

NORTH PACIFIC RESEARCH BOARD



"Building a clear understanding of the North Pacific, Bering Sea, and Arctic Ocean ecosystems that enables effective management and sustainable use of marine resources."

Tylan Schrock, Chairman
Jim Balsiger, Vice-Chairman
Clarence Pautzke, Executive Director

1007 West 3rd Avenue, Suite 100
Anchorage, AK 99501
Phone: (907) 644-6700 Fax: 644-6780

Marine Research Projects Approved by the North Pacific Research Board for 2002-2005

The North Pacific Research Board has approved 94 projects totaling over \$17 million in new marine research supported by the Environmental Improvement and Restoration Fund. The selections focus on addressing pressing fisheries and marine ecosystems information needs and fall into seven broad categories:

<u>Categories of Research</u>	<u>Number of Projects</u>	<u>Total Funding</u>	<u>Percent</u>
Oceanic and Estuarine Salmon	9	\$2.29 million	13
Other Fisheries-Related Research	22	\$2.66 million	15
Fish Habitat	12	\$3.15 million	18
Marine Mammals	16	\$2.76 million	16
Seabirds	10	\$2.07 million	12
General Ocean and Ecosystem Studies	19	\$3.79 million	21
Education and Outreach and Synthesis Information	6	\$1.12 million	6

All research is performed in the Alaska region, but principal investigators come from the broader research community throughout the nation. Most hail from Alaska and along the West Coast:

Alaska

Alaska Department of Fish and Game
Alaska Longline Fishermen's Association – Sitka
Alaska Sea Grant – UAF
Alaska SeaLife Center – Seward
Bristol Bay Science & Research, Inst. – Dillingham
Central Bering Sea Fishermen's Assoc. – St. Paul
Digital Observer LLC – Kodiak
NOAA Auke Bay Laboratory – Juneau
NOAA Kodiak Fisheries Science Center
Prince William Sound Science Center
Public Health Service - Anchorage
U.S. Fish and Wildlife Service – Anchorage
U.S. Geological Survey – Anchorage
University of Alaska Anchorage
University of Alaska Fairbanks, Juneau & Sitka

Washington

International Pacific Halibut Commission - Seattle
Natural Resources Consultants – Seattle
NOAA (Seattle)

- Alaska Fisheries Science Center
- National Marine Mammal Laboratory
- Northwest Fisheries Science Center
- Pacific Marine Environmental Laboratory

University of Washington – Seattle

Canada

Department of Fisheries and Oceans
North Pacific Anadromous Fish Commission
PICES – North Pacific Marine Science Org.
Sir A. Hardy Foundation for Ocean Sciences
Simon Fraser University – BC
Coastal and Ocean Resources, Inc. – BC
University of British Columbia

Oregon and California

Ecotrust - Portland
Hatfield Marine Science Center – Newport
Oregon State University - Corvallis
Hubbs SeaWorld Research Institute – San Diego
Moss Landing Marine Laboratories
NOAA SW Fisheries Science Center – San Diego
Scripps Institute of Oceanography – La Jolla
System Science Applications
PRBO Conservation Science – Stinson Beach
University of California – Davis & San Diego

Other States

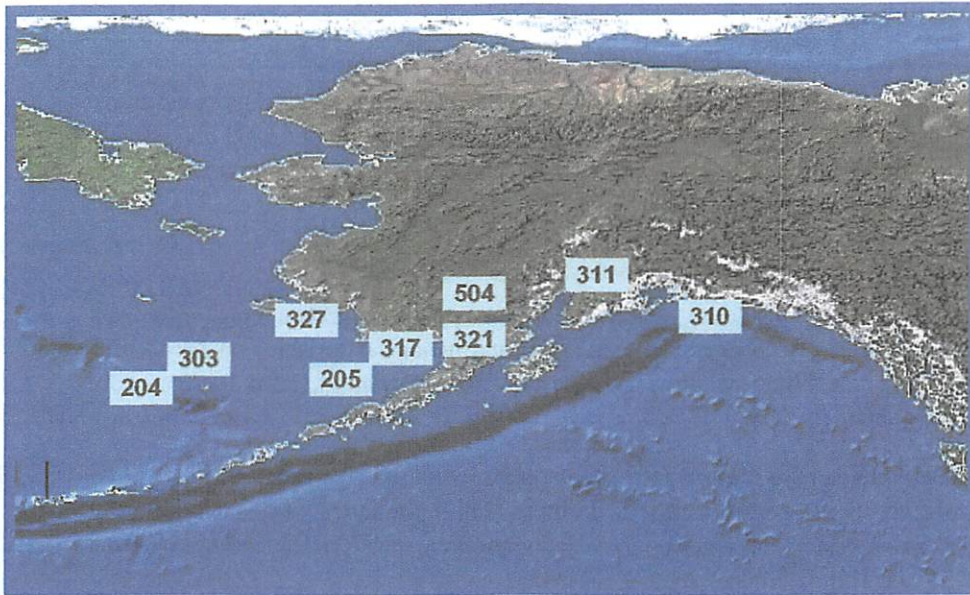
NOAA Environ. Technology Lab – Boulder, CO
Louisiana State University – Baton Rouge
National Institute of Standards and Tech. - SC
Texas A&M University

