



Sea Star

Marine Safety Training

WSG-Offered Classes Help Reduce the Risk of the Most Dangerous Occupation

Two years ago, when Brad Jensen, captain of the fishing vessel *Aldebaran*, learned he'd won a free Safety at Sea training class from Washington Sea Grant, he wasted little time in scheduling a session for his crew and himself.

Jensen's swift decision may have meant the difference between life and death. In August 2007, while fishing in Alaska, his Port Townsend-based seiner struck the north end of Bold Island and started taking on water. At Jensen's orders, the *Aldebaran's* crew donned survival suits and boarded the vessel's small skiff. Within minutes, the wood-hulled *Aldebaran* sank from sight, beneath the waves of Alaska's Inside Passage.

"Thanks to that training class, we were well prepared to deal with this emergency," says Jensen. "Everyone knew just what to do. Aside from a few bumps and scratches from the ship's impact with the island, nobody was seriously hurt."

Jensen and his crew were more fortunate than many other Northwest fishermen. With a fatality rate almost 36 times higher than that for the average worker, commercial fishing is the most dangerous occupation in the country. In some cases, shorter seasons and intense competition for harvestable resources are putting increased pressure on fisher-

During two days in May, WSG staff assisted in safety at sea training for more than 400 employees of American Seafoods, one of the largest harvesters and processors of seafood in the U.S.

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Sarah Fiskin, WSG Marine Education Coordinator

men to work under adverse conditions. Combined with the severe ocean environment in the North Pacific, this creates an even greater potential for loss of life and vessels.

In its *Marine Safety Update* for Summer 2008, the Alaska Marine Safety Education Association (AMSEA) listed 17 commercial fishing fatalities off the coast of Washington over the six-year period from 2000 to 2006. There were 20 fatalities off the Oregon coast and 20 off the California coast during the same period. The Dungeness crab fishery accounted for 17 of the 23 total shellfish fatalities within the three-state offshore area.

“The Alaska Bering Sea crab fishery has been sensationalized as ‘The Deadliest Catch’ by the popular television show on the Discovery Channel,” noted AMSEA. “However, we found that the Northwest Dungeness crab fleet not only had a higher number of fatalities than the Bering Sea fishery during 2000-2006... but also had a 50-percent higher fatality rate.”

Sea Grant’s Focus on Safety

Since 1992, Washington Sea Grant has provided port-based safety training courses for commercial fishing vessels for nearly 2,000 commercial fishermen, recreational boaters, passenger vessel operators and maritime students.

“Without exception, participants have made significant improvements in their readiness for emergencies at sea,” says Steve Harbell, WSG’s Marine Field Agent in Pacific and Grays Harbor counties. “They’ve been successful in dealing with flooding, man-overboard situations and firefighting on their vessels. Their preparedness has saved the lives of several fishermen and prevented the loss of nearly \$1.2 million in vessel and equipment costs.”

“While our classes address these situations, they also train people to respond to medical emergencies that require contacting the U.S. Coast Guard and

may involve medical evacuation by helicopter,” says Eric Olsson, a member of WSG’s safety training team. WSG’s Safety at Sea classes also promote an understanding of the capabilities and limitations of Emergency Position Indicating Radio Beacons and other commonly used safety equipment. “We demonstrate standard signaling equipment, life rafts and personal floatation devices, and also show crewmembers how to be resourceful by turning the flashes of digital cameras or the sun reflecting off a CD or credit card into lifesaving rescue signals,” offers Olsson.

Olsson also capitalizes on the classes to share information about reducing pollution at sea. As WSG’s Small Oil Spill Prevention Education Specialist, he is a strong proponent of the notion that a clean boat is a safe boat, freely offering technical assistance to help eliminate chronic small oil spills associated with boating operations and maintenance.

Olsson points to the benefit of being able to draw from the real-life experiences of the fishermen. “Because of our backgrounds, we can better relate the information we offer to the actual conditions aboard a ship,” he says. For instance, before she accepted the position as WSG’s Marine Education Coordinator, Sarah Fiskin fished on a troller, worked on a factory trawler in the Bering Sea and spent nine seasons purse-seining in Southeast Alaska. For nearly 25 years, she’s coordinated WSG’s marine safety and technology training efforts in the Puget Sound region, from her office at the West Wall of Seattle’s Fishermen’s Terminal.

