PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

the Breakwater

May 2008

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

Western Sandpipers are carefully removed from a mist net at Hartney Bay, Alaska

INSIDE

Tickets going fast!
COPPER RIVER NOUVEAU
June 21, 2008
Orca Adventure Lodge, Cordova

Banding project focuses on site fidelity of migrating shorebirds

by Mary Anne Bishop and Neil Dawson, PWSSC

During migration, shorebirds rest and refuel at stopover sites that may be separated by thousands of kilometers. Huge numbers of shorebirds of a variety of species use the Copper River Delta near Cordova each spring on their way to Arctic or subarctic breeding grounds. Along the Pacific Flyway, the Copper River Delta is the most important stopover area in spring for Western Sandpiper and Dunlin, hosting up to 4 million Western Sandpipers alone!

During 3 springs of monitoring for radio-marked birds (link), 8-21% of radio-marked birds detected on the Copper River Delta were recorded only at Hartney Bay, a small, shallow bay on the east side of Orca Inlet accessible by road from Cordova. The purpose of this study is to establish whether birds use the same specific locations within a larger stopover area year on year. A better understanding of when, where, and for how long migrant shorebirds stop over will help to estimate the number of individuals using a site and determine a site's importance to both species and flyway conservation.

We will attach color bands to Western Sandpiper, Dunlin, Least Sandpiper and Semipalmated Plover at Hartney Bay during peak shorebird concentrations over a 3 year period, 2008 - 2010. Bands will be red in 2008, green in 2009 and orange in 2010. Regular counts will ascertain the number of birds using the area. Proportions of each year's birds returning to Hartney Bay will be evaluated through recapture rate and corroborated by visual checks. We will also assess the age and body condition of marked birds to look for differences within the migration period and between years. A metal band with a unique number will be attached to each bird to provide future information about movements and survival rates.

This information will then be shared with the United States Shorebird Conservation Plan and the Western Hemisphere Shorebird Reserve Network.

PWSSC teams have captured, banded, measured and released Western and some other Sandpipers at Hartney Bay for the past three years.
Photos by Nancy DiNapoli

Investigations of Simpson Bay explore nursery habitat use by juvenile Pacific herring

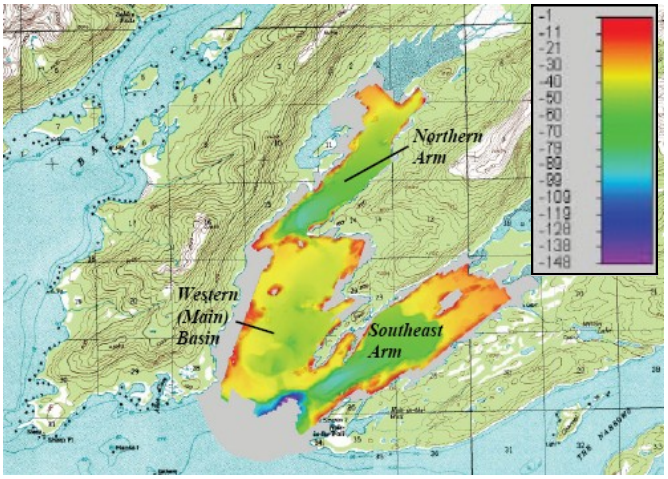


Fig. 1. Swath Bathymetry of **Simpson Bay** showing a relatively shallow (50-60m) main basin joined by two deeper (80-90m) inner basins. Also shown is the leading edge of a deep (>130m) trench entering along the SE side. *(Swath Bathymetry courtesy of Chris Noll, Texas A&M University at Galveston)*

by Shelton Gay, PWSSC

Initial results from data collected in the summer of 2007 indicate that water exchange from Orca Bay into Simpson Bay may have played a significant role in moving larval herring into Simpson's inner basin. The tidal currents and hydrography (profiles of the temperature and salinity – T/S) were measured repeatedly over diurnal (26 hr) tidal periods within Simpson Bay, a small fjord located in eastern Prince William Sound (PWS) Alaska (Fig. 1). In addition, two sets of moorings and weather stations were also deployed to track changes in water mass physical properties over time, such as the temperature, salinity and density, within the upper and lower water column of the two basins.