NPRB Research Funds 2002-2005

Individual Entities	NPRB Funds	Percentage	Major Alaska Entities	NPRB Funds	Percentage
UAF	5,059,194	29.9%	DOC-NOAA	5,802,189	34.3%
NOAA - AFSC	4,781,321	28.3%	UAF	5,059,194	29.9%
ADFG	913,270	5.4%	ADFG	913,270	5.4%
NOAA - PMEL	820,630	4.9%	DOI-USFWS-USGS	813,278	4.8%
UW	640,517	3.8%	ASLC	443,948	2.6%
ASLC	443,948	2.6%	PWSSC	398,681	2.4%
USGS	417,720	2.5%	TOTAL	16,914,689	79.4%
PWSSC	398,681	2.4%			
USFWS - OSU	395,558	2.3%			
OSU	385,040	2.3%			
NPAFC	317,865	1.9%			
UCSD - Supercomputer Center	294,350	1.7%			
Moss Landing Marine Laboratories	199,069	1.2%			
Sir Alister Hardy Foundation	179,995	1.1%			
Digital Observer LLC	165,000	1.0%			
Bristol Bay Science & Research Inst.	141,750	0.8%			
Coastal and Ocean Resources	120,000	0.7%			
NOAA - ETL	110,000	0.7%			
TAMU	109,699	0.6%			
Institute of Ocean Sciences	100,000	0.6%			
PICES	99,957	0.6%			
Consulting Fisheries Scientist	99,850	0.6%			
Ecotrust	94,220	0.6%			
IPHC	92,920	0.5%			
NOAA - NWFSC	90,238	0.5%			
System Science Applications	85,008	0.5%			
Natural Resources Consultants, Inc.	76,030	0.4%			
UC Davis	68,198	0.4%			
NIST	64,690	0.4%			
NIOSH	45,269	0.3%			
EDAW, Inc.	45,000	0.3%			
LSU	41,192	0.2%			
UBC	18,510	0.1%			
TOTAL	16,914,689	100.0%			

NPRB Salmon Research 2002-2005

\$2,292,036



<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
204	NPAFC salmon tagging and genetics in the Bering Sea North Pacific Anadromous Fish Commission. Salmon tagging and genetics research to understand the distribution patterns, habitat utilization, and movements of Bering Sea salmon stocks through an at-sea tagging program of immature and maturing fish.	\$190,800
205	Genetic stock identification of Western Alaska sockeye salmon NOAA Auke Bay Lab and Alaska Department of Fish and Game. Use of gene markers to track migration and relative survival of populations of sockeye salmon juveniles exiting Bristol Bay and the eastern Bering Sea.	\$216,515
303	Open ocean salmon stock structure and dynamics in the Bering Sea North Pacific Anadromous Fish Commission. Will provide better understanding of salmon community structure and improve ability to predict effects of short- and long-term climate change on ocean production of regional salmon stocks. International in scope, involving US, Canada, Russia and Japan. Includes genetic stock identification and early marine survival of chum, chinook, and sockeye salmon. Continuation of #204.	\$500,000
310	Copper River sockeye and coho salmon juvenile survival Prince William Sound Science Center. Couples intensive field surveys and otolith studies to quantify ages of outmigration and estuarine residence time for coho and sockeye within the Copper River Delta. Will provide information on survival rates in estuarine areas which are seldom studied.	\$400,000

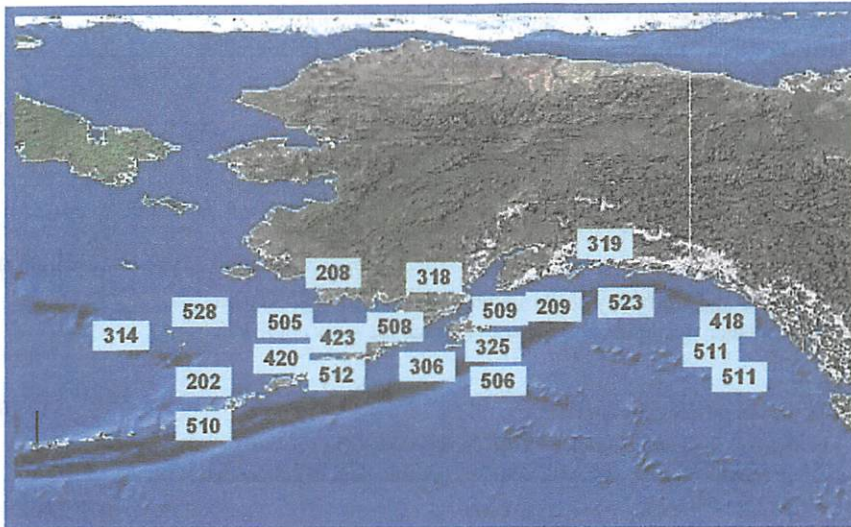
NPRB Salmon Research 2002-2005 (Continued)

311	Statewide data warehouse of salmon size, age and growth records Alaska Department of Fish and Game. Will start process for establishing an electronic data warehouse environment through which historical salmon sampling and scale pattern data for salmon size, age and growth records can be maintained and updated annually from collections throughout the state.	\$43,066
317	Run-timing analysis for Bristol Bay sockeye Natural Resources Consultants, Seattle. Update and publish migration timing model that quantifies effects of oceanographic conditions and biological variables on Bristol Bay salmon migration timing and provide forecast of Bristol Bay and Kvichak River sockeye migration timing in 2003.	\$24,930
321	Evaluation of alternative reasons for collapse of Kvichak sockeye runs Bristol Bay Science and Research Institute will host series of annual technical workshops to describe changes in enumeration programs for Kvichak sockeye over the past 30 years to determine whether the recent collapse was related to freshwater or marine factors. Will conduct comparative analysis of dynamics and age structure of several Bristol Bay sockeye salmon populations.	\$192,850
327	Early marine ecology of juvenile chums in Kuskokwim Bay University of Alaska Fairbanks and USGS. Goal is to assess effects of physical and biological environmental factors on feeding, condition, and growth of juvenile chum salmon using a bioenergetically-based food web model coupled with directed sampling for diet composition, growth, size structure, and energy content.	\$624,025
504	Analysis of salmon funding programs Consulting fisheries scientist. Will collect, organize, and analyze information on salmon research and associated funding allocations, identify potential redundancies and gaps in research, and identify opportunities for interagency coordination of research.	\$99,850

(At www.nprb.org, click on "Research" for more information on each project.)

