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Alaska Sea Grant Project Directory

Research and information on Alaska coastal and marine issues, 2006–2008

These marine research, education, and outreach projects address important regional issues identified through consultation with marine user groups, members of the seafood industry, and officials in state and federal government agencies. Each project was reviewed by peers and an advisory panel. Project numbers are linked to each project's administrative summary (90-2 form).

To see a list of publications resulting from past Alaska Sea Grant research and scientific meetings, take a look at our research catalog. To see projects from previous cycles, check out the links at left.

Advisory and Outreach

Marine Advisory Program [A/151-01]

- Paula Cullenberg, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Ray RaLonde, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008

In a state as big as Alaska, it's critical that people have quick and easy access to knowledge, training, technology, and information about the state's marine resources. Agents and specialists of the Marine Advisory Program (MAP) live and work in the communities they serve, linking Alaska Sea Grant and the University of Alaska to its constituents.

MAP's major focus is on the economic well-being of the state's coastal communities, particularly the commercial fishing, mariculture, and seafood industries. Agents and specialists work closely with charter boat operations, Native groups, subsistence and recreational users, school teachers, and others with an interest in coastal and marine resources.

Over the next two years, MAP will carry out numerous Alaska Sea Grant-supported activities, including continuing a highly successful industry training program aimed at boosting seafood quality and assisting the development of new seafood products and businesses. MAP agents and specialists will conduct community-based marine mammal and water quality studies, help to improve harbor water quality and develop watershed management plans, and assist the development of ecotourism and shellfish aquaculture, among many other projects. They'll also produce seafood training and awareness videos and public service video messages on important topics, and continue production of a public affairs television

program series. MAP offices are located in Anchorage, Bethel, Cordova, Dillingham, Homer, Ketchikan, Kodiak, Petersburg, and Unalaska. To learn more about the Marine Advisory Program, visit the MAP Web site.

Education Services [A/161-01]

- Kurt Byers, Alaska Sea Grant College Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008

Working with the Marine Advisory Program and other agencies, Sea Grant programs, and experts, Alaska Sea Grant Education Services publishes books, organizes scientific conferences and public meetings and workshops, and uses the Web and the broadcast and print media to provide people with information about Alaska's marine, estuarine, and coastal watershed resources.

In 2006–2008, Education Services will publish and promote more than two dozen new books, brochures, and posters, including a first-of-its kind field guide to Alaska's sharks and skates. We will commence a complete update of our elementary-grade curriculum guides, Alaska Sea Week; create a new Alaska marine education resources Web site; and cosponsor the Alaska Summer Research Academy for Marine Science. We will carry our information to the public via trade shows, community festivals, and other public events. Information also will be conveyed by our radio series, Arctic Science Journeys Radio (ASJ). We will continue to offer an array of education and information services through our Web site, which includes our online bookstore and ASJ Radio's multimedia site. We will coordinate several workshops and symposia on sustaining fishing in small communities, including sustainability of the Arctic-Yukon-Kuskokwim salmon fisheries; benthic mapping; and ecosystems approaches to fisheries management.

Coastal Communities and Economies

A Global Analysis of Salmon Prices: How Low Can They Go? [R/32-03]

- Keith R. Criddle, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Mark Herrmann, School of Management, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $197,348

Fishermen, processors, and fishery-dependent community planners need current information about salmon prices, given an ever-changing world marketplace. In this project, researchers will develop several predictive models that explore the possible future international market for wild and farm-raised salmon and rainbow trout. The models will incorporate production costs, tariffs, taxes, quotas, and other

factors to better predict the impact on the price fishermen receive for Alaska wild salmon. Researchers will estimate how low Alaska salmon prices might need to drop to stay competitive, and what industry reorganizations might be needed to raise product prices or lower production costs so that the industry can remain economically viable.

Improving Yields of Pacific Oysters in Alaska [R/42-01]

- Raymond RaLonde, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Chris Langdon, Hatfield Marine Science Center, Oregon State University
- Ford Evans, Hatfield Marine Science Center, Oregon State University

2/1/2006 – 1/31/2008 $83,286

Because Alaska's remotely located shellfish farms mean higher production costs, and cooler waters slow oyster growth, shellfish farmers are looking for ways to improve efficiency and reduce operational costs to become competitive and sustain their industry's growth. One way to improve efficiency is to plant faster-growing oyster seed. Researchers will work cooperatively with the Alutiiq Pride Shellfish Hatchery in Seward, Alaska, and the Molluscan Broodstock Program at the Hatfield Marine Science Center, Oregon State University, to continue growth experiments of genetically selected Pacific oysters. The goal of the project is to develop fast-growing oyster broodstock to produce seed for the state's shellfish industry.

