

# Kachemak Bay Research Reserve

## Quarterly Report for September 22<sup>nd</sup> – December 7<sup>th</sup>

Kachemak Bay Research Reserve's mission is to enhance understanding and appreciation of the Kachemak Bay estuary and adjacent waters to ensure that these ecosystems remain healthy and productive.

### Facilities

The Alaska Islands & Ocean Visitor Center (AIOVC) is currently open for its fall hours. The Visitor Center is open 12 noon to 5:00 pm, Tuesday - Saturday. Offices for both the Alaska Maritime National Wildlife Refuge and Kachemak Bay Research Reserve are open Monday through Friday from 8:00 a.m. - 5:00 p.m.

### Staff

- **Joel Markis** (Fishery Biologist II) has resigned his position effective December 1<sup>st</sup>. Please join the Reserve is wishing Joel best of luck with his move to Oregon.
- **Tim Blackmon** has been working with the Reserve as a technician from the other Fish and Game office to assist with the Sea Bird Diet project and with the System-Wide Monitoring Program (SWMP).
- **Tammy Hoem Neher** has been working as a technician assisting with gear organization and sample preparation for the watershed research projects. She will continue as a technician through mid-December.

### Administration

- **FY12 federal budget:** Congress passed a "minibus" spending bill in mid-November that sets the FY12 budget for NOAA. The NERRS came out with a very favorable budget number of \$22.28 million, same as FY11, which is excellent news in today's budget climate. There is an additional \$11 million undesignated reduction for NOAA/NOS which has yet to be determined how to implement. At this point, individual Reserve's operating budgets will be level-funded for the upcoming year.
- **Management Plan 2011 – 2015:** The draft is functionally complete and is undergoing final review and edits. A presentation on the Plan will be provided at the next Community Council meeting.

### Research

- **System-wide Monitoring Program (SWMP):** Tracking weather, water quality, and water nutrient levels continues at our long-term monitoring sites located in Seldovia and Homer.
  - Real-time data can be accessed from websites such as: National Data Buoy Center Weather Underground, Google Earth, and the Northwest Association of Networked Ocean Observing Systems
  - AOOS has a new real-time sensor map which includes KBNERR water quality and weather stations including the data from the Anchor Point weather station, which is not easily available elsewhere Link: <http://data.aos.org/maps/sensors>

- Up to ten years of historical data (2001-2011) can be accessed from the Centralized Data Management Office <http://cdmo.baruch.sc.edu/>
- **ARGUS Camera's:** KBRR provided maintenance as needed to the ARGUS array looking at sediment transport, however, the camera has been inactive much of this reporting period and repairs are needed.
- **Juvenile Salmon Rearing and Migratory Habitats of the Fox River Flats Estuary:** Sampling in the Fox River estuary was completed in late September. Over the six month season, we caught over 10,000 fish. Of those, 4,231 were juvenile coho; 2,903 were juvenile sockeye, 266 were Dolly Varden and 3 were juvenile chum salmon. The remainder were starry flounder, sculpins and sticklebacks. That's a lot of fish in those tributaries! Now that sampling is over, we've been busy retrieving and organizing field gear and equipment, and preparing samples for analysis. Potential prey items and stomach contents from juvenile salmon will be analyzed at the University of Washington this winter. We are looking forward to analyzing these results, as well as the results from the antennae, which will provide information on residency timing. We also collected data on plant communities around the tributaries where our fish sampling occurred, and we will be mapping those results with the intention of looking at linkages between prey items and vegetation communities.
- **Wintering Habitat of Juvenile Salmon in the Anchor River:** We continue analysis of our results. In particular, we've noted substantial variability in oxygen levels between groundwater supported habitats, and we are working on methods to explore this 'habitat patchiness', as it will likely have important consequences for juvenile salmon use of those habitats.
- **Headwater Stream research:** Analysis of the headwater stream data continues. The body of work we have now developed is providing good scientific documentation for how landscapes surrounding headwater streams are supporting stream productivity. We submitted a new proposal to the Alaska Sustainable Salmon Fund to continue this research, focusing on the connection between landscape features such as alder and wetlands and stream productivity, as well as fish movement. We now have two peer reviewed journal articles accepted for publication from our early headwater stream research. One article focusing on the connections between wetlands and headwater stream water chemistry will be forthcoming in the journal Wetlands. Another article on the flow-weighted slope model for predicting fish and macroinvertebrate assemblages in headwater streams will be published in the Journal of the North American Benthological Society. We are also currently working with the CTP program to develop outreach for the headwater stream research.



