



**Alaska Sea Grant
College Program**

**Biennial Report
2002-2004**

Alaska Sea Grant College Program

Biennial Report

February 1, 2002, to January 31, 2004



Alaska Sea Grant College Program University of Alaska Fairbanks

PO Box 755040
205 O'Neill Bldg.
Fairbanks, Alaska 99775-5040

phone (907) 474-7086
fax (907) 474-6285

www.uaf.edu/seagrant

The Alaska Sea Grant College Program is supported by the U.S. Department of Commerce, NOAA National Sea Grant College Program, grant no. NA16RG2321; and by the University of Alaska Fairbanks with state funds. AK-ADMIN-44.

Written by Doug Schneider, design by Dave Partee,
editing by Kurt Byers and Sue Keller.





Contents

From the Director	2
A Land Facing the Sea	4
Serving an Enterprise That Serves the World	6
Alaska Fisheries Extension Enhancement	6
Managing salmon fisheries for quality	7
Making the grade.....	8
Maintaining salmon quality aboard fishing vessels and on shore	10
Discovery and Communication Sustain Coastal Resources	11
Time traveler	11
Meeting of the minds	13
Ultimate whale watching	15
Advisors, Researchers Engage the Grassroots	17
Hope on the half shell.....	17
Science gets a helping hand	20
A trade adjustment	22
Teachable moments.....	24
Investment in Students Yields Big Returns	26
Information Empowers Alaskans	28
Region of wonders	29
Bringing science to the airwaves	30
Setting Sail	31
Alaska Sea Grant charts its future.....	31
The Rest of the Story	32
Supported projects	32
Publications and videos	33
Media	35
Symposia and workshops.....	35
Student support	37
Sea Grant program activity funding for 2002 and 2003	38
Awards and honors	39
Photo credits.....	40

From the Director



For thirty-three years, the Alaska Sea Grant College Program has helped fishermen, resource managers, visitors, and residents understand, conserve, and wisely use Alaska's bountiful marine resources. We've done this through a program of research, education, Marine Advisory activities, and information transfer to our constituents across the state.

As a result, Alaska Sea Grant has helped the state in significant, measurable, and beneficial ways. For example, we helped the state's seafood industry develop new processing methods and we provided training to processing plant workers, fishermen, and entrepreneurs that has made the industry more efficient and resulted in better, safer seafood for the consumer. Our targeted research and scientific symposia have improved fishery management and led to a greater understanding of our marine ecosystem. Alaska Sea Grant has supported dozens of graduate students who have gone on to work for resource management agencies. We've also raised awareness and understanding of marine issues with the publication of books, pamphlets, posters, and videos, as well as television programs, a radio news service, and magazine and newspaper articles.

Today, our commitment is as strong as ever to helping Alaska create a sustainable, productive, and diverse coastal economy while conserving its marine resources. In this report, we highlight efforts to achieve this overarching mission during the past two years. In this period, Alaska Sea Grant-supported scientists and graduate students, Marine Advisory Program agents and specialists, and communicators—together with a host of collaborating partners—have achieved specific noteworthy results. Among them:



- Fishery managers are now better able to monitor and regulate Alaska's critical fisheries because of our research on pollock, rockfish, salmon, and halibut.
- Fishermen facing hard times due to a collapse of the state's salmon market are better prepared for the future because of a series of statewide workshops we held on industry restructuring, independent marketing, business management, and the future of salmon runs.
- The quality of Alaska seafood is better because of our research that has improved refrigerated seawater systems on fishing vessels.
- Hundreds of seafood processing workers operate more safely and efficiently because of statewide training workshops we conducted on seafood quality, safety, sanitation, and refrigeration.
- Seafood entrepreneurs have a leg up on their competition, thanks to a technical assistance program we operated.
- Scientists are better able to manage marine mammals thanks to a training and education program we conducted that trained coastal residents, sport fishermen, commercial fishermen, pilots, subsistence harvesters, the U.S. Coast Guard, and federal fishery observers to report marine mammal sightings and strandings.
- The public is better informed about current marine resource issues because of a series of pertinent and timely television panel discussions we produced that aired across Alaska.
- Southeast Alaska communities are diversifying their economies with shellfish aquaculture as a result of hands-on technical assistance we provided.

- Hundreds of scientists and resource managers are better informed about advances in scientific discovery because of our internationally recognized Lowell Wakefield Fisheries Symposium series.
- Thousands of individuals are better informed about the marine environment thanks to the new books, brochures, posters, videos, and a weekly science radio program we produced and distributed.

Administratively, Alaska Sea Grant has successfully met several challenges during the past two years. I have formed an internal management team that has improved coordination of Alaska Sea Grant and Marine Advisory Program activities. I also established an external advisory committee to provide oversight and guidance as we develop a new strategic plan to reflect our commitment to meet state and national priorities through 2010. The advisory committee consists of 28 individuals with expertise in business, resource management, policy, and resource use. Following a series of meetings with the advisory committee as well as with marine stakeholder groups, researchers, and other interested parties, and after evaluating the responses from our statewide survey, I anticipate the new strategic plan will be completed by the winter of 2004.

Today, Alaska Sea Grant looks forward to a future filled with new discoveries, partnerships, and collaborations that will benefit Alaska's economy and people, while they are wisely using our abundant marine resources.



Brian Allee, Ph.D.
 Director
 Alaska Sea Grant College Program

A Land Facing the Sea

Thousands of years ago—scholars debate just how long ago—the first wave of humans walked from Siberia across a narrow, dry steppe into the unexplored, uninhabited continent of North America.

Following the coast and inland waterways, these intrepid first immigrants and later waves of descendants fanned out across the land. Likely, they came in search of food, following game herds. In time they would establish distinct cultures, languages, and traditions all the way to the tip of South America.

Some of these travelers ended up in the Aleutian Islands, and found the place to their liking. Their descendants called the land “aláxsxaq,” an Aleut word that refers to an object toward which the sea is directed.* Today, it is pronounced simply “Alaska,” but its meaning has not changed. Alaska and its people remain rooted in an enduring relationship with the sea.

For millennia, these first immigrants had Alaska to themselves. But by the 1700s, another wave of humans, this one seeking not food but riches, was poised to venture eastward from the Old World. They would not come on foot by land,

since rising sea levels had long since covered the land bridge. Instead they came on wooden ships rigged with sail and armed with cannon.

Danish sea captain Vitus Bering was in charge of the 1741 Russian-financed expedition to search for new lands and gold for Czar Peter the Great. While little gold was found, rafts of sea otters and fur seals stretched to the horizon. Whales—right, gray, minke, and others by the tens of thousands—crowded the coastal seas. Aboard the ship was naturalist Georg Wilhelm Steller. More interested in science than in riches, Steller was the first European to observe and make notes and drawings of the flora and fauna of the region. Animals such as the Steller’s sea cow, Steller sea lion, Steller’s jay, and Steller’s sea eagle are species named in his honor. Steller also has the distinction of being the first European to set foot on Alaska, at a place now called Kayak Island in Prince William Sound. His arrival on North American soil coincided with the beginning of an unprecedented period of social, political, religious, and economic transformation that continues to this day.

For more than a century, the Russians controlled Alaska from Sitka, a coastal fort tucked among the towering trees in the territory’s southeast island archipelago. Russian traders plied the coast, buying furs from Tlingit, Tsimshian, and Haida Natives, while Russian Orthodox priests paddled up rivers to “civilize” Athabascan Indian villages deep inside the vast interior. Today, many Alaska Natives still practice the Russian Orthodox religion.

In 1867, another transformation began. The United States purchased Alaska’s 570,374 square miles of



territory for a mere two cents an acre. At the time, many in the United States called Alaska an endless wasteland and the purchase a colossal waste. U.S. Secretary of State William H. Seward negotiated the deal that quickly earned the nickname “Seward’s Folly.” Other catchy nicknames of the day: Seward’s Icebox, Icebergia, Polaria, and Walrussia.

But Alaska has proven to be nothing like a wasteland. The state’s bountiful seas have produced unfathomable numbers of fish, crabs, and other high-value seafood. Abundant supplies of natural gas and oil pumped from the coastal zone have put billions of dollars into state and federal coffers.

Alaska’s coastal forests have provided billions of board feet of valuable timber, as well as paper, plywood, and other forest products. And let’s not forget the gold, silver, copper, iron, and other

In 2002, Alaska led all states in seafood volume landed with 5.1 billion pounds of seafood harvested from its waters.

ores wrought from the land; these alone have far exceeded the land’s purchase price.

Today, Alaska’s three largest industries—commercial fishing, oil and gas, and tourism—all are tied to the sea. In 2002, Alaska led all states in seafood volume landed with 5.1 billion pounds of seafood harvested from its waters. The next closest state was Louisiana with 1.3 billion pounds landed. Alaska also came out on top in the value of its landings. Seafood harvested in Alaska waters in 2002 pumped about \$3 billion into the state’s economy and another \$1.6 billion into the national economy. About 25,000 Alaskans made their living directly from the seafood industry in 2001, the latest year in which such numbers have been compiled. Another 12,000 were employed indirectly by the seafood

industry. The seafood industry is the state’s largest employer, albeit many of the jobs are seasonal.

The very first oil claims were staked in Cook Inlet in 1891. Today, oil and gas still flow from the inlet, as well as from more famous production facilities at Prudhoe Bay, along the Arctic coast. From there, an 800-mile-long pipeline transports roughly five per-



cent of the nation’s daily oil needs to the ice-free seaport in Valdez. Massive tankers then carry the oil to markets in the Lower 48. While not among the state’s largest employers, the oil and gas industry is the largest contributor of revenue to the state treasury. In 2002, Alaska received \$1.68 billion in royalties and taxes from oil and gas resources. About 80 percent of the state’s annual budget comes from the oil industry.

Tourism, much of it focused along the coast, plays a major role in Alaska’s economy. Dozens of cruise ships ply Alaska’s coastal waters each year, carrying nearly 600,000 visitors to the state to see whales, bears, mountains, and glaciers up close. Altogether, 1.5 million visitors came to Alaska in 2002, more than twice the state’s resident population. And they spent a lot of money. They left behind more than \$1.8 billion in the state’s economy.

It is in this setting that Alaska Sea Grant seeks to help ensure Alaska’s prosperity while conserving its important natural resources. ◆

* The word *Alaska* is sometimes loosely translated as the “great land.” It was used by the Russians to refer only to the Alaska Peninsula, but was used by the U.S. government to refer to the entire territory after its purchase in 1867. Source: Shearer, Benjamin F., and Barbara S. Shearer, 2001, *State Names, Seals, Flags and Symbols*, Greenwood Press, Westport, Connecticut.

Serving an Enterprise That Serves the World

WISER UTILIZATION OF FISHERIES

Alaska Fisheries Extension Enhancement

Workshops on change in the Alaska salmon industry

In recent years, Alaska's once globally dominant salmon industry has been more bust than boom. This hasn't been the result of low salmon returns. In fact, across the state most salmon runs have been healthy. The hard times Alaska salmon fishermen face are the result of a global increase and availability of imported farmed salmon.

With Alaska's salmon industry at a critical crossroad, the Marine Advisory Program during 2002 and 2003 organized and hosted a "Tools for the Salmon Industry" workshop series on several topics. Four statewide workshops were held

that addressed salmon industry restructuring, marketing and quality, and the future of Alaska's salmon stocks. The workshop on industry restructuring was repeated during the 2003 Fish Expo Trade show in Seattle, Washington. Speakers during this two-day workshop discussed the potential to increase the value of the fishery through buybacks, cooperatives, quota shares, and new gear types. The workshop series received excellent evaluations, and was attended by more than 150 people from forty communities in Alaska. The workshops also received print and radio press coverage. Alaska Sea Grant communicators participated by setting up a Web site devoted to the workshops and distributing information to the press. ♦

Results by design

The projects, activities, and accomplishments described in this report are rooted within a strategic plan that focuses our strengths in university-based applied research and education, as well as information transfer and Marine Advisory Program activities, on the pressing needs of Alaska and the nation.