NPRB Other Fisheries Research 2002-2005

\$2,663,525



<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
202	<p>Using new sonar technology to reduce salmon bycatch in pollock fisheries NOAA Alaska Fisheries Science Center. New sonar developed to study the dynamic behavior of salmon caught in trawl nets to help in developing effective excluders that may be used to reduce salmon bycatch in the pollock fishery.</p>	\$121,918
208	<p>Environmental cues for herring spawning University of Alaska Fairbanks and Juneau. Will develop predictive models for Pacific herring spawning at Togiak for use by managers. Will include spatially explicit models to predict interannual variability of spawning events.</p>	\$131,408
209	<p>Two species of rougheye rockfish in Northern Gulf of Alaska University of Alaska Fairbanks. Microsatellite and DNA analysis of rougheye rockfish sampled in Prince William Sound, Cook Inlet, and inside waters of Southeast Alaska to learn about rockfish associations.</p>	\$76,776
306	<p>Causes of bitter crab disease in Tanner crab University of Washington, NOAA Alaska Fisheries Science Center, Alaska Department of Fish and Game. Investigate impact of bitter crab syndrome on North Pacific Tanner crab populations, elucidate the life history of the parasitic dinoflagellate <i>Hematodinium</i> and determine whether one or more species of parasitic dinoflagellates cause the syndrome.</p>	\$99,805
314	<p>Thermal habitat preferences of Pribilof Island halibut International Pacific Halibut Commission and Central Bering Sea Fishermen's Association. Will determine whether average sea bottom temperature and its temporal variability correlate with catch rates in the halibut fishery of St. Paul Island. Hope to explain what causes movement and distribution patterns of halibut in shallow coastal waters of Pribilofs and throughout western Alaska.</p>	\$92,920
318	<p>Studies of fishing communities in Alaska EDAW, Inc. Produce a template for collection and analysis of community profile information for fishing communities in the North Pacific to construct four key fishing community profiles. Information will be used in various socioeconomic analyses. Joint funding support from NPRB and NPFMC.</p>	\$45,000

NPRB Other Fisheries Research 2002-2005 (Continued)

319	Health of Pacific herring University of California. Study disease in Prince William Sound and Sitka Sound herring and the role of pigmented macrophage aggregates to determine relative effects of age, season and gender of herring.	\$68,198
325	Video monitoring on factory trawlers Digital Observer LLC, Kodiak. Will experiment with using video monitoring gear to develop a verifiable method of enumerating bycatch aboard factory trawlers. Assess suitability to supplement onboard fisheries observer data.	\$165,000
418	Spiny Dogfish off Alaska University of Alaska Fairbanks and University of Washington. Will collect information on life history, ecology, population dynamics, and fisheries bycatch for spiny dogfish in Alaska. Continues as #511.	\$171,000
420	Young of the year Pacific ocean perch genetics University of Alaska Fairbanks. Will compare the genetic compositions of previously collected young of the year Pacific ocean perch with adult geographic population genetic structure. Continues as #512.	\$105,000
423	Supply and demand model for king crab and snow crab University of Alaska Fairbanks. An international econometric model will be constructed, estimated and simulated to target the primary and most important determinants of demand, estimate the relationship between North America crab landings and the resulting prices and revenues received for the crab, and set a foundation and educate fishery managers and industry participants on market factors which affect price.	\$80,000
505	Estimating movement of eastern Bering Sea pollock University of Alaska Fairbanks in Juneau. Will determine the statistical feasibility of mark-recapture techniques to estimate pollock movement and develop a spatially-explicit stock assessment model for Bering Sea and Aleutian Island pollock. Relates to #506.	\$63,996
506	Evaluating pollock tagging mortality using a trawl net University of Alaska Fairbanks in Kodiak. Will evaluate the feasibility of using a modified trawl net to capture pollock and to quantify the factors that contribute to mortality of trawl caught coded wire tagged pollock. Relates to #505.	\$133,938
508	Female reproductive output of snow crab in eastern Bering Sea University of Washington and NOAA Alaska Fisheries Science Center. Will investigate factors that may be contributing to the reduction in abundance and distribution of snow crab in the eastern Bering Sea, and whether and how the contraction of the female pool and the decline in global recruitment to the stock are related to each other.	\$206,353
509	Retrospective analysis of Kodiak red king crabs University of Alaska Fairbanks in Juneau. Will analyze historical data from pot and trawl surveys and commercial fishery landings to reconstruct historical Kodiak red king crab abundance, potential stock-recruit relationships, and investigate causes of major shifts in stock abundance.	\$120,699
510	Age and growth determination of Alaskan skates Moss Landing Marine Laboratories at San Jose. Will investigate the age, growth, longevity, reproductive biology, and demography of Bering Sea and Aleutian skates to provide information for their management if a fishery emerges.	\$199,069

