

# the Breakwater

Fall 2008

Newsletter of the Prince William Sound Science Center  
300 Breakwater Avenue, P.O. Box 705 Cordova, AK 99574

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## Cordova Hosts More Kids in the Chugach

By Lindsay Butters, PWS Science Center and Kim Kiml, U.S. Forest Service

This summer, Cordova hosted two groups of Anchorage youngsters to explore the wild lands of the Copper River Delta and the Chugach National Forest. The *More Kids in the Chugach* summer camp program recruited campers from Anchorage Big Brothers Big Sisters and the Mountain View Boys & Girls Club. For many of the campers, aged 10-14, this experience was their first time camping, hiking, canoeing, riding the Alaska Marine Highway, and being away from home and their parents.

Camp was based out of the Boy Scout cabin on Mavis Island, and the groups took daily field trips to explore the outdoors. They practiced their fishing skills at the Alaganik boat ramp, toured the Lucky Strike Mine and picked berries on the McKinley Lake Trail. Not one of the kids had seen anything that compared to Child's Glacier, and despite the rainy weather, the visit was the highlight of their trip.

A group leader from Big Brothers Big Sisters said she has never seen these children sit so quietly for over an hour without being in front of a computer. "They did not complain, no one said 'I'm bored,' no one said 'this is stupid,' no one asked 'when are we leaving?'" "We enjoyed every moment of this trip," one camper wrote. Five of the campers even thought it would be great to live in Cordova.

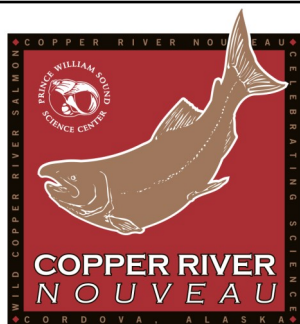
The summer camps were funded through the U.S. Forest Service's *More Kids in the Woods* national grant program. The purpose of this grant is to get more kids outdoors to experience nature and have fun, get dirty and get healthy. The U.S.F.S. Cordova Ranger District and the Prince William Sound Science Center worked

cooperatively to submit a grant proposal that was funded through the Washington Office.

Additional support from the Cordova Boy Scouts, U.S.F.S. Trail Crew, Alaska Department of Fish & Game, Ilanka Cultural Center, the City of Cordova's Bidarki Recreation Center and many volunteers contributed to the success of the camps. The kids and their chaperones were very appreciative of the kindness they were shown by the community of Cordova. A camper from the Mountain View Boys & Girls club reported that "Cordova's awesome!"

In addition to helping urban youth develop a personal connection to the land, these programs help children be better prepared to cope with environmental changes and increasing demands on natural resources. The long-term success of this program may not be determined until years from now, but there is no doubt that their experiences created life long memories for each camper. Have we created new stewards of the land? We hope so. We are certain of one thing: the campers are ready to come back next year.

The campers' parting comments reinforced our commitment to find funding support to repeat this experience for others. Educators from the Forest Service and Science Center will continue to work with group leaders from the Anchorage Big Brothers and Big Sisters and Boys & Girls Club to organize *More Kids in the Chugach* camps in 2009. The *More Kids in the Chugach* camp staff would like to extend a big Thank You to our camp partners and everyone who donated time and services to the 2008 camps.



### Save the Date!

Copper River Nouveau  
June 13, 2009

Orca Adventure Lodge  
Cordova

Tickets will go on sale starting  
early next year... don't miss out!



Boys & Girls Club campers take in the view from the Million Dollar Bridge.  
Photo by PWSSC staff.



Campers put both hands in with instructors Kate Alexander and Erin Cooper.  
Photo by Big Brothers Big Sisters (BBBS)

## Roberson lauded for his vision and dedication to the Copper River —by Nancy Bird & Mary Odden

Retired fisheries biologist Ken Roberson spent over 39 years working for a healthy and productive Copper River fishery. His dedicated work was highlighted June 20, 2008, during the Copper River Nouveau when Senator Lisa Murkowski presented Roberson the 2008 Copper River Fisheries Lifetime Achievement Award. Master of ceremonies R.J. Kopchak said Roberson has seen a lot of change in salmon rearing and

management during his career with the Alaska Dept. of Fish & Game. Kopchak said Roberson's vision for the Gulkana River hatchery has allowed it to become a state-of-the-art facility and also commented on Roberson's role in establishing the ADFG's Copper River sonar fish tracking system as a management tool.

The Gulkana River hatchery began in 1973 as a small egg box operation and has become the largest sockeye fry production facility in the world, introducing over 30 million sockeye fry to the Gulkana River drainage each year. The hatchery is owned by ADFG and is operated by the Prince William Sound Aquaculture Corporation (PWSAC).

Roberson pursued a long career in Alaskan fisheries, and has many publications to his credit on the subject of Copper River Salmon and the salmon enhancement projects at the Gulkana Hatchery. Co-workers repeatedly credit Roberson with seeing the big picture and planning for the future sustainability of the Copper River fishery. He initiated the escapement mode of management and installed the first sonar counter at Miles Lake in the late 1970s for the Copper River

fishery. He managed the sonar operation from upriver into the early 1980's when its oversight was transferred to the Cordova office.

One Prince William Sound gillnetter said, "If it weren't for Ken's early vision and determined work, there wouldn't be a Copper River fishery for harvest out of Cordova."

Roberson calls the challenges he faced a "good game for many years," with the external and internal politics involved with establishing the hatchery program: "In the early years there were those in politics that wanted us to expand before we were comfortable that the program was ready for expansion and there were others who said, 'Well, you can do this as a pilot or research program level, but these outdoor, gravel-filled incubators will never work as a production facility.'"

