

# Sea Star

## Cedar River Salmon

### Scientists learn first-hand how salmon colonize once-inaccessible habitat

In 2003, when the City of Seattle installed a fish ladder at its Landsburg Dam facility on the Cedar River, it opened a wealth of opportunities for coho and chinook salmon — and for Washington Sea Grant-funded researcher Thomas Quinn.

Landsburg Dam was originally intended to divert drinking water for Seattle residents. However, since its construction in 1900, the dam effectively excluded any migrating salmon from 21 miles of river and its tributaries in the upper Cedar River watershed, southeast of Seattle.

By today's understanding, this was not a good thing. In recent years, resource managers have become increasingly aware of the importance of salmon spawning habitat in Washington and elsewhere in the Pacific Northwest.

"Pacific salmon are by far the most valuable commercial resource of the fisheries of the eastern North Pacific, with a landed value of \$390 million over the past 10 years," says Quinn, a professor at the UW's School of Aquatic & Fishery Sciences.

"However, the fish have lost about 40 percent of their range and have declined markedly in abundance at the southern end of their distribution. They are in such jeopardy that one or more runs of all the species except pink salmon have been listed under the federal Endangered Species Act."

In collaboration with Seattle Public Utilities, the Muckleshoot Tribe, Washington Department of Fish and Wildlife and the National Marine Fisheries Service, Quinn and his research team are learning first-hand how salmon make use of previously inaccessible spawning habitat. This information will be extremely helpful, Quinn says, for planning any future dam alteration or removal projects. It will also provide insights into the ways with which salmon have historically colonized newly opened waterways under natural conditions.

Installing a fish ladder at the dam was an important step, according to Quinn. However, it didn't automatically ensure the success of salmon runs in the upper Cedar River watershed.

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Thomas Quinn  
Photo by James Seeb, Alaska  
Department of Fish and Game,  
from *The Behavior and  
Ecology of Pacific Salmon &  
Trout* (©2005, University of  
Washington Press)





Joseph Anderson

Photo by Karl Burton, Seattle Public Utilities

Right: The fish ladder at Landsburg Dam. Photo by Paul Faulds, Seattle Public Utilities

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“We had to address several nagging questions,” Quinn admits. “What if the fish don’t establish themselves in the habitat we’ve now provided them access to? And if they do, are we actually reducing the overall densities of salmon returning to other parts of the watershed?”

Quinn got what he describes as a “build it and they will come” answer to his first question. Within days of the fish ladder’s opening in September 2003, the first adult chinook salmon entered the ladder’s holding area. Here, Seattle Public Utilities biologists used nets to gently prod the fish into what is known as a pescalator — a giant, turning screw-like device inside a translucent tube. The pescalator carried these first fish and subsequent arrivals up the tube, to be released at the top.

During this step, Quinn made sure that data were gathered on the species, size and sex of each returning fish. A small piece of fin, about the size of a pencil eraser, was also snipped from each fish’s dorsal fin. The fin tissue samples would later be used for DNA testing, with which scientists could establish the identities and trace the parental lines of subsequent returning fish.

Other salmon were fitted with radio-tracking devices that Quinn’s assistant, UW doctoral student Joseph Anderson, could use to keep tabs on the movements of individual fish as they moved upstream, searching for suitable spawning sites. Wearing dive masks and dry suits, Anderson and others conducted “snorkel surveys” to locate juvenile salmon born in the watershed. Some of these fish were also individually tagged. Subsequent studies of these fish have shown that juveniles move upstream as well as downstream — a finding that may add to our understanding of the dynamics of colonization by generation after generation of adult salmon. Quinn theorizes



that the returning salmon may be encouraged by the presence of juvenile fish to exploit previously unexploited parts of the watershed.

To date, the research team has gathered data on hundreds of returning chinook and coho salmon. Interpretation of this information may tell us how salmon select breeding habitats in areas where they were not already imprinted as juveniles and whether predation on adult or juvenile fish might prevent populations from becoming established.

“Will the newly established habitat continue to attract stray salmon?” says Quinn. “Will returning adults in the next generation use the specific breeding habitat where they were spawned or will they spread out and colonize other parts of the upper watershed? How will the genetic structure of the new populations evolve, given the number of founders, variation in reproductive success and continued straying?”

Quinn saves the most fundamental question for last. Will the salmon establish self-sustaining populations that increase the total production from the river system? Only time — and further Sea Grant-funded research — will tell.

UW undergraduate assistant Dylan Galloway gathers samples of juvenile salmon in the Cedar River.



