

# AQUATIC & FISHERY

SCIENCES

NEWSLETTER OF THE SCHOOL OF AQUATIC & FISHERY SCIENCES ■ UNIVERSITY OF WASHINGTON

<http://fish.washington.edu>

SPRING-SUMMER '09

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## From the Director

For several months, we've read front-page headlines about the state of world financial crises and the fiscal ramifications. Many of you, our alumni and friends, have asked about resultant impacts on our School and wonder if the quality of our programs will diminish. The answer is that SAFS is still very healthy and flourishes despite profound reductions in state support. The reasons we can continue to offer world-class education and research programs are several.

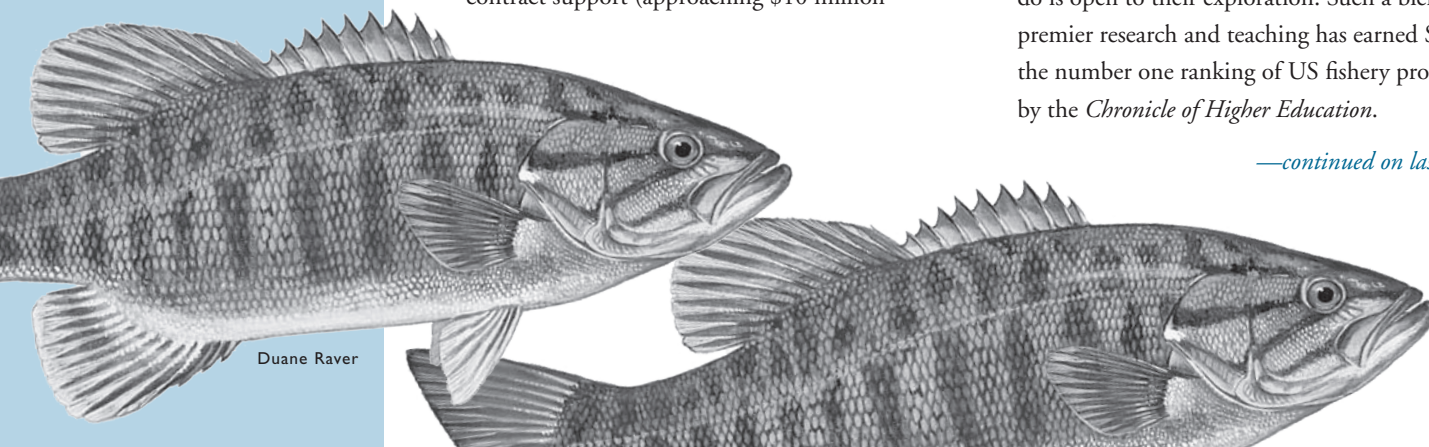
Our School's faculty are among the best scientists in the world. While their reputations are built on traditional scholarly activity conveyed through peer-review literature, their national and global influence and involvement are manifested in myriad ways. They serve on panels and committees, and advise, review, and recommend at all levels to many constituents. Local, state, and federal governmental organizations, as well as NGOs and private enterprises, seek their knowledge and advice across a range of topics, from sustainable harvest of aquatic resources to ecosystem-level effects of climate change.

Strong faculty attract substantial grant and contract support (approaching \$10 million

annually) and highly qualified students who enhance our program in many ways and help build the stature of the School. Our unique combination of theoretical, quantitative, and applied training readies students for entry into both academic and agency worlds. We believe that such training must include opportunities for presentation and publication. During 2008–2009, our graduate students were lead or co-authors on nearly 100 peer-review papers across a spectrum of journals that indicate broad research interests. Both undergraduate and graduate students made numerous presentations at national and international meetings, and we are very proud of the 11 awards bestowed on them for best paper and best poster presentations.

The scope and depth of research pursued by faculty, staff, and students carries into our teaching mission. This interface is dramatically evident in the "capstone" project required of our undergraduate majors: Students are given opportunities to delve into the scientific process under the mentorship of faculty on subjects including disease, genetics, animal population ecology, fishery management, conservation....all that we do is open to their exploration. Such a blend of premier research and teaching has earned SAFS the number one ranking of US fishery programs by the *Chronicle of Higher Education*.

