recipient funding level (i.e., cost share), and NMFS contact.

## Fisheries Utilization

Grantee: University of Alaska, Fairbanks, AK

Grant No.: NA76FD0038 NMFS Contact: F/AKO

Project Title: Blended Seafoods: Utilizing Bycatch for New Products from Undervalued Fish

Funding: Federal: $79,920 Recipient: $15,984

Assessment: The objective of this project was to develop value-added blended seafood products that will appeal to consumers, using small whitefish fillets and/or trimmings and pink or chum salmon fillets. Blended seafood production of pink salmon portions is financially feasible for any size processor at the round fish price and production costs used in this project. Under these conditions, pink salmon can compete on price with other protein sources in the food service market. Producers who pursue making blended seafood products will have substantial research, promotion, market development, and product refinement costs. The actual costs for a small producer trying to find small niche buyers may be less than for a large processor trying to scale up, but the relative costs will be similar. The conclusion is that production of blended seafoods can provide a potential product form for species that have little market value. These include late harvest or lower valued salmon and undersized pollock or sole destined for mincing or reduction. Blending effectively reduces the strong flavor of salmon and utilized whitefish that has no market. Blended seafoods may find acceptance in currently developing niche markets for similar seafood products such as salmon patties. A flaked blended seafood where particle size is greater than 1/3 inch provides texture and acceptable shelf life for many markets. Economic analysis indicates that blended seafoods would appeal to many buyers in the $2.00-$2.50/lb. range.

Grantee: Alaska Fisheries Development Foundation, Anchorage, AK

Grant No.: NA56FD0619 NMFS Contact: F/AKO

Project Title: Alaska Salmon: Taming the Wild Thing

Funding: Federal: $337,412 Recipient: $130,450

Assessment: The objective of this project was to assist the Alaska salmon industry by encouraging the creation of modern food products from pink, chum, and coho salmon, and explore market opportunities for value-added salmon products. When this project began little, if any, Alaska salmon found its way into North American mid-priced casual dining restaurants. By the end of 1997, markets had expanded so quickly that the U.S. secondary processing industry had to import nearly 5,000 metric tons of chum salmon from Japan to satisfy the demand. This project, in part, aided in this market success. Value-added salmon usage in healthcare feeding programs has grown and will continue to expand as long as raw material prices remain reasonably low. The product and market opportunities thought possible for coho seem more troublesome, most likely due to direct competition by the “consistency” of farmed salmon. This project identified the need to develop products and markets for pale-meated pink and chum salmon. Product development efforts led to successful trials of flavored products at retail and refrigerated cooked product as an ingredient for a broad range of value-added food opportunities.

Grantee: Radford University, Radford, VA

Grant No.: NA66FD0010 NMFS Contact: F/NEO

Project Title: The Arkshell Clams *Noetia ponderosa* & *Andara ovalis* in the Oceanside Lagoon System of Virginia: A Study of Predation, Reproductive Biology, and Condition Index

Funding: Federal: $57,582 Recipient: $1,250

Assessment: The objective was to study the biology of the arkshell (blood) clams, *Noetia ponderosa* and *Anadara ovalis*, which were the target species of a fishery beginning in the early 1990s on the eastern shore of Virginia. Several studies were conducted to learn more about these two species for purposes of fishery management and future aquaculture endeavors. Gametogenic cycles of both species were studied, and a condition index for *Noetia ponderosa*, the more abundant blood clam in the fishery, was determined. Laboratory and field predation experiments were conducted to identify potential predators and estimate predation rates. Spawning patterns for the two species differ substantially, with *Noetia* spawning during the winter and summer months and *Anadara* spawning only during summer months. Condition index for *Noetia* ranged from 7.4 to 11.3 and generally reflected stages of gametogenesis throughout the year as well as fluctuations in water temperatures in the spring and fall. The xanthid crab, *Panopeus herbstii*, is the major predator of juvenile *Anadara*.

Grantee: Virginia Polytechnic Institute and State University, Blacksburg, VA

Grant No.: NA36FD0100-01 NMFS Contact: F/NEO

Project Title: Development of Underutilized Species: The Atlantic Mackerel Fishery

Funding: Federal: $46,335 Recipient: $29,942

Assessment: The objective was to develop value-added products from Atlantic mackerel to assist the industry in marketing this underutilized species. The project demonstrated that with value-added modifications, Atlantic mackerel can be made into a consumer acceptable food product. Random consumer testing showed a favorable response to two marinated mackerel products. Microbiological testing revealed adequate shelf life of marinated products for market introduction. Cost analysis indicated that marinated mackerel products could be made available at relatively low cost to consumers. With appropriate marketing to overcome a negative public image, Atlantic mackerel could be successfully introduced into the marketplace.

## Marine Recreational Fisheries

Grantee: South Carolina Department of Natural Resources, Charleston, SC

Grant No.: NA77FD0062 NMFS Contact: F/SEO

Project Title: A Cooperative Interstate Study to Evaluate Non-Reporting Level of Recreational Anglers Who Capture Tagged Red Drum - Year 2

Funding: Federal: $68,625 Recipient: $28,478

Assessment: The objective was to document the non-reporting level of anglers who catch tagged red drum (*Sciaenops ocellatus)*, using hatchery reared red drum from wild adults. Two estuaries in South Carolina (SC) and two in Georgia (GA) with three release sites in each estuary were selected for the study. A total of 1,800 fish were divided into 12 groups of 150 fish. Each group contained 75 fish fitted with "Reward" tags, and 75 fish fitted with "$100 Reward" tags. Fish were stocked at all twelve sites. Based on the assumption that the "$100 Reward" tag reflected a reporting level of 100%, the tag return level for "Reward" tags was subtracted from the theoretical 100% level to estimate the non-reporting level for each site. Overall reporting level for tagged fish in SC was not significantly different from that reported in GA. A non-reporting level of 41% was calculated for SC. Similarly, significantly fewer "Reward" tags were reported compared to "$100 Reward" tags in GA, which had a non-reporting level of 37%. Non-reporting levels between sites were highly variable and ranged from 18-81% among all sites. The data indicate that the currently used non-reporting level of 50% appears to be an over-estimation of the current level of non-reporting. Population models based on fishery dependent data and assuming a 50% non-reporting level will produce misleading results.

## Management Alternatives and Fisheries User Conflicts

Grantee: Stanford University, Stanford, CA

Grant No.: NA76FD0047 NMFS Contact: F/SWO

Project Title: Molecular Genetic Analysis of Anadromous Steelhead Trout *(Oncorhynchus mykiss)* at the Southern Extent of their Range: A Comparison of Genetic Methods

Funding: Federal: $103,821 Recipient: $29,901

Assessment: The objective was to conduct genetic analyses of tissues from steelhead trout to better manage the species in southern and central California where it is listed under the Endangered Species Act. Significant genetic diversity was revealed for Oregon and California steelhead populations using ten microsatellite loci. The analysis supported strong genetic substructure in sample populations at the southern extent of the species' range and revealed significant separation of Oregon and California populations into distinct evolutionary units. Isolation by distance tests showed clear biogeographic structure in California steelhead populations and that southern steelhead hatchery stocks retain genetic similarity to their original parental stocks in the Sacramento River. Differentiation of Sacramento River and San Joaquin River populations was not possible using the ten loci. The results indicated that these microsatellite loci are valuable tools for addressing fine scale population genetic questions for differentiation of wild stocks, or for looking at wild versus hatchery interactions.

Grantee: University of Minnesota, Minneapolis, MN

Grant No.: NA66FD0058 NMFS Contact: F/SWO

Project Title: Investigation of Hawaiian Monk Seal (*Monachus schauinslandi)* Pelagic Habitat Use: Range and Diving Behavior

Funding: Federal: $219,610 Recipient: $11,250

Assessment: The objective was to investigate movement and diving behavior of adult Hawaiian monk seals at French Frigate Shoals (FFS) in the northwestern Hawaiian Islands. The goal was to better understand foraging ecology and address the apparently food-related decline in the population. Satellite-linked, time-depth recorders were used to monitor movement and diving behavior. Seals of both sexes that left the atoll spent time at various shallow banks 30-200 km away. Males and females traveled to equally distant banks, but there was some indication that a lower percentage of females depart the atoll. There was a slight, but inconclusive difference in distance traveled by adult and subadult seals. Comparison of dive depth and duration histogram data indicated a lower proportion of dives below 80 m by females. Distinct modes of diving activity were seen in the 40-80 m, 110-180 m and >300 m ranges. There were day versus night shifts in diving activity that likely correspond to prey availability. Three rough classifications of movement and diving behavior were evident: (1) Mid-range divers that frequented the banks; (2) shallow divers that remained in the vicinity of FFS; and (3) deep divers that were active along a ridge to the east of the atoll. The results showed that Hawaiian monk seals at FFS frequently exceed the current critical habitat boundaries.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA

Grant No.: NA76FD0146 NMFS Contact: F/NEO

Project Title: Evaluation of the Selectivity and Efficiency of Sea Scallop Trawls

Funding: Federal: $97,839 Recipient: $49,950

Assessment: The objective of the project was to assess the efficacy of gear restrictions found in Amendment #4 to the Sea Scallop Fishery Management Plan. During August and September 1997 and May 1998, three comparative fishing experiments were conducted aboard commercial sea scallop trawl and dredge vessels for this purpose. Restrictions that included minimum mesh and ring sizes and maximum gear widths were assumed to make sea scallop trawls and dredges equal with respect to size selectivity and efficiency. However, results indicated that the two regulated gear types were not equal in either respect. Absolute gear size selectivity could not be estimated. However, relative size selectivity patterns inferred from other analyses suggest broad yet different size ranges of scallops captured by each gear type. Relative harvest efficiency values demonstrated a shift at roughly 90 mm shell height. Trawl vessels were more efficient at capturing scallops less than 90 mm, while the dredge vessels were efficient capturing scallops greater than 90 mm. This shift coupled with a minimum cull size at roughly 70-75 mm shell height had a profound effect on both relative production rates and catch composition. The differing harvest patterns observed in this study may make equating current trawl and dredge designs difficult.

Grantee: Bio-Concept Laboratories, Inc., Salem, NH

Grant No.: NA76FD0102 NMFS Contact: F/NEO

Project Title: Bleach-Dipped Lobster Detection Technique

Funding: Federal: $ 41,179 Recipient: $9,750

Assessment: The objective of the project was to refine the technique for detecting the presence of chlorine bleach on lobster swimmerettes following the illegal removal of eggs. Results indicate that soaking a cotton swab in a solution containing starchiodide and rubbing the shell of the lobster is a safe, rapid, sensitive, and selective method to detect a bleach-dipped lobster. This eliminates the inconvenience of cutting the swimmerette and damage to an otherwise healthy lobster. The swabbing solutions can be prepared separately or as a combined formulation. The combined formulation is stable and effective for at least two months.

Grantee: University of Maine, Orono, ME

Grant No.: NA66FD0013 NMFS Contact: F/NEO

Project Title: Design Issues in a Transferable Input Management System for the New England Groundfishery

Funding: Federal: $59,343 Recipient: $9,970

Assessment: The objective was to assess the extent to which data available from NMFS records could be used to construct and implement a transferable input-control management system for the New England groundfishery. NMFS data from New England groundfish vessel permit files, weighout and trip files, and days-at-sea files were analyzed. Cost-and-earnings files and enforcement data files were unavailable for analysis. The results of the data analysis indicate that the estimation of a primal production function should be helpful in constructing a regulatory input index for the New England groundfishery. It is less clear if a truly adequate index can be defined. Industry adjustment to any input index will create regulatory problems significant enough to question the ultimate success of a transferable input-index system. At minimum, any input-control system should be adopted with two expectations. First, to achieve some target reduction in fishing mortality, the reduction in the input index must exceed the target by a significant margin. Second, regulation should anticipate the need to implement changes that respond to the changes made by the industry.

Grantee: Texas A&M Research Foundation, College Station, TX

Grant No.: NA77FD0076 NMFS Contact: F/SEO

Project Title: Development of Microsatellite Loci for Stock Structure Study of Gulf Red Snapper

Funding: Federal: $46,389 Recipient: $13,847

Assessment: The objective of the project was to develop species-specific genetic tools and background information that can be employed to address the resource-based issue of whether discrete genetic subpopulations of red snapper occur in the northern Gulf of Mexico. Five polymorphic microsatellite loci were developed from genomic DNA of red snapper (*Lutjanus campechanus)* and used to evaluate genetic variation among 194 red snapper sampled from three locations in the northern Gulf of Mexico, and one location off the northern Yucatan Peninsula. Five to 13 alleles were observed per locus. Locus-by-locus tests of allele-frequency homogeneity over the four localities were non-significant. These results are consistent with the hypothesis that red snapper at these localities comprise a single population. There are, however, a number of caveats to this hypothesis. Detection of population structure of red snapper in the Gulf may require larger numbers of samples, and the importance of local reproduction to recruitment must be assessed by examining larvae settling onto reefs. There was a positive, but non-significant, correlation between mean number of repeat units per microsatellite allele and heterozygosity of the locus.

Grantee: University of Georgia Research Foundation, Inc., Athens, GA

Grant No.: NA77FD0074 NMFS Contact: F/SEO

Project Title: Reproductive Parameters Needed to Evaluate Recruitment Overfishing of Spotted Seatrout in the Southeastern U.S.

Funding: Federal: $84,712 Recipient: $14,625

Assessment: The objective was to provide detailed reproductive information on spotted seatrout (*Cynoscion nebulosus)* to address the concern that this species is recruitment overfished. Data were collected from a hydrophone survey to locate spawning aggregations, and a trammel net survey to collect fish for assessment of reproductive condition. A total of 512 spotted seatrout were collected and 263 hydrophone observations made from March to December 1997 in the Duplin River in Georgia. Although courtship sound production was clearly linked to spawning activity, it did not consistently correspond to the presence of seatrout eggs. There was no clear relationship between spawning location and the recorded environmental parameters. The 1997 spawning season occurred from late April to mid-September, but most spawning activity occurred from June to August. Spotted seatrout mature at a small size (228-240 mm total length) and by age one, and 94% of the reproductively active females collected were age one. Batch fecundity ranged from 55,640 to 417,394 eggs/female and significantly increased with fish size. Spawning frequency estimates ranged from once every 2-3 days to once every 6-7 days, leading to an average annual fecundity of 3.6 to 8.5 million eggs/female. Additional work is necessary to better define size/age at maturity and interannual variations in fecundity.

Grantee: New York University Medical Center, Tuxedo, NY

Grant No.: NA77FD0071 NMFS Contact: F/SEO

Project Title: Genetic Structure, Status, and Mixed Stock Analysis of Atlantic Sturgeon in the Southeastern U.S.

Funding: Federal: $175,000 Recipient: $137,336

Assessment: The objective of the project was to determine the amount of genetic diversity necessary for successful release of cultured sturgeon to augment wild stocks. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) has a latitudinally broad distribution along the east coast of North America, with extant populations occurring from the St. Lawrence River to Georgia. This large anadromous fish once supported intensive caviar-based fisheries that resulted in over-harvest and sharply reduced population abundances. Directed commercial fishing for Atlantic sturgeon is currently banned in U.S. waters. When 332 specimens from 11 river systems were genetically analyzed, a pronounced latitudinal cline in the number of composite mtDNA haplotypes was discovered. Haplotypic diversity increased from north (St. Lawrence River, New Brunswick) to south (Satilla River, Georgia), and from previously glaciated and subsequently recolonized systems to the portion of their range which was never glaciated. The greater genetic diversity shown by southern populations is most likely a continuity of these populations through the Pleistocene and a result of their higher mutation rates associated with their shorter generation times. This study found stock structure among the southern populations and evidence of at least seven genetic stocks. The researchers conclude that management efforts to augment natural reproduction with hatchery production should involve broodstock from the rivers in which the offspring are to be stocked.

Grantee: Oklahoma Department of Wildlife Conservation, Oklahoma City, OK

Grant No.: NA77FD0064 NMFS Contact: F/SEO

Project Title: Grand Lake Commercial Freshwater Mussel Stock Assessment

Funding: Federal: $33,227 Recipient: $244

Assessment: The objectives of this project were to quantify the freshwater mussel resource of Grand Lake O' the Cherokees in northeastern Oklahoma to determine baseline information for future commercial harvest, and to assess the impact of zebra mussels should they be introduced. A total of 11 species of mussels were found in the lake with six species comprising about 96% of the individuals. It is estimated that these six species represent a total of 148,096 individuals in the lake. The mussel populations in Grand Lake are not dense enough to economically support a commercial harvest. These data can be used in the future as baseline data to monitor the effects of harvesting and the impacts associated with the introduction of zebra mussels.