# Guest Editorial: A Partnership to Market Wild Seafood

This feature continues our series of guest submissions, exploring the impacts of WSG-sponsored activities in Washington and throughout the Northwest. To be considered for a future editorial, contact David G. Gordon at 206.685.8191 or [davidg@u.washington.edu](mailto:davidg@u.washington.edu).

By Peter Philips, Publisher, Fishermen's News

Six years ago, my brother Chris Philips and I purchased the West Coast's oldest commercial fishing publication. For more than 50 years, *Fishermen's News* had been the "Advocate for the Independent Commercial Fisherman" and, from 1974 to 1983, our father was the voice of that publication, as editor.

Though a Philips is again at the helm of the paper, the West Coast commercial fishing industry has changed a lot since our father's days. Farmed salmon weren't even on the radar in the heady '70s, but, when we bought the paper in 2000, farmed salmon was putting extreme pressure on the independent commercial fishing fleet that made up our readership.

The economic viability of *Fishermen's News* depends on the economic health of our readers, and we felt part of our mission was to help the independent fleet respond to these pressures by identifying new markets and helping the independent fleet access those new markets. After surveying the fleet, we determined that restaurants and high-end retailers were natural markets for the high-end, wild product that our readers harvested. The question became: how could we help the independent fleet effectively market and deliver wild seafood to the retailers and restaurants looking to source that product?

We put the question to our readers. They responded by telling us to produce a conference to discuss the issues facing the marketing of wild seafood. The result was our decision to produce the first Wild Seafood Exchange in 2003. Our aim was to bring fishermen together with restaurants and retailers in an interactive discussion to develop relationships among them.

A natural outgrowth of that effort was helping fishermen develop business plans, access funding and learn about regulations affecting small businesses. Our need for expertise in this arena led us to Washington Sea Grant and Pete Granger, Program Leader for Marine Advisory Services.

Pete's involvement in year one was as moderator of a panel discussing grants and state funding opportunities for fishermen. The panel was well received by attendees, so we expanded the discussion of the business-side issues in subsequent conferences.

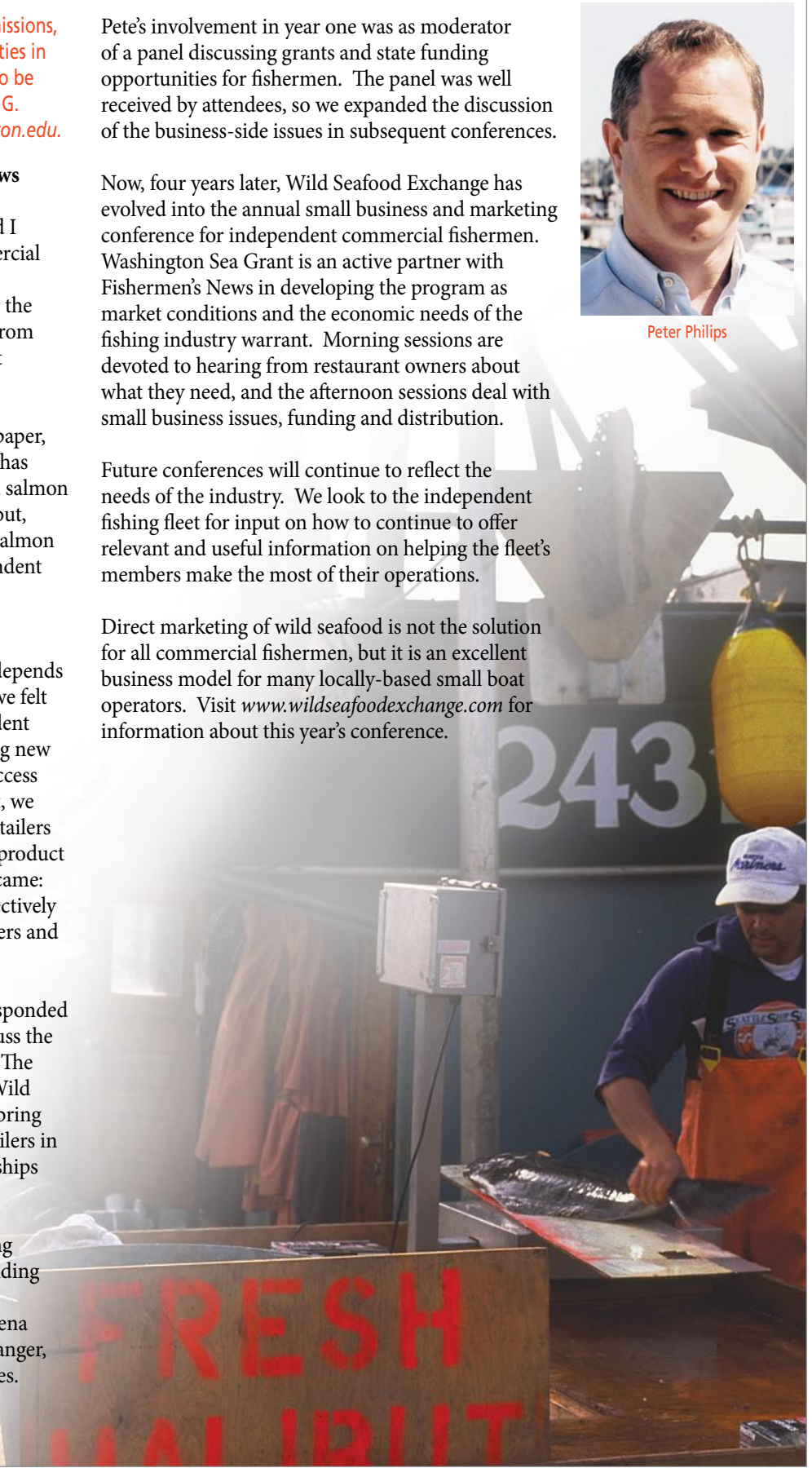
Now, four years later, Wild Seafood Exchange has evolved into the annual small business and marketing conference for independent commercial fishermen. Washington Sea Grant is an active partner with Fishermen's News in developing the program as market conditions and the economic needs of the fishing industry warrant. Morning sessions are devoted to hearing from restaurant owners about what they need, and the afternoon sessions deal with small business issues, funding and distribution.