—continued on last page



Duane Raver

# “What are we gonna’ do now?”

## AQUATIC INVASIVE SPECIES RESEARCH

—Bill Paxton, *“Aliens,”* 1986

*Unraveling the mystery of the entire invasion process is a core underlying theme for us.*

The alien invasions the Olden Lab investigates may not be quite as catastrophic as those in the movie, *Aliens*, but they still have the potential to wreak great ecological and economic harm. Led by SAFS faculty member Julian Olden, the lab is home to four graduate students, a postdoctoral research associate, and diverse research projects focusing on the core themes of conservation biology, environmental change, and invasive species in freshwater ecosystems. This research team seeks to understand the interactions between human-induced change in riverine flow regimes and the introduction, spread, and impact of invasive species.

Lab members are trying to understand the patterns and mechanisms that can explain the why, how, and where of new species invasions. They seek to determine how likely it is that these species will become established and spread, and whether they’ll have ecological and economic impacts. Study subjects and areas include crayfish in Washington, smallmouth bass in central Oregon, and a slew of fish invaders in Arizona desert streams.

Julian noted, “Unraveling the mystery of the entire invasion process is a core underlying theme for us. We are trying to develop tools that government agencies can use not only to manage against or minimize the spread of invaders already established in Washington waters, but also to prevent further invasions by the plethora of other non-native species that are looming at the door step.”

The lab also pursues education projects as a fundamental way of helping to limit invasions. Julian said, “We seek to raise the public’s awareness about streams and lakes that contain non-indigenous species. We also inform management actions, such as early detection programs and boat ramp education, to help prevent invasions in the first place. Prevention is where our management efforts may have the greatest chance of succeeding.”

Another central research area in the Olden lab is concerned with advancing the science of instream flow management for maintaining freshwater biodiversity and ecosystem function. Researchers are focusing on how riverine flow and thermal regimes may respond to future climate change and the potential impacts of that change on biological communities, including native and non-native species. Julian explained, “For example, warm-water fishes have been transplanted from eastern to western states. Although flow seasonality and temperature have restricted them thus far, what kind of range expansion and possible impacts can we expect based on future climate scenarios?”

Julian spoke to an aspect of the lab’s work that especially resonates with him: “It’s tough to take your research that additional step—to produce something that actually gets used. Some of our products—for example, risk assessments of the probability of invasion in western lakes and streams—are being distributed to state fish and wildlife agencies. Giving them something they can put to use is very rewarding.”

Courtesy of J. Olden



Julian

In the Multivariate Statistics course that Julian teaches, students learn to use statistical programs to analyze their graduate research data. The course has an unusual component: Final reports are reviewed for potential publication in a virtual journal created by Julian: the *Electronic Journal of Applied Multivariate Statistics*.

Each report is evaluated by two other students in the class, so every student both writes and reviews reports. "Based on their recommendations," said Julian, "along with my own reading, I accept a fraction of the papers for publication on a website that is restricted to the UW community to protect data for potential future publications." This exercise also showcases the diversity of approaches and datasets that grad students are working on at SAFS.

Students worked hard to get accepted. Julian observed, "This year, they even asked if they could resubmit their reports after making changes based on the reviews. This shows how excited they are about this assignment."



## Eric Larson

### PhD Program

I grew up in rural Natrona County, Wyoming. When I was around five or six years old, a family friend who was a fisheries biologist let me tag along on his field trips. I quickly realized he had a great job; consequently, fisheries as a career objective was implanted in my mind early on.

As an undergraduate at the University of Idaho, I worked on trout and salmon management projects throughout the western US. Everywhere I went, invasive species were a consistent conservation challenge; this sparked my interest in invasive species issues. An aquatic entomology course kindled my interest in freshwater invertebrates, leading me to a Master's program at the University of Arkansas, Fayetteville, where I worked on rare, endemic crayfish conservation in the Ozark Mountains of Arkansas and Missouri.

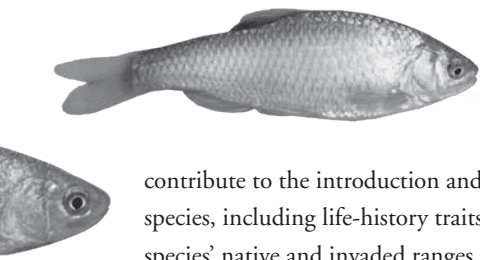
When I began looking for PhD programs, I contacted Julian. He was very enthusiastic about working on newly emerging invasive crayfish in the western US. Given his international reputation in invasive species ecology and his knowledge of quantitative tools, I was happy to pursue my PhD under Julian's direction.

