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# ANNUAL REPORT

2007 - 2008 • Program Highlights from Washington Sea Grant



## Program Guidance

The WSG Advisory Committee provides general program oversight, direction and advice. The Committee was established in August 2006 with an initial core membership of eight key stakeholders and federal and state partners, as well as two ex-officio members:

**Kenneth K. Chew**  
Commissioner  
Washington Fish and Wildlife  
Commission

**Mike Doherty**  
Commissioner  
Clallam County Board of  
Commissioners

**Linda Kirk Fox, PhD**  
Associate Vice President and  
Dean  
Washington State University  
Extension

**Robert F. Goodwin**  
Coastal Resources Specialist  
(retired)  
Washington Sea Grant

**Ed Johnstone**  
Fisheries Policy Spokesperson  
Quinault Indian Nation

**Peter Philips**  
President  
Philips Publishing Group

**Terry Stevens**  
Director  
Padilla Bay National Estuarine  
Research Reserve

**Dan Swecker**  
Senator  
Washington State Senate

**Margaret Tudor, PhD**  
Executive Director  
Pacific Education Institute

**Usha Varanasi, PhD**  
Science and Research Director  
NOAA Northwest Fisheries  
Science Center

**Jacques White, PhD**  
Director of Marine Conservation  
The Nature Conservancy

## Ex-Officio Members

**Penelope Dalton**  
Director  
Washington Sea Grant

**Arthur R.M. Nowell**  
Dean  
College of Ocean and Fishery  
Sciences, University of  
Washington



## From the Director

Throughout 2007, ocean and coastal issues dominated the discussions in Washington and among our Pacific neighbors. From this dialogue emerged several institutions charged with the daunting tasks of protecting, managing and restoring West Coast marine resources.

The Washington Legislature established the Puget Sound Partnership as a new state agency and called for creation of an “action agenda” for a healthy Puget Sound. The Partnership was asked to prioritize cleanup and improvement projects, coordinate federal, state, local, tribal and private resources and to focus on those actions with the biggest potential for positive impacts.

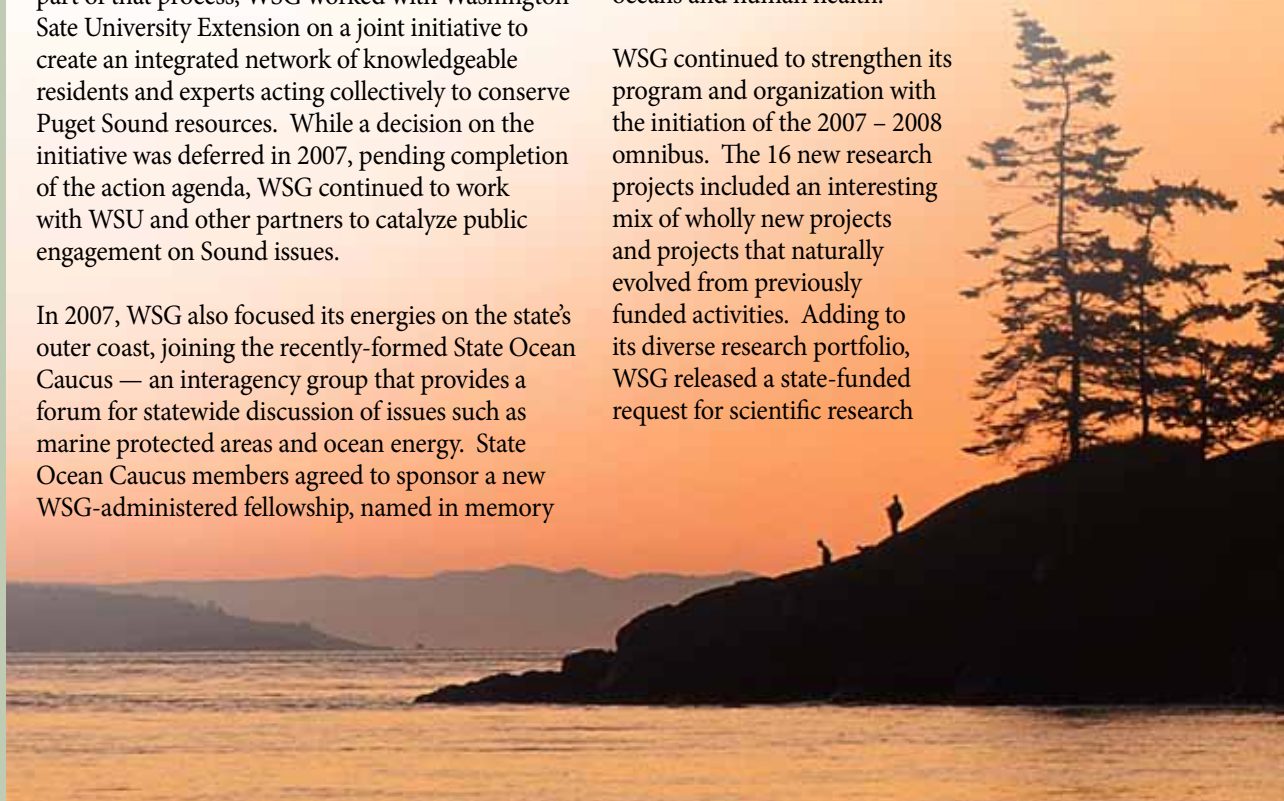
Washington Sea Grant has been fully engaged in Puget Sound Partnership actions, with staff serving on several of the newly formed panels and completing a full inventory of programs and activities to help address Partnership objectives. As part of that process, WSG worked with Washington State University Extension on a joint initiative to create an integrated network of knowledgeable residents and experts acting collectively to conserve Puget Sound resources. While a decision on the initiative was deferred in 2007, pending completion of the action agenda, WSG continued to work with WSU and other partners to catalyze public engagement on Sound issues.