Not all of the classes that Fiskin, Harbell and Olsson present are intended to prepare individuals for situations like that encountered by the *Aldebaran’s* crew. Many classes cover technical topics, such as Diesel Engine Trouble-Shooting or Fiberglass Maintenance and Repairs. However, two of the most sought-

WSG’s Eric Olsson demonstrates the safe and effective use of hand-held flares and smoke signals, instrumental during a maritime emergency.



Coastal Planning to Protect Puget Sound

by Katrina Hoffman, Coastal Resources Specialist

This is the fifth in a series of essays exploring the opportunities and issues addressed by Washington Sea Grant specialists in offices throughout western Washington.

Our state's population is projected to gain an additional two million people by 2030 and many of those newcomers will be living near marine waters or along tributaries emptying into them. Decades of human impacts have already degraded the quality of the marine environment in Washington, and the predicted population growth has undeniable potential to do further harm. Legislation such as Washington's Shoreline Management Act and the Growth Management Act were designed to minimize the negative impacts of growth and ensure that any future growth will occur in a coordinated, carefully planned manner. However, headlines about the health of Puget Sound and efforts to restore it are tangible evidence that we are still trying to figure out the best ways to accomplish this.

Many Washingtonians have jobs that require them to continuously consider the huge array of human impacts on Puget Sound. These professionals include land use planners and community development specialists at the city and county levels, biologists working for state and federal agencies, engineers and consultants serving municipalities with projects impacting our shorelines, and the people who review and approve permit applications for a range of development activities.

In my position with Washington Sea Grant, I explore these issues on a daily basis. Over the past six months, I've been working to build relationships with organizations and communities concerned about marine resources. While my primary office is at the Padilla Bay National Estuarine Research Reserve, I work with Sea Grant constituents all over western Washington on these issues.

One of my primary efforts is to revitalize the Shoreline and Coastal Planners Group (SCPG), a professional development and networking forum established in the 1970s.

SCPG participants gather a few times a year to discuss the diverse pressures affecting Washington waters, learn from experts, hear about successes and challenges experienced by their peers and share best management practices in shoreline and

coastal planning. Meetings often include field trips to relevant coastal locales. Our "reunion" meeting will be held later this year, and I look forward to making it as fruitful as previous gatherings. To ensure its success, I am coordinating the development of a new, more user-friendly SCPG Web site. In time, I hope the site will offer technological tools to facilitate communication among planners.

Another initiative I'm excited about will provide climate change-related training for planners. Thanks to a grant from NOAA's Coastal Services Center, staff of the Padilla Bay National Estuarine Research Reserve's Coastal Training Program, Washington Sea Grant, the University of Washington's Climate Impacts Group and the King County Executive's Office will present a one-day training session on climate issues for planners. Training priorities have been set, based on direct feedback from planners, to focus on action-oriented strategies to help local entities prepare for and adapt to climate change. The authoritative *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments* will serve as an important resource for this effort. This training will take place in Spring 2009.

Opportunities abound for outreach through other local avenues and I'm glad to be involved with some of them. One organization that provides options for local marine-related action and outreach is the Northwest Straits Commission. Each year, members of seven affiliated county Marine Resources Committees (MRCs) gather to learn about emerging issues affecting the San Juan Islands and Strait of Juan de Fuca. I'll be partnering with Commission staff member Simon Geerlofs to offer a plenary session on ocean acidification — a phenomenon traced to the build-up of carbon dioxide in the atmosphere — at the fall 2008 meeting. A marine ecologist will address the audience about the possible impacts of ocean acidification on ecosystems, how resilient ecosystems may adapt to climate change, and why acidification monitoring is an important initiative that communities could support.



For more information on these and other efforts to preserve our coasts, please contact Katrina Hoffman at 206.616.3368 or 360.416.7048 or by e-mail at kathoff@u.washington.edu.