Now, I am studying the ecology and management of invasive freshwater invertebrates, particularly crayfish.

With support from the Victor and Tamara Loosanoff and the Achievement Rewards for College Scientists fellowships, as well as a SAFS Seed Grant, I have been investigating factors that may



Crayfish: Eric Larson



contribute to the introduction and spread of non-native crayfish species, including life-history traits, food-web effects between species' native and invaded ranges, and landscape features. I hope to help management agencies minimize the impacts of invasive species by developing predictive models for anticipating where species will be introduced and how they will spread.

Many invasive species we're investigating are being introduced through the biological supply trade. Schools use live organisms in science laboratories, including invasive species, but teachers often don't know what to do with them when class is over. Organisms are being given to students as pets, or released into nearby waterways. Julian and I are working with universities and resource agencies in the USA and Canada (including the Washington and Oregon Sea Grant programs) to educate people in biological supply companies and school districts about the harmful effects of aquatic invasive species, to remove some of the worst invaders from the biological supply chain, and to provide teachers with humane euthanasia protocols for the organisms.

## Meryl Mims

### MS Program

I come from Thomasville, Georgia, a small town just north of the Georgia-Florida line. When I was a child, my family spent a lot of time fishing, canoeing, and scalloping in northern Florida, and I had a lot of exposure to aquatic systems. These systems were a natural context for my interest in the relationships between environmental functioning and human resource use. This interest motivated me to major in Biology when I went to Georgia Tech, where I earned a Bachelor of Science degree.



Scott Kerklor: background; Dave Lawrence

Julian's focus on conservation, management, and ecology of freshwater systems was the primary reason I joined his lab. He is very knowledgeable about topics ranging from freshwater biota to statistics to conservation policy.

For my Master's research—supported by the John N. Cobb Scholarship in Fisheries—I am examining how communities of freshwater fishes throughout the USA and the world are affected by dam-induced alterations in freshwater flow.

I am interested in understanding how environmental changes driven by human resource use affect the ecology and evolution of freshwater fish communities. Humans have altered freshwater rivers and streams through extensive dam construction, but the impacts of dams and flow alteration on freshwater fishes remain unclear.

I will be studying the effects of flow variability on the life-history strategies of freshwater fishes by examining how certain traits (such as fecundity, body size, reproductive tactic) vary relative to natural and altered flow regimes. By considering traits rather than taxonomy of freshwater fishes, we might more effectively predict which species or communities will be most affected by flow alteration across geographic regions that have few species in common. This research will help us understand how flow alteration affects the freshwater ecosystems upon which we rely and may help guide management decisions as human demand for fresh water grows.

After completing my MS, I plan to pursue a PhD and hope to continue contributing to our understanding of how we can limit our impact on the health and stability of the ecosystems with which our survival is so tightly coupled. I have always enjoyed sharing what I learn with others, which is a passion that will ultimately lead me to pursue a career in teaching and research.

