
The Saltonstall-Kennedy Grant Program: Fisheries Research and Development

Report 2011

U.S. DEPARTMENT OF COMMERCE

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Acting Secretary

National Oceanic and Atmospheric Administration

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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) 2011. The report contains information on the S-K Program regarding its legislative authority, the application solicitation and grant selection process, recipients, and funding.

There were no funds available for the S-K Program in FY 2011, therefore this report does not include information on the applications received or funded in FY 2011. However, ongoing projects in FY 2011 funded with prior year appropriations will be detailed.

Appendix I contains addresses of NMFS Headquarters and Regional Offices from which information regarding the S-K Program may be obtained.

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

1. The fisheries development goals and funding priorities for a national program of research and development for the next fiscal year (page 6).
2. A description of all ongoing fisheries research and development projects (page 9).
3. A list of those applications approved and disapproved and the total amount of grants made (no applications were received, no applications were approved or disapproved).
4. A statement of the extent to which available funds were not obligated or expended by the Secretary for grants (page 7).
5. An assessment of each project 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 31).

II. EXECUTIVE SUMMARY

- This annual report is required under the Saltonstall-Kennedy Act, as amended (15 U.S.C. 713c-3).
- The report includes a description of ongoing projects and an assessment of those projects completed since the last report.
- The report covers projects funded under both the Competitive Grant Program and the National Program.
- The S-K program is capitalized through annual transfers by the Secretary of Agriculture to the Secretary of Commerce into the Promote and Develop Fishery Products (P&D) account of amounts equal to 30 percent of the gross receipts collected under the customs laws on imports of fish and fish products.
- Since 1979, Congress has transferred portions or all available P&D account funding to the Operations, Research and Facilities (ORF) line. Any remaining P&D account funding has been used to conduct the National Program and Competitive Grants Program.
- The ORF offset supports critical regional and national fisheries research and management activities including the analysis and decision-making that support ecosystem approaches to fisheries management, fishery management plan and regulatory implementation, development of fisheries regulations and Fisheries Management Plans. It also supports survey and monitoring, stock assessments, and Cooperative Research which are needed to maintain and restore productive stocks important to commercial, recreational, tribal, and subsistence fisheries.
- Historically these funds have been executed under the “Fisheries Research and Management Programs” budget line item. For FY 2011, the enacted appropriations bill transferred the full amount under the P&D account to high priority needs in the ORF line so NMFS did not conduct a National Program nor a Competitive Grant Program. Funding priorities reflect NOAA’s goal to conserve, protect, manage, and restore living marine resources and coastal and ocean resources critical to public health and the vitality of the U.S. economy.
- For FY 2012, NMFS was unable to conduct a competitive S-K program due to the lack of availability of Federal allocations.
- Funding priorities reflect NOAA’s goal to optimize economic benefits within the context of rebuilding and maintaining sustainable fisheries, and in dealing with the impacts of conservation and management measures.

III. BACKGROUND

The Saltonstall-Kennedy Act, as amended (15 U.S.C. 713c-3), established a fund (known as the S-K fund) that the Secretary of Commerce uses to provide grants or cooperative agreements for fisheries research and development projects. Under this authority, grants and cooperative agreements are made annually on a competitive basis (subject to funding) to assist in carrying out projects related to U.S. commercial and recreational fisheries.

The S-K Grant Program funding priorities are consistent with the goals and objectives of the NOAA and NMFS Strategic Plans and the Magnuson-Stevens Fishery Conservation and Management 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.

Proposals received in response to a solicitation are evaluated for merit by appropriate private- and public-sector experts, and for usefulness by representatives of various fisheries constituencies. Proposals are ranked by their average scores. After proposals have been evaluated and ranked, recommendations for funding are developed and submitted to the Assistant Administrator for Fisheries, who determines which projects will be funded.

In addition, 15 U.S.C. 713c-3(d) authorizes the Secretary of Commerce to carry out a National Program to address aspects of U.S. fisheries not adequately addressed by projects assisted under the Competitive Grant Program.

For FY 2012, NMFS was unable to conduct a National Program or a Competitive Grant Program, because no funds were provided for the program in the final FY 2012 appropriation.

The S-K program is capitalized through annual transfers by the Secretary of Agriculture to the Secretary of Commerce into the Promote and Develop Fishery Products account of amounts equal to 30 percent of the gross receipts collected under the customs laws on imports of fish and fish products. Table 1 indicates the total duties collected on fishery products; the total receipts in Promote and Develop for FY 2011; the amount transferred to operations, research, and facilities (ORF) as directed by the annual Appropriations Act; and the amount allocated for the S-K Program, including the Competitive Grant Program, the National Program, and program administrative costs, including monitoring of ongoing awards. The ORF offset supports fisheries research and management activities including the analysis and decision-making that support ecosystem approaches to fisheries management.

Table 1. S-K Funding for FY 2011 (\$ in millions)

Funding Item	Amount
Total Duties Collected on Fishery Products	\$227.43
Total Transfer to Promote and Develop account	90.24
ORF Transfer	<u>(90.24)</u>
S-K Allocation	0.00
Carryover ¹	<u>0.00</u>
Total Available for S-K `Program	0.00
S-K Program Obligations/Commitments	
FY 2011 Grant Program	0.00
National Program	0.00
Program Administration	0.00
Estimated Unobligated Balance	<u>0.00</u>
Total	0.00

¹ Includes unanticipated prior year recoveries as well as unobligated funds.

Table 2 indicates the recent funding history of the S-K Program.

Table 2. S-K Funding, 1996–2011 (\$ in millions)

Fiscal Year	Total Duties	Total P&D Transfer	ORF Offset	Funds Directed to Non-S-K Activities in Appropriations Legislation	Available S-K Program Allocation	S-K Program Allocation as % of Transfer to P&D
1996	242.98	72.89	63.00	-	9.89	13.57
1997	221.27	66.38	66.00	-	0.38	0.57
1998	219.11	65.73	62.38	-	3.35	5.10
1999	221.42	66.43	63.38	-	3.05	4.59
2000	233.07	69.92	68.00	-	1.92	2.75
2001	242.76	72.83	68.00	-	4.83	6.73
2002	263.77	79.13	68.00	-	11.13	14.07
2003	250.75	75.22	65.00	10.00	0.22 ²	0.29
2004	265.75	79.72	62.00	17.00	0.72 ³	0.90
2005	258.46	77.54	65.00	10.00	2.54 ⁴	3.28
2006	264.28	79.28	67.00	7.00 ⁵	5.28	6.66
2007	276.05	82.82	79.00	-	3.82	4.61
2008	281.98	84.59	77.00	-	7.59	8.97
2009	361.70	108.51	79.00	-	29.83	27.49
2010	377.90	113.37	104.60	-	8.79	7.75
2011	300.80	90.24	90.24	-	-	-

² Another \$10 million was allocated, but directed to the Alaska Fisheries Marketing Board, outside of the S-K Program.

³ Another \$17 million was allocated, but directed to the Alaska Fisheries Marketing Board, Gulf and South Atlantic Fisheries Foundation, Inc., South Carolina Seafood Alliance, Oregon Trawl Commission, and Oregon State University Seafood Laboratory, outside of the S-K Program.

⁴ Another \$10 million was allocated, but directed to the Alaska Fisheries Marketing Board, outside of the S-K Program.

⁵ Allocation directed to Alaska Fisheries Marketing Board, per Public Law 109-108, Section 208.

IV. ONGOING GRANT PROGRAM PROJECTS

This section contains a description of all ongoing projects under the S-K Grant Program as of September 30, 2011, 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 for whom appear in Appendix I). The projects are listed by grantee within each subject area.

AQUACULTURE

Grantee: University of Connecticut, Storrs, CT
Grant No.: NA09NMF4270075 *NMFS Contact:* F/NER
Project Title: Biofouling Tunicates on Shellfish Aquaculture Gear as Potential Vectors of Harmful Algal Introductions
Funding: *Federal:* \$ 249,651 *Recipient:* \$ 74,055

Description: The purpose of this project is to determine the risk of transporting and introducing harmful algal cells and/or cysts originating on shellfish aquaculture facilities and gear via movement of gear and/or disposal of biofouling material; and to evaluate mechanisms to minimize these risks and facilitate bloom prevention through best management practices and education.

Grantee: University of Southern Mississippi, Hattiesburg, MS
Grant No.: NA09NMF4270083 *NMFS Contact:* F/SER
Project Title: Development of Hatchery Procedures for Aquaculture of Red Snapper (*Lutjanus campechanus*): Investigations on Larval Nutrition and Potential Alternative Diets
Funding: *Federal:* \$ 262,280 *Recipient:* \$ 85,344

Description: The goal of this 2-year project is to better understand red snapper larval nutritional requirements. Under controlled laboratory conditions, researchers will determine nutritional requirements of red snapper larvae and identify strategies that maximize larval quality. Researchers will focus on rotifers to be used as a partial substitute for copepods. This information will then be used to improve red snapper larval diets and larval rearing success.