## Fisheries Bycatch

Grantee: University of Alaska Fairbanks, Fairbanks, AK

Grant No.: NA66FD0041 NMFS Contact: F/AKO

Project Title: Flatfish Size Separation in Trawl Gear: Technique to Increase Bycatch Reduction and Underutilized Species Development

Funding: Federal: $178,510 Recipient: $55,942

Assessment: The objective of this project was to evaluate the use of separator panels in reducing undersized flatfish bycatch, separating flatfish species, and improving halibut release in direct cod trawl fisheries. Two separator panels were placed one and two meters above the belly of the net just aft of the footrope, with each separator panel leading to a codend. The catch from each separator panel codend and the main codend were sampled for species composition and length frequency. Results indicate that species-specific vertical and horizontal size separation occurs during capture. Vertical size separation of cod and flatfish occurs during trawling. Horizontal size separation also appears to occur, but to a lesser degree than vertical separation. Both vertical and horizontal size separation appear to be mitigated by panel position and species, with cod, rock sole, and arrowtooth flounder exhibiting the highest degree of size separation. Vertical separation by number is less evident in most species. However, cod and halibut exhibit distinct separation. No species exhibited distinct horizontal separation by number.

Grantee: Fisheries Information Services, Juneau, AK

Grant No.: NA76FD0033 NMFS Contact: F/AKO

Project Title: Study of Bycatch Avoidance by Fishermen in Hook and Line Greenland Turbot Fishery

Funding: Federal: $10,806 Recipient: $0

Assessment: The objective of this project was to reduce the inadvertent bycatch of Pacific halibut, thus optimizing the utilization of harvestable amounts of Greenland turbot. The hook-and-line fishery for Greenland turbot in the Bering Sea and Aleutian Islands from 1995-1997 was examined to document the effect of halibut bycatch and to determine what measures are effective for controlling that bycatch. The fleet was provided with recent detailed information about areas of high halibut bycatch and an individual vessel monitoring program was implemented during the 1997 season. This resulted in substantially improved halibut bycatch rates, allowing more turbot to be caught. The investigation concluded that with sufficient incentives and timely information, fishermen will voluntarily take appropriate actions to control bycatch. Therefore, additional regulatory measures may be unnecessary.

Grantee: New England Aquarium Corporation, Boston, MA

Grant No.: NA66FD0028 NMFS Contact: F/NEO

Project Title: Selectivity and Survival of Atlantic Cod (*Gadus morhua)* and Haddock *(Melanogrammus aeglefinus)* in a Northwest Atlantic Longline Fishery

Funding: Federal: $200,000 Recipient: $80,452

Assessment: The objective of the project was to examine the selectivity of commercial hook gear to evaluate the claim that juvenile fish caught by hook have minimal stress, and consequently, better survival. Two studies were conducted. The first study compared the length frequencies of cod caught on 11/0 versus modified 15/0 circle hooks. The 15/0 circle hook was non-traditional because it was constructed out of the same gauge wire as the 11/0 hook. This study found that the 15/0 circle hook retained the same number of legal cod yet caught few sublegal cod. In the second study, juvenile cod were collected during experimental longline fishing operations during 1996 and 1997. Fish were removed from fishing gear either by a mechanical dehooking device called a crucifier, or gently by hand. Survival rates were determined by placing the juvenile fish into large cages and returning them to the depth at which they were caught for a period of about 72 hours. The lowest survival figures were found for fish that were wounded by the mechanical dehooking device. The focus of the research in the second study was to assess the longline fishery and the rate of mortality of sublegal catch after the fish were in the cages for 72 hours. The results showed high mortality associated with capture using the 11/0 circle hook when the cod were damaged from the process of having their jaws broken or torn after passing through the crucifer. Mortality increased when predation by herring gulls was considered.

Grantee: South Carolina Department of Natural Resources, Charleston, SC

Grant No.: NA77FD0065 NMFS Contact: F/SEO

Project Title: Removing Gas from the Distended Swim Bladder of Reef Fish: Does it Really Increase Post-Release Survival?

Funding: Federal: $38,196 Recipient: $9,827

Assessment: The objective of the project was to determine if puncturing the distended swim bladder of reef fish in the southeastern U.S. would increase post-release survival. The benefits of deflating reef fish swim bladders were investigated by capturing fish by hook and line, deflating 203 fishes using a 16 gauge hypodermic needle, deflating 223 fishes with a 3 mm steel canula, and not deflating 227 fishes acting as control subjects. Benefit was measured by survival over the first 24 hours after release. This study found that black sea bass benefited significantly from deflation and that vermillion snapper also benefitted, but not to the same extent as black sea bass. Survival of fish deflated by the hypodermic needle and the 3 mm canula was approximately equal. The largest increase in survival was in black sea bass caught at 43-55 meter depth and deflated with the hypodermic needle. Control specimens exhibited a 61% survival rate while 100% of the specimens deflated by needle survived. Therefore, it is recommended that released black sea bass be deflated.

## Product Quality and Safety

Grantee: California State University, Hayward Foundation, Hayward, CA

Grant No.: NA76FD0048 NMFS Contact: F/SWO

Project Title: Using an Innovative Technique to Assess Fecal Contamination in Estuarine Waters and Shellfish

Funding: Federal: $39,613 Recipient: $24,838

Assessment: The objective of the project was to investigate a new method for enhancing the recovery of certain bacteria to assess fecal contamination in estuarine waters and in shellfish. Water samples from five sites in and around Elkhorn Slough, and six sites in and around the Tijuana River reserve, were tested for the presence of total and fecal coliforms and the anaerobic bacterium, *Bacteroides vulgatus.* Previous research by the investigators indicated that the anaerobic bacterium could potentially serve as an alternative indicator for human fecal contamination in shellfish and estuarine waters. A new selective medium previously developed was utilized to detect *Bacteroides vulgatus.* The data indicate that high coliform counts did not correlate with the presence of the test bacterium in water samples. However, a variety of other anaerobic bacteria were detected, especially in samples known to be associated with animal fecal contamination. These data indicate that *Bacteroides vulgatus* is more human-specific than other members of the *Bacteroides fragilis* group, and may be a better indicator for human fecal contamination than the coliforms. The highest coliform counts were observed during rainfall events and probably due to overgrowth of coliforms from animal contamination.

Grantee: PacMar, Inc., Honolulu, HI

Grant No: NA66FD0057 NMFS Contact: F/SWO

Project Title: Development of a Stock Profile for Methyl Mercury in the North Pacific Broadbill Swordfish Fishery

Funding: Federal: $240,963 Recipient: $51,062

Assessment: The objective of the project was to develop a stock profile for methyl mercury (MeHg) in the north Pacific swordfish fishery. This profile has the potential as a predictive model to be used by industry and regulatory agencies as a guideline for identifying potential MeHg hazards in swordfish. The relationship between dressed body weight and MeHg concentration in the edible muscle of broadbill swordfish (*Xiphias gladius*) from the central North Pacific fishery was evaluated. Swordfish ranging from 6 to 434 lbs. dressed weight and landed in Honolulu by Hawaii-based longliners were sampled between October 1996 and March 1998. Standard muscle samples were taken just posterior to the cleithrum (fillet sample). The highly significant correlation between dressed body weight and fillet MeHg content indicated that the MeHg content of central North Pacific swordfish can be estimated from the dressed body weight. The correlation between muscle tissue sampled just anterior to the caudal peduncle (tail sample) and the dressed weight was also highly significant, as was the correlation between the MeHg concentration of paired tail and fillet muscle samples. It was concluded that tail muscle samples could be used to make estimates of the MeHg content in the standard fillet sample, rather than the costly standard practice of sampling from the prime portion of the musculature.

Grantee: University of Florida, Gainesville, FL

Grant No.: NA77FD0079 NMFS Contact: F/SEO

Project Title: Critical Control Limits, Infective Dose, and Prevalence of Pathogenic *Vibrio* Species in Shellfish Products

Funding: Federal: $95,660 Recipient: $37,278

Assessment: The objective was to determine the infective dose from shellfish, for humans, of the pathogenic bacteria *Vibrio vulnificus,* and to establish the controls that have the greatest effect on maintaining *V. vulnificus* at safe levels in seafood. The research determined that concentrations of *V. vulnificus* in oysters associated with human disease were typically greater than 1,000 cells per gram of shellfish meat. It was also learned that the level of concentration of *V. vulnificus* is related to air temperature. The Interim Control Plan (ICP) adopted by the Interstate Shellfish Sanitation Conference was utilized to determine its effectiveness. The ICP minimizes the time harvested shellfish are exposed to elevated temperatures. It was found that oysters handled according to the ICP had significantly lower levels of *V. vulnificus*.

Grantee: University of Georgia, Athens, GA

Grant No.: NA67FD0035 NMFS Contact: F/SEO

Project Title: The Effect of Phosphates on the Moisture Content of Commercial Shrimp and Their Use to Improve the Quality and Shelf Life of Frozen Breaded Shrimp

Funding: Federal: $94,219 Recipient: $40,325

Assessment: The objective was to evaluate the moisture retention and nutritional effects on shrimp treated with sodium tripolyphosphate. Dehydration of frozen shrimp, and moisture migration from shrimp to breading in frozen breaded shrimp is a commercial problem. Sodium tripolyphosphate is believed to alleviate these problems, but its use in these products is currently prohibited by the Food and Drug Administration (FDA). The project was carried out to provide better information for the FDA for future decisions regarding the use of phosphate. The research found that shrimp treated with a 4.0% solution of sodium tripolyphosphate plus a 1.5% solution of salt produced the greatest weight gains due to water in shrimp prior to freezing. Phosphate treatment also helped reduce moisture migration from shrimp into breading during frozen storage. The sodium tripolyphosphate treatments did not affect nutritional constituents in breaded shrimp.

## Aquaculture

Grantee: Pacific Shellfish Institute, Olympia, WA

Grant No.: NA66FD0123 NMFS Contact: F/NWO

Project Title: Oyster Seed Mortality Prevention

Funding: Federal: $97,335 Recipient: $34,275

Assessment: The objectives of the project were to (1) determine seed mortality causes from West Coast production facilities; (2) compare diploid and triploid seed performance; (3) prepare a guide to seed anatomy; and (4) summarize and recommend procedures to prevent seed mortality. Rising imports of oysters and domestic production problems for seed oysters indicated the need to analyze causes of seed oyster mortality, which has an estimated economic impact of about $16.5 M on the West Coast alone. Four oyster seed nurseries in Washington and California that produced commercial quantities of Pacific oyster (*Crassostrea gigas),* Kumomoto oyster (*C. sikamea),* and flat oyster *(Ostrea edulis)* seed were the study sites. Histological analysis of tissue was conducted, and growth and mortality data were systematically collected from study areas. Seed growth was high in fall and spring, but flat during winter months. Seed survival was highly variable on nursery beds. Significant seed loss on nursery beds was due to bacterial infections originating in the adductor muscle, predation, heavy sedimentation in certain locations during a high rainfall period, and sunburn in seed planted at a small size in the summer. Mortality in cultchless seed cultivated in upwelling systems was caused primarily by infections, loss of digestive gland epithelium, and ingestion of cultch material containing microorganisms that interfere with normal digestive processes. This study showed for the first time that ciliates cause primary infections and must be managed to prevent losses to early stage juvenile oyster cultures. No differences were found in growth or diseases of triploid and diploid oysters. Survival in both groups was low but related to site characteristics. The normal developmental anatomy of juvenile oysters, and a review and management analysis of juvenile oyster diseases, will be published as a book based on work performed in this study.

Grantee: Oregon State University, Newport, OR

Grant No.: NA66FD0110 NMFS Contact: F/NWO

Project Title: Conservation of Commercial Kumamoto Oyster Broodstock

Funding: Federal: $81,890 Recipient: $12,465

Assessment: The objectives of this project were to determine if local oysters found at various commercial oyster sites were purebred Kumamoto oysters; to produce a genetically diverse Kumamoto oyster broodstock; and to produce larvae from the broodstock for distribution to participating hatcheries. Over 20 years ago, West Coast oyster farms imported Kumamoto oysters from Japan to develop a hybrid oyster by combining Pacific and Kumamoto oysters. The attempt to develop the hybrid failed. Today, the Kumamoto oyster stocks are greatly diminished. The researchers collected over 800 samples of oysters resembling Kumamotos from various sites and performed genetic analysis. About 700 were found to be purebred Kumamoto oysters. The researchers then conditioned and spawned purebred Kumamoto oysters. Purebred Kumamoto oysters and larvae produced from spawning efforts were returned to the original sites and a small subset of broodstock oysters are now held at the Hatfield Marine Science Center for further research purposes.

Grantee: Oregon State University, Corvallis, OR

Grant No.: NA66FD0107 NMFS Contact: F/NWO

Project Title: Microencapsulated Delivery of Amino Acids to Striped Bass and Other Altricial Larvae

Funding: Federal: $169,897 Recipient: $33,393

Assessment: The purpose of the project was to develop and evaluate a microencapsulation method for delivering water-soluble amino acids to larvae of striped bass and altricial fish species. Due to difficulties in obtaining striped bass larvae, most of the work was conducted with zebrafish larvae. Using phenol red as a substitute for amino acids, the lipid composition of the lipid wall microcapsules (LWM) was modified to maximize delivery efficiency. Spray techniques were developed for large scale production of LWM and spray beads. Unfortunately, leakage rates of amino acids from LWM were significantly greater than for phenol red and 80% of the encapsulated glycine was lost from the LWM within one hour suspension in water. Attempts to reduce the amino acid leakage rates were unsuccessful. However, spray techniques were successfully developed for a range of microgel particles for delivery of LWM to larvae. Feeding and growth experiments with zebrafish larvae indicated that alginate gelatin microgel particles had good potential for delivering artificial diets to larvae.

Grantee: Marine Resources Management Division, Colonia, Yap FSM

Grant No: NA67FD0053 NMFS Contact: F/SWO

Project Title: Trochus Reseeding in the Outer Islands of Yap State, FSM

Funding: Federal: $12,040 Recipient: $11,847

Assessment: The objective was to seed and establish reproducing populations of the commercial topshell (*Trochus niloticus*) in the outer islands of Yap State to provide additional income-generating opportunities for island residents. *Trochus* has been the basis of a successful and benign in-shore commercial fishery resource in the Pacific region for over 50 years. The high-valued shell is used in a variety of products and is an ideal income-generating resource for Pacific Islanders. Harvesting is currently limited to areas with established *Trochus* populations (Yap proper, Ulithi, and Woleai atoll). The project concentrated on seeding adult *Trochus* to four island groups (Elato, Lamotrek, Ifalik, and Faraulap) in 1996 and 1997. Yap Marine Resources Management Division staff and members of the outer island communities collected brood stock from Woleai reef and transplanted adult *Trochus* to the seeding sites on three occasions. Typically, 1,500 adult *Trochus* were transported in live wells on vessels and dispersed upon arrival at each site. A fourth trip was made to assess all newly seeded sites. The survival rate of the transplanted *Trochus* was high. However, the sites must be continually monitored by line transect surveys to determine the long-term success of the transplanting.

Grantee: Westport Fishing Corporation, New Bedford, MA

Grant No.: NA66FD0027 NMFS Contact: F/NEO

Project Title: Sea Scallop Enhancement and Sustainable Harvesting

Funding: Federal: $157,000 Recipient: $156,936

Assessment: The objective was to demonstrate sea scallop (*Placopecten magellanicus)* resource enhancement off the coast of Massachusetts by developing (1) the means to transport scallops live; (2) methods to grow out transplanted scallops on the bottom and in the water column; (3) criteria for managing scallop grow out areas; and (4) the means to identify potential grow-out areas. The intent was to develop and demonstrate technology to enhance sea scallop production, on a sustainable and environmentally sound basis, using the existing New England fishing industry and infrastructure. Scientists and the sea scallop fishing industry collaborated on this project to examine potential scallop enhancement/production strategies. After 30 months of effort, all required permits had been secured for the first aquaculture research area in U.S. Federal waters. The investigations occurred on a 24 square km open ocean location, 15 km south of Martha's Vineyard, MA. This area is closed to mobile gear and dedicated to researching culture and enhancement strategies. The site, subject to large waves and strong currents, was stocked with wild-caught scallops. Approximately 40,000 scallops, ranging in shell height from 40-100 mm, were placed in bottom cages, suspended nets, or loose on the bottom in 1997. The scallops were monitored for growth and mortality. In 1998, an additional 80,000 scallops, ranging in shell height from 50-140 mm, were direct seeded on the bottom and monitored by an underwater video camera sled. The scallops in the cages were hauled and measured. Sub-samples of all groups of scallops were evaluated for health and condition during the project. Data were collected to allow for an economic analysis of the culture strategies. The project results indicate that bottom seeding of scallops into grow-out areas is a very viable option for managing scallop production.