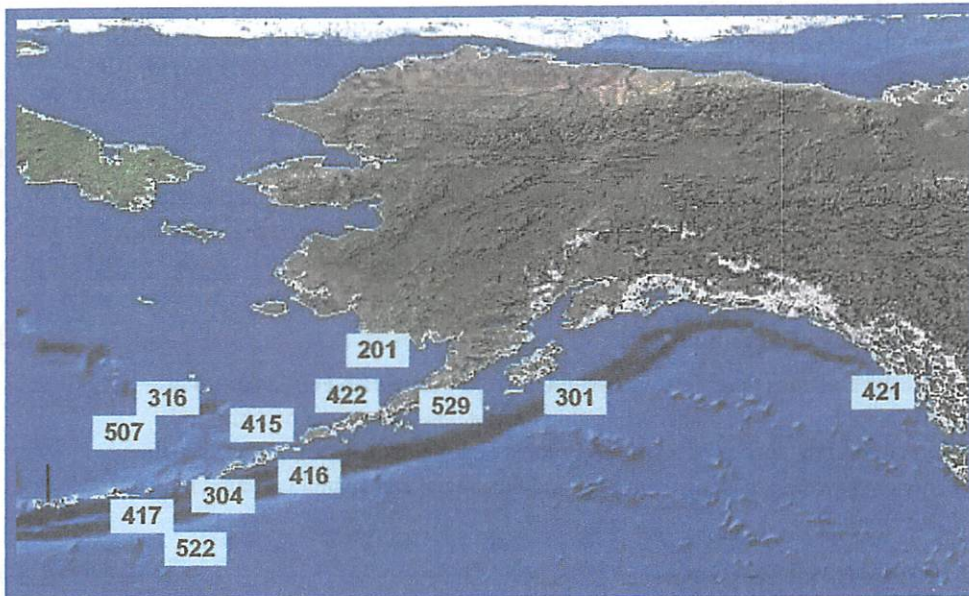
NPRB Other Fisheries Research 2002-2005 (Continued)

511	Abundance, life history and population demographics of Alaska spiny dogfish University of Alaska Fairbanks in Juneau and University of Washington. Will collect and analyze critical information on life history, ecology, population dynamics, and fisheries bycatch of spiny dogfish off Alaska. Continues #418.	\$305,235
512	Juvenile Pacific ocean perch genetics - phase 2 University of Alaska Fairbanks in Juneau. Will evaluate geographic and interannual differences in genetic compositions of young-of-the-year Pacific ocean perch in the Gulf of Alaska. Continues #420.	\$116,830
523	Pollock recruitment and stock structure in Gulf of Alaska NOAA Alaska Fisheries Science Center and Pacific Marine Environmental Laboratory and University of Washington. Will develop an index of abundance of pre-recruit pollock and information on stock structure based on modeled success of spawning and retention of juveniles in different regions of GOA.	\$131,251
528	Socioeconomic baseline information for the Pribilof Islands Ecotrust. Will collect and compile socioeconomic baseline information for the Pribilof Islands to support environmental and economic stewardship of marine resources and anticipated fishery management measures in the region.	\$94,220
530	Institutions for ecosystem-based management University of Washington. Will examine major federal and state management institutions with jurisdiction in waters off Alaska with respect to their past and present use of ecosystem-based management.	\$89,640
533	Safety evaluation of fisheries management National Institute of Occupational Safety and Health, U.S. Public Health Service. Will evaluate impact of changes in fisheries management regimes on safety in the halibut and sablefish fleet and the Bering Sea and Aleutian Islands pollock fisheries.	\$45,269

(At www.nprb.org, click on "Research" for more information on each project.)

NPRB Fish Habitat Research 2002-2005

\$3,145,348



<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
201	Pilot nearshore habitat mapping using acoustic and visual techniques Coastal and Ocean Resources, Inc. Pilot biophysical mapping project using a combination of acoustic and visual tools for habitat delineation, including both biological and substrate characteristics in Togiak Bay.	\$120,000
301	Evaluation of essential fish habitat for juvenile flatfish around Kodiak Oregon State University and NOAA Alaska Fisheries Science Center. Integrated research program, combining small-mesh trawl surveys, higher resolution/spatially explicit camera sled surveys, and field experiments to examine importance of emergent structure in the behavior, ecology and survival of juvenile halibut and northern rock sole near Kodiak Island.	\$261,102
304	Mapping deep sea coral distributions in the Aleutians University of Alaska Fairbanks, NOAA Auke Bay Lab and Alaska Department of Fish and Game. Detailed mapping of coral and sponge habitats in Aleutians and develop statistical model to predict coral and sponge distribution as a function of measurable environmental characteristics. Determine importance to commercially valuable fish and invertebrates and provide information to North Pacific Fishery Management Council.	\$1,303,001
316	Cultivation Techniques for blue king crab larvae NOAA Kodiak Fisheries Science Center. Cultivation and settlement of blue king crab larvae and verification of ability to raise them in laboratory and optimum conditions for cultivation. Will study settlement behavior and habitat selection, survival of larval and juvenile stages, and competitive interactions with red king crab.	\$85,561

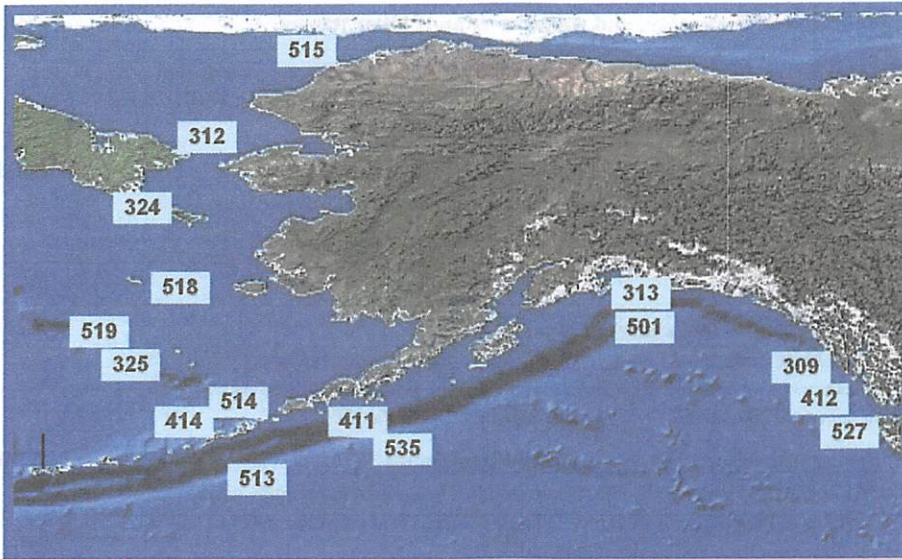
NPRB Fish Habitat Research 2002-2005 (Continued)