Future conferences will continue to reflect the needs of the industry. We look to the independent fishing fleet for input on how to continue to offer relevant and useful information on helping the fleet's members make the most of their operations.

Direct marketing of wild seafood is not the solution for all commercial fishermen, but it is an excellent business model for many locally-based small boat operators. Visit [www.wildseafoodexchange.com](http://www.wildseafoodexchange.com) for information about this year's conference.



Peter Philips



In April, **Eric Olsson, WSG Small Oil Spill Prevention Education Specialist**, will participate in planning process with the Washington State Oil Spill Advisory Council (OSAC) subcommittee on outreach and education, chaired by Kathy Fletcher of People for Puget Sound. OSAC is charged with the challenge of integrating the state's efforts in oil spill prevention and response. For more information, contact Olsson at 360.221.4636 or [olsson@u.washington.edu](mailto:olsson@u.washington.edu).

**Steve Harbell, WSG Marine Field Agent** in Grays Harbor and Pacific counties, helped organize the annual National Aquaculture Extension Conference for extension and Sea Grant specialists, held in Cincinnati in April. Harbell also served as moderator at sessions on shellfish sanitation, ecological impacts of shellfish farms and the benefits of shellfish restoration projects. Contact Harbell at 360.875.9331 or [sharbell@u.washington.edu](mailto:sharbell@u.washington.edu).

On May 12, WSG and the Puget Sound Action Team will present the Kitsap County Marine Shoreline Landowner Workshop at Kingston Junior High in Kingston. **Jeff Adams, Marine Water Quality Specialist in Kitsap County**, is planning and coordinating the workshop, designed to enhance the long-term stewardship of the county's shorelines. For more information, contact Jeff Adams at 360.337.4619 or [jaws@u.washington.edu](mailto:jaws@u.washington.edu).

**Marine Ballast Water Specialist Russ Herwig** has submitted an ambitious proposal to the National Sea Grant Office to locate a facility for research, testing and evaluation of ballast water treatment technologies in the Pacific Northwest. The \$1.25-million project would be carried out in partnership with U.S. Geological Survey at its Marrowstone Island laboratory. Herwig can be reached at 206.685.2163 or [herwig@u.washington.edu](mailto:herwig@u.washington.edu).

## Marine Birds: Trend and Stewardship workshops: addressing decline

by Carolyn White

Over 100 species of marine birds spend time in the Puget Sound Basin. Some are permanent residents, while others are seasonal visitors from coastal areas and open ocean to the north or south. Recent studies, including some assisted by Washington Sea Grant funding, have indicated that these populations are far from stable. Scientists have noted a 47-percent decline in overall marine bird numbers, with declines as high as 95 percent for some species.