## Thomas K. Pool

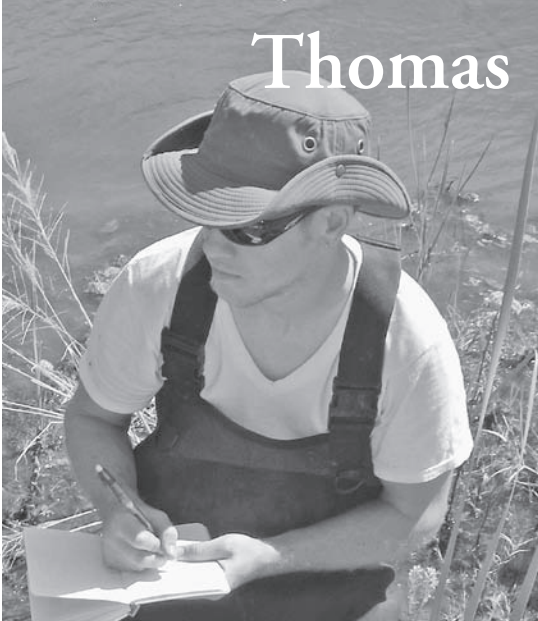
### PhD Program

I grew up in the Detroit area, where my exposure to natural systems was fairly limited until I attended Kalamazoo College. While pursuing a Biology degree at Kalamazoo, I took an aquatic entomology course on the "bugs" of Michigan streams, which convinced me that I wanted to learn more about aquatic ecosystems. I later studied the impacts of marine non-native species during my Master's research at James Cook University in Australia. My experience there, studying the damaging impacts of non-native species on aquatic communities, ultimately attracted me to Julian's research program.

Julian's research incorporates quantitative ecology, invasion biology, and biogeography, and it integrates components relevant

# Thomas

Courtesy of Eric Schoen



to management. This fits well with my interest in exploring how natural and anthropogenic factors shape native and non-native species diversity across different spatial and temporal scales.

My research is focused on community ecology and conservation of freshwater fishes in the lower Colorado River Basin. The study of fish trait composition is an exciting aspect of my work, providing insight into why human disturbance of ecosystems often drives patterns of native species extinction and non-native species invasion.

I also study the traits of fishes to learn if native species are able to withstand invasion by non-native species. Many scientists suggest that native communities with high species diversity may better resist non-native invasions than communities with low diversity. I am using a long-term dataset for species occurrence in the lower Colorado River Basin to explore whether this type of biotic resistance can quantitatively be assessed.

At SAFS, I also hope to produce research that can be integrated into the current management practices of my study area. Besides developing my own quantitative skills and ecological understanding of aquatic ecosystems, I hope to provide insight into how we can use landscapes for basic human needs while minimizing our impact on native fish communities in the American Southwest.

## Dave Lawrence

### PhD Program

I spent my early life trotting around local streams and forests in the Midwest, outside of Chicago. I completed my Bachelor's degree at Benedictine University in Illinois, where I majored in Biology. I earned my Master's degree at Boston University, studying estuarine ecology at the Woods Hole satellite campus. After graduate school, I worked in marine systems in Louisiana, Florida, Alaska, Massachusetts (in that order), and ultimately Washington,

studying fish ecology, food-web interactions, and invasive species issues. In my own career "anadromy," I have now returned to where I started, trotting around streams and forests.

I was interested in working with Julian because I liked how he combined statistical and ecological modeling techniques with a strong field component. I felt that incorporating these techniques into my research would greatly strengthen my capabilities as a scientist. I have also spent the last few years working on invasive species questions, and Julian has done a lot of pioneering work on this subject. When an opening in Julian's lab opened up, I jumped on it.

At SAFS, my graduate research is focused on freshwater fish ecology, conservation in a changing climate, and the interaction of native and non-native fish assemblages in the Pacific Northwest.

Specifically, I am studying the impacts of non-native fishes on native fishes in rivers of the Pacific Northwest. I'm also interested in examining how alterations in climate and land use may modify these impacts. For example, climate-induced stream warming could expand the range of warm-water invasives, such as smallmouth bass, while reducing the thermally suitable habitat for cold-water native species, such as stream-rearing chinook salmon.

One way to mitigate climate-induced stream warming involves restoring vegetation that shades streams, particularly in agricultural areas where riparian vegetation has been largely removed by grazing cattle. I hope my work will provide both a better understanding of the problems freshwater ecosystems face in a changing climate and some solutions that could help to offset these threats. ■

Sarah Furtek; background: Dave Lawrence



# Dave

# Bevan Symposium 2009

## ON THE GROUND AND IN THE WATER ECOSYSTEM-BASED FISHERIES MANAGEMENT

Since 2001, SAFS has hosted the annual Bevan Series on Sustainable Fisheries, which brings renowned speakers from around the world to present weekly seminars on current global fisheries management and conservation issues. Bevan Series speakers emphasize finding solutions to the complex problems that sustainable fisheries represent. This series honors the late Donald E. Bevan, an alumnus, faculty member, and director of our School.

In 2004, and again this year, the Bevan Series presented two-day symposia in lieu of the weekly seminar series. “Bevan 2009” was held at SAFS on April 30–May 1, 2009. As with the first symposium, Bevan 2009 attracted a diverse audience, including people from several universities; state, federal, and tribal fishery agencies; and the Nature Conservancy and other environmental NGOs; and several environmental journalists and writers attended as well.

