PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

the Breakwater

Summer 2010

300 Breakwater Avenue
PO Box 705 Cordova, AK 99574

Vessel adds to research capacity

In March the Science Center purchased a vessel for our work in Prince William Sound (PWS) and the coastal Gulf of Alaska. The M/V New Wave began life as a Cook Inlet gill-netter, and fished there for twenty summers.

Moving the New Wave to Cordova was an adventure in itself. We purchased the vessel in Kasilof, had it hauled to Seward, and brought it to Cordova during a rare break in the March weather. The New Wave is a 39-foot aluminum stern-picker, with a large back working deck, net drum and a comfortable cabin. It cruises at 20 knots, has a range of approximately 500 miles, and has bunks for three people.

It is currently being used for monthly herring surveys as part of the Exxon Valdez Oil Spill Trustee Council Integrated Herring Program. We take oceanographic measurements, collect plankton samples, and use a drop camera to identify fish schools spotted from the air.

The New Wave is also being used in a U.S. Geological Survey funded project in the Copper River (and a related NASA project coming on line later this summer). That work entails oceanographic transects and collection of plankton and fish across the Copper River plume.
See additional photos on page 6.

The New Wave goes on the grid adjacent to the Science Center for its first 100-hour service in Cordova. (photo courtesy PWSSC)

Campers visit fishwheels and tag Chinooks

Three more Science Camps are in the history books and the Science Center Education staff is looking back on all the great memories and fun times had during our June Camps. While we could have had a few more sunny days, we couldn't have had a better mix of campers, guest scientists and volunteer helpers contributing to the success of the camps.

A fisheries technician from the Native Village of Eyak help science campers tag and mark the gill of a King salmon. (A. Dou-Wang/PWSSC)

One highlight of the overnight Science Camp was part of our trip out to visit Childs Glacier. Tribal Biologist Tom Hauska of the Native Village of Eyak (NVE) met our group at the glacier. He took the campers up the Copper River to see the Native Village of Eyak's Baird Canyon Camp and research fishwheels. The half-hour boat journey was thrilling, and everyone was excited to motor under the Million Dollar Bridge and in front of the impressive Miles Glacier.

While speeding past icebergs in Miles Lake and up Abercrombie rapids, we saw many seals swimming around the lake and hauled out on the icebergs. The campers looked closely for bears, and though none were spotted, everyone enjoyed the beautiful scenery, blue skies and warm sun upriver from Childs Glacier.

At the fishwheels, we saw salmon being scooped out of the silty Copper River and campers learned how the fishwheels are turned by the river current. The Baird Canyon fisheries

Continued on page 4

THANK YOU

To the many volunteers, diners, corporate and individual sponsors, auction donors and bidders who contributed to

the 11th Annual Copper River Nouveau!!!

Proceeds from this event may exceed $50,000 and will benefit education, outreach and research planning programs.

Thanks also to Chef Brett Knipmeyer of Kinley's Restaurant & Bar!

Check out our Blogs!

Interact with the new education and research focused blogs of the Prince William Sound Science Center. We'll be posting news, photos, student work, and stories to keep you up to date on our activities and programs.

www.pwssc.org/news

www.pwssc.org/blog

Balloon with camera surveillance aids spill response

by W. Scott Pegau, *OSRI Research Program Manager*

OSRI's aerial balloon system equipped with regular and infrared cameras was tested near Nikiski on the Kenai Peninsula.

Visibility and weather conditions often hamper oil spill response efforts, particularly in Arctic regions during winter months. In an effort to improve our spill response capabilities, OSRI recently funded the purchase and demonstration of a tethered-balloon surveillance system with visible and infrared capabilities.

The intention is to provide a system that can be rapidly deployed from spill response vessels to provide a continuous aerial view to the spill responders. The camera system is controlled from within the vessels and provides both visible and infrared pictures. The infrared provides a means to view oil at night and in limited weather conditions. The camera's signal is wirelessly broadcast to the vessel and could easily be seen by surrounding vessels or potentially sent back to the incident command center.

