

Kachemak Bay Research Reserve

Quarterly Report for Dec 10, 2014 – Feb 24, 2015

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 open during winter hours 12:00 p.m.–5:00 p.m., Tuesday through Sunday. Offices for both the Alaska Maritime National Wildlife Refuge and the Kachemak Bay Research Reserve are open Monday through Friday from 8:00 a.m. – 5:00 p.m.

Staff

- We are once again hiring for an Administrative Assistant with interviews taking place February 23 and 24. We hope to have someone in place by mid-March. Sara Longson, who aptly filled this role from mid-September until mid-January, left for a terrific opportunity in Fairbanks as an ADF&G wildlife veterinary technician under Kimberly Beckman. We wish her the very best and hope she's adjusting to the cold (it was -45 on the day she arrived).
- Our System-wide monitoring program position, which was the care of Ori Badajos until her departure, is currently being covered by Steve Baird. Eventually we hope to hire someone to oversee this program and allow Steve to return to the GIS work he does so well.
- Finally, we have submitted a request for a three-month Education Specialist to help with Discovery Labs, Estuary Hikes, and our other spring programs.

Administration

- Jessica Shepherd (Ryan) continues to serve as the Acting Manager for KBRR. She will serve in this capacity throughout the rest of this fiscal year as we move toward a transition to UAA as our state partner.
- The transition from ADF&G to UAA continues to proceed slowly but surely, with ongoing meetings between leadership at ADF&G, UAA, and NERRS. Final edits are being made to the Memorandum of Agreement (MOA) and, once that's signed, we'll start working on job descriptions and transfer of assets and program funding.

Research Project Updates

- **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.
 - In November, we pulled the Bear Cove water quality sonde for the winter and we will remove the Homer surface sonde prior to freeze up.
 - AOOS has a new real-time sensor map showing KBRR water quality and weather stations, and it includes data from the Bear Cove water quality monitoring site and the Anchor Point weather station: <http://portal.aos.org/real-time-sensors>.
 - 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 (NANOOS).
 - Historical data (2001-present) can be accessed from the Centralized Data Management Office: <http://cdmo.baruch.sc.edu/>

- **Headwater Stream Research:** The AKSSF headwater stream research project was granted an extension, with a new project end date of June 30, 2015. We will use the remaining time to complete analyses, report and manuscript preparations.
- **Watershed Research Proposals:**
 - *Moving forward!* Our proposal to design tools for decision making based on economic valuation of ecosystem support for rearing juvenile salmon was selected by the UA Center for Salmon and Society. Development staff from the Center will work with us to develop a full proposal that they will market to potential funders, including the Moore Foundation. This project will be a collaboration between KBNERR, UA Natural Heritage Program, UA Institute of Social and Economic Research, and the Kenai Peninsula Fish Habitat Partnership.
 - *Final preparations are underway* for a proposal to the NERR Science Collaborative. Our project will center around working collaboratively to fill important knowledge gaps about juvenile Chinook salmon rearing in the mid river region between the headwaters and the estuary. We would like the support of the KBRR Council to work collaboratively with us on this project. Pre-proposals are due February 27th 2015. This project will be a collaboration between KBRR, Baylor University, University of Washington, UA Natural Heritage Program, Cook Inletkeeper, and the Kachemak Heritage Land Trust. The Kenai Fish Habitat Partnership and the KBRR Community Council are proposed conduits for collaboration with end-users.
 - *Next up* is development of a proposal to EPA for investigations of focused groundwater inputs to headwater streams. This will be a partnered effort with the University of South Florida and the Smithsonian Institute.
- **Anchor River: Juvenile Chinook and Coho Salmon Estuary and Nearshore Rearing:** Approval for funding of this new project was delayed at the USFWS for several months. However, we received word that the project can officially this month. This will be a two year project with matching funds coming from the University of Washington and Coble Geophysical Inc. The project will include a graduate student from the UWA and a NOAA Hollings Scholar intern.
- **Seabird Diet Monitoring:** 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. Ori Badajos was the primary biologist funded under this project. She developed skills in marine zooplankton identification, a database structure for integrating the information, and protocols to determine zooplankton species and life stages in the diet of seabirds. All of the seabird diet samples containing marine zooplankton have been processed. Because Ori moved on to a new position, we will contract the remainder of the funding to labs with skills in the identification of forage fish in seabird diets. This work is funded by the USFWS Alaska Maritime National Wildlife Refuge.
- **Gulf Watch Kachemak Bay & Lower Cook Inlet:** Developing an understanding of the physical oceanography is important to help interpret observed biological patterns in the marine ecosystem. In the overall Gulf Watch program (<http://www.gulfwatchalaska.org/>), we are striving to understand both natural and anthropogenic (i.e. Exxon Valdez oil spill) stressors through long-term ecosystem monitoring. We are mapping the waters in lower Cook Inlet and Kachemak Bay to understand the connectivity of water movement (and potential marine plankton transport) between