The weather stations were both set up near the mouth, one on the mast of a mooring buoy and one on shore. Currents in the bay were measured using a 600 kHz acoustic Doppler current profiler (ADCP) and the transects were repeated for approximately 26 hours with temperature and salinity (T/S) profiles collected on every other run. In addition to T/S and depth data, a CTD instrument also measured fluorescence (a proxy for chlorophyll) and turbidity with an ancillary sensor (see figures on page 6).

(continued on page 6)

Oil Spill Recovery Institute Strategic Planning

W. Scott Pegau, Research Program Manager

The Oil Spill Recovery Institute is currently reviewing its strategic plan and long-term goals. The OSRI Advisory Board, Scientific and Technical Committee, along with members of the Prince William Sound Science Center Board will meet this spring to review OSRI's progress over the last five years and begin setting direction for the next five years.

OSRI's Mission is mandated by Congressional legislation which established it.

The purpose of the Prince William Sound Oil Spill Recovery Institute (OSRI) is to support research, education, and demonstration projects which are designed to deal with oil spills in Arctic and sub-Arctic marine environments.

Five years ago, the Advisory Board adopted four goals based on this mission statement. It is these goals which will be reviewed and revised, as deemed appropriate by the Board through discussions this spring and later this summer. The current goals are:

Understand – Attain a four dimensional interdisciplinary understanding of Prince William Sound to enable detection and prediction of spill-related impacts and subsequent recovery.

- Design a Nowcast/Forecast observation system, demonstrate its utility, and seek long-term operational funding.
- Conduct environmental research.
- Profile potential impacts on the economy, life-style and well-being of communities and resource users in Prince William Sound.

Respond – Enhance the technical ability of oil spill responders to mitigate impacts of spills in Arctic and sub-Arctic marine environments.

- Fill knowledge gaps on behavior of spilled oil.
- Fill knowledge gaps on use and effectiveness of specific mitigation techniques.
- Identify and evaluate new prevention and response technologies.

Inform – Disseminate information and educate the public on the issues of oil spill prevention, response, and impacts.

- Publish scientific and technical results in the open literature.
- Brief oil spill responders on OSRI products and assist to include them in operational activities.
- Facilitate the exchange of information and ideas.
- Provide graduate and undergraduate fellowships and internships.

Partner – Partner with other organizations to take advantage of pooled funding, facilities, knowledge and experience.

- Collaborate with other partners in achieving a long-term coastal and ocean observing system for Alaska.
- Coordinate with the efforts of other related programs.

To keep informed of progress on the strategic plan or to provide input please contact Scott Pegau at wspegau@pwssc.org.

President's Corner - *by Nancy Bird*

It was great to have the Exxon Valdez Oil Spill Trustee Council visit Cordova this month and make commitments to both a long-term herring research and restoration program, and also to the Cordova Center! Their decision to award $7 million to the multi-purpose community center is a major turning point for this project which the Science Center has long supported because it will provide enhanced space for our educational programs as well as a 206-seat auditorium. This will dramatically improve our ability to host scientific meetings. The PWSSC has worked since the mid-1990's with the City of Cordova on this and we are delighted to finally have the Trustee Council's support for this worthy project.

We also applaud the Trustee Council's recommitment to an integrated herring research and restoration program. On rather short notice last month, the Council invited a group of scientists, fishermen, resource managers and the general public to meet in Cordova for a four-day workshop on this topic. The workshop's goal was to design a plan for herring restoration work with an emphasis on participation by residents of communities impacted by the loss of the herring fishery. Our staff were active at the workshop particularly because four of 14 currently funded herring projects by the Trustee Council are led by PWSSC researchers.