Field Notes

In September, WSG's Marine Ballast Water Specialist Russ Herwig traveled to Key West, Fla., to meet with the Ballast Water Treatment Environmental Technology Verification (ETV) Technical Panel. Along with the panel, Herwig reviewed the results and test protocol recommendations presented by the U.S. Navy Research Laboratory in Key West for evaluating treatment technologies that will control releases of aquatic invasive species in ships' ballast water. In mid-October, the peripatetic Herwig will speak about hull fouling at the Third Annual Alaska Invasive Species Conference and meet with one of his research sponsors, the Prince William Sound Regional Citizens' Advisory Council in Anchorage.

Jeff Adams, WSG's Marine Water Quality Specialist in Kitsap County, along with staff of the Kitsap County Surface and Stormwater Management Program, Kitsap PUD, Kitsap County Stream Team, Great Peninsula Conservancy, City of Bremerton Water Utilities and Suquamish Tribe, is helping to organize a regional salmon celebration on Sunday, November 22. The event highlights the return of chum salmon to Kitsap streams at three sites — Fish Park in Poulsbo and Chico Creek (at Golf Club Hill Road) and Jarstad Park in Bremerton. Salmon experts will give short presentations at each site from 10 a.m.-2 p.m.. For more information, contact Adams at 360.337.4619 (jaws@u.washington.edu) or Debbie Thomas, Kitsap PUD, at 360.626.7723 (dthomas@kpud.org).

MAS Specialists Sarah Fisksen and Steve Harbell, MAS Program Leader Pete Granger and UW graduate student Mark Gleason are offering 12 hours of retail seafood training to participants of the Meat Business Apprenticeship Program of South Seattle Community College, Duwamish Training Center. Training dates are October 23 and 30 and November 6. The Alaska Seafood Marketing Institute is partnering with WSG for this project. Contact Pete Granger, 206.685.9261 or pgranger@u.washington.edu, for more information on this unique opportunity.

WSG Education Coordinator Julie Hahn met in September with the regional coordinators of the National Ocean Sciences Bowl in Washington, DC, in preparation for next year's competitions. "More than a logistical update, the meeting was designed to recharge coordinators," says Hahn. "We spent time learning from the experiences of others involved in hosting these events." For Hahn, the meeting marked the beginning of many months of planning, prior to the launch of Washington's Orca Bowl '09 to be held on Saturday, February 7th. This is Hahn's second year as a regional coordinator. "Last year, I shared the role with Veronique Robigou, formerly with the University of Washington's School of Ocean-

WSG Funds a Second Look at Glass Sponges

by Colleen Craig

In August, UW Oceanography professor Paul Johnson led a second Washington Sea Grant-funded cruise to investigate unusual glass-sponge reefs in Gray's Canyon, 40 miles off the southern Washington coast. Discovered by Johnson's team on an earlier WSG-funded expedition, the reefs are part of a vast undersea community that may be supported by ancient methane gas seeping out of the sea floor. Samples collected during this second trip may clarify the relationship between the methane plume and the teeming biology in the vicinity of the glass sponge reefs.

Once thought to have become extinct, deep-dwelling glass sponges are alive and well off the Washington coast.

Scientists had observed other species of glass sponges throughout the world's oceans, but reef-builders were thought to be extinct until the late 1980s, when 8,000-year-old living reefs were discovered in several places in British Columbia. The Washington reef represents the only live glass-sponge reef yet discovered in U.S. waters, and preliminary results of this year's cruise indicate that it may be much older than the British Columbia reef.

In sonar images of the site from the 2007 expedition, Johnson observed networks of roughly parallel lines on the sea floor, as if the reefs had been "plowed" or partially damaged. "I thought these traces were from human activity," says Johnson. During this year's cruise, surveys using a Remotely Operated Vehicle (ROV) revealed that these traces are actually about 60 to 100 meters wide and 20 to 40 meters deep — too large to be caused by anthropogenic sources. Further, these gouges contain boulders made of rock that are not normally found on the sea floor. These boulders, called glacial erratics, must have been carried to that site by something.

