

# Alaska Sea Grant College Program Strategic Plan 2009-2013

## Letter from the Director

Alaska's marine and coastal environments, so precious to our residents and visitors alike, are constantly changing. As our country's most northern state, Alaska and its resources and people are seeing firsthand the impacts of a warming climate and acidification of our oceans. The pressures to use and develop Alaska's natural resources are ongoing in our nation's quest for energy independence and economic prosperity. At the same time, Alaska's expansive fish and shellfish resources continue to sustain strong commercial and tourism industries, as well as provide a source of recreational sport-fishing and cultural well-being through subsistence harvests.

The Alaska Sea Grant College Program is charged with promoting a strong understanding of our resources, carrying out responsive research and training activities that support our coastal communities, and disseminating knowledge and technical information to assist in wise decision making about the development and conservation of Alaska's marine and coastal resources. The challenge for Alaska Sea Grant is to provide these services in the huge geographic area that is Alaska, with a budget not commensurate with Alaska's size or wealth of marine and coastal resources. To help us meet the challenge, we have developed this strategic plan to guide our efforts and help us focus our activities on achieving the most important goals.

Our 26-member statewide Alaska Sea Grant Advisory Committee has played an active role in the development of this plan. We have received additional public input through a survey of Alaska stakeholders and input from our staff and Marine Advisory Program faculty. I thank them all for their hard work and dedication to our coastal resources and people.

We invite you to share your thoughts about this plan with us at any time.

—David Christie, Director

## Vision

Alaska Sea Grant will help Alaska have the nation's most vibrant and productive marine and coastal watershed environments, maintained through ecosystem approaches to management, balancing wise use and conservation. Alaskan people and communities will reconcile different values about resource use and conservation by blending and applying objective, science-based, and traditional knowledge for the social and economic benefit of all Alaskans.

## Mission

Alaska Sea Grant develops and supports research, education, and extension programs and partnerships to help sustain economic development, traditional cultural uses, and conservation of Alaska's marine and coastal watershed resources.

# Introduction

## Sea Grant in Alaska

### **ALASKA'S INTERESTS ARE THE NATION'S INTERESTS**

Alaska often is depicted on maps of the United States as a small island somewhere south of California; in fact, Alaska's awe-inspiring landscape accounts for nearly one-fifth the area of the United States. Alaska's extensive natural resources help fuel the national economy, as well as the country's imagination, as one of the last great symbols of a proud, can-do frontier nation.

Central to Alaska's importance to the nation and the world are its marine resources, which are without rival in the United States. At some 36,000 miles, Alaska's coastline exceeds that of the other states combined. Waters offshore of Alaska cover about 75 percent of the U.S. continental shelf. These waters host some of the world's most abundant populations of marine life and influence the entire Pacific Ocean food web. The U.S. Arctic, experiencing the first impacts from global climate change, is located in Alaska's northern land and waters.

About 75 percent of Alaska's land and many of its marine mammal and fishery resources are owned by the public and managed by the federal government. Alaska residents, as well as visitors from elsewhere, place a high value on the vast undeveloped expanses in the state. And the appeal of Alaska each year draws over a million tourists from around the United States and the world, many of whom vacation in Alaska's marine and coastal areas.

## Marine Resources Underpin Alaska's Society

The waters of the Bering Sea and Gulf of Alaska annually yield more commercial fisheries harvest than the combined balance from the United States. According to NOAA Fisheries, Dutch Harbor/Unalaska has been the nation's number one seaport in volume of commercial fisheries landings for 19 consecutive years. Value of the commercial fisheries in Alaska exceeds \$2 billion per year. In 2008, Dutch Harbor/Unalaska ranked second and Kodiak ranked third in value of landed harvest, with Seward and Sitka ranked ninth and tenth nationally. This ocean bounty helps maintain Alaska's national importance as a valuable source of U.S. natural resource exports.

Thirteen percent of U.S. crude oil production comes from Alaska, most of it extracted from wells along the coast and offshore. Once the oil meets the coastline, it is transported via ship through the state's pristine waters. The oil industry easily ranks as the state's greatest source of income, in 2007 providing almost 86 percent of Alaska's total tax revenue.

Coastal tourism accounts for much of the state's visitor industry, a burgeoning enterprise that rivals the seafood industry in both dollar value and number of people employed. In 2007, nearly 2 million people visited Alaska, injecting an estimated \$3.8 billion into Alaska's economy. Tourism supported approximately 40,000 full-time equivalency jobs—about 14 percent of all employment in Alaska and over a billion dollars in wages and benefits.

While Alaska's coastal and marine resources are a key part of the U.S. economic foundation, these same resources are the lifeblood of Alaska's society. Nearly everyone in Alaska lives along the coast or major rivers that flow to the ocean. Perhaps more than any other state, livelihoods of a large portion of Alaska's population in some way center on or are affected by marine resources. Alaska's Native people and other rural residents incorporate subsistence harvest of fish, shellfish, and marine plants into their diets at levels up to 600 pounds per person per year. Subsistence in Alaska is a cultural tradition dating back thousands of years, and is a critical part of the economic well-being of rural communities.