The workshop's results are still being drafted but include a new structure for a planning team with diverse representation of fishermen, community residents and scientists. Details are being refined and new research proposals will be accepted in the coming months. Our staff is motivated to remain very involved in these investigations. Herring are central to the marine food web and we must gain a better understanding on their decline and lack of recovery.

Just over a year ago, the Herring Restoration Steering Committee stated criteria as follows, defining when the population of Prince William Sound's herring will be considered recovered, namely when:

- The spawning biomass has been above the current (2007) regulatory fishery threshold of 43,000 tons for 6 to 8 years;
- Two strong recruitments (>220 million) of age-3 fish have occurred during those 6 to 8 years, and
- Spawning occurs in at least three geographic regions of the Sound (e.g., East, North, West)

Strategies to achieve this recovery will require perseverance, care and long-term funding support. The current research efforts lay a good foundation for possible intervention projects. We need to be careful in choosing those interventions to assure long-term recovery of Prince William Sound's herring population.

Hearing Herring Blowing Bubbles

By Richard E. Thorne, Prince William Sound Science Center and Gary L Thomas, Rosenstiel School of Marine and Atmospheric Sciences, University of Miami

It is well known that whales can be heard with underwater listening devices. PWSSC and University of Miami scientists recently demonstrated that it is also possible to hear herring. Unlike whales, herring do not vocalize. However, under certain circumstances they blow bubbles, and the sound of the bubble release from large herring schools can be heard at distances of more than a kilometer.

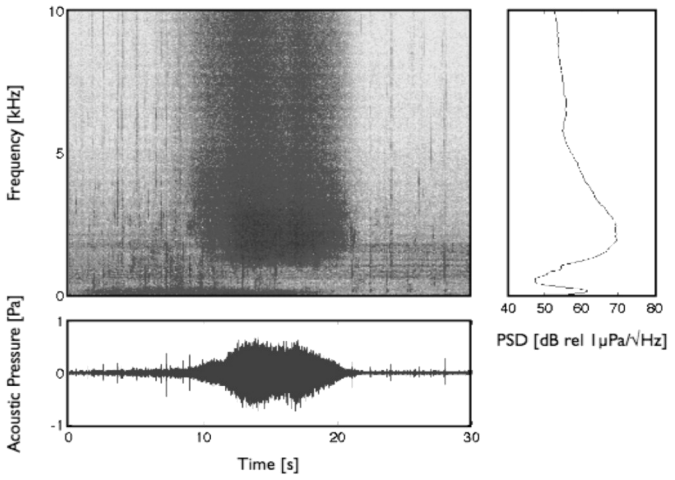
Senior PWSSC scientist, Richard Thorne, and Gary Thomas, former PWSSC President, now a professor at the Rosenstiel School of Marine and Atmospheric Sciences (RSMAS), University of Miami, were well aware that herring blew bubbles. They reported that phenomenon nearly 20 years ago in an article published by the Canadian Journal of Fisheries and Aquatic Sciences. Both were on the faculty at the University of Washington, School of Fisheries at the time. In a more recent article in the ICES Journal of Marine Sciences, the two scientists pointed out that surfacing behavior associated with bubble release (herring have to replace the lost air by gulping at the surface) was the likely mechanism that exposed herring to toxic oil during the Exxon Valdez Oil Spill.

One of the difficulties in assessing herring abundance is that they are difficult to locate. The capability to hear herring would make it easier to find them. Consequently, the two scientists, along with Dr. Thomas Hahn, an engineer at RSMAS, recorded the acoustic characteristics of the herring gas bubble release during a cruise last spring. They discovered that the loudest sounds were associated with massive gas releases by herring when they were attacked by whales. Apparently the herring release the gas to confuse the echo-location capability of whales, similar to the way submarines release chaff to confuse the sonars of attacking destroyers or torpedoes.