In 2007, WSG also focused its energies on the state’s outer coast, joining the recently-formed State Ocean Caucus — an interagency group that provides a forum for statewide discussion of issues such as marine protected areas and ocean energy. State Ocean Caucus members agreed to sponsor a new WSG-administered fellowship, named in memory

of Marc Hershman, past director of the University of Washington’s School of Marine Affairs. Several State Ocean Caucus recommendations have found their way into the agenda of the West Coast Governors’ Agreement on Ocean Health. WSG and three other West Coast Sea Grant programs also contributed to the Governors’ Agreement through development of a regional research plan.

While building relationships with state agencies, WSG has also been more active with federal partners. We’ve served as the Sea Grant representative on NOAA West and have continued to play a central role in NOAA Science Camp for middle-school youth. WSG has enjoyed effective collaborations with NOAA’s Northwest Fisheries Science Center on outreach pertaining to aquaculture and oceans and human health. Partnering with its University of Washington and NOAA colleagues, WSG became part of a joint traineeship program centered on oceans and human health.

WSG continued to strengthen its program and organization with the initiation of the 2007 – 2008 omnibus. The 16 new research projects included an interesting mix of wholly new projects and projects that naturally evolved from previously funded activities. Adding to its diverse research portfolio, WSG released a state-funded request for scientific research







contracts to assess the environmental impacts of geoduck clam aquaculture, an issue that has been the source of intense local controversy.

At the same time, we've taken steps to enhance the effectiveness of WSG, both externally for its varied constituents and internally for its hard-working staff. Significant progress was made on rebuilding WSG's Web site and other major communications tools and to fill several key positions for information and outreach specialists.

Overall, 2007 was a year of unique challenges and opportunities. It has also been a year of substantial achievement, as illustrated by the numerous program highlights presented in this report.

Penelope D. Dalton  
Director, Washington Sea Grant



## Our Constituents at a Glance

- Seventy percent of Washington's 6.5 million residents live in the state's coastal counties. Statewide, the marine sector employs almost 150,000 people.
- A substantial part of the state's \$11-billion-a-year tourism industry is based in coastal areas.
- Washington's commercial fishing industry is the largest of the Pacific states. Commercial landings for 2007 totaled 206,950 metric tons, valued at more than \$214 million.
- Washington is the leading producer of farmed bivalve shellfish in the United States, producing about 90 million pounds worth almost \$100 million, annually.
- The 29 federally recognized Indian tribes or nations in Washington are co-managers for coastal and marine resources and play an important cultural role.



## Washington Sea Grant: The Program in Context

For more than 40 years, Washington Sea Grant (WSG) has served the Pacific Northwest and the nation by funding marine research and working to strengthen understanding and sustainable use of ocean and coastal resources. Based at the University of Washington, the program is part of a national network of 30 Sea Grant colleges located in every coastal and Great Lakes state and in Puerto Rico. The Sea Grant program is administered by the National Oceanic and Atmospheric Administration (NOAA) and funded through federal-state partnerships.