And beyond direct economic yield, Alaska's seas and coasts in their unused state represent enormous assets. Alaska's natural resources provide "ecosystem services" including ecological processes, watershed benefits, habitat for animals and people, and the biodiversity that makes a healthy planet and sustains life.

## **The Challenges of Space and Society**

Alaska's resources face unique challenges in use, management, and conservation. Within Alaska, travel is not trivial. The vast, rugged, and often difficult-to-access territory stretches human and monetary resources. These geographic conditions present logistical hurdles in trying to conduct management, scientific, educational, or commercial activities in Alaska.

For example, approximately 800 miles and a \$600 round-trip airfare separates Sea Grant headquarters in Fairbanks, in Alaska's Interior, from Juneau, the capital city in Southeast Alaska. A trip from Fairbanks to the Marine Advisory office 1,200 miles away in Unalaska, in the Aleutian Islands, costs about \$1,200 and can take seven hours, depending on flight connections. Most Alaska communities, including Juneau, Cordova, Ketchikan, Petersburg, Bethel, Dillingham, Sitka, Unalaska, and Kodiak, are accessible only by air or water.

Management of Alaska's commercial, subsistence, and sport fisheries is divided among state, federal, and Alaska Native jurisdictions, and international rules sometimes apply. State resource management laws that are dictated by the Alaska Constitution sometimes conflict with federal laws. Alaska Natives representing five distinct groups in the state make up 17 percent of the population and add a multicultural dimension to every decision debated.

Interest groups within Alaska vie for what they believe is their fair share of the state's natural resources or for complete preservation of resources. These often-contentious conditions present a ripe environment for the Alaska Sea Grant College Program, to exercise its strength as a respected and trusted entity that can bring together diverse interests to discuss and resolve issues with the aid of science-based information.

## **Service to the State**

For more than three decades, Alaska Sea Grant and its extension arm, the Marine Advisory Program, have helped people understand, conserve, and wisely use Alaska's bountiful coastal and marine resources. We do this through a program of research, education, and extension activities across the state. Alaska Sea Grant's program has grown to include marine advisory offices in communities that provide strategic coverage of Alaska.

Alaska Sea Grant's efforts have yielded tangible results. For example, the Alaska Young Fishermen's Summit has brought the next generation of commercial fishermen face-to-face with leaders in the industry and regulatory bodies to train future leaders. Establishment of a new public community cold storage facility was led by the Petersburg marine advisor and has now operated in the black for two years.

Research and outreach by Alaska Sea Grant has helped coastal communities prepare for tsunamis, and information and training provided by the Marine Advisory Program has contributed to fewer fishing-related deaths.

Innovative research on salmon, funded by Alaska Sea Grant, has helped fisheries managers better understand long-term fluctuations in salmon populations and how interbreeding can affect salmon. Information shared by scientists and resource managers during our international scientific symposia has improved fishery management and led to greater understanding of high latitude marine ecosystems.

Alaska Sea Grant has contributed to a well-trained workforce through support of dozens of graduate students. A high proportion of students has gone on to work for resource management agencies, marine industries, conservation groups, and academic institutions in Alaska.

We've also improved public awareness and understanding of our seas and coasts and the complex issues around them. Alaska Sea Grant Education Services and the Marine Advisory Program collaborate to produce and distribute thousands of books, pamphlets, posters, and videos.

Alaska Sea Grant is one of several partners initiating the new NSF-funded Alaska Center for Ocean Science Education Excellence (COSEE Alaska). We are one of the state's best sources of teaching tools on Alaska's marine resources for homeschoolers and the public and private K-12 system. Sea Grant's

educational materials also target “free-choice learners,” people who on their own initiative seek out educational opportunities in places such as interpretive centers, museums, and aquariums.

## **Looking to the Future**

While most coastal and Great Lakes states grapple with how to fix problems that stemmed from overuse of natural resources, we still have time in Alaska to prevent problems. As part of a national network of Sea Grant programs and a key asset of the University of Alaska Fairbanks—the nation’s premier arctic university and Alaska’s research university—Alaska Sea Grant is ideally situated to apply lessons learned in other states in an effort to not only fix, but also prevent, marine-related problems.

This strategic plan outlines our goals for 2009-2013, compiled in partnership with fellow Alaskans who share a keen interest in the vitality of our coastal and ocean resources. Our Advisory Committee has helped us create an overall vision for the program and a set of specific goals that meet Alaska’s needs.

