

Annual Report to the
Alaska Sea Grant College Program
Advisory Committee

Alaska Sea Grant College Program
November 2008-November 2009

Welcome *from the Director*



Welcome to the seventh annual meeting of the Alaska Sea Grant College Program Advisory Committee. I am delighted to have the opportunity to work with you—and with our capable, creative, and extremely dedicated staff. This report will give you a sense of the breadth of our Alaska Sea Grant program. The variety, quality, and sheer volume of Sea Grant activities, both in Alaska and nationally, is incredible, providing unparalleled “bang” for your hard-earned tax “buck.” In Alaska, the “bang” is more than doubled by the strong state support we receive through the University of Alaska Fairbanks.

Despite the success of our program and its popularity among our constituents and partners, we are facing serious budget challenges. If we are to keep our program strong and effectively reach out to meet urgent new challenges associated with a changing climate, we will need to increase our efforts to find new funds, new partners, and new ways to collaborate. In the course of our meeting, I invite you to take up this challenge—if each advisory committee member could draw from his or her experience one new lead or idea with the potential to grow our program and commit to working with us to explore that avenue, the results could be truly remarkable.

Thank you for coming and thank you for all of your support. I am sure we will have an enjoyable and productive meeting.

Cordially,

A handwritten signature in black ink, appearing to read "David Christie". The signature is fluid and cursive, with a horizontal line at the end.

David Christie, Director

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Alaska Sea Grant College Program Advisory Committee Annual Report

Introduction

The past year has brought extraordinary changes to Alaska Sea Grant. After more than a year of strong and forward-looking leadership, by Marine Advisory Program leader Paula Cullenberg as interim director, and David Christie as acting associate director, we selected David as Alaska Sea Grant director. David assumed the directorship in August 2009, succeeding Brian Allee who retired in May 2008.

David brings great depth of experience working with NOAA as co-director of the NOAA-UAF Kasitsna Bay Laboratory and director of the UAF/NOAA West Coast and Polar Regions Undersea Research Center. As NOAA and the National Sea Grant Office strengthen ties, David's experience administering NOAA research efforts in Alaska, and participation on the NOAA Alaska Regional Collaboration Team, will serve ASG well in our already strong working relationship with NOAA. David retains his posts with the Kasitsna Bay Laboratory and NOAA National Undersea Research Program.

We thank the search committee members Paula Cullenberg (chair), Kurt Byers, Gordon Kruse, Jeffrey Stephan, and Arliss Sturgulewski for their thoughtful and successful work.

The roster of experts on the Alaska Sea Grant Advisory Committee changed with the addition of Fred Schlutt Jr., UAF's recently hired vice provost of outreach and director of the Cooperative Extension Service (CES). Fred replaces interim CES director, Pete Pinney. We thank Pete for his participation on the Advisory Committee, and look forward to Fred's contributions.

Another exciting advance in staffing was the hiring in spring 2009 of Marilyn Sigman, our first faculty level marine education specialist. Marilyn is well known in Alaska marine education circles as the long-time executive director of the Center for Alaskan Coastal Studies in Homer. She is winner of the Alaska Conservation Foundation's Jerry S. Dixon Award for Excellence in Environmental Education, and former coordinator for the Alaska Department of Fish and Game Alaska Wildlife Curriculum program. Now at the MAP headquarters in Anchorage, Marilyn directs the National Science Foundation-funded Center for Ocean Science Education



KURT BYERS

Alaska Sea Grant director,
 David Christie



JEFF FAY

Cooperative Extension
 director, Fred Schlutt.



KURT BYERS

Alaska Sea Grant marine
 education specialist,
 Marilyn Sigman.



KURT BYERS

Dillingham Marine
 Advisory Program agent,
 Izetta Chambers.

Excellence program in Alaska. COSEE connects university marine scientists with K-12 educators and students, <http://www.coseealaska.net/>.

Also in 2009, we hired Izetta Chambers to fill our MAP agent position in Dillingham. Izetta grew up in the Bristol Bay region, where her family owns a salmon processing business. She holds a bachelor's degree in business management and a law degree, both from the University of Arizona.

MAP agent Terry Johnson transferred from Homer to MAP headquarters in Anchorage, where he will continue work as marine recreation and tourism specialist.

MAP also landed three AmeriCorps VISTA (Volunteers in Service to America) volunteers to help carry out rural economic development assistance and education activi-

GARY FREITAG



A “red tide” in southeastern Alaska. Algae account for the color of red tides, and sometimes carry highly toxic paralytic shellfish poisoning.

ties. Stefanie Benca, at the Anchorage office, coordinates the Alaska Marine Science and Fisheries Career Coalition and other efforts to engage more rural Alaskans in fisheries and marine science. In Bethel, Terry Reeve is working with volunteers Amanda Barker and Sabrina Woofert to help people in 56 villages market their arts and crafts and other products. Terry also arranged for Amanda to tutor students at the UAF Kuskokwim campus.

We were sad to lose our meetings coordinator Sherri Pristash from Fairbanks Education Services, and wish her well in her new endeavors in Connecticut.

LINKS STRENGTHEN BETWEEN ALASKA SEA GRANT AND NATIONAL MARINE POLICY ARENA

An ongoing development is the realignment of our ASG strategic and implementation plans with the new National Sea Grant (NSG) Strategic Plan. This nationwide realignment process will focus Sea Grant network efforts around a set of common themes. Having a more clearly defined common purpose, and an enhanced ability to recognize and publicize our achievements as part of the “big picture,” will make our program more competitive within the goal-oriented federal structure.

With the stamp of approval this fall from a national review panel, our ASG plans will guide our efforts through 2013. We thank the ASG Advisory Committee members for their diligent work articulating Alaska’s most pressing issues on marine and coastal resource use and conservation, and for working with us to update our strategic goals and objectives.

Further strengthening links to the national scene, Alaska Sea Grant Advisory Committee member Molly McCammon instituted bimonthly Alaska marine policy teleconferences, sponsored by Alaska Sea Grant and the Alaska Ocean Observing System. Alaska congressional staff and other state and federal insiders have shared the latest information about marine program funding, legislation, and state and federal marine policy issues.

Highlights of our 2008-2009 research, education, and extension work follow, organized under ASG’s new strategic focus areas. The new focus areas closely connect to our former strategic themes under which some of this work began.

Healthy Coastal Ecosystems

Goal: Sustained, well-managed, and healthy marine, coastal, and watershed ecosystems in Alaska.

International activities, publications, and research all contributed to our strategic focus area, Healthy Coastal Ecosystems. Publications on marine resources and several coastal and marine observing and monitoring activities played prominent roles in addressing this focus area.

OUTREACH

MAP agents Ray RaLonde, Gary Freitag, and Reid Brewer led monitoring programs to identify invasive species, detect harmful algal blooms that may cause paralytic shellfish poisoning, and document other potential effects of climate change. MAP worked with the Alaska Department

of Fish and Game, Smithsonian Environmental Research Center, and NOAA Office of Protected Resources to monitor for invasive European green crabs, non-native tunicates, and bryozoans near Ketchikan and Unalaska. MAP agent Heidi Herter worked with tribal representatives to develop a community water quality sampling program on the Tubutuluk River near Nome.

Armed with materials produced by Education Services, MAP has for years worked to educate the public, and monitor the health risks associated with harmful algal blooms and with consumption of tainted shellfish. In 2009 MAP initiated a statewide, community-based monitoring program for domoic acid, a natural toxin that can cause serious harm to humans and mammals eating contaminated shellfish.

MAP agents Kate Wynne and Sunny Rice launched a project in 2009 with commercial gillnetters and seiners in southeastern Alaska and Kodiak to reduce encounters between mariners and whales. The NOAA Office of Protected Resources is a partner, and funding is from the North Pacific Research Board.

The Alaska Ocean Observing System (AOOS) provides data used by scientists worldwide and mariners in Alaska, <http://www.aoots.org>. During two weeks in 2009, AOOS evaluated models that predict wind, waves, and ocean circulation in Prince William Sound. MAP agent Torie Baker and others coordinated community outreach during the PWS field experiments.

NOAA-ASG Partnership Yields Unique Field Guide

The book *Field Guide to Squids and Octopods of the Eastern North Pacific and Bering Sea*, <http://seagrant.uaf.edu/bookstore/pubs/SG-ED-65.html>, was published in September 2009. Author Elaina Jorgensen, a biologist with the NOAA Alaska Fisheries Science Center in Seattle, secured \$20,000 from NOAA Fisheries to help cover printing cost. Education Services learned of Jorgensen's intent to create the field guide and offered to be the publisher, after she gave a talk in 2005 at MAP's Forum of Alaska Marine Issues in Unalaska.

SFOS Scientists and ASG Contribute to International Polar Year

At the request of UAF/SFOS faculty members Rolf Gradinger, Bodil Bluhm, and Russell Hopcroft, we published a landmark translation of an identification key by Russian scientists, *Illustrated Key to Free-Living Invertebrates of Eurasian Arctic Seas and Adjacent Deep Waters, Vol. 1*. This book stems from an International Polar Year (IPY) proposal and is a product of the Arctic Ocean Diversity Census of Marine Life project. The sponsoring SFOS faculty members obtained \$7,000 from

the Sloan Foundation to help pay for printing. Education Services is working on the second volume and we expect to publish it in 2010.