"They look like iceberg gouges!" says Johnson. "You're only going to get icebergs during the last glacial maximum, which was about 20,000 years ago, so that means these reefs probably date back to the last interglacial period," which occurred more than 125,000 years ago.



ography, and coordinator of the statewide competition for the previous four years," Hahn says. For information about Orca Bowl '09, contact Hahn at 206.685.9117 or jkhahn@u.washington.edu.

Jim Brennan, WSG's Marine Habitat Specialist, is continuing to work on *The Ecology and Management of Marine Riparian Areas in Puget Sound*. This guidance document is the product of a multi-agency task force comprised of representatives from Washington state departments of Ecology, Transportation, Natural Resources and Fish and Wildlife. "The primary audience will be local jurisdictions updating their Shoreline Master Program and Critical Areas ordinances," says Brennan. "It should be useful for others with natural

resource management responsibilities and for education and outreach efforts, as well." A science panel will review the document at a workshop scheduled for November. The results of the workshop will be summarized and integrated into the draft document, and a final draft will be produced by WSG and made available for distribution in the spring of 2009.

Correction

An article in the Summer 2008 *Sea Star* incorrectly stated that Cherry Point herring stocks lay their eggs in gravel. Like many other stocks of Puget Sound herring, these fish spawn on eelgrass or kelp. We apologize for this error.



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Sea Grant
Washington



Large Reefs

During the last glacial period, sea levels dropped by about 120 meters, moving the glass sponge reefs much closer to the surface waters and to sunlight. This means they had to compete unsuccessfully with diatoms — photosynthetic single-celled organisms that build their cell walls from silica, the same substance that glass sponges use to build *their* skeletons. The sponges probably died during this period, but their skeletons remained, forming a network of reefs that stretched for miles along the Washington continental margin.

The glass-sponge reef in Gray's Canyon sits on top of a large methane seep, which could prove to be the base of a massive undersea food chain. The methane bubble plumes "are very common. They seem to be all over the place," says Johnson. "And around all the plumes, there are sponges, clams, crabs, swarms of tiny shrimp-like krill, rockfish, tube worms and other organisms. It's a very intense biological habitat."

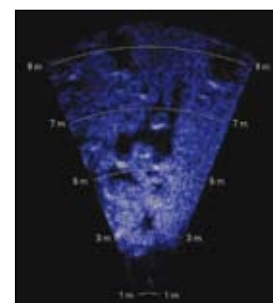
Also known as natural gas, methane (CH₄) is a simple compound of carbon and hydrogen, which can serve as a food source for types of bacteria called methanotrophs. The bacteria extract energy from methane in much the same way that a human cell extracts energy from sugar. "Methane is a tremendous energy source for biology," Johnson said in 2007. "Whenever you find methane seeps in the ocean, you find large populations of bacteria."



During this year's cruise, the team used the ROV to investigate a large methane bubble plume and, instead, encountered a swarm of krill, hundreds of meters in diameter and so thick that there were few discernable spaces between the individuals. In the ROV video, the swarm "looked like something from Alfred Hitchcock's movie, *The Birds*," says Johnson. The implication is that the large population of krill may be supported by a large population of methanotrophic bacteria, which use the abundant methane flux from the sea floor as food source.

"Salmon eat the krill, rockfish eat the krill, whales eat the krill. Everybody eats the krill. It is the marine equivalent of fast food, only freely available all year."

The primary source of biological productivity in the ocean is photosynthesis in the surface waters, where the dead organisms and their debris eventually fall



Hi-tech ROVs (top) and sonar images (bottom) gave invaluable clues to the reef's composition.

Glass Sponge Reefs • continued on page 6



Marine safety classes may feature fly-ins by U.S. Coast Guard helicopters.

after classes — First Aid at Sea and Sea Safety and Survival — deal solely with the crews' well-being. Both U.S. Coast Guard-certified classes meet the training requirements of the federal Commercial Fishing Vessel Safety Act. In Westport alone, Harbell says, the WSG team has conducted 17

drill instructor/safety orientation courses certified through AMSEA, the first in November 1992 and the most recent in May of last year.

"The safety classes help protect people on the water, but the technical classes can help defray some of the expenses incurred by owning a boat," Fisken says. "If you can fix an engine on your own, you can often avoid costly mechanic's bills," she says.