# **Alaska Sea Grant’s Focus Areas**

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## **HEALTHY COASTAL ECOSYSTEMS**

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### **Strategic Issues**

- Alaska borders two oceans and three seas. Its shoreline includes arctic, subarctic, and temperate habitats that support freshwater, estuarine, and marine ecosystems. These high latitude ecosystems support an abundance of local and migrant species that capitalize on seasonally elevated rates of productivity. For millennia, humans have utilized these seasonally abundant resources to meet the subsistence, cultural, and economic needs of their coastal communities.
- Global climate change and its direct and indirect consequences will first be evident in arctic ecosystems. Tangible consequences of changes in ocean temperature, level, and acidity are already felt in coastal Alaska communities. Through complex food webs, these environmental changes will affect the composition, abundance, and distribution of species available for use by subsistence and commercial harvesters. They may contribute to the increased frequency of harmful algal blooms (HABs) and intrusion of nonindigenous species. Anticipating and coping with the physical and biological repercussions of climate change will be a growing challenge to coastal Alaska communities.
- A variety of human activities pose current and potential threats to the sustained health of Alaska’s coastal species, habitats, and communities. Physical and acoustic disturbance due to vessel traffic, military activities, and resource extraction can disrupt the migration, feeding, and/or breeding activities of plant and animal species that rely on Alaska’s highly productive coastal ecosystems. Marine species may suffer both acute and chronic health problems due to exposure to debris, oil, and chemical contaminants. The potential for exposure to these and other anthropogenic threats exists throughout Alaska but is greatest in coastal waters where shipping, gas/oil extraction, and urban development are concentrated and where new ice-free zones are seeing increased traffic.
- As these environments change, particularly with a changing climate or with increased or new uses by humans, Alaska Sea Grant’s role in enhancing the understanding of how to adapt to change and means to mitigate impacts is key to sustaining the health of Alaska’s extensive coastal ecosystems and the communities they support.

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

## Objectives

1. Increase understanding of human-induced and natural impacts—particularly from climate change—on Alaska’s marine and coastal ecosystems through research, education, and extension.
2. Support healthy marine and coastal ecosystems in Alaska by providing decision makers with science-based information that can be used to craft well-informed policies governing the use and conservation of Alaska’s marine and coastal resources.

## Strategies

- Coordinate community-monitoring activities through use of the Marine Advisory Program network. Monitoring in coastal sites may include monitoring for invasive species, harmful algal blooms, water temperatures, marine mammal and seabird mortalities, and ocean acidification.
- Participate in benthic mapping and surveying in the Norton Sound area, looking in particular at king crab habitat.
- Develop and carry out applied research into harmful algal blooms and their impact on coastal and marine ecosystems, marine mammals, and humans.
- Contribute science-based information and regional perspectives through participation in marine science planning and advisory committees.
- Use publications, presentations, and media to enhance understanding and encourage participation in policy making related to upcoming offshore outer continental shelf development and potential impacts of mining and other development on river ecosystems; and enhance the understanding of climate change and increases in harmful biotoxins.
- Participate in and support watershed planning efforts.
- Teach classes, and give classroom presentations and public lectures that increase the understanding of ecosystems.
- Coordinate Alaska Ocean Observing System outreach program in Prince William Sound.
- Enhance Alaska Sea Grant’s responsible wildlife viewing program.
- Continue coordination with the collaborative effort to reduce rat infestation.

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## SUSTAINABLE COASTAL DEVELOPMENT

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### Strategic Issues

- About 70 percent of Alaska's 700,000 residents live along the coastal zone or in coastal watersheds. These cities, small towns, and villages are culturally diverse and geographically distant from each other. In Alaska's largest city, Anchorage, more than 90 languages are spoken in the school district, and cultural diversity is common across Alaska.
- Less than 10 percent of the coastal Alaska communities are connected by road; they are accessible only by boat or plane. This "lack of connection" is one of the most defining aspects of Alaska's coastal communities and often is relished by its residents. However, it also creates economic and educational challenges. In small towns employment-producing industries may not be profitable, such as seafood processing, fish waste disposal, tourism, and other service businesses. Educational opportunities to build capacity are distant and expensive and thus less available to coastal residents.
- High cost of power in small Alaska communities often defines the economic feasibility of small businesses, including fishing operations and shore-based coastal industries. In Emmonak, for example, the average price of electricity (a village of 800 with primarily diesel-generated power) in early 2009 is \$0.47 per kWh and Cordova with mixed hydroelectric and diesel pays \$.32 per kWh, well above the Anchorage level of \$0.11 per kWh and the U.S. average of \$0.10 per kWh. The cost of a gallon of gasoline in Alaska is consistently above the national average.
- Coastal Alaska is feeling impacts from climate change. Sea ice in the Bering Sea is melting at rates significantly faster than predicted. Loss of sea ice reduces access by subsistence hunters to marine mammals and no longer provides a dependable barrier to winter storms. Increased water temperatures are resulting in fish species moving to new areas, and warmer waters invite a northerly movement of invasive species. Coastal erosion threatens a number of villages along northwestern Alaska. Communities across Alaska are working to develop and understand how to adapt to their changing environment.
- Critical to the well-being of coastal Alaska communities is a diverse economic base able to dampen the peaks and valleys of changing opportunities. While commercial fishing is the economic backbone of many coastal communities, fluctuations in stock sizes or market demand make for a dynamic industry. Tourism, charter boat recreation, handicrafts, small seafood processing, shellfish farming, and other coastal service businesses are important sources of jobs and income. Government positions such as fisheries managers, teachers, and other professionals also provide employment. Alaska communities are focusing on keeping their economies vibrant and encouraging their young people to move into these careers.
- In the Bristol Bay region and other areas of the state, proposed upland copper and gold mining, and onshore and possibly offshore oil and gas drilling are leading to hard decisions. These regions have traditionally relied on renewable resources, especially the annual sockeye salmon fishery, for economic well-being. Extractive resource development needs to be evaluated and assessed, given concerns about potential negative effects on the viability of renewable resources. Local residents need a clear understanding of potential impacts and a means to have their voices heard.
- Despite struggling with economic uncertainty, rural and coastal Alaskans share a strong interest in maintaining the health of their natural resources, their ability to interact with the resources in a commercial, subsistence, or recreational manner, and the continued viability of their unique community character.