WSG is involved in implementing the Puget Sound Partnership's action agenda to restore and protect Puget Sound. It is also a member of the State Ocean Caucus, established to implement an action plan for improving protection and management of Washington's ocean and coastal resources. On a larger regional scale, WSG is actively collaborating with NOAA's Western Region, the six West Coast Sea Grant programs and the West Coast Governors' Agreement on Ocean Health.

WSG's activities are organized around four core programs: Research, Outreach, Education and Communications. Integration of the four programs is key to effectively carrying out WSG's mission:

- Identifying and addressing important marine issues
- Providing better tools for management of the marine environment and use of its resources
- Initiating and supporting strategic partnerships within the marine community.







The state of Washington resides within one of the world's most productive ocean and coastal regions, providing a bounty of resources associated with fisheries, tourism, alternative energy and habitat for threatened and endangered species. It serves as a gateway to Alaska and is interconnected through commerce and shared resources with other nations of the Pacific Rim. Residents and visitors draw deep cultural, aesthetic and spiritual benefits from the ocean and its surroundings.

Washington's ocean environment is strongly influenced by the colder waters of the California Current and is characterized by temperate marine flora and fauna. Rocky northern shores support prolific assemblages of marine animals and plants. Winding eastward and to the south are Puget Sound, Grays Harbor and Willapa Bay, three of the largest and most productive estuaries along the West Coast. The nutrient-rich sediment plume of the Columbia, one of the continent's largest rivers, varies seasonally and exerts its influence over a broad area at the Washington-Oregon border.

Coastal Washington is a study in contrasts — geographically, ecologically, socially and culturally. The outer coast is a region of low population densities, small ports, natural resource-based economies and multigenerational fishing families and has limited access to goods, services and infrastructure. However, the Puget Sound basin is a hub of activity, home to about 3.5 million people — more than half the state's population. By 2025, an estimated 5.2 million people will populate the area.

The Puget Sound region is characterized by diversified urban economies and contains the ports of Seattle and Tacoma, among the largest container ports in North America. The region also faces significant concerns about polluted waters, habitat loss and declines in native species.





## Washington Sea Grant Research

Research sponsored by WSG combines scientific excellence and a focus on problems and opportunities faced by ocean users and managers in Washington and the Pacific Northwest.