The National Sea Grant Program encourages the development of strong programmatic themes that focus individual state program strengths in research, education, marine extension, and communication efforts on emerging issues. In this report, Alaska Sea Grant has directed these programmatic resources toward four priority regional issues:

1. **Impacts on salmon**—assisting fishermen, seafood processors, and resource managers affected by the economic downturn of the state's once-dominant wild salmon fishery.
2. **Wiser utilization of fisheries**—developing new seafood markets for underutilized fisheries, and tools that more wisely use currently harvested fisheries.
3. **Marine environmental issues**—addressing marine environmental issues that could potentially affect the lifestyle and employment of coastal citizens.
4. **Economic diversification**—diversifying the economic base of coastal communities dependent on commercial fisheries.





IMPACTS ON SALMON

Managing salmon fisheries for quality

Many of Alaska's commercial fisheries are managed as terminal fisheries. That is, managers allow fishermen to catch salmon close to hatcheries or to the spawning grounds. This strategy helps assure that only targeted salmon stocks are caught. But fish harvested near hatcheries or spawning grounds often are of reduced quality because they have matured more than if they were caught days earlier and farther out to sea.

Recognizing the need to improve the quality of Alaska's salmon, fisheries managers in Prince William Sound and Kodiak began conducting some fisheries farther from their terminus. To see if quality improved as a result of the management approach, researchers collected pink salmon during three summers in Prince William Sound and Kodiak. The fish were evaluated for quality through the season and then correlated with fishery management decisions (such as open

and closed areas) to determine the effects of management decisions on fish quality.

"We saw differences in the salmon," said Chuck Crapo, professor of seafood technology at the University of Alaska Fairbanks. "The salmon caught farther away had brighter skin, better meat color and firmness. They had better texture and a lot more protein and less water. Their overall quality was much better, as one might expect."

Crapo presented preliminary results at the Pacific Fisheries Technologists Meeting in 2000.

While fishermen didn't receive a better price for their improved product, they were able to continue fishing since processors typically would have stopped buying the salmon once they became too mature. ♦

WISER UTILIZATION OF FISHERIES

Making the grade

MAP helps seafood industry reinvent itself amid hard times

Low prices for Alaska wild salmon and competition from salmon farmed in other countries have cut a wide swath through Alaska's fishing towns. Large corporate seafood processing plants have scaled back or closed, forcing fishermen to fold up or look

elsewhere to sell their catch. But Alaskans are fighting back. Small upstart fish processors and fishermen who want to turn their catch into innovative new products and market the products themselves hold the promise of a rebirth for Alaska's salmon industry.

But while Alaskans have lots of ideas, they need technical help. It's not as easy as smoking salmon in the backyard and hawking it to tourists from a roadside stand. There are myriad state and federal regulations to contend with. Meeting the regulations requires that processors conduct their operations in ways that ensure a clean, wholesome product will reach the consumer.

That's where experts like Don Kramer and Chuck Crapo come in. Kramer and Crapo are seafood quality specialists with the Marine Advisory Program. For decades, the two have traveled the state teaching fishermen and seafood processors how to produce high-quality seafood that meets state and national standards. It's a job Crapo says keeps him on his toes, especially as the industry undergoes a dramatic shift from large corporate-dominated seafood companies to smaller businesses that make value-added specialty products from Alaska's abundant salmon.

"What we're seeing in the industry is that everyone wants more and more information, whether it's regulators, buyers, fishermen, or entrepreneurs," said Crapo. "In many cases they don't have the time or technical expertise to answer some of the questions. I've always felt that Alaska Sea Grant has a role in assisting these people who are trying to develop small seafood businesses around the state."

Each year, Kramer and Crapo come to Indian Valley Meat Company just outside Anchorage to teach seafood quality courses to people who have come from the far reaches of the state. For Kramer, Indian Valley Meats is a short trip down the road from his Anchorage office—an easy gig compared to where he goes most of the time. One week might find him training seafood processor workers in the tiny Alaska Native village of Hooper Bay, where the community has rights to harvest halibut from small boats in nearshore waters. The next week, Kramer might be in the Southeast Alaska community of Wrangell teaching fishermen about quality control or showing a





group of entrepreneurs about the latest canning methods.

“I just got back from Naknek, a village in Bristol Bay, where I taught a seafood processing class,” said Kramer. “And right now, MAP is partnering with Prince William Sound Community College in Valdez where we’ve trained 100 people in Valdez, Cordova, and Wrangell. And I just finished one class in King Salmon and there’s another one coming up in Kenai. It’s been very successful.”

“We could not have been successful had it not been for the university’s Marine Advisory Program. We lacked people with the understanding of proper quality control practices. They had that.”

*Doug Drum, owner of
Indian Valley Meats*

Doug Drum, owner of Indian Valley Meats, said Don Kramer and Chuck Crapo are among the unsung heroes helping Alaska’s seafood industry reinvent itself.

“We could not have been successful had it not been for the university’s Marine Advisory Program,” said Drum. “We had the basics of how to do things, but what we lacked was people with the understanding of proper quality control practices. They had that.”

From small beginnings, Indian Valley Meats is now one of Alaska’s largest and most creative value-added seafood processors. Business is booming, but Doug Drum says the market is huge. The U.S. market for value-added products

made from salmon has quadrupled in the past two years, to more than 20 million pounds a year. To help more Alaskans take advantage of the shift to value-added processing, he’s established his own seafood processing school. Each year, dozens of fishermen from across the state, as well as entrepreneurs hoping to start a new company, take the courses offered at the school. Kramer and Crapo come in for several days to provide instruction on hazard analysis and critical control point (HACCP) methods, sanitation, quality control, quality assurance, and other issues.

“This is the most important time for people like Chuck and Don to be helping the industry, because we can no longer sell fish the way we as an industry have been,” said Drum. “The focus has to be quality and value-added, and MAP emphasizes that.”

Kramer and Crapo have trained more than 1,200 people in HACCP and sanitation since starting the program in 1996. Their presence at this critical time in the industry’s evolution offers hope that Alaska’s fishing communities will survive and prosper amid ever-changing global pressures.

“There’s a movement toward a wider variety of products, products that are more processed than simply headed and gutted,” said Kramer. “This shift toward innovative products, new packaging, and attention to quality will continue. Producing high-quality fish in a variety of products is the direction the industry is going. And we’re glad to be a part of that.” ♦



IMPACTS ON SALMON

Maintaining salmon quality aboard fishing vessels and on shore

Sometimes the tried and true methods really are the best. Take preserving the quality of freshly caught salmon for example. MAP seafood quality specialist Chuck Crapo evaluated some methods that are promoted to improve the quality of salmon held in refrigerated seawater (RSW) systems. Several options were tested, including partial water removal, treatment with acid, treatment with acidified sodium chlorite, treatment with chlorine dioxide, and treatment with chlorine.

“We looked at a number of additives and techniques to reduce the amount of bacterial growth in fish holds using RSW systems to see if we could extend the quality of fish a bit,” explained Crapo. “They all improved the shelf-life of salmon, but only marginally.”

Turns out, good old-fashioned cleanliness proved the best method of all. Crapo said cleaning and sanitizing fish holds after every delivery slowed bacterial growth most effectively.

“I think it boils down to having a decent sanitation program onboard,” said Crapo. “Thoroughly cleaning and sanitizing the holds and equipment is key. Trying to make up for inadequacies in cleanliness by adding stuff to the system doesn’t work very well.”

Beyond attention to cleaning details, Crapo said a diluted solution of chlorine bleach in the RSW system depressed bacterial growth and improved quality. An article on this research has been submitted to the *Journal of Aquatic Food Products Technology*. ♦



Discovery and Communication Sustain Coastal Resources

Time traveler

Scientists study lake sediments to glimpse ancient salmon runs

It's a drama that plays out each summer across Alaska. Wild adult Pacific salmon return from the sea to their freshwater birthplaces to spawn and then die. In death, they ensure the survival of their own and many other species. The rotting carcasses of millions of salmon release nutrients into Alaska's streams and lakes that nourish the next generation of salmon, and in turn perpetuate a cycle unbroken for thousands of years. The most important component of these nutrients is nitrogen. Freshwater lakes and rivers throughout Alaska are traditionally nitrogen poor. But when salmon die, they infuse a generous supply of this life-giving element into the environment.

In a study funded by Alaska Sea Grant, scientist Bruce Finney of the University of Alaska Fairbanks Institute of Marine Science set out to measure a tracer of marine nitrogen called nitrogen 15, an isotope elevated in salmon that have spent time in the ocean. Finney believed that concentrations of marine nitrogen ($\delta^{15}\text{N}$) trapped in the sediments of freshwater lakebeds where salmon spawned and died could be used to estimate the size of salmon runs going back thousands of years. His findings have had a profound impact on both our understanding of why salmon runs fluctuate and how salmon fisheries are managed today.

Finney began his work by measuring the amount of marine nitrogen trapped within layers of sediment cored from the bottom of several sockeye salmon nursery lakes in Southwest Alaska. The concentration of $\delta^{15}\text{N}$ within these layers is an indication of the relative size of past salmon runs. Lots of $\delta^{15}\text{N}$ within sediment layers indicate a large salmon return, for example. By using various methods, including matching layers of volcanic ash to dates of known eruptions, Finney was able to date the sediment layers and



by extension estimate the year of the salmon run. It soon became clear that salmon run size fluctuated across the decades, and there seemed to be a pattern to the fluctuation. To estimate when the runs occurred, Finney examined known climate events that had occurred across the North Pacific during the past several hundred years, and found a correlation.

“The patterns of salmon abundance revealed within the lake sediments we studied corresponded to climate change events, such as warming and cooling periods, that we know occurred,” said Finney. “That’s consistent with the belief that climatic and oceanographic changes are driving the sockeye populations up and down in sync over decades-long time scales.”

The study was originally aimed at understanding the role of climate in shaping salmon runs. But the research has had important practical benefits as well. In some cases, researchers learned that certain systems once supported much larger numbers of salmon than they do



“The patterns of salmon abundance are consistent with the belief that climatic and oceanographic changes are driving the sockeye populations up and down in sync over decades-long time scales.”

*Bruce Finney, Professor, University of Alaska Fairbanks
Institute of Marine Science*

today. Armed with this information, fishery managers have been able to boost salmon escapement into these rivers and lakes.

After proving their techniques could accurately reconstruct salmon runs going back several centuries, Finney went on to reconstruct salmon runs going back 2,000 years. Today, this study is heralded as important to our understanding of some of the factors that impact salmon abundance, and is helping scientists better predict how salmon stocks might respond to accelerated present-day climate warming. Such information is critical to fishery managers in a state where salmon fishing is important for commercial, sport, and subsistence interests.

Articles on this research have appeared in several distinguished scientific journals, most notably *Science* and *Nature*. This study also received state and national media attention following a news release issued by the Alaska Sea Grant communications office. And although the study is officially complete, additional scientific breakthroughs continue. In mid-2003, researchers used sediment cores originally collected for this study to assess the transport by salmon of marine-derived PCBs into subarctic freshwater systems. This important study received national media attention following its publication in the journal *Nature*.

This project supported master’s degree student Jon Sweetman, who is now working on his doctorate research at Canada’s Queen’s University in the study of contaminants transported into Alaska by salmon.

The success of this work has led to additional projects aimed at further understanding the importance of marine-derived nutrients to the success of sockeye salmon returns. In a related Alaska Sea Grant project, Milo Adkison and Bruce Finney used these techniques to study the importance of salmon-derived nutrients to the productivity of thirty-three additional wild sockeye salmon–producing systems in Alaska. In this project, scientists were determined to learn what nutrients these systems need for optimum salmon production. So far, they have constructed preliminary models that represent the influence of sockeye salmon–derived nutrients on the production of future salmon stocks.

Researchers also have taken sediment core samples from the bottom of twelve sockeye salmon nursery lakes to measure concentrations of marine nitrogen and relate them to known salmon escapement. From the records, researchers will be able to reconstruct salmon runs back in time to determine the long-term capability of these systems to produce sockeye salmon.