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

## Objectives

1. Foster diverse and sustainable local economic activity in coastal communities through technical assistance and training.
2. Build the capacity of residents in Alaska's coastal communities to identify and take advantage of economic opportunities by providing leadership, vocational, and professional development opportunities.

## Strategies

- Coordinate workshops and conferences that bring in resources and speakers and focus on economic opportunities available to coastal communities.
- Teach workshops on financial management subjects including filing income tax, evaluating investment opportunities, business planning, and basic financial management. Support local businesses in coastal communities through assistance with development of business plans, applying for financing, and marketing.
- Participate in local, regional, and statewide advisory groups focusing on economic development.
- Assist with development of the shellfish farming industry in coastal Alaska by working with groups such as OceansAlaska in Ketchikan, the Kachemak Bay Mariculture Cooperative, and communities such as the Annette Island Indian Reserve and the Native Village of Kasaan. Carry out applied research on oysters, geoducks, littleneck clams, and rock scallops.
- Support the charter industry through publications, workshops, and Web-based information.
- Encourage working professionals based in or moving to coastal Alaska through publications, Web site, and consultations with professionals and communities.
- Develop and offer leadership training for young people entering coastal career paths including fisheries, seafood processing, regulatory, or management careers.
- Establish an avenue for advanced coursework in local high schools that gives all students the opportunity to be better prepared for college.
- Encourage and provide information to local students for programs of higher education that lead to employment opportunities in coastal Alaska.
- Teach classes for locally offered or distance taught certificate and associate level programs offered by local campuses.

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## **SAFE AND SUSTAINABLE SEAFOOD SUPPLY**

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### **Strategic Issues**

- Alaska is the commercial fishing capital of the United States, harvesting over 60% of America's seafood each year. Dozens of coastal communities from Ketchikan to Kotzebue depend on fishing and seafood processing to power their local economies. Commercial fishing and seafood processing are the largest private employers in the state with approximately 50,000 Alaskans engaged each year. Fluctuations in the resource base and market prices and product expectations are constant and result in a dynamic industry. Strong financial planning and some level of diversification can stabilize earnings for many commercial fishermen in the state.
- Many fisheries and shellfish resources remain strong in Alaska, while others are at low or decreasing levels. Stress on ecosystems from climate change, annual and decadal fluctuations, and human impacts are not fully understood. Management systems, while in many cases considered the best in the nation, are continually challenged to adapt to changing parameters.
- Privatization of fishing access is becoming more common in Alaska. On the federal level, managers seek to design access programs that clearly meet objectives and coastal residents seek to participate in the process to the fullest extent.
- Globalization of seafood markets now requires Alaska to compete with the world. The industry must respond by developing new products that are safe, nutritious, and easy to prepare.
- Seafood quality continues to be an issue in some parts of the state where the nature of the fishery, lack of infrastructure, and costs hamper improvement. With buyers demanding ever-increasing quality, the industry must improve within the constraints of their fisheries.
- The seafood industry is becoming more complex and technical, and small processors are at a competitive disadvantage. They do not have the time or the in-depth knowledge to develop new products and deal with the myriad regulations.
- The seafood market and regulatory requirements for greater utilization will be felt over the next five years. The seafood industry needs to obtain value from previously discarded materials. Development of viable byproducts meets today's emphasis on "green" manufacturing and can also increase value of the fishery.

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

## Objectives

1. Develop innovative seafood processing methods and expand the variety of Alaska seafood products through research support.
2. Maintain seafood quality and safety through research, training, and outreach.
3. Increase value of Alaska seafood to industry, communities, and consumers through information transfer and training that improves production efficiencies and marketing.
4. Increase utilization and economic value of seafood waste byproducts through research and outreach on new technologies, products, and processing efficiencies.

## Strategies

- Work with seafood processors to enhance their businesses through preference and food analysis of new seafood products, assistance with business plan development, and development of marketing strategies.
- Lead or participate in applied research in partnership with shellfish growers and divers to develop methods to enhance the production of geoducks.
- Work with local partners to investigate the feasibility of new fisheries or seafood products through analysis of economic potential, regulatory implications, or market opportunities.
- In partnership with community groups, support and enhance local fishing and seafood processing business through local economic development planning.
- Develop online classes for seafood processors related to marketing.
- Teach HACCP, Better Processing Control, and other classes for seafood processors.
- Teach classes for fishermen that enhance Alaska seafood value, including refrigeration.
- Develop leadership training opportunities to encourage Alaskans to pursue long-term careers in seafood processing.
- Produce publications, Web sites, and videos directed at seafood processors and fishermen that enhance their business viability.
- Assist in research to use fish processing wastes such as crab in compost for gardening soil.
- Assist the Alaska Department of Environmental Conservation in finalizing regulations and water temperature monitoring requirements for shellfish farms to prevent occurrence of the human pathogen *Vibrio parahaemolyticus* in Alaska farmed oysters.
- Provide technical information, environmental monitoring protocols, and outreach to shellfish farmers to prevent illness caused by *Vibrio parahaemolyticus* in Alaska farmed oysters.