The tethered balloon provides significantly improved aerial views by getting the camera up to 500 feet above the boat. A big advantage of this system in contrast to an unmanned aircraft is that the balloon does not require an FAA permit for most situations in which it might be deployed. The kite-style balloon is also designed for operations in heavy winds so the system can remain in use during most spill response operations.

In April, the OSRI system was deployed by Cook Inlet Spill Prevention and Response Inc. during an at-sea training session. This was the first deployment from a spill response vessel, and it clearly demonstrated the utility of the approach. One lesson learned from this test was that a winch must be used for the balloon. With just 15 knots of wind, the balloon had enough lift that it took four people to bring it down by hand.

BP recently contacted OSRI for details about this system, and we understand that BP purchased two similar systems for use in the Gulf of Mexico spill response effort.

Above: Operators control the camera and view pictures from aboard the boat. Right: Inflating the balloon with helium before deployment.

Gulf oil spill spurs media visits to PWS oiled beaches

OSRI and PWSSC staff continue to respond to calls and visits by national and international media covering the Gulf of Mexico oil spill. Media questions focus on the continuing impacts from the 1989 Exxon Valdez oil spill with particular interest in oil that remains on beaches of Prince William Sound 21 years later.

Recently, inquiries ask more about lessons learned from the Alaska spill which might inform those now responding to the Gulf spill, as well as recommendations for future research and development.

Check our website for links to several articles or TV programs in which Scott Pegau (OSRI Research Program Manager) and R.J. Kopchak (PWSSC Development Director) have appeared.

OSRI was established by Congress in response to the 1989 Exxon Valdez oil spill. The Congressional mandate given OSRI is to identify and develop the best available techniques, equipment and materials for dealing with oil spills in the Arctic and sub-Arctic marine environments and to complement federal and state damage assessment efforts.

www.pws-osri.org

Deep oceanographic moorings recovered from their final deployment

by Mark Halverson, Ph.D.

In April 2010, I led a cruise aboard the M/V Auklet to recover moored oceanographic instruments from Hinchinbrook Entrance and Montague Strait, the two primary entrances to Prince William Sound (PWS). For the past five years, the Oil Spill Recovery Institute has funded this work with the purpose of monitoring the exchange of water between the Gulf of Alaska and PWS.

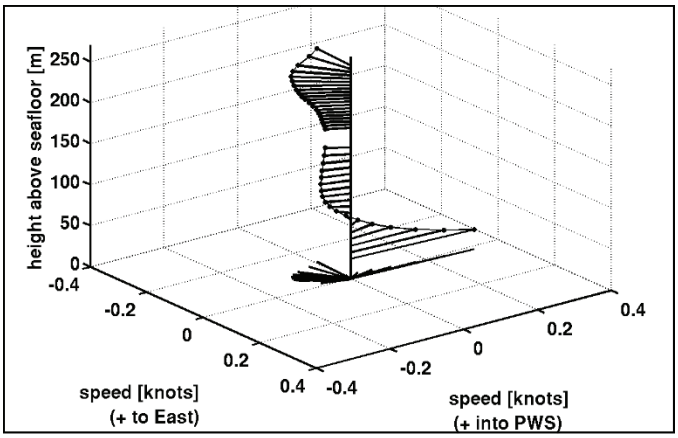
Previous studies by the PWSSC have identified the exchange as one of the key factors affecting the local ecosystem. This exchange can potentially transport organisms and toxins into or out of PWS, as well as affect local water properties (for example, nutrient concentrations, or water density which drives currents).

Each mooring is equipped with an array of sensors fixed at strategic depths to measure ocean currents, water temperature, and salinity. The instruments which measure water currents rely on high frequency acoustics. When sound reflects from moving water, its frequency changes (known as the Doppler effect - think of how an ambulance siren changes pitch as it whizzes by). The instrument measures how much the frequency changes, which is proportional to the water velocity.

The temperature/salinity sensors measure electrical conductivity to determine the salinity. The moorings are also equipped with satellite-tracked locator beacons in case the mooring should accidentally surface.

Preliminary analysis of the data has revealed some fascinating observations. For example, the strength of the currents varies substantially with depth in Hinchinbrook Entrance. Along the western side of Hinchinbrook Entrance, the currents from 200m depth to the bottom (270m) consistently flow into PWS.