Event coordinators Tim Essington and André Punt (SAFS faculty members) described the objective of this symposium: “The considerable discussion about the need and benefits of adopting more holistic, ecosystem-based approaches to fisheries management has yielded core principles, ‘commandments’, and concepts. Now it’s time to talk about how we actually implement these concepts and look at the successes and the main barriers that have prevented wider implementation.”

To that end, Tim and André invited international speakers with expertise in science, policy, and law to share case studies, identify promising new tools, and develop a synthesis about the best ways to start implementing ecosystem-based fisheries management (EBFM).

Tim elaborated, “The presentations and ongoing discussions were consistently excellent, and each session seemed to provide several ‘aha’ moments. We’re really indebted to the participants for making this symposium quite exceptional.”



<http://fish.washington.edu/bevan09>

<http://courses.washington.edu/susfish>

Highlights included the keynote address by Jake Rice, Canadian Department of Fisheries and Oceans, who provided an overview of the key concepts of EBFM, the challenges ahead, and specific applications of various new tools; SAFS faculty member Ray Hilborn provided a traditional fisheries perspective, suggesting that many of the problems would be solved if we handled single-species management correctly; and members of two US fishery management councils and Australia’s fishery ministry made presentations.

Tim and André acknowledged several important financial contributors to Bevan 2009: the Donald E. Bevan Fund in Fisheries, and NOAA Fisheries’ Alaska Fisheries Science Center and Northwest Fisheries Science Center. Graduate student Meaghan Brosnan (UW School of Marine Affairs) was hired to handle logistics. Tim said, “She did an amazing job; I think she even got a few job offers as a result!”

We invite you to view the abstracts and videos of Bevan 2009 presentations and discussions at the website listed above. In addition, abstracts and videos for previous Bevan seminar series and the 2004 symposium are available via the website. ■

# Awards & Honors

## Leifur Eiríksson Foundation

PhD student **Pamela Woods** was awarded a Leifur Eiríksson Foundation scholarship. The award promotes scholarly exchanges between Iceland and the USA. This 3-year grant will support the first dual degree between the UW and an external university. Woods will be supervised by Tom Quinn (SAFS), Skúli Skúlason (Hólar University College), and Síggi Snorrason (University of Iceland), and will study the ecology and evolution of Arctic char.

## Puget Sound/Georgia Basin Conference 2009

Two SAFS students earned awards at the Puget Sound/Georgia Basin Conference, a biennial event focusing on scientific research and policy for the Salish Sea (comprising Puget Sound, the Strait of Georgia, and the Strait of Juan de Fuca):

- MS student **Sarah Heerhartz** (Charles Simenstad, advisor) won the Best Student Poster award. Her poster was titled “Integrating new fish habitat along urban shorelines: an example from the Olympic Sculpture Park in Seattle, Washington.”
- In the “Toxic chemicals in the biota of the Salish Sea” session, PhD student **Jenifer McIntyre** (Dave Beauchamp, advisor) won the Best Student Oral Presentation for her talk “Weathering the storm: copper impacts juvenile coho behavior and survival.”

## National Shellfisheries Association

PhD student **Aaron Galloway** (Glenn VanBlaricom, advisor) was presented with the Castagna Student Research Award by the National Shellfisheries Association. The award includes support for Aaron’s research on ecological impacts of geoduck aquaculture operations on nearshore communities of the Puget Sound region.

## American Fisheries Society

Two of our students walked away with awards at the American Fisheries Society’s 2009 annual meeting of the Washington–British Columbia Chapter:

- **Ryan Simmons** (Ray Hilborn, advisor) won the 2009 Best MS Student Presentation for his talk, “The seasonal population structure of juvenile sockeye salmon (*Oncorhynchus nerka*) rearing in the Chignik system of Southwest Alaska.
- **Gordon Holtgrieve** (Daniel Schindler, advisor) won the 2009 Best PhD Student Presentation for his talk, “Marine-derived nutrients and ecosystem metabolism: reconsidering the role of salmon in streams.”