Grantee: University of Maine, Orono, ME

Grant No.: NA66FD0024 NMFS Contact: F/NEO

Project Title: Refinement of Computer Models for Determining Distribution of Finfish Aquaculture Wastes and Transfer of Technology to Regulatory Agencies

Funding: Federal: $118,900 Recipient: $16,916

Assessment: The objective of the project was to refine previous computer simulation models while accounting for critical shear velocities associated with resuspension of settled wastes. Mathematical models are useful in monitoring hydrodynamic, water quality, and benthic conditions in evaluating environmental impacts of net-pen aquaculture operations. A mathematical model called Aquaculture Waste Transport Simulator (AWATS) provides first-order estimates of the physical dispersion of finfish aquaculture wastes for regulatory purposes. The modeling strategy entails the utilization of a vertically averaged, two-dimensional flow model to produce flow-field information. This information is input to a particle tracking waste transport model to simulate the resulting transport of wastes. Earlier studies have shown that the transport modeling results are sensitive to the threshold shear stress at which settled fish-pen wastes are resuspended. Therefore, field work was conducted to improve the parameterization of erodibility in the transport model. Application of AWATS to several aquaculture sites in coastal Maine shows that it is a convenient tool in the regulatory process.

Grantee: New England Fisheries Development Assn., Boston, MA

Grant No.: NA66FD0023 NMFS Contact: F/NEO

Project Title: A New Harvest: Sea Scallop Enhancement and Culture in New England

Funding: Federal: $265,548 Recipient: $34,074

Assessment: The objective of this project was to demonstrate a viable fishery based on harvesting scallop spat and the subsequent grow-out of juvenile scallops to harvest size. Spat collection gear was deployed during two settlement periods at four sites: Georges Bank, Portsmouth, NH, and Truro and Wellfleet, MA. In 1997, a small number of scallops with a very high growth rate were captured in Truro. Although a greater quantity of spat was collected from Georges Bank, the animals died before the bags were retrieved, possibly through predation. Studies in Portsmouth to test the hypothesis that spat collection activities enhance the natural set were inconclusive. Juvenile scallops were transplanted to three grow-out areas: Portsmouth (pear nets and benthic cages; Truro (benthic cages); and Chatham (upwellers). Average growth rates ranged from 5.53 mm/month in Truro, to 2.0 mm/month in Portsmouth. No statistical difference in growth or mortality was observed between the Portsmouth scallops in suspension and those in benthic cages. Truro was the least expensive grow-out site to manage ($0.19/scallop). The upwellers in Chatham were the most expensive ($1.27/scallop) due to the cost of electricity to run the pumps. The break-even point for spat collection was also calculated at 76 spat/bag. Vandalism was a constant problem, pointing out the need for greater social acceptance if aquaculture is to expand in New England. A Guide to Permitting Aquaculture Lease Sites was written to clarify the application process. A mail-in survey indicated that there is a great deal of interest in farm-raised scallops.

Grantee: Texas A & M Research Foundation, College Station, TX

Grant No.: NA67FD0036 NMFS Contact: F/SEO

Project Title: Technology Development for Commercial Production of Native Bait Shrimp in the U.S.

Funding: Federal: $247,000 Recipient: $85,450

Assessment: The objective of the project was to develop culture methods for native bait shrimp for the sportfishing industry, in order to reduce overfishing of shrimp populations and develop the live bait shrimp industry. Research was conducted on production and marketing of three species of live bait shrimp (Atlantic white, pink, and brown shrimp). A dependable source for native species postlarvae is needed to successfully develop the industry. Production technologies for white shrimp can be used successfully for high density culture in raceways and ponds. Induced maturation, spawning, and postlarvae production of pink shrimp are feasible. Wild gravid female brown shrimp can be used to produce viral pathogen-free postlarvae with good survival. With the supply of wild live bait shrimp below seasonal demand in the Gulf states, dealers will pay higher prices for farm-raised live bait shrimp if quality and supply are secure. The production technology developed was transferred to other research institutes and private producers, increasing the potential for commercial live bait shrimp production. Results from the research were presented in ten meetings of national and international professional societies.

Grantee: Mississippi Agricultural and Forestry Experiment Station
Mississippi State, MS

Grant No.: NA67FD0033 NMFS Contact: F/SEO

Project Title: Use of Constructed Wetlands to Improve Water Quality in Finfish Pond Culture - Phase 2

Funding: Federal: $146,806 Recipient: $17,712

Assessment: The objective was to assess the effects of constructed wetlands on pond culture of freshwater catfish. Ponds with recirculated water from constructed wetlands were compared to control ponds in regard to pond water quality, crop survival, incidence of off-taste, and release of nutrient-laden effluent to the environment. Vegetation in the constructed wetland consisted of *Sagittaria lancifolia* (duck potato). Several sizes of wetlands, and flow rates into the wetlands, were tested. Costs associated with both types of pond operation were examined. Ponds with constructed wetlands had lower pH, total ammonia, nitrites, nitrates, phosphorous, and total suspended solids than ponds without wetlands. However, this did not result in higher survivability, faster or larger growth, or less off-flavor of the catfish. Based upon these results, it is not economically feasible to use constructed wetlands vegetated by *Sagittaria lancifolia* for catfish pond culture.

Grantee: South Carolina Department of Natural Resources, Charleston, SC

Grant No.: NA67FD0030 NMFS Contact: F/SEO

Project Title: Sustainable Aquaculture and Stock Enhancement for Native White Shrimp (*Penaeus setiferus)*

Funding: Federal: $142,369 Recipient: $32,879

Assessment: The objective of this research was to determine if Atlantic white shrimp could be farm-reared to achieve growth and production rates comparable to Pacific coast white shrimp. Using Atlantic white shrimp could reduce the potential of adverse impacts of aquaculture on the environment and wild shrimp stocks. Due to catastrophic failures of aeration equipment one year, and the occurrence of white spot disease the following year, the research was postponed. However, the second goal of the research was to determine if wild shrimp could be successfully overwintered in captivity to enhance wild stocks killed by extremely cold winters. Nearly 98% of 11,939 shrimp survived 90 days in overwintering ponds and were successfully reintroduced to the wild. This procedure could be used in the future to replenish white shrimp spawning stocks depleted by severe winter kill and provide shrimpers with a more consistent supply of shrimp.

Grantee: The University of Texas at Austin, Austin, TX

Grant No.: NA77FD0070 NMFS Contact: F/SEO

Project Title: Application of Nutritional Strategies for the Development of Low Pollution Feeds for Marine Species

Funding: Federal: $70,625 Recipient: $29,134

Assessment: The objective was to advance environmentally sound aquaculture through the development and demonstration of low pollution feeds for commercial production of red drum and Pacific white shrimp. The use of feed grade protease as a dietary supplement to enhance protein retention in juvenile shrimp and red drum proved to be ineffective. Similarly, reduced protein diets or increased lipid diets did not significantly increase growth or feed efficiency.

Grantee: Cornell University, Ithaca, NY

Grant No.: NA66FD0059 NMFS Contact: F/SF2

Project Title: Increasing Economic Efficiency of Water Recirculating Systems by Improving Water Quality and Reducing System Costs

Funding: Federal: $88,940 Recipient: $82,960

Assessment: The objective was to improve the economic efficiency of water recirculating systems used for the production of food fish. Several factors were evaluated and the results indicate that: (1) microbead filters can reduce costs significantly when compared to trickling filter technology; (2) the use of ozone in a foam fractionator application adversely affects the performance of the fractionator in removing suspended solids from waste water; (3) in round tanks, treatment costs to remove solids are more related to volume of water treated than mass of solids treated; (4) although no statistical differences in feed conversion ratios were found between three stocking densities, the numerical trend in the data indicates that increased stocking densities result in decreased feed conversion ratios; and (5) an economic analysis to compare production costs of outdoor ponds to indoor systems revealed that indoor production can be competitive with outdoor production systems. An international short course was held that focused on the principles of water reuse technology and included the findings from this project.

Grantee: Regents of the University of California, Berkeley, CA

Grant No.: NA66FD0104 NMFS Contact: F/SF2

Project Title: Fate and Microbial Effects of Aquaculture Drug Residues in the Environment

Funding: Federal: $172,165 Recipient: $51,969

Assessment: The objectives of the project were to develop data on the environmental fate and effects of two chemotherapeutants used in aquaculture to expedite Food and Drug Administration approval of drugs for industry, and to assess environmental issues associated with their use. Tetracycline (TC) and the chemically similar oxytetracycline (OTC) are antibiotics widely used in U.S. fish culture. Few studies have been conducted on the environmental fate of waste antibiotics released in farm effluent and their effect on indigenous microbial communities. The fate and effects of TC used as a bath treatment were investigated at a California sturgeon farm, with medicated effluent discharged to a small stream. TC residues were chemically detectable in both the effluent and sediments of the receiving waters, but not of sufficiently high concentration to elicit a measurable response in sedimentary microbes. This study provided clear evidence that the microbial effects of aquacultural drug residues are highly dependent upon physical/chemical factors of the sediment affecting drug bioavailability and/or the composition of the native microflora and their inherent sensitivity to antibiotics. Concentrations of OTC typically reported surrounding aquaculture facilities may affect bacterial densities, but most often will not.

## Habitat Conservation

Grantee: South Carolina Department of Natural Resources, Charleston, SC

Grant No.: NA77FD0063 NMFS Contact: F/SEO

Project Title: Critical Habitats of Atlantic Sturgeon

Funding: Federal: $129,473 Recipient: $27,621

Assessment: The objective of the project was to collect information on the abundance, habitat use, age distribution, and seasonal movements of adult Atlantic sturgeon in two major river systems to assist the effective management and recovery of Atlantic sturgeon stocks in the southeastern U.S. Forty-two adult Atlantic sturgeon were caught. Pectoral fin spines were taken for ageing, a tissue sample was taken for a molecular genetics study, the fish were tagged, a gonad biopsy was taken when possible, and radio and acoustic transmitters were surgically implanted in 30 individuals ranging in age from 7-20 years. Of the 20 fish for which sex was definitively ascertained, 17 were male and 3 were female. Ripe males and females were captured in both spring and fall. Directed upriver movements of over 100 miles by two fish in October also support the hypothesis that there is a fall spawn. Continuous tracking of one fish for 36 hours suggested active, extensive use of shallow areas (oxbows) at night followed by relative inactivity in a deep portion of the main river during the day. It is likely that spawning occurs at several locations with varying substrates in the rivers. Summer habitats included the lower and upper estuary, tidal freshwater river, and probably the ocean, since some fish left the system entirely. Two fish recaptured, one after a year, confirmed that the surgical and other fish handling procedures were effective, and that males can be in spawning condition (running ripe) in consecutive years.

# VI. COMPLETED NATIONAL PROGRAM PROJECTS

The following section contains an assessment of each S-K National Program project completed during the period June 1, 1998 to May 31, 1999, regarding the extent to which the objectives of the project were attained and the project contributed to fishery development. The projects are listed by subject area, along with the project number, project title, federal funding level, and NMFS contact.

## Management Alternatives and Fisheries User Conflicts

Project No.: 97-SE-23 NMFS Contact: F/SEO

Project Title: Collection of Biological Samples and Catch/Effort Data from the U.S. South Atlantic and Gulf of Mexico Headboat Fisheries

Funding: Federal: $169,664

Assessment: The objective of the project was to elevate coverage for the NMFS Gulf of Mexico headboat fishery survey to the level maintained from 1986-1994 by (1) collecting length/weight data from approximately 2,000 fish/month; (2) collecting biological materials (otoliths, gonads, stomachs, tissue, etc.) from approximately 200 fish/month; and (3) distributing, collecting, coding, and verifying approximately 1,200 trip reports/month. The areas of coverage were southeast North Carolina, southeast Florida, southwest Florida, Louisiana, and Texas (Corpus Christi-Galveston). Port agents were located in all designated areas to regularly intercept vessels to obtain bioprofile and catch/effort data. Between July 1, 1997 and December 31, 1998, the port agents intercepted 1,616 trips from which they collected 36,702 length/weight measurements, 2,295 otoliths, and approximately 13,500 catch/effort reports. Bioprofile data were submitted weekly and catch/effort reports were coded and submitted monthly. These data were used to calculate landing/fishing effort estimates for the headboat fishery in 1997 and are currently being used to estimate the same summary information for 1998.

Project No.: 97-SW-05 NMFS Contact: F/SWC

Project Title: Genetic Analysis of the Population Structure of Thresher Sharks in the Northeastern Pacific Ocean

Funding: Federal: $44,000

Assessment: The objective of the project was to genetically determine the stock/species structure of thresher shark in the northern Pacific Ocean utilizing state-of-the-art DNA auto-sequencing equipment. DNA sequences of a portion of the mitochondrial DNA control region (D-loop) were used to assess the population structure of common thresher sharks (*Alopias vulpinus*) from the eastern North Pacific. Among 207 individuals sequenced, only two haplotypes that differed by a single transition were found, suggesting either a loss of genetic diversity due to a current or historical population bottleneck, or selective constraints on control region sequences. Analysis of haplotypic frequencies among collections from different geographic localities disproved the null hypothesis of a single homogenous population. However, the observed departures from the null hypothesis were relatively minor, and did not suggest a clear alternative model of population structure.

Project No.: 97-SF-02 NMFS Contact: F/SF

Project Title: Comprehensive Management Plan for the Pelagic Longline Fishery

Funding: Federal: $50,000

Assessment: The objective of this study, mandated by the Magnuson-Stevens Fishery Conservation and Management Act, was to design and conduct a survey and workshops on the Atlantic pelagic longline fishery, and develop recommendations for a comprehensive management system for the fishery, including property rights-based management systems. A panel of experts, the Longline Advisory Panel (LLAP), was convened to consider the most efficient management strategies for the fishery. The LLAP discussed limited access, individual quotas, allocation of quotas, gear restrictions, time/area closures, and days-at-sea limitations. A report to Congress was prepared identifying seven major issues in the pelagic longline fishery that should be addressed by any comprehensive management system: overfishing/recovery of stocks; international issues; effort control; bycatch; relationship to other highly migratory species (HMS) fisheries; better understanding of the fishery; and data needs. The LLAP concluded that a comprehensive management system is feasible, but recommended against implementing one. A series of workshops was held based on the issues established by the LLAP. Information from the study was used in the preparation of the HMS Fisheries Management Plan.

## Fisheries Bycatch

Project No.: 97-NW-01 NMFS Contact: F/NWO

Project Title: Columbia River Steelhead Stock Composition and Bycatch Monitoring Program

Funding: Federal: $125,000

Assessment: The objective of the project was to characterize passage timing of selected steelhead stocks at Bonneville Dam and stock-specific impacts in both the fall and winter/spring season fisheries. In 1997, genetic stock identification-mixed stock analysis was conducted on Columbia River steelhead using a 29 stock electrophoretic baseline. Mixed stock estimates for Group A and Group B steelhead compare more favorably with the length method of stock separation and less favorably with the date method. The run size and harvest estimates for the Lower Columbia River evolutionary significant units (ESU), Upper Columbia River ESU, and Group B steelhead appear to be near expected estimates. However, precision error is a problem for all wild run size estimates at Bonneville Dam due to low sample size. Snake River Group A and Middle Columbia River ESU estimates appear to be outside the range of expected values. The discrepancy of these estimates may be due to the lack of baseline collections from the Middle Columbia River ESU in Oregon and from Idaho's Salmon and Clearwater Rivers. The 1997 estimates should be re-analyzed after the baseline is updated. Further, simulations should be conducted to determine the sensitivity of this analysis.

## Aquaculture

Grantee: Interstate Shellfish Sanitation Conference, Columbia, SC

Grant No.: NA67FD0260 NMFS Contact: F/SF2

Project Title: *Vibrio vulnificus* Model Education Campaign

Funding: Federal: $250,000 Recipient: $55,920

Assessment: The objective of the project was to develop education materials and evaluate them for effectiveness in advising high-risk shellfish consumers of the hazard from the pathogen, *Vibrio vulnificus*. The final report provides logical interpretations and conclusions drawn from a multi-state evaluation of materials aimed at those with liver disease and their physicians. Recommendations include an approach for utilizing these findings through other educational channels, such as health advocacy groups. The report also points out a means to enable state agencies with the tools of this project to initiate educational programs directed toward these and other high-risk groups of shellfish consumers. The grantee has printed approximately 300 copies of the report to fully inform and involve its members in furthering the education effort.