- | | | |
|------------|---|------------------|
| 415 | Investigations of a skate nursery
NOAA Alaska Fisheries Science Center. Will investigate potential skate nursery area in southeastern Bering Sea where fishery data suggest an area of heavy use by skates for the deposition of egg cases. | \$140,936 |
| 416 | Ecological value of juvenile rockfish habitat
NOAA Alaska Fisheries Science Center. Will assess the value of habitat in the Aleutian Islands to juvenile rockfish by examining abundance, condition and growth in five study areas using two acoustical techniques to map habitat. | \$143,384 |
| 417 | Reproductive ecology of Atka mackerel
NOAA Alaska Fisheries Science Center and University of Alaska Fairbanks. Will locate and characterize Atka mackerel nesting habitat, analyze the spatio-temporal distribution of populations, produce an embryonic development series, investigate the temporality of spawning, nesting, hatching, and the annual and spatial variation in reproductive output. | \$200,000 |
| 421 | PBDE levels in estuarine ecosystems
University of Alaska Southeast. Will identify and quantify polybrominated biphenyl ethers (flame retardant derivatives) in sediment and tissue samples of organisms inhabiting estuarine habitats near a landfill in Southeast Alaska and compare them to samples obtained from a more pristine estuarine habitat. | \$48,402 |
| 422 | Hydrocarbons in Nelson Lagoon
Anchorage Fish and Wildlife Field Office. Will monitor hydrocarbon contamination using passive water sampling devices and blue mussels as bioindicators to establish baseline measurements of petroleum contaminants in Nelson Lagoon. | \$108,820 |
| 507 | Essential habitat for Pribilof blue king crab
NOAA Kodiak Fisheries Research Center and University of Alaska Fairbanks. Will continue studies of habitat needs for blue king crab. Includes study of embryonic development and effects of temperature. Continues research started with #316. | \$172,948 |
| 522 | Reproductive ecology of Atka mackerel
NOAA Alaska Fisheries Science Center, University of Alaska Fairbanks, and Alaska SeaLife Center. Will analyze distributions of reproductive stages, embryonic development, reproductive output and fecundity of Atka mackerel. Continues research started with #417. | \$500,000 |
| 529 | Valuation of habitat closures
Institute for Social and Economic Research, University of Alaska Anchorage, and University of British Columbia. Will design and demonstrate a method to quantify the net cost to the fishing industry of closing areas for habitat protection. | \$61,194 |

(At www.nprb.org, click on "Research" for more information on each project.)

NPRB Marine Mammal Research 2002-2005

\$2,764,901



<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
309	Sperm whale interactions with longline fisheries off Southeast Alaska University of Alaska Southeast Sitka Campus, Alaska Department of Fish and Game, Hubbs-SeaWorld, Alaska Longline Fishermen's Association. Collect information, working with local fishermen, on the timing of interactions seasonally and diurnally, and identify sperm whales occurring on the fishing grounds through photographic identification and genetic samples. Will provide information to help minimize sperm whale depredation on longline gear and sablefish. This project is related to #412.	\$184,518
312	Ecology of ice seals in the Bering-Chukchi Seas Alaska Department of Fish and Game. Will develop monitoring program of population status of ringed, bearded, spotted, and ribbon seals in conjunction with annual subsistence seal harvest.	\$150,000
313	Feeding ecology and distribution of harbor seals in Prince William Sound Alaska Department of Fish and Game and Simon Fraser University (BC). Will examine prey availability and predation risk to the population dynamics of harbor seals in Prince William Sound. Will also explore how alternative fisheries scenarios might influence foraging ecology and demography of seals.	\$172,886
324	Bering Sea wintering grounds of beluga whales NOAA National Marine Mammal Laboratory. Will conduct field work in several small bays and inlets on Chukotsk Peninsula and attach satellite transmitters to indicate winter movements and diving behavior. Biopsies will be used for genetic stock identification and to determine diet and contaminant load. Will identify beluga stocks that are vulnerable to harvest in Russian as well as U.S. and Canadian waters.	\$161,700
325	Bering Sea right whale distribution Scripps Institute of Oceanography. Will continue processing acoustic data from SE Bering Sea and combine with other data to characterize baleen whale abundance, distribution, calling behavior, and habitat preferences.	\$56,117