Workshop Proceedings Highlight Marine Ecosystems

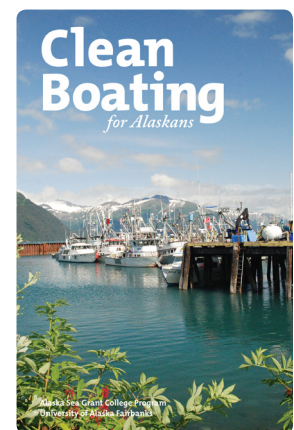
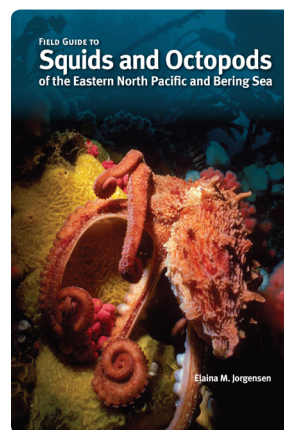
We published three workshop proceedings that address the Healthy Coastal Ecosystems focus area: *North Aleutian Basin Energy-Fisheries Workshop Proceedings* <http://seagrant.uaf.edu/bookstore/pubs/AK-SG-09-03.html>, *Marine Debris in Alaska: Coordinating Our Efforts*, <http://seagrant.uaf.edu/bookstore/pubs/AK-SG-09-01.html>, and our first digital proceedings, *Marine Habitat Mapping for Alaska*, <http://seagrant.uaf.edu/bookstore/pubs/AK-SG-08-03.html>, which won two national awards. Even before ASG published the habitat mapping proceedings, chapter authors said that the work was the first of its kind worldwide and was already in use as a resource by the experts. ASG cosponsored the three workshops in 2008.

Clean and Green Boating in Alaska

To promote clean harbors and nearshore ocean waters in Alaska, MAP specialist Terry Johnson and Education Services production staff Sue Keller and Jen Gunderson teamed with the National Park Service and the Alaska Marine Conservation Council to write and publish the free booklet, *Clean Boating for Alaskans*. NPS provided \$30,000 to pay for writing and production. Over the past year we distributed more copies of this title (3,000) than any other, most to Alaska harbormasters and harbor users.

Marine Mammal Expertise Shared Internationally

The Division of Marine Fisheries in Ghana, Africa, and the International Commission for the Conservation of Atlantic Tuna, raised concerns about marine mammal and turtle bycatch in commercial fisheries. In response, NOAA asked MAP marine mammal specialist Kate



Wynne to train 40 fishery observers in marine mammal identification in Ghana. The U.S. Navy provided logistical support. The training helped Ghana develop a fishery observer program that now ensures the sustainability of their fishing industry. In 2009 MAP continued this international work by training fishery observers in Senegal, Africa, and in Costa Rica. A Sea Grant field guide primarily authored by Kate, *Guide to Marine Mammals and Sea Turtles of the U.S. Atlantic Coast*, published by Rhode Island Sea Grant and co-distributed by ASG, was a key tool in Kate's international observer training work, http://www.sfos.uaf.edu/news/journeys/kate_wynne_dakar_senegal_0209.html.

Funding Secured for New Books

Three field guides, an underwater photo book, and a unique Western science–Native knowledge book are scheduled to be published in 2010:

In May 2009, the Alaska Department of Fish and Game (ADFG) provided \$40,000 to help publish *Field Guide to Common Marine Fishes and Invertebrates of Alaska*, by marine biologists Susie Byersdorfer and Leslie Watson. The new 360-page book will fill a void left by the out-of-print guide by NOAA biologist Doyne Kessler (1985).

In August 2009, NOAA Fisheries provided \$20,000 toward the cost of printing *Field Guide to Common Seaweeds of Alaska*, by Mandy Lindeberg of NOAA Fisheries at Auke Bay. In 2006 Lindeberg generated a buzz among seaweed scientists when she discovered a new genus (and species) of kelp, dubbed “Golden V,” in the



JOHN LAFARGUE

Kate Wynne and participants in the 2008 Joint U.S.- Ghana Fishery Observer Training Workshop toured a Korean trawler (above) and other commercial fishing vessels in Tema Harbor, Ghana.

Aleutian Islands, http://juneauempire.com/stories/022908/sta_252445474.shtml. This will be the only print guide to Alaska seaweeds that includes species north and south of the Alaska Peninsula.

NPRB committed \$5,000 for a field guide to Aleutian Islands sea stars, by SFOS faculty member Stephen Jewett. Reid Brewer secured funding toward the cost of publishing his book featuring photographs of underwater biota and habitat in the Aleutians, from the Alaska Department of Environmental Conservation (\$5,000), City of Unalaska (\$11,000), and Ounalashka Corporation (\$4,000).

STEPHEN JEWETT



A sea star and green sea urchin in the Aleutian Islands.

The Rasmuson Foundation (\$19,800), University of Alaska Press (\$5,000), Chugach Heritage Foundation (\$2,000), and the Pratt Museum (\$200) committed funds to help ASG publish the book *Imam Ciumiucia (Our Changing Sea)*, by Anne Salomon. As a University of Washington doctoral student, Anne worked with Alaska Natives on the Kenai Peninsula to assess how and why the local coastal ecosystem has changed over 70 years. She now is an assistant professor and research fellow at Simon Fraser University, School of Resource and Environmental Management, British Columbia.

RESEARCH

In a pilot study funded by ASG in summer 2009, UAA chemistry professor Laura Mujica collected sediment and water samples from several freshwater lakes on the Kenai Peninsula, in the Kenai National Wildlife Refuge, Captain Cook Recreation Area, and near Ninilchik. Preliminary data show elevated methylmercury levels in 42 percent (8 of 19) of the samples. A proposal has been submitted to ASG to resample and expand the scope of this important investigation. Methylmercury from highly industrialized areas of the planet likely is transported to Alaska and deposited as atmospheric fallout.

UAF/SFOS fisheries professor Terrance Quinn and recently graduated doctoral student Kray Van Kirk developed a multispecies age-structured assessment model for arrowtooth flounder, Pacific cod, and walleye pollock. The goal of the model is to improve the assessment and understanding of complex multispecies dynamics in the Gulf of Alaska, with special focus on pollock and the predation consequences of the increased abundance of arrowtooth flounder.

UAF/SFOS marine science professor Russell Hopcroft and master's student Jenefer Bell studied the accuracy and effectiveness of ZooImage, a new digital imaging system designed to measure the abundance, biomass, and zooplankton species in areas where newly released hatchery



THOMAS KLINE

Spawning pink salmon in a Prince William Sound tributary.



BRAD STEVENS

A juvenile red king crab.

salmon are likely to feed. The technology may offer salmon hatcheries a real-time tool to improve the timing of juvenile salmon releases into the wild. ZooImage was found to be relatively accurate, and continued improvements will enhance automatic identification of zooplankton.

In a multiyear research project to better understand the effects of interbreeding between hatchery and wild salmon, researchers and graduate students led by UAF/SFOS professor of fisheries Anthony Gharrett are examining the extent of "outbreeding depression" in hybrids between related populations of early and late run pink salmon in Auke Creek. Results are expected in 2011. Education Services published the online publication, *What's genetics got to do with it?* aimed at helping hatchery managers, fish culturists, fishermen, science students, and fisheries researchers better understand salmon genetics, <http://seagrants.uaf.edu/bookstore/pubs/AN-18.html>.

UAF/SFOS fisheries professor Gordon Kruse and graduate student Bill Bechtol completed a study of the collapse of the Kodiak red king crab stock and fishery. Bechtol developed a new population dynamics model for improving stock assessment of Kodiak red king crab, and earned his doctoral degree in May 2009. The model was provided



RUSSELL HOPCROFT

Through image recognition technology, ZooImage can detect different shapes of whatever it scans, and match that information with an ever-growing database of similar images to suggest species identification.

to the Alaska Department of Fish and Game for use in managing the crab fishery, if and when the stocks recover and the fisheries reopen. Project results were included in a proposal to the Alaska Board of Fisheries on how to improve crab harvest management. The proposal is likely to result in management changes for all red king crab fisheries in the Gulf of Alaska. After graduating, Bill formed a research consulting company in Alaska, Bechtol Research, which has brought in several research contracts.

UAF/SFOS professor of fisheries Terrance Quinn, and doctoral student Peter-John Hulson, developed tools for scientists and managers to incorporate uncertainty in integrated age-structure assessment models. ADFG and NOAA scientists use the methods; the first application was on Pacific ocean perch.

Sustainable Coastal Development

Goal: Diverse and sustainable coastal communities where residents have the knowledge and skills they need to adapt to natural and man-made changes in resource use and availability.

Training provided by MAP for new members of the marine industry workforce and for commercial fishermen and seafood processing plant managers and line workers took center stage in addressing the focus area of Sustainable Coastal Development.

OUTREACH

The multifaceted Alaska Fisheries Business Assistance Project (Fi\$hBiz), <http://seagrant.uaf.edu/map/fishbiz/>, was developed by MAP agent Glenn Haight to provide training in financial management and efficiency for commercial fishermen, and increase profits by improving product quality and marketing. In 2008-2009, Glenn taught “The Business of Fish” class via public access cable television and the Internet.

Alaska’s commercial fishermen have increased the value of their catch by producing a better product through careful handling and immediate chilling. MAP agent Torie Baker partnered with industry and the Alaska Vocational Technical Education Center to teach maintenance and repair of refrigeration systems to commercial fishermen in several fishing ports. With support from the University of Alaska Workforce Development Program, in 2009 MAP bought a portable refrigeration unit that is used in classes. Over 160 fishermen have attended the filled-to-capacity workshops in the last two years.