Project No.: 97-NE-07 NMFS Contact: F/NEO

Project Title: Shellfish and Finfish Aquaculture: Recirculating Systems, Technology Development, Testing, and Demonstration

Funding: Federal: $235,945

Assessment: The objective of the project was to determine practical operational parameters of a mass algal production system and recirculating, land-based culture systems for marine shellfish and finfish, i.e., the bay scallop (*Argopecten irradians*) and the tautog (*Tautoga onitis*). The project also attempted to determine the economic feasibility of using such systems for the culture of juvenile scallops. The systems functioned well for the culture of algae, juvenile scallops, and larval and juvenile tautog. Valuable information was collected on the functioning of an algal greenhouse and scallop recirculating nursery system, particularly on the energy use.

Project No.: 96-SE-PC NMFS Contact: F/SEO

Project Title: Climate Controlled Seawater System

Funding: Federal: $57,000

Assessment: The objective of the project was to construct a climate controlled seawater system at the Panama City Laboratory (PCL) to further develop hatchery rearing techniques for red drum, and to further investigate spawning, rearing, and growth requirements, and the sex reversal process of gag grouper. There is currently an increase in demand for the holding and maintenance of live marine fishes due to concern for exploitation rates and population levels of reef fish (primarily grouper and snapper) in the Gulf of Mexico. The most cost-effective method of improving the understanding of the life history traits of these fishes is to study individuals maintained in captivity. The facility constructed at the PCL includes a 1200 square ft. steel and fabric shelter housing four 800 gallon and eight 400 gallon polyethylene tanks. A single-line continuous-duty pump supplies the system with 40 gallons per minute of high salinity seawater. A titanium heater/chiller allows for climate control of the system. The resulting aquaculture facility is one of the most advanced in the Southeast Fisheries Science Center and is heavily utilized by NMFS researchers. Completed and ongoing projects include: validation and growth study on gag grouper; validation on juvenile grey and lane snapper; validation on adult red and vermilion snapper (for stock assessment); metabolic and bioenergetic study on bonnethead shark; and spawning and sex-change in red porgy.

## Habitat Conservation

Project No.: 97-HC-01 NMFS Contact: F/HC

Project Title: National Project to Pursue Habitat Management as an Innovative Approach to Fisheries Management

Funding: Federal: $600,000

Assessment: The objective of the project was to develop information concerning essential fish habitat (EFH) for use by the Fishery Management Councils to meet the statutory requirements of the Magnuson-Stevens Fishery Conservation and Management Act by the October 1998 deadline. This enabled the Councils to prepare amendments to fishery management plans (FMPs) to identify EFH, describe adverse impacts on EFH, and recommend actions that should be considered to ensure the conservation and enhancement of EFH. The funds were divided equally among the NMFS Regional Habitat Offices and supported cooperative efforts with the Councils to describe the information needed to (1) develop plans for collecting and analyzing the necessary EFH information; (2) establish priorities by which a Council's FMPs were to be amended; and (3) allow Councils to incorporate EFH management into FMPs. In addition, protocols to identify threats to EFH were developed and implemented by the NMFS Regional Habitat Programs, individual states, and the Councils.

Project No.: 97-HC-03 NMFS Contact: F/HC

Project Title: Mapping Fishery Habitat to Support Innovative Fisheries Management

Funding: Federal: $350,000

Assessment: The objective was to provide the Fishery Management Councils with information and recommendations on essential fish habitat (EFH) to enable the Councils to identify EFH, the adverse impacts on that habitat, and the actions that should be considered to ensure the conservation and enhancement of that habitat. Funding was used to (1) develop protocols for mapping EFH using geographic information systems; (2) generate data bases from which maps of EFH could be produced; and (3) produce maps of EFH for species covered by fishery management plans (FMPs). The project enabled the Councils to develop EFH amendments for FMPs by the October 1998 deadline mandated by the Magnuson-Stevens Fishery Conservation and Management Act.

# APPENDIX I

Information regarding the Saltonstall-Kennedy Grant Program may be obtained from the following offices of the National Marine Fisheries Service:

Alicia L. Jarboe, National Marine Fisheries Service (F/SF2)
Financial Services Division
1315 East West Highway
Silver Spring, Maryland 20910
Telephone: (301) 713-2358
Email: alicia.jarboe@noaa.gov

Kenneth L. Beal, National Marine Fisheries Service (F/NEO)
State, Federal & Constituent Programs Division
One Blackburn Drive
Gloucester, Massachusetts 01930
Telephone: (978) 281-9267
Email: ken.beal@noaa.gov

Ellie F. Roche, National Marine Fisheries Service (F/SEO)
Cooperative Programs Division
9721 Executive Center Drive, North
Koger Building
St. Petersburg, Florida 33702
Telephone: (727) 570-5324
Email: ellie.roche@noaa.gov

Patricia J. Donley, National Marine Fisheries Service (F/SWO)
Fisheries Management Division
501 West Ocean Boulevard
Suite 4200
Long Beach, California 90802-4213
Telephone: (562) 980-4030
Email: pat.donley@noaa.gov

Kevin A. Ford, National Marine Fisheries Service (F/NWO)
Trade and Industry Services Division
7600 Sand Point Way, NE
BIN C15700, Building 1
Seattle, Washington 98115
Telephone: (206) 526-6115
Email: kevin.ford@noaa.gov

William P. Hines, National Marine Fisheries Service (F/AKO)
Office of Trade and Industry Services and International Affairs
P.O. Box 21668
Juneau, Alaska 99802
Federal Building
709 W. 9th Street, 4th Floor
Juneau, Alaska 99801
Telephone: (907) 586-7224
Email: william.hines@noaa.gov

# APPENDIX II

available. For further information or copies of the minutes, contact William Dawson, (202) 482–5155.

Dated: February 25, 1998.

**Troy H. Cribb,**

*Chairman, Committee for the Implementation of Textile Agreements.*

[FR Doc.98–5299 Filed 2-27-98; 8:45 am]

BILLING CODE 3510–DR–F

## DEPARTMENT OF COMMERCE

### National Institute of Standards and Technology

### Visiting Committee on Advanced Technology

**AGENCY:** National Institute of Standards and Technology, Department of Commerce.

**ACTION:** Notice of Partially Closed Meeting.

**SUMMARY:** Pursuant to the Federal Advisory Committee Act., 5 U.S.C. app. 2, notice is hereby given that the Visiting Committee on Advanced Technology, National Institute of Standards and Technology (NIST), will meet Tuesday, March 10, 1998 from 8:30 a.m. to 5:00 p.m. The Visiting Committee on Advanced Technology is composed of fifteen members appointed by the Director of NIST who are eminent in such fields as business, research, new product development, engineering, labor, education, management consulting, environment, and international relations. The purpose of this meeting is to review and make recommendations regarding general policy for the Institute, its organization, its budget, and its programs within the framework of applicable national policies as set forth by the President and the Congress. The agenda will include an update on NIST programs; report on the objectives and milestones for the Advanced Technology Program (ATP), the Manufacturing Extension Partnership (MEP), and the National Quality Program; benchmarking with other national laboratories; and a laboratory tour. Discussions on staffing of management positions at NIST scheduled to begin at 8:30 a.m. and to end at 9:00 a.m. on March 10, 1998, and the NIST budget, including funding levels of the MEP and ATP programs scheduled to begin at 4:30 p.m. and to end at 5:00 p.m. on March 10, 1998, will be closed.

**DATES:** The meeting will convene March 10, 1998, at 8:30 a.m. and will adjourn at 5:00 p.m. on March 10, 1998.

**ADDRESSES:** The meeting will be held in the Employees Lounge (seating capacity 80, includes 38 participants), Administration Building, at NIST, Gaithersburg, Maryland.

**FOR FURTHER INFORMATION CONTACT:** Chris E. Kuyatt, Visiting Committee Executive Director, National Institute of Standards and Technology, Gaithersburg, MD 20899, telephone number (301) 975–6090.

**SUPPLEMENTARY INFORMATION:** The Assistant Secretary for Administration, with the concurrence of the General Counsel, formally determined on February 13, 1998, that portions of the meeting of the Visiting Committee on Advanced Technology which involve discussion of proposed funding of the Manufacturing Extension Partnership and the Advanced Technology Program may be closed in accordance with 5 U.S.C. 552b(c)(9)(B), because those portions of the meetings will divulge matters the premature disclosure of which would be likely to significantly frustrate implementation of proposed agency actions; and that portions of meetings which involve discussion of the staffing issues of management and other positions at NIST may be closed in accordance with 5 U.S.C. 552b(c)(6), because divulging information discussed in those portions of the meetings is likely to reveal information of a personal nature where disclosure would constitute a clearly unwarranted invasion of personal privacy.

Dated: February 24, 1998.

**Robert B. Hebner,**

*Acting Deputy Director.*

[FR Doc. 98–5187 Filed 2–27–98; 8:45 am]

BILLING CODE 3510–13–M

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

**[Docket No. 960223046–8030–03; I.D. 012398C]**

**RIN 0648–ZA09**

### Financial Assistance for Research and Development Projects To Strengthen and Develop the U.S. Fishing Industry

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notification of solicitation for applications.

**SUMMARY:** NMFS issues this document describing the conditions under which applications will be accepted under the Saltonstall-Kennedy (S–K) Grant Program and how NMFS will select applications for funding.

The S–K Grant Program assists eligible applicants in carrying out research and development projects that address various aspects of U.S. fisheries (commercial or recreational), including, but not limited to, harvesting, processing, marketing, and associated infrastructures.

**DATES:** Applications must be received by close of business May 1, 1998, in one of the offices listed in **ADDRESSES**. Applicants must submit one signed original and nine signed copies of the completed application (including supporting information). No facsimile applications will be accepted.

**ADDRESSES:** Application packages can be obtained from, and completed applications sent to any office listed below:

Regional Administrator, Northeast Region, NMFS, One Blackburn Drive, Gloucester, MA 01930; telephone: (978) 281–9267.

Regional Administrator, Southeast Region, NMFS, Koger Bldg., 9721 Executive Center Drive, North, St. Petersburg, FL 33702; telephone: (813) 570–5324.

Regional Administrator, Southwest Region, NMFS, 501 West Ocean Boulevard, Suite 4200, Long Beach, CA 90802–4213; telephone: (562) 980–4033.

Regional Administrator, Northwest Region, NMFS, BIN C15700, 7600 Sand Point Way, N.E., Seattle, WA 98115; telephone: (206) 526–6115.

Regional Administrator, Alaska Region, NMFS, P.O. Box 21668, Juneau, AK 99802, or Federal Building, 709 West 9th Street, 4th Floor, Juneau, AK 99801; telephone: (907) 586–7224.

In addition, this solicitation and the application package are available on the NMFS S–K Home Page at: www.nmfs.gov/sfweb/skhome.html.

**FOR FURTHER INFORMATION CONTACT:** Alicia L. Jarboe, S–K Program Manager, (301) 713–2358.

**SUPPLEMENTARY INFORMATION:**

#### I. Introduction

*A. Background*

The S–K Act, as amended (15 U.S.C. 713c–3), provides that a fund (known as the S–K fund) will be used by the Secretary of Commerce to provide grants or cooperative agreements for fisheries research and development projects addressed to any aspect of U.S. fisheries, including, but not limited to, harvesting, processing, marketing, and associated infrastructures. U.S. fisheries [1] include any fishery,

[1] For purposes of this document, a fishery is defined as one or more stocks of fish, including

Continued

commercial or recreational, that is or may be engaged in by citizens or nationals of the United States, or citizens of the Northern Mariana Islands, the Republic of the Marshall Islands, Republic of Palau, and the Federated States of Micronesia.

The funding priorities of the S–K Grant Program have evolved over the years since the program began in 1980. The original focus of the program was on development of underutilized fisheries within the U.S. Exclusive Economic Zone (EEZ). The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), originally passed in 1976, directed NMFS to provide the domestic fishing industry priority access to the fishery resources in the EEZ. In an attempt to accelerate development of domestic fisheries, the American Fisheries Promotion Act of 1980 amended the S–K Act to stimulate commercial and recreational fishing efforts in underutilized fisheries.

In the ensuing years, the efforts to Americanize the fisheries were successful to the point that most nontraditional species were fully developed and traditional fisheries became overfished. Therefore, the S-K Program priorities evolved to include a wide range of resource conservation and management issues and aquaculture.

In 1993, NOAA developed a long-range Strategic Plan that included a focus on rebuilding fisheries for sustainable use. The NOAA Strategic Plan strengthened the basis for the continued shift in the priorities of the S–K Program toward issues such as overfishing and bycatch reduction.

The NOAA Fisheries Strategic Plan, produced by NMFS in 1997, continues to emphasize management for the sustainable use of living marine resources. The NOAA Fisheries Strategic Plan will guide NMFS marine resource management decisions over the next 5 years. It includes objectives to maintain healthy stocks; eliminate overfishing and rebuild overfished stocks; increase long-term economic and social benefits from living marine resources; promote environmentally sound aquaculture development; recover protected species; reduce conflicts involving protected species; and protect, conserve, and restore habitat/biodiversity.

Passage in 1996 of the Sustainable Fisheries Act (Public Law 104–297), which amended the Magnuson-Stevens Act, supported further adjustment to the S–K Program to address the current condition of fisheries.

The Magnuson-Stevens Act recognizes that U.S. fisheries face many problems. It also recognizes the adverse effects of fishing in terms of bycatch of nontarget species, and habitat impacts. The Magnuson-Stevens Act requires that overfishing be stopped and that the problems of U.S. fisheries be corrected. Specifically, the Magnuson-Stevens Act requires NMFS to undertake efforts to prevent overfishing, rebuild overfished fisheries, insure conservation, protect essential fish habitats, and realize the full potential of U.S. fishery resources. However, the Magnuson-Stevens Act also acknowledges the potential adverse impacts on people in making such corrections. Therefore, it requires that conservation and management measures, consistent with conservation requirements of the Magnuson-Stevens Act, take into account the importance of fishery resources to fishing communities in order to provide for the sustained participation of such communities and, to the extent practicable, minimize adverse economic impacts on such communities. A ''fishing community'' is defined in the Magnuson-Stevens Act as ''a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.'' (16 U.S.C. 1802 (16).)

The 1999 S–K Grant Program announced under this notification will address the needs of fishing communities in optimizing economic benefits within the context of rebuilding and maintaining sustainable fisheries and in dealing with the impacts of conservation and management measures. The funding priorities listed under section II of this notification identify areas of research and development that relate to these needs. The scope of this program is limited to marine species and Great Lakes species.

While the S–K Program continues to be open to applicants from a variety of sectors, including industry, academia, and state and local governments, successful applicants will be those whose projects demonstrate significant direct benefits to fishing communities.

*B. Funding*

NMFS issues this document to solicit applications for Federal assistance, pursuant to 15 U.S.C. 713c–3(c), describing the conditions under which applications will be accepted under the S–K Grant Program and how NMFS will select the applications it will fund.

This notification is published subject to, and funding of projects is contingent upon, the appropriation of funds by Congress for this program in Fiscal Year (FY) 1999, which begins on October 1, 1998. The Administration's request for the S–K Grant Program for FY 1999 is $4 million.

Funding under the program will be provided for research, development, and technology transfer activities that address the funding priorities listed in section II. Funding will not be provided for projects that primarily involve infrastructure construction, port and harbor development, and start-up or operational costs for private business ventures. Furthermore, projects primarily involving data collection should be directed to a specific problem or need and be of a fixed duration, not of a continuing nature, in order to be considered.

*C. Catalogue of Federal Domestic Assistance*

The S–K Grant Program is listed in the ''Catalogue of Federal Domestic Assistance'' under number 11.427, Fisheries Development and Utilization Research and Development Grants and Cooperative Agreements Program.

**II. Funding Priorities**

Applicants should insure that their proposals address one of the following priorities as they pertain to marine or Great Lakes species. If more than one priority is selected, the priority that most closely reflects the objectives of the proposal should be listed first in the application.

The priorities are stated here in no particular order.

*A. Minimize Interactions Between Fisheries and Protected or Non-Targeted Species*

Develop methods to eliminate or reduce adverse interactions between fishing operations and nontargeted, protected, or prohibited species (e.g., juvenile or sublegal-sized fish and shellfish, females of certain crabs, marine turtles, seabirds, or marine mammals), including the inadvertent take, capture, or destruction of such species.

Conduct research on behavioral responses of both target and nontarget marine organisms to fishing gear and practices, including catch and release, in order to facilitate the design of gear and practices to actively avoid nontarget organisms.