Habitat loss, dwindling forage fish populations, air and water pollution, oil spills and entanglement in fishing gear are all contributing factors in the reduced seabird numbers. Everyday human activities also play a role; wildlife-watching tours, low-flying planes and recreational and commercial boating can disturb marine birds while they are nesting, feeding or resting. Coupled with most seabirds' inherently low reproductive rates, such factors make it very difficult for these animals to rebuild their populations. (For more on this topic, read an earlier *Sea Star* feature, *Watching and Waiting*, online at [wsg.washington.edu/publications/seastar/archive/storyarchives/birdstudy.html](http://wsg.washington.edu/publications/seastar/archive/storyarchives/birdstudy.html)).

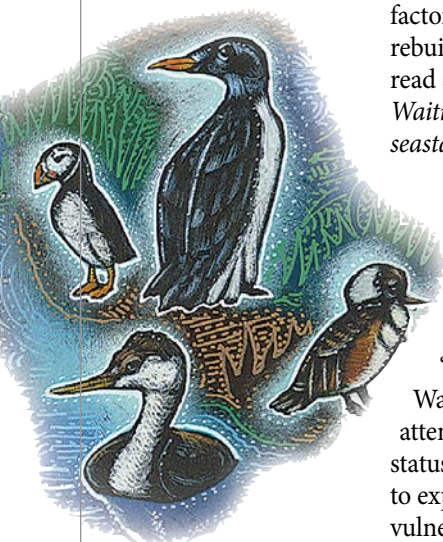
Aware of continuing declines in seabird populations, the Port Townsend Marine Science Center (PTMSC) hosted a series of workshops for educators, naturalists and other professionals in 2006. Titled "Marine Birds: Trends and Stewardship," these Washington Sea Grant-funded workshops gave attendees a chance to hear recent updates on the status of marine birds from leading researchers and to explore strategies for reducing human impacts to vulnerable marine bird species.

Judy D'Amore, educator and curator of the PTMSC's natural history exhibit, coordinated the workshops. According to her, a goal of these workshops was to get people talking about solutions to these disturbing trends. To do this, they decided to bring together people who were in positions to share information and ideas from these sessions with a wider audience.

Workshop attendees — a total of 130 people — included representatives from King and Jefferson counties, cities of Edmonds and Everett, WSU Cooperative Extension, the Stillaguamish Tribe and NOAA. Many participants were affiliated with the wildlife-viewing industry, and volunteers from The Seattle Aquarium and nonprofit groups such as the Audubon Society and North Olympic Salmon Coalition rounded out the crowd.

Each workshop was led by a leading researcher, who discussed recent studies and what they revealed. Speakers included David Nysewander from the Washington Department of Fish and Wildlife, John Bower from Western Washington University, Julia Parrish from the University of Washington and Bob Boekelheide, Director of the Dungeness River Audubon Center. Part of each session also included time in the field, where attendees could see the species under discussion and, in some cases, view field research techniques first-hand.

At the conclusion of the series, PTMSC produced "Sharing Puget Sound with Marine Birds," an article highlighting topics covered in these sessions, as well as a list of recommendations generated by workshop presenters and participants. Both of these documents can be downloaded from the PTMSC



In February, WSG's Marine Fisheries Scientist Ed Melvin accepted the Special Achievement Award from the Pacific Seabird Group. Earlier that month, the North Pacific Fishery Management Council took final action on Melvin's research that eliminates seabird avoidance requirements for longline vessels fishing Alaska's inside waters and tightens requirements for small vessels fishing outside waters.

The Northwest Straits Commission has received an Excellence in Restoration award from NOAA's Restoration Center for its derelict fishing gear removal program. "Over 118 acres of fishing nets and more than 1,100 crab pots have been recovered in an ongoing effort to rid Puget Sound of marine debris," reports WSG's Marine Habitat Conservationist Ginny Broadhurst, who coordinates the marine debris program for the

Commission. Derelict gear can kill fish, marine mammals and sea birds, as well as negatively affect habitat, she says. Protocols developed by the Northwest Straits Commission has to report, remove and catalog derelict fishing gear are now used throughout the country.

#### SEA GRANT PUBLICATIONS

Many marine-related publications are available from Washington Sea Grant.

To order publications: WSG Publications, University of Washington, 3716 Brooklyn Ave. N.E., Seattle, WA 98105. 206.543.0555.