MAP released the DVD *Salmon Quality for Gillnet Fishermen*, produced by Deborah Mercy, <http://seagrant.uaf.edu/bookstore/pubs/MAPV-66.html>, on how to handle fish to maintain high quality. SnoPac, a buyer in Bristol Bay, gave the DVD to all of their fishermen in the 2009 season. On the Kuskokwim River, MAP agent Terry Reeve helped salmon catcher-sellers direct market their catch at the local farmers markets and to Anchorage fresh food markets.

Commercial fishermen from Kodiak attend a daylong hands-on class for onboard refrigeration systems, organized by Cordova MAP agent Torie Baker and taught by industry partner Integrated Marine Systems.



DAVE PARTEE



Marie and Ron Bader tend nets on their Moss Island Oyster Farm in Peterson Bay, Kenai Peninsula, Alaska, June 2007.

Joining with Ecotrust and the Gulf of Alaska Coastal Communities Coalition, MAP cosponsored a workshop on developing Community Quota Entity (CQE) programs, <http://seagrant.uaf.edu/map/workshops/2009/cqe/index.html>. CQEs allow communities to buy halibut and sablefish quota and then lease it to local residents for economic development. MAP agents Torie Baker and Sunny Rice offered workshops in their communities about how to participate in the Board of Fisheries public process. Participants immediately used skills from the workshop in the board's meeting process.

Growing the Shellfish Farming Industry

Ray RaLonde, MAP aquaculture specialist, worked with leaders in the shellfish aquaculture industry to develop the Alaska Shellfish Growers Logbook, <http://seagrant.uaf.edu/map/aquaculture/shellfish/shellfishlog.pdf>, and a Web site with guidance on taxes, finances, business management, and aquaculture techniques.

The Kachemak Shellfish Mariculture Cooperative built a shellfish refrigeration facility in Homer. Several years ago Ray helped the farmers write a business plan, apply for grants, plan construction, and develop quality standards. When legal issues later stalled the project, Ray and MAP seafood marketing specialist Quentin Fong provided the court with probable economic impacts if the project were to be scrapped. The court used this information in deciding to allow resumption of the project. The building opened in 2009, <http://www.globalfoodcollaborative.com/articles/kachemak-bay-oysters-coop-growing-and-seeking-new-partnerships-.html>.

MAP agent Gary Freitag heads the board of the nonprofit OceansAlaska Marine Science and Mariculture Center, <http://www.oceansalaska.org/>, in Ketchikan. The project

will help diversify the local economy, which has been hit hard by the loss of timber jobs. A groundbreaking with U.S. Senator Lisa Murkowski took place in August 2009.

Building Rural Enterprises

After being coached by MAP agents Quentin Fong, Torie Baker, and Terry Reeve, three coastal residents won funding for their projects in the Alaska Marketplace competition.

Terry Reeve is coordinator and planner for an eco-tourism/archeology project in southwestern Alaska. The project involves birding, tundra walks, village visits, and participation in archeological digs. In 2009, excavation crews produced the largest cache of Yup'ik artifacts ever collected on the Yukon-Kuskokwim Delta.



RICK KNECHT

Michael Smith, high school student in Quinhagak, participated throughout the 2009 archeological dig on the Yukon-Kuskokwim Delta.

KURT BYERS



A net bag of freshly caught and iced halibut being offloaded at Kodiak.

Quentin Fong facilitated the sale of at least 3,250 metric tons of Alaska seafood, with an estimated value of at least \$2.5 million to Qingdao Fortune Seafoods, for export to China. Quentin and the Cooperative Extension Service facilitated a workshop—How to Start a Business in Kodiak—geared to women in the Kodiak Hispanic community.

RESEARCH

Ray RaLonde, MAP aquaculture specialist, teamed with Chris Langdon of the Oregon Department of Fisheries and Wildlife to develop larger, faster growing lines of Pacific oysters. Their goal is to develop better brood stock for Alaska. Interim data indicate that the project is on track to success. This effort will flow into another project to compare the post-harvest quality of oysters raised in Kachemak Bay, Alaska, with those from other northwest locations.

UAF economics professors Keith Criddle and Mark Herrmann recently completed an economic analysis of the Pacific halibut commercial fishery, and results are contributing to policy debates over the design of Individual Fishery Quota programs in Bering Sea crab fisheries, Gulf of Alaska bottom trawl fisheries, and Bering Sea flatfish fisheries. The study provides a baseline for determining the value of these commercial fisheries and helps managers understand how the value of the fisheries is affected by changes in the allowable harvest.

Assistant professor Marie Lowe with the UAA Institute for Social and Economic Research is studying why young people leave Alaska rural coastal villages. She has found that young people in coastal communities feel a strong sense of place, and their aspirations tend to be lofty, but vague. Surveys show that young villagers place low value on occupations associated with industries that are expanding in their communities, such as fish processing and tourism, regarding these industries as outsider controlled and culturally beneath them.

Safe and Sustainable Seafood Supply

Goal: Safe, sustainable, and sought-after seafood products providing stable economic returns to Alaska communities.

Goal: Commercial, sport, and subsistence fisheries will remain biologically and economically healthy, and remain a long-term economic force in coastal communities.

Applied research and training supported by how-to publications and videos helped strengthen Alaska's seafood industry, addressing ASG's focus area, Safe and Sustainable Seafood Supply.

OUTREACH

MAP taught courses statewide to seafood processors and commercial fishermen on seafood handling, safety, sanitation, and quality. Also, MAP seafood technology specialist Chuck Crapo runs the Better Process Control school for salmon canners, and conducts a course for processing plant workers on how to handle salmon. A list of workshops is in the appendices.

Because of the distances to market, Alaska geoducks must be sold frozen instead of live. But frozen meat is much tougher and sells for only 20 percent of the price of fresh, unfrozen meat. Ray RaLonde initiated research with the Southeast Alaska Regional Dive Fisheries Association and the UAF Fishery Industrial Technology Center to determine the cause of geoduck tissue toughening and pursue a solution. The researchers found that tough tissue



A seafood processing worker in Juneau shows off a freshly caught coho (silver) salmon. MAP gives workshops that educate processing plant workers on how to best handle salmon and other fish and shellfish, to maintain highest quality.

KURT BYERS



KURT BYERS

Ben Daly shows a clutch of developing eggs in a blue king crab at the Alutiiq Pride Shellfish Hatchery in Seward.

was due to rigor mortis. Now they are developing techniques to eliminate rigor mortis and thereby increase the marketability of frozen geoducks.

Education Services in partnership with MAP published and distributed 1,060 copies of publications and videos to help strengthen and expand seafood harvest and processing businesses, especially small to medium size companies. In addition, ASG distributed 406 copies of three different fish field guides, primarily to seafood processors and marketers, and commercial and charter fishermen to improve utilization and conservation of marine fishes.

Education Services continued to provide information about ASG activities and products to Laine Welch, producer of Fish Radio in Kodiak, <http://www.marineconservationalliance.org/fishradio.htm>. ASG is a cosponsor of Fish Radio and Welch routinely mentions our products and activities, and refers listeners to our Web site. She also describes ASG products and services in her newspaper and Web print column, Fish Factor.

RESEARCH

The Alaska King Crab Research, Rehabilitation and Biology (AKCRRAB) project funded largely by NOAA Fisheries, http://seagrant.uaf.edu/research/projects/initiatives/king_crab/general, had another successful year in its effort to determine the feasibility of raising red and blue king crab in hatcheries, with a view to restoring wild stocks, such as those near Kodiak and the Pribilof Islands. Survival rates of hatched larvae in the lab increased from 10 percent in 2008 to 21 percent in 2009. The research is now in its third year of successful brood stock collection,

and egg hatch and larval development at the Alutiiq Pride Shellfish Hatchery in Seward. UAF scientists in Seward and Juneau, with NOAA scientists at the Alaska Fishery Science Center in Kodiak and Oregon, are studying growth and survival, handling techniques in a hatchery setting, and predation dynamics in the laboratory. Education Services created a new electronic newsletter, *News Flash*, <http://seagrant.uaf.edu/research/projects/initiatives/king-crab/newsflash/>, written by research biologist Ben Daly, to keep constituents abreast of AKCRRAB.

Alaska wild salmon compete in international markets with other wild and farmed salmon and rainbow trout products. Researchers Keith Criddle and Mark Herrmann are developing models to better predict the impact of competing salmonid products on the price fishermen receive for Alaska wild salmon.

Economics professor Gunnar Knapp of the UAA Institute of Social and Economic Research (ISER) is finishing his examination of the total economic impact of all Alaska commercial, sport, and subsistence fisheries. The intent is to help Alaska policy-makers and citizens make informed decisions about Alaska fisheries policy. ISER will publish a summary report for broad public distribution.

Seafood scientist Subramaniam Sathivel, formerly with the UAF Fishery Industrial Technology Center (FITC) in Kodiak and now with Louisiana State University, partnered with ASG seafood quality specialist Chuck Crapo and UAF microbiologist Brian Himelbloom, both at FITC, to develop a protein powder from arrowtooth flounder. The researchers have applied for U.S. Patent protection for the technologies and methods used to produce the protein powder.

Hazard Resilience in Coastal Communities

Goal: Healthy, safe Alaskans and resilient coastal communities in the face of marine and coastal hazards.