Finally, sockeye salmon smolts from thirty lakes have been analyzed to understand the importance of marine-derived nutrients relative to terrestrial sources of nutrients. Master’s degree student Tadayasu Uchiyama began work on this project in January 2003. ♦

Meeting of the minds

Wakefield Fisheries symposia bring scientists together

On a recent crisp, late fall Alaska morning, small groups of scientists stood—coffee and pastries in hand—talking among themselves as they waited for the conference to start.

The scientists, some 112 in all, had come from across the state and around the world to learn about one of the hottest topics in modern-day fisheries management: how to sustainably harvest species about which there is very little information. “Assessment and Management of New and Developed Fisheries in Data-Limited Situations” was the official name of the conference held in October 2003. But to most of the scientists, the gathering was perhaps better known as the 21st Lowell Wakefield Fisheries Symposium.



The symposia began auspiciously in 1982, when Alaska Sea Grant named a scientific symposium series after Lowell Wakefield, founder of the Alaska king crab industry (see sidebar, page 14). In a recent interview, Lowell’s widow, Frankie, said the science symposium series has been a fitting legacy to her late husband.

“Lowell was very concerned that red king crab not be overfished and that the quality of the harvest be maintained,” Frankie said. “When Sea Grant said they wanted to create a symposium series and name it after Lowell, I was thrilled.



It has taken off and has become tremendously successful.”

Since the first symposium more than two decades ago, scientists have met annually to discuss the pressing scientific issues surrounding Alaska’s marine ecosystem. Gordon Kruse is the University of Alaska President’s Professor of Fisheries. At several times in his career, Kruse has been either in the audience, on the podium, or backstage helping to organize many of the Lowell Wakefield symposia. And for nearly two decades, Kruse has been one of the series’ biggest fans.

“The Lowell Wakefield symposia are unique in the world, with features that distance them from other large scientific meetings,” said Kruse. “The symposia attract people from around the globe on topics of interest to Alaska. That’s the real beauty. We bring people with all this expertise into Alaska. It gives us a chance to showcase what we’ve been doing on these topics and it allows us to

hear about the advances of others on the issues relevant to Alaska.”

Kruse said each Wakefield symposium attracts different people. One meeting might be devoted to flatfishes, while the next might focus on forage fishes or fish genetics. Still others are more broadly oriented, such as the 1998 groundbreaking meeting on incorporating ecosystem issues into fisheries management, or the 1999 conference on spatial processes and management of marine populations.

“The trend for the Wakefield series is to conduct symposia that offer a nice mix of important species and cutting-edge themes,” said Kruse. “It’s a strategy that has helped the series rank quite highly among scientists around the world.”

In 2000, Frankie Wakefield endowed the symposium series with a \$100,000 gift. A portion of the interest earnings of the endowment is used to offset the costs of conducting the series, as well as to assist with foreign participant travel to the meetings.

“Hundreds of scientists and students have had the opportunity to meet and exchange ideas and research results on a great range of important topics,” said Sherri Pristash, Alaska Sea Grant’s conference coordinator. “There’s no doubt that the Wakefield symposia have been important vehicles for improving the way Alaska manages its fisheries.”

The next Lowell Wakefield Symposium, the 22nd, is scheduled for October 2004 and will tackle “Sea Lions of the World: Conservation and Research in the 21st Century.” About 150 scientists are expected to attend. Two more symposia are on the calendar; the first, “Biology, Assessment, and Management of Pacific Rockfishes,” will occur in 2005. This symposium is being held in conjunction with the American Fisheries Society annual meeting in Anchorage. In 2006, scientists will gather for the 24th Lowell Wakefield Symposium: “Resiliency of Gadid Stocks to Fishing and Climate Change.” ♦

Lowell Wakefield: Fisheries pioneer, scientific visionary

More than any other single individual, Lowell Wakefield pioneered and modernized Alaska’s king crab fishery. That’s according to all who knew him, but also well documented by historian Mansel G. Blackford.

According to Blackford, Lowell Wakefield knew a good business opportunity when he saw it. Just after World War II he saw the rising king crab catches in the Bering Sea, and decided to join the fray. Beginning in 1945 with just one ship, Wakefield started Wakefield Seafoods, Inc. The first years were an endurance test like those of any new business trying to stay afloat. But by 1953, his business was on solid footing and poised for greatness.

The mid-1960s through the 1970s brought Alaska its latest gold rush. But this boom had nothing to do with yellow gold. This gold rush was red, as in red king crab. Red king crab were so abundant that it seemed like some sort of locust plague on the bottom of the sea. It was a bounty Alaska fishermen harvested with vengeance. And Lowell Wakefield was ready for it. The decade spanning 1953 to 1963 found Wakefield Seafoods operating catcher ships at sea and processing plants on shore.

To stand out from the competition, Wakefield adopted modern catching and processing technologies, and called for increased attention to consumer quality. The effort paid off. By the mid-1960s, Wakefield Seafood’s annual sales topped \$10 million. The company was among Alaska’s largest seafood firms. Lowell Wakefield used his position to urge industry reform. He called for quality standards and increased scientific studies aimed at improving fisheries management.

Yet as quickly as Wakefield Seafoods rose, both the crab fishery and the business faltered. As crab stocks dwindled, the company attempted to diversify its products. But the move wasn’t successful, and in 1968 Wakefield was forced to sell his company to a competitor.

While Wakefield Seafoods wasn’t to last, Wakefield’s legacy has stood the test of time. Throughout the rest of his life, he continued to urge better stewardship of Alaska’s fisheries by both managers and fishermen. He helped draft fishing regulations for Alaska waters and international agreements for the high seas. Toward the end of his life, he joined the faculty of the University of Alaska as an adjunct professor of fisheries, where he influenced the early directions of the university’s Sea Grant Program.

MARINE ENVIRONMENTAL ISSUES

Ultimate whale watching

Learning more about Alaska whales may help fishermen reduce encounters

Janet Doherty has a life some people might envy. As a biological technician with the National Park Service, Doherty spends her days in a small open boat in Alaska's Glacier Bay National Park. Here she keeps vigil on humpback whales as they swim, feed, and sometimes leap into the air. During the summer of 2003, Doherty identified more than 60 individual whales.

"We've had what I think is probably going to be a record number of whales in Glacier Bay," Doherty said. "Every time we go out it just seems like we're surrounded by these animals. It's really neat."

Humpback whales come to Glacier Bay's deep, icy-cold waters to feast on the catch of the day—teeming schools of juvenile pollock, herring, sandlance, and capelin. But it's not only whales that come to Glacier Bay. Dozens of cruise ships bring tens of thousands of tourists each summer to see the park's towering mountains, majestic tidewater glaciers, pristine fjords, and of course

humpback whales. Between the whales, the cruise ships, and other vessels in the park, the place can get pretty crowded. It's Doherty's job to make sure the whales have plenty of room.

"For the Park Service I'm monitoring the whale population, trying to learn who's around, how many are there, and where they are," Doherty said. "We do that by taking a location, latitude and longitude, off a global positioning system, and then we also take photographs to identify it as an individual."

Janet Doherty also is an Alaska Sea Grant-funded graduate student. In 2003 she received seed money from Alaska Sea Grant to assess how many whales within the park have at one time or another during their long lives been entangled in commercial fishing nets.

"I'm trying to discover how frequently that's happening by looking at scarring patterns on the bodies of humpback whales, mostly around the tail," Doherty explained. "The gear usually leaves injuries, and those injuries scar up. The scars are distinct and last for many years."

Doherty says that about ten reports come in each year of humpback whales caught in fishing gear across the state, with most of those reports coming from Southeast Alaska. But since Alaska is so vast and remote, Doherty says the number



of entangled whales is probably higher. In other parts of the country, such as the Gulf of Maine, for example, scientists found that about half the humpback whales appeared to have scars left by fishing gear.

In her first summer of field research, Doherty took hundreds of photos of whales to determine what portion of the population has had interactions with fishing gear. The work has never been done before in Southeast Alaska. Beginning in 2004, Doherty, through University of Alaska faculty Susan Hills and Janet Straley, received additional Alaska Sea Grant support to continue her study through 2006. This study formally establishes a collaborative effort by Alaska Sea Grant, the National Park Service, Glacier Bay National Park and Preserve, and the nonprofit group Southeast Alaska Wilderness Exploration, Analysis & Discovery.

Doherty's study will extend beyond national park boundaries to include waters as far south as Sitka and Petersburg, about 125 miles away. In this expanded study, Doherty will estimate the rate of nonlethal entanglement of humpback whales in fishing gear. She'll also use known information about whale demographics to identify vulnerable segments of the humpback whale population. Doherty also plans to describe the location of scarred and unscarred humpback whales in relation to where area commercial fisheries occur. Finally, Doherty will calculate the rate at which fishermen in the region report whale entanglements to the National Marine Fisheries Service Alaska Region stranding database. Ultimately, Doherty said, this project will help resource managers decide whether a program is needed to help commercial fishermen reduce their encounters with this federally protected marine mammal. ♦



Advisors, Researchers Engage the Grassroots

DIVERSIFICATION OF ECONOMY

Hope on the half shell

MAP agent helps coastal communities develop shellfish aquaculture

Most people tend to give up and move on when they run up against excessive government bureaucracy and regulation. When Ray RaLonde encounters it, he sets out to change the system. If you're among the many Alaskans who yearn to raise oysters, clams, mussels, or geoducks along Alaska's coast, Ray RaLonde is just the sort of person you want on your side.

RaLonde is the Marine Advisory Program aquaculture specialist, and his passion is to help Alaskans diversify their economy through shellfish aquaculture. But until recently, if you asked RaLonde where a good place to start an oyster farm might be, he wouldn't have an easy answer.

"People come to my office and ask me, for example, where they can start an oyster farm," RaLonde said. "I had to tell them that, 'Gosh, I don't have a clue.' It wasn't because of biological considerations, since I know of areas that would do well. Rather, it was because there were so many regulatory hurdles to clear and issues to be resolved before someone could establish an oyster farm. The process was mind-numbing."

BEGIN AT THE BEGINNING

One of the first things a shellfish farmer needs is an aquatic farm permit, RaLonde said. To get that, the farmer needs a tidelands lease—essentially the state's permission to use nearshore waters. But this lease took months to get and the applica-



tion often would become mired in bureaucracy, explained RaLonde. Adding to the difficulty was the state's policy to issue permits only every other year.

"Under that system, we weren't getting anywhere in helping develop this industry," said RaLonde.

In 2001, RaLonde decided to change the system. It began with an Alaska Sea Grant-funded project to help communities around Prince of Wales Island in Southeast Alaska develop shellfish operations.

At 132 miles long and 45 miles across, Prince of Wales is one of Alaska's largest islands. The region is dotted with small, economically depressed communities in dire need of cash flow. The island is dented with small coves and bays that could harbor shellfish farms. And the proximity of the island to oyster-loving cities such as Anchorage, Alaska; Seattle, Washington; and



"Shellfish mariculture represents a major economic development opportunity for Alaska and its communities."

Rep. Cheryll Heinze, Chair, House Committee on Economic Development, International Trade & Tourism, from 2004 Alaska Legislature Web site

Vancouver, British Columbia, make the location ideal, RaLonde said.

“If there is going to be aquaculture in this state, this is where it is going to happen. It is a huge place with enormous potential,” said RaLonde.



BRIGHT PROSPECTS

Alaska’s clean, plankton-rich waters and long summers more than make up for the ocean’s frigid temperature that would otherwise slow shellfish growth. Instead, Alaska shellfish grow fast and they grow big. Restaurants and seafood stores pay a premium price for the small harvest that comes from the 61 Alaska farms already operating in places like Kachemak Bay and Prince William Sound. For communities struggling from the loss of commercial fishing and timber harvesting jobs, shellfish aquaculture is seen as one way communities can diversify their economy.

“The average ten-acre oyster farm produces about \$17,000 to \$20,000 worth of oysters annually,” said RaLonde. “A ten-acre farm should gross about \$170,000 or more each year. So this has the potential to provide a sustainable, environmentally friendly livelihood for people.”