Responses to Coastal Erosion in Alaska: A Guide for Coastal Residents, Businesses, Resource Managers, Engineers, and Builders [A/75-02]

Orson P. Smith, School of Engineering, University of Alaska Anchorage 2/1/2006 – 1/31/2008 $56,912

A published guide is needed to help Alaskans cope with increasing coastal erosion. Researchers will prepare a comprehensive peer-reviewed guide describing the nonstructural responses and constructed responses to coastal erosion. Topics such as design features, strengths and weaknesses, cost and effectiveness, risk of failure, and potential impacts on adjacent shorelines and ecologies will be discussed. Long-term maintenance and climate change considerations also will be addressed. Alaska Sea Grant will publish the guide, which is expected to help coastal residents and businesses, coastal resource managers, and designers and builders of coastal public and private works make wise decisions.

Ecosystems and Habitats

The Seasonal and Interannual Patterns of Larvaceans and Pteropods in the Coastal Gulf of Alaska, and Their Relationship to Pink Salmon Survival

[R/101-05]

- Russell Hopcroft, Institute of Marine Science, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $31,197

Juvenile pink salmon appear to preferentially feed upon two little-known groups of tiny marine zooplankton—larvaceans and thecosome pteropods—and these may be tied to salmon survival and returns. At present, scientists have poor estimates of the composition, abundance, biomass, and production of the larvaceans and pteropods. This project will provide the first detailed characterization of larvaceans and pteropods in the Gulf of Alaska, and will describe their impact on pink salmon survival.

The Interannual Variability of Zooplankton within Prince William Sound, Alaska: Assessment of the ZooScan System as a Tool for Optimizing Juvenile Pink Salmon Release [R/101-06]

- Russell Hopcroft, Institute of Marine Science, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $26,035

Knowing how much and what kind of prey is available is important in deciding when to release juvenile pink salmon from hatcheries and in predicting survival rates and ultimately the return of adult salmon. Researchers will assess data on zooplankton abundance collected over 20 years to better understand the timing of specific zooplankton abundance in relation to juvenile salmon release. This project also will test ZooScan, a new digital imaging system designed to measure the abundance, biomass, and composition of major zooplankton groups. If successful, ZooScan systems could be installed in hatcheries to offer real-time monitoring of prey availability that would improve the timing of juvenile salmon releases.

Analysis of the Collapse of the Kodiak Red King Crab Stock and Fishery [R/31-15]

- Gordon H. Kruse, Fisheries Division, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Thomas Weingartner, Institute of Marine Science, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $96,342

Alaska's red king crab fishery in Kodiak went bust about as fast as it boomed. After a few exceptional harvest years, the fishery has been closed since 1983. Because of interest by coastal communities in the potential to rebuild red king crab through enhancement, researchers in this project will conduct a retrospective analysis of the Kodiak red king crab stock and fishery, including the natural and anthropogenic factors surrounding its rise, collapse, and failure to rebuild. This study is expected to broaden understanding of major changes that have occurred in the Gulf of Alaska marine ecosystem, and aid in planning red king crab stock enhancement efforts.

Multispecies Fisheries Models for Ecosystem Decision Support [R/31-14]

- Terrance J. Quinn II, Fisheries Division, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $55,338

Even with the vast computing power and ecosystem knowledge available today, most fisheries are managed as a single species without significant consideration given to other species that may be affected. This project seeks to further efforts begun with Alaska Sea Grant to develop models that incorporate multiple species into management decisions. In the new work, researchers will alter North Pacific Fishery Management Council (NPFMC) harvest goals for each of five species in the Gulf of Alaska to evaluate alternative harvest strategies and test the viability of the model.