Programs encouraging best mariner practices aimed at improving marine safety, and a public discussion by legal experts on the status of oversight of hazardous substance shipping in Alaska waters, 20 years after the *Exxon Valdez* oil spill, addressed this focus area.

OUTREACH

Mariner Safety Remains Key Focus

MAP agent Torie Baker taught the annual Coast Guard–approved Drills Conductor course to an audience composed primarily of Prince William Sound fishermen. Torie also partnered with Cordova District Fishermen United to develop, print, and deliver a safety packet to 235 Prince William Sound skippers on deck winch safety and improving wheel watch communication between skippers and crew. As a result of MAP efforts, more than 70 percent of the Copper River Delta gillnet fleet now meets or exceeds USCG Fishing Vessel Safety Exam standards.

Exxon Valdez Oil Spill 20th Anniversary Highlights ASG Research

Education Services manager Kurt Byers organized a reunion of the three surviving members (Zygmunt Plater, Alison Rieser, Harry Bader) of the four-person ASG *Exxon Valdez* legal research team, <http://seagrant.uaf.edu/conferences/2009/evos-anniversary/index.html>. Soon after the

March 1989 spill, ASG assembled the team from three law schools and UAF to study legal measures that Alaska could employ to improve oversight of hazardous substance transport. In March 2009, the trio, joined by former Alaska attorneys general Charlie Cole and John Havelock, current deputy attorney general Craig Tillery, former chair of the Alaska Oil Spill Commission Walter Parker, and others gave four panel discussions in Fairbanks and Anchorage on the evolution of government and citizen oversight of the marine transport industry. The legal team reunion was funded with \$10,000 from the National Sea Grant Law Center, and was a cooperative effort with the Prince William Sound Regional Citizens Advisory Council.

This year Education Services also published the ASG EVOS legal research team 1989 final report, <http://seagrant.uaf.edu/bookstore/pubs/AK-SG-89-02.html>. Until 2009 the report was available only as appendices to the Alaska Oil Spill Commission 1990 final report to the legislature and governor. The legal team report underpinned the Alaska Oil Spill Commission’s recommendations on stronger state regulatory authority.

State Teams with ASG to Inform Coastal Residents about Tsunami Threat

The Alaska Division of Homeland Security and Emergency Management (ADHSEM) bought 1,000 copies of our national award-winning video, *Ocean Fury: Tsunamis in Alaska*, for free distribution to its constituents. The video describes the history of tsunamis in Alaska via historical records, eyewitness accounts, and tsunami propagation research at UAF, and provides safety advice for coastal communities. ADHSEM was one of three original funders of the project and a content consultant.



Walter Parker, former chair of the Alaska Oil Spill Commission, with Alison Rieser, Zygmunt Plater, and Harry Bader, members of the 1988–1990 Alaska Sea Grant EVOS Legal Research Team.



Several tsunamis hit the Seward waterfront after the 1964 Alaska earthquake. This photo shows damage at the site of the present SFOS Institute of Marine Science Center.



MAP carries out many informal marine education activities with kids. Here, Unalaska MAP agent Reid Brewer works with children during an annual summer marine science camp he founded and leads.

Marine Literacy and Stewardship

Goal: Alaska residents and visitors understand, appreciate, and safely and sustainably enjoy Alaska's marine and coastal environments.

Highlights of ASG work to address Marine Literacy and Stewardship centered on full implementation of the new Alaska Seas and Rivers K-8 curriculum, formation of a Center for Ocean Science Education Excellence (COSEE) partnership, and placement of three UAF graduate students in Washington, D.C., as Sea Grant Knauss Fellows, a national competitive fellowship program.

K-12 Education

Led by education specialist Marla Brownlee, ASG workshops in 2009 trained eight curriculum leaders who are now qualified to conduct teacher workshops on how to most effectively use our new online Alaska Seas and Rivers K-8 Curriculum. One hundred seventy teachers participated in teacher workshops in the final year of the project. After a training workshop, a third grade teacher from Kodiak said, "I am impressed with the format of the Alaska Seas and Rivers curriculum. It is very informative, user friendly, well written, age appropriate for all grades with science Grade Level Expectations and Standards, and packed with engaging investigations for teachers and students."

Rural Alaskans and Alaska Natives are underrepresented in the marine resource and fisheries science and

management professions. MAP agents worked with K-12 students to inspire them and expose them to marine science opportunities. MAP agent Reid Brewer taught pre-kindergarten through third grade children in summer camps in Unalaska. As a result, Unalaska MAP received a \$54,750 grant from the Qawalangin Native Tribe to continue education activities.

MAP agents coached local high school teams in the Alaska regional competition of the National Ocean Sciences Bowl (NOSB). Four former members of the Unalaska High School NOSB team have gone on to pursue science degrees in college, and in 2008 four alumni of other Alaska NOSB teams enrolled in the UAF undergraduate fisheries program.

College and Post Graduate Education

MAP faculty taught university courses via distance technology: The Oceans, Fishes of Southeast Alaska, Introduction to Oceanography, and Introduction to Aquaculture. One result is that six students took jobs in fisheries-related fields.

Three 2009 ASG Knauss fellows from UAF started work in Washington, D.C., in early February. Mary Bozza joined NOAA Program Planning and Integration, where she provides in-depth strategic analyses and assessments to NOAA senior management, among other tasks. She also serves on internal NOAA committees and is involved in interagency efforts related to climate and ocean policy.

Celeste Leroux helps represent the NOAA National Ocean Services National Marine Sanctuaries program to

Congress, the White House, the public, and fishermen and locals. She works with Matt Stout, chief of the communication, outreach, and education division of the National Marine Sanctuaries program. In addition she has worked as a liaison with Sea Grant international programs.

Erin Steiner works for the NOAA Fisheries Office of Science and Technology as the scientific advisory coordinator, with NOAA marine biologist Laura Oremland and fishery biologist David Detlor.

Seanbob Kelly, 2008 Alaska Sea Grant Knauss fellow, landed a job with NOAA Fisheries Sustainable Fisheries Division in Juneau and began work in February 2009. His job focuses on fisheries management projects under program manager Sally Bibb.

In July 2009, President Obama named former ASG-funded graduate student and Knauss Fellow, Dana Hanselman, one of six scientists from the U.S. Department of Commerce to be recognized with the Presidential Early Career Award for Scientists and Engineers. Dana studied marine fisheries population dynamics under ASG researcher Terrance Quinn, and he now works for NOAA Fisheries in Juneau.

Public Education

Coastal residents often have no access to the scientists who visit their communities and may learn little about the goals or results of their research. MAP bridges the gap to link scientists with local residents. In 2009 Heidi Herter coordinated the second annual Western Alaska



Dana Hanselman, former ASG-funded graduate student and Knauss Fellow, won a prestigious award from President Obama in 2009.

Interdisciplinary Science Conference and Forum in Nome. In 2010 Reid Brewer will coordinate the meeting in Unalaska. The intent of this program is to bring together scientists, educators, rural leaders, community members, and subsistence hunters and gatherers to discuss science and issues relevant to western Alaska.

Reid also maintains the Forum of Alaska Marine Issues (FOAMI) lecture series, which features talks at the Museum of the Aleutians by scientists who visit Unalaska, <http://www.faculty.uaf.edu/ffrsb/outreach/foami.html>. Heidi organized a similar lecture series in the Bering Strait region, in partnership with International Polar Year participants. The Nome-based lecture series had more than 1,350 attendees over two years.

After a several year hiatus, 2009 marked ASG's return to the radio airwaves with the debut of a new radio news



Nome MAP agent Heidi Herter teaches field biology (for university credit) to high school students from Bering Strait villages.

service CoastWise Alaska, <http://seagrant.uaf.edu/news/coastwise/index.php>. The program, produced by information officer Doug Schneider, features interviews with ASG experts who discuss marine and coastal issues.

To provide constituents with lay language descriptions about ASG activities, we are creating research project summary Web pages that are efficiently fed directly from our database, <http://seagrant.uaf.edu/research/projects/>. We will be adding features such as photos and links to related information.

In 2008-2009 marketing coordinator Kathy Kurtenbach, distribution assistant Dawn Montano, and others explored and implemented fast-evolving social media tools on the Internet to provide information to constituents. In concert with other Sea Grant programs, we established Facebook, <http://www.facebook.com/pages/Fairbanks-AK/Alaska-Sea-Grant-College-Program/104960004595?ref=ts>, and YouTube, <http://www.youtube.com/AlaskaSeaGrant>, sites to promote ASG services and products.



In the past 12 months, Education Services filled 1,285 orders for 233 different ASG information products and

distributed 20,000 items to 47 states and 28 countries. Of those, 12,500 publications and videos were distributed to Alaskans, including Alaska retailers who in turn sold our products to Alaskans and visitors. Cost recovery via sales was \$82,900. The National Sea Grant Library distributed an additional 36,600 ASG publications as PDFs worldwide, an increase of 4,000 over the previous year. The total number of ASG products distributed by the NSGL placed ASG third in the national Sea Grant network—behind Florida, which serves a state population of 18.3 million, and Virginia, which serves a state population of 7.8 million. In terms of number of educational products distributed by NSGL per state resident, ASG is far ahead of all other Sea Grant programs.

New Research Projects

Six new research projects have been selected for funding for 2010-2014. ASG issued a request for proposals in December 2008, and received 33 preproposals and subsequently 16 full proposals. Final selection was based on proposal review by science peers and an advisory panel. Funding for the six projects for two years totals approximately \$1,000,232.