But helping farmers one at a time to negotiate the web of state regulations and permits would take years. What if RaLonde could help an entire region of the state at once? His strategy was simple: work with the region’s communities and

individuals as one group to gather all of the information needed by the state to issue a tidelands lease, and convince state regulators to preapprove large tracts of tidelands for aquaculture.

ON THE ROAD AGAIN

RaLonde began by traveling to communities all across Prince of Wales Island. Some communities didn’t want shellfish aquaculture. But Thorne Bay, Kasaan, and Naukati did. Art King represents Naukati West Inc., a homeowners association of 137 people who live in the small former logging camp on the island.

“We were just loggers here, and we recognized that we needed to change our economy,” said King. “Ray came here and worked with us to set up a shellfish nursery and has led the effort to streamline the aquaculture permit process. Ray’s expertise has been an enormous help to us.”

With money from Alaska Sea Grant, the University of Alaska President’s Natural Resources Fund, and the Alaska Cooperative Extension Service, RaLonde spent three months in 2001 surveying 900 square miles of bays, estuaries, and beaches near interested communities. Some places were off limits because they had other uses, such as for recreation or subsistence.

Months’ more time went into gathering all of the information the state required on such things as wildlife uses, commercial fisheries, uplands ownership and tidelands uses, marine mammal haul-outs, eagle nest locations, and myriad other details. In the end, one application that would set aside large tracts of the island’s tidelands for aquaculture was submitted to the state.

MR. RALONDE GOES TO JUNEAU

What happened next surprised even Ray RaLonde. In August 2002, the Alaska Legislature invited RaLonde to give a presentation about his efforts. RaLonde brought with him the state shellfish hatchery manager and two farmers. He explained the project and the progress they had made in communities like Naukati.

“We blew their socks off,” said an elated RaLonde. “By the end of the day, the state legisla-

ture introduced House Bill 208, which required the Alaska Department of Fish and Game and the Alaska Department of Natural Resources to approve 90 aquaculture sites within a year.”

Even more good news came the following year. In 2003, the Alaska Legislature provided \$470,000 for additional site selection studies and state agency support. Another \$900,000 state grant was awarded to the Alaska Shellfish Growers Association for eight aquaculture infrastructure projects. The grant was used to make improvements to the Qutekcak Shellfish Hatchery in Seward, as well as to construct a shellfish marketplace in Homer and provide smaller grants to individual growers to improve their operations.

GOOD NEWS TRAVELS FAST

As word spread, more communities expressed an interest in shellfish aquaculture. RaLonde helped Wrangell residents survey their nearby tidelands. Then in September 2003, the city of Ketchikan

requested RaLonde’s help in jump-starting an aquaculture program.

“At that point we had a three-week deadline to submit applications,” said RaLonde. “But we made it. We nominated a total of 10,000 acres to be zoned for aquaculture development. From all that acreage the state approved 1,350 acres of tidelands for public lease around Prince of Wales Island and near Ketchikan. That’s enough water for 130 farms, so we are very happy.”

Leases for aquaculture sites on these newly approved tidelands were made available to would-be shellfish farmers in January 2004. Most of the leases were purchased by area residents, while several leases remain available through an over-the-counter sales program run by the state. RaLonde, once frustrated with a burdensome system, now says he’s pleased with how everyone—state resource managers, communities, lawmakers, and the farmers themselves—came together.

“The change is enormous,” said RaLonde. “The nice thing for me is that now I can tell people where to find sites for their shellfish farm.”

Back in Naukati, Art King said the first batch of young oysters, called spat, were due to arrive in April 2004 from the state hatchery in Seward. Thanks to Ray RaLonde’s efforts, Naukati has a small nursery that will grow the spat to a size suitable for planting by local farmers. In two years the oysters will reach market size. And while the oysters grow, the loggers-turned-shellfish-farmers of Naukati and other Southeast communities will turn their attention to workshops on marketing and business management being organized by RaLonde.

“We are starting to blossom again here,” said Naukati’s Art King. “Ray has helped us and this industry enormously.” ♦



MARINE ENVIRONMENTAL ISSUES

Science gets a helping hand

MAP agent pairs Kodiak residents with researchers to gather science

Maybe you've heard of Neighborhood Watch, a program in which homeowners keep vigil against suburban crime. But have you ever heard of a neighborhood watch for whales?

That's not what it's called officially, but Kate Wynne, the Marine Advisory Program marine mammal specialist in Kodiak, says the analogy is a good one to explain her efforts to get residents of this small fishing town to keep an eye out for whales. The only difference is that this neighborhood watch isn't for crime prevention. It's for science.

"There's a network of local people here interested in whales," said Wynne. "Someone sees a killer whale in the harbor and they call me. It helps us collect better data."

The idea of enlisting Kodiak's fishermen, students, teachers, tourists, pilots, seafood processing workers, and others in this fishing town grew, Wynne said, out of the community's sense of being left out of important issues affecting their town.

"The sightings made by residents have given us a good idea of where to start searching. It's also a good thing because it gets people involved. It helps people feel close to the work that's going on."

Craig Matkin, killer whale scientist

"It came down hard on this community that fishermen may be impacting Steller sea lions with their fishing activities," Wynne explained.

"At the same time, everyone has seen these killer whales come into the harbor and eat sea lions. There was a general disgruntlement in that they see resource management decisions focused on them, but they also see these other



things happening. They don't know how it all fits together."

So Wynne set to work on a plan to involve Kodiak residents in the collection of scientific data, beginning with reporting sightings of killer whales. With dozens more eyes scanning the ocean, information started to pour in.

"People here in Kodiak like getting involved," Wynne said. "They get to see something really incredible and they really appreciate that. It's been a huge benefit to have the public on the cell phone or VHF marine radio letting us know where the killer whales are."

Along with her efforts to enlist locals in reporting their sightings of killer whales, Wynne recruited other people likely to frequently see orcas and other whales in their daily jobs on the water. She enlisted crewmembers aboard U.S. Coast Guard ships that ply the waters off Kodiak to record their whale sightings, and has even signed up a few wilderness lodge owners and several local charter pilots for whale watching duty.

"For the pilots, I made an abbreviated guide to whales," Wynne said. "It shows what the five big species of whales that frequent the island look like from the air."

On the back of the guide is space where pilots record important facts like the date, the species, the location, and what the animals seemed to be doing.

“Several charter pilots have kept meticulous notes,” Wynne said. “They have enjoyed it because they learned a lot about whale identification and behavior. Now they can tell their sight-seeing clients what it is they are looking at and chitchat with their customers about the whales.”

That’s good for their business, and good for science. In all, Wynne said she has about 200 sightings collected from the Coast Guard, and about the same number of sightings recorded by charter pilots. Wynne has taken these sightings and plotted them into a computerized Geographic Information System to produce maps that show where the whales are throughout the year. That’s interesting in general, but Wynne says the information is being used by scientists, too. Independent killer whale scientist Craig Matkin used the database to better plan his research around the island.

“Kodiak is a very difficult place to work on killer whales. It’s a lot bigger than most people



think,” Matkin said. “The sightings made by residents have given us a good idea of where to start searching. It’s also a good thing because it gets people involved. It helps people feel close to the work that’s going on. I think people can make more of a contribution than they think.”

Wynne says making science work for the public and for scientists is exactly the kind of thing that makes MAP and Alaska Sea Grant unique. “We are the conduit to get the sightings from the people to the researchers who need it,” Wynne said. ♦



IMPACTS ON SALMON

A trade adjustment

MAP helps fishermen hit by low salmon prices

Marine Advisory Program agent Liz Brown has racked up a pile of airline miles in recent months. The miles weren't on jumbo jets to places like Hawaii or Seattle, but rather on small bush planes to remote fishing villages on Bristol Bay and the Alaska Peninsula.

Brown went to the villages to conduct workshops aimed at helping fishermen complete applications for benefits under the Trade Adjustment Assistance (TAA) program run by the U.S. Department of Agriculture (USDA). The program provides financial compensation, as well as education and training, to salmon fishermen who lost money due to low salmon prices caused by competition with foreign-farmed salmon.

"I have 62 workshops under my belt," said Liz Brown at the end of the program. "I made contact with 717 fishermen and helped them complete their applications."

MAP was selected to personally explain the TAA program to fishermen across the state because USDA's traditional grassroots network, the Cooperative Extension Service, lacked enough agents in Alaska to do the job.

"The task of delivering the program fell to the Cooperative Extension Service at the University of Alaska Fairbanks, and through them a partnership was formed with MAP," explained Torie Baker, Trade Adjustment Assistance specialist. "They knew we had the people on the ground in the coastal communities. So we became the go-to partner."

In rural Alaska, where roads are virtually nonexistent and the geography immense, the only way to get from one community to another is to fly. Baker and assistant Bill Hall, as well as MAP leader Paula Cullenberg, graduate student Erin Harrington, and MAP agents Liz Brown, Allison Rice, Brian Paust, Dolly Garza, Terry Johnson, Terry Reeve, and Reid Brewer presented 240 workshops and 80 audio conferences to as

few as one person and as many as 83 people at a time. At the end of the program, in June 2004, MAP agents had spoken with every one of the 4,500 people who signed up for the program.

"I'm thrilled with the turnout we have had," said Baker. "We've been using eleven people to make these presentations and deliver audio conferences to places we can't get to."

Several tools, including a direct mailing, a Web site, news releases, and public service announcements were used to notify fishermen of workshops scheduled in their communities. Communicators at Alaska Sea Grant helped with media announcements and by designing a Web site with information about the program and a schedule of workshops. The TAA Web site received more than 4,250 visits, and over 2,000 people called the program's toll-free number for more information.

At the workshops, Marine Advisory agents explained the financial, educational, and training benefits offered under the TAA program and





discussed issues such as direct marketing, business management, and diversification aimed at helping fishermen weather low salmon prices. Workshop facilitators used a comprehensive 64-page guide written by agent Terry Johnson, and a 13-minute primer video produced by Deborah Mercy, MAP instructional media specialist.

“When we saw that there was a mandate to talk about business management and efficiency issues, we thought this was right up our alley,” said Baker. “We developed the guide and have used it as the cornerstone of our curriculum.”

Beyond the singular importance of explaining the TAA program to fishermen, MAP recognized the workshops as an unprecedented opportunity to interact with fishermen to explain how MAP can help them, while also learning more about the needs of fishermen.

“It’s been a great sounding board for MAP,” said Baker. “It’s helping us to develop new ways to provide distance delivery information. We definitely have taken this as an opportunity to further hone where we can be most effective regionally and throughout the state.”

In all, MAP agents have visited more than 151 Alaska coastal communities. Brown alone visited 24 communities in her region of Bristol Bay.

Liz Brown says the program has been very effective.

“What I think shows that this has been successful is the stack of applications for education benefits,” Brown said. “To me that’s the best story of our success. The other way I measure it is from the evaluation form participants filled out. In those evaluations—I have about 350—I think only two of them were negative.” ♦



MARINE ENVIRONMENTAL ISSUES

Teachable moments

MAP agent brings Exxon Valdez oil spill lessons to developing nations

An oil tanker lies grounded and leaking oil. The government isn't responding. It doesn't know how to respond. It doesn't know how to clean up the mess. Days pass and finally the ship breaks apart, gushing its toxic cargo into the sea and onto miles of beach and shoreline. Wildlife is killed, and people get sick from the stench of raw crude. No, this isn't the 1989 *Exxon Valdez* oil spill in Alaska. This is 2003, and the oil tanker *Tasman Spirit* has run aground in the Arabian Sea just outside Karachi, Pakistan.



It's déjà vu for Rick Steiner, Marine Advisory Program marine conservation specialist. He was among the first on the scene of the Alaska spill. He watched, as we all did, as oil leaked into Prince William Sound's calm seas. Days passed as state and federal agencies blamed each other and debated their response. Within a week, a major storm would send the spill surging onto more than 1,000 miles of wilderness coastline.