Exposure of Wintering Sea Ducks to Disease Agents and Parasite Burdens in Southwest Alaska [R/101-07]

- Kimberly Trust, U.S. Fish and Wildlife Service
- Paul Flint, U.S. Geological Survey
- Tuula Hollmen, Alaska SeaLife Center
- Reid Brewer, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2007 – 1/31/2008 $68,110

Sea ducks, most notably Steller's eiders, in Unalaska Bay appear to be in poor physical condition and have been exposed to a variety of disease agents. Poor nutrition, disease, and interactions between potentially immunosuppressive contaminants and diseases may directly affect Steller's eider survival on their wintering grounds. In this project researchers will assess sea ducks in Unalaska Bay, and within Izembek National Wildlife Refuge as a control, to determine whether high rates of disease exposure from Unalaska Bay are constant among years. With the data collected, they will assess the effect of

disease agents and parasite burdens on population dynamics of sea ducks wintering along the Alaska Peninsula and Aleutian Islands. This study will provide information to local coastal communities related to current management practices of public water resources in marine species harvest areas. Findings will aid in the management of a federally listed threatened species, and spur cooperative partnerships with community wastewater treatment and seafood processing facilities to address potential contaminant problems.

Paralytic Shellfish Poisoning in Alaska: Characterizing Toxin Distribution in Bivalves and Toxin Uptake, Retention, and Depuration in the Littleneck Clam (Protothaca staminea) [R/95-05]

- Raymond RaLonde, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Dean Stockwell, Institute of Marine Science, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

[dates pending revision] [dollar amount pending revision]

Despite warnings of paralytic shellfish poisoning (PSP), many Alaskans and visitors harvest shellfish from uncertified beaches. Due to historical preferences and local custom, residents of Kodiak are particularly likely to engage in shellfish harvesting from untested beaches, and many people have become sick and some have died as a result. In this project, researchers will measure the ability of littleneck clams to accumulate, retain, and cleanse themselves of PSP. The project will also evaluate the effectiveness of the Jellett PSP Rapid Test Kit.

Ma-ku (Dead Beached Sea Mammal): An Alaska Natives' Field Guide to Stranding Response [A/143-01]

- Lianna Jack, The Alaska Sea Otter and Steller Sea Lion Commission
- Donna Willoya, The Alaska Sea Otter and Steller Sea Lion Commission

4/1/2006 – 1/31/2007 $72,855

Alaska Natives live, work, and pursue subsistence activities along the coast, and are often the first people to witness a stranded marine mammal. Yet few Alaska Natives are trained to collect data and samples from the stranding for use by scientists and managers. Researchers will work with Alaska Native groups, scientists, and resource agencies to produce a field guide for stranding response specific to the needs of Alaska Natives. The guide will blend Western scientific knowledge and data needs with traditional ecological knowledge and practices to achieve the goal of gathering important data on stranded marine mammals. Such a culturally appropriate guide will empower Alaska Natives to contribute to the scientific management of marine mammals.

Fisheries

Outbreeding Depression in Pink Salmon: Effects of Hybridization between Seasonally Distinct Subpopulations (Phase 2) [R/31-13]

- Anthony Gharrett, Fisheries Division, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- William W. Smoker, Fisheries Division, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Milo D. Adkison, Fisheries Division, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Raymond RaLonde, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $191,571

Salmon that breed with other salmon outside their own distinct population may be less likely to pass on to their offspring traits that allow them to survive in the wild. These traits are said to become "depressed." Researchers will examine the extent of outbreeding depression in hybrids between related populations of early and late-run pink salmon in Auke Creek in both even and odd broodyears. They will observe traits likely to be depressed by outbreeding: primarily reduced marine survival of hybrids, but also changes in return timing, differences in development rate and embryo survival, and changes in the distribution of family sizes.

Acoustic Behavior of Salmon [R/21-01]

- John K. Horne, School of Aquatic and Fishery Science, University of Washington
- Debby Burwen, Alaska Department of Fish and Game

2/1/2006 – 1/31/2008 $57,453

Acoustic technologies, such as side-scan sonar, are commonly used to assess salmon escapement, especially within rivers too wide or muddy for direct visual counts. In rivers hosting returns of multiple salmon species, differentiating among stocks is critical to management. Distinguishing among salmon species has generally been inferred through the strength and shape of the sonar signal: larger salmon such as chinook reflect a larger, more intense sonar signature than do smaller salmon such as sockeye. However, fish behavior has been known to impose errors in acoustic counts. This project seeks to better understand how fish behavior influences the acoustic signal. A better understanding of behavioral effects on signal amplitude and shape will help scientists produce more accurate assessments of salmon returns

that will improve salmon management.