Grantee: Hubbs - Sea World Research Institute, San Diego, CA
Grant No.: NA09NMF4270101 *NMFS Contact:* F/SWR
Project Title: Advancement of Hatchery Technologies for Commercial-Scale Production of California Yellowtail (*Seriola lalandi*) and Yellowfin Tuna (*Thunnus albacares*)
Funding: *Federal:* \$ 246,056 *Recipient:* \$ 140,214

Description: The primary goal of this project is to promote the development of offshore aquaculture in California and the United States by establishing successful larval rearing

techniques that lead to reliable production of two pelagic marine finfish species—the California yellowtail and the yellowfin tuna.

Grantee: University of Washington, Seattle, WA
Grant No.: NA09NMF4270093 *NMFS Contact:* F/NWR
Project Title: Threats to Bivalve Aquaculture and Fisheries: The Influence of Emerging Diseases and Environmental Change.
Funding: *Federal:* \$ 243,115 *Recipient:* \$ 70,799

Description: The goal of this grant activity is to characterize the environmental factors that threaten the aquaculture industry and wild shellfish. The primary approaches include a series of laboratory experiments and environmental sampling. The following hypothesis will be tested: Environmental stressors (elevated temperature and reduced pH) will enhance disease expression (vibriosis bacteriological toxin and or OsHV-virus) and reduce larval bivalve survival. This study will assist industry and government agencies in predicting mortality events, improve hatchery practices, manage wild populations, and develop improved broodstocks.

Grantee: Pacific Shellfish Institute, Olympia, WA
Grant No.: NA09NMF4270092 *NMFS Contact:* F/NWR
Project Title: Biosecure Domestication of Native Geoduck Clams
Funding: *Federal:* \$ 210,267 *Recipient:* \$ 51,000

Description: Increased production of cultured geoducks in Washington State has raised concerns about the effects of genetic interactions between hatchery-bred geoduck at high densities and nearby wild geoducks. The goal of this project is to develop methods to increase the biosecurity associated with wild geoducks through production of a sterile geoduck. The study includes efforts to grow out sterile geoducks and assess their growth and survival rates.

Grantee: Board of Trustees, Southern Illinois University Carbondale, Carbondale, IL
Grant No.: NA09NMF4270078 *NMFS Contact:* F/NER
Project Title: Use of Alternative Lipid Sources and Finishing Feeds to Improve the Nutritional Value and Safety of Aquaculture Products
Funding: *Federal:* \$ 183,548 *Recipient:* \$ 71,206

Description: To balance the conflicting demands of increasing aquacultured fish fillet highly unsaturated fatty acid (HUFA) content while limiting concentrations of persistent organic pollutants, this project will evaluate the use of alternative lipid sources in conjunction with finishing feeds in the culture of the sunshine bass *Morone chrysops* x *M. saxatilis*. The two objectives of this effort are to (1) identify grow-out feed formulations that minimize fish oil inputs to aquafeeds for sunshine bass while maximizing fillet HUFA content at harvest, and (2) assess concentrations of various persistent organic pollutants in fillets resulting from objective 1 and determine compound-specific patterns of accumulating and practical consumer exposure levels.

Grantee: University System of New Hampshire, Durham, NH
Grant No.: NA09NMF4270070 *NMFS Contact:* F/NER
Project Title: Addressing Issues of Hatchery Production and Grow Out of Sea Urchins for Aquaculture Development in the Gulf of Maine
Funding: *Federal:* \$ 236,503 *Recipient:* \$ 52,906

Description: This study focuses on refining approaches to develop the most cost-effective larval culture system to maximize juvenile production and to increase growth and survival of juvenile urchins by comparing land-based versus field-based systems for cultivation to out planting size. Tank-based cultivation will focus on the variables of density and diet (natural algal-based omnivorous diet versus formulated diets) to promote somatic growth of juveniles. Field-based cultivation utilizes cage systems that promote natural micro algal growth as food and a slow migration of urchins onto the bottom. Outplanting studies will focus on winter seeding and out-planted individuals will be monitored for survival, movement, and growth.

Grantee: University of Maine, Orono, ME
Grant No.: NA09NMF4270065 *NMFS Contact:* F/NER
Project Title: The Development of a Probiotic Feed Supplement for the American Lobster (*Homarus americanus*)
Funding: *Federal:* \$ 247,547 *Recipient:* \$ 61,705

Description: To develop a probiotic nutritional supplement for use in the American lobster commercial aquaculture industry, as defined by the impoundment of live lobsters in tidal lobster pounds or storage in land-based holding tank facilities.

Grantee: University of Maine, Orono, ME
Grant No.: NA09NMF4270066 *NMFS Contact:* F/NER
Project Title: Establishment of an Atlantic cod breeding program for the US aquaculture industry
Funding: *Federal:* \$ 246,738 *Recipient:* \$ 88,194

Description: This FY 2009 grant addresses the Saltonstall-Kennedy grant program priority related to aquaculture and the improvement of aquaculture science. It has five objectives: (1) development of a breeding program for Atlantic cod after evaluation of individual cod families with quantitative genetic technology; (2) election of an Atlantic cod line; (3) development of collaborative relations among the University of Maine, the U.S. Department of Agriculture, and private industry in evaluating experimental cod stocks and the transfer of selected broodstock to commercial producers; (4) wide dissemination of project findings to industry participants, including distribution of selected cod stocks to industry partners in the form of eggs and juveniles from selected lines or through broodstock fish to hatcheries; (5) publication of results in peer-reviewed journals as well as presentation of results at regional and national aquaculture meetings.

Grantee: Micro Technologies, Inc., Richmond, ME
Grant No.: NA09NMF4270071 *NMFS Contact:* F/NER
Project Title: Development of a Technology Platform for the Assessment and Controlled Delivery of Therapeutic Bacteriophage in Aquaculture
Funding: *Federal:* \$ 185,645 *Recipient:* \$ 23,370

Description: The goal of this aquaculture project will be to develop and test a novel, therapeutic phage (virus) delivery system which targets disease control in aquacultured organisms through prevention and treatment of bacterial infections. There are two different, but interlinking, parts to the project: in the Phage Isolation and Evaluation element, researchers will develop processes for isolating specific phage that infect key bacterial pathogens affecting aquaculture. They will work with model systems where phage/host pairs are already available to develop processes to monitor how effective the phage are at killing their bacterial hosts. They will also determine whether a bacterial host population adapts, becoming resistant to the phage over time, thereby necessitating the isolation of new, infective phages, and also whether there is a cost in terms of viability of phage resistance. In the Microsphere Delivery System element of the project, in-vitro model systems will be used to examine different microsphere constituents. Researchers will incorporate active phage into microspheres and determine phage survival. Release data will be obtained under different in-vitro conditions, allowing assessment of how microsphere characteristics can be optimized to maximize phage retention and activity. Investigators will determine how the uptake of microspheres by animal immune cells varies with different microsphere constituents and size and determine ways microspheres might be employed in an environmental setting.

Grantee: Virginia Institute of Marine Science, Gloucester Point, VA
Grant No.: NA09NMF4270073 *NMFS Contact:* F/NER
Project Title: Epidemiological Studies on a Parasitic Ciliate of Blue Crabs, *Callinectes sapidus*, and Its Possible Role in Winter Mortalities
Funding: *Federal:* \$ 247,767 *Recipient:* \$ 27,700

Description: A parasitic ciliate infects the American Blue Crab in the Chesapeake Bay and it is capable of rapid spread and could be responsible for winter mortalities in blue crabs. This study aims to investigate the transmission, mortality, and pathogenicity of this emergent disease and to (1) determine how the pathogen is transmitted, how selected environmental factors affect disease transmission, and subsequent mortality in blue crabs exposed to the parasite; (2) describe the pathology and pathobiology of crabs infected with the parasite and develop rapid methods to diagnose it in hemolymph samples of crabs; and (3) assess the prevalence of the disease in the over-wintering crab population in select locations within Chesapeake Bay to incorporate into current models of future stock predictions. This study will help to determine the potential threat of this disease to the fishery.

Grantee: University of North Carolina, Wilmington, Wilmington, NC
Grant No.: NA09NMF4270084 *NMFS Contact:* F/SER
Project Title: Practical Diet Development for Intensive Cultivation of Red Porgy in the Southeastern U.S. Using Alternative Protein Sources
Funding: *Federal:* \$ 149,165 *Recipient:* \$ 18,672

Description: This 2-year project investigates the underutilized, readily available ingredients (including soybean meal and corn meal) as an alternative to fish meal, using red porgy as a test species. The controlled laboratory studies will help formulate a cost-effective and environmentally friendly diet for commercial red porgy culture. This will, in turn, serve as a model for other carnivorous marine finfish species. The effects of these alternative protein-based diets on red porgy performance will be evaluated. Those evaluations will be made by monitoring red porgy growth, feed efficiency, and body biochemical composition.