The opportunity to prevent an Alaskan environmental disaster was lost, but the fight to change the laws that govern how the state and the nation prevent and respond to spills was just beginning. In that battle, Steiner would rise to become among the loudest, most influential voices to call for, and finally get, changes in state and federal laws governing oil transportation, spill prevention, and response. Since then, Steiner has traveled the world, to places like Ireland, Azerbaijan, Kazakhstan, Russia, and South America to help governments beef up their oil spill safeguards.

That's why when, half a world away, the *Tasman Spirit* ran aground some fourteen years later, Ali Raza Rizvi picked up the phone from

In 1997, the Japanese frozen seafood freighter Kuroshima was grounded in remote Dutch Harbor, Alaska. The U.S. Coast Guard estimated that almost 40,000 gallons of fuel oil were spilled.

his office at the World Conservation Union in Karachi and asked Steiner to come to Pakistan's aid.

"Rick Steiner was of great assistance to both the World Conservation Union and the government of Pakistan," said Rizvi. "He was part of the team that included the government, the United Nations, and the World Conservation Union to undertake the initial damage assessment for the disaster."

Soon after his arrival in Pakistan, Steiner was asked to serve as the spill's chief technical advisor to the Pakistani government. Together, he and a colleague from the United Nations wrote the *Tasman Spirit* Oil Spill Assessment Report.

"We took the experiences I had dealing with the damage assessment of the *Exxon Valdez* oil spill and transposed it to Pakistan to show them how to assess their environmental damage," Steiner said.

Rizvi said Steiner's assistance in the spill was invaluable. "Rick's presence helped in highlighting the issue at the highest level," said Rizvi. "He, along with the local team, had a number of meetings with the relevant minister and other high government officials."

That damage assessment plan included scientific studies to learn how the environment had been impacted by the spill and what steps might be taken to restore damaged habitats and



ecosystems. Steiner also helped the government understand the need for laws aimed at protecting the environment and the importance of joining several international conventions that govern liability issues and oil spill cleanup.

Steiner has thus far been to Pakistan three times, most recently in February 2004, to advise the Pakistani government and scientists on their damage assessment studies.

Steiner's efforts to help Pakistan are set against a backdrop that is sad and at the same time hopeful.

"The marine environment there is terribly degraded and polluted," said Steiner. "I'm hoping the *Tasman Spirit* oil spill will be a catalyst for them taking better care of their coastal and ocean resources."

To help with this larger environmental problem, Steiner recommended Pakistan establish a

coastal commission that would bring together government agencies with oversight on coastal and ocean issues. He envisions the commission having a substantial endowment, in part from monetary damages leveled on the owners of the *Tasman Spirit*, that would support research and restoration projects aimed at cleaning up and improving the management of the coastal ecosystem.

Like the *Exxon Valdez*, the *Tasman Spirit* offers its own lessons to the world.

"I think the main lesson is that we need to get our technical services and scientific expertise spread around the world quicker. Many countries still lack adequate regulations and procedures to prevent and respond to oil spills, and many are not party to important international agreements on oil transportation and liability," Steiner said. ◆

Investment in Students Yields Big Returns

Alaska Sea Grant is a leading supporter of graduate students within the University of Alaska system. Each year, we provide students with valuable financial assistance, training, and support. From 2002 to 2004, Alaska Sea Grant supported 26 graduate students. These students receive assistance because they are an important

resource agencies and congressional offices in Washington, D.C. Alaska Sea Grant also participates in the National Marine Fisheries Service/Sea Grant Graduate Fellowship Program in Population Dynamics and Marine Resource Economics. In 2000, this program awarded Alaska Sea Grant graduate student Dana Hanselman a three-year fellowship. Hanselman used the fellowship to develop a new method for assessing the abundance of rockfish stocks, which won high marks from fishery managers.

Alaska Sea Grant–funded graduate students come from all over the world—from Germany, Croatia, Russia, Japan, Canada, China, Norway, South Korea, and of course the United States. They come to earn graduate degrees but they leave with unparalleled experiences and life lessons that can be learned only in Alaska. Sea Grant graduate students play key roles in important research that helps determine the way we use and manage our resources. Their

“Alaska Sea Grant provided an exceptional opportunity for me, for which I will be eternally grateful. I’ve never, before or since, dealt with a system that so effectively supported the work I was trying to get done.”

Sherwood Hall, Ph.D., Chief, FDA Seafood Laboratory, 1982 graduate of the University of Alaska.

part of Sea Grant–funded research projects and the training they get will help them prepare for marine-related careers. Other students receive indirect support for needs such as equipment or travel.

Additional students are helped through partnerships we’ve forged. For example, since 2000 Alaska Sea Grant has supported graduate student fellowships in the Global Change Student Research Grant Competition sponsored by the University of Alaska Fairbanks Center for Global Change and Arctic System Research. Typical support for each student is \$5,000 per year. During 2002–2003, Alaska Sea Grant supported four graduate students whose climate research is directed at marine issues that fit our strategic plan.

We also promote the Knauss Sea Grant Marine Policy Fellowship competition, a National Sea Grant program that awards graduate students interested in marine policy one-year appointments to executive branch



experiences help form a solid foundation to carry the students forward to successful careers. And following graduation, the majority of Alaska Sea Grant students go on to work in their fields of study for state and federal resource agencies, universities, and the private sector.

Sherwood Hall, who in 1982 earned his doctorate in marine chemistry, is now the Chief of the federal Food and Drug Administration's Seafood Laboratory in Washington, D.C. Hall said Sea Grant support played an important role in his budding career.

"Alaska Sea Grant provided an exceptional opportunity for me, for which I will be eternally grateful. I've never, before or since, dealt with a system that so effectively supported the work I was trying to get done," commented Hall.

Alaska Sea Grant's involvement in student education extends beyond the university to Alaska's public schools. Alaska Sea Grant is a key sponsor of the Alaska Region National Ocean

Alaska Region National Ocean Sciences Bowl winners

2002

First Place Overall

Kodiak High School
"Crustacean Sensation"

Knowledge Quiz

Kodiak High School
"Crustacean Sensation"

Research Project and Oral Presentation

Ninilchik School "Abyss"
Catching the Fish and Eating Them Too—Halibut: A Pressured Species

Juried Art Show

Best of Show: Emily Berezin
Skyview High School, Soldotna

2003

First Place Overall

Juneau-Douglas High School
"Team Tempest"

Knowledge Quiz

Kodiak High School
"Perspicacious Pinnipeds"

Research Project and Oral Presentation

Juneau-Douglas "Team Tempest"
Juneau International Airport: Safety Concerns and Estuarine Habitat Values

Juried Art Show

Best of Show: Heather Harris
Juneau-Douglas High School

Sciences Bowl. The competition, now heading into its eighth year, brings together high school students from around the state for several days of spirited competition that tests their knowledge of marine issues. ♦



Information Empowers Alaskans

Fundamentally, all of us at Alaska Sea Grant are communicators. Whether we're scientists, Marine Advisory agents, or editors; whether we speak directly with marine users in coastal communities or produce television programs; each of us understands that our core responsibility is to pass what we know on to others. At Alaska Sea Grant, scientists, Marine Advisory agents and

At Alaska Sea Grant, scientists, Marine Advisory agents and specialists, and professional communicators are the vital conduit to those people who may benefit from our discoveries.

specialists, and professional communicators are the vital conduit to those people who may benefit from our discoveries. We deliver information to a diverse group of publics using a wide range of tools, including books, fact sheets, pamphlets, videos, Web sites, CDs, magazine articles, and news releases, as well as television and radio programs.

In 2002 and 2003, twenty-eight publications were published and seven videos were produced. Seven news releases about important marine



issues were distributed and used by the state's major daily and weekly newspapers, and radio and television stations. Numerous other stories were spurred by ongoing direct relationships we maintain with reporters and editors across the state.

We also coordinated three major international symposia, two of which were held as part of the Lowell Wakefield Fisheries Symposium series. These symposia were "Genetics of Subpolar Fish and Invertebrates," held in spring 2002, and "Assessment and Management of New and Developed Fisheries in Data-Limited Situations," held in October 2003. A third symposium, the "Second International Seafood Byproduct Conference," was held in November 2002 in conjunction with the United States Department of Agriculture.



Region of wonders

Sea Grant book pays tribute to Bering Sea and Aleutian Islands

To most people, the Bering Sea is a faraway and mysterious place. We'd wager that few Americans could point to it on a globe without some blank stares and head scratching. But the international importance of this pristine northern sea is in direct contrast with its public notoriety.

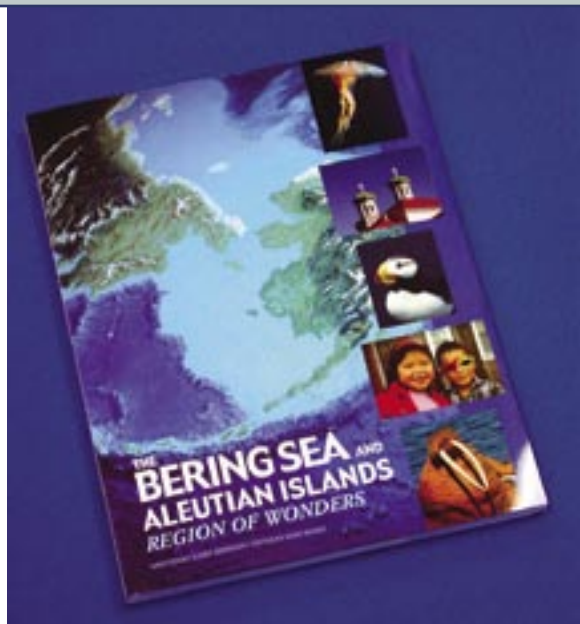
What's so special about the Bering Sea? Well, for starters, Alaska waters yield about half of the United States' annual commercial fisheries harvest. Most of that comes from Bering Sea and Aleutian Island waters. Thousands of Native people in Bering Sea coastal communities in Alaska and Russia depend on the bounty of the sea. The shallow and often stormy waters provide shipping routes between the United States and our Asian trading partners. The Bering Sea and

the landforms in and bordering it are habitat to myriad marine and terrestrial flora and fauna, which together make up one of the most remarkable ecosystems on Earth.

Recognizing the critical importance of the North Pacific and Bering Sea, the U.S. government in 1999 created the North Pacific Marine Research Program (NPMR). The program included a requirement to convey research results to people interested in what's going on with the northern marine ecosystem. Alaska Sea Grant Information Services communications manager, Kurt Byers, received a \$130,000 grant to create a radio series and book about the Bering Sea and Aleutian Islands. The two products would highlight information generated by NPMR researchers.

As the research progressed, our radio producer, Doug Schneider, cranked out nine radio stories about specific NPMR research projects. The stories were included in our award-winning





radio series, Arctic Science Journeys, which airs statewide on the Alaska Public Radio Network. Later, when the book was published, titled *The Bering Sea and Aleutian Islands: Region of Wonders*, the radio stories went on an audio CD, packaged with the book. Sidebars in the book highlight still more NPMR research projects.

Several months before the book came out, the nationally distributed *Alaska* magazine ran a six-page photo spread that featured pictures and some text from the nearly finished book.

The project became a collaboration with MAP. The idea for a book about the Bering Sea was suggested in the early 1990s by MAP specialist Rick Steiner. The NPMR book is based on Steiner's original concept.

MAP agent Terry Johnson volunteered to write the main text. At the time he volunteered, Johnson was based in Dillingham on the Bering Sea's Bristol Bay. He's long had a keen interest in the Bering Sea, having fished for herring and sockeye salmon there. He currently operates a walrus-watching ecotour charter business out of Dillingham in the summer. Johnson, now based in Homer, also is an expert on Russian commercial fisheries of the Bering Sea.

The book is a one-stop-shopping guide to basic information about the Bering Sea and Aleutian Islands. In addition to profiles of NPMR research, topics include an overview of the vast ecosystem, its international strategic importance, physical environment, sea life, minerals and

energy, culture and commerce, resource management, and cultural and environmental challenges.