Alaska Sea Grant Conferences and Workshops, 2008-2009

Year	Month	Title	Presenter/host	Location	Attendees
2008	June	Introduction to Direct Marketing	Haight, Greg Fisk	Elfin Cove	12
2008	June	Alaska Seas and Rivers Summer Institute	Brownlee, Trisha Herminghaus	Kasitsna Bay Lab	12
2008	June	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	17
2008	August	Sea Grant West Coast Fisheries Extension Educator Conclave	Rice, Baker	Petersburg	
2008	August	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	25
2008	August	National Estuarine Research Reserve Luncheon, Consuming Shellfish Safely	RaLonde	Homer	12
2008	September	Prince William Sound Science Committee, Community Science Lectures, Allen Marquette, Hubble Telescope	Baker	Cordova, Valdez, Copper Center, Glenallen	
2008	September	Prince William Sound Science Committee, Community Science Lectures, Carol Ann Woody, Pebble Mine and Salmon	Baker	Cordova, Valdez, Copper Center, Glenallen	
2008	September	Prince William Sound Science Committee, Community Science Lectures, Laurel McFadden, Going North for Little Auks	Baker	Cordova, Valdez, Copper Center, Glenallen	
2008	September	Prince William Sound Science Committee, Community Science Lectures, Rita Miraglia, Point Steele	Baker	Cordova, Valdez, Copper Center, Glenallen	
2008	September	Climate Change Elementary and Jr. High School Lectures (3)	Brewer		
2008	September	Climate Change High School Lectures (8)	Brewer		
2008	September	Climate Change Workshop	Brewer	Kodiak	74
2008	September	Climate Change Workshop	Brewer	Cordova	55
2008	September	Climate Change Workshop	Brewer	Ketchikan	91
2008	September	Climate Change Workshop	Brewer	Petersburg	189
2008	September	Climate Change Workshop	Brewer	Juneau	38
2008	September	Alaska Seafood Processing Leadership Institute, Leadership, Marketing	Haight	Anchorage	7
2008	September	International Polar Year Talk, Leonard Apangalook, Climate Change	Herter	Nome	49
2008	September	International Polar Year Talk, Leonard Apangalook, Climate Change, Nome Students	Herter	Nome	93
2008	September	Surviving Cold Water Emergencies, Cold Water Near Drowning and Hypothermia	Herter	Shishmaref	15
2008	September	Surviving Cold Water Emergencies, Ice Safety, grades 5-12	Herter	Shishmaref	100
2008	October	Prince William Sound Science Committee, Community Science Lectures, Dave Crowley, North Slope Bird and Mammal Skulls	Baker	Cordova, Valdez, Copper Center, Glenallen	17
2008	October	Prince William Sound Science Committee, Community Science Lectures, Lori Trummer, Alder Pathology	Baker	Cordova, Valdez, Copper Center, Glenallen	27
2008	October	Prince William Sound Science Committee, Community Science Lectures, National Oceanic and Atmospheric Administration Weather Service, Tsunami Physics	Baker	Cordova, Valdez, Copper Center, Glenallen	54
2008	October	Prince William Sound Science Committee, Community Science Lectures, River Gates, North Slope Shorebird Breeding Studies	Baker	Cordova, Valdez, Copper Center, Glenallen	32
2008	October	Climate Change Research in the Aleutian Islands	Brewer	Juneau	54
2008	October	Climate Change Research in the Aleutian Islands (Wildlife Wednesday Event)	Brewer	Anchorage	134
2008	October	International Polar Year Seminar, Joe Senungetuk, Making a Living as an Artist	Herter	Nome	37
2008	October	International Polar Year Seminar, Gay Sheffield, Whale Life History	Herter	Nome	40
2008	October	Marine Mammal Training, National Marine Fisheries Service, UAA	Wynne	Anchorage	
2008	October	Pacific Coast Shellfish Growers Association, The Financial Management Program for Alaska Shellfish Farmers	RaLonde	Lake Chelan, WA	83
2008	November	Forum on Alaska Marine Issues, Refuge Update, Rat Eradication, and Wild Horses	Brewer	Unalaska	20
2008	November	Potential Impacts of a Changing Climate	Brewer	Unalaska	22
2008	November	Alaska Seas and Rivers Continuing Education, Teachers	Herter	Anchorage	
2008	November	Water Safety	Herter	Stebbins	
2008	November	Water Safety, Ice Safety, grades 5-12	Herter	Elim	
2008	November	Financial Management for Alaska Shellfish Farmers	RaLonde	Anchorage	
2008	November	Oasis Earth	Steiner	Prince Rupert, BC	
2008	November	The Alaska Citizen Council Model	Steiner	Prince Rupert, BC	
2008	November	Annual Alaska Sea Grant Advisory Committee Meeting, Variability in the Quality of Alaska Farmed Oysters	RaLonde	Anchorage	23
2008	November	Annual Meeting of the Alaska Shellfish Growers Association, Problems and Opportunities for Shellfish Aquaculture in Alaska	RaLonde	Anchorage	33
2008	November	The Potential for Intertidal Farming of Geoduck Clams in Alaska: Results from 4 Years of Growout	RaLonde	Anchorage	21

Year	Month	Title	Presenter/host	Location	Attendees
2008	November	Annual meeting of the Alaska Shellfish Growers Association, Vibrio in Shellfish Hatcheries	RaLonde	Anchorage	34
2008	November	Financial Management For Alaska Shellfish Farmers: Hands-On Sessions and Consultation	RaLonde	Anchorage	33
2008	December	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	12
2008	December	How to Start a Business in Kodiak	Fong, Tony Gasbarro	Kodiak	22
2008	December	Alaska Sea Grant Program, Southeast Alaska Discover Center Insight Series	Freitag	Ketchikan	25
2008	December	Preparing for the Board of Fish	Rice	Petersburg	
2009	January	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	10
2009	January	University of Alaska TV FishBiz Workshop Series, Financial Management	Haight	Juneau	46
2009	January	University of Alaska TV FishBiz Workshop Series, Determining Profits and Value	Haight	Juneau	46
2009	January	Alaska Seas and Rivers Facilitator Workshop	Brownlee, Trish Herminghaus, Linda Frame, Sigman	Anchorage	8
2009	January	Alaska Marine Science Symposium, Alaska Seas and Rivers Presentation	Brownlee, Sigman	Anchorage	
2009	January	Putting Fish on the Table	Fong	Skidegate, BC	
2009	January	We Are All Niche Marketers Now	Fong	Skidegate, BC	19
2009	January	Chinook Salmon Bycatch in the Pollock Fishery	Herter	Nome	33
2009	January	International Polar Year Seminar, Lee Cooper, Declining Ice and the Bering Sea Ecosystem	Herter	Nome	
2009	January	International Polar Year Seminar, Craig George, Integrating Traditional Knowledge	Herter	Nome	
2009	January	International Polar Year Seminar, Ernestine Hayes, What shall We Do with Our Histories?	Herter	Nome	
2009	January	Proposal Writing for Alaska Federation of Natives Marketplace	Reeve	Bethel	9
2009	January	Alaska Salmon Hatchery Managers Workshop, Shellfish Mariculture in Alaska: From the Farm to an Industry	RaLonde	Juneau	47
2009	February	A Sustainable Future: Fish Processing Byproducts	Peter Bechtel, Scott Smiley	Portland, OR	70
2009	February	Alaska Seas and Rivers Teacher Workshop	Pam Garcia, Linda Frame	Juneau	22
2009	February	University of Alaska TV FishBiz Workshop Series, Is Direct Marketing Right for You?	Haight, Fong	Juneau	53
2009	February	University of Alaska TV FishBiz Workshop Series, Seafood Cooperatives	Haight	Juneau	53
2009	February	University of Alaska TV FishBiz Workshop Series, Global Food Marketing	Haight, Fong	Kodiak	53
2009	February	Sanitation	Crapo	Anchorage	16
2009	February	National Oceanic and Atmospheric Administration, Marine Mammal Training	Wynne	Dakar, Senegal	35
2009	February	Hazard Analysis Critical Control Points	Crapo	Anchorage	27
2009	February	Alaska Marine Safety Education Association Drills Class	Baker	Cordova	
2009	February	Better Process Control School	Crapo	Anchorage	
2009	February	Quality Assurance, Quality Control	Crapo	Anchorage	
2009	February	Alaska Forum for the Environment, Increasing Rural Alaskans and Alaska Natives in Fisheries and Marine Science	Cullenberg	Anchorage	
2009	February	CQE Technical Support Workshop, Direct Marketing Talk	Greg Fisk	Anchorage	50
2009	February	Southwest Alaska Municipal Conference, Business Planning	Haight, Fong	Kodiak	
2009	February	International Polar Year Seminar, Lauren Dick, Antarctica Photographs	Herter	Nome	
2009	February	International Polar Year Seminar, Terrence Cole, Mutiny, Murder and Cannibalism: The Tragic Tale of A.W. Greely	Herter	Nome	
2009	February	Hatchery Managers Meeting, Alaska Private Nonprofit Salmon Aquaculture Research Initiative	RaLonde	Juneau	
2009	February	Harmful Algae Blooms Status in Alaska	RaLonde	Portland, OR	
2009	February	Hatchery Manager's Meeting, Shellfish Mariculture in Alaska	RaLonde	Juneau	
2009	February	West Coast Harmful Algae Blooms Summit, Marine Toxins in Alaska	RaLonde	Portland, OR	130
2009	March	Wakefield Symposium, Biology and Management of Exploited Crab Populations under Climate Change,	Gordon Kruse et al.	Anchorage	71
2009	March	Alaska Seas and Rivers Teacher Workshop	Katie Villano	Homer	14
2009	March	Alaska Seas and Rivers Teacher Workshop	Pam Garcia, Paula Savikko	Juneau	17
2009	March	University of Alaska TV FishBiz Workshop Series, Transferring Your Fishing Business	Haight, Rice	Juneau	53
2009	March	University of Alaska TV FishBiz Workshop Series, Lowering Your Fishing Fuel Bill	Haight	Juneau	53
2009	March	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	16
2009	March	University of Alaska TV FishBiz Workshop Series, Regional Development Associations	Haight	Juneau	53
2009	March	Iditarod Talk, Climate Change and Bering Sea Animals	Herter	Nome	