Left: grad student, Pam Kostka, with installed array for measuring instream periphyton growth in one of the headwater streams. Right: Crew collecting groundwater samples from wells along alder flowpaths.



- **Sea Bird Diet:** The KBRR is working collaboratively with the Alaska Maritime National Wildlife Refuge (AMNWR) for the next five years to develop a seabird diet analysis program. Analysis of seabird diets in Alaska will provide information on prey and shifts in prey composition over time; this may be a valuable proxy for monitoring environmental change in our oceans. An annual progress report produced for AMNWR is available. In October, KBRR and AMNWR hosted an informal workshop to further train staff on plankton identification with Chris Stark, a plankton taxonomist with the University of Alaska Fairbanks. This winter, Tim Blackmon will be working with KBRR staff on the project.
- **Assessing Coastal Uplift and Habitat Changes in a Glacially Influenced Estuary System:** Progress on this study has been insightful and interesting. In the past 6 months, we held two Core Intended User (CIU) meetings with our collaborators on the study (16 March and 1 June 2011). In March, our Coastal Zone Management representative, Gary Williams presented on coastal erosion and land use planning issues in our region. In June, our Harbor Master presented on dredging and sedimentation issues in the Homer Harbor. In July, we held a Discovery Lab about all aspects of our Science Collaborative study for the general public (320 people attended over a 3-day period). On 7 December, we will host our first year wrap-up CIU meeting and discuss the integration of science to decision making, potential barriers and solutions.

Since the last quarterly report, we accomplished the following: installed a fourth at the head of Fox River Flats and fifth Continuously Operating GPS Reference Stations (CORS) on the Spit with the help and consultation of Brian Hawkins, retrieved all instruments from four salt marsh sites (soil, water, and barometric loggers), and completed our GPS campaigns for the season in the salt marshes and local benchmarks with the help of Yuning (UAF graduate student). Kenny Dahr has been conducting interviews with the CIU and local people who were influential in introducing the need for the study in our area. Kenny has helped tremendously with field work during the summer and has been working closely with Megan Murphy the past few months on creative ways of integrating science in local decision making. His last day with KBRR is 23 December as he returns to complete his graduate degree at the University of New Hampshire; we have really enjoyed having him work with us!

- **Alaska Marine Invasive Species: Monitoring, Research, and Response Planning.** Research staff are using SWMP monitoring data to examine the physical parameters associated with algal bloom timing and hope to also use this information to inform our understanding of the possibility of tunicate and green crab invasions into Kachemak Bay.
- **Graduate Research Fellow (GRF): Tammy Hoem Neher and Raphaelle Descoteaux** are continuing with their respective projects. Tammy will be wrapping up her final sampling in the Fox and Anchor Rivers in September, and will then move on to data analysis and writing her dissertation. Raphaelle is back in Fairbanks to continue data analysis and writing on experiments at the KBL on ocean acidification and larval crab.
- **EVOS (Exxon Valdez Oil Spill) Proposal:** KBRR joined a consortium of researchers in a long-term monitoring proposal which was submitted to the EVOS Trustee Council in early March. The draft proposal was accepted for funding and proposal development continues. In early November, the full team of 26 researchers met to refine goals and objectives of the overall long-term monitoring project that includes Prince William Sound, Gulf of Alaska, Seward line, GAK1 Monitoring Buoy, Lower Cook Inlet, Katmai Coast, Kenai Fjords, and Kachemak Bay.

## Education

- **Fall Discovery Labs:** Fall public and school-based Discovery Labs are under way. Due to budget constraints we will be offering four month-long Discovery Labs this school year and two one-day public labs. This compares to six month-long and two one-day labs last year.