Dr. Robert Abel, the first director of the National Sea Grant College Program, called this book (and another Alaska Sea Grant book on commercial fishing) "...two of the finest Sea Grant products that I have ever come across."

Our intent is that this book and radio project will help people better understand how and why changes are happening in the Bering Sea ecosystem—and reduce the number of people who may scratch their heads and stare blankly at a globe when asked what they know about the Bering Sea. ♦

Bringing science to the airwaves

Arctic Science Journeys Radio brings science home

Alaska Sea Grant has delivered valuable information and insight via the airwaves. During the past two years, fifty-eight Arctic Science Journeys Radio (ASJ) stories were produced and aired on thirty radio station affiliates across Alaska, reaching thousands of people each week. These stories also were made available, complete with audio, text, graphics, photos, and useful links, through a popular Web site, www.asjnews.org. ASJ Radio is occasionally heard on the Voice of America and is sometimes used by National Public Radio. It also appears as a weekly column in several Alaska newspapers. ♦



Setting Sail

Alaska Sea Grant charts its future

As we talk about the accomplishments of the recent past, we also look to the future. In the coming two years, Alaska Sea Grant will undertake numerous new projects that combine our resources with those of others to achieve important new milestones in our understanding of the marine environment and in our goal to help Alaskans. We'll also begin a new process of gaining feedback from coastal residents, policy makers, resource managers, environmental activists, tour operators, and other marine stakeholders.

Future emphasis may include initiatives to assist the expansion of coastal shellfish mariculture, developing value-added seafood products and marketing, developing and testing engineering solutions to solve coastal erosion, and assisting Interior Alaska communities as they work to enhance and improve local salmon stocks.

In early 2003, Alaska Sea Grant welcomed Dr. Brian Allee as the new program director. Allee began his tenure by organizing an advisory committee with the central goal of seeking guidance, focus, and direction from Alaska's many publics as we chart a course into the future. Drawn from public and private sectors, members include scientists, lawmakers, fishermen, business leaders, resource managers, Native leaders, conservationists, and educators.

In the months and years to come, Alaska Sea Grant will explore new directions ideally suited to our strengths, while we continue our involvement in traditional areas. Future work and emphasis may focus on initiatives to assist the



expansion of coastal shellfish mariculture and develop innovative value-added seafood products and marketing. Other areas of new involvement may include developing and testing engineering solutions to solve coastal problems such as coastal erosion, a larger role in ecotourism, and assisting Interior Alaska communities as they work to enhance and improve local salmon stocks.

From this interaction with the Sea Grant advisory committee, Alaska Sea Grant will produce a comprehensive strategic plan in 2004. This document will provide context and justification for new directions Alaska Sea Grant may take in research, education, outreach, and information services from 2006 to 2010. ♦

The Rest of the Story

Supported projects

Research projects

Long-Term Variability in Alaska Sockeye Salmon 2: Effects of Past Warm Climate on Salmon Abundance

B.P. Finney, R/31-05

Setting Escapement Goals to Account for Climatic Fluctuations and Uncertainty

M.D. Adkison, R/31-07

Understanding the Role of Marine-Derived Nutrients in Population Dynamics of Sockeye Salmon

M.D. Adkison and B.P. Finney, R/31-08

Utilization of Alaska Kelp Beds by Commercially Important Fishes

B. Konar, R/31-09

An Economic Analysis of the Pacific Halibut Commercial Fishery

K. Criddle and M. Herrmann, R/32-02

Managing Salmon Fisheries for Quality

C. Crapo, R/51-01

Maintaining Salmon Quality Aboard Fishing Vessels and on Shore

C. Crapo and B. Himelbloom, R/51-02

Paralytic Shellfish Poisoning: Characterization of Saxitoxin Genes

F.G. Plumley, R/95-02

Identification of the Cyanobacterial "Saxitoxin Genes"

F.G. Plumley, R/95-03

A Model System to Examine Delayed Effects of Pollution Exposure

M.S. Stekoll, R/97-01

Generalized Models of Local Depletion for Walleye Pollock in Steller Sea Lion Critical Habitat

T.J. Quinn II, R/101-02

The Seasonal and Biochemical Nutritional Variance in Pollock as a Food for Marine Mammals

M.A. Castellini, R/101-03

GIS-Coupled Social Spatial Data Mapping of Coastal Environmental Values in the Kenai Peninsula

L. Alessa, RR/02-01

Environmental Cues for Herring Spawning and Inseason Fishery Management

G.H. Kruse, RR/02-02

Isotopic Analysis of Kelp Forest Food Webs: A Comparison Study

B. Konar, RR/02-06

The Eelgrass Ecosystem of Izembek Lagoon: Retrospective Analysis and Development of a Protocol for Future Monitoring

C.P. McRoy, RR/02-07

Entanglement in Fishing Gear by Humpback Whales in Southeastern Alaska

S. Hills, RR/03-01

An Economic Analysis of Producing and Exporting Alaska Salmon Protein Powder to China

M. Herrmann, RR/03-02

Population Genetic Structure of Pacific Ocean Perch in Alaska

A.J. Gharrett, RR/03-04

Comparison of Aggression and Dominance Behavior in Chinook Salmon Derived from Hatchery and Wild Broodstocks

W.W. Smoker, RR/03-06

Marine Advisory projects

Coastal Community Development Program and Fisheries Assistance Project

P. Cullenberg, A/152-01

Technical Assistance Program for Alaska Seafood Processors

C. Crapo and Q. Fong, A/152-02

Seafood Technology Literature Log

D. Kramer, A/152-03

Assortment Analysis of Hong Kong Seafood Products

Q. Fong and C. Crapo, A/152-04

Herring Market Survey

Q. Fong and T. Johnson, A/152-05

Technology Transfer to Enhance Seafood Plant Productivity

E. Kolbe, A/152-06

Training Assistance for Alaska Processors

D. Kramer, C. Crapo, and E. Kolbe, A/152-07

National Ocean Sciences Bowl Video Program

D. Mercy, A/152-08

Sightings and Samples: A Community-Based Research Effort

K. Wynne, A/152-09

Marine and Fisheries Adult Education Workshops for Yukon-Kuskokwim Area

D. Kramer, A/152-10

Alaska Resource Issues Forum Television Series

R. Steiner, A/152-11

Charter Log and Boatkeeper Publication Series

T. Johnson, A/152-12

Development of Voluntary Guidelines for Marine Wildlife Viewing

T. Johnson, A/152-13

Paralytic Shellfish Poisoning Outreach, Monitoring, and Research Project

R. RaLonde, A/152-14

Purple Hinge Rock Scallop Aquaculture Development for Alaska

R. RaLonde, A/152-15

Coastal Development and Shellfish Aquaculture for Prince of Wales Island, Alaska

R. RaLonde, A/152-16

Alaska Fisheries Extension Enhancement: Workshops on Change in the Salmon Industry

P. Cullenberg, A/152-17

Alaska Regional Fisheries Extension Enhancement: Future of West Coast Commercial Fisheries

T. Johnson and P. Cullenberg, A/152-18

Oil Spill Technical Advisory Services

R. Steiner, RR/04-03

Global Change Workshops

R. Steiner, RR/04-04

Publications and videos

Education publications

Outdoor Adventures: Survivor! Vol. 1

M. Allen et al., SG-ED-36, 326 pp., A/161-01

Outdoor Adventures: Cold Water Safety & Survival, Vol. 2

M. Allen et al., SG-ED-37, 342 pp., A/161-01

Outdoor Adventures: Land Safety & Survival, Vol. 3

M. Allen et al., SG-ED-38, 260 pp., A/161-01

Outdoor Adventures: Small Boat Safety & Survival, Vol. 4

M. Allen et al., SG-ED-39, 312 pp., A/161-01

Angler's Guide to the Rockfishes of Alaska: Biology and Fishery Management

S. Meyer, SG-ED-40, brochure, A/161-01

Ocean Treasure: Commercial Fishing in Alaska

T. Johnson, SG-ED-41, 200 pp., A/151-01, A/161-01

Marine Advisory bulletins

Beating the Odds on Northern Waters: A Guide to Fishing Safety, 4th edn.

J. Dzugan and J. Jensen, eds., MAB-41, A/161-01

Boatkeeper (6 new articles)

T. Johnson, MAB-52, A/152-12, A/161-01

Fishermen's Direct Marketing Manual

T. Johnson, ed., MAB-53, 66 pp., A/152-18

Administrative publications

Alaska Sea Grant 2002–2004 Project Directory

ADMIN-40, 8 pp., M/170-01, A/161-01

Alaska Sea Grant: Science Serving Alaska's Coast, 2002 Annual Report

ADMIN-41, 33 pp., M/170-01

Wakefield Symposium series promotional brochure

ADMIN-42, A/161-01

Alaska Sea Grant College Program Strategic Plan 2003–2008

ADMIN-43, 14 pp., M/170-01, A/161-01

Recently Published Research 2003

Brochure, A/161-01

2002 Book and Video Catalog

48 pp., A/161-01

2003 Book and Video Catalog

48 pp., A/161-01

Sea Grams

Finding a Seasonal Job on Alaska's Waters: Fishing Guide, Charter Boat Operator, Kayaking Guide, Rafting Guide, or Crew Member

T. Johnson, ASG-37, 8 pp., A/151-01, A/161-01

Common Mistakes in HACCP: Hazard Analysis

L. Brown, ASG-38, 1 p., A/151-01, A/161-01

Common Mistakes in HACCP: Groundfish

L. Brown, ASG-39, 1 p., A/151-01, A/161-01

Common Mistakes in HACCP: Cooked Crab

L. Brown, ASG-40, 1 p., A/151-01, A/161-01

Common Mistakes in HACCP: Products for Export

L. Brown, ASG-41, 1 p., A/151-01, A/161-01

Technical reports

Crabs in Cold Water Regions: Biology, Management, and Economics

A.J. Paul et al., eds., AK-SG-02-01, 876 pp., A/161-01

Steller Sea Lion Decline: Is It Food II

D. DeMaster and S. Atkinson, eds., AK-SG-02-02, 80 pp., A/161-01

Advances in Seafood Byproducts: 2002 Conference Proceedings

P. Bechtol, ed., AK-SG-03-01, 566 pp., A/161-01

Proceedings of the Arctic Biodiversity Workshop

K. Iken and B. Konar, eds., M-26, 164 pp., A/161-01

Videos

Tsunami Bowl: Alaska Regional 2002 National Ocean Sciences Bowl

D. Mercy, MAPV-50, 13 min., A/152-08

The Future of Alaska's Salmon Industry

R. Steiner, MAPV-51, 60 min., A/152-11

Marine Protected Areas in Alaska

R. Steiner, MAPV-52, 57 min., A/152-11

Conservation vs. Development: The Alaska Dilemma

R. Steiner, MAPV-53, 57 min., A/152-11

Off the Hook in Alaska: Seabird Bycatch and Longlines

D. Mercy, MAPV-54, A/151-01

Wolf Control in Alaska

R. Steiner, MAPV-55, 57 min., A/152-11

Keeping Your Net Wet: Business Tools and Resources

D. Mercy, MAPV-56, 13 min., A/151-01

Periodicals

Charting new courses for Alaska salmon fisheries: The legal waters, *Alaska's Marine Resources* 9(1)