Grantee: Kona Blue Water Farms, LLC, Kailua Kona, HI
Grant No.: NA10NMF4270270 *NMFS Contact:* F/PIR
Project Title: Fishmeal Replacement Using the Byproducts from Microalgae-Based Biofuel Production and Food Processing in the Diets of High-Value Marine Finfish
Funding: *Federal:* \$ 242,889 *Recipient:* \$ 38,152

Description: This project will examine novel protein sources, as a substitute for fish meal in the diets of Kona Kampachi (*Seriola rivoliana*)—a sashimi-grade, carnivorous marine finfish grown in Hawaii. The products of interest are a defatted algal biomass, a byproduct of biofuel production; a Single Cell Protein (SCP) made using food processing waste, and a Fish Protein Concentrate (FPC) made from the waste of fish processing plants. These products will be substituted for fish meal at increasing rates (0%-30% substitution) and the effect of this on growth rate and food conversion ratio will be ascertained. Products that offer promising results (similar or better growth rate and equal or lesser cost when compared to the commercial diet used to raise Kona Kampachi) will be used to grow fish to a marketable size for a consumer taste test. Results of these trials will be shared with the industry through industry publications and presentations at industry-related conferences. This project addresses the following FY 2010 Saltonstall-Kennedy program priorities: “Aquaculture” and “Optimum Utilization of Harvested Resources under Federal or State Management.” All work involved with this project will take place in land-based systems and will therefore have no impact on the offshore environment and will not require additional permitting.

Grantee: Pacific Shellfish Institute, Olympia, WA
Grant No.: NA10NMF4270309 *NMFS Contact:* F/NWR
Project Title: Evaluation and Development of Advanced Farm Management and Harvesting Tools for Economically Efficient and Environmentally Sustainable Production of Manila Clams
Funding: *Federal:* \$ 224,118 *Recipient:* \$ 27,603

Description: This project will evaluate the effects of a new Manila clam intensive culture and mechanical harvesting techniques on production levels, economic costs and benefits, and environmental parameters outside of the area of a demonstration farm. The new harvesting technique employs a mechanical clam harvesting device as compared to the current hand digging procedure. The goal is to increase the profitability of Manila clam culture in Washington State in order to compete with low-cost imported clams from overseas producers.

Grantee: Texas A&M Research Foundation, College Station, TX
Grant No.: NA10NMF4270199 *NMFS Contact:* F/SER
Project Title: Construction of a Genetic Map for Direct Use in Aquaculture and Management of Red Drum (*Sciaenops ocellatus*) Resources in the Gulf of Mexico and U.S. South Atlantic
Funding: *Federal:* \$ 159,661 *Recipient:* \$ 51,727

Description: Researchers at Texas A&M University (College Station) will work in the laboratory to generate a moderately saturated genetic map of red drum during a 19-month period. The map will be usable for marker-assisted selection of traits that currently constrain red drum aquaculture in the private sector. The map also can be used in resource management to (1) identify discrete geographic stocks based on genetic differences affecting important adaptive traits, and (2) assess whether adaptive genetic profiles of released fish in stock enhancement match genetic profiles of resident (wild) fish. However, no aquaculture activities are proposed. No genetic enhancement of fish is proposed. Samples of age-0 red drum from at least two cohorts in each of eight bays or estuaries along the Texas coast are already available in the Texas A&M laboratory.

Grantee: Great Bay Aquaculture, LLC, Portsmouth, NH
Grant No.: NA10NMF4270212 *NMFS Contact:* F/NER
Project Title: Development of Cod Aquaculture for Downeast Fishermen
Funding: *Federal:* \$ 249,940 *Recipient:* \$ 59,250

Description: This project will begin the process of providing displaced fishermen with an opportunity to transition from fishing to fish farming. It will provide infrastructure and technical support for marine aquaculture trainees and prove the concept that seeding pilot-scale cod farms owned by fishermen can start a new, natively owned aquaculture industry in Maine. It has four objectives: (1) to coordinate this project with the cod culture training program (also known as the "Cod Academy"), targeting downeast fishermen; (2) to establish two cod farms managed by graduates of the Cod Academy; (3) to provide continuing training and monitoring during the course of the project; and (4) to provide and coordinate site support services to the two farms during the project.

Grantee: Hubbs - Sea World Research Institute, San Diego, CA
Grant No.: NA10NMF4270308 *NMFS Contact:* F/SWR

Project Title: The Use of Fish Processing Trimmings to Replace Traditional Industrial Fish Meal and Fish Oil Ingredients in Aquaculture Feeds for Marine Finfish

Funding: *Federal:* \$ 210,470 *Recipient:* \$ 60,143

Description: The search for replacements for traditional fish meal and oil ingredients in the diets of farmed fish continues to be a very high priority to sustain the necessary growth of the industry. Trimmings from fish processing facilities, which historically have been mostly discarded, are a viable replacement. California yellowtail and white sea bass are top candidates for marine aquaculture in California because of their high value and status of biological knowledge. This project brings together an expert team of scientists with all of the required skill sets and experience to cost-effectively investigate the use of processing trimmings as a dietary ingredient for marine fish. The results of this study will offer significant benefits to the aquaculture and fishing industry in the United States.

Grantee: Downeast Institute for Marine Research, Beals, ME

Grant No.: NA10NMF4270214 *NMFS Contact:* F/NER

Project Title: Enhancing Sea Scallop Stocks in Eastern Maine through Applied Aquaculture Research and Technology Transfer

Funding: *Federal:* \$ 165,183 *Recipient:* \$ 18,353

Description: This 2-year study will take place in downeast Maine and involves substantial involvement and participation with regional fishermen. It is a marine aquaculture project designed to (1) determine the most cost-effective methods of producing sea scallop spat (*Placochelone magellanicus*) for stock enhancement; (2) determine effects of stocking density of wild and cultured sea scallop spat on growth and survival in three intermediate (i.e., grow-out) nursery culture scenarios (submerged bottom trays versus floating surface trays versus suspended pearl nets); (3) determine how spat size affects growth and survival in bottom plots over a 10-month period; and (4) determine how the interactive effects of predator deterrence and habitat modification influence scallop spat growth and survival in bottom plots over a 10-month period. It specifically addresses several aspects of marine aquaculture, including the collection of wild spat through culture techniques developed in Japan and transferred successfully to Canada, hatchery and grow-out methods, predator prevention and control, and environmental protection and control.

Grantee: University of Maryland, Baltimore County, Baltimore, MD

Grant No.: NA10NMF4270422 *NMFS Contact:* F/NER

Project Title: Development of an Oral Vaccine for Nodavirus Infection

Funding: *Federal:* \$ 236,561 *Recipient:* \$ 41,687

Description: This proposal was developed in response to the Saltonstall-Kennedy Grant Program research priorities “Aquaculture Feasibility” and “Optimization of Harvested Resources under Federal or State Management.” Its focus is on the reduction or elimination of factors such as diseases, human health hazards, and quality problems that limit the utilization of fish and their products in the United States and abroad through cooperative research with fishing industry

participation. The goal of the project is to develop a safe and effective oral vaccine against nervous necrosis virus (NNV) which can infect aquacultured Atlantic cod with disastrous and costly effects. The idea is to develop an oral vaccine that does not need to be injected and that could be delivered easily to large-scale aquaculture populations. The primary objective is to clone the structural coat protein gene of NNV, express it in yeast and baculovirus/insect cells systems, and then evaluate the immunogenicity of the orally fed recombinant proteins in protection against NNV challenge. This research has three objectives: (1) clone and sequence the coat protein gene of NNV, (2) express the surface coat protein gene of NNV using yeast and baculovirus/insect cell systems, and (3) evaluate the efficacy of the recombinant antigens to induce immune response in fish. Results from this study may lead to the development of novel strategies for the control of NNV and other fish viral pathogens.

Grantee: University System of New Hampshire, Durham, NH
Grant No.: NA10NMF4270213 *NMFS Contact:* F/NER
Project Title: Submerged Culture of Steelhead Trout for Open Ocean Aquaculture in the Northeastern United States
Funding: *Federal:* \$ 225,196 *Recipient:* \$ 35,368

Description: This proposal was developed in response to the Saltonstall-Kennedy grant program priority for Marine Aquaculture. Research has not yet identified an ideal species for offshore, submerged culture in New England, and this project will attempt to address that problem. A prime candidate for open ocean aquaculture, steelhead trout (*Oncorhynchus mykiss*) has been domesticated for more than 150 years, and there exists a supply of juveniles readily available from commercial hatcheries. Among other positive attributes of the species, juveniles can go directly from the freshwater hatchery to full-strength seawater and the species has a relatively fast growth rate, is disease-resistant, has a high market value, and is tolerant of warm water temperatures. Additional advantages include the availability of triploid (sterile) fish, and, in the event of escapes from open ocean net pens, the species exhibits a tendency to remain close to the escape site for a considerable period of time. The primary objective of this research project is to test the null hypotheses that the behavior, growth, food conversion ratio, incidence of fin damage, and mortality of steelhead trout held in periodically submerged cages do not differ from steelhead trout held in surface cages. An equally important objective is to involve commercial fishermen in the research project, thereby giving them both experience and training on the techniques of steelhead trout aquaculture.