# Publications Wired

During SAFS’ 90-year history, faculty, students, and staff have published nearly 1500 theses and dissertations; approximately 4000 peer-review publications including journal articles, book chapters, and books; and countless technical reports.

In recent years, we have put many of our publication resources online to make them more accessible to our stakeholders and interested parties. We highlight three of our online resources below.

## Degrees Awarded

<http://fish.washington.edu/degrees>

The SAFS degree database provides detailed information in an easy-to-use, searchable interface. It covers all our MS and PhD graduates, from the first, in 1922, to the present. We include student’s name, degree earned, manuscript title, year, and, when available, the advisor’s name and quarter graduated. Recently, we have been adding links to thesis or dissertation PDFs when available: Currently, we have more than 100 manuscripts available and anticipate adding many more in the future.

## FRI-UW Reports

<https://digital.lib.washington.edu/researchworks/handle/1773/3783>

The Fisheries Research Institute (FRI) was formed in the late 1940s to study Alaska salmon. Originally part of the UW Graduate School, it later became affiliated with the School of Fisheries and in 2000, FRI was effectively absorbed into SAFS. The results of FRI’s research projects, including the FRI-UW technical reports, remain in demand.

Last summer, the UW Libraries scanned a majority of the FRI-UW reports and made them available online in PDF format. This is a win-win situation: users now have a no-cost, quick, and easy way to obtain these reports, and we save the considerable expense and time needed to make photocopies upon request.

The search feature enables you to find reports by report number, author, title, or keywords; an advanced search also is available. If you cannot find what you seek, please contact the School’s editor: [safsweb@u.washington.edu](mailto:safsweb@u.washington.edu), 206-543-4678.

## Citations Online

<http://fish.washington.edu/publications>

Citations for journals, books and book chapters, proceedings and other peer-publications, as well as gray literature, authored by SAFS members are available online. Copies of many of these publications can be obtained through the UW Libraries’ Interlibrary Loan department, <http://lib.washington.edu/ill/>.

# Staff Feature

JANE DOLLIVER

COASST PROGRAM COORDINATOR

Jane is a native of the Seattle area. She earned her Bachelor's degree from the University of Washington (2004), majoring in Biology with a focus on conservation and ecology. She noted, "After a few lab courses, I knew I wanted to get out in the field and do applied science."

As an undergrad, Jane took the Bevan Series on Sustainable Fisheries course (<http://courses.washington.edu/susfish>), coordinated by SAFS faculty member Julia Parrish. In 2003, Julia offered Jane an internship with the Coastal Observation and Seabird Survey Team (COASST)—a volunteer citizen science program that collects data on beached birds from California to Alaska—and Jane has been with COASST ever since.

Jane said: "The internship opened my eyes: managing more than 500 volunteers is a team effort. Answering questions, responding to requests, and hosting events are really important to COASST's success and the continued support of our volunteers."

Jane also began working with Julia on the long-term study of seabirds on Tatoosh Island (with special permission from the Makah Nation). Jane described Tatoosh as an island "at the end of the earth—a spectacular site located where the Strait of Juan

de Fuca meets the Pacific Ocean. It's home to one of the largest Common Murre colonies in Washington."

Why murre? She explained: "As top predators, seabirds are great food-web indicators. The murre population in Washington is quite small compared with Oregon and Alaskan populations, so literally one catastrophic event could be really devastating."

Her Tatoosh work prompted Jane to become a volunteer coordinator with COASST: "Besides ongoing contact with the volunteers, I work on a variety of projects, including the soon-to-be published guide, *Beached Birds-Alaska*." Jane now oversees many program functions such as funding, and vetting and recording data from hundreds of sites and thousands of carcasses yearly.

For Jane and other COASST staff, training is just one part of maintaining good volunteer relations: "We have weekend 'socials' for them; we host talks by scientists to introduce COASSTers to these researchers 'outside the box'. The audience loves these events and it's rewarding to see science become such a big part of the community." Jane added that "Because volunteers contribute so much to COASST, we spend a lot of time looking at their data, processing it, and putting it back out there in publications for our volunteers to see."

To the inevitable question, "Why dead birds?", Jane responded that recording data on dead birds, as opposed to live ones, provides independently verifiable data—photos and measurements—that can be vetted by COASST staff, or in the case of litigation following an oil spill, by any other expert. She adds, "and you don't have to go chasing after anything—everything is right at the end of your (gloved) fingertips."