[sgpubs@u.washington.edu](mailto:sgpubs@u.washington.edu), [wsg.washington.edu](http://wsg.washington.edu).

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**Sea Grant**  
Washington



## ines in Puget Sound marine bird populations

Web site, [www.ptmsc.org/science/marinebirds/marinebirdsindex.htm](http://www.ptmsc.org/science/marinebirds/marinebirdsindex.htm). Participants proposed working with boaters and kayakers through information distributed on ferries and marinas and at meetings of boater groups. They recommended education to help the public understand the growing connection between habitat loss and climate change with marine bird declines. They identified the need for a Web site where research, sightings and other information about seabirds, including stewardship efforts, could be shared.

According to D'Amore, the workshops were extremely well received. "Participants really valued the information presented in this program," she says. "They had many ideas on how to share what they learned with people they worked with and also exchanged contact information to help keep each other apprised of new information and events related

to marine birds around Puget Sound." Some have already begun incorporating what they've learned into public outreach programs, through newsletters, and in planning upcoming public events.

"We're grateful to Washington Sea Grant for recognizing the importance of this issue, and acknowledging our ability to bring people together to share their insights with an even broader audience," says PTMSC's director, Anne Murphy. "With Sea Grant support, we've been able to build a valuable program that now has a life of its own."





RV Thompson

## Oceanography Open House, April 28

Visit with WSG's Marine Ballast Water Specialist Russ Herwig and watch high-magnification video of live planktonic critters from Puget Sound as part of this year's Washington Weekend open house. The event is on Saturday, April 28, from 10:00 a.m. to 2:00 p.m., on the UW campus. Other highlights include shipboard tours of the UW's research vessel, the *Thompson*, moored nearby. For more information, please contact David G. Gordon, 206.685.8191 and [davidg@u.washington.edu](mailto:davidg@u.washington.edu) or Cara Mathison, 206.685.1456 and [caram@u.washington.edu](mailto:caram@u.washington.edu).



Three conference attendees (left to right): seafood promoter Jon Rowley, UW professor emeritus Kenneth Chew and Taylor Shellfish's Bill Dewey.

## 15th Shellfish Conference a Success

A full agenda of formal presentations and informal gatherings drew 140 people, some from as far as Gloucester Point, Virginia, to the 15th Conference for Shellfish Growers in March. Speakers addressed topics such as scallop culture, beach cleanups and shellfish disease. The conference concluded with a half-day session on geoduck farming — a topic that WSG researchers have been involved with for several years. For information about next year's event, contact Teri King at 360. 432.3054 or [guatemala@u.washington.edu](mailto:guatemala@u.washington.edu).



New Knauss Fellows (left to right): Greg Pendleton, Jennifer Kassakian and Greer Anderson. Not pictured: Molly Jacobs.

## New Fellows

Congratulations to the four University of Washington students who were selected as fellows in the Dean John A. Knauss Fellowship program this year. This brings the total number of WSG Fellows to 59 — more than any other Sea Grant program in the nation. All four fellows are now spending a year in Washington, D.C.: Greer Anderson (UW School of Aquatic & Fishery Sciences) has been placed at U.S. Fish and Wildlife Service's Branch of Fish and Wildlife Management Assistance; Molly Jacobs (UW Oceanography) is assisting Congressman Tom Allen; Jennifer Kassakian (UW School of Marine Affairs) is now with the House Committee on Resources; and Greg Pendleton (UW Law Department) is working for the Undersecretary of Commerce for Oceans and Atmosphere. "We look forward to nominating another group of great candidates this year," says Nancy Reichley, WSG's Education Specialist. For information on the Knauss Fellowship program, contact Reichley at 206.685.8302 or [reichn@u.washington.edu](mailto:reichn@u.washington.edu).

## Win/Win with WSG Communications Interns

Washington Sea Grant Communications has a win/win solution to meeting its editorial commitments. The key? Communications interns — aspiring or established writers who help produce brochures, booklets and other materials for the program. Many of these hard-workers also contribute feature articles to *Sea Star* and the College of Ocean and Fishery Sciences newsletter, *Explore*. Readers of these publications may recognize a few of their names: Colleen Craig, Eric Wagner, Jen Schripsema, Blake Trask, Stephanie Cartier and Jessica Hayden-Spear.

For Washington Sea Grant, the internship program is a wonderful way to involve students in outreach and education efforts. In turn, the interns gain valuable on-the-job experience in writing and production. Plus, the interns may get some quality samples of science journalism to flesh out their portfolios.