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

## **Objectives**

1. Improve understanding of fisheries research by engaging individual fishermen and other stakeholders in relevant research planning, design, and implementation.
2. Enhance understanding of sustainability of fish populations and fisheries in face of climate change through research and outreach activities.
3. Support equitable and sustainable fisheries through research on how access-related management decisions may affect fisheries and communities.
4. Strengthen the voice of local residents and industry stakeholders in the fisheries regulatory process through outreach activities.

## **Strategies**

- Assess foraging ecology of whales in the Kodiak area and application to resolution of potential conflicts with coastal fisheries.
- Survey and develop whale avoidance and deterrent techniques for coastal Alaska fisheries.
- Collaborate with NOAA in development of international fisheries observer programs.
- Assist stakeholders by facilitating meetings with researchers and managers of resources, such as mariculture and Pacific Salmon Commission panels.
- Participate as a member of resource management committees, and advisory groups such as the local Fish and Game advisory committees.
- Write and publish publications and videos on related issues.
- Develop fishing training opportunities for communities that are trying to support continued participation in fisheries for the next generation, such as Petersburg, and communities that are trying to revitalize access to commercial fisheries, such as Chenega or Old Harbor.
- Hold a workshop on possible policy changes to address barriers to entry issues in Alaska fisheries.

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## HAZARD RESILIENCE IN COASTAL COMMUNITIES

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### Strategic Issues

- Alaska's climate is changing rapidly. The buffering effect of winter sea ice continues to be compromised by a warming climate that reduces the buildup of sea ice along Alaska's coasts, especially along the Bering Sea coast. The loss of protective sea ice exposes shorelines to the forces of winter storms, which cast waves and tidal surges onto previously protected shores. In 2004, a coastal storm in Nome eroded the riverbanks, causing flooding and damage to businesses downtown. More recently, high waves brought about by a reduced ice edge resulted in drowning deaths of subsistence whalers in a northern Alaska coastal community. In 2006, huge masses of sea ice plowed ashore in Barrow, threatening city infrastructure and personal property. Villages located for hundreds of years along these coastlines are now at risk of disappearing into the sea as shorelines erode.
- Growing international shipping through Alaska's increasingly ice-free northern seas poses potential hazards in an area with unique characteristics and little experience in prevention and response to spills of fuel oil and crude oil, which could foul shorelines and compromise pelagic and benthic habitats. Marine traffic by cruise ships and continued shipment of crude oil from Valdez and Cook Inlet pose similar threats to more southerly regions of the Alaska coast.
- Harmful algal blooms have sickened hundreds of Alaskans and even killed several people. No Alaska beaches are tested for paralytic shellfish poison, yet subsistence and recreational harvest of clams, mussels, and other shellfish continues throughout the state, with many people unaware of the threat of consuming tainted shellfish.
- Alaska's drowning rate has been as high as ten times the national average, and drowning is the second leading cause of death for children in Alaska.
- Alaska has the highest boating fatality rate in the United States, with 41 deaths for every 100,000 residents. Boaters at highest risk operate boats under 26 feet in rural areas. In the past several years, annual loss of life in commercial fishing has decreased from 38 to 11, but the industry is still considered dangerous.

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

## **Objectives**

1. Improve public safety and community resiliency by providing information on coastal adaptation techniques that enhance communities' capabilities to plan for, mitigate, and respond to extreme events and adverse effects of climate change, including storm surges, tsunamis, sea ice changes, and erosion.
2. Enhance the capability of coastal communities to plan for, prevent, and respond to hazardous substance spills, marine debris, and other marine pollution through education and outreach activities.
3. Reduce drowning and injuries of boaters through training and educational materials on responding to weather and other hazards.

## **Strategies**

- Develop a regionalized, statewide outreach program that addresses local adaptation tools and methods to respond to climate change impacts.
- Develop educational programs around risk identification and reduction in Alaska waters, specifically the Aleutian shipping lane and the emerging arctic shipping route.
- Work with local communities to enhance their response procedures, protocols, and systems related to oil spill response, marine search and rescue, tsunamis, and other hazardous events.
- Work with NOAA's Alaska Regional Collaboration Team (ARCTic), to link NOAA resources to coastal communities related to hazard communication, prevention, and response.
- Offer public educational programs in coastal communities that increase understanding of potential local hazards.
- Interact with policy makers and industry on prevention policies and mitigation approaches.
- Work with commercial and recreational boaters to reduce fishing gear interactions.
- Assist the National Institute of Occupational Safety and Health and other groups in research related to marine safety.
- Teach marine safety prevention and response training to commercial fishermen and other mariners, such as subsistence harvesters and recreational users.
- Write, publish, revise, and reprint publications and videos related to coastal hazards such as erosion response guides and safety manuals.