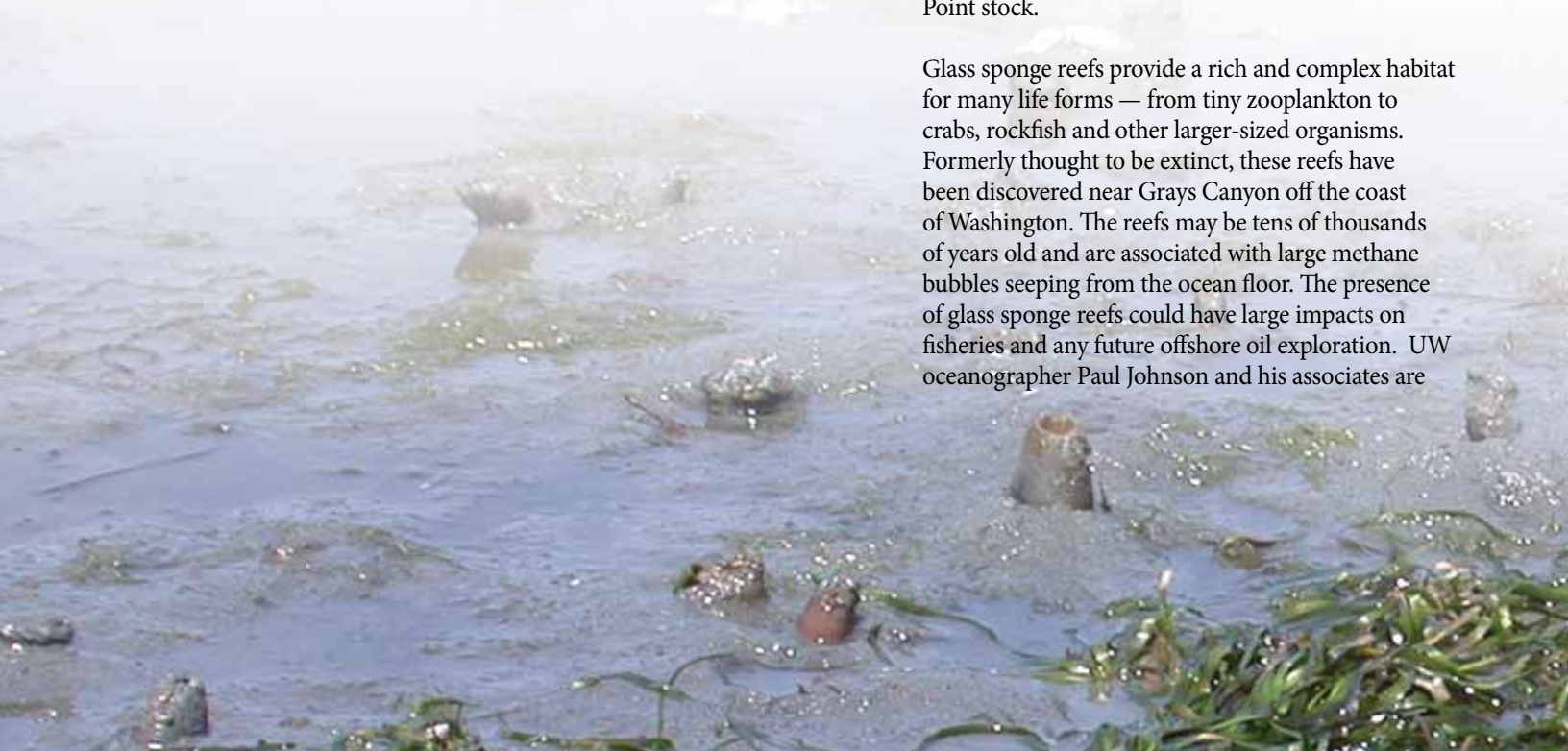
In 2007, WSG funded and administered a portfolio of more than 60 research and education projects. Each project was carefully selected to maximize the productive use of marine resources while preserving and, if necessary, helping to restore the essential qualities of the marine environment and the vitality of coastal communities.

In addition to these projects, WSG was commissioned by the state Legislature to review existing scientific literature on geoduck farming — a somewhat controversial endeavor in Washington and British Columbia. The Legislature tasked WSG with selecting and managing scientific research contracts for the purpose of assessing the effects of geoduck aquaculture on Puget Sound and Strait of Juan de Fuca environments. By assigning these tasks, the Legislature showed its recognition of WSG's expertise in translating science for public use, as well as the program's ability to serve as an honest, unbiased broker of scientific information.

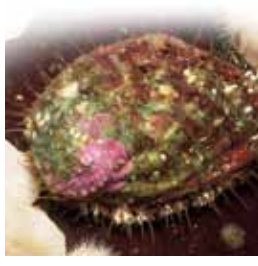
In September 2007, WSG co-hosted the Northwest Workshop on Bivalve Aquaculture and the Environment. National and international experts presented data on an array of topics, including genetics and disease, culture of native species and public health. Research recommendations, together with a literature review of current research, provided direction for a WSG request for research proposals, issued the following month. Three large projects were launched, one of which brought together researchers from Washington and Maryland, to further our understanding of geoduck aquaculture's possible impacts.

Despite the closure of the Cherry Point herring fishery in 1996, this population of forage fish is still declining. Sea Grant researchers detected distinct patterns of genetic differentiation between the Cherry Point population and other Puget Sound populations. The information uncovered by Lorenz Hauser, a Sea Grant-funded scientist, and his research team will aid managers in forecasting abundance trends and determining the conservation status of the Cherry Point stock.

Glass sponge reefs provide a rich and complex habitat for many life forms — from tiny zooplankton to crabs, rockfish and other larger-sized organisms. Formerly thought to be extinct, these reefs have been discovered near Grays Canyon off the coast of Washington. The reefs may be tens of thousands of years old and are associated with large methane bubbles seeping from the ocean floor. The presence of glass sponge reefs could have large impacts on fisheries and any future offshore oil exploration. UW oceanographer Paul Johnson and his associates are







currently characterizing the spatial extent, physical state and viability of Washington's sponge reefs. This information is essential for scientists and managers.