Communications intern Carolyn White has been contributing stories to *Sea Star* for nearly two years. In that time, she's written about *Captain Copepod's Coloring Book*, efforts to bring a 60-ton boat hoist from Alaska to the hurricane-damaged Louisiana coast, and, most recently, a cover story on UW professor Jennifer Ruesink's studies of non-native oyster drills.

Two other interns have parlayed their experiences with WSG Communications into full-fledged editing internships at *Science* and *Discover* magazines. A third intern landed a job as science writer for Maryland Sea Grant.

"Having studied more formal science, I hadn't previously experienced this form of writing," says White, who holds a bachelor's degree from the UW School of Aquatic & Fishery Sciences. "Communications work has allowed me to stretch, and it's always exciting to see my byline," she adds.

WSG Communications is in the process of solidifying the internship program with help from Deborah Illman, an assistant professor in the UW Department of Technical Communication. If everything goes as planned, future Communications interns could receive academic credit for their work.

For more information about the internship program, contact WSG Science Writer David G. Gordon at 206.685.8191 or [davidg@u.washington.edu](mailto:davidg@u.washington.edu).



The winners (left to right): Ann Williams (coach), Kyle Crockford, Drew Goss, B.J. Schlecht, Pamela Crockford (coach), Kirsten Williams, Rebekah Altig.

## ExCEL Homeschoolers Rock 10th Annual Orca Bowl

On Saturday, February 24, students from Vancouver, Washington's ExCEL Academic League homeschool battled their way to First Place at the 10<sup>th</sup> annual Washington State Ocean Sciences Bowl, or Orca Bowl. Held on the University of Washington's Seattle campus, this Jeopardy-style academic competition attracted a total of 16 teams from across the state.

The ExCEL homeschoolers proved outstanding in a round-robin series of challenges with the other teams, answering tough, rapid-fire questions about the biology, chemistry, geology, physics, history and economics of the ocean. As statewide champions, the ExCEL team has earned an all-expenses-paid trip to Stony Brook, New York, and the chance to compete in the National Ocean Sciences Bowl competition, held in April.

"The University of Washington and the other sponsors of Orca Bowl did an excellent job of running the competition," said coach Ann Williams. "Our team is thankful for the opportunity to compete and, now, to represent Washington at the National Ocean Sciences Bowl."

The Orca Bowl is part of the National Ocean Sciences Bowl program, presented in cooperation with the University of Washington's College of Ocean and Fishery Sciences, with support from Washington Sea Grant, The Seattle Aquarium, Kenmore Air, University Bookstore, National Oceanic and Atmospheric Administration and many other agencies and businesses.

The National Ocean Sciences Bowl is a program of the Consortium for Oceanographic Research & Education (CORE), based in Washington, DC. Approximately 2,000 students from over 400 high schools participated in regional competitions this year. Through this educational forum, the NOSB strives to encourage and support the next generation of marine scientists, policy makers, teachers, explorers, researchers, technicians, environmental advocates and informed citizens.

For more information or to compete in next year's Orca Bowl, contact Veronique Robigou, UW School of Oceanography, 206.543.9282 or [vero@ocean.washington.edu](mailto:vero@ocean.washington.edu).

# Summer Camp for Young Scientists

**N**OAA Science Camp is an opportunity for seventh and eighth graders to explore marine science and have fun at the same time. During the five-day camp at NOAA's Seattle facility at Sand Point, the campers develop an understanding of the roles scientists play in solving local and global environmental problems. For the fourth consecutive year, WSG has assisted with funding and the overall coordination of the camp, as well as the crafting of posters and other promotional materials.

This year's camp is scheduled from July 9 to 13, from 9:00 a.m. to 2:30 p.m. Each day will be filled with science activities and tours of NOAA departments. Activities will vary — from setting up sonar devices and tracking weather balloons

to learning about sampling methods, practicing whale identification techniques and reading navigational charts. The \$150 registration fee includes a field trip to the Pacific Science Center, temporary home of the Treasures of NOAA's Ark exhibit, celebrating NOAA's 200-year history.

Online registration will open in March and scholarships are available, with applications found on the camp's Web site, [www.nwfsc.noaa.gov/sciencecamp.cfm](http://www.nwfsc.noaa.gov/sciencecamp.cfm). For more information about NOAA Science Camp, visit the Web site or contact WSG's Camp Coordinator at 206.685.9117 or [sciencecamp@noaa.gov](mailto:sciencecamp@noaa.gov).



'06 Science Campers scrutinize Lake Washington sediment.



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