Develop methods to improve the survivability of fish discarded or

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tuna, and shellfish that are identified as a unit based on geographic, scientific, technical, recreational and economic characteristics, and any and all phases of fishing for such stocks. Examples of a fishery are Alaskan groundfish, Pacific whiting, New England whiting, and eastern oysters.

intentionally released and protected species released in fishing operations, including modifications in gear, fishing practices, and handling practices to reduce the detrimental effects of capture and/or release, and develop methods to assess both the immediate and delayed mortality associated with capture and/or release.

Develop reliable methods to assess or record the extent and composition of fisheries bycatch, especially onboard vessels, to reduce the need for labor-intensive and expensive onboard observer programs.

*B. Rebuild Overfished Fisheries/ Maintain Healthy Fish Stocks*

Develop scientific information, plans, procedures, and methods that contribute to the rebuilding of overfished fisheries, including information on status of overfished stocks, prototype capacity reduction programs, and projects that facilitate the development of rebuilding plans for fisheries.

Conduct biological, economic, social, and other studies to support the development of sound management practices for important recreational and commercial species.

Develop alternative or innovative approaches to decrease mortality from catch and release fishing.

Develop innovative approaches to address the transition of fishing communities affected by declines in traditional commercial or recreational fisheries toward alternate employment, activities, or new business opportunities. These may include business planning or demonstration projects. However, the S–K Program does not cover business start-up and development expenses or ongoing operational expenses for individuals or individual companies.

Develop innovative approaches to improve fisheries management, including but not limited to, assessment of alternative management systems and resolution of user conflicts.

*C. Obtain Maximum Social and Economic Benefits from Harvestable Marine Resources*

Contribute to the development of commercial and recreational fisheries for underutilized or non-utilized species of potential economic importance, while maintaining long-term sustainability.

Optimize the utilization of harvestable resources through innovations in how such resources are targeted, harvested, processed, marketed, or released.

Develop marketable products from economic discards, either whole fish discarded because they are an undesirable species, size, or sex, or parts of fish discarded as not commercially useful.

Develop improved approaches to control environmental hazards which affect fishery resource health and the safety of harvested fish and their products for human consumption.

*D. Promote Aquaculture Development in the Marine Environment*

Develop or demonstrate cost-effective approaches for advancing environmentally sound public and private mariculture for food, enhancement, industrial, and other purposes.

Develop and evaluate culture systems that reduce the potential for negative impacts on wild stocks and protected resources.

Develop models for aquaculture regulation that address the impediments to development caused by current regulatory processes.

*E. Conserve and Enhance Essential Fish Habitat*

Develop and test procedures to characterize the condition of essential fish habitat (such as water quality criteria, indicators of biological integrity, and biodiversity).

Develop scientific approaches to assess and reduce human induced impacts on essential fish habitat.

If proposals received do not adequately respond to the above listed priorities, NMFS may carry out, in addition to the program announced by this document, a national program of research and development addressed to aspects of U.S. fisheries pursuant to section 713c–3(d) of the S–K Act, as amended.

## III. How to Apply

*A. Eligible Applicants*

Applications for grants or cooperative agreements for fisheries research and development projects may be made, in accordance with the procedures set forth in this document, by:

1. Any individual who is a citizen or national of the United States;

2. Any individual who is a citizen of the Northern Mariana Islands (NMI), being an individual who qualifies as such under section 8 of the Schedule on Transitional Matters attached to the constitution of the NMI;

3. Any individual who is a citizen of the Republic of the Marshall Islands, Republic of Palau, or the Federated States of Micronesia; or

4. Any corporation, partnership, association, or other non-Federal entity, non-profit or otherwise, if such entity is a citizen of the United States or NMI, within the meaning of section 2 of the Shipping Act, 1916, as amended (46 U.S.C. app. 802).

DOC/NOAA/NMFS are committed to cultural and gender diversity in their programs and encourage women and minority individuals and groups to submit applications. Recognizing the interest of the Secretaries of Commerce and Interior in defining appropriate fisheries policies and programs that meet the needs of the U.S. insular areas, applications from individuals, government entities, and businesses in U.S. insular areas are also encouraged. Furthermore, NMFS encourages applications from members of the fishing community, and applications that involve fishing community cooperation and participation. The extent of fishing community involvement will be considered by the Constituent Panel(s) evaluating the potential benefit of funding a proposal.

DOC/NOAA/NMFS employees, including full-time, part-time, and intermittent personnel are not eligible to submit an application under this solicitation or aid in the preparation of an application, except to provide information on program goals, funding priorities, application procedures, and completion of application forms. Since this is a competitive program, NMFS employees will not provide assistance in conceptualizing, developing, or structuring proposals, or write letters of support for a proposal.

Employees of Federal agencies, and Regional Fishery Management Councils and their employees, are not eligible to submit an application under this solicitation.

*B. Duration and Terms of Funding*

Generally, grants or cooperative agreements are awarded for a period of 1 year but no more than 18 months at a time.

If an application for an award is selected for funding, NMFS has no obligation to provide any additional prospective funding in connection with that award in subsequent years. Any subsequent proposal to continue work on an existing project must be submitted to the competitive process for consideration and will not receive preferential treatment. Renewal of an award to increase funding for an additional period is at the discretion of Commerce.

Publication of this announcement does not obligate NMFS to award any specific grant or cooperative agreement or to obligate any part or the entire amount of funds available.

*C. Cost-Sharing*

For this solicitation, NMFS is requiring cost-sharing in order to leverage limited funds and to encourage partnerships among government, industry, and academia to address the needs of fishing communities. A minimum of 10 percent up to a maximum of 50 percent cost-share is required. (NMFS must contribute at least 50 percent of total project costs, as provided by statute.) Applications that do not provide for at least the minimum cost-share will be returned to the applicant and will not receive further consideration.

The non-Federal share may include funds received from private sources or from state or local governments or the value of in-kind contributions. Federal funds may not be used to meet the non-Federal share except as provided by Federal statute. In-kind contributions are non-cash contributions provided by the applicant or non-Federal third parties. In-kind contributions may be in the form of, but are not limited to, personal services rendered in carrying out functions related to the project, and permission to use real or personal property owned by others (for which consideration is not required) in carrying out the project.

The appropriateness of all cost-sharing proposals, including the valuation of in-kind contributions, will be determined on the basis of guidance provided in the relevant Office of Management and Budget (OMB) Circulars. In general, the value of in-kind services or property used to fulfill the applicant's cost-share will be the fair market value of the services or property. Thus, the value is equivalent to the costs of obtaining such services or property if they had not been donated. Appropriate documentation must exist to support in-kind services or property used to fulfill the applicant's cost-share.

The degree to which cost-sharing exceeds the minimum level may be taken into account by the NOAA Assistant Administrator for Fisheries (AA) in the final selection of projects to be funded. Applicants whose proposals are selected for funding will be obligated to account for the amount of cost-share reflected in the award documents.

*D. Format*

Project applications must be clearly and completely submitted in the following format:

1. *Cover sheet.* An applicant must use OMB Standard Form 424 and 424B (4–92) as the cover sheet for each project. (In completing item 16 of Standard Form 424, see section V.A.5. of this document.)

2. *Project Summary.* An applicant must complete NOAA Form 88–204 (10–95), Project Summary, for each project. The specific priority contained in section II of this document to which the application responds must be listed on the Project Summary.

3. *Project Budget.* A budget must be submitted for each project, using NOAA Form 88–205 (10–95), Project Budget and associated instructions. The applicants must submit detailed cost estimates showing total project costs. Cost-sharing must be indicated as Federal and non-Federal shares, divided into cash and in-kind contributions. To support the budget, the applicant must describe briefly the basis for estimating the value of the cost-sharing derived from in-kind contributions. Estimates of the direct costs must be specified in the categories listed on the Project Budget form.

The budget may also include an amount for indirect costs if the applicant has an established indirect cost rate with the Federal government. The total dollar amount of the indirect costs proposed in an application under this program must not exceed the indirect cost rate negotiated and approved by a cognizant Federal agency prior to the proposed effective date of the award, or 100 percent of the total proposed direct costs dollar amount in the application, whichever is less. The Federal share of the indirect costs may not exceed 25 percent of the total proposed direct costs. Applicants with approved indirect cost rates above 25 percent of the total proposed direct costs may use the amount above the 25-percent level up to the 100-percent level as part of the non-Federal share. A copy of the current, approved, negotiated indirect cost agreement with the Federal government must be included in the application.

NMFS will not consider fees or profits as allowable costs for applicants.

The total costs of a project consist of all allowable costs incurred, including the value of in-kind contributions, in accomplishing project objectives during the life of the project. A project begins on the effective date of an award agreement between the applicant and an authorized representative of the U.S. Government and ends on the date specified in the award. Accordingly, the time expended and costs incurred in either the development of a project or the financial assistance application, or in any subsequent discussions or negotiations prior to award, are neither reimbursable nor recognizable as part of the cost-share.

4. *Narrative Project Description.* The narrative project description may be up to 15 pages in length. The narrative should demonstrate knowledge of relevant research and development activity, and demonstrate how the proposal builds upon any past and current work in the subject area, as well as relevant work in related fields. Each project must be described as follows:

a. *Project goals and objectives.* Identify the problem/opportunity to be addressed by the proposed project and what the project is expected to accomplish. Identify the specific priority to which the project responds. Indicate the size and economic value of the fisheries involved and the fishing community affected. If the application is for the continuation of a project previously funded under the S–K Program, describe in detail the progress to date and explain why additional funding is necessary.

b. *Project impacts.* Describe the anticipated impacts of the project on fishing communities in terms of reduced bycatch, increased product yield, or other measurable factors. Describe how the results of the project will be made available to the public.

c. *Evaluation of project.* Specify the criteria and procedures that will be used to evaluate the relative success or failure of a project in achieving its objectives.

d. *Need for government financial assistance.* Explain why government financial assistance is needed for the proposed work. List all other sources of funding that are being or have been sought for the project.

e. *Participation by persons or groups other than the applicant.* Describe the participation by government and non-government entities, particularly members of fishing communities, in the project, and the nature of such participation.

f. *Federal, state, and local government activities and permits.* List any existing Federal, state, or local government programs or activities that this project would affect, including activities requiring certification under state Coastal Zone Management Plans, those requiring section 404 or section 10 permits issued by the Corps of Engineers, those requiring experimental fishing or other permits under fishery management plans, and those requiring scientific permits under the Endangered Species Act and/or the Marine Mammal Protection Act. Describe the relationship between the project and these plans or activities, and list names and addresses of persons providing this information.

g. *Project statement of work:* The statement of work is an action plan of activities to be conducted during the

period of the project. This section requires the applicant to prepare a detailed narrative, fully describing the work to be performed that will achieve the previously articulated goals and objectives. The narrative should respond to the following questions:

(1) What is the project design? What specific work, activities, procedures, statistical design, or analytical methods will be undertaken?

(2) Who will be responsible for carrying out the various activities? (Highlight work that will be subcontracted and provisions for competitive subcontracting.)

(3) What are the major products?

A milestone chart must be included which graphically illustrates the specific activities and associated time lines to conduct the scope of work. Time lines should be described in increments (e.g., month 1, month 2), rather than by specific dates. The individual(s) responsible for the various specific activities shall be identified.

Because this information is critical to understanding and reviewing the application, NMFS encourages applicants to provide sufficient detail. Applications lacking sufficient detail may be eliminated from further consideration.

h. *Project management.* Describe how the project will be organized and managed. Identify the principal participants in the project and include copies of any agreements between the participants and the applicant describing the specific tasks to be performed. Provide a statement of the qualifications and experience (e.g., resume or curriculum vitae) of the principal investigator(s) and any consultants and/or subcontractors, and indicate their level of involvement in the project. If any portion of the project will be conducted through consultants and/or subcontracts, applicants must follow procurement guidance in 15 CFR part 24, ''Grants and Cooperative Agreements to State and Local Governments,'' and OMB Circular A–110 for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations. Commercial organizations and individuals who apply should use OMB Circular A–110. If a consultant and/or subcontractor is selected prior to application submission, indicate the process used for selection.

5. *Supporting documentation.* This section should include any required documents and any additional information necessary or useful to the description of the project. The amount of information given in this section will depend on the type of project proposed.

## IV. Evaluation Criteria and Selection Procedures

### *A. Evaluation of Proposed Projects*

1. *Initial Screening of Applications*

Upon receipt NMFS will screen applications for conformance with requirements set forth in this document. Applications that do not conform to the requirements may not be considered for further evaluation. In addition, proposals from ineligible applicants or those seeking funds primarily for infrastructure development and business costs will not be considered and will be returned to the applicant.

2. Consultation with Interested Parties

As appropriate, NMFS will consult with NMFS Offices, the NOAA Grants Management Division (GMD), Commerce and other Federal and state agencies, the Regional Fishery Management Councils, and other interested parties who may be affected by or have knowledge of a specific proposal or its subject matter.

3. Technical Evaluation

NMFS will solicit individual technical evaluations of each project application from three or more appropriate private and public sector experts. These reviewers will assign scores ranging from a minimum of 60 (poor) to a maximum of 100 (excellent) to applications based on the following evaluation criteria, with weights shown in parentheses:

a. *Soundness of project design/ conceptual approach.* Applications will be evaluated on the fishing community need(s) to be addressed by the project; the conceptual approach; whether the applicant provided sufficient information to evaluate the project technically; and, if so, the strengths and/or weaknesses of the technical design relative to securing productive results. (50 percent)

b. *Project management and experience and qualifications of personnel.* The organization and management of the project, and the project's principal investigator and other personnel in terms of related experience and qualifications will be evaluated. The principal investigator must be identified in order for the application to be accepted. (25 percent)

c. *Project evaluation.* The effectiveness of the applicant's proposed methods to monitor and evaluate the success or failure of the project in terms of meeting its original objectives will be examined. (10 percent)

d. *Project costs.* The justification and allocation of the budget in terms of the work to be performed will be evaluated. Unreasonably high or low project costs will be taken into account. (15 percent)

In addition to the above criteria, in reviewing applications that include consultants and contracts, NMFS will make a determination regarding the following:

(1) Is the involvement of the primary applicant necessary to the conduct of the project and the accomplishment of its objectives?

(2) Is the proposed allocation of the primary applicant's time reasonable and commensurate with the applicant's involvement in the project?

(3) Are the proposed costs for the primary applicant's involvement in the project reasonable and commensurate with the benefits to be derived from the applicant's participation?

4. Constituent Panel(s)

After the technical evaluation, individual comments will be solicited from a panel or panels of three or more representatives selected by the AA, from the fishing industry, state government, and others, as appropriate, to evaluate and rank the projects. Considered in the rankings, along with the technical evaluation, will be the significance of the problem or opportunity addressed in the project and the degree of involvement by fishing community members. Each panelist will rank the projects in terms of importance or need for funding, and provide recommendations on the level of funding NMFS should award and the merits of funding each project.

### *B. Selection Procedures and Project Funding*

After projects have been evaluated and ranked, the reviewing NMFS offices will develop recommendations for project funding. These recommendations will be submitted to the AA who will determine the projects to be funded, ensuring that there is no duplication with other projects funded by NOAA or other Federal organizations, and that the projects selected for funding are those that best meet the objectives of the S–K Grant Program.

The exact amount of funds awarded to a project will be determined in preaward negotiations between the applicant and NOAA/NMFS representatives. The funding instrument (grant or cooperative agreement) will be determined by NOAA GMD. Projects should not be initiated in expectation of Federal funding until a notice of award document is received.

**V. Administrative Requirements**

*A. Obligation of the Applicant*

An Applicant must:

1. Meet all application requirements and provide all information necessary for the evaluation of the proposal, including one signed original and nine signed copies of the application.

2. Be available, upon request, to respond to questions during the review and evaluation of the proposal(s).

3. Complete Form CD–511, ''Certification Regarding Debarment, Suspension and Other Responsibility Matters; Drug-Free Workplace Requirements and Lobbying.'' The following explanations are provided:

a. *Nonprocurement debarment and suspension.* Prospective participants (as defined at 15 CFR part 26, section 105) are subject to 15 CFR part 26, ''Nonprocurement Debarment and Suspension'' and the related section of the certification form prescribed above applies;

b. *Drug-free workplace.* Grantees (as defined at 15 CFR part 26, section 605) are subject to 15 CFR part 26, subpart F, ''Governmentwide Requirements for Drug-Free Workplace (Grants),'' and the related section of the certification form prescribed above applies;

c. *Anti-lobbying.* Persons (as defined at 15 CFR part 28, section 105) are subject to the lobbying provisions of 31 U.S.C. 1352, ''Limitation on Use of Appropriated Funds to Influence Certain Federal Contracting and Financial Transactions,'' and the lobbying section of the certification form prescribed above applies to applications/bids for grants, cooperative agreements, and contracts for more than $100,000, and loans and loan guarantees for more than $150,000; and

d. *Anti-lobbying disclosures.* Any applicant who has paid or will pay for lobbying using any funds must submit an SF–LLL, ''Disclosure of Lobbying Activities,'' as required under 15 CFR Part 28, appendix B.