Frequently offered Marine Refrigeration Workshops have become some of the most popular courses, according to Fisken. Fishermen need to be more knowledgeable about freezing their catches to meet the increased demand for higher-quality seafood, she says. During these hands-on trainings, workshop

participants learn about general maintenance, controller programming and environmentally friendly ways to charge their vessels' cooling units with Freon. A 7 ½-ton refrigeration unit is often used as a training aid during class.

In recent years, WSG has offered certified safety courses for Washington's Makah, Quilleute and Quinault tribes. As a result, WSG has expanded its positive role and made the seas safer for tribal fishermen and traditional canoeists.

"Washington Sea Grant has always accommodated both tribal and non-tribal fishermen by adjusting these fees to encourage maximum participation," says Harbell. "The fees charged for our courses have been minimal, only serving to defray a relatively small portion of our expenses, while representing a commitment on the part of participants to complete the training."

Back from a season in Alaska, where he fished from a leased vessel, Brad Jensen recognizes the value of that commitment. "I've signed up my crew for safety training classes several times in the past," he says. "With Washington Sea Grant's help, we now think and act aboard ship like a team. That's made a real difference in the way we work together, and we're all glad for that."

Glass Sponge Reefs • continued from page 5

through the water column and provide nutrients for organisms at lower depths that are out of reach of sunlight. "The only place where this is known to be fundamentally different are the chemosynthetic biological systems near mid-ocean ridge hydrothermal vents, where the heat and nutrients come from the volcanic rocks that form the ocean crust rather than sunlight," says Johnson. Although there are also chemosynthetic communities derived from methane vents on other continental margins, they tend to be in much deeper water and are not known to be associated with glass sponges or krill swarms.

At the Gray's Canyon site, large bubble plumes appeared to be generally associated with large populations of krill, and the glass sponges seemed to be associated with high levels of dissolved methane. Individual sponges remain fixed in place during their 100- to 200-year life span, and feed by filtering bacteria from the surrounding waters. The team found that the bottom waters surrounding the reefs with live sponges also had high levels of dissolved methane, which presumably supports the bacteria that the sponges feed on. In areas where there were no live sponges, the researchers also found very low levels of dissolved methane.

"We think that there may be a relationship between methane concentration and glass sponges, although our number of samples is small," says Johnson.

The methane seeps may also explain why certain areas off the coasts of Washington, Oregon and Alaska have such active commercial fisheries. The abundant krill populations may be feeding on the bacterial floc and, in turn, provide sustenance for fish and other predators in the area. The glass sponges also feed on the bacteria and offer hiding places for juvenile fish, providing protection from the abundant predators in the environment.

"We should be able to map the influence of these methane plumes using carbon isotope analyses," says Johnson, who is currently awaiting these test results from the Woods Hole Oceanographic Institute in Massachusetts.

"The methane coming out of the sea floor may be the energy source that supports an entirely different undersea ecosystem on the Washington continental margin," says Johnson. "It could be an area where a chemosynthetic marine biological community doesn't get its energy directly from the sunlight, it gets its energy from methane gas coming out of the sea floor. That could be really, really interesting."

Introducing Troy Guy

Please welcome Troy Guy, WSG's new Marine Fisheries Research Associate, working with Marine Fisheries Specialist Ed Melvin to develop methods to reduce the incidental mortality of seabirds in a range of commercial fishing gear.

"Working with Ed on seabirds and fisheries is right up my alley," Guy explains.

The former Astoria, Ore., resident has been a fisheries research scientist for most of his post-college career. His work has taken him to the Alaskan tundra, the desert of eastern Oregon and the rainforests of western Oregon.

As an undergraduate at Oregon State University, Guy studied coastal cutthroat trout in headwater streams. This led to a Master of Science degree from Oregon State, examining the influence of landscape features on the genetic diversity of these fish.

After college, Guy started to work for Oregon State University and NOAA's Northwest Fisheries Science Center as part of a team studying seabirds as predators on fishes and as indicators of ecological hotspots.

"I conducted many at-sea surveys for seabirds, captured sooty shearwaters to deploy satellite telemetry gear on them, managed the data and helped publish the results generated during these activities," he says.