With the help of staff, Julia used COASST data to see if bird deposition along Washington's north coast could be used to determine what's happening with murre on Tatoosh. They found a strong correlation between the proportion of dead murre chicks on the beaches and reproductive success at Tatoosh: "In good years for the murre, lots of chicks show up on the beaches. And in bad years, you don't see any dead chicks on the beaches because there weren't any produced—in this context, the absence of dead birds is actually a bad sign."

In the long term, Jane hopes to go to graduate school, somewhere on the West Coast, "to explore other regions and ecosystems." ■



Jane  
Dolliver

A. Trites



# Alumnus Feature

GARY T. SAKAGAWA  
PHD, 1972

The dynamics of juvenile salmon, with particular emphasis on pink salmon (*Oncorhynchus gorbushca*), during their early marine life

Gary Sakagawa is the Assistant Center Director for Fishery Management Programs at the NOAA Fisheries Southwest Fisheries Science Center, in La Jolla, California. He has been working with NOAA Fisheries since 1971. His research is focused on population biology and stock assessment of highly migratory species, including several species of tuna.

A longstanding supporter of our program, Gary reflected on the value of the educational and research experience based on his time at the UW: “I learned to formulate the right questions, take a systems point of view, and especially interact with students of diverse backgrounds and experiences. This helped shape my view that fisheries issues need to be addressed in a broad context of biology, economics, politics, and social forces.”

To address such issues, Gary urges students to get a well-rounded education, in part because the specialties they study in college often do not persist throughout their careers. “One constant, however,” he added, “is that fisheries work requires interaction with people, so training in interpersonal skills will always be useful.”

Gary observed that a major strength at SAFS is the many opportunities students have to gain field experience. He also emphasized the importance of training in stock assessment techniques: “Few universities have significant programs in this discipline, and UW is one. The job market for graduates trained in stock assessment is ‘hot’. I’m amazed that more universities have not picked up on this.”

In considering the role of higher education in research and policy, Gary cited three basic, interconnected areas: “Foremost is training students to be marketable for good jobs and make significant contributions to society and the world. Second is advancing fishery science that leads to medium- to long-term payoffs to society. Third is partnering with the private and government sectors to implement research findings.” By addressing these three areas, Gary believes an institution like SAFS can serve as a catalyst for conducting research and

Gary T.  
Sakagawa



implementing research findings for the benefit of the greater community.

Gary allowed that this is no easy task, given the challenges we face: “We must balance the demands of the growing human population with the biological limits of fisheries resources in a changing environment.” He observed that many people rely on fish products for a good part of their diet, especially in developing nations, and that people are becoming increasingly aware of seafood’s health benefits: “In short, demand will remain high and grow.” Further, while he noted that aquaculture could help us recover wild stocks and partially satisfy growing demands, he cautioned that “it too is facing enormous challenges.”

Gary has been contributing to the SAFS program for many years: “At an early age, my parents taught me the importance of giving back to the community that played a part in my success. It’s a family tradition to support the community that I reside in as well as those communities that contributed to my fisheries training and that will continue to train diverse students in the future.” We are grateful that the SAFS community remains high on Gary’s support list. ■

Make a gift

<http://fish.washington.edu/fund>

# In Memoriam

## DOROTHY T. GILBERT 1929–2008

It's not every day that a newly discovered species of fish is named after you. But such a day did occur for Dorothy Gilbert: In 2006, the sculpin, *Triglops dorothea*, was named by SAFS Professor Ted Pietsch and Affiliate Professor Jay Orr (see Fisheries Bulletin U.S. 104:238-246) in recognition of Dorothy's steadfast and invaluable support to graduate students at SAFS.

The William W. and Dorothy T. Gilbert Ichthyology Research Fund was established in 1998. It was Dorothy's way of commemorating the life and work of her late husband's grandfather, Charles Henry Gilbert, a pioneer ichthyologist and fishery biologist, expert on Pacific salmon, and noted conservationist of the Northwest.