In the end, though, the success of the program was evident to all. Roberson says "It simply became a weight of numbers issue with large numbers of sockeye being produced at a low cost and no 'downside' demonstrated."



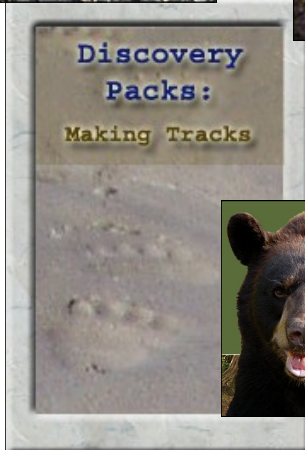
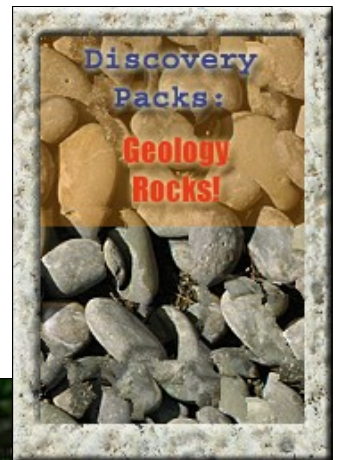
Ken Roberson (center) is congratulated by (left to right) Verla Pirtle, Chuck Meacham, Vera Roberson, and Karen & Gary Martinek. (Photo by L. Woodruff)

## DID YOU KNOW?

The Prince William Sound Science Center has Discovery Packs available for you to check out and explore the Prince William Sound and Copper River Delta... all for FREE! They are filled with resources, such as field guides or magnifiers, to help you explore our environment, rain or shine.

Call or stop in and ask Lindsay or Jenn about them!

You can get more information about these on our website at [http://pwssc.org/education/community/community\\_discoverypacks.htm](http://pwssc.org/education/community/community_discoverypacks.htm)





# Annual Spring Survey of PWS Herring Population

By Richard Thorne

Concerned over the status of herring in Prince William Sound in 1993, Cordova District Fishermen United contracted with the Prince William Sound Science Center to conduct a hydroacoustic survey of the herring population. Sixteen years later, the Center is still involved with herring research, currently with support from the National Marine Fisheries Service and the Exxon Valdez Oil Spill Trustee Council.

The 2008 spring survey was conducted from March 16 to 30 and covered the Sound from Simpson Bay to Sawmill Bay. Objectives included not only measurement of both juvenile and adult herring abundance and distribution, but also studies of predator impacts and herring condition factors that might affect herring survival. Science Center participants included Richard Thorne, James Thorne, Mary Anne Bishop, Tom Kline, Richard Crawford, Neil Dawson and Kevin Siwicke, along with USFWS avian ecologist, Karen Brenneman. The M/V Auklet and the F/V Kyle David were chartered for the survey.

The most striking feature of the cruise was the unusual adult herring distribution. Normally by late March, adult herring are concentrated in a few pre-spawning areas. During the spring 2008 cruise period, the herring were still on the move in large, deepwater schools, a distribution usually found in late February and early March. The largest adult schools were seen in Port Fidalgo and within St. Mathews Bay.

As is normally the case, large numbers of seabirds, Steller sea lions and humpback whales were actively foraging on the herring. A remarkable observation is the ability of the sea lions to locate the herring schools. While the humpback whales are busy finding herring with their sonars 24-hrs a day, the sea lions spend most of the day relaxing and playing near shore. However, by the time we pulled anchor at dusk to begin our night-time transects, the sea lions that were earlier frolicking around our boat had already beat us to the offshore schools several miles away.

Science Center investigators will be cruising again in November 2008 as part of an effort to understand seasonal changes in herring distributions and associated survival factors.



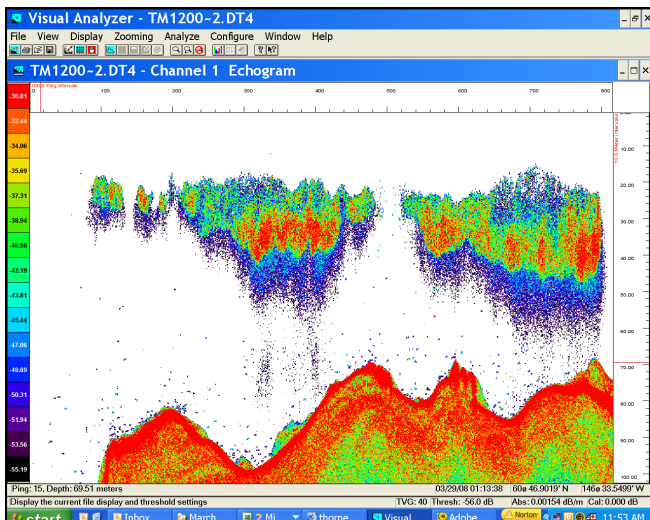
Stellar Sea Lions check out PWSSC research vessel anchored in Two Moon Bay. Photo by R. Thorne



Harbor Seals hauled out in St. Mathews Bay keep a wary eye on Steller Sea Lions. Photo by R. Thorne



Humpback whale cruises in the upper end of St. Mathews Bay. Photo by R. Thorne



Echogram of large herring school group off Two Moon Bay, Port Fidalgo. Photo by R. Thorne

Note that a full color version of this figure can be seen in a pdf of this newsletter posted at our website.)