The main conclusion of the study is that it would be feasible to locate herring by their sound production, perhaps as part of an automated buoy system. The study is reported in the proceedings of Oceans07, held in Vancouver, B.C. last October.

At left, a herring school larger than a football field boils at the surface in response to simulated humpback whale sounds.

Sound characteristics of a herring gas bubble release. Sound frequency and acoustic pressure shown over time in seconds and power spectral density (PSD) showing decibels relative to the sound frequency.



NOAA awards Bronze Medal to Oceanographer, Jennifer Ewald

NOAA defines its Bronze Medal award as "The highest honorary award granted by a head of an operating unit or Secretarial Officer or equivalent. A Bronze Medal is defined as superior performance characterized by outstanding or significant contributions which have increased the efficiency and effectiveness of the operating unit. To warrant a Bronze Medal, a contribution must focus on qualitative and quantitative performance measures reflected in the Department's Strategic Plan and be identified in one of the following areas: leadership, personal and professional excellence, scientific/engineering achievement, organizational development, customer service, administrative/technical support or heroism."

PWS Science Center physical oceanographer Jennifer Ewald received the award at the NOAA Honor Awards ceremony, which recognizes the recipients of the 2007 Bronze Medal and Distinguished Career Awards. The ceremony took place on Friday, April 18, 2008, at the Andrew Mellon Auditorium in Washington, D.C.

Marine debris removal and tidepooling programs receive grant award

By Lindsay Butters, PWSSC

The Education Program was awarded a grant from the **National Parks Foundation** to conduct ocean-based educational activities to enhance stewardship of marine and coastal resources. The grant award will support a Marine Debris Removal project for elementary and high school students, Community Kayak Day and two Tidepooling for Tots events during the summer of 2008.

The Marine Debris Removal project will engage five student groups in a three-phase project to increase awareness of marine debris along Cordova's shores and in Prince William Sound. First, students will receive a classroom presentation to introduce the sources and environmental impacts of marine debris and petroleum contamination. Then students will walk collection routes to inventory and remove existing and potential marine debris. The debris that is collected will be cleaned and dried, then incorporated into sculptures that will be on display during the **2008 Community Earth Day Festival**. The purpose of the sculptures is to educate the community about what types of materials are likely to become marine debris. Some student groups will also create outreach materials such as posters, brochures, short films or public service announcements to help get the word out about reducing marine debris.

To date, two classes from Mt. Eccles Elementary and two Cordova High School Marine Biology classes have been involved in the project.

Community members and visitors to Cordova are invited to participate in **Kayak Day 2008**, a popular day trip that kicks off our summer season. Novice and seasoned paddlers alike are welcome to join educators from the Science Center and guides from Cordova Coastal Outfitters for a paddle in Orca Inlet. Participants will learn about the natural history of the area, explore the intertidal zone and practice Leave No Trace principles to reduce our impact on the beautiful beaches of Prince William Sound.

Also supported by National Parks Foundation grant is **Tidepooling for Tots**, an afternoon program held during the summer months for families with children aged 2-6. During the events, children will explore the intertidal habitat near the Science Center and learn about the various critters that call the intertidal zone their home. Participants may also create some ocean crafts and munch on some ocean-themed snacks.

Community Kayak Day is slated for Saturday, June 7. Tidepooling for Tots events are scheduled for July 23 and August 12. For more information please contact Krysta Williams at 907-424-5800 x238 or kwilliams@pwssc.org.

NATIONAL PARK FOUNDATION
Share the Experience

Upcoming summer science education programs

NEW!

Oceanography of Prince William Sound

Oceanography of Prince William Sound is an adventurous, ten-day field course for high school students ages 15-18. The Oceanography course combines technical skills and hands-on, experiential learning opportunities in an active study of physical and biological oceanography. Students will also develop basic kayaking skills and participate in a three-day guided kayak expedition. The course begins in Cordova, Alaska and includes travel to and from Whittier on the Alaska State Marine Highway.