The pinto abalone is the only abalone species native to Washington. Once the mainstay of a popular recreational fishery, this species is severely depleted and a state-recognized "species of concern." Sea Grant-funded researchers Carolyn Friedman, Kerry Naish, Joth Davis and Betsy Peabody have worked to fill critical information gaps on the abalone's larval dispersal characteristics and ability to tolerate different temperature and salinity levels — information that may help managers develop an effective and successful plan for rebuilding pinto abalone stocks.

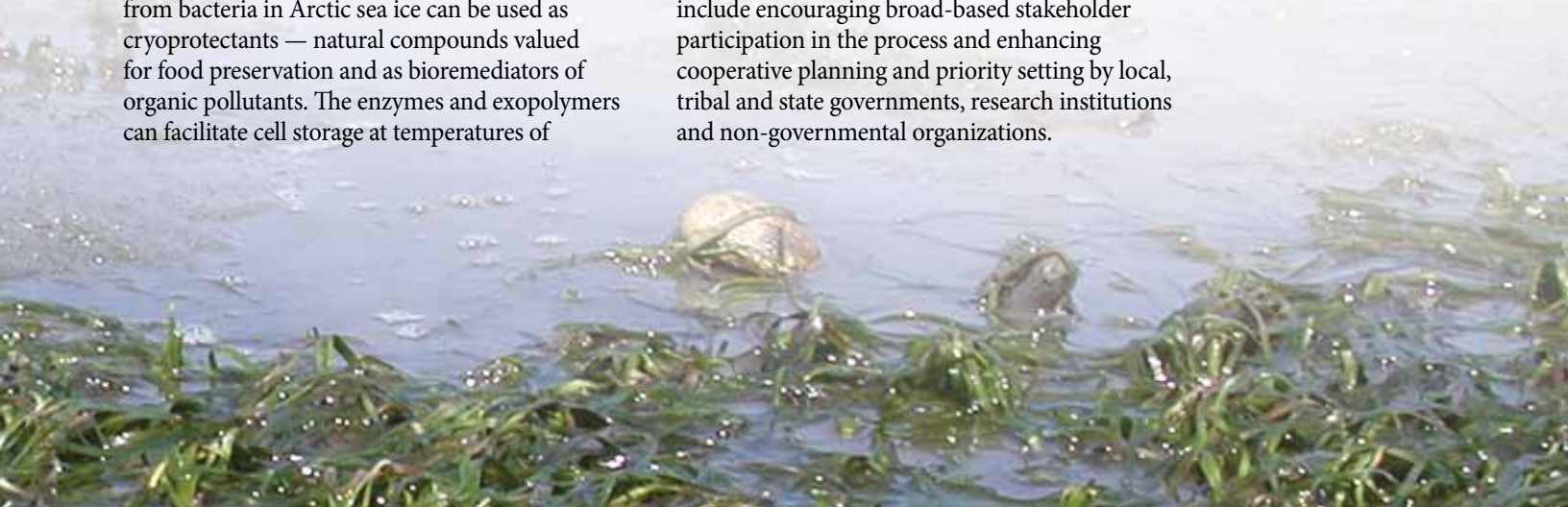
WSG-funded researchers from UW's Applied Physics Laboratory, launched their new Boater Information System, or BIS. Delivered via a Web portal ([http://bis\\_portal.apl.washington.edu](http://bis_portal.apl.washington.edu)), this useful decision-making tool is now helping the region's sailing and motoring enthusiasts plan trips on Puget Sound. BIS shows the interaction of four types of boaters' most requested data — winds, currents, tides and temperature — for up to 72 hours, at 12-kilometer resolution.

With WSG support, UW researcher Jody Deming is exploring how enzymes and exopolymers from bacteria in Arctic sea ice can be used as cryoprotectants — natural compounds valued for food preservation and as bioremediators of organic pollutants. The enzymes and exopolymers can facilitate cell storage at temperatures of

–80°C and may be useful in the food, aquaculture, pharmaceutical and biomedical industries. In the long-term, our knowledge of these bacteria will shed light on microbial survival strategies in extreme habitats and, ultimately, contribute new compounds and insights for biotechnological, medical and engineering applications.