## Cool Facts...

- You can sometimes tell a Harbor Seal's age by the number of growth rings in its teeth, but it may bite you if you try!
- Mature females are the dominant whales in a pod. Female orcas outnumber males 4-to-1, and some live to be 80. The average age for males is only 30.
- You can tell otter species apart by the shape and amount of fur on their noses.
- Fish can get sunburns.
- Count the rings on a fish scale to determine their age. The oldest known salmon is 7 years old. Five to six million years ago salmon had fangs, weighed over 500 pounds and were ten feet long.

## Oceanography Students Take On Marine Debris

Written by 10 high school students participating in the 2008 Oceanography of Prince William Sound field course.



Have you ever walked down the street and dropped some garbage, even accidentally? Most likely the answer is yes, and most people will pick up what they've dropped, but not every time. This doesn't happen only on the street either, it could be when out on a boat, fishing in river, or just hanging out around at the beach. All these places and many more ultimately lead to the ocean, which means anything dropped in or near them winds up in the ocean. This creates **marine debris**, also known as marine litter, which is any type of manufactured or manmade material that enters the coastal or marine environment.

Marine debris impacts sea life. Plastic 6-pack rings get stuck on birds, and other sea animals can choke on plastic bottles. Plastic makes up 90% of all floating marine debris. It is lightweight, durable, and strong; it does not break down easily, so one piece of plastic can kill multiple animals over the years. Many animals mistake plastic for food, and eat it. Plastic in the stomach may cause a false feeling of being full, and animals can starve to death. A recent study<sup>1</sup> showed that there were about six pounds of plastic for every one pound of plankton in the North Pacific Central Gyre, an area larger than the U.S., Canada, and Mexico combined! That's a whole lot of garbage that could be accidentally swallowed. Marine debris affects numerous species worldwide, including humans.

How does marine debris affect us? Have you ever looked out the window and seen how beautiful nature is? Marine debris damages that. By collecting in the ocean and on the shorelines, it ruins the beauty of the sea and beaches. It makes the waters and beaches around us unpleasant, nobody likes to go to a beach covered in garbage. Marine debris can also physically hurt people. It gathers on beaches, and beachgoers can step on glass, plastic or metal and cut themselves. And when fishing, nobody wants a piece of garbage getting stuck in their propeller or getting tangled in their nets. Most people would rather see sea life when they are on the water instead of disconcerting debris floating all over. That trash can also destroy sea life that you would otherwise be enjoying. But thankfully, even though marine debris has lots of negative effects, there **is** something we can do about it.

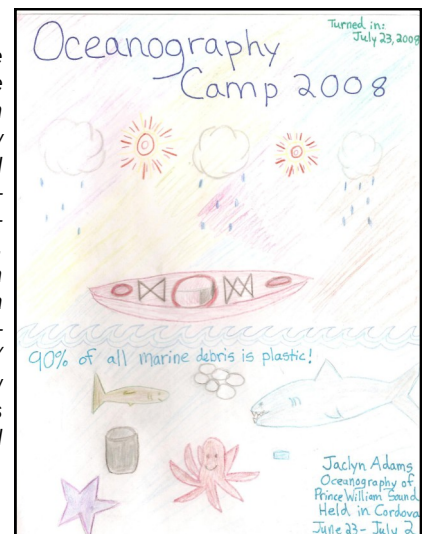
Prevention is an important method to stop marine debris. The three main ways to prevent marine debris are not littering, community outreach, and recycling. Cleaning up after ourselves is a major part in preventing marine debris. When we litter, we are affecting our life style as well as everyone else around us.

Reach out to your community through presentations and public announcements. By working together can prevent marine debris. Organizing a cleanup day is a good way to get the community involved, this way everyone understands the need to protect their environment and respect their community. By spreading the word of prevention and taking action as a group we can become marine debris free.

What else can one do? Reduce, reuse, repair, and recycle. Reduce means reducing the amount of plastic you buy or looking for packaging with more biodegradable materials. Reuse means not throwing away things that are still useful, for instance buying one water bottle and reusing it, rather than buying a new one every time. Repair involves going out and removing marine debris at places that are already tainted by it. This can be as simple as picking up trash as you see it. Recycling can also aid in the prevention of debris; putting our trash in a recycling stream removes a source of marine debris. Marine debris is a serious problem that needs everyone's help to be solved. If we all do our part we can make the world a better place.

<sup>1</sup>Moore, C.J., S.L. Moore, M. K. Leecaster, and S.B. Weisberg. 2001. A comparison of plastic and plankton in the North Pacific central gyre. *Marine Pollution Bulletin* 42:1297-1300.

Oceanography of Prince William Sound was made possible with support from the Educational Legacy Fund, the PWS Oil Spill Recovery Institute, Conoco-Phillips, BP and the National Parks Foundation. Special thanks to Cordova Coastal Outfitters, Alaska Sea Kayakers, Honey Charters, USCGC Sycamore, M/V Chenega Captain & Crew and the many volunteers who donated their time and supplies.