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## MARINE LITERACY AND STEWARDSHIP

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### Strategic Issues

- Alaska's marine and coastal environments are changing rapidly. In particular, climate change has the potential to adversely affect marine and aquatic species and Alaskans who depend on them. Alaskans need access to the most current research and information to enable them to wisely use and conserve these natural resources. Deterioration of the ecosystems can adversely affect Alaska's social structure and economy, and cause conflicts over resource use.
- Alaska does not have a coordinated and comprehensive K-12 approach to marine and aquatic education. Teachers have limited classroom resources and professional development opportunities focused on Alaska's marine resources and ecosystems. Students often enter adulthood without a background in the fundamentals of Alaska's marine, estuarine, and coastal watershed resources.
- Resource managers and researchers seeking to understand complex ecosystems need to interact and share their work in order to better comprehend the information and move forward. The cumulative knowledge of marine and coastal watershed ecosystems among Alaska Natives and other rural residents, acquired through decades of daily observation and reliance on natural resources, can help enlighten scientists and resource managers about long-term changes in ecosystems.
- Alaska residents face ongoing difficult decisions on the conservation, use, and management of marine and coastal watershed resources. Without access to science-based information and opportunities to share and understand it, resource use conflicts are increased.
- Alaska's marine and coastal resources are some of the most pristine and extensive in the world. Annually, over a million visitors join the 700,000 state residents in enjoying these resources through recreational activities. Understanding and knowledge of Alaska's resources increases the public's enjoyment and conservation of this unique environment.

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

## Objectives

1. Foster wise stewardship, understanding, and enjoyment of Alaska's marine and coastal resources by sharing science-based and traditional knowledge of our marine and coastal resources with Alaska residents and visitors.
2. Enhance stewardship, science literacy, and decision-making capabilities among Alaska's youth through formal and informal educational activities.

## Strategies

- Develop educational programs and partner with local and regional educational groups to support and enhance their teaching activities.
- Initiate, coordinate, and develop conferences, workshops, and symposia to link current research with important local, regional, and state issues to enhance knowledge and encourage well-informed, open discussion and debate.
- Sponsor or cosponsor and make presentations at informal educational events such as Forum of Aleutian Marine Issues, Prince William Sound Science series, Whalefest, and Alaska Oceans Festival, to increase public access to information about marine and ocean issues.
- Provide local access to Sea Grant publications through the coastal Marine Advisory Program and Cooperative Extension Service offices, other University of Alaska facilities, and government agency offices.
- Write, publish, and promote educational books and update and reprint publications, as needed, to widen audience access, including translations.
- Produce and promote Web sites and radio and video productions related to Alaska Sea Grant goals for a wide audience.
- Exploit emerging Internet communication technology to reach state, national, and international audiences with educational information about Alaska's seas and coasts and Alaska Sea Grant research and outreach efforts.
- Write monthly newspaper columns in regional papers.
- Participate on NOAA's Alaska Regional Collaboration Team, a communication and outreach effort, to implement outreach and education activities germane to missions of Alaska Sea Grant and NOAA in Alaska.
- Establish and nurture joint marine education efforts with the marine biology and outdoor education programs at Alaska Pacific University.
- Participate on marine science committees, resource management committees, and granting agencies, such as the Pacific Salmon Commission, North Pacific Research Board, and Alaska Ocean Observing System.
- Establish joint publication production and marketing projects with the University of Alaska Press and with the Alaska Cooperative Extension Service.
- Through participation in Alaska Center for Ocean Science Education Excellence (COSEE Alaska), work with marine partners to develop a strong linkage between scientists working in Alaska and educators.
- Continue to circulate and encourage the use of the new online Alaska Seas and Rivers curriculum.

- Attend and share educational resources at the biennial Alaska Math and Science Conference.
- Promote Alaska Sea Grant educational materials at the annual homeschoolers' IDEA Fair in Fairbanks.
- Collaborate with marine education entities including the National Park Service, COSEE, University of Alaska Museum, Prince William Sound Science Center, and the Alaska SeaLife Center, to extend marine education to Alaskans and visitors to Alaska of all ages.
- Develop new formal or informal curricula or lesson plans.
- Support students, either formally as a faculty advisor or informally through information about educational or career opportunities.
- Support teachers through classroom assistance, in-service training, or support for enrichment activities.
- Teach children or adults via formal credit classes (many of them offered distance), classroom visits, participation in summer camps, or other enrichment programs such as the National Ocean Sciences Bowl.

## Strategic Planning Process

This 2009-2013 strategic plan stems from our 2004-2009 strategic plan, both created using a rigorous process facilitated by professional strategic planning consultants. During our National Sea Grant Program Assessment Team (PAT) review in 2006, the 2004-2009 plan received the highest grade possible.

Development of our current 2009-2013 strategic plan began in September 2007 when our state Advisory Committee's (AC) Strategic Planning Subcommittee met to identify emerging strategic issues and review the existing plan. Recommendations were sent to the full AC on revisions to the themes, strategic issues, goals, and objectives.