4. If applicable, require applicants/bidders for subgrants, contracts, subcontracts, or other lower tier covered transactions at any tier under the award to submit a completed Form CD–512, ''Certifications Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions and Lobbying'' and disclosure form SF–LLL, ''Disclosure of Lobbying Activities.'' Form CD–512 is intended for the use of recipients and should not be transmitted to Commerce. An SF–LLL submitted by any tier recipient or subrecipient should be submitted to Commerce in accordance with the instructions contained in the award document. This requirement applies only to applicants whose applications are recommended for funding. All required forms will be provided to successful applicants.

5. Complete item 16 on Standard Form 424 (4–92) regarding clearance by the State Point Of Contact (SPOC) established as a result of E.O. 12372. A list of SPOCs may be obtained from any of the NMFS offices listed in this document (see **ADDRESSES**), and is also included in the ''Catalog of Federal Domestic Assistance.''

6. Complete Standard Form 424B (4–92), ''Assurances—Non-construction Programs.''

*B. Obligations of Successful Applicants (Recipients)*

A recipient of a grant award for a project must:

1. Manage the day-to-day operations of the project, be responsible for the performance of all activities for which funds are granted, and be responsible for the satisfaction of all administrative and managerial conditions imposed by the award.

2. Keep records sufficient to document any costs incurred under the award, and allow access to records for audit and examination by the Secretary of Commerce, the Comptroller General of the United States, or their authorized representatives; and, submit financial status reports (SF 269) to GMD in accordance with the award conditions.

3. Submit semiannual project status reports on the use of funds and progress of the project to NMFS within 30 days after the end of each 6-month period. These reports will be submitted to the individual specified as the NMFS Program Officer in the funding agreement.

4. Submit a final report within 90 days after completion of each project to the NMFS Program Officer. The final report must describe the project and include an evaluation of the work performed and the results and benefits in sufficient detail to enable NMFS to assess the success of the completed project.

NMFS is committed to using available technology to achieve the timely and wide distribution of final reports to those who would benefit from this information. Therefore, recipients are required to submit final reports in electronic format, in accordance with the award terms and conditions, for publication on the NMFS Home Page. Costs associated with preparing and transmitting final reports to NMFS in electronic format are appropriately funded from the grant award. Requests for exemption from this requirement may be considered by NMFS on a case-by-case basis.

Formats for the semiannual and final reports, which have been approved by OMB, will be provided to successful applicants.

5. In order for NMFS to assist the grantee in disseminating information, the grantee is requested to submit all publications printed with grant funds (in addition to the final report in section V.B.4. above) to the NMFS Program Officer. Either three hard copies or an electronic version of any such publications should be submitted.

*C. Other Requirements*

1. *Federal policies and procedures.* Recipients and subrecipients are subject to all Federal laws and Federal and Commerce policies, regulations, and procedures applicable to Federal financial assistance awards.

2. *Name check review.* All recipients are subject to a name check review process. Name checks are intended to reveal if any key individuals associated with the recipient have been convicted of, or are presently facing, criminal charges such as fraud, theft, perjury, or other matters that significantly reflect on the recipient's management, honesty, or financial integrity.

3. *Financial management certification/preaward accounting survey.* Successful applicants for S–K funding, at the discretion of the NOAA Grants Officer, may be required to have their financial management systems certified by an independent public accountant as being in compliance with Federal standards specified in the applicable OMB Circulars prior to execution of the award. Any first-time applicant for Federal grant funds may be subject to a preaward accounting survey by Commerce prior to execution of the award.

4. *Past performance.* Unsatisfactory performance under prior Federal awards may result in an application not being considered for funding.

5. *Delinquent Federal debts.* No award of Federal funds shall be made to an applicant or to its subrecipients who have an outstanding delinquent Federal debt or fine until either:

a. The delinquent account is paid in full,

b. A negotiated repayment schedule is established and at least one payment is received, or

c. Other arrangements satisfactory to Commerce are made.

6. *Buy American.* Applicants are hereby notified that they are encouraged to the extent feasible to purchase American-made equipment and

products with the funding provided under this program.

7. *Preaward activities.* If applicants incur any costs prior to an award being made, they do so solely at their own risk of not being reimbursed by the Government. Notwithstanding any verbal or written assurance that may have been received, there is no obligation on the part of Commerce to cover preaward costs.

8. *False statements.* A false statement on the application is grounds for denial or termination of funds and grounds for possible punishment by a fine or imprisonment (18 U.S.C. 1001).

Classification

Prior notice and an opportunity for public comments are not required by the Administrative Procedure Act or any other law for this notification concerning grants, benefits, and contracts.

Furthermore, a regulatory flexibility analysis is not required for purposes of the Regulatory Flexibility Act.

This action has been determined to be not significant for purposes of E.O. 12866.

Applications under this program are subject to Executive Order 12372, ''Intergovernmental Review of Federal Programs.''

This document contains collection-of-information requirements subject to the Paperwork Reduction Act. The collection of this information has been approved by OMB under control numbers 0348–0040, 0348–0043, 0348–0046, and 0648–0135.

Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

A solicitation for applications will also appear in the ''Commerce Business Daily.''

Dated: February 20, 1998.

**Rolland A. Schmitten,**

*Assistant Administrator for Fisheries, National Marine Fisheries Service.*

[FR Doc. 98–5184 Filed 2–27–98; 8:45 am]

BILLING CODE 3510–22–P

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

**[I.D.012798B]**

### Highly Migratory Species and Billfish Advisory Panels; Public Meeting

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice of public meeting.

**SUMMARY:** The Atlantic Highly Migratory Species (HMS) and Billfish Advisory Panels (APs) will hold a joint meeting to discuss issues in, and future management options for, the fisheries for Atlantic HMS.

**DATES:** The meeting will be held from 1:00 p.m. to 5:00 p.m. on March 16, from 8:00 a.m. to 5:00 p.m. on March 17, and from 8:00 a.m. to 4:00 p.m. on March 18, 1998. A public comment period is scheduled for Tuesday, March 17, 1998, from 7:00 to 9:00 p.m. at the meeting location.

**ADDRESSES:** The APs will meet at the Radisson Bay Harbor Inn, 7700 Courtney Campbell Causeway, Tampa, FL. Written comments should be submitted to, and informational materials related to the AP meeting are available from, Jill Stevenson, Highly Migratory Species Management Division, 1315 East-West Highway, Silver Spring, Maryland 20910.

**FOR FURTHER INFORMATION CONTACT:** Jill Stevenson, telephone: (301) 713–2347, fax: (301) 713–1917.

**SUPPLEMENTARY INFORMATION:** The HMS and Billfish APs have been established under the authority of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 *et seq.* The APs will assist the Secretary of Commerce in collecting and evaluating information relevant to the development of a fishery management plan (FMP) for Atlantic tunas, swordfish and sharks and an amendment to the Billfish FMP. All AP meetings are open to the public and will be attended by members of the AP, including appointed members, representatives of the five Fishery Management Councils that work with HMS, and the Chair, or his representative, of the U.S. Advisory Committee to the International Commission for the Conservation of Atlantic Tunas. A public comment period is scheduled for Tuesday, March 17, 1998 from 7:00 to 9:00 p.m. at the meeting location. Comments are solicited on overfishing definitions and rebuilding analyses that will be presented at the AP meeting on Tuesday. To request informational materials related to the AP discussion or to submit public comments on overfishing definitions and rebuilding analyses, see **ADDRESSES.** Agenda items for the joint AP meeting include discussion of:

1. Objectives for the HMS FMP and Billfish FMP amendment;
2. Rebuilding scenarios for overfished stocks of Atlantic HMS;
3. Development of overfishing criteria and definitions for Atlantic HMS;
4. Research and monitoring requirements in HMS fisheries;
5. Permitting and reporting requirements in HMS fisheries; and
6. Enforcement issues in HMS fisheries.

#### Special Accommodations

This meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to Jill Stevenson, 1315 East-West Highway, Silver Spring, MD 20910, phone (301) 713–2347, at least 7 days prior to the meeting date.

Dated: February 23, 1998.

**Bruce Morehead,**

*Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.*

[FR Doc. 98–5182 Filed 2–27–98; 8:45 am]

BILLING CODE 3510–22–F

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

**[I.D. 021798C]**

### New England Fishery Management Council; Meeting

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce

**ACTION:** Closed Meeting.

**SUMMARY:** The New England Fishery Management Council (Council) will hold a one-day closed meeting, with a session open to the public before and after the closed meeting.

**DATES:** The meeting will be held on Wednesday, March 18, 1998 at 9:30 a.m.

**ADDRESSES:** The meeting will be held at the Tara Ferncroft Conference Resort, 50 Ferncroft Road, Danvers, MA 01923; telephone: (978) 777-2500.

*Council address*: New England Fishery Management Council, 5 Broadway, Saugus, MA 01906-1036.

**FOR FURTHER INFORMATION CONTACT:** Paul J. Howard, Executive Director, New

# APPENDIX III

| Region | | Project Title | Recipient Organization | Federal Funding | Recipient's Cost Share |
|---|---|---|---|---|---|
| **Alaska** | | | | | |
| | 1. | Evaluation of Ozone for Ready to Eat Seafoods | University of Alaska Fairbanks<br>Fairbanks, AK | 80,715 | 16,143 |
| | 2. | Seafood HACCP Validation Using the ATP Bioluminescent Assay | University of Alaska Fairbanks<br>Fairbanks, AK | 63,133 | 7,939 |
| | 3. | The Effects of Fishery-Induced Directional Selection on Run Timing in Sockeye Salmon | University of Washington<br>Seattle, WA | 80,903 | 8,467 |
| | 4. | Population Structure of Rougheye, Shortraker, and Northern Rockfish Based on Analysis of Mitochondrial DNA Variation in Microsatellites | University of Alaska Fairbanks<br>Fairbanks, AK | 151,018 | 25,783 |
| | 5. | Reducing Seabird Bycatch in North Pacific Longline Fisheries | University of Washington<br>Seattle, WA | 180,000 | 49,200 |
| | | | **Sum** | 555,769 | 107,532 |
| **Northeast** | | | | | |
| | 1. | Test of Two Stock Hypotheses for Atlantic Bluefin Tuna Using Otolith Elemental Fingerprints | University of Maryland<br>Cambridge, MD | 88,374 | 22,207 |
| | 2. | Developing a Low Impact Sea Scallop Dredge | Massachusetts Div. of Marine Fisheries<br>Boston, MA | 35,388 | 10,994 |
| | 3. | Recruitment Dynamics of Northern Shrimp (Pandalus borealis) | University of Maryland<br>Cambridge, MD | 92,789 | 21,871 |
| | 4. | Co-Management of the Lobster Resource - Taking Responsibility and Action | Rhode Island Lobstermen's Association<br>Wakefield, RI | 70,508 | 37,500 |
| | 5. | Influence of Host Genetic Origin and Geographic Location on QPX Disease in Hard Clams, Mercenaria mercenaria | Virginia Institute of Marine Science<br>Gloucester Point, VA | 212,998 | 68,120 |
| | 6. | Density-Dependent Growth and Reproduction of Chesapeake Bay Striped Bass | University of Maryland CES<br>Cambridge, MD | 88,702 | 23,404 |
| | 7. | Aquaculture Regulation: Economic and Legal Models for the U.S. Exclusive Economic Zone | Woods Hole Oceanographic Institution<br>Woods Hole, MA | 92,935 | 26,107 |
| | 8. | Genetic Monitoring of Oyster Stock Enhancement in the Chesapeake Bay | University of Delaware<br>Lewes, DE | 68,835 | 24,819 |

| Region | | Project Title | Recipient Organization | Federal Funding | Recipient's Cost Share |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| | 9. | Fishing Industry Cooperative Enterprises Co-Production Training Program | Community Economic Development Ctr. New Bedford, MA | 103,202 | 94,344 |
| | | | **Sum** | 853,731 | 329,366 |
| **Northwest** | | | | | |
| | 1. | Manila Clam Mortality and Health Evaluation | Pacific Shellfish Institute Olympia, WA | 168,111 | 32,410 |
| | 2. | Rebuilding Naturally Spawning Coho Salmon Stocks--An Assessment of Bycatch Reduction Measures and Spawning Escapement Stock Composition in the Southern Puget Sound (Fishery Management Area 13 D-K) | Squaxin Island Tribe Shelton, WA | 141,768 | 141,768 |
| | | | **Sum** | 309,879 | 174,178 |
| **Southeast** | | | | | |
| | 1. | Development of Hypervariable, Nuclear-DNA Markers for Population Structure Analysis of Atlantic Bluefin Tuna | Virginia Institute of Marine Science Gloucester Point, VA | 125,866 | 21,539 |
| | 2. | Conserving and Enhancing Essential Fish Habitats by Differentiating the Specific Sources of Fecal Pollution in Estuarine Waters | University of Florida Gainsville, FL | 89,922 | 13,192 |
| | 3. | A Histamine Dipstick Test for Spoilage in Fisheries Products | University of Southern Mississippi Hattiesburg, MS | 52,875 | 22,207 |
| | 4. | Management of the Red Hind Fishery in Western Puerto Rico through a Regional Demographic Analysis | University of Puerto Rico San Juan, PR | 144,100 | 91,364 |
| | 5. | Sampling and Evaluation of White Spot and IHHN Virus in Commercially Important South Atlantic Penaeid Shrimp Stocks | SC Department of Natural Resources Charleston, SC | 136,931 | 42,494 |
| | 6. | Reduction in the V. vulnificus Load in Oysters by a Novel Short-Term Combination Biodepuration Treatment | Louisiana State University Med. Center New Orleans, LA | 173,111 | 133,283 |

| Region | | Project Title | Recipient Organization | | Federal Funding | Recipient's Cost Share |
|---|---|---|---|---|---|---|
| **Southeast** | | | | | | |
| | 7. | Flounder Sex Determination: Biotechnology for Controlled Breeding in Fishery Enhancement and Mariculture | North Carolina State University Raleigh, NC | | 68,465 | 48,432 |
| | 8. | The Effect of Bank-Barrier Reef Lagoon Habitat Loss on Post-Settlement Juvenile and Sub-Adult Coral Reef Fishes | University of Massachusetts Boston, MA | | 85,790 | 43,261 |
| | 9. | Spatial and Temporal Analyses of Genetic Variability in Bigeye and Yellowfin Tuna Larvae | University of South Carolina Columbia, SC | | 80,000 | 13,120 |
| | | | | **Sum** | 957,060 | 428,892 |
| **Southwest** | | | | | | |
| | 1. | Restoration of the White Abalone in Southern California: Population Assessment, Brood Stock Collection, and Development of Husbandry Technology | Regents U of Calif, Santa Barbara Santa Barbara, CA | | 244,806 | 105,841 |
| | 2. | Life History of an Exotic Sabellid Polychaete Pest in Cultured Abalone in California | Regents University of California Davis Davis, CA | | 112,064 | 25,945 |
| | 3. | Economic Assessment of the Domestic Fisheries Development Potential in the Commonwealth of the Northern Mariana Islands (CNMI) | Commonwealth of the N. Mariana Islands Saipan, MP | | 40,068 | 4,795 |
| | | | | **Sum** | 396,938 | 136,581 |
| | | | | **Grand Total** | 3,073,377 | 1,176,549 |