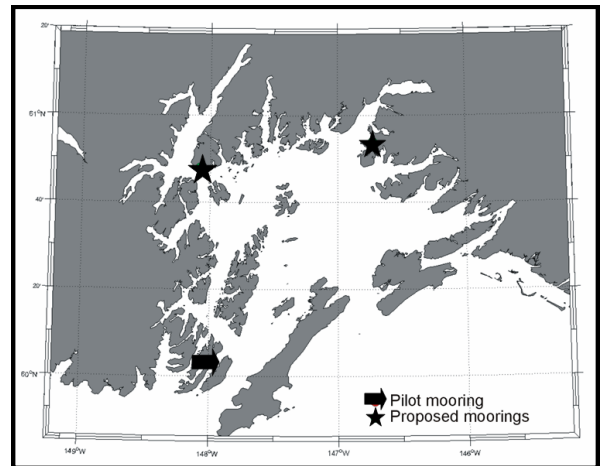


## Nearshore moorings provide information on plant biomass, water temperatures and salinity — By Rob Campbell

The dynamics of the surface layer of Prince William Sound are largely influenced by the input of fresh waters from rivers and glaciers. The timing and amount of fresh water can influence biological productivity, which can “cascade” up ecosystems and influence the amount of food available for larval and juvenile fish like herring and salmon. In order to more closely monitor changes in freshwater and heat budgets in the nearshore portions of Prince William Sound, the Science Center has begun deploying near real-time satellite telemetered moorings as part of the Alaska Ocean Observing System (AOOS). A pilot mooring was installed in November 2007 near the Armin F. Koernig hatchery, in Sawmill Bay in the southwestern corner of Prince William Sound. Plans are to install two more moorings in 2008: one near the Wally Noerenberg Hatchery on Esther Island and one near the village of Tatitlek.



The mooring consists of a Seabird Electronics SBE16 that measures temperature and salinity, and a WetLabs ECO FLNTUSB fluorometer that measures chlorophyll fluorescence (a measure of the amount of plant biomass in the water) and turbidity (a measurement of the cloudiness of the water). The instruments are set at a fixed depth of 5 m (slightly more than 15 feet). Data is collected from the instruments and broadcast by radio to a satellite uplink station at the nearby hatchery. Power is supplied by a solar panel and battery bank. The datalogging electronics, solar panel and antenna at the Sawmill Bay mooring are mounted on an Alyeska Pipeline Service Company's Ship Escort/Response Vessel System (SERVS) buoy.



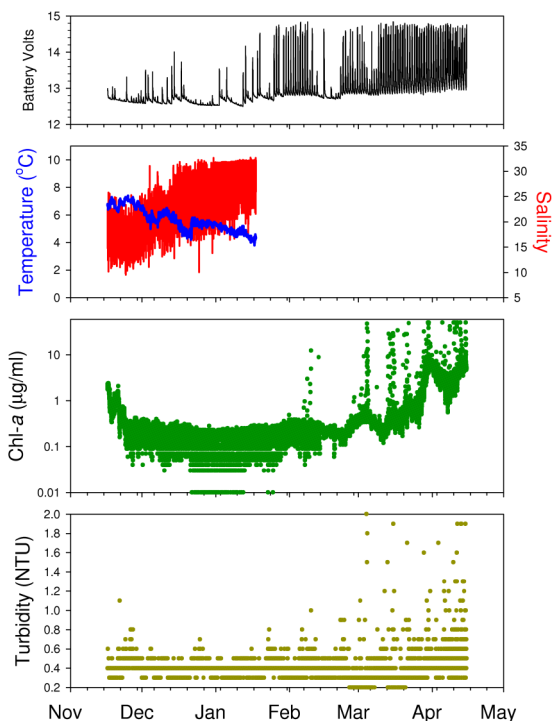
The instruments are mounted on a stainless steel cage, and suspended by a plastic-sheathed Kevlar cable to a depth of 5 meters. The large white instrument is a temperature-conductivity recorder (salinity is determined from conductivity), and the smaller black instrument is the fluorometer/ turbidometer. The fluorometer/ turbidometer is an optical instrument, and has a rotating copper cover and wiper assembly to reduce bio-fouling and keep the optics clean.

Data is collected every ten minutes. The temperature conductivity recorder had some corrosion issues beginning in mid January, and some data is missing from that time. A trip to the buoy to modify the mooring cage and swap in a new instrument is planned for April 2009. Battery voltage is an indicator of the amount of sunlight, voltage increases when the solar panel is producing energy.

The chlorophyll-a signal shows the tail end of a fall bloom, as well as the beginning of a spring bloom in late February after low values over the winter. Turbidity (bottom panel) also began to increase in April, and should continue to increase towards the summer as glacial silt is carried into the Sound by meltwater.

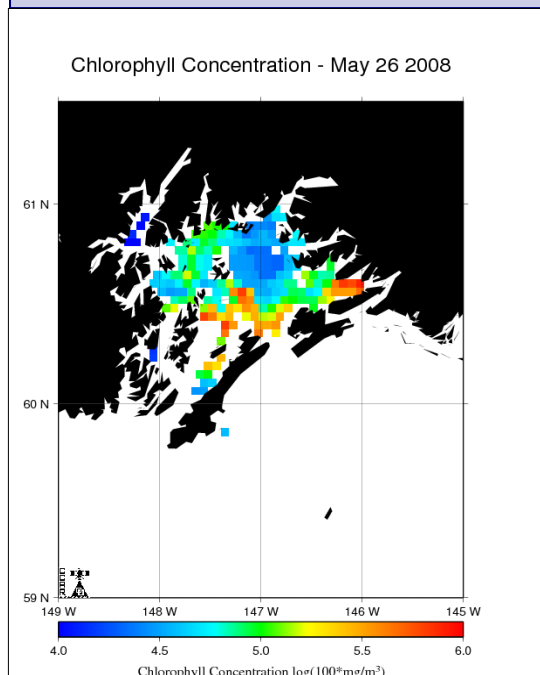
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To contact Rob regarding this project, call 424-5800 x 239 or e-mail him at [rcampbell@pwssc.org](mailto:rcampbell@pwssc.org)