CONSERVATION ENGINEERING

Grantee: New England Aquarium Corporation, Boston, MA
Grant No.: NA08NMF4270418 *NMFS Contact:* F/NER
Project Title: The Immediate and Short-Term Post-Release Mortality of Species in the Northwest Atlantic Skate Complex Captured by Gillnet and Otter Trawl
Funding: *Federal:* \$222,618 *Recipient:* \$24,739

Description: The study aims to quantify the species-specific at-vessel and short-term discard mortality rates from trawl and gillnet capture for skates in the Northeast Skate Complex. The analyses will consider not only the impacts of fishing conditions (e.g., season, depth, and seawater and air temperature), but also fishing practices (e.g., tow/soak times, sorting durations/deck times, and handling protocols (i.e., picking versus non-picking)). In addition to generating data of great interest to management of species in the complex, this study will expand the limited body of field-oriented stress investigation in elasmobranch fish.

Grantee: Skagit River System Cooperative, LaConner, WA
Grant No.: NA08NMF4270424 *NMFS Contact:* F/NWR
Project Title: Impact of Hatchery Steelhead Smolt Release Levels on Wild and Hatchery Steelhead Survival Rates
Funding: *Federal:* \$189,601 *Recipient:* \$88,829

Description: Reduce or eliminate adverse interactions between fishing operations and non-targeted, protected, or prohibited species, including the inadvertent take, capture, or destruction of such species. These include juvenile or sublegal-sized fish and shellfish, females of certain crabs, fish listed under the Endangered Species Act, marine turtles, seabirds, or marine mammals. Improve the survivability of fish discarded or intentionally released and of protected species released in fishing operations.

Grantee: Arizona State University, Tempe, AZ
Grant No.: NA09NMF4270098 *NMFS Contact:* F/SWR
Project Title: Joint Modeling of Seasonal Recreational Demand, Entry-Exit Decisions, and Fish Stocks Over Time with an Application to Great Lakes Sportfishing
Funding: *Federal:* \$ 190,806 *Recipient:* \$ 45,126

Description: Develop a model that integrates a multisite, multispecies, seasonal model of angler demand for sportfishing with a dynamic, bio-economic model of fish stocks for the purpose of comparing the welfare impacts and conservation implications of various recreational fishery management alternatives. Calibrate and apply this model to recreational fisheries for lake trout and Chinook salmon in the Wisconsin Great Lakes and utilize the model to evaluate a range of policy options in light of multiple management objectives for lake trout recovery and the maximization of the value of the fishery for recreational anglers.

Grantee: Texas A&M Research Foundation, College Station, TX
Grant No.: NA09NMF4270081 *NMFS Contact:* F/SER
Project Title: Development of Molecular Assays to Determine the Gender of Billfishes
Funding: *Federal:* \$ 130,617 *Recipient:* \$ 15,961

Description: The 18-month research addresses a research need to identify the gender of billfish and other pelagic fishes from tissue samples. Because billfish have size differences between the sexes (sexual dimorphism), gender identification is critical in understanding the life histories,

stock structure, and population dynamics. Under the research award, samples of white marlin, blue marlin, and sailfish will be collected in the Gulf of Mexico and the Caribbean. Using DNA extracted from these billfish, the researchers will identify gender-specific genetic markers in the laboratory, thereby improving assessments of these three recreational species.

Grantee: Florida Atlantic University, Boca Raton, FL
Grant No.: NA09NMF4270082 *NMFS Contact:* F/SER
Project Title: Efficacy of Electropositive Metals for Bycatch Reduction in Longline Fisheries
Funding: *Federal:* \$ 283,888 *Recipient:* \$ 32,000

Description: This 2-year research will develop a technique to reduce shark bycatch in the pelagic longline fisheries. The shark electrosensory system is sensitive to electropositive metals, and thus can be used to deter the sharks from taking longline bait when those metals are present on the gear. The recipient will first conduct laboratory experiments to study the reactive nature of the various metals. Based on the laboratory results, the selected metals will be tested during longline experiments aboard a Florida State University research vessel in the northeast Gulf of Mexico. The final research phase will be additional metal testing aboard a contracted commercial fishing vessel.

Grantee: Florida Keys Community College, Key West, FL
Grant No.: NA09NMF4270079 *NMFS Contact:* F/SER
Project Title: Chemical Extraction Process for Converting Shark Bycatch Discards from Commercial Pelagic Longlines into a Chemical Shark Repellent for Application as Bycatch Reduction Technology
Funding: *Federal:* \$ 112,000 *Recipient:* \$ 12,773

Description: This 2-year project will conduct research on a new process for converting shark discards into a shark-repellent bait treatment, and studying the effectiveness of that treatment. The research is intended to reduce the incidental take of sharks by pelagic commercial longlining. The initial step is the formation of repellent chemicals (semiochemicals) in decayed shark tissue under laboratory conditions. The semiochemicals will then be applied on the shark bait as part of the longline operation on the contracted fishing vessel.

Grantee: Pacific Shellfish Institute, Olympia, WA
Grant No.: NA09NMF4270089 *NMFS Contact:* F/NWR
Project Title: Harvest Management Tools to Control the Levels of *Vibrio parahaemolyticus* in Oysters and Other Bivalve Shellfish
Funding: *Federal:* \$ 245,133 *Recipient:* \$ 52,665

Description: The primary focus of this research in *Vibrio parahaemolyticus*, a common bacterial contaminant of bivalve shellfish found in U.S. waters. Major outbreaks of *Vibrio parahaemolyticus* associate with shellfish have occurred from 1997 through 2007, including a protracted event in Washington State in 2006 that resulted in extensive area closures, product

recalls, and losses of millions of dollars to industry. The goal of this project is to analyze the factors affecting *Vibrio parahaemolyticus* levels and preharvest methods to minimize the risk of illness due to these bacteria. Specifically, this study will investigate the effects of various holding practices on the bacteria clearance under natural conditions during tidal inundation.

Grantee: University of Massachusetts, Dartmouth, North Dartmouth, MA
Grant No.: NA09NMF4270076 *NMFS Contact:* F/NER
Project Title: Post-Release Survivability of Longline-Caught Large Coastal Sharks
Funding: *Federal:* \$ 362,294 *Recipient:* \$ 37,716

Description: To increase the understanding of capture related stress and the potential long-term effects on survival with a focus on sandbar and dusky sharks captured in the commercial demersal longline fishery. For each captured fish, blood and tissue samples will be gathered to quantify the capture-related physiological, biochemical, and molecular stress responses, with selected fish tagged (PSAT) in order to correlate stress parameters of a fish with its post-release movement patterns and long-term survival. A captive study on sandbar sharks will also be undertaken to (1) determine their baseline non-stressed condition; (2) subject to capture stress to document the onset of the potential disruptions of physiological homeostasis; and (3) correlate the degree of stress resulting from the controlled captive studies to values obtained from individuals captured on commercial longline gear.

Grantee: Oregon State University, Corvallis, OR
Grant No.: NA09NMF4270088 *NMFS Contact:* F/NWR
Project Title: Fieldable Early Detection Method for *Vibrio tubiashii* Toxin in Marine Hatcheries
Funding: *Federal:* \$ 187,500 *Recipient:* \$ 51,800

Description: Recently, oyster hatcheries on the West Coast have experience mass mortalities of oyster seed due to the bacteria *Vibrio tubiashii*. The applicant will develop fieldable early detection kits (rapid, sensitive dip stick assay) for hatchery and nursery use. Previously, the applicant has produced monoclonal antibodies which will allow for the development of this detection technology. This early detection technology will assist hatcheries by providing early detection of the toxin and assist with preventing or reducing losses due to the disease.

Grantee: University of Massachusetts, Dartmouth, North Dartmouth, MA
Grant No.: NA10NMF4270430 *NMFS Contact:* F/NER
Project Title: Test of Floating Trawl Bridles to Reduce Finfish Bycatch and Seabed Impact for the Gulf of Maine Pink Shrimp Fishery
Funding: *Federal:* \$ 122,550 *Recipient:* \$ 48,975

Description: The objective is to test a floating bridle system of a shrimp trawl to reduce finfish bycatch and seabed disturbance in the pink shrimp fishery in the Gulf of Maine. Specific objectives are to: (1) design and test a floating bridles system to reduce flounder bycatch and seabed disturbance for the 45-foot vessel class shrimp trawlers; (2) conduct sea trial of the

prototype using an industry vessel to test its effectiveness in reducing bycatch and operational feasibility; and (3) facilitate the adoption of the bridle rigging in the pink shrimp fishery in the Gulf of Maine through workshops, on-site and at-sea demonstrations, and publication in trade magazines.