What are the benefits of incorporating complex intertidal habitats into vertical seawalls along Seattle's urban shoreline? With WSG funding, a team of UW scientists is enhancing the nearshore environment of the city's downtown waterfront with several different designs of specially constructed habitat test panels and troughs to bolster habitat complexity. This enhanced environment will be monitored for benefits to fish, marine invertebrates and plants. Project results will help guide the upcoming reconstruction of the Seattle seawall and similar structures in aquatic settings.

Through a collaborative project, Sea Grant programs in Washington, Oregon and California began to assess the marine research and information needs for the West Coast. The primary goal of the Regional Marine Research and Information Plan for the California Current Large Marine Ecosystem is to identify research and outreach activities that would help the region move toward an ecosystem-based approach to ocean and coastal management. Other objectives include encouraging broad-based stakeholder participation in the process and enhancing cooperative planning and priority setting by local, tribal and state governments, research institutions and non-governmental organizations.





## MARINE ADVISORY SERVICES

Outreach staff work individually and in teams to provide technical expertise and connect marine and coastal constituents to the best scientific information available.

Throughout 2007, WSG Marine Advisory Services staff maintained high levels of outreach, extension and technical assistance. Their effectiveness was enhanced through numerous partnerships with federal, regional, tribal, state, local, nongovernmental and international organizations. The fishing and aquaculture industries, other businesses, educational institutions and other Sea Grant programs also played important roles. The outcomes from this synergistic approach have directly affected the health and vitality of Washington's marine resources, to the benefit of those who manage, use and enjoy the state's ocean and coasts.

The metrics speak for themselves: in 2007, MAS conducted 24 marine education programs for children and families, reaching 2,783 individuals with instruction. In addition, 143 WSG-sponsored adult events reached 3,864 individuals and another 5,595 individuals attended events in which MAS staff made presentations. Throughout the year, staff made 261 radio appearances and supervised a total of 1,402 volunteer hours.

MAS is at the forefront of applied research and outreach pertaining to water quality and safe commercial and recreational shellfish harvests. Its marine habitat expertise is in constant demand — in 2007, Marine Habitat Specialist Jim Brennan was named President of the Pacific Estuarine Research Society, a regional branch of the national Estuarine Research Federation. MAS is strengthening its focus on coastal communities to provide innovative outreach and technical training for coastal planners and other decision-makers.

Two-thirds of MAS staff work on issues pertaining to Puget Sound and are involved with development and implementation of the Puget Sound Partnership's action agenda. For her work with homeowners in the Hood Canal watershed and southern Puget Sound, WSG Marine Water Quality Specialist Teri King was presented with an Outstanding Staff Award at the 2007 ceremony for UW College of Ocean and Fishery Sciences graduates. King was also appointed to the Puget Sound Partnership's Ecosystem Coordination Board.

Eric Olsson, WSG's Oil Spill Prevention Education Specialist continued to provide practical alternatives to spill-prone practices by vessel owners and operators. His program targets







commercial fishing and recreational boats, ferries, ports and marinas to promote waste oil reduction and recycling, as well as sound maintenance and operating practices. In 2007, MAS developed a partnership with the nonprofit Puget SoundKeeper Alliance to certify marinas in the Clean Marina Washington program.

MAS continued to refine its relationship with the commercial fishing industry. In 2007, WSG's bycatch mitigation program, which has helped reduce the incidental capture of seabirds in Alaska's demersal longline fisheries by nearly 80 percent, completed its work with the Alaska longline and trawl fisheries and has since turned its attention to vital work in the international arena. For his work in this area, Ed Melvin, WSG's Marine Fisheries Senior Scientist, accepted the Special Achievement Award from the Pacific Seabird Group.

Ships' ballast water contains billions of organisms that range from microscopic viruses and bacteria to planktonic forms of invertebrates and fish. To curb the unintentional release of these organisms into the local environment, WSG's Marine Ballast Water Specialist Russ Herwig has been testing and evaluating treatment technologies on a range of scales, from the laboratory bench to actual

shipboard prototype installation, in conjunction with the University of Washington's Ballast Water Research Team.

Vessel safety training classes for commercial fishermen are helping to save equipment and lives in Washington and throughout the Pacific Northwest. The West Coast and Alaskan fisheries are the highest-risk fisheries in the country and port-based training for commercial fishermen helps improve emergency preparedness and the ability to effectively use new safety equipment. Marine Education Coordinator Sarah Fisker, Marine Field Agent Steve Harbell and other MAS staff offer a range of classes and workshops, focusing on vessel safety, maintenance and operations. These workshops have also attracted recreational boaters and others with ties to the marine environment.