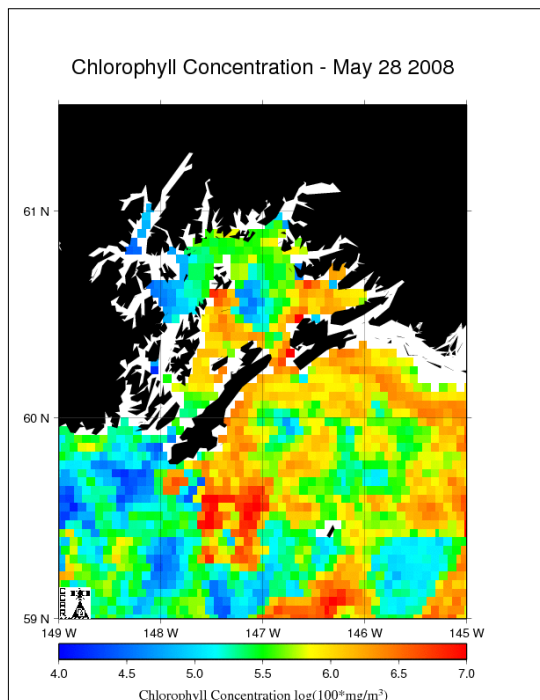
## PWSSC Researchers Observe Prince William Sound in Bloom

By Dr. Thomas C. Kline, Jr.



**Figure 1.** Spatial distribution of chlorophyll on the last day of our 2008 spring plankton survey, May 26. Image obtained from the Colorado Center for Atmospheric web site.

**NOTE**—Full color versions of these figures can be seen in a pdf of this newsletter posted at our website.



**Figure 2.** Spatial distribution of chlorophyll a two days following our 2008 spring plankton survey, May 28. Image obtained as in Fig. 1.

Most marine food chains are based on plankton. The organisms forming the foundation of this base, which consists mainly of microscopic single-cell plants, are collectively referred to as phytoplankton. Phytoplankton are then consumed by microscopic animals, which are collectively referred to as zooplankton. Some kinds of zooplankton spend their entire lives as part of the plankton whereas others are the early life stages of larger animals. Therefore when we examine plankton samples we may find many kinds of plankton including those that will grow into larger animals such as fish and crabs.

Many commercially important fishes have planktonic larval stages. Of particular importance in Prince William Sound are the planktonic larvae of herring. Herring deposit their eggs on the intertidal and subtidal areas of our shores which hatch out and become part of the plankton for the first month or so of their life. These early stages are thought to drive year class strength and when strong, enable fisheries on those year classes. The poor recruitment of recent herring cohorts has provided an impetus for our current studies.

Plankton are also very important as food for fishes such as herring and other animals. Much of the organic carbon in a marine ecosystem is generated during the spring plankton bloom. No two spring blooms are exactly the same. It is important to monitor blooms to understand how ecosystem shifts occur, particularly those that affect fisheries.

A spring plankton bloom is characteristic of high latitude aquatic ecosystems. The increasing length of day interacting with stratification of the water column following a winter period (when storm activity mixes mineral nutrients into the upper water column) generally results in a massive bloom of microscopic life. Our goal is to sample and characterize the differences among spring blooms using the tools available to us.

In May 2008 we conducted our second spring bloom plankton survey as part of the present herring recovery research being funded by the Exxon Valdez Oil Spill Trustee Council. PWSSC scientists participating in this cruise were Drs. Tom Kline (the project principal investigator or PI) and Rob Campbell and Kevin Siwicke. The cruise took place on the Cordova-based seiner F/V Kyle David captained by Dave Butler.

Phytoplankton can be detected from space because they contain photosynthetic chlorophyll pigments that naturally fluoresce. However, this fluorescence can only be seen from a satellite orbiting in space when skies are clear. The cloudiness that prevails in our area often precludes remote sensing from space. This happened during our 2008 plankton bloom survey; the first day with clear skies was the last day of our cruise, 26 May. We obtained an image showing chlorophyll in PWS on that last day of the cruise (Figure 1). This was just the beginning of a clearing trend so that two days later we were able to see even better coverage shown in Figure 2.

Figures 1 and 2 collectively show that (1), chlorophyll was most concentrated in parts of PWS bordering the Gulf, (2) that the bloom was even stronger out in the Gulf and (3), that the bloom can shift in distribution in a few days. In addition to cloudy days, limitations of these satellite images are that only the surface of the ocean is looked at and that smaller spatial scales features such as the chlorophyll in herring nursery bays within PWS are not seen.

During our cruise we overcame these deficiencies of remote sensing from space through in situ detection of chlorophyll, which is also based on fluorescence. Our Multinet plankton-sampling device that we purchased just over a year ago with a generous grant from the Murdock Charitable Trust is equipped with a fluorometer measuring fluorescence (Figure 3).

The fluorometer, along with temperature, depth, salinity, and oxygen sensors generate data at a rate of approximately once per second during net deployments. Because the net was towed horizontally there are more data points at the target sampling depth and less data reflecting the relatively more limited time when the net was lowered or brought back to the surface. Nonetheless the accumulated data provide a good picture the variability of these parameters in PWS.

Figure 4 shows the distribution of chlorophyll measured with the Multinet's fluorometer during our spring 2008 plankton survey. It is quite obvious that there was far more chlorophyll a in Zaikof Bay than anywhere else. This was quite noticeable as we observed the water to have a dark olive drab color indicative of a diatom bloom. In fact this was one of the strongest blooms that I have seen in the last decade of research in the PWS region. I was able to obtain nearly pure samples of diatoms for analysis.