The subcommittee reviewed all 11 of the national themes, and reaffirmed the appropriateness of the existing five Alaska Sea Grant themes. The subcommittee identified global climate change as a new issue that should be included in the strategic plan. The subcommittee also suggested some revisions and reductions in the number of objectives.

At the November 7-8, 2007 annual meeting of the full AC, presentations were given on the emerging issue of global climate change, focusing on community resilience and adaptation to the changes. The AC then engaged in a World Café workshop process to develop recommendations for new objectives addressing that emerging issue. The AC further reviewed existing goals and objectives, along with the recommended new ones and the Strategic Planning Subcommittee's recommendations. The AC used a multi-voting process to determine a rank order for all objectives. Decision criteria were articulated to help guide the discussion and voting process. Our strategic planning consultant compiled the results into a matrix of objectives and votes received. The AC also reviewed the vision statement and made suggestions for revising the statement in response to suggestions from the PAT.

In 2007, the National Sea Grant Office (NSGO) published its draft revised Strategic Plan, and they completed it in 2008. The new plan centers on four "focus areas." The new focus areas were determined in cooperation with the Sea Grant network and others. To form a more perfect union, the NSGO asked each state Sea Grant program to realign their respective strategic plans with the NSGO strategic plan, which in turn aligns with the National Oceanic and Atmospheric Administration strategic plan.

While the new NSGO strategic plan was being finalized in early 2008, we distributed a survey to constituents in Alaska to collect advice aimed at helping us update our strategic plan under our five new focus areas. Print and online versions of the survey were made available through the spring and summer of 2008 (Appendices 2 and 3).

The AC's Strategic Planning Subcommittee met again on August 1, 2008. It determined that the four new national focus areas were well suited to Alaska and would be appropriate to serve as the foundation for a realigned Alaska Sea Grant strategic plan. The subcommittee further recommended that we add a fifth focus area, marine and aquatic science literacy, which was not among the NSGO focus areas. Committee members also reviewed the vision statement, the input from the PAT, and the suggestions from the 2007 AC meeting, and made recommendations for revising the vision statement.

Based primarily on input gathered via the constituent survey, from the AC, and from Marine Advisory faculty, in August 2008 the Alaska Sea Grant Management Team produced an updated draft of strategic goals and objectives, arranged under five new focus areas and aligned with the new NSGO strategic plan. A draft update of our vision statement also was produced, based in part on input solicited from the AC at its 2007 annual meeting, input from the 2006 PAT, input from the 2008 meeting of the AC's Strategic Planning Subcommittee, and advice from our planning consultant.

Soon after the AC annual meeting in November 2008, we submitted an "alignment memorandum" required by NSGO, which described our progress on aligning our strategic plan with the NSGO strategic plan, and our projected completion date.

In March 2009 Alaska Sea Grant, including Marine Advisory faculty, provided issues and strategies based on their communities, constituents, areas of expertise, and needs. In April 2009, we completed the update of our strategic plan and its alignment with the NSGO strategic plan.

## Appendix 1

# Definitions of Planning Terms

**Vision:** Statement of a preferred future state; the overall destination.

**Mission:** Statement of the organization's basic purpose or reason for being; the business the organization is involved in.

**Values:** The principles of the organization; what it stands for and believes in, addressing people, process, and performance.

**Strategic Issue:** An opportunity, problem, factor, trend, etc., that has overarching significance to the organization or its customers, or as an internal or external challenge to the organization's mission, direction, policies, way of doing business, or culture.

**Goal:** A broad, directional statement of intent providing directional context for setting objectives. Often worded "to improve, increase or decrease, maintain, provide, foster, sustain."

**Outcome (Impact, Target):** A statement of what would result if the goal were achieved. A result, benefit, effect, endpoint, or target to be achieved with the goal, from which success, effectiveness, or quality can be determined.

**Indicator (Outcome Measure, Performance Measure, Evaluation Criteria, Metric):** A predetermined measurement of quality, effectiveness, or success; the information used to determine success. Quantity, quality, timeliness, cost, amount of improvement, effectiveness, and success can be measured.

**Objective:** An output-oriented statement of what needs to be done to move toward meeting a goal (action or product). A concise statement of what will be accomplished, how much or to what extent, by when; answers the question "What shall we do?" Tends to be addressed by solutions (strategies).

**Strategy:** A specific course of action to achieve an objective. It defines the steps (methods) needed to reach it, and is a list of ways to accomplish an objective (to-do list), often a jumping-off point for annual work plans. Answers the question "How shall we do it?"

**Actions (often included in the Implementation or Operational Plan instead of in Strategic Plan):** Actual, specific projects that must be completed to achieve a strategy. Where the work takes place; convert strategic plans into action.