Dorothy set up the fund to provide financial assistance for graduate student thesis or dissertation research at SAFS—specifically fundamental (that is, specimen-based) research in systematic ichthyology. The fund provides students with stipends and pays for books, publication costs, and computer equipment. Her support has been especially valuable in



Courtesy of Gilbert Estate

Dorothy  
Gilbert



Courtesy of Gilbert Estate

Dorothy T. and William W. Gilbert

covering student travel costs to conduct research and attend scientific conferences and meetings.

In previous issues, we have talked about the importance of attending scientific conferences for our students: The opportunity to interact and network with members of the scientific community is critical to students' development as aquatic science professionals.

Students who benefited from Dorothy's generosity have routinely written to her about their experiences, not only to thank her for helping them, but to tell her what her support has enabled them to do. Dorothy derived much satisfaction from hearing about our students' research, knowing that she was able to help them achieve their goals. Often, she took the time to reply in writing to students.

Shortly before her death, knowing she did not have much time left, Dorothy described how happy she was to have been able to affect the lives of students at SAFS, saying that she almost thought of them as her own children.

We are saddened by Dorothy's passing and we celebrate her life and her dedication to our students and to ichthyological research. Thanks to her support, our students will continue to have opportunities to gain invaluable experience in pursuit of their academic goals. ■

## FREDERICK JOHNSON 1951–2008

PhD, University of Washington, 1979  
The effects of aromatic petroleum hydrocarbons on chemosensory behavior of the sea urchin, *Strongylocentrotus droebachiensis*, and the nudibranch, *Onchidoris bilamellata*

Students in the Pacific Northwest lost a great teacher August 3, 2008, when Frederick Gardner Johnson passed away suddenly at his home in Port Townsend, Washington, at the age of 57. Fred spent his whole life teaching: more than 10,000 students attended his classes through the years.

Even at the age of 10, when he became a certified scuba diver, he started to teach others to dive. He continued teaching while working on BS and MS degrees at Stanford, and later, when he worked at the Hopkins Marine Station. Then he went to the US Virgin Islands as an aquanaut, where he lived in his element—underwater—for weeks at a time.

In the 1970s, Fred relocated to the Pacific Northwest and earned a PhD from the University of Washington (UW) School of Fisheries, where he later taught large cohorts of Fish 101 students for nearly 10 years. Whether he was pumping iron while hooked to an oxygen monitor to display anaerobic function, syncing Depeche Mode tracks to live ROVER deep-sea footage from the Monterey Bay canyon, or having students process the contents of research tows in Puget Sound for the local Loaves and Fishes food bank, he put his students above all else and inspired them to care for the marine environment.

After teaching at UW Fisheries, Fred moved to the more intimate teaching environment of the Center of Excellence of Peninsula College, where he received a 10-year service award.

While at the UW, Fred edited and wrote several chapters for *Fisheries: Harvesting Life from Water*, and true to the title, he spent a good portion of his time



Courtesy of Marianne McClure

doing just that—harvesting fish, crab, and abalone, which he was as good at cooking as he was at catching. In the chapter that Fred wrote about the history of the earth and life on it, he ends with a characteristically poetic phrase, “Let us not forget that we are made of stardust.” Fred will never be forgotten by those who knew him. ■

Courtesy of Wikipedia.com

School of Aquatic & Fishery Sciences  
1122 Boat Street NE  
Box 355020  
University of Washington  
Seattle, WA 98195-5020  
<http://fish.washington.edu>

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Permit No. 62

—continued from front page

You also play an essential role in support of our world-class programs. There is no missing the fact that much of our resiliency is due to the School's strong endowment base built by all of you over many generations of giving. While the University has prudently reduced distributions from the endowment pool in response to a drop in world markets, SAFS is still very fortunate to receive vital revenue that fuels our undergraduate and graduate programs. We are able to offer recruitment scholarships, fund research expenses, and provide travel support to scientific meetings for many of our students.

Inquiry and exploration will remain vibrant in SAFS, assisted in great measure by your commitments to the School. Your generosity is particularly critical going forward, and we are ever grateful for the contributions you make. The legacy of this School is now 90 years in the making, and economic hard times in the short term will not distract us from ensuring another 90 going forward. ■

## AQUATIC & FISHERY SCIENCES

The *Aquatic & Fishery Sciences Newsletter* provides current information on teaching, research, and service.

Comments are welcome.

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