*Continued on page 7*



The second and third most chlorophyll rich areas were, respectively, the transect made from Porpoise Rocks to Naked Island and, the transect made from Eleanor Island to Montague Point. The data corresponding to these transects are labeled as, respectively, Entrance, and Montague Strait in Figure 3. These areas also had high chlorophyll in the satellite images (Figures 1 and 2). In addition to this massive phytoplankton bloom, there were many herring larvae in Zaikof Bay (Figure 5). This was also observed in 2007.

May is actually quite late for a phytoplankton bloom in PWS. The cruise was timed to catch the expected zooplankton bloom. I observed the zooplankton bloom as relatively late this year based on the relative abundance of the developmental stages of the largest copepod found in the area, *Neocalanus cristatus*. For the past decade, I have been sampling *N. cristatus* during this time period. Usually there are far more of the fifth copepodid stage (the life history of copepods consists of six naupliar and six copepodid stages) than the fourth, but this year this ratio seemed to be reversed.

My assessment is based on the effort it took and the number of samples picked for stable isotope analysis during the cruise. This will have to be verified when the actual counts are complete from preserved samples also collected on the cruise.

Another indication of the relative lateness of the 2008 bloom was arrived at by comparing life stage distribution with that from the same time last year. This required a more focused sampling effort enabling a rapid turnaround of results due to less lab work. For this effort we sampled vertically rather than horizontally with the Multinet. *Neocalanus* copepods migrate into deep water following the spring bloom. This depth requirement enabled us to focus our sampling effort to deep areas. The deep parts of PWS are in a well-defined area known as the Black Hole (depth > 700m). Just a few tows were needed there in compassion to the broad spatial scale needed to assess the bloom across PWS. The latter need is easy to justify based on the high spatial variability evident in the chlorophyll distribution (Figures 1 and 2).

When *Neocalanus* migrate into deep water the different species have slight differences in life history pattern. *N. cristatus* remain at stage copepodite-V until they mature during the winter. There were less stage copepodite-V *N. cristatus* in late May 2008 compared to late May 2007.

The smaller but more numerous *N. flemingeri* do things differently. *N. flemingeri* mature into adult stages (copepodite-VI) as they migrate down to deep water. The males do not live long. Only the females remain at depth until about December when spawning commences. Thus male *N. flemingeri* only live for a narrow window of time.

The late May time frame is when we have observed male *N. flemingeri* in PWS. We observed far fewer male *N. flemingeri* in 2008 compared to 2007. Females were all but absent. Evidence of recent copulation was observed in just one *N. flemingeri* in 2008. There were more copepodite-V stage *N. flemingeri* in shallow water but less in deep water in 2008 than 2007. My interpretation is that in 2008 neither species had progressed as far in its maturation and migration pattern as they had in 2007. Hence the bloom was relatively late.



Figure 3.

The Multinet plankton-sampling device on the deck of the F/V Kyle David during the plankton collection phase of a deployment (after being towed). The electronic sensors including the fluorometer are seen in this photograph on top of the stainless steel box portion of the device. The Multinet is equipped with five separate interchangeable nets (e.g., to enable using different mesh sizes) that end in the orange plankton buckets or cod-ends. One of the cod-ends has been removed to obtain a plankton sample; it is in the lower left-hand corner. The contents of individual cod-ends may be either (1) picked and frozen as individual plankters, (2) frozen whole or, (3) preserved whole in formalin (generally all three protocols are used on samples obtained from a typical tow).

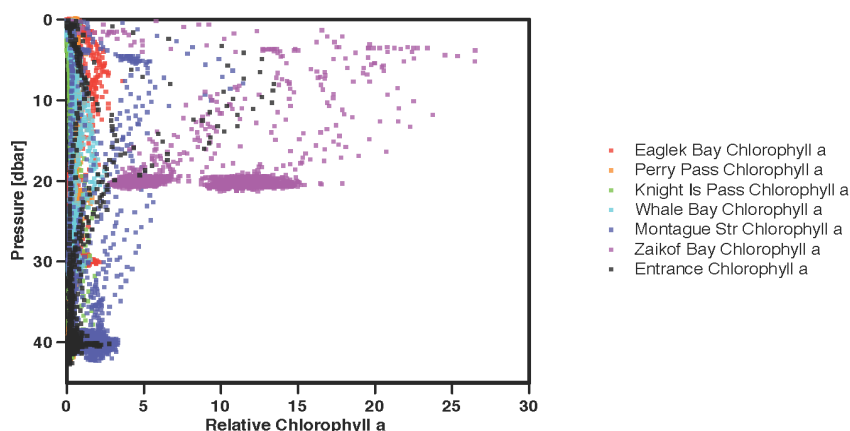


Figure 4. Vertical distribution of chlorophyll a among sampling sites from spring 2008 plankton survey. 1 dbar of pressure = 1 meter of depth.

(Note that a full color version of this figure can be seen in a pdf of this newsletter posted at our website.)



Figure 5.

Herring larvae from PWS; length about 15mm.

## New Staff Members at the Prince William Sound Science Center

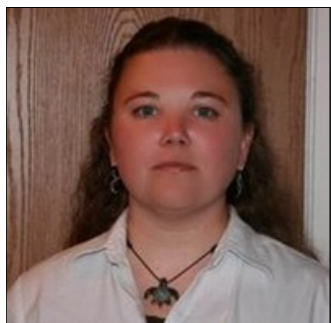
We would like to welcome our newest members, not only to the Prince William Sound Science Center but to Cordova as well.  
It is great to have you join us!