A fan of all forms of fish and fishing, Guy suggests that his fondness for seabirds stems from two interests. "Maybe it's because I love boats and the ocean or because my wife, Lisa, studies seabirds," he says. Lisa and he have been leading pelagic birdwatching tours with the Hillsboro, Oregon-based Bird Guide, Inc. for several years.

"When I'm not fishing, I'll likely be out looking for that motherload of chanterelle mushrooms or, perhaps, clamming or picking huckleberries," he adds.

Contact Guy at 206.616.1260 or troyguy@u.washington.edu.



Troy Guy

Announcing the 2010 Dean John A. Knauss Marine Policy Fellowship

Washington Sea Grant invites qualified individuals to submit applications to the Dean John A. Knauss Marine Policy Fellowship. Approximately 30 students are selected nationally for this prestigious Fellowship to spend a year in Washington, D.C., working in Congress or the Executive Branch on critical marine policy and resource management issues. The Knauss Fellowship provides a stipend and living expense allowance totaling \$44,000 annually. The fellowship begins February 1, 2010.

Each year, WSG nominates up to six students to the National Sea Grant College Program for Knauss Fellowships. Nominees must be enrolled in a U.S.-accredited graduate or professional degree program in a marine or aquatic-related field in the U.S. or its territories. Applications are due by Friday, Feb. 20, 2009.

Selected applicants will be interviewed by WSG, with all applicant materials due to the National Sea Grant office by April 3, 2009. Selection criteria for the fellowship, established by the National office, include academic excellence, communication skills, diversity and appropriateness of academic background and support of the student's major professor and the WSG director.

The selection process and subsequent notification of finalists by the National Sea Grant College Program will be completed by May 23, 2009. Finalists will be required to participate in an orientation program in Washington, D.C., to be held during late November or early December 2009.

For more information, contact Nancy Reichley, Education Specialist, 206.685.8302, sgfellow@u.washington.edu, or visit the WSG Web site, wsg.washington.edu/education/fellowships/Knauss.html.

A Second Fellowship Opportunity

The Sea Grant/NOAA Fisheries Fellowship program offers two- and three-year research opportunities to doctoral candidates interested in either population dynamics and stock assessment or in marine resource economics. Fellows work closely with a NOAA expert on thesis issues of public interest and relevance to NOAA Fisheries. Applications are due to WSG on Jan. 20, 2009, with notification of Fellows in May of that year. For additional details: wsg.washington.edu/education/fellowships/SG-NOAA.html.



Orca Bowl Helpers Sought



Help shape the future of ocean science and have fun at the same time, as a volunteer for Orca Bowl '09, the state-level challenge of the National Ocean Sciences Bowl. Orca Bowl '09 will be held at the University of Washington campus on Saturday, Feb. 7. Volunteers help with registration, set-up, judging and other important tasks and must attend a minimum of two training sessions prior to the event. To sign up, contact Julie Hahn, Education Coordinator at 206.685.9117 or jkhahn@u.washington.edu.

Two Opportunities to Learn and Enjoy

Visit us on Saturday, Nov. 1, at Elliott's Oyster House in Seattle, as we celebrate the return of oyster season and enjoy the world's longest oyster bar. All proceeds from Elliott's Oyster New Year event will benefit the Puget Sound Restoration Fund's Henderson Inlet Project, reestablishing commercially viable oyster populations in this once-polluted part of Puget Sound. For more information, contact Elliott's at 206.232.9292, extension 2855, or visit www.oysternewyear.com.

We'll also be staffing our booth (#640) at Pacific Marine Expo, the largest commercial marine trade show on the West Coast, Nov. 20-22 at Qwest Field Event Center in Seattle. This event serves people from all facets of the marine trades, including commercial fishermen, boat builders and seafood processors.

WSG staff is eager to answer your questions about our program and to showcase the new interactive Boater Information System, created by the University of Washington's Applied Physics Laboratory with funding from WSG. Contact Sarah Fisksen, 206.543.1225 or sfisksen@u.washington.edu for more information.



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**SAFETY AT SEA TRAINING
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