November was Jammin' Salmon month, and we kicked off the month with a Jammin' Salmon Discovery Lab on November 9<sup>th</sup> with 52 people in attendance.

This public lab was followed by eight school groups who participated in the Discovery Lab to learn about the salmon life cycle; salmon anatomy via a dissection; and a hands-on look at the freshwater invertebrates salmon eat.

In addition, Catie brought Homer's fishing community together on November 10<sup>th</sup> for two presentations by Dr. David Montgomery – author of "King of Fish – The Thousand-Year Run of Salmon". 60 people attended the lunch time brown bag and 120 filled the I&O auditorium for an evening lecture on The History of Salmon.

And on November 15<sup>th</sup> we offered "Canning the Catch" to a small but attentive group of six, with Linda Tannehill from the Cooperative Extension in Soldotna.

We have a new Discovery Lab volunteer. Education volunteer Carole Demers – one of our Education Committee members and a 30-year teacher just recently retired – was an outstanding addition to our team this month teaching kids of all ages about salmon anatomy and adaptations. Thank you so much, Carole for manning the fish dissection table with such flare and joining our team!

Our upcoming Public Discovery Lab schedule is as follows:

December 7	<i>Sponge Bob Goes to School</i>
February 1	<i>Fish On! Sport Fishing in Kachemak Bay</i>
March 7	<i>What's New in the Bay</i>
April 4	<i>Our Landscape Over Time</i>
May 2	<i>Growing Naturalists</i>

School year EE over the past 3 years

2010-11 (Sep – May)	1,493
2009-10 (Sep – May)	1,156
2008-09 (Sep – May)	1,624

- **Special Programs and Projects:**

December 20th	1:00 -3:00	Winter Fest - Ice Fishing mini-lab
January 24, 25, 26	3:30 – 5:30	Drawing Nature: Scientific Illustration Workshop for Students ages 10 – 18 with Catie Bursch and Lee Post!
January 26 <sup>th</sup>	6:30 – 8:30	Adult Science Illustration with Catie Bursch and Lee Post!
February 12th	9:00 – 2:00	BBOW - Family Ice Fishing Event

- We have introducing a new feature in our lab classroom - the **Nature Trading Post**. Housed in a corner of the Discovery Lab, we offer a tradable **collection of interesting objects from nature: a skull, a shell, a seed pod, a fossil....items visitors can trade for with a natural object they've brought in** (though nothing alive please!). Research Reserve staff will assign points to a visitor's incoming object based on 1) how "cool" the object is, 2) how much the

collector knows about the object, and 3) whether or not they've written or created an artistic documentation of the object. Collectors can trade immediately for something that catches their eye, or Research Reserve staff can log their points for a future trade. The *Nature Trading Post* will be open during all public Discovery Lab times throughout the year.

- **Brown Bags and Evening presentations thus far in FY2011:**

7/22	Hollings Scholar Jenny Thomas	Trends and Variability in pH and Oceanography in Kachemak Bay
7/27	Hollings Scholars Rob Skoumal, Danielle Claar and Courtney Ham	
8/15	Dr. Pat Tester	Paralytic Shellfish Poisoning
8/18	Jeff Goldman	The History of Studying Endothermy in Fishes: How Many Places Can You Stick a Thermometer?
9/8	Lauren Bell	Investigating the behavior of Humboldt squid, Alaska's most intriguing prospective resident
11/10	David Montgomery	King of Fish – the 1000 Year History of Salmon
11/15	Linda Tannehill	Canning the Catch
11/17	Olga Matkin	Humpback Whales In PWS

## **Marine Invasives**

### **Phytoplankton Monitoring Program**

Presently entering the data from the phytoplankton monitoring that took place this summer. Report will be available in the early new year.

### **Smithsonian Tunicate Plate Program**

Settling plates continue to be checked in the Seldovia and Homer harbors. Nothing invasive has shown up this year. Although the closer we look the more different native tunicates we are identifying. We are also looking into expanding our monitoring into Cook Inlet a bit with a partnership with set netters to check their year round submerged lines for organism identification. (Check back next September for results). We will also fine tune the dive surveys that we experimented with last summer.