Conferences and Workshops (continued)

Year	Month	Title	Presenter/host	Location	Attendees
2009	March	Iditarod Talk, Little Diomed Blue King Crabs	Herter	Nome	
2009	March	International Polar Year Seminar, Inspiration for the Iditarod, Gay Salisbury, Leonhard Seppala	Herter	Nome	
2009	March	Survival Swimming	Herter	Nome	
2009	March	Shrimp Fishermen Exchange	Rice, Haight, Greg Fisk	Juneau, Petersburg	
2009	April	Alaska Seas and Rivers Teacher Workshop	Pam Garcia	Sitka	8
2009	April	Alaska Seas and Rivers Teacher Workshop	Pam Garcia	Kodiak	18
2009	April	Alaska Seas and Rivers Teacher Workshop	Paula Savikko	Petersburg	7
2009	April	Alaska Seas and Rivers Teacher Workshop	Paula Savikko	Haines	7
2009	April	University of Alaska TV FishBiz Workshop Series, Tracking Shellfish Farm Products and Production	Haight, RaLonde	Juneau	53
2009	April	University of Alaska TV FishBiz Workshop Series, Risk Management for a Fishing Operation	Haight	Juneau	53
2009	April	Marine Refrigeration: Troubleshooting, Maintenance and Safety	Baker, Integrated Marine Systems	Kodiak	
2009	April	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	17
2009	April	University of Alaska TV FishBiz Workshop Series, Alternative Fishing Technologies	Haight	Juneau	53
2009	May	Alaska Seas and Rivers Teacher Workshop	Katie Villano	Homer	5
2009	May	Marine Refrigeration: Troubleshooting, Maintenance and Safety	Baker, Integrated Marine Systems	Homer	
2009	May	Marine Refrigeration: Troubleshooting, Maintenance and Safety	Baker, Integrated Marine Systems	Anchorage	
2009	May	Observer Training Center, Marine Mammal Training	Wynne	Anchorage	15
2009	May	Hazard Analysis Critical Control Points	Crapo	Anchorage	2
2009	May	North Pacific Research Board, Whale Interactions with Kodiak Salmon Gillnets	Wynne	Kodiak	8
2009	May	North Pacific Research Board, Whale Interactions with Kodiak Salmon Seiners	Wynne	Kodiak	5
2009	May	Sanitation	Crapo	Anchorage	2
2009	May	Hazard Analysis Critical Control Points	Crapo	Anchorage	2
2009	May	Sanitation	Crapo	Anchorage	2
2009	June	Alaska Salmon Hatchery Managers Workshop, Research and Development for the Alaska PNP Hatchery Program	RaLonde	Juneau	51

Alaska Sea Grant Publications and Media Placement

November 2008–November 2009

TECHNICAL REPORTS

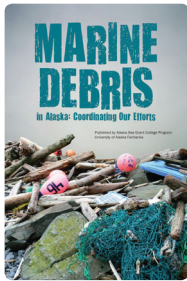
Kloff, S., E. Obot, R. Steiner, and C. Wicks. 2008. A proposed contribution to an oil and gas strategy. Policy Matters. IUCN Commission on Environmental, Economic, and Social Policy 16:58-68.

Steiner, R. 2008. Energy: Climate security 2050 goal. Policy Matters. IUCN Commission on Environmental, Economic, and Social Policy 16:218-220.

PROCEEDINGS, SYMPOSIA

Allee, B.J., ed. 2009. North Aleutian Basin Energy-Fisheries: Workshop Proceedings. Alaska Sea Grant, University of Alaska Fairbanks, AK-SG-09-03, Fairbanks. 208 pp.

Williams, M., and E. Ammann, eds. 2009. Marine Debris in Alaska: Coordinating Our Efforts. Alaska Sea Grant, University of Alaska Fairbanks, AK-SG-09-01, Fairbanks.



BROCHURES, FACT SHEETS

Alaska Seas and Rivers Informational Flyer.
 Alaska Seas and Rivers Teacher Workshop Flyer.
 Ecosystems Management Wakefield Symposium Brochure (2010).
 Northern Fishing Communities Wakefield Symposium Flyer (2011).
 King Crab General Information.
 Knauss and NOAA Fellowships Flyer.
 MAP Highlights Statewide.
 MAP Regional Highlights Bristol Bay.
 MAP Regional Highlights Kodiak/Kenai.
 MAP Regional Highlights Prince William Sound.
 MAP Regional Highlights Southeast Alaska.

PEER-REVIEWED JOURNAL ARTICLES, BOOK CHAPTERS

Bechtol, W.R., and G.H. Kruse. 2009. Analysis of a stock-recruit relationship for red king crab off Kodiak Island, Alaska. *Mar. Coastal Fish.* 1(1):29-44.

Bell, J., and R.R. Hopcroft. 2008. Assessment of Zooimage as a tool for the classification of zooplankton. *J. Plankton Res.* 30(12):1351-1367.

Costa, P.R., K.A. Baugh, B. Wright, R. RaLonde, S.L. Nance, N. Tatarenkova, S.M. Etheridge, and K.A. Lefebvre. 2009. Comparative determination of paralytic shellfish toxins (PSTs) using five different toxin detection methods in shellfish species collected in the Aleutian Islands, Alaska. *Toxicon* 54(3):313-320.

Newman, K., and A.M. Springer. 2008. Nocturnal activity by mammal-eating killer whales at a predation hot spot in the Bering Sea. *Mar. Mammal Sci.* 24(4):990-999.

Park, W., and T.C. Shirley. 2008. Development and distribution of Dungeness crab larvae in Glacier Bay and neighboring straits in southeastern Alaska: Implications for larval advection and retention. *Anim. Cells Syst.* 12:279-286.

Park, W., and T.C. Shirley. 2008. Variations of abundance and hatch timing of Dungeness crab larvae in southeastern Alaska: Implications for climate effect. *Anim. Cells Syst.* 12:287-295.

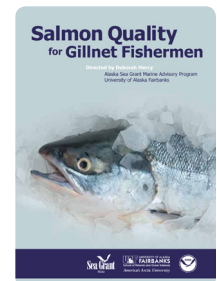
Selbie, D.T., B.P. Finney, D. Barto, L. Bunting, G. Chen, P.R. Leavitt, E.A. MacIsaac, D.E. Schindler, M.D. Shapley, and I. Gregory-Eaves. 2009. Ecological, landscape, and climatic regulation of sediment geochemistry in North American sockeye salmon nursery lakes: Insights for paleoecological salmon investigations. *Limnol. Oceanogr.* 54(5):1773-1745.

CDS, DVDS

Mercy, D., director. 2009. Salmon Quality for Gillnet Fishermen. Alaska Sea Grant Marine Advisory Program, University of Alaska Fairbanks. MAPV-66. 30 min. DVD.

Mercy, D., and J. Dzugan, directors. 2008. Trashing Your Livelihood: Marine Debris and Commercial Fishing. Alaska Marine Safety Education Association, Marine Conservation Alliance Foundation, and National Oceanic and Atmospheric Administration. MAPV-65. 16 min. DVD.

Reynolds, J.R., and H.G. Greene, eds. 2008. Marine Habitat Mapping Technology for Alaska. Alaska Sea Grant, University of Alaska Fairbanks, AK-SG-08-03, Fairbanks. 286 pp. CD-ROM.



MANUALS, GUIDES

Alaska Sea Grant. 2009. Clean Boating for Alaskans. Alaska Sea Grant, University of Alaska Fairbanks, MAB-63, Fairbanks.

Jensen, S.C., and J. Dzugan. 2009. Beating the Odds on Northern Waters: A Guide to Fishing Safety, 6th edn. Alaska Sea Grant, University of Alaska Fairbanks, MAB-41, Fairbanks.

Jorgensen, E.M. 2009. Field Guide to Squids and Octopods of the Eastern North Pacific and Bering Sea. Alaska Sea Grant, University of Alaska Fairbanks, SG-ED-65, Fairbanks.

Kramer, D., H. Herter, and A. Stoner. 2009. Handling of Fresh Crab and Crabmeat. Alaska Sea Grant, University of Alaska Fairbanks, ASG-48, Fairbanks.

Vassilenko, S.V., and V.V. Petryashov, eds. 2009. Illustrated Keys to Free-Living Invertebrates of Eurasian Arctic Seas and Adjacent Deep Waters, Vol. 1. Rotifera, Pycnogonida, Cirripedia, Leptostraca, Mysidacea, Hyperiidea, Caprellidea, Euphausiacea, Dendrobranchiata, Pleocyemata, Anomura, and Brachyura. Alaska Sea Grant, University of Alaska Fairbanks, AK-SG-09-02, Fairbanks.