In the middle of the water column, the currents are weaker and flow out of PWS. Near the surface, the currents generally flow to the west and are relatively weak. The flow structure along the eastern edge of Hinchinbrook Entrance looks quite different, though we don't know why.



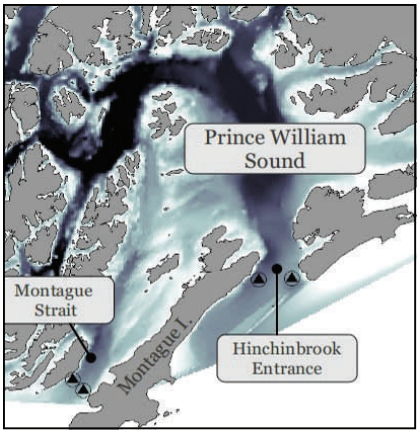
Average summer 2009 currents at Hinchinbrook Entrance.

Future work will hopefully explain this puzzle. Also, we will focus on identifying seasonal and inter-annual changes in the water exchange. For example, we may expect to find differences in the exchange depending on whether or not it was an El-Nino year.

Mark Cummings and Mark Halverson unloading surface buoys from the M/V Auklet. (Photo by Dave Janka)

Senator Mark Begich visits PWSSC

We were honored to have Senator Mark Begich visit the PWS Science Center on July 7. Traveling with the Senator was Mignon Clyburn, a Commissioner for the Federal Communications Commission. During their visit, we shared slides highlighting our recent research and education programs. Discussions with the Commissioner focused on the importance of efficient and affordable network communications for our work.



Left to right: R.J. Kopchak (PWSSC Development Director), FCC Commissioner Mignon Clyburn, Senator Mark Begich and Nancy Bird (PWSSC President)

Campers visit fishwheels...*continued from page 1*

technicians explained the mark-recapture method used to estimate Copper River salmon recruitment, and demonstrated the process of sampling and tagging King salmon. A few of the campers even got the chance to tag their own salmon!

Many thanks to the Native Village Eyak, Tom Haluska and the Baird Canyon fisheries crew for giving our campers this opportunity! We learned a lot and had an amazing experience! Another topic explored during each of our Science Camps was salmon habitat in Eyak Lake. Each camp spent a day canoeing on Eyak Lake and learning about riparian zones, water quality monitoring, and the salmon life cycle.

Science Campers also spent a morning with Tracey Nuzzi from Copper River Watershed Project working on a lakeside re-vegetation project to enhance salmon habitat. Using shovels and pulaskis, we dug trenches along the shoreline, then planted willow shoots that had been collected earlier in the spring. We sure hope the little willows get established in the bank so we can come back and see the fruits of our labor for summers to come!

We'd like to thank everyone who contributed to our June camps, including the U.S. Forest Service, Alaska Department of Fish & Game, Native Village of Eyak, Copper River Watershed Project, Alaska River Expeditions and dozens of volunteers. We appreciate all that you do!

Campers helped gather and plant willow shoots for re-vegetation of Lake Eyak's shoreline. In this picture, they proudly display their "attack" tools for the work. (Photo courtesy PWSSC)

Copper River Delta Wetlands Ecology—July 25-August 3

The wetlands of the Copper River Delta will be the focus of a 9-day course that is part of the Chugach Children's Forest program. (Photo courtesy PWSSC)

This expedition will take place **July 25-August 3** on the Copper River Delta, and is part of the Chugach Children's Forest 2010 Youth Expedition program. The course will focus on documenting the impacts of climate change on a large wetland ecosystem. Explorations will focus on plants, soils, hydrology, birds and wildlife associated with one of North America's largest wetlands. A number of scientists and local experts will be part of the expedition, including plant, soil and bird ecologists and community leaders. The expedition will start in Cordova, AK and will largely take place at a U.S. Forest Service research field camp on the Copper River Delta. Canoes and poke boats will be the primary form of transportation once at the Delta field camp. Wetlands Ecology is presented by Alaska Geographic, U.S. Forest Service and the PWS Science Center.