Grantee: University of Washington, Seattle, WA
Grant No.: NA10NMF4270310 *NMFS Contact:* F/NWR
Project Title: Development of High-Resolution DNA Markers to Manage Fishery Interactions of Chum Salmon in Western Washington
Funding: *Federal:* \$ 245,300 *Recipient:* \$ 93,503

Description: This project focuses on the Saltonstall-Kennedy Grant Program objectives to reduce or eliminate adverse interactions between fishing operations and non-targeted species and populations. The project will use results from high-resolution DNA sequencing to more precisely manage fisheries to achieve optimal spawning escapements of chum salmon in Washington State. The stock identification information will be provided to fishery managers and will allow them to shape fisheries to facilitate the sustainability and productivity of chum salmon and will support the recovery of depleted chum salmon stocks listed as threatened under the Endangered Species Act.

Grantee: Washington Department of Fish and Wildlife, Olympia, WA
Grant No.: NA10NMF4270314 *NMFS Contact:* F/NWR
Project Title: Validating Current Method for Forecasting Impacts on ESA-Listed Chinook Stocks by Washington Ocean Chinook Fisheries
Funding: *Federal:* \$ 212,770 *Recipient:* \$ 23,798

Description: This project will address the “Conservation Engineering” Saltonstall-Kennedy program priority in its aim is to reduce or eliminate adverse interactions between fishing operations and Chinook populations listed under the Endangered Species Act (ESA). The project will attempt to provide an understanding of the complex interactions between Chinook migration, fisheries, and the physical environment. The project will provide direct observations of ESA-listed Chinook populations in Washington ocean fisheries. These direct observations will be compared with Pacific Fishery Management Council forecasted impacts, and integrate the occurrence of specific ESA-listed populations with ecosystem variables to investigate the interactions between fish migratory behavior and the environment.

OPTIMUM UTILIZATION OF HARVESTED RESOURCES

Grantee: South Carolina Department of Natural Resources, Marine Center, Charleston, SC
Grant No.: NA09NMF4270085 *NMFS Contact:* F/SER
Project Title: Evaluation of Habitat Utilization, Recruitment Bottlenecks, and Movement of Coastal Striped Bass Population(s) Using Cultured Animals and Genetic-Based Identification Tools

Funding: *Federal:* \$ 215,939 *Recipient:* \$ 27,168

Description: This 2-year research project will build a conceptual restoration model for striped bass by improving their life history, habitat usage, and population dynamics in coastal rivers in the Charleston estuary. The researchers will conduct trammel net sampling and electrofish sampling to determine locations of striped bass age classes and to analyze habitat partitioning. Water-quality data will also be collected in order to replicate production and stocking of juvenile striped bass. During the restoration phase, 100,000 striped bass (raised in the rearing facilities) will be released into the Ashley River to improve the abundance of this important species.

Grantee: University of the Virgin Islands, St. Thomas, VI
Grant No.: NA09NMF4270068 *NMFS Contact:* F/SER
Project Title: Defining Biologically Relevant Boundaries for Protecting Grouper Spawning Aggregations in the U.S. Virgin Islands and Pohnpei
Funding: *Federal:* \$ 249,948 *Recipient:* \$ 49,500

Description: The goal of this 2-year research is to determine the appropriate boundaries for fishery closed areas to protect spawning aggregations of several commercially important groupers in the Caribbean and Indo-Pacific. The research is designed to also minimize the impact of the closed areas on commercial fishermen. Researchers will investigate movement patterns of tiger grouper and other grouper species during spawning season. Researchers will define appropriate boundaries for fishery protected areas to produce refined maps.

Grantee: Trustees of Boston University, Boston, MA
Grant No.: NA09NMF4270064 *NMFS Contact:* F/NER
Project Title: Connectivity between Offshore and Inshore Lobster Populations in Southern New England: Genetics and Morphology
Funding: *Federal:* \$ 243,493 *Recipient:* \$ 71,609

Description: To characterize lobster stocks and map the levels of genetic exchange within and between lobster populations from fishing grounds in specific offshore canyons and inshore fishing grounds in Rhode Island and southern New England using new, high-resolution DNA markers. In addition, morphological differences between lobster stocks from offshore and inshore sites will be characterized using newly selected characters based on classical morphological methods. The morphological data will be used to develop an easy, cost-effective morphology-based tool for identifying fishing ground of origin for lobsters from different regions of New England.

Grantee: Smithsonian Institution, Arlington, VA
Grant No.: NA09NMF4270067 *NMFS Contact:* F/NER
Project Title: Novel Application of Bio-Geochemical Fingerprinting to Evaluate the Nursery Potential of Chesapeake Bay Subestuaries to Contribute to the Blue Crab Spawning Stock

Funding: *Federal:* \$ 229,544 *Recipient:* \$ 26,210

Description: This study aims to further develop and optimize a novel application of well-studied bio-geochemical tracers (trace elements, stable isotopes) for the blue crab to understand spatial variation in the production of mature female blue crabs among Chesapeake Bay tributaries. Investigations include: (1) identifying the subestuary of origin for mature female blue crabs that comprise the Chesapeake Bay spawning stock; (2) determining whether stable isotope chemistry can be useful to identify these areas; and (3) conducting both laboratory and field tests to determine the feasibility of using bio-geochemical tracers to assess the relative contribution of individual subestuaries in Chesapeake Bay to the spawning stock.

Grantee: University of New England, Biddeford, ME

Grant No.: NA09NMF4270099 *NMFS Contact:* F/NER

Project Title: Dismissing Dogma: The Use of Satellite Tags to Examine the Behavior of Spiny Dogfish (*Squalus acanthias*) in Relation to Habitat Use, Depth Preferences, and Movement Patterns in the Northwest Atlantic

Funding: *Federal:* \$ 237,078 *Recipient:* \$ 26,400

Description: This study aims to test the hypothesis that the horizontal and vertical behavioral patterns of spiny dogfish preclude the species from being effectively captured by Northeast Fisheries Science Center (NEFSC) otter trawl surveys, and will be tested using PSAT technology in order to (1) quantify sex-specific horizontal and vertical movement patterns; (2) compare vertical and horizontal movement patterns of satellite-tagged dogfish to the NEFSC bottom trawl survey over the same time period for anomalies in catchability; and (3) compare movement patterns of males and females to ascertain the true sex ratio of the population.

Grantee: Dantec Engineering, Inc, Danville, CA

Grant No.: NA10NMF4270194 *NMFS Contact:* F/AKR

Project Title: Development of a Self-Contained Modular Dryer for Utilization of Seafood Processing Byproducts and Bycatch

Funding: *Federal:* \$ 249,787 *Recipient:* \$ 82,697

Description: This project proposes to develop a modular self-contained dryer unit to be designed around a 40-foot modular shipping container for utilization of seafood processing byproducts and bycatch.

Grantee: University of New England, Biddeford, ME

Grant No.: NA10NMF4270203 *NMFS Contact:* F/NER

Project Title: Dismissing Dogma II: The Use of Satellite Tags to Examine the Behavior of Spiny Dogfish (*Squalus acanthias*) in Relation to Habitat Use, Depth Preference, and Movement Patterns in the Northwest Atlantic

Funding: *Federal:* \$ 100,000 *Recipient:* \$ 12,069

Description: This study aims to test the hypothesis that the horizontal and vertical behavioral patterns of spiny dogfish preclude the species from being effectively captured by Northeast Fisheries Science Center (NEFSC) otter trawl surveys, and will be tested using PSAT technology in order to (1) quantify sex-specific horizontal and vertical movement patterns; (2) compare vertical and horizontal movement patterns of satellite-tagged dogfish to the NEFSC bottom trawl survey over the same time period for anomalies in catchability; and (3) compare movement patterns of males and females to ascertain the true sex ratio of the population.

Grantee: Applied Food Technologies LLC, Gainesville, FL
Grant No.: NA10NMF4270197 *NMFS Contact:* F/SER
Project Title: Species Identification of Grouper in Commerce Utilizing Real-Time Polymerase Chain Reaction (PCR)
Funding: *Federal:* \$ 135,000 *Recipient:* \$ 15,000

Description: The 2-year research will aim to develop a definitive real-time PCR-based diagnostic for species identification of grouper. The research will primarily utilize taxonomically verified groupers in the reference library, which have been validated by certified taxonomists at the University of Florida or the Smithsonian Museum. Approximately 100 whole fish samples also will be obtained from local fish markets and then subjected to the same taxonomic validation process at the University of Florida or the Smithsonian Museum. The researchers will then be provided tissue from each validated species for development of DNA reference standards. This process will help develop a usable PCR method by comparing the real-time PCR primers and probes against a wide range of fish DNA templates isolated from local markets as well as all of the validated grouper samples in the researcher's reference library. The real-time PCR method will be converted into a portable kit form. This kit will contain a detailed sampling protocol, extraction materials, test reagents, controls, and grouper gene targets. The kits will then be made available for real-time use by federal and state regulatory agencies, public and private laboratories, and inspection services.