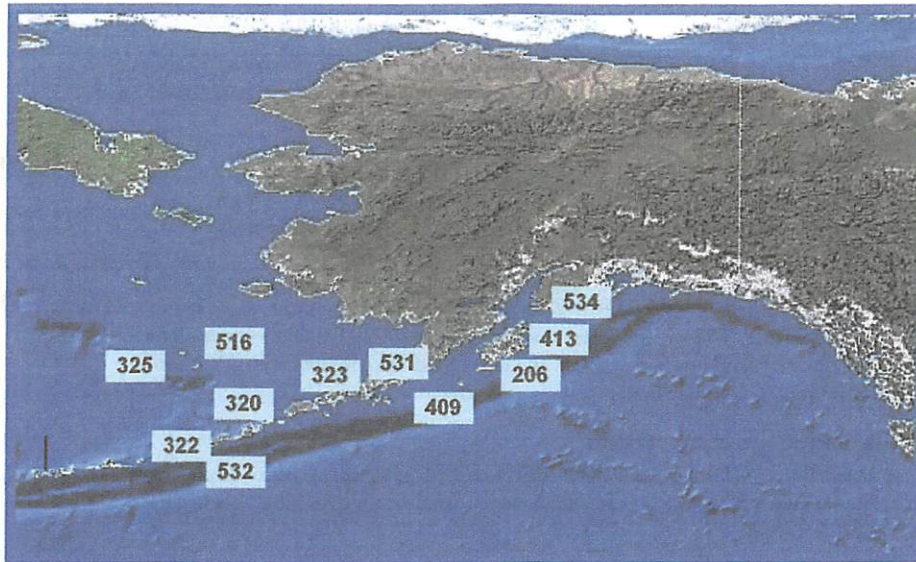
NPRB Marine Mammal Research 2002-2005 (Continued)

411	Dietary specialization of Bering Sea and Aleutian Islands killer whales NOAA National Marine Mammal Laboratory and Northwest Fisheries Science Center, and University of Alaska Fairbanks. Will investigate the dietary specialization of killer whales in the BSAI region through the use of stable isotope and fatty acid analysis.	\$168,000
412	Sperm whale & longline fisheries interactions - passive acoustics University of Alaska Southeast Sitka Campus and Scripps Institute of Oceanography. Will attach a set of autonomic acoustic recorders to anchor lines of a longline deployment, converting the fishing gear into a vertical acoustic array. This project is related to #309.	\$68,626
414	Fur seal foraging strategies and consequences NOAA National Marine Mammal Laboratory and University of Alaska Fairbanks. Will compare consequences of foraging in different habitats of the Bering Sea (Pribilofs vs. Bogoslof) in summer versus that of winter foraging in the North Pacific.	\$244,000
501	Remote monitoring of harbor seals in Prince William Sound Alaska Dept. of Fish and Game. Will establish 6 monitoring stations to remotely assess survival of radiotagged harbor seals in Prince William Sound. Will collect samples to assess age, genetics, body condition and health. Continues #313.	\$160,600
513	Winter movements of northern fur seal pups Texas A&M and Alaska SeaLife Center. Will characterize movements, foraging behavior and prey ingestion using satellite telemetry on northern fur seals captured on Pribilof Islands.	\$245,824
514	Consequences of fur seal foraging strategies NOAA National Marine Mammal Laboratory and University of Alaska Fairbanks. Will compare consequences of foraging in different habitats of the Bering Sea (Pribilofs vs. Bogoslof) in summer versus winter foraging in the North Pacific. Continues #414.	\$420,339
515	Ice seal movements and stock structure University of Alaska Southeast and NOAA National Marine Mammal Laboratory. Will use satellite-linked transmitters to determine whether ringed seals return to same breeding locations in successive breeding seasons.	\$203,644
518	Oceanography and occurrence of endangered whales in Bering Sea Oregon State University and NOAA National Marine Mammal Laboratory. Will monitor seasonal occurrence of large whales in Bering Sea from Pribilofs to Bering Strait and relate whale occurrence to oceanographic conditions.	\$143,000
519	Right and fin whale acoustics in Bering Sea Scripps Institute of Oceanography. Will continue processing acoustic data from SE Bering Sea and combine with other data to characterize baleen whale abundance, distribution, calling behavior, and habitat preferences. Continues #325.	\$30,000
527	Evaluation of sperm whale deterrents in longline fisheries University of Alaska Southeast Sitka, Alaska Department of Fish and Game, Scripps Institute of Oceanography, NOAA SW Fisheries Science Center, Alaska Longline Fishermen's Association. Will evaluate passive deterrents for mitigating sperm whale interactions with longline fisheries in the Gulf of Alaska to help reduce interactions and economic losses. This project is related to #309 and #412.	\$172,507
535	Dietary specialization of Bering Sea and Aleutian Islands killer whales NOAA National Marine Mammal Laboratory and Northwest Fisheries Science Center, and University of Alaska Fairbanks. Will investigate the dietary specialization of killer whales in the BSAI region through the use of stable isotope and fatty acid analysis. Continues #411.	\$183,140

(At www.nprb.org, click on "Research" for more information on each project.)

NPRB Seabird Research 2002-2005

\$2,072,083



<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
206	<p>Marine bird/mammal observations and continuous plankton recorder program</p> <p>Pt. Reyes Bird Observatory Conservation Science. Augment and enhance the existing continuous plankton recording program on ships of opportunity to conduct observations of marine mammals and seabirds along the CPR survey lines. Related to #302.</p>	\$60,009
320	<p>Seabird studies on kittiwakes, murre, auklets, and short-tailed albatross</p> <p>University of Alaska Fairbanks. Will study feeding ecology of seabirds in southeastern Bering Sea, Pribilofs and Aleutians to determine food availability and stress patterns. Will provide insight on relationships between climate and food web dynamics and a better understanding of how the marine ecosystem may change in response to long-term climate changes and global warming.</p>	\$900,000
322	<p>Short-tailed albatross interactions with North Pacific commercial fisheries</p> <p>Oregon State University and U.S. Fish and Wildlife Service. Capture up to 15 short-tailed albatrosses and attach satellite transmitters for 4-6 months to learn about migrations and interactions with commercial fisheries. Characterize oceanographic habitats exploited by foraging albatrosses and quantify overlap with fisheries areas.</p>	\$99,321
323	<p>Assessing trawl third wires as threat to seabirds & short-tailed albatross</p> <p>NOAA Alaska Fisheries Science Center. Identify extent of use of trawler sonar cables (third wires) and interactions with seabirds. Provide risk profiles to albatrosses and ways to reduce mortalities.</p>	\$100,000
409	<p>Marine bird/mammal observations and continuous plankton recorder program</p> <p>Pt. Reyes Bird Observatory Conservation Science and Duke University Marine Laboratory. Will continue two years of integrated marine birds, mammals and plankton monitoring program in order to assess yearly variability in seabird and marine mammal distributions relative to CPR derived plankton communities, temperature and chlorophyll. Continuation of #206.</p>	\$255,690