This Oceanography course offering also includes a case study of the Exxon Valdez Oil Spill and a visit to Knight Island in the western Prince William Sound. Four undergraduate credits are available through the University of Alaska, Prince William Sound Community College.

Participants will explore the beautiful Prince William Sound with PWSSC Research and Education staff, and gain practical experience in the fields of physical science and marine ecology.

Anchorage Students: Thanks to TOTE Ocean Express, full scholarships are available for **two** Anchorage high school students to participate in this course! Contact Lindsay Butters, lbutters@pwssc.org (or 424-5800 x 231) for an application form.

Science Camps I & II target 10-15 year olds

These camps are adventurous studies of the wildlife and habitats of the Copper River Delta and Prince William Sound. Each day is filled with outdoor activities and hands-on exploration of the wild inhabitants of this region, including salmon, birds, beavers, moose and more!

Camp I is open to 12-15 year olds and runs June 9-13.

Camp II is open to 10-12 year olds and runs August 4-8.

Activities include hiking, kayaking, canoeing, river rafting and, for those in Camp I, glacier trekking*. Nights are spent at a field camp on the Delta and will be filled with evening camp activities, delicious meals, crafts and games.

Natural History of the Copper River Watershed

PWSSC and Alaska River Expeditions are collaborating on several programs including **an adventurous 7-day field study for adults and teachers** based in the dramatic landscape of the Copper River Watershed. In Cordova, participants will be introduced to the natural history of the Copper River Delta. Then we'll spend five days rafting the Copper River and investigating the tectonic, glacial and fluvial processes that shape this magnificent landscape. Geologist guides and Science Center educators will teach participants how to "read" the natural history of the landscape and identify the processes that created the remarkable Copper River Basin. Two professional development credits will be available from University of Alaska, Anchorage.

2008 Summer Education Program Schedule

Session	Date	Age	Cost	Activities
Community Kayak Day	June 7	All ages	$10	Kayaking, tidepooling
Science Camp I	June 9-13	12-15 yrs.	$425	Kayaking, hiking, glacier trekking, rafting
Science Day Camp*	June 16-20	8-11 yrs.	$175	Hiking, boat ride, canoeing, glacier viewing
Oceanography of Prince William Sound	June 23-July 2	Minimum age 15 years	$995 + $25 for academic credit (optional)	Kayaking expedition, hiking, camping
Natural History of the Copper River Watershed**	July 16-22	Adults	$2165 w/meals & lodging $1725 no meals or lodging + 2 credits	River rafting, light hiking
Tidepooling for Tots	July 23	2-6 yrs. with parent/guardian	Free!	Tidepooling, ocean crafts
Community Canoe Day*	August 2	All ages	$10	Canoeing
Science Camp II	August 4-8	10-12	$350	Kayaking, hiking, rafting
Tidepooling for Tots	August 12	2-6 yrs. with parent or guardian	Free!	Tidepooling, ocean crafts

* A PWSSC and U.S. Forest Service/Cordova Ranger District partnership program.
** A PWSSC and Alaska River Expeditions partnership program.

Binocular astronomy and Sound Science— Listen on KLAM!

By Allen Marquette

A new educational radio program titled "Binocular Astronomy and Sound Science" was started in Cordova a few months ago and is sponsored by the Prince William Sound Science Center Education Program and KLAM Radio (1450 on the AM dial). The new science program **airs at 10 am on the first Monday of each month** and explores all aspects of astronomy including what can be seen in the night sky during the coming month with the naked eye or binoculars.

The program offers listeners an opportunity to call into a live radio program to discuss the current month's topic or to start a new discussion. Topics other than astronomy focus on science that is pertinent to Cordova, the Copper River Delta or Prince William Sound. To date, listeners have participated in topics ranging from rogue asteroids in space to herring management in Prince William Sound. The program airs every month throughout the year, although a few of the summer months will be taped and will not include the live call-in portion of the program.