Ocean Science & Leadership Expedition

This 10-day expedition for high school students takes place **August 5-14** in Cordova and near Valdez. We're excited to welcome four high school students this year from the Gulf Coast oil spill region. They are being sponsored by scholarships offered through the **Carol Treadwell Memorial Scholarship Fund** and **Louisiana Sea Grant**.

The course includes a 4-day sea kayaking expedition from Columbia Glacier to Valdez, during which students will conduct a marine debris survey and cleanup. Students will also meet with experts at the Prince William Sound Regional Citizens' Advisory Council in Valdez to learn about response and prevention of future oil spills.

They will engage in a simulated oil spill scenario where they will learn the decision-making process of responding to environmental emergencies and experience the challenges of cleaning up oil in the marine environment. This course, eligible for 1 college credit, is conducted by the research and education staff at Prince William Sound Science Center, Oil Spill Recovery Institute and the Prince William Sound Regional Citizen's Advisory Council.

Copper River Stewardship

Ten students from throughout the Copper River Watershed will be recruited to participate in this ten-day adventure from **July 30 to August 8**. The program engages future leaders of the region in an active exploration of their surroundings to learn about the history, ecology and future challenges facing the watershed and the wild salmon upon which they and their communities depend. Participants will meet with several guests upriver, then raft the Gulkana River before traveling to Cordova to learn about the commercial salmon fishery. Active partners are the Wrangell Institute for Science and Environment, Copper River Watershed Project, Wrangell-St. Elias National Park, U.S. Bureau of Land Manage-

PWS Herring Survey—how we are learning about juvenile herring

The Exxon Valdez Oil Spill Trustee Council funded "PWS Herring Survey" project coordinated by OSRI Research Program Manager **Scott Pegau** is in full swing this year. Juvenile herring surveys were done in November 2009 and March 2010 during which herring abundance and distribution was estimated with hydroacoustics by **Dick Thorne**. Herring were collected during these surveys for energetic measurements by **Tom Kline** and **Ron Heintz** (NOAA Juneau), and for disease prevalence by **Paul Hershberger** (USGS Marrowstone).

The surveys also included abundance estimates of fish predators by **Mary Anne Bishop** and **Sean Powers** (Univ. S. Alabama) to determine which fish may be preying on herring. The most abundant fish caught were Pacific Cod, Walleye Pollock, and Great Sculpin. Methods to survey avian predators with advanced night vision options are also being developed. A broadscale survey of herring distributions was done during the March survey by area fishers in cooperation with **Cordova District Fishermen United**.

Rob Campbell has done oceanographic and plankton surveys of PWS since November, and will continue conducting surveys every month. **Shelton Gay** deployed oceanographic moorings in the four main study bays (Simpson, Zaikof, Whale and Eaglek) in March, and will service them this autumn. The oceanographic data will help us understand what conditions juvenile and adult herring tend to be found in .

Aerial photo taken during aerial surveys of Prince William Sound in June 2010. The photo was shot at approximately 1,000 feet in altitude. The dark patch in the water nearshore is a school of fish. The white spot in the fish school is a gull which helpfully puts the extent of the school in perspective. *(Photo by M. Buckhorn/PWSSC)*

Evelyn Brown is conducting aerial surveys for juvenile and adult forage fish this summer. She observed numerous schools throughout PWS in June. More detailed ground-truthing for the aerial and hydroacoustic surveys of school composition will be done in July and August. This will be accomplished with the use of underwater cameras and capturing and identifying fish in the schools. **Michele Buckhorn** has joined the project and will be dividing her time working on the hydroacoustic survey trips and the final synthesis of all the individual projects.

Figure 1 Digitally enhanced photograph, to enhance visibility, shows herring schooling under a boat in the Cordova harbor.

A large number of herring have been seen in the Cordova harbor since May (Fig. 1). These herring appear more concentrated than what was observed during the March survey. This is the good news. The bad news is that the herring appear very unhealthy (Fig. 2). Many have visible external lesions and some also have external parasites. These parasites are copepods and are related to the crustaceans that form part of the herring diet.

In this case, however, the copepods are consuming the herring rather than the other way around. Lab and field technician Jenn Todd collected and prepared samples for pathology investigations which are being conducted by Paul Hershberger. Energy content and stable isotope analysis is being performed by the project led by investigator Tom Kline.