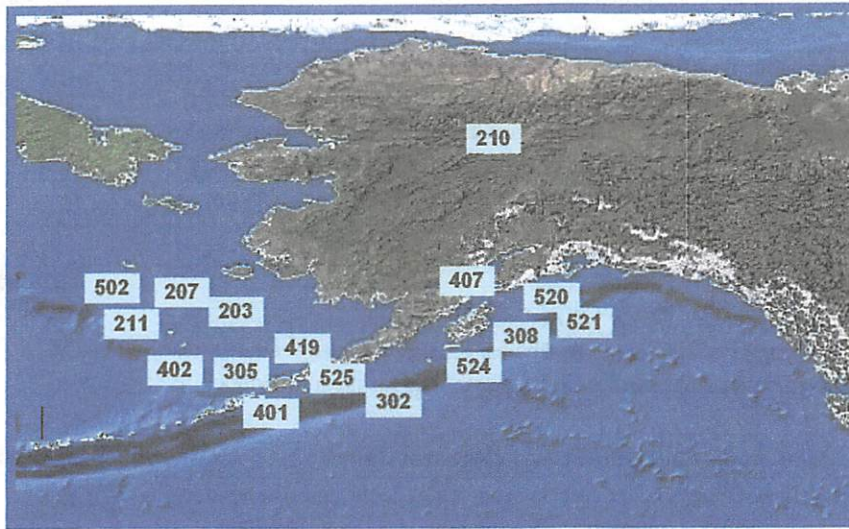
NPRB Seabird Research 2002-2005 (Continued)

413	Tufted Puffins as bioindicators University of Alaska Fairbanks. Will utilize quantitative fatty acid signature analysis and stable isotope analysis to estimate the diets of tufted puffins breeding in Chiniak Bay, Kodiak, Alaska.	\$131,476
516	Seabirds as ecosystem indicators U.S. Geological Survey, U.S. Fish and Wildlife Service, PRBO Conservation Science, & University of Alaska Fairbanks. Will synthesize current state of knowledge of seabirds as indicators of marine ecosystems and change in North Pacific.	\$200,000
531	Coupled seabird-fish responses to environmental variation PRBO Conservation Science. Will examine relationships between Pribilof seabirds and sockeye salmon runs in Bristol Bay, and between seabirds and herring off Sitka in Southeast Alaska to test whether seabirds and fish covary in time.	\$31,234
532	Albatross habitat and fisheries interactions Oregon State University and U.S. Fish and Wildlife Service. Will study three species of albatross and spatial-temporal interactions with commercial fisheries using satellite tracking. Related to and extends #322.	\$171,690
534	Expanding the seabird tissue archive for contaminants monitoring U.S. Fish and Wildlife Service, National Institute of Standards and Technology, and U.S. Geological Survey. Will expand the Seabird Tissue Archival and Monitoring Project by analyzing murre eggs collected at Alaskan colonies in 2003-2005 for chlorinated pesticides, PCBs, dioxins, PBDEs, and mercury.	\$122,663

(At www.nprb.org, click on "Research" for more information on each project.)

NPRB General Ocean and Ecosystem Studies 2002-2005

\$3,785,074



<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
203	<p>Monitoring of biophysical moorings in Bering Sea</p> <p>NOAA Pacific Marine Environmental Laboratory and Alaska Fisheries Science Center and University of Alaska Fairbanks. This study continues the long-term monitoring of ocean and biological variables at biophysical moorings 2 and 4 on the Bering Sea shelf to lay the foundation for a knowledgeable forecast of how future changes in the climate may impact this ecosystem, its living marine resources and protected marine species. Continues as #315, #410, and #517. Funding shown is total amount for all projects.</p>	\$960,894
207	<p>Detecting change in the Bering Sea ecosystem</p> <p>NOAA Pacific Marine Environmental Laboratory and Alaska Fisheries Science Center. Develop measures of ecosystem status for the Bering Sea based on retrospective data and design a protocol that will test the hypothesis that the effects of environmental change in the Bering Sea often occur from single strong forcing events in the atmosphere and ocean, which lead to an ecosystem reorganization that persists for many years.</p>	\$124,084
210	<p>Nutritional quality of Alaskan fish for predators</p> <p>University of Alaska Fairbanks. Funding will support purchase and set-up of equipment to measure the caloric density of fish and other prey items to enhance understanding of trophic dynamics and predator-prey relationships.</p>	\$24,782
211	<p>Sinking particles/pelagic food webs in the SE Bering Sea</p> <p>University of Alaska Fairbanks. Supports the continued monitoring of zooplankton in the Bering Sea by using sediment traps on biophysical moorings 2 and 4 on the Bering Sea shelf. Related to #203.</p>	\$21,661
302	<p>Plankton surveys across the North Pacific</p> <p>Sir Alister Hardy Foundation for Ocean Science and DFO-Canada. Will sample plankton using ships of opportunity crossing the North Pacific and characterize associated environmental conditions. Will enhance interpretation of plankton, marine bird and mammal data and improve understanding of marine ecosystem. Funding includes additional \$100,000 approved by NPRB in September 2004.</p>	\$280,000