Grantee: Maine Department of Marine Resources, Augusta, ME
Grant No.: NA10NMF4270204 *NMFS Contact:* F/NER
Project Title: Conduct a Collaborative Research Study on One of Maine's "Species of Concern" in the Near-Shore Gulf of Maine Cusk (Brosme Brosme)
Funding: *Federal:* \$ 33,845 *Recipient:* \$ 4,225

Description: The goal of this study is to estimate the mortality of cusk caught as bycatch in the longline and lobster trap fisheries. Specific objectives include: (1) provide immediate estimates of mortality for cusk after capture by demersal longline and trap gear; (2) provide longer-term (72 hours) estimates of survival for fish determined to be in "good" condition upon capture; and (3) collect biological information on live fish, including length and weight. If cusk are caught in "poor" condition, then stomach contents, maturity determination, otoliths, and tissue samples for genetic analysis will be collected. The study also aims to determine what factors contribute to fish being caught in "good" condition (e.g. depth, temperature, gear type, hauling speed, etc.).

Grantee: East Carolina University, Greenville, NC
Grant No.: NA10NMF4270196 *NMFS Contact:* F/SER
Project Title: Assessing and Developing Best Practices in Seafood Marketing and Consumption: A Regional Ethnographic Approach
Funding: *Federal:* \$ 134,263 *Recipient:* \$ 41,439

Description: This 2-year research will compare traditional and innovative seafood educational and marketing methods and seafood consumption, as well as views about fishing and fishermen, in 10 ports. In each site, the researcher will collect data on seafood marketing alternatives from observations and from commercial fishermen, professional recreational fishermen, seafood market owners/processors, seafood festival organizers, and others involved in seafood education and marketing. The researchers will develop a classificatory system of seafood marketing methods, such as branding local seafood, emphasizing sustainability of fisheries, and emphasizing local products over imports. The researchers will interview professional seafood consumers (e.g., chefs) and general consumers, and determine which methods are most effective in guiding seafood purchasing/consumption decisions, and how perceptions about fishing and fishermen come into play in those decisions. The interviews will provide important data about seafood preferences, the consumption of seafood from recreational or subsistence fishing, and about fishing in general. Following the data collection, educational materials will be produced and disseminated via websites. Four community forums will facilitate project discussions between seafood marketing outlet representatives such as restaurant owners, chefs, and members of the fishing industry.

Grantee: University of Southern Mississippi, Hattiesburg, MS
Grant No.: NA10NMF4270195 *NMFS Contact:* F/SER
Project Title: Climate-Related Hydrological Regimes and Their Influence on Gulf Menhaden Recruitment in the Northcentral Gulf of Mexico.
Funding: *Federal:* \$ 148,690 *Recipient:* \$ 39,180

Description: The goal of this 2-year research is to provide data needed to analyze the role of climate change in regulating recruitment in Gulf menhaden. As a first step, researchers at the University of Southern Mississippi will obtain indices of abundance using their extensive collection of samples of the early life stages of menhaden. The indices will then be subjected to analysis to identify structure or groupings in the data. The data results will then be compared with climate indices (e.g., NOAA Climate Prediction Center, NOAA Earth System Research Laboratory) and observed weather data to determine whether climate change affects menhaden recruitment. The results will be shared with the Gulf States Marine Fisheries Commission.

Grantee: Gulf of Maine Research Institute, Portland, ME
Grant No.: NA10NMF4270205 *NMFS Contact:* F/NER
Project Title: Developing Markets for Underutilized and Undervalued Seafood Products in the Northeast: An Industry Collaboration led by the Gulf of Maine Research Institute

Funding: *Federal:* \$ 176,486 *Recipient:* \$ 32,473

Description: The goal of the project is to engage commercial fishermen, restaurant owners and chefs, and seafood distributors to create markets for underutilized and undervalued seafood products. A steering committee will be assembled and will work cooperatively to understand the logistical challenges in bringing seafood to niche markets, as well as some of the quality standards necessary to attract high-end markets (e.g., restaurants). In addition, a training program will be designed for fishermen on quality handling techniques.

Grantee: Pacific Islands Fisheries Group, Kailua, HI

Grant No.: NA10NMF4270200 *NMFS Contact:* F/PIR

Project Title: Hawaii Oio Tagging Project to Provide Data Used in Tracking Movement and Growth of Oio Obtained on the Island of Oahu and Analyze/Compare Deep Water Bag Net Fishing Method to Hook/Line Tag Deployment

Funding: *Federal:* \$ 84,810 *Recipient:* \$ 40,000

Description: Pacific Islands Fisheries Group (PIFG) is a nonprofit organization whose mission is to facilitate communication among and participation of all marine resource users to support sound resource utilization, management, research, conservation, and education. PIFG program goals are to: support cooperative research that utilizes resource user participation; develop and distribute timely information to resource users on potential of proposed management and conservation measures; work with local, national, and international non-profit groups and organizations that support fisheries; and support fishery and marine education and outreach activities that facilitate meeting PIFG program goals. This project proposes to collect and add to the information available on the biology of the bonefish or oio complex in Hawaii by instituting a tagging project over 2 years. Tagging operations will be limited to the leeward coast of Oahu between Kalaeloa and Kaena Point. Previous to this effort, the tagging has been done only on shallow water and has resulted in primarily tagging only a single species. This project will target the offshore schooling portion of the bonefish population that has not been previously targeted by past and current tagging projects. This previously little known and unresearched portion of the resource may well represent the significant portion of the bonefish stock in Hawaiian waters.

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

Grant No.: NA10NMF4270218 *NMFS Contact:* F/SER

Project Title: Population Structure, Gene Flow, and Genetic Demography of the Blacknose Shark (*Carcharhius acronotus*) in U.S. Waters and Genetic Marker Development for the Smooth Dogfish (*Mustelus canis*)

Funding: *Federal:* \$ 240,463 *Recipient:* \$ 50,859

Description: The 2-year award will: (1) provide critical population-genetics data that will be useful for assessment and allocation in order to rebuild the overfished blacknose shark resource, and (2) develop important tools for future genetic studies of smooth dogfish. Regarding blacknose sharks, existing surveys will be used to acquire tissues (fin clips) from a total of 350 adults from localities in the U.S. South Atlantic, eastern and western Gulf of Mexico, and the

Bahamas, and from 100 to 200 small juvenile/neonate individuals from nursery grounds in the U.S. South Atlantic and eastern Gulf of Mexico. Samples of adults from throughout the Gulf of Mexico will be provided by NMFS. Supplementary samples of adults from the Gulf and U.S. South Atlantic will be obtained by the University of Florida from fisheries observers. Supplementary samples of juveniles from the U.S. South Atlantic and eastern Gulf will be provided by the University of Florida. Regarding smooth dogfish, 30 individual fish from each of three areas will be collected (90 total samples) during existing surveys.

Grantee: Research Foundation of the State University of New York, Stony Brook, NY
Grant No.: NA10NMF4270202 *NMFS Contact:* F/NER
Project Title: Restoring Long Island's Winter Flounder Fishery
Funding: *Federal:* \$ 234,596 *Recipient:* \$ 89,750

Description: Investigators will examine abundance, growth, condition, and mortality estimates in year over year (YOY) winter flounder collected by beam trawls from six south shore bays that vary in their degree of anthropogenic loadings. To assess the health of YOY winter flounder, measurements of environmental variables such as dissolved oxygen, salinity, ammonia, and temperature will be made as well as an assessment of contaminant exposure will be conducted by measuring cytochrome P450 1A (CYP1A), and vitellogenin (Vtg) expression in YOY fish. The combined effects of these stressors on immune competency will be assessed through the measurement of innate immune factors (i.e., pleurocidin and complement expression and anti-microbial activity of sera/mucus) and prevalence and intensity of infection by pathogenic organisms. A suite of statistical tests to evaluate relationships between health and the variables will be examined.

Grantee: West Chester University of Pennsylvania, West Chester, PA
Grant No.: NA10NMF4270215 *NMFS Contact:* F/NER
Project Title: Seasonal Frequency and Development of Hemic Neoplasia in the Soft Shell Clam (*Mya arenaria*) along the East Coast of the United States
Funding: *Federal:* \$ 116,210 *Recipient:* \$ 29,773

Description: Fish and shellfish disease diagnosis, treatment, and prevention are among the most significant variables in aquaculture. Soft-shell clam hemic neoplasia (leukemia) is among the most devastating bivalve diseases, and although it has been characterized at the molecular level, almost nothing is known about the environmental triggers, annual frequencies, and development of this disease. By increasing our basic biological understanding of the mechanisms of the disease and its progression, this investigation will provide useful guidance for managing healthier clam populations. The objectives are to: (1) follow seasonal prevalence of hemic neoplasia in populations of *Mya arenaria* from New England to Maryland, focusing on areas where clam fisheries, aquaculture, and management are most significant; and (2) follow establishment of the disease within specific sites in the states referenced above by transplanting hatchery-raised, disease-free *Mya arenaria* and correlating neoplasia development with environmental characteristics, immune response, and age. Further understanding of

environmental onset and development of the disease will help implement necessary regulatory and management strategies.