# APPENDIX IV

# FY 1999 S-K Applications Not Recommended for Funding



| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Alaska** | | | | | |
| | 1. | Developing Processes for Utilizing Bitter Crab | University of Alaska Fairbanks<br>Fairbanks, AK | 75,924 | 25,185 |
| | 2. | Development of a Definition and a Standard for Surimi | University of Alaska Fairbanks<br>Fairbanks, AK | 206,345 | 28,124 |
| | 3. | Assessment of the Distribution and Abundance of Commercially Harvested Forage Fish in the Northern Gulf of Alaska | University of Alaska Fairbanks<br>Fairbanks, AK | 101,553 | 20,311 |
| | 4. | Hydrodynamics of Codends: Evaluation of Mechanisms to Improve Escape and Survival | University of Alaska Fairbanks<br>Fairbanks, AK | 125,073 | 24,764 |
| | 5. | Development of a Field Techniques Manual for the Collection of Data on King Crabs, Lithodes and Paralithodes | University of Alaska Anchorage<br>Anchorage, AK | 48,361 | 7,114 |
| | 6. | Increased Byproduct Utilization from Seafood Processing Operations | Dantec Engineering, Inc.<br>Danville, CA | 74,663 | 36,000 |
| | 7. | Subsea Tag Reader (or Scanner) for Reading Passive Implantable Transponder Tags in Submarine Environment | Russell S. Thynes<br>Petersburg, AK | 24,565 | 10,712 |
| | 8. | Development of a Pelagic Longline Fishery for Underutilized Rockfish off Sitka, Alaska | Seafood Producers Cooperative<br>Sitka, AK | 146,475 | 16,925 |
| | 9. | Abundance and Harvest Rates of Spot Shrimp in Southeast Alaska | Alaska Department of Fish & Game<br>Juneau, AK | 56,261 | 21,397 |
| | 10. | Porphyra Mariculture: Optimizing Spore Production for Successful Field Cultivation | University of Alaska Southeast<br>Juneau, AK | 120,774 | 35,358 |
| | 11. | Effectiveness of Bird Avoidance Devices for the Northeast Pacific Longline Fleet | International Pacific Halibut Comm.<br>Seattle, WA | 162,400 | 159,300 |
| | 12. | Forecasting Pink Salmon Returns to Prince William Sound from Otolith Marked Out-Migrating Juveniles | State of Alaska Dept. of Fish & Game<br>Juneau, AK | 37,867 | 30,640 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Alaska** | | | | | |
| | 13. | Takotna River Salmon Escapement Monitoring Project | Alaska Department of Fish & Game Anchorage, AK | 138,773 | 81,919 |
| | 14. | Tools for Estimation and Reduction of Halibut Bycatch in the Gulf of Alaska Hook-and-Line Cod Fishery | Fisheries Information Services Juneau, AK | 17,850 | 3,150 |
| | 15. | Age and Growth, Demographics, and Thermal Biology of Salmon Sharks, Lamna ditropis, in Alaska Waters | Virginia Institute of Marine Science Gloucester Point, VA | 163,377 | 24,093 |
| | 16. | Availability of Commercial Fish Species as Food for Marine Mammals, Part 3: Post-El Nino | University of Alaska Fairbanks Fairbanks, AK | 135,591 | 22,907 |
| | 17. | Development of a Prototype Cod Trawl Designed for Halibut Bycatch Reduction and Under-Utilized Species Development | University of Alaska Fairbanks Fairbanks, AK | 188,219 | 35,879 |
| | 18. | Assessment of Benthic Habitat After Trawling: Evaluation of Factors That Influence Essential Fish Habitat in Alaska | University of Alaska Fairbanks Fairbanks, AK | 174,380 | 49,876 |
| | 19. | Surimi Recovery Improvement | Dantec Engineering, Inc. Danville, CA | 60,713 | 22,800 |
| | | | **Sum** | 2,059,164 | 656,454 |
| **Northeast** | | | | | |
| | 1. | Fishery Interactions: An Evaluation of the Biological Impact of Pelagic Longline Fisheries on Co-Occurring Fisheries in the Mid-Atlantic and Southern New England Bight | National Fisheries Institute, Inc. Arlington, VA | 58,910 | 11,123 |
| | 2. | Integration of Biological and Economic Aspects of Management in the Atlantic Herring and Mackerel Fisheries | University of Rhode Island Kingston, RI | 149,526 | 25,031 |
| | 3. | Market Development for Styela clava, a Non-Indigenous Pest Invading New England Coastal Waters | Martha's Vineyard Shellfish Group, Inc Oak Bluffs, MA | 113,839 | 34,703 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| | 4. | Development of Mammal Excluder Devices for Trawls | Rutgers University<br>Piscataway, NJ | 184,608 | 10,210 |
| | 5. | A North American Lobster Hatchery & Observation Facility | Georgetown Fisherman's Co-Op<br>Georgetown, ME | 26,600 | 6,050 |
| | 6. | Age and Growth of Long-Finned Squid | University of Rhode Island<br>Narragansett, RI | 79,199 | 15,333 |
| | 7. | Development of a Crepidula fornicata Fishery in New England | Tufts University<br>Medford, MA | 122,461 | 19,419 |
| | 8. | Maximizing the Value of Cultured Marine Finfish: Integration of a Land-Based Hatchery/Nursery Conditioning System | Great Bay Aquafarms, Inc.<br>Portsmouth, NH | 99,960 | 46,675 |
| | 9. | Effect of Oceanographic Factors on Recruitment Success of Mya arenaria in the Gulf of Maine and Implications for Clam Flat Management | University of Maine<br>Orono, ME | 40,645 | 16,784 |
| | 10. | Retraining Fishermen for Merchant Marine Careers | Northeast Maritime, Inc.<br>New Bedford, MA | 139,523 | 16,169 |
| | 11. | Twin Trawl Technology for Improved Trawl Replication | William Hugo Amaru<br>South Orleans, MA | 90,600 | 20,500 |
| | 12. | "Potentially Explosive" - An Analysis of the Impact of the 10-Man Rule Tax Subsidy | Cheryl J. Latos<br>Wood River Junction, RI | 33,566 | 4,300 |
| | 13. | Temperature-Dependent Sex Determination in Summer Flounder (Paralichthys dentatus) | The Research Foundation of SUNY<br>Stony Brook, NY | 141,263 | 34,897 |
| | 14. | Aquaculture of Sea Scallops (Placopecten magellanicus) | Maine Department of Marine Resources<br>Augusta, ME | 63,626 | 46,470 |
| | 15. | Recruitment into the Fishery: Ocean Quahog (Artica islandica) | Rutgers University<br>Piscataway, NJ | 200,127 | 57,820 |
| | 16. | Recovery of Fish Habitat in the Western Gulf of Maine Closure Area Following Cessation of Fishing | University of Connecticut<br>Groton, CT | 118,512 | 33,848 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| | 17. | Feasibility of Developing a Marketable, Safe, Commercial White Perch Fishery in Southern Green Bay, Lake Michigan | Wisconsin Dept. of Natural Resources Madison, WI | 27,000 | 3,000 |
| | 18. | Fisheries Conflict Resolution Center | University of New Hampshire Durham, NH | 62,460 | 7,813 |
| | 19. | Domestication of Native Porphyras (Nori) for Food, Industrial Products, and Bioremediation | University of New Hampshire Durham, NH | 252,145 | 39,586 |
| | 20. | Development of a Cost-Effective Hatchery System for the Green Sea Urchin (Strongylocentrotus droebachiensis) for Aquaculture and Stock Enhancement in the Gulf of Maine | University of New Hampshire Durham, NH | 135,673 | 20,622 |
| | 21. | Optimizing Environmental Conditions and Hatchery Practices for Aquaculture of Black Sea Bass (Centropristes striata) | University of Rhode Island Kingston, RI | 162,800 | 56,804 |
| | 22. | Automatic Bycatch Diversion and Management System | Sonic Industries, Inc. Hatboro, PA | 149,520 | 113,646 |
| | 23. | Marine Natural and Nutraceutical Products and Research: Global Survey and Resource Availability in the Northeast Region | University of Rhode Island Kingston, RI | 22,875 | 4,000 |
| | 24. | Bioproduction of Fish Flavor and Sauce from Squid Process Waste and Herring | University of Rhode Island Kingston, RI | 114,936 | 16,500 |
| | 25. | Development of Molecular Diagnostics and Culture Studies of Hematodinium perezi, A Parasitic Dinoflagellate of the Blue Crab | Virginia Institute of Marine Science Gloucester Point, VA | 136,834 | 33,106 |
| | 26. | The Reduction in Harvest of Undersized Summer Flounder (Paralichthys dentatus) as Bycatch in the Mid-Atlantic Sea Scallop Dredge Fishery | Virginia Institute of Marine Science Gloucester Point, VA | 65,235 | 43,520 |
| | 27. | Enhancing Hard Clam Populations in Chincoteague Bay, Maryland | Maryland Dept. of Natural Resources Annapolis, MD | 119,147 | 70,900 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| | 28. | Enhanced Striped Bass Larval Growth and Survival via Supplemental Feeding with Hormone Enriched Microencapsulated and Bioencapsulated Diets | Virginia Institute of Marine Science Gloucester Point, VA | 139,470 | 40,511 |
| | 29. | Shellfish Hatchery to Demonstrate a Self-Sustaining Fishery | Warwick Cove Marina, Inc. Warwick, RI | 313,375 | 58,900 |
| | 30. | Natural Dermo Resistance and Its Role in Oyster Restoration and Aquaculture | Virginia Institute of Marine Science Gloucester Point, VA | 74,389 | 31,061 |
| | 31. | Evaluation of a Sea Scallop Dredge Designed to Minimize Habitat Impacts | Massachusetts Institute of Technology Cambridge, MA | 114,250 | 39,000 |
| | 32. | Reducing the Risk to Protected Species from Fixed Aquaculture and Fishing Gear | Woods Hole Oceanographic Institution Woods Hole, MA | 87,207 | 29,831 |
| | 33. | Economics, Equity, and Quotas in the Atlantic Surf Clam and Ocean Quahog Fisheries | Rutgers University Piscataway, NJ | 55,100 | 29,800 |
| | 34. | Evaluation of the Potential for Increasing Fisheries Revenues and Stability through Price Forecasting and Hedging with Currency Futures | University of Rhode Island Kingston, RI | 64,707 | 10,525 |
| | 35. | Development of a Simplified, Business Friendly, and Environmentally Sound Regulatory Framework Model to Foster the Orderly Development of Marine Aquaculture | First Coastal Corp. Westhampton, NY | 87,060 | 23,200 |
| | 36. | Improvement of Oxidative Stability of Encapsulated Fish Oil in Food Powders | University of MA Amherst, MA | 92,462 | 33,734 |
| | 37. | A Study to Determine the Applicability of Membrane Separation Technology to Seafood Processing Wastewater | Eastern Maine Development Corporation Bangor, ME | 44,285 | 7,000 |
| | 38. | Understanding and Predicting the Dynamic Response of Essential Fish Habitat in Estuaries to Coastal Development | Marine Biological Laboratory Woods Hole, MA | 198,321 | 68,495 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| | 39. | Recruitment, Growth, and Survival of Juvenile Groundfish in Nursery Habitat within the New York Bight with Emphasis on Yellowtail Flounder | The Research Foundation of SUNY<br>Stony Brook, NY | 233,755 | 76,442 |
| | 40. | Improving the Management of a Resource; Studies on the Distribution and Bycatch of Juvenile Sea Scallops | Allan D. Michael<br>Gloucester (Magnolia), MA | 53,810 | 17,560 |
| | 41. | Innovative Training Program to Facilitate Future Integration of Commercial Fishermen with NOAA Fisheries Research | MA Fishermen's Partnership, Inc.<br>Gloucester, MA | 55,816 | 7,536 |
| | 42. | Gear Conflict Resolution Study for Hook and Gillnet Fishermen in Chatham, Massachusetts | MA Fishermen's Partnership, Inc<br>Gloucester, MA | 77,583 | 9,106 |
| | 43. | Collecting and Mapping Fishermen's Ecological Knowledge Including Spawning Area Data | Gloucester Fishermen's Wives<br>Gloucester, MA | 155,816 | 18,000 |
| | 44. | Improved Fingerling Production Methods for Yellow Perch Aquaculture | Board of Regents University of WI<br>Madison, WI | 144,051 | 31,416 |
| | 45. | Maintaining Genetic Diversity in Quahog Stock in the Public Shellfisheries in Orleans and Eastham, Massachusetts | Lower Cape Cod Community Dev. Corp.<br>North Eastham, MA | 59,828 | 14,952 |
| | 46. | The Biologic, Economic, and Technologic Feasibility of: Developing a Salt-Water Community Composting System; Using Refrigerators Recovered from the Waste Stream as Composting Tanks; and Utilizing the Sustainable Yield of the Salt Water Community | Mark R. Johnson<br>Quincy, MA | 17,600 | 4,025 |
| | 47. | Aquaculture Innovation Project at Teel Cove Sea Farm | Island Institute<br>Rockland, ME | 135,000 | 88,205 |
| | 48. | Utilization of Crustacean Processing By-Product in the Development of an Extruded Snack Food | University of Maine<br>Orono, ME | 48,494 | 41,399 |
| | 49. | Analysis of Shrimp Fishing Techniques to Optimize a Sustainable Fishing Yield while Minimizing Bycatch and Habitat Degradation | The School for Field Studies<br>Beverly, MA | 63,848 | 88,132 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| | 50. | Demonstration of Tautog Aquaculture in Land-Based Recirculating Systems | Massachusetts Institute of Technology<br>Cambridge, MA | 110,000 | 50,200 |
| | 51. | Survival of Atlantic Bluefin Tuna Caught by the "Chumming" Method with "J" Type Straight Hooks | New England Aquarium Corp.<br>Boston, MA | 173,373 | 37,907 |
| | 52. | Sea Scallop Spawn at Cat Cove Salt Pond and Rotational Enhancement in Ipswich Bay, Massachusetts | Salem State College<br>Salem, MA | 156,496 | 76,302 |
| | 53. | Realizing the Potential to Harvest, Transport, and Market Live Groundfish Caught by Hook and Line Gear | Cape Cod Commercial Hook Fishermen's<br>West Chatham, MA | 180,139 | 63,316 |
| | 54. | A Practical Approach to Assessing the Economic Feasibility of Integrating Shellfish Aquaculture into Private Marinas for Public Resource Enhancement Purposes | Mr. Ralph Boragine<br>Wakefield, RI | 141,169 | 85,214 |
| | 55. | Assessing the Behavioral Response of Harbor Porpoise to the Sounds Transmitted from Gillnet Pingers | University of New Hampshire<br>Durham, NH | 104,418 | 28,912 |
| | 56. | Assessment of the Stock Structure of Subpopulations of Winter Flounder in Massachusetts Bay | Northeastern University<br>Boston, MA | 162,996 | 37,447 |
| | 57. | Developing Technology for the Culture of Atlantic Halibut | University of New Hampshire<br>Durham, NH | 114,015 | 16,603 |
| | 58. | Spatial Analyses of the Coastal Stock Complex of Atlantic Herring (Clupea harengus) | University of Rhode Island<br>Kingston, RI | 47,347 | 22,108 |
| | 59. | Feasibility Study Exploring the Use of Vessel-Mounted Automatic Video Imaging of Fishing Operations and Catch to Diminish the Need for On-Board Fishing Observers in the New England Groundfish Fishery | Manomet, Inc.<br>Manomet, MA | 224,551 | 190,539 |
| | 60. | Identifying Essential Habitat for Production of Juvenile Weakfish (Cynoscion regalis) | New Jersey Marine Sciences Consortium<br>Fort Hancock, NJ | 68,177 | 13,542 |