NPRB General Ocean and Ecosystem Studies 2002-2005 (Continued)

305	Predator-prey relationships for groundfish and forage fish NOAA Alaska Fisheries Science Center. Continue time series of fish food habits data in the North Pacific by further collection of groundfish stomach samples during groundfish bottom and midwater trawl surveys. Analyze fish stomachs collected in 2000-2002 and update Bering Sea multispecies virtual population analysis model to provide more current advice on implications of fishing strategies on the ecosystem via the Ecosystems Chapter in the stock assessment documents for the North Pacific Fishery Management Council.	\$350,000
308	Forage fish studies near Kodiak NOAA Alaska Fisheries Science Center. Will determine relationship of zooplankton prey and forage fishes in western Gulf of Alaska near Kodiak and how winter conditions influence the prey field and feeding opportunities for juvenile Pollock.	\$320,000
401	Forage fish assessment to support integrated BSAI ecosystem study NOAA Alaska Fisheries Science Center and Environmental Technology Laboratory, University of Alaska Fairbanks, University of Washington, and Louisiana State University. Will assess abundance, distribution, diet, and condition of forage fish species and their prey, by assessing abundance, examining food web relationships, testing a potential monitoring program, using underwater acoustics, and airborne visual and remote sensing of a nearshore section from Dutch Harbor to Port Moller.	\$500,000
402	Ocean circulation models University of Alaska Fairbanks and NOAA Pacific Marine Environmental Laboratory. Will convene a workshop on the present state of ocean circulation modeling for the Bering Sea and Aleutian Island (BSAI) region of the North Pacific.	\$75,000
407	Kelp-grazer interactions in Kachemak Bay University of Alaska Fairbanks. Will study kelp-grazer interactions with emphasis on grazing activity, significance of chemical defenses and resource allocation strategies in dominant kelp species in Kachemak Bay.	\$165,000
419	Modeling multispecies groundfish interactions NOAA Alaska Fisheries Science Center. Work will focus on the update and further development of the Multispecies Statistical Model. This approach will make available the tools used in single-species stock assessment in a multispecies context, providing probabilistic statements on the future state of some commercially important components of the ecosystem. Continues as #525.	\$90,000
502	Conference on utility of ecosystems indicators for Bering Sea PICES Secretariat. Will develop a set of operational objectives for the southeast Bering Sea ecosystem, investigate methodologies for monitoring system-wide structural changes within the marine ecosystem, and identify steps for validating indicator performance, improving the monitoring network, and integration into predictive models.	\$99,957

NPRB General Ocean and Ecosystem Studies 2002-2005 (Continued)

- | | | |
|------------|---|------------------|
| 520 | Gulf of Alaska long term observations along the Seward Line
University of Alaska Fairbanks. Will continue oceanographic and lower trophic level data collection along the Seward Line to help evaluate the current state of the Northern Gulf of Alaska in 2005. | \$420,000 |
| 521 | Profiling echosounder for North Pacific monitoring
Institute of Ocean Sciences, Fisheries and Oceans Canada. Will design, construct and test a new profiling echo-sounder system, specifically designed to monitor the deep vertical biomass distributions (surface to 2000 m) of two key components of the subarctic Pacific food web: large copepods and midwater micronekton (myctophid fishes, cephalopods, and shrimps). | \$100,000 |
| 524 | Productivity of capelin and pollock in Gulf of Alaska
NOAA Alaska Fisheries Science Center. Will investigate potential competition between juvenile pollock and capelin and how ecosystem change may affect capelin and pollock productivity in Barnabus Trough, Kodiak. | \$70,017 |
| 525 | Modeling multispecies groundfish interactions
NOAA Alaska Fisheries Science Center. Will couple population dynamics models that incorporate predator-prey interactions with a technological interactions model to improve capability to evaluate alternative management policies within a multispecies framework. Continues #419. | \$183,679 |

(At www.nprb.org, click on "Research" for more information on each project.)

NPRB Education, Outreach and Synthesis Activities 2002-2005 **\$1,118,437**

<u>Project</u>	<u>Title, Organization, and Brief Description</u>	<u>Funding</u>
326	Support participation in the Alaska Regional National Ocean Sciences Bowl Alaska Sea Grant at University of Alaska Fairbanks. Will provide travel funds for participating teams from Alaska communities off the road system and support regional workshops with interested rural teachers and students. Alaska Regional National Ocean Sciences Bowl provides for public involvement in marine resource issues and in capacity building for dealing with those issues in rural communities.	\$100,000
403	NPRB education and outreach Alaska SeaLife Center. Will disseminate information on the Board's marine research priorities, projects and results through a variety of venues and media.	\$303,000
404	Alaska Marine Information System University of California, San Diego and System Science Applications. Will develop a system for access to and long term data archive of marine data for Alaska and the North Pacific Ocean, Bering Sea and Arctic Ocean.	\$150,000
406	Southeast Alaska synthesis University of Alaska Southeast. Will organize a workshop in which experts in marine biology and oceanography of Southeast Alaska will present syntheses of the progress made in specific areas, including biological, physical, and chemical oceanography, climatic forcing, and the temporal and spatial variability in a variety of marine populations with different life histories, including fished species.	\$120,000
503	Arctic Ocean Synthesis University of Alaska Fairbanks. Will identify most crucial information gaps, pulse points in the biological/physical environment that require monitoring, and how climate change might impact biota through its influence on sea ice, ocean currents and transport and coastal currents.	\$195,437
	Local and traditional knowledge These activities include development of the North Pacific Research Board's program to involve local communities in the identification of hypothesis, collection of ecosystems information, and coordination and collaboration in research.	\$250,000

(At www.nprb.org, click on "Research" for more information on each project.)