Grantee: Bristol Bay Regional Seafood Development Association, Inc., AK
Grant No.: NA10NMF4270192 *NMFS Contact:* F/AKR
Project Title: Quantifying Quality in Bristol Bay: Advancing a Proven Project to Specify, Quantify, and Communicate Best Fishing and Handling Practices in America's Most Valuable Salmon Fishery
Funding: *Federal:* \$ 95,500 *Recipient:* \$ 33,200

Description: This project seeks to specify, quantify, and communicate the best fishing and handling practices of salmon in the Bristol Bay Alaska Fishery.

FISHERIES SOCIOECONOMICS

Grantee: Massachusetts Institute of Technology, Cambridge, MA
Grant No.: NA10NMF4270208 *NMFS Contact:* F/NER
Project Title: Socioeconomic Impacts of Herring Fisheries Management in the Northeast: Looking Back to Move Forward
Funding: *Federal:* \$ 180,034 *Recipient:* \$ 26,748

Description: The goal of the project is to evaluate the socioeconomic impacts of the Federal and interstate management of herring in the Northeast United States and to analyze the implications of these impacts for the existing and potential regulatory regimes.

Grantee: University of Rhode Island, Kingston, RI
Grant No.: NA10NMF4270206 *NMFS Contact:* F/NER
Project Title: The Economic Impacts of No-Fishing Zones on Stellwagen Bank National Marine Sanctuary: An Analysis of the Small-Scale Groundfishing Fleet and Their Local Coastal Communities
Funding: *Federal:* \$ 208,164 *Recipient:* \$ 71,722

Description: The goal of the project was to estimate the impacts of area closures in Stellwagen Bank National Marine Sanctuary (SB-NMS) on the groundfish fishing industry and on local fishing communities. Investigators will compile historical data on daily fishing locations, landings, and fishing effort to understand the overall structure and characteristics of groundfish fishing vessels that annually fish in SB-NMS from Gloucester. Factors that influence the location and fishing effort decisions of fishermen will be analyzed, and linkage effects of the groundfish fishery to the local economy in Gloucester will be identified. Lastly, the impacts of establishing area closures in SB-NMS on spatial fishing behavior and landings and on the local economy will be simulated.

Grantee: University of Maine, Orono, ME
Grant No.: NA10NMF4270207 *NMFS Contact:* F/NER
Project Title: A Study of the Social and Economic Capacity of Eastern Maine Fishing Communities: How Can Small-Scale Fishing Communities Participate in Catch Share Programs?
Funding: *Federal:* \$ 207,176 *Recipient:* \$ 32,723

Description: The goal of the project is to document the current and historical capacity of Eastern Maine fishing communities to participate in the groundfish fishery, and to identify future needs for community-based management of catch shares. Investigators will collect and analyze qualitative and quantitative data using multiple methods, including secondary data analysis, rapid appraisal, focus groups, oral history interviews, and semi-structured interviews. The study will focus on communities in Eastern Maine currently or historically engaged in the New England groundfish fisheries.

Grantee: Gulf of Maine Research Institute, Portland, ME
Grant No.: NA10NMF4270209 *NMFS Contact:* F/NER
Project Title: Understanding Opportunities and Barriers to Increased Profitability for the Gulf of Maine Lobster Industry
Funding: *Federal:* \$ 165,659 *Recipient:* \$ 20,671

Description: The goal of the project is to improve the understanding of the economics of the New England lobster fishery to increase the knowledge base for making decisions that affect the profitability and economic viability of the commercial fishery. Comprehensive data on earnings, costs, physical inputs, and labor for the commercial lobster fishery in Lobster Conservation Management Area 1 will be collected. In addition, vessel level simulators of representative fishing vessels will be constructed to analyze how vessel level profitability is impacted by changes in input and output prices, catch rates, and operational decisions such as amount and seasonal distribution of effort.

V. ONGOING NATIONAL PROGRAM PROJECTS

This section contains a description of all ongoing projects under the S-K National Program, as of September 30, 2011, 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 for whom appear in Appendix I). The projects are listed by grantee within each subject area.

Grantee: Seward Association for the Advancement of Marine Science, Alaska Sealife Center, Seward, AK

Grant No.: NA09NMF4390169 *NMFS Contact:* F/AKR

Project Title: Alaska SeaLife Center Marine Mammal Research Program 2011-2013

Funding: *Federal:* \$ 1,108,497 *Recipient:* \$ 0

Description: S-K funds were added to this existing award to continue the research conducted at the Sealife Center regarding the fisheries ecosystems in the Alaska waters and how the interactions with marine mammals influence the fisheries and fishery managers.

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

Grant No.: NA10NMF4720313 *NMFS Contact:* F/HQ

Project Title: VIMS Shark Research Program 2010

Funding: *Federal:* \$ 135,000 *Recipient:* \$ 8,008

Description: The Virginia Institute of Marine Science (VIMS) Shark Research Program has been monitoring shark populations in the Chesapeake Bight using standardized fishery independent longline surveys since 1973. This long-term data set may represent the longest running fishery-independent shark monitoring program in the world. In addition, the program continues to provide detailed analyses of habitat utilization, age, growth, reproduction, trophic dynamics, and demographics of dominant species. Research results of the VIMS Shark Research Program will be directly used in the NMFS assessment of Atlantic Shark Stocks, in the preparation of the Atlantic States Marine Fishery Commission (ASFMC) Shark Management Plan, and by the Virginia Marine Resources Commission in promulgating shark fishery regulations for the Commonwealth of Virginia.

Grantee: Gulf States Marine Fisheries Commission, Ocean Springs, MS

Grant No.: NA10NMF4340013 *NMFS Contact:* F/SER

Project Title: GSMFC/NMFS Cooperative Southeast Recreational Fisheries Information Network (RECFIN, SE) Commercial Fisheries Information Network (COMFIN)

Funding: *Federal:* \$ 500,000 *Recipient:* \$ 0

Description: S-K Funds were added to this existing award to coordinate, plan, and administer Fisheries Information Network (FIN) activities throughout the year as well as provide recreational and commercial information to the FIN participants.

Grantee: Pacific States Marine Fisheries Commission, Portland, OR
Grant No.: NA10NMF4370460 *NMFS Contact:* F/NWR
Project Title: 2010-2014 PSMFC Pacific Fisheries Information Network (PacFIN) Project
Funding: *Federal:* \$ 830,000 *Recipient:* \$ 0

Description: S-K funds were added to this existing award to the Pacific States Marine Commission to work with the states and with NMFS to coordinate, organize, and analyze fishery-dependent data for West Coast fisheries. These data/programs include state fish tickets, state logbooks, port sampling, and federal at-sea data.

VI. COMPLETED GRANT PROGRAM PROJECTS

This section contains an assessment of each S-K Grant Program project completed during the period October 1, 2010, through September 30, 2011, 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 the NMFS contact.

FISHERIES SOCIOECONOMICS

Grantee: University of Alaska, Fairbanks, AK
Grant No.: NA08NMF4270420 *NMFS Contact:* F/AKR
Project Title: Fishing for Pollock in a Sea of Change
Funding: *Federal:* \$144,715 *Recipient:* \$16,079

Description: This project retraced the evolution of the pollock fishery, modeled its current economic and institutional structure, and explored the resiliency of that structure to substantive changes in pollock biomass and fuel costs. It determined the extent to which alternative fishery management strategies, such as sector allocations and Limited Access Privileges (LAPs), affect the likelihood of achieving economic, social, and resource management objectives in the face of ecosystem change and changes in markets.

Grantee: Gulf and South Atlantic Fisheries Foundation, Inc., Tampa, FL
Grant No.: NA09NMF4270086 *NMFS Contact:* F/NER
Project Title: Assessment of the Impacts of the Oculina Bank Marine Protected Area and In-Depth Ethnographic Profile of the Fort Pierce, Florida, Fishing Community
Funding: *Federal:* \$ 120,794 *Recipient:* \$ 13,800

Description: The award evaluated the impacts of the Marine Protected Area (MPA) on a fishing community, in particular Ft. Pierce, Florida. This was accomplished through in-depth interviews conducted by trained community volunteers who represent the recreational, charter, and commercial sectors of the fishing community. Further, the interviews provided an in-depth description of the fishing community of Fort Pierce with regard to the use of the Oculina Bank. A social network analysis was then conducted to determine a model of community networks and resource utilization. This research could affect fisheries policy, management, and research that are sensitive to social and economic consequences, as mandated.