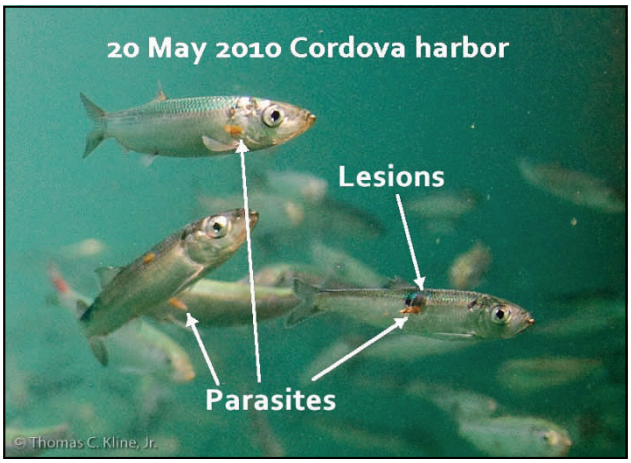


Figure 2

M/V New Wave *continued from page 1*

by Rob Campbell, Ph.D.

Left: *Student Intern Drew Lindow captures water samples from six different levels, all the way down to 50 meters in depth.*

Right top*: Anchored up at Glacier Island, the crew tracks down the mid-Sound weather buoy that went adrift in March.*

Right bottom*: The New Wave deck is equipped with a reel and roller used to raise and lower CTDs (measuring conductivity, temperature and depth) as well as plankton nets, for paying out tow body, and for trawling.*

(Photos courtesy PWSSC)

Check out Tom Kline's photographic marvel on the cover of Alaska Magazine

http://www.alaskamagazine.com/article/76/3/spawners

The March issue of Alaska Magazine celebrates its 75th anniversary covering stories about the landscape and wildlife in the great north. Editor Andy Hall comments that spawning salmon represent *" . . .renewal of the species, the promise of runs to come and as a reminder to seize the day because the seasons are passing, whether we notice or not."*

Tom Kline Ph.D., a PWSSC biochemical oceanographer, researches Pacific Herring Energetic Recruitment Factors as part of the PWS Herring Survey funded by EVOS Trustee Council. In his free time, Kline can often be found outdoors photographing the lives of fish.

Delta Sound Connections is a unique natural history annual publication directed at visitors to this region and also the general public. Over 15-pages of full color maps, photographs and graphics help illustrate short articles on the natural systems and cultural history of the Prince William Sound and Copper River Delta region. Educational information on wild salmon, salmon aquaculture and commercial fishing is also included. Among our goals is a greater understanding and appreciation for our sustainable wild salmon fisheries; the backbone of the economy and lifestyle in the region.

In addition, articles on recent and ongoing research activities offer new insights into a natural system undergoing rapid change. These science news articles offer a unique opportunity for fellow organizations and businesses to help 'get the word out' and educate the public on fish and wildlife and the habitats that help maintain them. Helping visitors better understand what they are seeing increases their appreciation of and stewardship for our region's resources.

The first edition, in 2009, of *Delta Sound Connections* was a big success, with over 8,000 copies distributed to residents and visitors to the region. Readers responded enthusiastically to the ease of reading and content in this publication. The 2010 edition was printed in late April and we welcome additional outlets for its distribution. If you would like a copy or would like host a stand, please contact Kate Alexander at (907) 424-5433 or kalexanderpwssc@gmail.com . And, if you have suggestions for topics in the 2011 edition, please also contact Kate!

Who makes possible all that we do?

Our staff are the foundation for all our efforts to understand our region's ecosystems and share that knowledge. Thanks to each of our staff members for their dedication. In this column, we highlight the experience and interests of some of our newer staff members.

Tawna Morgan, M. S., serves as a Research Assistant working with Dr. Mary Anne Bishop. Tawna joined the Science Center in 2009 after completing a Master's in biology from the University of Alaska, Fairbanks where she studied avian physiology and behavior. Besides earning GIS certification from the University of Montana, she has worked on numerous terrestrial and marine research projects spanning from Penguins in Antarctica to songbirds in Alaska. She currently focuses on shorebird and seabird research projects in Prince William Sound. You may reach her at tmorgan@pwssc.org .