M-28, 12 pp., A/152-17

Charter Log

T. Johnson, ed., 3 issues, A/152-12

Fishlines Newsletter

S. Keller, ed., 20 issues, A/161-01

Research publications

- Baker, T.R., G.J. Doucette, C.L. Powell, G.L. Boyer, and F.G. Plumley. 2003. **GTx4 imposters: Characterization of fluorescent compounds synthesized by *Pseudomonas stutzeri* SF/PS and *Pseudomonas/Alteromonas* PTB-1, symbionts of saxitoxin-producing *Alexandrium* spp.** *Toxicon* 41:339–347. RP-03-01, R/95-01.
- Budsberg, K.J., C.F. Wimpee, and J.F. Braddock. 2003. **Isolation and identification of *Photobacterium phosphoreum* from an unexpected niche: Migrating salmon.** *Applied and Environmental Microbiology* 69:6938–6942. RP-03-04, RR/01-05, GC/01-01.
- Criddle, K.R., M. Herrmann, S.T. Lee, and C. Hamel. 2003. **Participation decisions, angler welfare, and the regional economic impact of sportfishing.** *Marine Resource Economics* 18:291–312. RP-04-01, R/14-17.
- Finney, B.P., I. Gregory-Eaves, M.S.V. Douglas, and J.P. Smol. 2002. **Fisheries productivity in the northeastern Pacific Ocean over the past 2,200 years.** *Nature* 416:729–733. RP-02-08, R/07-22.
- Fu, C. T.J. Quinn II, and G.H. Kruse. 2000. **Analyses of harvest strategies for pandalid shrimp populations.** *Journal of Northwest Atlantic Fishery Science* 27:247–260. RP-02-05, R/07-21, R/31-03.
- Gharrett, A.J., S. Lane, A.J. McGregor, and S.G. Taylor. 2001. **Use of a genetic marker to examine genetic interaction among subpopulations of pink salmon (*Oncorhynchus gorbuscha*).** *Genetica* 111:259–267. RP-02-06, R/02-05.
- Hamel, C., M. Herrmann, S.T. Lee, K.R. Criddle, and H.T. Geier. 2002. **Linking sportfishing trip attributes, participation decisions, and regional economic impacts in Lower and Central Cook Inlet, Alaska.** *The Annals of Regional Science* 36:247–264. RP-02-09, R/14-17.
- Herrmann, M., S.T. Lee, K.R. Criddle, and C. Hamel. 2001. **A survey of participants in the Lower and Central Cook Inlet halibut and salmon sport fisheries.** *Alaska Fishery Research Bulletin* 8(2):107–117. RP-02-04, R/14-17.
- Hoyt, Z.N., T.C. Shirley, J.J. Warrenchuk, C.E. O'Clair, and R.P. Stone. 2002. **Observations of movement and habitat utilization by golden king crabs (*Lithodes aequispinus*) in Frederick Sound, Alaska.** In: A.J. Paul et al. (eds.), *Crabs in Cold Water Regions: Biology, Management and Economics*. Alaska Sea Grant College Program, Fairbanks, pp. 595–608. RP-02-01a, RR/01-01.
- McLaughlin, P.A., and J.M. Paul. 2002. **Abdominal tergite and pleopod changes in *Lithodes aequispinus* Benedict, 1895 (Decapoda: Anomura: Lithodidae) from megalopa to juvenile.** *Proceedings of the Biological Society of Washington* 115(1):138–147. RP-02-07, R/06-36.
- Milner, L.M., M. Herrmann, K. Giraud, M. Skogen Baker, and R.F. Hiser. 2003. **International sport fishing: The case of the German angler in Alaska.** *Tourism Analysis* 8:89–94. RP-03-02, RR/99-01.
- Paul, A.J., and J.M. Paul. 2001. **Intermolt durations of captive juvenile and adolescent male Tanner crabs *Chionoecetes bairdi*.** *Journal of Shellfish Research* 20(1):373–376. RP-02-01, R/06-32.
- Paul, A.J., and J.M. Paul. 2001. **The reproductive cycle of golden king crab *Lithodes aequispinus* (Anomura: Lithodidae).** *Journal of Shellfish Research* 20(1):369–371. RP-02-02, R/06-36.
- Plumley, F.G. 2001. **Purification of an enzyme involved in saxitoxin synthesis.** *Journal of Phycology* 37:926–931. RP-02-03, R/95-01.
- Su, Z., and T.J. Quinn II. 2003. **Estimator bias and efficiency for adaptive cluster sampling with order statistics and a stopping rule.** *Environmental and Ecological Statistics* 10:17–41. RP-02-10, R/31-04.
- Sweetman, J.N., and B.P. Finney. 2003. **Differential responses of zooplankton populations (*Bosmina longirostris*) to fish predation and nutrient-loading in an introduced and natural sockeye salmon nursery lake on Kodiak Island, Alaska USA.** *Journal of Paleolimnology* 30:183–193. RP-03-03, R/07-22.

Media

Arctic Science Journeys

Radio stories

2002

Reindeer Gals
Ballast Invaders
Sea Lion Numbers Up
Boulder Patch
Counting Chandalar Salmon
Jello Plankton
Seamount Oasis
Life in Ice
Hidden Ocean
Science Sub
Whale Count Results
Alaska's Melting Glaciers
Wanted: Killer Whale Sightings
State of the Sea
Gray Whale Chow Line—Closed?
Elephant Seal Slumber
Steller Sea Lions Say Ahhh
Disappearing Act
Saving City Salmon
Forest Fire Season Begins
Kodiak's Steller Sea Lions
Predicting the Sea
DEET Dilemma
Wimpy Walrus
Salmon Boom
Watch Carefully
Antarctic Seal Cam
Too Close for Comfort
More Than Trees
Sea Otter Crash
Gambling on Ice
Sorting Seals
California Sea Lions Venture North
Sea Lion Survival
Ghost Pots

2003

Alaska's Coral Gardens
Alaska's Thorny Future
Past Tense Ice
Ultimate Whale Watching
Shuttle Clouds
Warmer Arctic Hosts New Plants
Natives Help Scientists
Fish Food
Feeding the Bering Sea
Arctic Ocean Diversity
Ocean Diversity
Noisy Oceans
Adapting to Climate Warming
Reindeer Wranglers
Beluga Cafe
Satellites See Sea Changes
Risky Science
Vanished!
Rocket Science
Kid Science
Orcas and Sea Lion Decline
Tracking Right Whales
El Niño Winners and Losers

Magazine article

"Cry of the Sea Lion," *Alaska* magazine, July 2002.

News releases

17 April 2002—Alaska salmon booms once lasted centuries

Fishermen accustomed to the quick boom-then-bust of Alaska's salmon runs may wish they were born in a different time—about 800 years ago to be exact.

14 February 2003—Brian Allee to head Alaska Sea Grant College Program

Alaska Sea Grant announces the arrival of Dr. Brian Allee, our new director, on 3 February 2003.

2 June 2003—UA scientist named to Arctic Research Commission

President Bush names Dr. Susan Sugai to prestigious panel.

1 August 2003—Dillingham gets new Marine Advisory Program agent

Liz Brown to help Bristol Bay residents address fisheries issues.

6 October 2003—Public seafood processing and cold storage facilities

Upcoming workshop addresses economic feasibility of cold storage facilities.

31 October 2003—Public seafood processing and cold storage facilities

Update on details of upcoming workshop on economic feasibility of cold storage facilities.

Symposia and workshops

Symposia

Genetics of Subpolar Fish and Invertebrates (Wakefield)

29–31 May 2002, Juneau, Alaska

2nd International Seafood Byproduct Conference

10–13 November 2002, Anchorage, Alaska

Assessment and Management of New and Developed Fisheries in Data-Limited Situations (Wakefield)

22–25 October 2003, Anchorage, Alaska

Marine Advisory workshops

2002

February

Guiding Your Way to a New Career	Anchorage
HACCP Training	Anchorage

March

Marketing Alaskan Spot Prawn to Europe	Petersburg
--	------------

April

HACCP Training	Indian
Live Crab, Direct Marketing, and Quality Control	Nome
Creating a New Paradigm for Oil and Society	Siberia
Siberia Village Workshops on Oil and Gas	Siberia
Oasis Earth—Earthwalk March	Seattle, WA
Recommendations for Update on Injured Species	Anchorage
NMFS-OTC Groundfish Marine Mammal Observer Training	Kodiak
NMFS-Alaska Marine Mammal Observer Program	Kodiak

May

Tigers, Rainforests, Albatrosses, and Humans	Japan
Cosmic Manifest Destiny	Denver, CO
HACCP Training (2)	Cordova, Kenai

June

Aquatic Products Marketing	Hilo, HI
Public Participation in Oil and Gas Projects (2)	Azerbaijan, New York
Natural Resource Policy Debates on Public Television	Naples Beach, FL
HACCP Training (3)	Juneau, King Cove, Sand Point

July

Salmon Quality for Processors (2)	Petersburg
Rural Comm. Pearl Farm Business Management	Kodiak
Water Quality Monitoring: NAFWS II	
PSP Training	
Water Quality Monitoring: Fish 195	
Nunivak Island Halibut Workshops	Mekoryuk
Citizens Oversight of Oil and Gas Projects	Baku, Azerbaijan
Improving Ocean Governance	
Creating a Space Envir. Commission	U.K.
Salmon Quality for Processors (2)	Cordova
Seaweeds (2)	Craig, Ketchikan
Seaweeds Field Trip (2)	Craig, Ketchikan
Salmon Quality for Processors (2)	Kodiak

September

Direct Marketing of Kodiak Sea Cucumber	Kodiak
Seafood Marketing	Kodiak
Fish Husbandry: Fish 411	Sitka
Water Quality Monitoring II	
Water Quality Monitoring: Fish 195	
Envir. Monitoring	
PSP Training	
Science Methods for Teachers	
BIA Technician Training Fish Hatcheries	

Fisheries Biology: Fish 436	
Socially Conscious Investment	Juneau
NMFS-OTC Groundfish Marine Mammal Observer Training	Kodiak

October

Direct Marketing (4)	Dillingham, Naknek, Ketchikan
Community Processing Center Development	Wrangell
Designating Earth's Moon as a World Heritage Site	Houston, TX
Proposal for PWS Herring Fishery Buyback	Valdez
UA Lands Management Debate	Anchorage
Envir. Aspects of Oil Pipelines	
Sanitation Training (2)	Anchorage
HACCP Training (2)	Anchorage
Enhancing the Marketing and Quality of Alaska's Salmon Fisheries	Anchorage

November

Technical Review of Russia/China Envir. Assessment	Siberia
Southeast Subsistence Uses and Values	Ketchikan
Sea Gull Contaminants	Anchorage

December

Citizens Oversight of Oil and Gas Projects	New York
--	----------

2003

Direct Marketing	Seattle, WA
Direct Marketing (2)	Newport & Astoria, OR
Direct Marketing (2)	Yakutat, Kodiak

January

Envir. Considerations, Russian Oil and Gas Projects	Washington, D.C.
Oasis Earth—Planet in Peril	Anchorage
Alaska Native Co-Management of Sea Otter (2)	Massett, BC
Economic Value of Ecological Systems	
HACCP Training	Yakutat
Sanitation Training	Yakutat
Sea Gull Egg Contaminants (3)	Mekoryuk, Sitka
Enhancing the Marketing and Quality of Alaska's Salmon Fisheries	Anchorage

February

Better Process Control School	Anchorage
HACCP Training (3)	Anchorage, Dillingham
Sanitation Training (3)	Anchorage, Dillingham

March

Water Quality Monitoring	
HACCP Training (2)	Indian, Anchorage
Sea Lion Information	Craig
Sea Otter Small Boat Surveys	Craig

April

Establishing Regional Citizens Advisory Council for Bering Sea	Girdwood
Public Oversight of Oil and Gas Projects	Washington, D.C.
NMFS-OTC Groundfish Marine Mammal Observer Training	Kodiak

QAPP Training for NAFWS	
Water Quality Monitoring: Fish 195	
Mariculture: Fish 412	Sitka
Seaweeds (3)	Craig, Klawock, Hyدابurg
HACCP Training	Ketchikan
Seaweeds Field Trip	Craig
The Future of Alaska's Salmon Returns	Anchorage

May

HACCP Training (2)	Kodiak, Hooper Bay
Sanitation Training	Hooper Bay
Alaska's Prince William Sound and Cook Inlet	Seattle, WA
A Global Permanent Fund	Juneau
Retort Training	Kodiak

June

Biodiversity and Extinction Crisis	Kantishna
Global Warming and Alaska	Kantishna
Alaska—Last Frontier/Lost Frontier	Kantishna
Salmon Quality for Processors (3)	Cordova, Kenai
Salmon Quality for Processors (4)	Sitka, Ketchikan
Fisheries Co-ops and Beyond: Realigning Fisheries Management	Anchorage