2007 also saw planning for a major retail seafood training effort, to introduce apprentices in the United Food and Commercial Workers Union to sustainable seafood education, handling and merchandising. Seafood workers are certain to benefit from training, the industry will gain better-trained help and shoppers will get more accurate information on their purchases.





## WASHINGTON SEA GRANT EDUCATION

The WSG Education program provides opportunities to graduate students for academic growth and to students of all ages to improve understanding of marine ecosystems.


Sustained high numbers of WSG-nominated students were selected for the national Dean John A. Knauss Marine Policy and Sea Grant / NOAA Fisheries fellowships in 2007. Since the Knauss Fellowship's establishment in 1979, nearly 500 students have served on a congressional staff or with an executive agency. In the 30-year history of the program, more than 60 fellows have been selected from Washington Sea Grant — more than any other Sea Grant program in the nation.

WSG Education staff actively participated in numerous marine education activities. They planned and initiated professional development scholarships for the local chapter of the National Marine Educators Association, presented exhibits and poster sessions at the National Science

Teachers Association and the Environmental Education Association of Washington, and sat on the advisory boards/education committees of the Education, Communication and Outreach Network (ECO-Net) of the Puget Sound Partnership, the Northwest Association of Networked Ocean Observing Systems (NANOOS) and Climate Quest, a UW-sponsored camp on climate change.







In partnership with NOAA, WSG Education continued to serve as a key player in the educational development and evaluation of NOAA Science Camp for middle-school youth. For the fifth year in a row, the camp was held in July at NOAA's Western Regional Center in Seattle. Through its emphasis on hands-on education, participants learn about NOAA science and its roles in the community. Simultaneously, WSG provides high school, undergraduate, graduate students and educators with opportunities to work at the camp and learn more about NOAA's education resources and science-based careers.

2007 witnessed the birth of the Marc Hershman Marine Policy Fellowship, a state fellowship based on the national Knauss Fellowship. The new fellowship is named in memory of Marc Hershman, past director of the UW School of Marine Affairs and a highly respected researcher and advisor on numerous WSG projects. It offers first-hand experiences in natural resource policy and enables students to share their academic expertise with policy-makers in the state capitol. It places two highly motivated, qualified graduate students per year with Washington State Ocean Caucus agencies in Olympia.

High school students benefited from WSG's role as co-coordinator of Orca Bowl '07, the state's regional component of the National Ocean Sciences Bowl. WSG increased support of this Knowledge Bowl-like competition through a partnership with the UW's School of Oceanography. WSG helped recruit teams, managed registrations and assisted with volunteer training and event logistics. Fifteen teams registered in 2007, with the winning team, from Vancouver, Washington's ExCEL Academic League, traveling to New York and placing seventh in the national finals.

WSG Education staffers Nancy Reichley and Julie Hahn co-authored "NOAA Science Camp: Environmental Detectives in Action," an article published in *Current*, the journal of the National Marine Educators Association.



## WASHINGTON SEA GRANT COMMUNICATIONS

WSG Communications translates information on the ocean and coastal environment for use by agencies, organizations, businesses, schools and individuals.

Throughout 2007, WSG Communications maintained a steady stream of quality materials in support of outreach, education, research and administration. Major works included three large pull-up displays for conferences, workshops and other events, as well as updates of already popular publications on fellowship opportunities, gathering safe shellfish and, in cooperation with the Alaska and Oregon Sea Grant programs, a 92-page *Fishermen's Direct Marketing Manual*.

Communications' established reputation for excellence attracted an assortment of clients during the work year. WSG staff edited, designed and produced a series of 10 technical reports on Puget Sound ecosystem components for the Puget Sound Nearshore Partnership and, for the Joint Institute for the Study of the Atmosphere and Ocean, forged

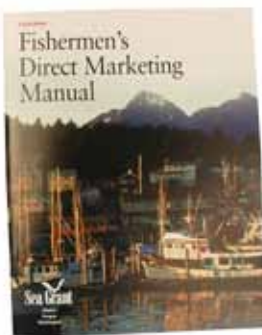
a visual identity and finalized an annual report for this federal program housed at the UW.