ELECTRONIC PUBLICATIONS

Brownlee, M., ed. 2009. Alaska Seas and Rivers Curriculum. Alaska Sea Grant, University of Alaska Fairbanks, SG-ED-66, Fairbanks. Online. <http://seagrants.uaf.edu/marine-ed/curriculum/>

Gharrett, A.J. 2009. What Does Genetics Have to Do with It? Alaska Sea Grant, University of Alaska Fairbanks, AN-18, Fairbanks. 97 pp. Online. <http://seagrants.uaf.edu/bookstore/pubs/AN-18.html>

THESES, DISSERTATIONS

Bechtol, W.R. 2009. Abundance, recruitment, and environmental forcing of Kodiak red king crab. Ph.D. dissertation, University of Alaska Fairbanks, SGT-09-01, 205 pp.

Steiner, E. 2009. Chilean farmed salmon production forecasts and biological consequences of managing Bristol Bay sockeye salmon for economic stability. Master's thesis, University of Alaska Fairbanks, SGT-09-02, 99 pp.

NEWSLETTERS

Daly, B. 2009. News Flash. 7 issues

Haight, G., and S. Rice, eds. 2008. The Fish Entrepreneur, Vol. 2, Fall 2008. Alaska Sea Grant Marine Advisory Program, University of Alaska Fairbanks, M-92, Fairbanks. 6 pp.

Keller, S., ed. 2008-2009. Fishlines. 12 issues.



PROGRAM REPORTS

Alaska Sea Grant. 2008. Alaska Sea Grant College Program Year in Review: November 2007-November 2008. Alaska Sea Grant, University of Alaska Fairbanks, ADMIN-62, Fairbanks. 16 pp.

Alaska Sea Grant. 2009. Alaska Sea Grant College Program Strategic Plan 2009-2013. Alaska Sea Grant, AK-ADMIN-64, Fairbanks.

Alaska Sea Grant. 2009. Alaska Sea Grant Implementation Plan 2009-2013. Alaska Sea Grant, University of Alaska Fairbanks, AK-ADMIN-66, Fairbanks.

Alaska Sea Grant. 2009. Report to the University of Alaska Regents: Alaska Sea Grant Marine Advisory Program 2008-2009. Alaska Sea Grant, University of Alaska Fairbanks, AK-ADMIN-65, Fairbanks.

DIRECTORY

Alaska Sea Grant. 2009. 2009 Alaska Sea Grant Catalog. Alaska Sea Grant, University of Alaska Fairbanks, AK-ADMIN-63, Fairbanks. 48 pp.

RADIO SCRIPTS, OTHER

Alaska Sea Grant. 2009. 2010 Alaska Coastal Calendar. Alaska Sea Grant, University of Alaska Fairbanks, SG-ED-64, Fairbanks.

School of Fisheries and Ocean Sciences. 2009. Pollock Conservation Cooperative Research Center: Research Summaries 2009. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, M-93, Fairbanks.

Alaska Sea Grant Coastwise Radio Scripts

Alaska Stranding Network
Bristol Bay Local Hired as New MAP Agent
Caring for Your Catch
Cutting Fuel Costs
FishBiz: One-Stop Training for Alaska Fishermen
Invasive Species
Net Recycling
Rats!
Rebuilding King Crab
Responsible Wildlife Viewing

MEDIA PLACEMENT

Alaska Sea Grant in the news

MAP Vessel Fuel Survey Results

Sustainable Shipping News 11/19/08

Petersburg Pilot 11/27/08

Tundra Drums 12/2/08

Facing hard times, South Carolina shrimpers look to Alaska for help

IntraFish 3/6/09

Anchorage Daily News 3/6/09

SitNews 3/9/09

HaulingGearBlog 3/10/09

KFSK Sitka 3/20/09

Sea Grant publishes proceedings of Aleutian Energy-Fisheries Workshop

Bristol Bay Times 4/2/09

Commercial Fishing.org 5/25/09

Christie to lead Alaska Sea Grant

Fairbanks Daily News-Miner 7/25/09

FishRadio, 27 commercial and public radio stations 8/09

FishFactor newspaper column in 20 newspapers 8/09

Bristol Bay region welcomes local as new Marine Advisory Program agent

Bristol Bay Times 9/17/09 and other Alaska Newspapers Inc. editions

FishRadio, 27 commercial and public radio stations 9/09

FishFactor newspaper column in 20 newspapers 9/09

Wakefield Fisheries Symposium, Ecosystems 2010

Oncorhynchus (Newsletter of the Alaska Chapter, AFS)
Fall 2009

UAF seafood scientist receives international acclaim

FishRadio, 27 commercial and public radio stations 10/09

FishFactor newspaper column in 20 newspapers 10/09

CoastWise Alaska Radio: Net Recycling

SitNews 10/27/09

Alaska Newspapers, six community papers across the state 10/09

ASG News Release: Alaska's young fishermen to gather to become savvy businessmen, chart industry future

FishNewsEU 10/29/09

Alaska Newspapers, six community papers across the state 10/09

Alaska Sea Grant Awards and Honors November 2008-November 2009

RESEARCH

Stevan Phelps Memorial Award, American Fisheries Society, for 2007 published paper synthesizing several Alaska Sea Grant-funded projects: Harold Geiger, Ivan Wang, Pat Malecha, Kyle Hebert, William Smoker, and Anthony Gharrett.

EXTENSION

2009 Earl P. McFee award, Atlantic Fisheries Technology Conference, for outstanding achievements in seafood technology: Chuck Crapo.

International Association of Fish Inspectors Award, for exceptional outreach and service to the seafood industry: Chuck Crapo.

PUBLICATIONS

Outstanding Professional Skills Award in Graphic Design, Association for Communication Excellence, for cover design on *Rat Control for Alaska Waterfront Facilities*: Jen Gunderson.

Gold Award, Association for Communication Excellence, graphic design book cover category: *Rat Control for Alaska Waterfront Facilities*.

Bronze Award, Association for Communication Excellence, 1-3 color popular publication category: *Rat Control for Alaska Waterfront Facilities*.

Silver Award, Association for Communication Excellence, 4-color popular publication category: *2009 Alaska Coastal Calendar*.

First Place, 2009 National Association of Government Communicators, calendar category: *2009 Alaska Coastal Calendar*.

APEX 2009 Award of Excellence: *Marine Habitat Mapping Technology for Alaska*.

American Library Association 2008 Best Notable Government Document: *Marine Habitat Mapping Technology for Alaska*.

PHOTOGRAPH

Honorable Mention, 2008 Rarefied Light juried fine art photographic exhibit in Alaska, for photograph "Fishing for Blue Crab": Deborah Mercy.

Alaska Sea Grant Collaborative Partners

November 2008–November 2009

FEDERAL PARTNERS

Americorps
Centers for Disease Control, National Institute for Occupational Safety and Health, Commercial Fishing Safety Program
Consortium for Oceanographic Research and Education (CORE)
Department of Agriculture, Cooperative State Research, Education and Extension Service
Department of Agriculture, Trade Adjustment Assistance Program
Department of Agriculture, United States Forest Service
Department of Commerce, Pacific States Marine Fisheries Commission
Department of Education
Department of the Interior, Fish and Wildlife Service
Department of the Interior, Geological Survey
Department of the Interior, Minerals Management Service
Department of the Interior, National Park Service
Environmental Protection Agency
Exxon Valdez Trustee Council
Food and Drug Administration
National Museum of Natural History, Smithsonian Institution
National Oceanographic Partnership Program, Alaska Ocean Observing System
National Science Foundation, Alaska Native Science Commission
National Science Foundation, Arctic Research Commission of the United States
National Science Foundation, Centers for Ocean Science Education Excellence (COSEE)
NOAA Alaska Fisheries Science Center
NOAA Alaska Marine Mammal Stranding Network
NOAA Alaska Regional Marine Research Program
NOAA Coastal Ocean Program Environmental Entrepreneurship Program for Minority Serving Institutions
NOAA Fisheries
NOAA Kachemak Bay National Estuarine Research Reserve
NOAA National Ocean Service
NOAA National Tsunami Hazard Mitigation Program
NOAA Northeast Fisheries Science Center
NOAA West Coast and Alaska Tsunami Warning Center
North Pacific Fishery Management Council
North Pacific Research Board
U.S. Coast Guard

LOCAL, STATE, AND TRIBAL PARTNERS

Alaska Board of Fisheries
Alaska Commercial Fisheries Entry Commission
Alaska Commercial Fishing and Agriculture Bank
Alaska Cooperative Extension Service
Alaska Department of Commerce, Community and Economic Development, Div. of Investments and Alaska Energy Authority
Alaska Department of Education and Early Development
Alaska Department of Environmental Conservation
Alaska Department of Fish and Game
Alaska Department of Labor, Business Partnerships
Alaska Department of Natural Resources, Alaska Coastal Management Program, Div. of Alaska Coastal Zone Management
Alaska Department of Transportation
Alaska Division of Emergency Services
Alaska Division of Homeland Security and Emergency Management