September

Economic Feasibility of Small-Scale Pearl Farms in Cent. Pac.	Marshall Islands
Marketing Workshop for Hawaiian Aquaculture Products	Honolulu, HI

November

QAPP Training, Alaska Center for Envir.	Anchorage
IGAP Training on Water Quality Monitoring for NAFWS	Anchorage
Cold Storage	Anchorage

2004

January

Trade Adjustment Assistance (2)	Kodiak
Trade Adjustment Assistance (2)	Old Harbor, Ouzinkie
Trade Adjustment Assistance (2)	Dillingham
Trade Adjustment Assistance (6)	Juneau
Trade Adjustment Assistance (2)	Manokotak, Togiak
Trade Adjustment Assistance (2)	Hoonah, King Salmon
Trade Adjustment Assistance (2)	Haines
Trade Adjustment Assistance (2)	Seward
Trade Adjustment Assistance (2)	Naknek
Trade Adjustment Assistance (2)	Kenai
Trade Adjustment Assistance (2)	Wasilla, Yakutat
Trade Adjustment Assistance (3)	Anchorage
Trade Adjustment Assistance (3)	Petersburg
Trade Adjustment Assistance (2)	Homer

BIA	Bureau of Indian Affairs
HACCP	Hazard Analysis Critical Control Point
IGAP	Indian Environmental General Assistance Program
NAFWS	Native Fish and Wildlife Society
NMFS	National Marine Fisheries Service
OTC	Observer Training Center
PSP	paralytic shellfish poisoning
QAPP	Quality Assurance Project Plan

Student support

Graduate student stipend and/or tuition funded by Alaska Sea Grant College Program (February 2002–January 2004)

Student	Degree seeking	Grad.	PI	Project
Bando, Monica Comparing the nutritional quality of Steller sea lion (<i>Eumetopias jubatus</i>) diets	M.S. Marine biology	Dec 02	Norcross	GC/00-02
Brown, Eloise Effects of commercial bottom trawling on the sediment characteristics and benthic community of essential fish habitat on the inner Bering Sea shelf	M.S. Biological oceanography	May 03	Hills & Finney	RR/99-02
Budsberg, Kevin Isolation and characterization of <i>Photobacterium phosphoreum</i> from migrating Alaskan salmon	M.S. Biology	May 04	Braddock	GC/02-01
Dukhovskoy, Dmitry Decadal variability in the Arctic Ocean–Greenland–Iceland–Norwegian seas ice–ocean–atmosphere climate system	Ph.D. Physical oceanography	Dec 03	Johnson	GC/01-02
Gilk, Sara Outbreeding depression in hybrids between spatially separated populations of pink salmon (<i>Oncorhynchus gorbuscha</i>): Marine survival, homing, and distribution of family size	M.S. Fisheries	May 03	Gharrett	R/31-06
Hanselman, Dana Gulf of Alaska Pacific ocean perch: Stock assessment, survey design and sampling	Ph.D. Fisheries	May 04	Quinn	E/142-02
Hoyt, Zachary Movement and habitat utilization by golden king crab (<i>Lithodes aequispinus</i>) in Southeastern Alaska	M.S. Fisheries	Dec 03	Shirley	RR/01-01
Matweyou, Julie Paralytic shellfish poisoning: The relationship between <i>Alexandrium</i> abundance and PSP toxins on Kodiak Island, Alaska	M.S. Biological oceanography	May 03	Plumley	R/95-02
Wessel, Maria Lang Variation of agonistic behavior and morphology among juvenile chinook salmon (<i>Oncorhynchus tshawytscha</i>) of hatchery, wild, and hybrid origin under common rearing conditions	M.S. Fisheries	May 04	Smoker	RR/03-06
Barto, David	M.S. Fisheries oceanography		Finney	R/31-08
Battaile, Brian	Ph.D. Fisheries management		Quinn	R/101-02
Doherty, Janet	M.S. Marine biology		Hills	RR/03-01
Hamilton, Judy	M.S. Marine biology		Konar	R/31-09
Hicken, Corinne	M.S. Fisheries		Stekoll	R/97-01
Hoover, Carrie	M.S. Fisheries		Gharrett	R/31-06
Inglis, Susan	Ph.D. Marine biology		Castellini	R/101-03
Kasper, Jeremy	Ph.D. Physical oceanography		Weingartner	GC/03-02
Krohn, Andrew	M.S. Biochemistry & molecular biology		Plumley	R/95-03
Oxman, Dion	Ph.D. Fisheries		Gharrett	R/31-06
Palof, Katie	M.S. Fisheries		Gharrett	RR/03-04
Pyper, Brian	Ph.D. Fisheries		Adkison	R/31-07
Schmitz, Colin	M.S. Fisheries		Quinn	NFI/02-01
Tojo, Naoki	M.S. Fisheries		Kruse	RR/02-02
Tose, Leslie	M.S. Aquatic resources management		McRoy	RR/02-07
Uchiyama, Tadayasu	M.S. Fisheries		Adkison	R/31-08
Xu, Cathy	M.S. Economics		Herrmann	RR/03-02

Sea Grant program activity funding for 2002 and 2003

Program Activity	2002			2003		
	Federal	Match	Pass Through	Federal	Match	Pass Through
Core Funding	1,447,000	881,591		1,429,500	935,456	
Fisheries Extension Enhancement	45,000	15,448				
NMFS/NSG Population Dynamics Fellowship	12,667	6,333	19,000			
Minority Serving Institutions			95,550			
OAR/NSG Steller Sea Lion Outreach			475,000			
Observer Training Center			617,500			755,060
Total	1,504,667	903,372	1,207,050	1,429,500	935,456	755,060



Awards and honors

Individual awards and honors

Liz Brown, Dillingham MAP agent, was elected in October 2003 as a board member of the Bristol Bay [Alaska] Coastal Resource Service Area.

Dolly Garza, Ketchikan MAP agent, was tapped in January 2003 for the NOAA National Marine Protected Area Federal Advisory Committee. Garza won the 2003 Alaska Native Literature Award, sponsored by Honoring Alaska's Indigenous Literature, for her book *Tlingit Moon and Tide Teaching Resource*. Garza also was appointed as technical advisor to the Alaska Native Science Commission.

The poster by **Olav Ormseth**, "Linking environment to the distribution and recruitment of Pacific cod in the North Pacific" (GC/02-02), won the 2002 North Pacific Marine Science Organization (PICES) best poster award.

Rick Steiner, Marine Advisory Program marine conservation specialist, was appointed as Chief Technical Advisor to the Government of Pakistan for the *Tasman Spirit* Oil Spill Natural Resource Damage Assessment program. Steiner also was appointed to the Commission on Environment, Economic, and Social Policy of the International Union for the Conservation of Nature (IUCN). Steiner served on the International Advisory Group to the Open Society Institute's

Caspian Revenue Watch program. In addition Steiner was nominated and accepted into the "International Who's Who of Professionals" 2004/2005 list.

President George W. Bush in May 2003 announced the appointment of **Susan Sugai**, associate director of Alaska Sea Grant, to the United States Arctic Research Commission.

Book awards

Boatkeeper, 32 online articles on boat maintenance by MAP agent **Terry Johnson**, won a 2003 Gold Award in a competition run by Agricultural Communicators in Education (ACE).

Alaska Sea Grant communications received an Apex 2002 Award for Excellence for publications supporting the Herring 2000 symposium.

Crabs in Cold Water Regions won honorable mention in the 2002 Blue Pencil competition held by the National Association of Government Communicators (NAGC).

The **Surviving Outdoor Adventures** books won a Blue Ribbon Award at the 2003 biennial Sea Grant Week publications competition.

Beating the Odds on Northern Waters: A Guide to Fishing Safety won a 2003 Apex Award of Excellence.

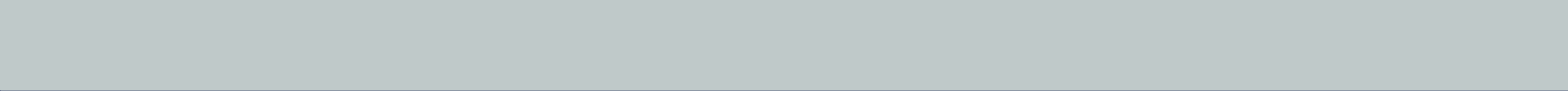
Media awards

The article "Hard Times at the Haulout" by **Doug Schneider**, the cover story in the July 2002 *Alaska* magazine, won a 2003 Silver Award in the ACE competition. The article also won second place in the 2002 NAGC competition.

The **Arctic Science Journeys Radio** story "Kodiak's Steller Sea Lions" won an honorable mention in the 2002 NAGC competition.

Photo credits

- cover Sculpin (Red Irish Lord), Kiska Island (Aleutian Islands), Alaska. Photo by Stephen Jewett.
- pp. ii–2 Photos by Kurt Byers.
- p. 2 Alaska Sea Grant Director Brian Allee. Photo by Kurt Byers.
- p. 4 Fossil Beach, Kodiak Island, Alaska. Photo by Kurt Byers.
- pp. 5–6 Photos by Kurt Byers.
- p. 7 Salmon seiner offloads to tender, Kodiak, Alaska. Photo by Kurt Byers.
- pp. 8–9 Photos by Kurt Byers.
- p. 10 Salmon seiner and tender, Kodiak, Alaska. Photo by Kurt Byers.
- p. 11 Sockeye salmon, Lake Iliamna, Alaska. Photo by Tom Kline.
- p. 12 University of Alaska Fairbanks professor Bruce Finney. IMS photo.
- p. 13 Lowell Wakefield symposium publications. Photo by Kurt Byers.
- p. 13 Lowell Wakefield symposium poster session. Alaska Sea Grant photo.
- p. 15 Cruise ship in Seward, Alaska. Photo by Kurt Byers.
- p. 16 Humpback whale, Resurrection Bay, Alaska. Photo by Kurt Byers.
- p. 17 Photos by Marilyn Holmes.
- p. 18 Photo by Kurt Byers.
- p. 19 Photo by Marilyn Holmes.
- p. 20 Steller sea lions, Hall Island, Alaska. Photo by Alison Hammer, NOAA.
- p. 21 Killer whale in Kodiak Harbor, Alaska. Photo by Briana Witteveen.
- p. 21 Marine Advisory Specialist Kate Wynne and whale. Photo by Briana Witteveen.
- p. 22 Marine Advisory agent Liz Brown, Dillingham, Alaska. Photo by Kurt Byers.
- p. 23 Photo courtesy of Alaska Seafood Marketing Institute.
- p. 23 Trade Adjustment Assistance workshop in Petersburg. Photo by Jon Newkirk.
- p. 24 Marine Advisory Specialist Rick Steiner. Photo courtesy of MAP.
- p. 25 Oil spill, Dutch Harbor, Alaska. Photo by PAC Ed Moreth, USCG.
- p. 26 Photo by Kurt Byers.
- p. 27 National Ocean Sciences Bowl, Alaska region, team from Bethel Alternative Boarding School. Photo by Hank Pennington.
- p. 28 Photo by Kurt Byers.
- p. 28 Sea Grant staffer Adie Callahan at the camera, and Marine Advisory Instructional Media Specialist Deborah Mercy with the microphone interviewing students at the 2004 National Ocean Sciences Bowl, Alaska region competition. Photo by Hank Pennington.
- p. 29 Aleutian Islands. Photo courtesy of UC Santa Cruz research expedition.
- p. 30 Alaska Sea Grant publication *Bering Sea and Aleutian Islands: Region of Wonders*. Photo by Kurt Byers.
- p. 30 Arctic Science Journeys Radio producer Doug Schneider. Photo by Kurt Byers.
- p. 31 Alaska Sea Grant Director Brian Allee. Photo by Kurt Byers.
- p. 38 Kodiak Harbor at night. Photo by Kurt Byers.



Alaska Sea Grant College Program

University of Alaska Fairbanks
PO Box 755040
Fairbanks, AK 99775-5040
www.uaf.edu/seagrant