Economic Impacts of Alaska Fisheries [R/32-04]

- Gunnar Knapp, Institute of Social and Economic Research, University of Alaska Anchorage

2/1/2006 – 1/31/2007 $58,290

Alaska's fisheries have large and important economic impacts. However, the nature and scale of these impacts are not well understood by policy-makers or the public, and reliable information about economic impacts rarely enters into discussion of fisheries policy. This project will systematically collect, analyze, summarize, and explain the economic impacts and benefits of Alaska's sport, commercial, personal-use, and subsistence fisheries, drawing on data from a wide variety of sources and analysis from a number of earlier studies. The broad objective of this project is to provide Alaska policy-makers and citizens with a useful tool in making public policy decisions.

Marine and Aquatic Science Literacy

Endangered Species and Sea Duck Teaching Kits for Coastal Alaska Public School Districts [A/141-01]

- Charla Sterne, U.S. Fish and Wildlife Service

2/1/2007 – 1/31/2008 $18,422

Populations of 10 of the 15 known species of Alaska sea ducks have inexplicably declined, and biologists and waterfowl managers are rushing to determine why. To foster better public understanding of sea ducks and their coastal habitats, investigators in this project will develop and deliver K–8 curricula and teaching kits to 13 schools in western Alaska and the Aleutian Islands.

Seafood Science and Technology

Alaska Oyster Safety: Monitoring and Identification of Vibrio parahaemolyticus [R/51-04]

- Brian Himelbloom, Fishery Industrial Technology Center, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Alexandra Oliveira, Fishery Industrial Technology Center, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008 $1,844

In summer 2005, more than sixty Alaska tourists were stricken with food poisoning caused by consuming locally aquacultured oysters containing pathogenic Vibrio parahaemolyticus. In this project, researchers will set up a V. parahaemolyticus monitoring and testing system with aquaculture farms in Prince William Sound, Kachemak Bay, and Southeast Alaska. Further, researchers will study the cold-water tolerance of the pathogen in an effort to find creative, cost-effective ways to prevent accumulation of the pathogen in oysters.

Developing Microencapsulated Fish Oil Powder from Alaska Salmon Oil for Nutraceutical Markets [R/54-02]

- Subramaniam Sathivel, Fishery Industrial Technology Center, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
- Charles Crapo, Alaska Sea Grant Marine Advisory Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2007 – 1/31/2008 $15,145

The value of Alaska salmon oil can be increased through purification and encapsulation for use as oil powders for the human-grade food industry. This study will develop an encapsulation delivery system for salmon oil and enriched salmon oil for use as food ingredients. Unrefined salmon oil will be purified using adsorption technology. Purified salmon oil will be evaluated for fatty acid profiles, free fatty acid content, lipid classes, peroxide values, thermal stability, melting point, specific heat capacity, and other properties. The polyunsaturated fatty acid (DHA and EPA) content of salmon oil will be enriched and optimized using enzyme-based technologies. Salmon oil and DHA- and EPA-enriched salmon oil fractions will be encapsulated with protein and/or carbohydrate to produce dry, flowable oil powders. The salmon oil powders will be evaluated for shelf-life stability, sensory quality, nutritional properties, product acceptance, and market potential.

Education and Training

Sea Grant Traineeships

- Brian Allee, Alaska Sea Grant College Program, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

2/1/2006 – 1/31/2008

Sea Grant traineeships provide the nation's future scientists with the educational and hands-on research

tools needed to provide leadership to manage marine resources. To date, Alaska Sea Grant has provided 95 students with direct support of their Alaska Sea Grant–funded research. Most students graduate to productive careers in business, academia, and government, with nearly 40 percent remaining in Alaska. An investment of 20–25 percent of the program's federal funds is directed at education programs and traineeships. Over the next two years, 11 graduate students will receive traineeship support.

Additional objectives of the Sea Grant traineeships include:

- Forging partnerships with other funding agencies to further the educational opportunities of undergraduate and graduate students in fields such as seafood science, resource economics, oceanography, fisheries, and marine biology.
- Assisting Alaska's teachers, especially in rural areas, to earn graduate credit on marine resource issues.
- Supporting professional development opportunities to help educators deliver instruction on integrated watershed science and water quality.
- Developing an Alaska Sea Grant fellowship in marine education.
- Developing a summer undergraduate research fellowship in seafood science.

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Last modified 20 October 2006, 3:42pm AKDT. Contact: Alaska Sea Grant web coordinator.
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