Alaska Office of Boating Safety
Alaska Seafood Marketing Institute
Aleutians East Borough
Alutiiq Museum
Anchorage Economic Development Council
Anchorage School District
Bering Straits School District
Bristol Bay Borough
Chenega Corporation
City of Craig
City of Dillingham
City of Fairbanks
City of Kodiak
City of Petersburg
City of Unalaska
Clausen Memorial Museum
Cordova Chamber of Commerce
Cordova High School
CyberLynx
Dillingham Planning Commission
Fairbanks North Star Borough School District
Interior Distance Education of Alaska
Juneau Economic Development Council
Juneau School District
Ketchikan School District
Kodiak Advisory Committee
Kodiak Chamber of Commerce
Kodiak Comprehensive Economic Development Strategy
Kodiak Filipino Women's Council
Kodiak Island Borough
Lower Kuskokwim School District
Matanuska-Susitna Borough School District
Museum of the Aleutians
Native Village of Eyak
Nelson Lagoon Village
North Slope Borough
Petersburg Chamber of Commerce
Petersburg High School
Petersburg Indian Association
Port of Valdez
Pratt Museum
Prince of Wales Island Citizen's Advisory Council
Qawalangin Tribe of Unalaska
Quinhagak Village Corporation
Raven Correspondence School
Ray Stedman Elementary School, Petersburg
Sitka Tribe
The Imaginarium Science Discovery Center
Unalaska City School District
Unalaska Parks, Culture and Recreation Center
Western Regional Aquaculture Center

NGO PARTNERS

Alaska Association of Harbormasters and Port Administrators
Alaska Center for the Environment
Alaska Community Action on Toxics
Alaska Conservation Foundation
Alaska Conservation Solutions
Alaska Federation of Natives

NGO Partners (continued)

Alaska Fisheries Development Foundation
Alaska Forum for Environmental Responsibility
Alaska Geographic Association
Alaska Groundfish Data Bank
Alaska Library Association
Alaska Marine Conservation Council
Alaska Marine Mammal Stranding Network
Alaska Marine Safety Education Association
Alaska Natural Resource and Outdoor Education Association
Alaska Oceans Network
Alaska Oceans Program
Alaska Science Consortium
Alaska SeaLife Center
Alaska Small Business Development Center
Alaska Underwater Science Foundation
Alaska Wildlife Alliance
Arctic Yukon Kuskokwim Sustainable Salmon Initiative
Association for Communication Excellence
Barrow Arctic Science Consortium
Bristol Bay Native Association
Bristol Bay Science and Research Institute
Center for Alaskan Coastal Studies
Center for Marine Conservation
Central Bering Sea Fishermen's Association
Coastal Observation and Seabird Survey Team (COASST)
Cook Inletkeeper
Discovery Southeast
Ecotrust
Gulf of Alaska Coastal Communities Coalition
Kawarek
Kodiak Whalefest 2009
Marian Center (Kodiak)
Marine Conservation Alliance Foundation
National Association of Government Communicators
Northern Southeast Regional Aquaculture Association
Ocean Advocates
Oceana
Oceans Blue Program
OceansAlaska
Pacific Environment
Pacific Fisheries Technology
Petersburg Economic Development Council
Petersburg Marine Mammal Center
Pribilof Island Collaborative
Prince William Sound Keeper
Prince William Sound Regional Citizens Advisory Council
Providence Kodiak Island Counseling Center
Salmon Nation
Shipping Safety Partnership
Southeast Alaska Conservation Council
Southeast Alaska Inter-Tribal Fish and Wildlife Commission
Southeast Alaska Regional Dive Fisheries Association
Southwest Alaska Municipal Conference
The Alaska Sea Otter and Steller Sea Lion Commission
The Nature Conservancy
U.S. Wildlife Foundation
Wild Food Development Center (Cordova)
World Wildlife Fund (U.S. and Costa Rica)

INTERNATIONAL PARTNERS

Dr. Abdoulaye dJiba, Dakar, Senegal
Fisheries and Oceans Canada
Food and Agriculture Organization (United Nations)
International Pacific Halibut Commission (U.S.)
Marine Research Institute (Norway)
North Pacific Groundfish Observer Program (Russia)
North Pacific Marine Science Organization (PICES)
Northwest Atlantic Fisheries Centre (Canada)
Pacific Fisheries Research Center (Russia)
Pacific Salmon Commission
Senegal Minister of Fisheries

INDUSTRY/BUSINESS PARTNERS

Al-Lou's Fish
Alaska Aqua Farms
Alaska Blue Harvest Seafoods
Alaska Charter Association
Alaska Crab Coalition
Alaska Draggers Association
Alaska Fresh
Alaska Independent Tenderman's Association
Alaska Shellfish Growers Association
Alaska Tide Book Company
Aleut Corporation
Aleutian Pribilof Island Association
Aleutian Pribilof Island Community Development Association
Alutiiq Pride Shellfish Hatchery
Amazon booksellers
American Fisheries Society
At-sea Processors Association
Barnes and Noble booksellers
Bering Sea Fishermen's Association
Blue Starr Oyster Co
Boat U.S.
BP
Bristol Bay Economic Development Corporation
Bristol Bay Regional Seafood Development Association
Calendar Club, LLC
Calista Corporation
Coastal Cold Storage, Inc.
Coastal Villages Region Fund (Western Alaska CDQ)
Consortium for Ocean Leadership
Cook Inlet Aquaculture Association
Cook Inlet Books
Cook Inlet Salmon Branding
Copper River Fine Seafoods
Cordova District Fishermen United
Cross Sound Marketing Association
Dancing Salmon Fisheries
Digital Observer, Inc.
Diversified Communications
Douglas Island Pink and Chum Inc.
EDAW Inc.
Englund Marine Supply Fish Expo Inc.
Enviro-Pak Smoking Ovens
Favco Seafood
Fleet Refrigeration

Gastineau Guiding Service
Graystar Pacific Seafood Ltd.
Great Alaskan Seafood Company
Hearthside Books
Hydroacoustic Technology, Inc.
Iceberg Seafood Company
Icicle Seafoods Inc.
Indian Valley Meats
Integrated Marine Systems
International Seafood of Alaska Inc.
Joma Wild Seafoods
Joycraft Marine Safety Equipment
Kachemak Bay Gear Shed
Kachemak Shellfish Mariculture Association
Kanektok River Adventures
Kenai River Professional Guide Association
Kenai River Sportfishing Association
Kenai Wild
Kodiak ComFish Alaska
Kodiak Fish Company
Kruzof Fisheries LLC
Laine Welch, Alaska Fisheries Report
LGL Limited
Lofoten Fish Company
Made in Alaska
McDowell Group
Mikunda, Cottrell & Co.
National Fishermen Magazine
National Food Products Association
National Shellfisheries Association
New Bedford Seafood Consulting
New England Trawl Systems
North Pacific Processors Inc.
Northern Economics Inc.
Northern Southeast Salmon Regional Aquaculture Association
Norton Sound Economic Development Corporation
Ocean Beauty Seafoods Inc.
Olga-Moser Bay Seafood Producers Alliance
Orca Book and Sound
Pacific Seafood Processors Association
Pacific Star Seafoods
Petersburg Vessel Owners Association
Polaris Strategic Consulting (M. Matthews)
Prince of Wales Island Community Holding Corporation
Prince William Sound Aquaculture Corporation
Prince William Sound Marketing Association
Prince William Sound Regional Seafood Development Association
Princess Tours
PURAC America Inc.
Resource Analysts International
Resource Decision Support (M. Merritt)
Royal Dutch Shell Oil Co.
Sea Crest Seafood Market Developers
SeaFisk Consulting
Seafood Business Magazine
Seafood HACCP Alliance
Silver Lining Seafood
Sitka Sound Seafoods
Sloth Boatworks
SnoPac
Solomon Gulch Hatchery
Sound Metrics Corp.
Southeast Alaska Fishermen's Alliance (SEAFA)
Southeast Alaska Seiners Association
Stellar Financial Services, Juneau
Taku Smokeries

TDX Corporation
Trident Seafoods
Trillium Technology Solutions, LLC
Unalaska Native Fisherman Association
UniSea Inc.
United Catcher Boats
United Fishermen of Alaska
United Fishermen's Marketing Association
United Southeast Alaska Gillnetters Association
West Marine
Westward Seafoods
Wild Salmon Direct
Wrangell Insurance Center
Yukon Delta Fisheries Development Association
Yukon River Drainage Fisheries Association

ACADEMIC INSTITUTION PARTNERS

Alaska Vocational Technical Education Center
Bodø University (Norway)
California State University
Clatsop Community College
Clemson University
Colegio de Biologos de Costa Rica
Hatfield Marine Science Center
Hiram College, Ohio
Iowa State University, Farmers Transition Center
Kenai Peninsula College
Louisiana State University
Monterey Bay Aquarium
Northwestern Alaska Career and Technical Center
Oregon Coast Aquarium
Oregon State University
Prince William Sound Community College
Prince William Sound Science Center
Russian Academy of Sciences, Zoological Institute (Russia)
Scripps Institution of Oceanography
Seattle Aquarium
UAF Pollock Conservation Cooperative Research Center
University of Alaska Anchorage
University of Alaska Fairbanks
University of Alaska Press
University of Alaska Southeast
University of Hawaii
University of Massachusetts
University of Minnesota
University of Puget Sound
University of Washington
Utah State University
Virginia Institute of Marine Science
Washington State University Extension
Western Washington University
Woods Hole Oceanographic Institution

SG PROGRAM PARTNERS

California Sea Grant
Hawaii Sea Grant
National Sea Grant Law Center
Oregon Sea Grant
Rhode Island Sea Grant
Texas A&M Sea Grant
South Carolina Sea Grant
Washington Sea Grant
Virginia Sea Grant

Alaska Sea Grant Directory

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