☆ ☆ ☆

To learn more about our Summer Education programs, please visit us on the web at: www.pwssc.org/education or contact Lindsay Butters at (907) 424-5800 x 231 or lbutters@pwssc.org.

Water exchange in Simpson Bay, investigations of Pacific herring nursery habitats

(continued from page 1)

Simpson Bay is generally a shallow fjord with depths ranging from 50 to 60m., but there are two regions where the basin depths reach 80m or greater. One region is located on the east side of the mouth and is formed by a deep (> 100m) channel extending northeastward from Orca Bay that continues into the southeastern arm (80-90m). The other deep region (80m) is located just inside a shallow reef that separates the northern arm from and western (southern) basin (Fig. 1).

The currents within Simpson revealed a complex structure forced by the interaction of tidal flow, bathymetry and winds. A prominent feature of the tidal circulation is a northward jet (0.25-0.3 m/s) generated by flow across the shallow shelf on the western side of the mouth. A secondary hydrodynamic response to this forcing is a southward flow along the eastern shoreline. This outflow ultimately re-circulates water at the mouth via an anticyclonic (clockwise) eddy.

During ebb tides the cross-channel flow field is reversed and water exits Simpson along the western side of the fjord. This current is initially generated by acceleration of an estuarine outflow from the northern arm through a channel on the western side of the reef that separates the northern and southern basins.

However, the imbalance in cross-channel flow created by this current eventually generates a cyclonic (counter-clockwise) eddy around the reef forcing exchange of PWS water into the northern basin. This occurs through a small channel located on the eastern side of the reef.

Flows within the northern basin exhibit a two to three layer structure with the upper 15 to 20m layer currents being in phase with the tides, but with the deeper layers exhibiting reversals in direction. For example, as the upper layer flows southward towards the reef during the ebb tide the deeper layer is moving northward towards the head of the basin. This structure simply reverses itself with each tide phase.

Winds also play a role in water exchange into Simpson, and the dominant effects occur during periods of high barometric pressure over the region. During these times up-fjord winds are enhanced by afternoon sea-breeze effects. Westerly winds in Orca Bay and sea-breeze effects began early in the summer of 2007, resulting in frequent periods of up-fjord winds with average speeds ranging from 5 to7m s^{-1}. These winds are evident in the time series shown in Figure 5 as periods of sustained high speeds with exceptionally low variation. When in resonance with flood tides, the combined effects of wind and tide may result in extensive intrusions of PWS water into the northeastern region of the main fjord basin.

The meteorological conditions in the summer of 2007 were probably more conducive to larval drift towards Simpson Bay as opposed to summers with more frequent winds from the east and southeast. Southerly and westerly winds along with tides in Orca Bay may bring plankton and larval fish to the mouth of Simpson, where the tidal currents in the fjord can then take over in advecting them into the northern (inner) basin.

All of these factors explain how larval herring that are advected from spawning locations into Orca Bay may ultimately reach Simpson's inner basin and how they may be retained there. During the SEA project in the 1990's the northern basin exhibited relatively high abundance of age 0 herring believed to be tied to higher biological productivity. In 1996 and 1997 this appeared to be related to higher stratification from freshwater runoff into this basin. However, in 2007 this basin again exhibited a relatively high phytoplankton biomass, and water exchange from Orca Bay may have played a significant role.