The photo of many *Asterias Amurensis* was taken by Carmen Field this September on Peir One Beach on the Homer Spit, during an European Green Crab trapping event with the school class.

### **Invasive European Green Crab Program**

No European green crabs were discovered in Kachemak Bay this summer or anywhere in Alaska to date. In addition to our 10 regular monitors and locations, we were fortunate to have



the local ADF&G repeat a green crab trapping effort that was first conducted in 1998. The main difference is that in 1998 they caught 32 sea stars, 9 Dungeness crab and 42 helmet crab. This summer they caught 1,930 *Asterias amurensis* sea stars!, 0 Dungeness crab and 44 helmet crab. Report on 2011 Green Crab trapping has been generated and sent to all monitors and interested parties.

## CTP

- The summer quarter has been utilized to plan and develop September 2011 – May 2012 CTP events and pursue funding support for CTP and reserve-wide activities. Upcoming events in which CTP is participating/partnering are:
  - September 14 & 15<sup>th</sup> “Climate Friendly Refuge Workshop” in Soldotna for KP audience
  - October 6 & 7<sup>th</sup> Watershed Symposium in Soldotna for KP audience
  - Coastal Service Center training, Public Issues and Conflict Management, dates TBD
  - March 8, 9, & 10<sup>th</sup> Kachemak Bay Science Conference

## Upcoming Events/Meetings

- **December 20<sup>th</sup>**: Winter Fest Ice Fishing mini-lab from 1:00 – 3:00 pm.
- **January 16<sup>th</sup> – 20<sup>th</sup>**: The Marine Science Symposium will be held in Anchorage this week.
- **January 24<sup>th</sup> – 26<sup>th</sup>**: Drawing Nature: Scientific Illustration Workshop from 3:30 – 5:30 for students ages 10-18 with Catie Bursch and Lee Post. Contact Catie at 226-4661 for more details.
- **January 26<sup>th</sup>**: Adult Science Illustration workshop from 6:30 – 8:30 with Catie Bursch and Lee Post.
- **February 11<sup>th</sup>**: Beyond Becoming an Outdoor Woman Family Ice Fishing event to Encelewski Lake (all day). Contact Carmen Field at 226-4659 for more details.
- **March 8<sup>th</sup> -10<sup>th</sup>**: Kachemak Bay Science Conference will be held in Homer.

## Staff Attended Meetings/Training:

- **October 6<sup>th</sup> – 7<sup>th</sup>**: Terry Thompson and Megan Murphy attended the watershed symposium meeting in Kenai. Megan created an overview of all Kenai Peninsula watershed research projects, for more information or a copy contact Megan at 226-4653.
- **October 21<sup>st</sup>**: Catie Bursch attended the Annual AK Invasive Species meeting in Anchorage.
- **October 27<sup>th</sup>**: ADF&G Commissioner, Cora Campbell and Commercial Fisheries Director, Jeff Regnart visited the Reserve and toured the AK Islands & Ocean Visitor Center.
- **October 23<sup>rd</sup> -28<sup>th</sup>**: Terry Thompson attended the NERR national meeting hosted by the GTM NERR in Ponte Verda Beach, FL.
- **November 2<sup>nd</sup> - 4<sup>th</sup>**: Angie presented at the National Park Service Southwest Science Symposium in Anchorage. All of the presentations and most of the posters have now been posted at the website. <http://science.nature.nps.gov/im/units/swan/>
- **November 2<sup>nd</sup>**: Terry attended the Coastal America meeting in Anchorage.
- **November 3<sup>rd</sup>**: Celebrating the Anchor River: A special presentation was a special event coordinated between the Kachemak Heritage Land Trust and KBRR Coastal Training Program.
- **November 7<sup>th</sup> – 8<sup>th</sup>**: Angie Doroff attended an EVOS coordination meeting for the PIs of the recently funded long-term monitoring project.
- **November 10**: David Montgomery presented at a brown bag luncheon and evening presentation on the “History of Salmon” to a total of 180 participants.
- **November 14<sup>th</sup> – 17<sup>th</sup>**: Angie Doroff and Megan Murphy attended the FWS training course on Vulnerability Assessments in Anchorage.