• • • • •



**Laurel McFadden**, field biologist and lab technician, joined the PWSSC in August 2008. She has done extensive work in the Arctic since 2005, with continued studies done in Svalbard, Norway that revolved around local population dynamics of the little auk colony at Hornsund Fjord. During that time, she conducted at-sea surveys, pit-tagging, plankton tows, and a variety of other research collection methods. She is a graduate of Pomona College, with a BA in Science, and has studied abroad in Greenland, Arctic Canada, China, and Russia. Laurel spent 3 months at sea as a lab and field sampling assistant aboard a Canadian Coast Guard icebreaker in the arctic where she prepared water samples for carbon and silica flux studies. She also collected and identified amphipods and bryozoans, prepared water and sediment samples, and collaborated with international scientists in arctic winter field conditions while in Norway. Laurel returned to the US in August 2007 and worked as a Geology Technician at Pomona Geology Department.

You can reach Laurel at:  
424 - 5800 x230  
lmcfadden@pwssc.org



**Jennifer Larsen** joined the Science Center as the Executive Assistant in May '08. She moved to Cordova from Port Angeles, WA. Her background is with the U.S. Coast Guard as a Marine Science Technician for 8 years and also has an AAS degree in Veterinary Technology and is a Registered Veterinary Technician. Jenn works on public relations and administrative projects as well as maintains the visitor center. With her husband, who is in the U.S. Coast Guard stationed on the USCGC Sycamore, she enjoys traveling, photography, outdoor activities such as fishing, hiking, and mountain biking, winter sports, journaling, birdwatching, volunteering, and spending time with her pets. She anticipates pursuing her Bachelor of Science degree while in Cordova.

You can reach Jenn at:  
424-5800 x227  
jlarsen@pwssc.org



**Alice Dou Wang**, Education Specialist, recently joined the Education Department at the PWS Science Center. She earned a B.S. in Biology from Wheaton College in 2007. After graduation she spent a season as a sea lion observer on the Columbia River in Oregon with the U.S. Army Corps of Engineers Fisheries Field Unit. She has also worked as an intern in the science policy division at the American Association for the Advancement of Science in Washington DC. In summer 2008 she spent three months in the Alaskan wilderness with the National Outdoor Leadership School.

You can reach Alice at:  
424-5800 x237  
adouwang@pwssc.org

### Career and Volunteer Opportunities

Interested in a job or volunteering at the Prince William Sound Science Center? We have some great opportunities for you!

#### Job Openings

GIS Analyst

Development Director

You can visit our website for complete position announcements and descriptions at <http://pwssc.org/whatsnew/employment.shtml>

#### Volunteers

We could use your help with our 6th grade Technology Program. Do you have skills in cutting and/or measuring wood, tools or a shop that we could utilize, or experience with robotics? If so, we'd love to hear from you!

Stop by or contact Lindsay (424-5800 x231 [lindsay@pwssc.org](mailto:lindsay@pwssc.org)) to donate your time to a great organization!

Also, Kim Kiml at the Forest Service (424-4735) would greatly appreciate any volunteers to assist with our Discovery Room K-2 programs!



## Just for fun... PWSSC Word Find

S	M	A	A	S	C	N	H	A	O	K	A	L	A	S	K	A	A	E	D
H	U	O	H	T	G	O	E	K	S	A	I	R	F	E	D	E	R	A	L
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ACOUSTIC  
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BIRD  
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SEA OTTER  
SHOREBIRD  
SOUND

STELLER  
T SHIRT  
TESTING  
WATER  
WILLIAM  
WINE GLASSES

**LISTEN UP!**

**What:** Sound Science radio program... describing, explaining, and exploring scientific topics that are relevant to the area and intriguing to local residents

**Who:** Allen Marquette, Education Specialist for the Prince William Sound Science Center

**When:** Monday mornings- 10:00 to 10:30... October 6th, November 3rd, and December 1st

**Where:** On the radio, Cordova's KLAM, 1450 AM (also found in the *Cordova Times*)

**STILL LISTENING?**

**What:** Field Notes radio program... short educational segments about the ecology around Prince William Sound and the Copper River

**Who:** Allen Marquette, Education Specialist for the Prince William Sound Science Center

**When:** during KCHU's Children's Hour every Sunday afternoon.

**Where:** On the radio, Valdez's KCHU, 88.1 FM or online at our website: [http://pwssc.org/education/community/community\\_radio.htm](http://pwssc.org/education/community/community_radio.htm)

## News from the Oil Spill Recovery Institute

W. Scott Pegau, Research Program Manager



OSRI began several exciting new projects this summer. The first is funding research on the transport of oil through sea ice. The project is a portion of a much larger proposal to the Coastal Resource Recovery Center (CRRRC) in New Hampshire as a biological component to the Joint Industry Program examining oil spills in ice covered waters. The CRRRC funded project aims to understand the transport of oil through sea ice, the ability of micro-organisms to degrade the oil in ice, and combining the results in a model that will predict the exposure of organisms to different components of oil contained in ice.

OSRI has partnered with CRRRC on this program and is funding Hajo Eicken and Chris Petrich at the University of Alaska Fairbanks to model the flow through ice of the water-soluble compounds of oil. The team brings extensive experience with measuring and modeling properties of sea ice. Besides the modeling work, they will collaborate with Norwegian counterparts at SINTEF to set up appropriate laboratory tests to measure the transport of the water-soluble compounds.