WSG Communications continued to produce its award-winning quarterly newsletter, *Sea Star*, as well as *Explore*, the quarterly newsletter for the UW's College of Ocean and Fishery Sciences. Staff also worked with students and the WSG associate director to update the organization's publications database.

Nurturing student communication skills remains a priority and, to meet this goal, Communications provided writing opportunities and internships for several students. In 2007, WSG also launched its new Science Writing Fellowship program, selecting one science-writing fellow for each of three quarters during the academic year.







## Program Awards and Honors

Eric Olsson awarded Sea Grant Outstanding Outreach award for work on marine travel lift transfer from Alaska to hurricane-stricken Plaquemines Parish, Louisiana. Award presented at Sea Grant Week, September 2007

Jim Brennan serves as President of Pacific Estuarine Research Society and Board Member of the Coastal and Estuarine Research Federation (CERF)

Jim Brennan awarded Environmentalist of the Year award by Association of Bainbridge Island Community and Outstanding Stewardship award by City of Bainbridge

Ed Melvin awarded UW School of Aquatic and Fishery Sciences Affiliate Associate Professor for the 2007-2008 academic year

Ed Melvin gave invited Keynote presentation on fisheries bycatch at the International Council for Exploration of the Sea (ICES) 2007 Annual Science Conference

Teri King and Jeff Adams elected co-chairs of the Hood Canal Watershed Education Network, July 2007

Teri King selected to Ecosystem Coordination Board for the Puget Sound Partnership, December 2007

Teri King selected for Outstanding Professional Staff award for UW College of Ocean and Fishery Sciences, May 2007

## COMMUNICATIONS

In the summer of 2007, Communications brought WSG'S new Web site online — a maneuver that more than doubled Web site visits from previous years. Among the many features of the new site were expanded staff biographies, a user-friendly calendar of events and an archive of past *Sea Star* editions.

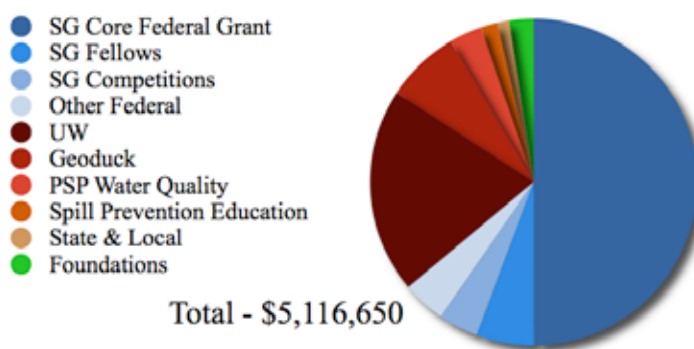




## WSG by the Numbers, 2007 - 2008

- WSG-sponsored or organized meetings, workshops and conferences..... 138  
Attendees..... 3811
- Media appearances and interviews..... 261
- Public presentations..... 191  
Attendees..... 5392
- Volunteer hours donated ..... 1201

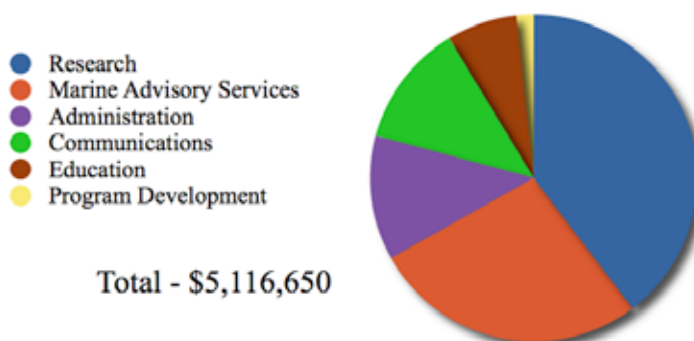
2007 Washington Sea Grant Funding Sources



### WSG Student Support 2007 - 2008

- Knauss Fellows ..... 4
- Sea Grant/NOAA Fisheries Fellows..... 6
- WSG-supported undergraduate students..... 17
- WSG-supported graduate students ..... 30
- WSG-supported PhD graduate students ..... 22

Washington Sea Grant Expenditures by Program Element







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Produced by Washington Sea Grant

A publication of the University of Washington pursuant to National Oceanic and Atmospheric Administration Award No. NA07OAR4170007. The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its sub-agencies.

WSG-PM 09-01



*Serving the people who manage, use and enjoy Washington's ocean and coasts*