| Region | | Project Title | Applicant | | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|---|
| **Northeast** | | | | | | |
| | 61. | Mixed Stock Analysis of Wintertime Aggregations of Striped Bass Along the Mid-Atlantic Coast | New York University Medical Center New York, NY | | 93,685 | 29,979 |
| | 62. | Development of Farmed Atlantic Deep-Sea Scallops as a Downeast Community Asset | Cobscook Bay Seafood, Inc. Eastport, ME | | 68,500 | 34,500 |
| | | | | **Sum** | 6,872,683 | 2,264,228 |
| **Northwest** | | | | | | |
| | 1. | Harmful Algal Blooms (HABs) and their Impacts on Shellfisheries and Finfisheries in Western Washington | University of Washington Seattle, WA | | 230,081 | 49,698 |
| | 2. | Closed System Photobioreactor Aquaculture of Turkish Towel Seaweed (Chondracanthus exasperatus) | University of Washington Seattle, WA | | 121,886 | 28,950 |
| | 3. | Biochemical Comparison of Conventional Hatchery and Natural Pond Methods of Rearing Salmonids | University of Washington Seattle, WA | | 233,604 | 38,199 |
| | 4. | Solving Bycatch 2000 Workshop | Fisheries Management Foundation Shaw Island, WA | | 34,000 | 208,656.75 |
| | 5. | Development of Prerecruit Survey for Pacific Whiting off the U.S. West Coast | Whiting Conservation Cooperative Seattle, WA | | 95,800 | 65,660 |
| | 6. | A Proposal for the Collection of Biological Data for Nearshore Rockfish on the Pacific Coast | Pacific States Marine Fisheries Comm. Gladstone, OR | | 114,212 | 12,763 |
| | 7. | An Assessment of the Feasibility of Conducting Echo Integration-Midwater Trawl Population Asessments of Pacific Whiting on Spawning Concentrations | Whiting Conservation Cooperative Seattle, WA | | 383,800 | 142,620 |
| | 8. | Resolving Fishery Bycatch/Endangered Species Act Conflicts with Genetic Data: An Application for Summer-Run Chum Salmon in Hood Canal, Washington | Washington Dept. of Fish and Wildlife Lacey, WA | | 224,196 | 45,651 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Northwest** | | | | | |
| | 9. | Olympia Oyster Restoration in Washington State | Washington Dept. of Fish and Wildlife<br>Lacey, WA | 246,028 | 47,206 |
| | 10. | The Ecological Characterization and Role of Molluscan Shellfish Culture in the Estuarine Environment | Pacific Shellfish Institute<br>Olympia, WA | 169,441 | 39,719 |
| | 11. | Evaluation and Status of Sturgeon and Paddlefish Caviar Fishing, Processing, and Marketing Operations in North America | Dennis Scarnecchia<br>Moscow, ID | 125,185 | 13,950 |
| | 12. | Optimum Pasteurization Methods for the U.S. Surimi Seafood Industry | Oregon State University<br>Corvallis, OR | 93,790 | 19,731 |
| | 13. | Origin of Chinook Salmon Incidentally Caught in the Puget Sound Purse Seine Fishery Targeting Fraser River Salmon | Natural Resources Consultants<br>Seattle, WA | 94,985 | 14,700 |
| | 14. | Skokomish Coho Fishery Gear Evaluation | Skokomish Tribe<br>Shelton, WA | 71,560 | 8,399 |
| | 15. | Pathogenic Calicivirus Detection and Assessment (Seafood Safety) in Foods from the Sea | Oregon State University<br>Corvallis, OR | 198,895 | 44,063 |
| | 16. | The Use of High Hydrostatic Pressure to Reduce Pathogens in Oysters | Oregon State University<br>Astoria, OR | 75,709 | 25,233 |
| | 17. | Hydraulics and Stability of Constructed Roughened Channels Inside Culverts for Fish Passage | Washington State University<br>Pullman, WA | 55,682 | 16,603 |
| | | | **Sum** | 2,568,854 | 821,801.75 |
| **Southeast** | | | | | |
| | 1. | Comparison of "Traditional" and Newly Developed "Tarp" Purseseine Fisheries and their Impact on the Baitfish Stocks in the Northeastern Gulf of Mexico (Florida's Panhandle Region) | FL Dept. of Environmental Protection<br>Tallahasse, FL | 689,616 | 136,099 |
| | 2. | Aquaculture of Marine Ornamental Shrimps | Florida Institute of Technology<br>Melbourne, FL | 49,269 | 16,243 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Southeast** | | | | | |
| | 3. | Demonstration of Packaged Skid-Mounted Biofiltration System for Recirculating Marine Fish and Shellfish | Tampa Bay Tropicals, Inc.<br>Ruskin, FL | 140,037 | 96,110 |
| | 4. | Underwater Video Monitoring of Wild Sea Turtles in Two Trawl Styles with Soft and Hard TEDs | University of Georgia<br>Athens, GA | 29,719 | 21,146 |
| | 5. | Inventory of Fishery Independent and Opportunistic Observations of Shark Longline Catch Rates in the U.S. Gulf and Western North Atlantic | National Fisheries Institute, Inc.<br>Arlington, VA | 65,706 | 18,620 |
| | 6. | Evaluation and Demonstration of Sustainable, Environmentally Friendly Mariculture at Commercial Scale | SC Department of Natural Resources<br>Charleston, SC | 74,520 | 26,713 |
| | 7. | Fishing Village Imagery Tourism Promotion as a Model of Alternative Employment in Traditional Fisheries Communities | Clemson University<br>Clemson, SC | 59,568 | 28,555 |
| | 8. | Estimation of Sea Turtle Abundance and the Frequency of Interaction with the Shrimp Fishery of the Northwestern Gulf of Mexico | Gulf & South Atlantic Fish. Dev. Found<br>Tampa, FL | 419,577 | 45,000 |
| | 9. | Stock Enhancement, Survival, and Migration of Striped Mullet and Spotted Seatrout in the Indian River, Florida | Harbor Branch Oceanographic Inst.<br>Fort Pierce, FL | 207,017 | 131,146 |
| | 10. | An In-Water Assessment of Trawl-Induced Submergence on Wild Kemp's Ridley Sea Turtles | Texas A&M Research Foundation<br>College Station, TX | 196,690 | 35,124 |
| | 11. | Intensive Culture of Mahimahi (Coryphaena hippurus) in Recirculating Tanks: The Effects of Stocking Density and Feeding Rate on Growth, Survival, and Incidence of Cannibalism | Florida Institute of Technology<br>Melbourne, FL | 41,413.76 | 27,123.76 |
| | 12. | Application of HACCP Principles as a Risk Management Approach for Exotic Pathogen Control in Aquaculture | VA Polytechnic Institute and State U<br>Blacksburg, VA | 28,100 | 6,300 |
| | 13. | Culturing Marine Ornamental Tropical Fishes from Wild-Caught Post-Larvae | Florida Institute of Technology<br>Melbourne, FL | 61,367 | 24,357 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Southeast** | | | | | |
| | 14. | Assessment of Land-Based Activities Affecting Essential Fish Habitat in Georgia | Coastal GA Center for Sustainable Dev.<br>Saint Simons Island, GA | 76,800 | 39,600 |
| | 15. | Avoiding the Pitfalls of Stock Enhancement with Hatchery Reared Fish, and Experimental and Modelling Protocol Using Summer Flounder | North Carolina State University<br>Raleigh, NC | 99,241 | 45,460 |
| | 16. | Genetic Structure, Status, and Mixed Stock Analysis of Atlantic Sturgeon in the Southeast U.S. | New York University Medical Center<br>Tuxedo, NY | 149,529 | 40,809 |
| | 17. | Experimental Assessment of Intertidal Oyster Reefs as Essential Fish Habitat: Habitat Development and Utilization by Finfish | SC Department of Natural Resources<br>Charleston, SC | 141,021 | 35,813 |
| | 18. | Do Estrogens in Formulated Diets Reduce Productivity in Marine Finfish Aquaculture? | Medical University of South Carolina<br>Charleston, SC | 107,878 | 16,306 |
| | 19. | Rapid Quantitative Detection of Vibrio vulnificus in Seafood | University of Southern Mississippi<br>Hattiesburg, MS | 131,600 | 56,687 |
| | 20. | Texas Coastal Waters Environmental Impact: Reducing Bycatch through Improved Gear Technology to Boost the Economic Welfare of the Fisheries Industry | Charles R. Truelove<br>Port Aransas, TX | 136,444 | 16,740 |
| | 21. | Enhancement of Red Drum Aquaculture through Genetic Engineering | Texas A&M Research Foundation<br>College Station, TX | 105,039 | 33,295 |
| | 22. | Essential Fish Habitat: Predicting Habitat Quality from Biological Endpoints | Louisiana State University<br>Baton Rouge, LA | 163,069 | 30,174 |
| | 23. | Evaluation of a Marine Recirculating Design Criteria Utilizing Pompano (Trachinotus carolinus) | Louisiana State University<br>Baton Rouge, LA | 136,951 | 50,468 |
| | 24. | Passive Sonar to Assess Density of Penaeid Shrimp in Aquaculture Ponds | Auburn University<br>Auburn, AL | 124,797 | 25,996 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
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| **Southeast** | | | | | |
| | 25. | Population Structure in Vermilion Snapper (Rhomboplites aurorubens) as Determined by Analyses of Mitochondrial DNA | Texas Parks and Wildlife Department<br>Austin, TX | 57,065.2 | 21,264.79 |
| | 26. | Evaluation of Shrimp Trawl Bycatch Reduction Devices in Texas Bays | Texas Parks and Wildlife Department<br>Austin, TX | 80,720 | 47,515.2 |
| | 27. | Comparison of Survival of Bycatch Associated with Bait Shrimping in Three Texas Estuarine Areas | Texas Parks and Wildlife Department<br>Austin, TX | 65,131 | 21,742 |
| | 28. | Culture of the Arkshell Clam (Anadara ovalis) in Coastal Georgia and the Oceanside Lagoon System of Virginia | University of Georgia<br>Athens, GA | 66,655 | 30,844 |
| | 29. | A Three Tier System to Control Moisture Loss and Lipid Oxidation in Frozen Breaded Seafood Using Edible Films and Modified Atmosphere Packaging | University of Georgia<br>Athens, GA | 77,907 | 59,012 |
| | 30. | A Test of Methods to Reduce Bycatch of Bottlenose Dolphins in North Carolina Gillnets | University of North Carolina<br>Wilmington, NC | 107,091 | 20,873 |
| | 31. | Bycatch of Atlantic Sturgeon in the South Atlantic Shrimp Trawl Fishery (NC, SC, GA) and Evaluation of the Potential for Development of a Recruitment Index | SC Department of Natural Resources<br>Charleston, SC | 174,011 | 22,768 |
| | 32. | Atlantic Sturgeon Habitat Use and Bycatch in the Upriver Shad Gillnet Fishery in the Winyah Bay System | SC Department of Natural Resources<br>Charleston, SC | 239,364 | 32,074 |
| | 33. | Economic and Microbiological Analyses of Intensive Fresh Water Prawn Production in Ponds with Constructed Wetlands | Mississippi State University<br>Mississippi State, MS | 148,765 | 18,955 |
| | 34. | Assessment of Essential Fish Habitat in Near-Shore, MId-Shelf, and Shelf-Edge Regions of St. Thomas and St. John, U.S. Virgin Islands | University of the Virgin Islands<br>St. Thomas, VI | 184,059 | 102,695 |
| | 35. | Assessment and Development of a Microbiological Database for Gulf of Mexico Shrimp | Mississippi State University<br>Mississippi State, MS | 149,472 | 35,574 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Southeast** | | | | | |
| | 36. | Sharks: Home-Grown Solutions for Minimizing Fishery / Non-Targeted Fish Interaction in the Gulf Menhaden Fishery with an Awareness of Ecosystem Interactions | Louisiana State University<br>Baton Rouge, LA | 69,565 | 27,358 |
| | 37. | Development of Mariculture Techniques for Oceanic Species | University of Texas at Austin<br>Austin, TX | 92,131 | 43,522 |
| | 38. | Determination of Essential Fish Habitat in the Rookery Bay National Estuarine Research Reserve | FL Dept. of Environmental Protection<br>Tallahassee, FL | 187,090 | 71,588 |
| | 39. | Characteristics of the Striped Mullet Fishery in Florida during the Post "Net-Ban" Period | FL Dept. of Environmental Protection<br>Tallahassee, FL | 97,743 | 21,515 |
| | | | **Sum** | 5,231,737.96 | 1,581,184.75 |
| **Southwest** | | | | | |
| | 1. | Pacific Coast Studies: An Educational Video Describing Marine Science Contributions Made by the National Marine Fisheries Service, State Agencies, and Individuals, Which Help Insure the Future of Marine Resources | Michael Lance Milbrand<br>Solana Beach, CA | 150,437 | 23,969 |
| | 2. | A Proposal to Identify, Assess, and Incorporate Important Biological, Other Scientific, and Socio-Economic Information into a GIS Database to Plan, Design, Site, Construct, and Manage Artificial Reefs | American Sportfishing Association<br>Alexandria, VA | 145,200 | 45,657 |
| | 3. | Development of Protocols for the Mass Culture of California Halibut | Los Angeles Co. Museum of Natural Hist<br>Los Angeles, CA | 246,506 | 138,858 |
| | 4. | Analysis of Acoustic Behavior of Dolphins to Develop Tuna/Dolphins Bycatch Prevention Measures | University of Hawaii<br>Honolulu, HI | 91,341 | 11,000 |
| | 5. | Characterization of Genetic Diversity in Cultured and Wild Stock Abalone Haliotis spp. through DNA Fingerprinting Using Highly Specific Microsatellite Analysis | Carlsbad Aquafarm, Inc.<br>Carslbad, CA | 43,800 | 10,500 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
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| **Southwest** | | | | | |
| | 6. | Demonstration of the Viability of Land-Based Pearl Oyster Cultivation | Kuala<br>Kaunakakai, HI | 100,000 | 10,000 |
| | 7. | Understanding Recruitment Growth of California Market Squid, Loligo opalescens, Using Experimental Culture, Statolith Age Barometers and Enzyme Analysis | University of Texas Medical Branch<br>Galveston, TX | 149,263 | 74,631 |
| | 8. | Reviving of All Fish Traps in Yap Proper | Marine Resources Management Division<br>Colonia, Yap State, FM | 88,350 | 87,915.5 |
| | 9. | Development of Commercial Opportunities for Sea Cucumbers through Aquaculture Cultivation in the Republic of the Marshall Islands | Marshall Islands Specialty Seafood Co.<br>Majuro, MH | 130,318 | 18,920 |
| | 10. | Economic Analysis of Coastal Fisheries Resources of the Marshall Islands | MALGOV'T<br>Majuro, MH | 64,700 | 4,400 |
| | 11. | Development of Acoustic Stunning Methods for the Tuna Fishery | Nature's Own Research Association<br>Dover, NH | 242,750 | 70,000 |
| | 12. | Determination of the Biogenic Source(s) of Palytoxin in Toxic Reef Fishes | Oceanit Test Systems, Inc.<br>Honolulu, HI | 102,635 | 13,300 |
| | 13. | Proposal to Compile a Comprehensive Analysis of the Interaction between Tourism, Marine Resources and Local Fishermen in the Republic of Palau | University of Memphis<br>Memphis, TN | 69,999 | 22,301 |
| | 14. | Evaluation of Effectiveness of Using Live Milkfish (Chanos chanos) as Bait on Commercial Longline Vessels | The Oceanic Institute<br>Waimanalo, HI | 248,421 | 142,742 |
| | 15. | A Video/Film Project to Educate the Public and Various User Groups about Salmonid Declines in Northern and Central California and Solutions to Help Restore Salmonid Populations | Louise Kane<br>Eastham, MA | 208,308 | 120,000 |
| | 16. | Mariculture of Algae Containing Antiviral and Antibiotic Substances | Bruce W. W. Harger<br>Goleta, CA | 88,168 | 18,000 |
| | 17. | California Sea Lion/Salmonid Interaction Study - Year Three | Fishermen's Alliance of Monterey Bay<br>Monterey, CA | 29,500 | 29,500 |

| Region | | Project Title | Applicant | Requested Federal Funding | Applicant's Cost Share |
|---|---|---|---|---|---|
| **Southwest** | | | | | |
| | 18. | Development and Appliction of Molecular Methods for Detection and Differentiation of North American and Asian Isolates of White Spot Syndrome Virus and Yellow Head Virus | University of Arizona<br>Tucson, AZ | 83,000 | 45,263 |
| | 19. | Development of Microparticulate Diets for the Improved Culture of Marine Fish Larvae | Regents Univ of Calif Santa Barbara<br>Santa Barbara, CA | 98,680 | 58,958 |
| | 20. | Evaluation of Traits Amenable to Biosecure Cost-Effective (BCE) Recirculating Systems for Marine Shrimp (Penaeus vannamei) | The Oceanic Institute<br>Waimanalo, HI | 144,691 | 71,240 |
| | 21. | Effort and Uncertainty Characterization in the California Chinook Fisheries | Regents University of Calif Santa Cruz<br>Santa Cruz, CA | 29,729 | 3,339 |
| | 22. | Isolation and Identification of Intestinal Anaerobic Bacteria from Select Foodfish | California State University Foundation<br>Hayward, CA | 181,889 | 75,580 |
| | 23. | Effect of Salinity Exposure on Reproductive Outcome in Pacific Herring | Regents University of California Davis<br>Davis, CA | 115,369 | 39,461 |
| | 24. | California Market Squid Population Structure, Migration Patterns, and Early Development in Regard to Environmental Temperature Changes and Fishery Relevance | Stanford University<br>Stanford, CA | 246,290 | 71,163 |
| | 25. | The Therapeutic Treatment of Abalone Infected with Rickettsial Withering Syndrome | Virginia Institue of Marine Science<br>Gloucester Point, VA | 163,340 | 25,929 |
| | 26. | Ecological Mariculture of Scallops Integrated with Mussels and Marine Plants in a Rapidly Urbanizing Lagoon | Regents University of Calif, Irvine<br>Irvine, CA | 179,080 | 32,204 |
| | | | **Sum** | 3,441,764 | 1,264,830.5 |
| | | | **Grand Total** | 20,174,202.96 | 6,588,499 |