The second new project is a socioeconomics project designed to examine the social disruption from oil spills and spill response. This project is also a collaboration with CRRRC. OSRI has been working to develop a socioeconomic research component, but has not been able to get a project funded on its own. When the CRRRC received a very highly rated socioeconomic proposal that fit the direction that OSRI was trying to go it led to a natural partnership between the two organizations.

The project is being led by Thomas Webler from the Social and Environmental Research Institute. It is designed to characterize effects, vulnerabilities, and the adequacy of existing data to inform decision-making in regard to social disruption from oil spills and spill response. OSRI's contribution covers the cost of adding Cordova, Alaska to their study sites. This provides a study site that has had a relatively long period for the effects to be fully realized. It also builds on the previous research done in relation to the Exxon Valdez oil spill.

A third project looks to build upon existing fish databases and habitat mapping efforts to examine the ability to use high-resolution habitat maps to predict fish associations. The project is led by Rob Bochenek at Axiom Consulting and Design.

It combines the herring data collected in Prince William Sound and Cook Inlet with the ShoreZone habitat mapping data to examine the habitats being utilized and to begin to tease out if certain habitats and areas lead to greater reproductive success for herring. This project is being funded by OSRI but is anticipated to be of use for the Exxon Valdez Oil Spill Trustees Council's upcoming herring restoration program.

Finally, the Oil Spill Recovery Institute joined together with Tesoro Maritime Company, Cook Inlet Spill Prevention and Response Inc., and Alaska Clean Seas to fund the test of a skimming system that utilizes a new oleophilic (oil loving) surface. The new surface, developed by CRUCIAL, INC., is made of a rough oleophilic material. The roughness of the material improves the skimmers capability to collect oil when compared to the traditional smooth oleophilic surfaces used in most systems. Another change to the system's the pumping system reduced the emulsification of the oil and water collected, which allows for more rapid separation of water from the oil collected.

CRUCIAL's system was tested at the national oil spill test tank facility, Ohmsett, in July 2008. Testing was conducted using the new ASTM testing protocols for skimmers and used Alaska North Slope Crude for the test material. A large disk skimmer with the new surface and other modifications was able to collect 387 gal per minute (gpm) of oil and had at an efficiency of eighty-three percent. Without the modifications the system would collect 130 gpm of the fresh crude oil. A whopping three-fold increase in the recovery rate with the new system.

While OSRI did not contribute to the development of this new technology, our ability to work with industry and oil spill response organizations to ensure the proper testing of new developments helps forward the ability to respond to oil spills.



Pictured is the Crucial skimmer being tested at the Ohmsett facility. Each disk on the skimmer has the new oleophilic surface applied. The splash guards have been removed allowing better visibility of the system.

*Photo supplied by Eric Haugstad of Tesoro.*

The full report on this article can be found at  
[http://pws-osri.org/programs/projects/annual\\_reports/2008/08-10-12.pdf](http://pws-osri.org/programs/projects/annual_reports/2008/08-10-12.pdf)



## Prince William Sound Science Center Membership Roster

As of September 30, 2008

We greatly appreciate the generous donations of our members and, also sponsors of the Copper River Nouveau (see back page). Your annual contributions support our research and education programs and allow us to continue to inform the public about the environment in which we live... the Prince William Sound, Copper River Delta, and northern Gulf of Alaska.

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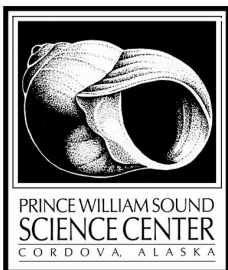
The Prince William Sound Science Center is a 501(c)3 corporation. Your contribution is tax deductible.

The mission of the Prince William Sound Science Center is to:

- Contribute to the comprehensive description, sustained monitoring and ecological understanding of Prince William Sound, the Copper River and Gulf of Alaska;
- Promote the goal of maintaining long-term, self-regulating biodiversity, productivity and sustainable use of renewable resources;
- Educate and inform the youth and the general public about the critical interdependence of the biology and regional economies of Alaska

Membership includes **Breakwater** newsletter subscription, a decal and 10% discounts on logo merchandise. Higher categories include a poster of the whale Eyak and more.

Please feel free to stop in to pick up your premiums or we can ship them to your door if you are not located here in Cordova.



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## **Biggest profit ever at the Nouveau, thanks to generous sponsors and auction buyers!**

The 9th annual Copper River Nouveau overflowed with generosity, perhaps fueled by tap dancing and a \$20,000 anonymous donor! The net profit from the fundraising event totaled \$72,000!!!

These funds support education program activities, the Carol Treadwell Memorial Scholarship Fund, and general research planning for the Center's programs.

**Special thanks to this year's chefs from ORSO & the Glacier Brewhouse!**



Photos by L. Woodruff



Entertainers included Senator Lisa Murkowski and the Copper River Queens dancing to Shirley Temple's "Cod Fish Ball." Above: Playwright David Roemhildt directs diners Lila Koplin, John Bocci, Gary Martinek, Ed Zeine, Eric Knudsen and EJ Cheshier in a skit titled "Salmon Life Cycle."

### **Upcoming Events**

- **Oil Spill Recovery Institute Advisory Board Meeting**  
Mon., Oct. 20, 2008 in Cordova
- **PWSSC Board Meeting**  
Wed., Oct. 22, 2008 in Cordova
- **Alaska Marine Science Symposium**  
Jan. 19-23, 2009, Anchorage
- **Tuesday evening Lecture Series schedule**  
[www.pwssc.org/What'sNew](http://www.pwssc.org/What'sNew)

### **Copper River Nouveau Individual Sponsors**

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