Michele Buckhorn, Ph.D., serves as a Fish Ecologist. Her research interests are in marine conservation, marine community ecology and fisheries sustainability. She graduated from U.C. Santa Cruz with a B.A. in Biology in 1999, and received her Ph.D. in Ecology from U.C. Davis in 2009. Her PhD project looked at the population biology of a fisheries target and the effects of predator depletion on reef assemblages in Loreto Marine Park, Baja California Sur. She spent a year as a postdoctoral researcher implanting acoustic tags in sevengill sharks in San Francisco Bay to determine if they were a migratory or resident population. Even when not working with fish she is still trying to photograph them or draw them. You may reach her at 907-424-5800 ext 239 or mbuckhorn@pwssc.org .

Erica Thompson serves part time as Education Program Assistant for the Education Dept. Upon earning a B.S. in Communication from Southern Oregon University, she returned to her hometown of Kodiak, Alaska to commercial fish and work as an advocate and educator for local agencies. She is currently working on a Masters of Education in Counseling, through the University of Alaska, Fairbanks. You may reach her at 907-424-5800 ext 238 or ethompson@pwssc.org .

Copper River Nouveau 2010

Event coordinator Signe Fritsch (above) was honored for her multiple years of service.

Using the "Price is Right" game format, diners vied to guess the cost of research and education program equipment and analysis work. (Photos by A. Marquette/PWSSC).

Please become a valued member of PWSSC!

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- ❑ $10-Student … basics: decal + newsletter subscription
- ❑ $25-Individual… basics + Eyak poster by artist Paula Payne
- ❑ $50-Family… basics + poster, CRN tote, t-shirt or mug
- ❑ $100-Chinook… basics + poster, t-shirt , and 1 retail item
- ❑ $250-Eagle… basics + poster, t-shirt, and 2 retail items
- ❑ $500-Grizzly… basics + poster, t-shirt, and 3 retail items
- ❑ $1000-Grizzly… basics + poster, t-shirt, and 4 retail items

Members receive a 10% discount on purchases of merchandise

Thank you for your support!

The Prince William Sound Science Center is a 501(c)3 corporation. Your contribution is tax deductible.

Upcoming Events

- **Tuesday Evening Science Program** for the public, scheduled September-May and periodically during June, July, August. Check our Web calendar and/or join the email update by contacting amarquette@pwssc.org
- **Small Fry education activities** at Copper River Wild! Salmon Festival Sat., July 10 - 3-5 p.m.
- **Cordova Astronomy Day** Sat., September 25, 2010
- **PWSSC Board of Directors meeting** Late September 2010 in Cordova
- **OSRI Advisory Board meeting** Late September 2010 in Cordova

COPPER RIVER NOUVEAU

SAVE THE DATE
SATURDAY JUNE 11, 2011

Kuttel honored for his service to fisheries

The 2010 Fisheries Achievement award was presented to Peter Kuttel at the annual Copper River Nouveau on June 12. The award acknowledges those who have made significant contributions toward the sustainable use of fishery resources in Prince William Sound and the Copper River regions.

Kuttel is the former owner of Bear&Wolf which he sold about two years ago to Trident Seafoods. At the ceremony, held at the Science Center prior to the Copper River Nouveau gourmet dinner, Ken Roemhildt lauded Kuttel's innovative business style and emphasized the steps taken by Kuttel to assure high quality seafood products.

Senator Lisa Murkowski and Peter Kuttel admire his "temporary award," a stuffed vulture. Arrival of the real award, a wooden and brass plaque, was delayed in the mail. Kuttel also received a water-color painting by Anna Copeland.

Did you know that a four million year-old resides at the Science Center? It is a rock from the Yakataga formation discovered during a U.S.G.S. survey. Have you seen it yet? Stop by any weekday between 8:30am-5:30pm to learn more. You'll notice the gray whale skull on display in the atrium near our merchandise. If your group desires a tour of the rest of our research facility, we'd be happy to schedule that for you.

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

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