AQUACULTURE

Grantee: Kona Blue Water Farms, LLC, Kailua Kona, HI
Grant No.: NA09NMF4270104 *NMFS Contact:* F/PIR
Project Title: Operational and Economic Efficiencies of Surface Cage Technologies: The Key to Profitability in America's Open Ocean Fish Farming Industry

Funding: *Federal:* \$ 247,433 *Recipient:* \$ 116,750

Description: This work evaluated an improved, more robust plastic pipe float-ring design that is now in wider use in Europe, which was also fitted with two additional innovations: a new type of resilient, purportedly predator-proof cage netting material (Kikkonet) and an improved cage mooring system (the AEG Containment System). The performance of this surface cage at Kona Blue Water Farms offshore farm site was compared and contrasted with a submersible Sea Station cage run in parallel with the surface cage. The recipient evaluated for each of the two cages the efficiency of operation, production advantages, risks to marine mammals and other environmental impacts, and overall cost effectiveness. In addition, the surface cage performance was compared with historical data for Sea Stations that has been compiled by Kona Blue over the past 3-1/2 years of operation. Results will be disseminated throughout the offshore aquaculture industry and the wider seafood community.

Grantee: University of Miami-Marine Affairs and Policy, Miami, FL
Grant No.: NA09NMF4270080 *NMFS Contact:* F/SER
Project Title: Development of Hatchery Technology for Blackfin Tuna (*Thunnus atlanticus*)
Funding: *Federal:* \$ 294,517 *Recipient:* \$ 67,150

Description: This 2-year study proposed to develop hatchery technology for spawning and production of blackfin tuna fingerlings. Under controlled laboratory conditions, the researchers established protocols and techniques for capture, transport, and quarantine of adult blackfin tuna. The results of this work will allow other researchers to augment current tuna farming practices and, in turn, improve the U.S. aquaculture industry.

Grantee: University of Miami-Marine Affairs and Policy, Miami, FL
Grant No.: NA09NMF4270072 *NMFS Contact:* F/SER
Project Title: Developing Aquaculture Technology for Reproduction, Larval Rearing, Fingerling Production, and Grow-out of Goggle Eye (*Selar crumenophthalmus*), a High-Value Marine Baitfish
Funding: *Federal:* \$ 264,614 *Recipient:* \$ 60,332

Description: This work developed efficient and commercially viable aquaculture techniques for the hatchery production and grow-out of goggle eye (*Selar crumenophthalmus*), a high-value fish used by commercial and recreational fishermen as bait to catch other species. Goggle eye currently are under intense fishing pressure by fishermen who catch them in the wild to use for bait. The research addressed this problem using the following steps. First, broodstock goggle eye were obtained in the wild and conditioned to spawn in the hatchery. The larval rearing trials were conducted to determine an appropriate feeding regime and proactive health management strategies, and also to study the effects of stocking density on overall survival. The final stage of this project was to analyze the aquaculture performance based on growth rates and food conversion rates at various stocking densities.

IMPACTS OF REDUCED FISHING EFFORT IN SHRIMP AND REEF FISH FISHERIES

Grantee: Florida State University, Tallahassee, FL
Grant No.: NA08NMF4270414 *NMFS Contact:* F/SER
Project Title: Indirect Effects of the Bait Shrimp Fishery on Juvenile Gag Grouper
Funding: *Federal:* \$76,847 *Recipient:* \$13,525

Description: The goal of this project was to evaluate the effects of the bait-shrimp fishery on populations of juvenile gag grouper (*Mycteroperca microlepis*). The bait-shrimp fishery operates in shallow seagrass beds and primarily targets penaeid shrimps (especially pink shrimp, *Penaeus duorarum*). The fishery uses rollerframe trawls to capture the shrimp, which are sold to bait houses that supply recreational fishermen. As with other trawl fisheries (e.g., commercial food-shrimp fishery in Gulf of Mexico), rollerframe hauls can include high abundances of both targeted and non-targeted species. Juvenile gag grouper are common and often abundant in the same seagrass habitats in which the bait-shrimp fishery occurs, and survival of gag during this life stage is crucial for the long-term sustainability of their populations. Data were collected that starts to show the impacts of the bait-shrimp fishery on ecosystems.

OPTIMUM UTILIZATION OF HARVESTED RESOURCES

Grantee: Texas A&M University, Corpus Christi, TX
Grant No.: NA08NMF4270415 *NMFS Contact:* F/SER
Project Title: Assessing Stock Enhancement Efficacy and the Success of Hatchery-Reared Fish Using a Combination of Genetics and Otolith Chemistry
Funding: *Federal:* \$69,791 *Recipient:* \$44,349

Description: Marine stock enhancement programs have been instituted to offset habitat declines and overfishing, and improve economically important fisheries. Clearly, the efficacy of such programs depends on the survival of hatchery-reared fish, and documenting the fate of these hatchery fish is important. Although many resources are spent on stock enhancement, the success of hatchery programs remains controversial. We applied a combination of techniques to gain insight to the contribution of hatchery fish to wild stocks using spotted sea trout (*Cynoscion nebulosus*) as a model species. Information has been produced that will help fisheries managers make decisions in the future.

Grantee: University of Rhode Island, Kingston, RI
Grant No.: NA09NMF4270074 *NMFS Contact:* F/NER
Project Title: Assessment of Nutraceutical Properties and Palatability of Squid Processing Byproduct Hydrolysate for Applications in Human and Pet Food Supplements
Funding: *Federal:* \$ 167,226 *Recipient:* \$ 32,107

Description: The study aimed at the assessment of nutraceutical properties and palatability of hydrolysate produced from the squid processing byproduct (SPB) for its use as human and pet food supplements. This effort expanded the SPB utilization potential in addition to applications in aquaculture larval feed and organic fertilizer. Specific objectives were to: (1) produce squid processing byproduct hydrolysate (SPBH) at varying degrees of hydrolysis and fractionate for further refinement with necessary compositional characterization; (2) assess the nutraceutical properties of SPBH by assaying antioxidant, anti-diabetic, antihypertensive, and immunostimulant activities; (3) identify potential biomarkers for standardization of SPBH; and (4) evaluate the palatability of SPBH for pet food applications.

KLAMATH RIVER CHINOOK SALMON

Grantee: California Salmon Council, El Dorado Hills, CA

Grant No.: NA08NMF4270421 *NMFS Contact:* F/SWR

Project Title: Strategies to Minimize Catch of Klamath River Chinook Salmon in West Coast Mixed Salmon Fisheries

Funding: *Federal:* \$1,000,000 *Recipient:* \$216,314

Description: This work determined the distribution of Klamath River Chinook and other Chinook stocks in times and areas closed to commercial salmon fishing due to restrictions on ocean harvest of Klamath River fall Chinook and ESA-listed stocks, including some times and areas that have been closed for over 20 years. The project provided information that will allow fishery managers to design fisheries that provide greater harvest of strong (abundant) stocks while limiting weak stock impacts to ensure compliance with allowable fishery impacts on weak stocks. The project was successful in establishing a uniting collaborative process among fishermen, scientists, and fisheries managers on the West Coast by working together to achieve goals and objectives as outlined in this proposal.

VII. COMPLETED NATIONAL PROGRAM PROJECTS

There were no National Program Projects completed during the period October 1, 2010, through September 30, 2011, thus there are no projects listed in this section of the FY 2011 S-K Report.

APPENDIX I:

NATIONAL MARINE FISHERIES SERVICE OFFICES

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

NMFS Headquarters

Daniel A. Namur
National Marine Fisheries Service
Office of Management and Budget
1315 East-West Highway
Silver Spring, MD 20910
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Northeast Region

Nicole MacDonald
National Marine Fisheries Service
State, Federal & Constituent Programs
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One Blackburn Drive
Gloucester, MA 01930
Telephone: (978)-281-9299
Email: nicole.macdonald@noaa.gov

Southeast Region

Ellie F. Roche
National Marine Fisheries Service
Cooperative Programs Division
263 13th Avenue, South
St. Petersburg, FL 33701
Telephone: (727) 824-5324
Email: ellie.roche@noaa.gov

Southwest Region

Trisha Culver
National Marine Fisheries Service
Fisheries Management Division
501 West Ocean Boulevard, Suite 4200
Long Beach, CA 90808
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Email: trisha.culver@noaa.gov

Pacific Islands Region

Scott Bloom
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Fisheries Management Division
1601 Kapiolani Boulevard, Suite 1110
Honolulu, HI 96814-4704
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Email: scott.bloom@noaa.gov

Northwest Region

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

Alaska Region

Shawn Carey
National Marine Fisheries Service
Office of Management and Information
Federal Building
709 West 9th Street, 4th Floor
Juneau, AK 99801
Telephone: (907) 586-7845
Email: shawn.carey@noaa.gov

**APPENDIX II: FY 2011 NOAA OMNIBUS SOLICITATION NOTICE FOR S-K
PUBLISHED IN THE FEDERAL REGISTER**

-None

APPENDIX III: FY 2011 S-K APPLICATIONS RECEIVED

- None

APPENDIX IV: FY 2011 S-K APPLICATIONS RECOMMENDED FOR FUNDING

- None

APPENDIX V: FY 2011 S-K APPLICATIONS NOT RECOMMENDED FOR FUNDING

- None