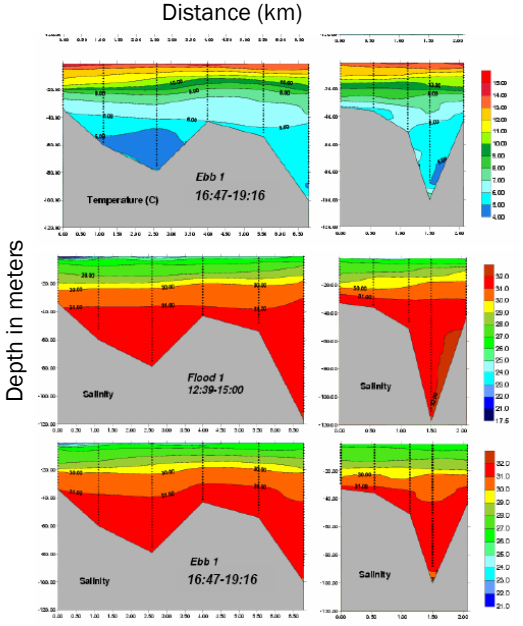
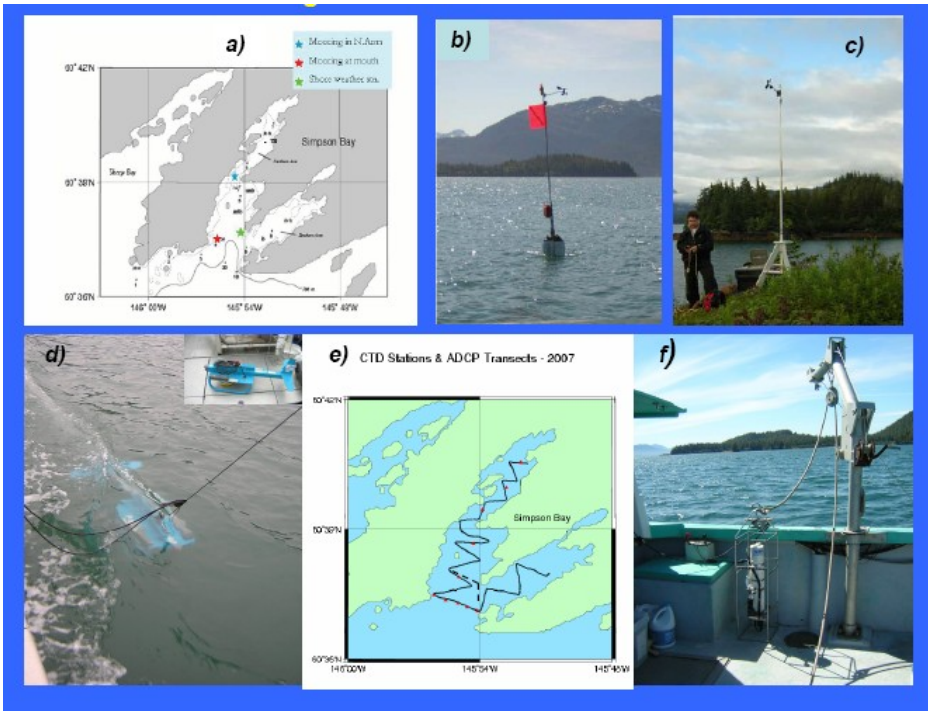


Fig. 5. (above) Temperature and salinity during flood and ebb tide 1 showing restructuring of the water mass physical properties in Simpson due to redistribution of water via the circulation during the tides. Both isotherms and isohalines exhibit vertical changes indicative of internal wave action and cross-channel tilting of isopycnals at the mouth during the flood tide.

Fig. 2. ***a)*** Locations of moorings and weather stations in Simpson Bay; (***b*** and ***c***) Davis Instrument weather sensors mounted to an oceanographic buoy and a shore station (located near the mouth (red and green stars in panel *a*); ***d***) 600 kHz ADCP mounted on a biosonics tow sled; ***e***) Transects and CTD stations repeatedly sampled over the 26 hr diurnal period; and ***f***) the SBE 19 plus CTD used to measure the hydrography.



Young marine scientists win scholarships and more at statewide Tsunami Bowl in Seward

SEWARD, ALASKA -- This year's Tsunami Bowl drew a record fifteen teams from across Alaska, including teams from Unalaska, Cordova, Soldotna, Anchorage, Kenny Lake, Wasilla and White Mountain in northwest Alaska. Last year, Juneau-Douglas swept first, second and third place at the Tsunami Bowl.