## Appendix 2

# Constituent Survey Distillation

### Issues Arranged under New Focus Areas

#### Hazard Resilience in Coastal Communities

Coastal Erosion ///////////////  
Harbor and community infrastructure and land use planning ////  
Shipping safety /  
Marine safety and survival /

#### Sustainable Community Development

High fuel and transportation costs and related management strategies ///////////////  
Dangers to coastal community vitality due to climate change, adaptive strategies for residents ////  
Local societal impacts in rural communities due to lack of economic opportunities ////  
Subsistence and personal use opportunities, enhancement and protection ///  
Alternative energy options in rural communities ////  
High cost of seafood harvesting and processing ////  
Potential for economic diversification with oil, gas, mineral development ////  
Maintenance of economically viable fisheries in rural communities ///  
Local education of resource managers //  
Local retention of more value from Alaska's natural resources //  
Citizen participation in community infrastructure development //  
Economic impact of changing access to/ownership of coastal resources //  
Best use of coastal lands to maintain economic viability /  
Transfer of quota shares to younger generation /  
Need for small-business advice and services in rural communities /  
Funding options for community development /  
Transportation system improvements /  
Employment in rural Alaska /

#### Safe and Sustainable Seafood Supply

Halibut fishery conflict between sport, charter, and commercial fishing industries ///////////////  
How to manage harvest levels at economically good level in face of climate change ///////////////  
Bycatch of salmon at sea and other prohibited species ////  
Maintenance of sustainable fisheries ///  
Value-added local seafood production ///  
International competition in seafood markets //  
Seafood quality //  
Consolidation of fishing fleets /  
Overcapitalization of commercial fishing fleet /  
Use of seafood processing byproducts /  
Improved marketing /  
Viable small-boat fisheries /  
Support for salmon enhancement projects /  
Recreational fisheries access and management /

## Healthy Coastal Ecosystems

Ecosystem and socioeconomic effects of climate change ////////////////  
Effects of oil and gas development on ecosystems ////////////////  
Marine pollution ////////////////  
Ocean acidification ////////////////  
Biological sustainability and ecosystem health ///////  
Effects of mining on fisheries ///////  
Sea ice loss ///////  
Marine mammal conservation including belugas, great whales, polar bears ///////  
Overfishing ///////  
Marine debris ////  
Invasive species ////  
Habitat protection ////  
Commercial shipping through Bering/Beaufort seas ////  
Northward expansion of trawling ////  
Negative effects of coastal development ///  
Threat to wild fisheries of finfish farming ///  
Ecosystem based management ///  
Conservation of noncommercial marine resources /  
At-sea salmon survival /  
Decline in salmon populations /  
Salmon disease in Yukon River/  
Marine sanctuaries /  
Habitat damage from fishing gear /  
Effects of logging on fisheries habitat /  
Clean boating /  
Science-based resource management decision making /

## Ocean Literacy

Declining public knowledge/interest in commercial fishing and management /  
Marine and fisheries science careers for rural residents /  
Lack of public/user awareness about marine ecosystem function /

## Appendix 3

# 2008 Alaska Sea Grant College Program Strategic Plan Constituent Needs Survey

**Complete this survey and provide contact information, and you will qualify to win your choice of \$150 in Alaska Sea Grant publications, videos, posters, and even a Ray Troll tee shirt! All contact information and your responses will remain confidential.**

It's time again to ask for your help in updating the Alaska Sea Grant College Program Strategic Plan. Your input will be valuable as we align our Strategic Plan over the next few months with a new Strategic Plan from the National Sea Grant College Program (NSG).

The new NSG strategic plan centers on four focus areas, listed below. All are relevant to Alaska, and with your help, we can easily align our plan with these focus areas. Please tell us what university research, education (*K-12, college/graduate school, technical training, and general public information/publications*), and extension (*marine advisory services*) efforts we ought to pursue over the next 5 years in any or all of the four interrelated focus areas.

For your convenience, we also provide this survey online.

## Healthy Coastal Ecosystems

How should Alaska Sea Grant apply its research, education, and extension efforts to help maintain and protect healthy, vibrant, and productive coastal and marine ecosystems in Alaska?

## Sustainable Coastal Development

How should Alaska Sea Grant apply its research, education, and extension efforts to help Alaskans accommodate and balance environmentally sound economic, social, and recreational development opportunities in Alaska's seas, and along our coasts and rivers?

## Safe and Sustainable Seafood Supply

How should Alaska Sea Grant apply its research, education, and extension efforts to help strengthen the capability of the Alaska seafood industry (including shellfish/invertebrate aquaculture) to sustain our commercial, recreational, and subsistence fisheries, and provide safe, wholesome seafood to the world?

## Resilient Coastal Communities

How should Alaska Sea Grant apply its research, education, and extension efforts to help people in Alaska coastal communities anticipate, adjust to, and thrive in the face of economic and environmental change, and coastal hazards?

## Other Ideas

What other marine and coastal needs or issues should we consider addressing with our research, education, and extension that do not fit into any of above four focus areas?

Thank you for providing your advice on how Alaska Sea Grant should serve Alaska through research, education, and extension. If you provide your postal or email address, we will alert you when our updated Strategic Plan is available this summer. All contact information and your survey responses will be held strictly confidential.

**Name:** \_\_\_\_\_

**Affiliation (optional):** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_

- Yes, please mail a free 2008 Alaska Sea Grant publication/video catalog.
- Yes, please send announcements of new Alaska Sea Grant publications, videos, brochures, and posters. I prefer notification via (select one) email or U.S. Postal Service.a