One team to watch out for in 2009 is this year's third place winner, Team Visceral Mass from Cordova. Visceral Mass had the best overall team record for the competition, winning seven games and only losing one. The team also beat the first and second place teams during matches earlier on in the competition. Composed of three juniors and one sophomore, the team says it will be back for next year's competition. Cordova team coach Lindsay Butters of the Prince William Sound Science Center says that Visceral Mass was "super motivated."

"These kids were at practice every day, asking good questions," she added. Butters said that it helped that Cordova High School started offering a marine biology course last fall. That course, and frequent interaction with guest scientists from the Prince William Sound Science Center, helped the students prepare for the competition.

Cordova High School's ***Visceral Mass*** *working on a Team Challenge question.*
photo by Hank Pennington

In April, the **national finals were held in Alaska** for the first time in NOSB history. Hosted by the UAF School of Fisheries and Ocean Sciences, teams from almost 30 states met in Seward April 25-27, 2008. The event required assistance from 250 volunteers, students, judges and family members from across the U.S. and within Alaska.

The National Ocean Sciences Bowl was established in 1998 to encourage learning about the oceans and increase the teaching of ocean sciences in high schools. Support for NOSB is provided by the Consortium for Ocean Leadership. The regional competition is supported by the UAF School of Fisheries and Ocean Sciences, Alaska Sea Grant, the North Pacific Research Board and the Oil Spill Recovery Institute. Special awards this year made it possible to host the national event.

Story by Carin Bailey Stephens, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks Public information officer

Group photo*:* Back row*: Steffan Ronnegard, Darin Gilman, Craig Bailer, Trae Lohse* Middle row: *Ian Americus, Drew Lindow, Grafton "Spud" Schikora* Front row: *Coach Lindsay Butters, Keegan Irving.*

Please Join as a Member of the Prince William Sound Science Center !

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

Your contribution supports locally based research and education in Prince William Sound, the Copper River Delta and the North Gulf of Alaska.

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Premium gifts include mugs, posters, sweatshirts, T-shirts and aprons!

Credit card contributions may be made by calling (907) 424-5800 x 223 or 227

or mail to: P.O. Box 705, Cordova, AK 99574

PRINCE WILLIAM SOUND SCIENCE CENTER CORDOVA, ALASKA

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See the latest news about our research and education programs as well as membership premium gift details at our web site: **www.pwssc.org**

The Prince William Sound Science Center is an independent, nonprofit research and education organization based in Cordova, AK. Most of our research and education programs are grant-funded. Communications and research planning activities are funded by membership contributions. Help us to continue to serve the public as an information resource.

Newsletter of the Prince William Sound Science Center
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Get involved with the Prince William Sound Science Center

Learn from...

Community Education

Have fun, volunteer & learn from weekly programs on relevant Alaska science topics

Call in your science questions to KLAM radio and hear Field Notes on KCHU

Join us at...

Copper River Nouveau

More fun & a gala seafood dinner with arts auction, the next Copper River Nouveau is June 21, 2008

Our annual fund raiser celebrates Science, Wild Copper River Salmon and Cordova!

Support

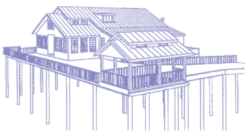
Membership or Donation

Individuals and institutions across the US make annual contributions to the PWS Science Center

Members receive this newsletter and champion Cordova based, resource focused science

Share our story...

News and Information

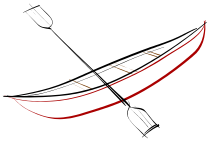


Tell your neighbors & friends what you know about our programs, share their interests & issues with us

Cordova based, resource focused, fisheries supportive, ecosystem research

Participate in...

Summer Education



Tide-pooling, kayak trips, hikes and guided explorations of our fabulous natural surroundings

In-depth, multiday, hands on science investigations for School age as well as Adult campers