lower Cook Inlet and Kachemak Bay. Lauren McCaslin, a UAA undergraduate volunteer, completed a manual to identify species of crabs consumed by sea otters in Kachemak Bay from scat samples. UAF graduate student, Sarah Traiger, completed a survey of sea otter forage pits, pit retention, and an analyses of shell litter at soft sediment sites being monitored by the Gulf Watch Program in Kachemak Bay. Sarah presented a poster at the Alaska Marine Science Symposium this January. We are doing our best to find a weather window to conduct our February lower Cook Inlet surveys, and we will provide a progress update once we get the weather window! KBNERR is partnered with the NOAA Kasistna Bay Lab on this study with funding from the Exxon Valdez Oil Spill Trustee Council.

- **Synthesis of Oceanographic Data to Aid Monitoring Programs for Harmful Algal Blooms (HAB) in Kachemak Bay, Alaska:** This study integrates several long-term monitoring efforts by KBNERR in Kachemak Bay. We are partnering with UAF faculty members Georgina Gibson, Mark Johnson, and Ken Coyle to validate an ocean circulation model being developed by NOAA's National Ocean Service for Kachemak Bay. Data from satellite drifters are being compared to the modeled current speeds and directions to assess model skill in replicating observed surface ocean circulation patterns. If necessary, model adjustments will be made in order to improve model skill. An understanding of ocean circulation in the estuary will help to identify convergence zones that concentrate primary productivity and, in doing so, we may be able to minimize detrimental effects to this area's natural resources from point-source pollution, larval transport of marine invasive species, and harmful algal blooms. This study is funded by leveraging the ongoing Long-term Monitoring of Environmental Drivers and ADF&G State Wildlife Grant funding.
- Additional research proposals have been submitted and include:
 - National Science Foundation: KBNERR is a partner with UCD, Duke, University of Florida, and USGS on a proposal Collaborative Research: Effects of top predator recovery on food web structure and the functioning of coastal ecosystems.
 - NOAA, National Competitive HAB Programs 2015-2019: Harmful Algal Blooms in South-Central Alaska: Implementation of Improved Tools for Monitoring, Early Detection and Event Response for Paralytic Shellfish Poisoning
 - State Wildlife Grant 2015-2016: Larval distribution, abundance, and settlement: factors influencing early life history parameters for bivalves in Kachemak Bay
 - North Pacific Research Board: Diet and behavior of offshore foraging sea otters in Kachemak Bay, Alaska assessed through unmanned aerial systems (UAS) 2016
 - Habitat Blueprint Focus Area 2015-2016: We are looking to build from our bivalve workshop, the Kenai Fish Habitat Partnership CAP process, and our harmful algal bloom workshop to fill information gaps identified in those planning processes ~ stay tuned!

Education

Winter Programming for Families:

- Our family programs have focused mainly on ice fishing. We kicked off this focus with a December 30th Ice Fishing Mini-Discovery Lab, with 63 people in attendance.
- Next up was an Ice Fishing outing for area Girl Scouts. Jessica joined Scout Leader Poppy Benson along with six 12 and 13-year old girlscouts for a drive up to Johnson Lake and a day of fishing. While the fish seemed to have been given advance warning about the event and laid low, the girls made the most of the outing and enjoyed hotdogs over a fire and a mild day on the ice.

- Finally, on February 8th Carmen and Jessica conducted our fourth annual Family Ice Fishing Event on Johnson Lake. The weather was reminiscent of a real winter day with temperatures hovering just above zero, but the sun was out and 23 hardy souls made the most of it, drilling through 20” of ice and eventually landing two very respectable rainbows, plus tales of a few that got away.
- We would like to extend a special thanks to Chris and Cheryl Zabel who generously donated funds which went to the purchase of an ice fishing tent, propane heaters and a new (skook um!) propane-powered ice auger, and assorted fishing gear.





- **NOTE:** During winter months, KBRR lends out jigging rods, ice ladles, and ice augers to individuals and families at no cost. Stop by the AK Islands & Ocean Visitor Center information desk to borrow ice fishing gear.

K-12 Programs:

- This winter season we are collaborating with the Alaska Maritime National Maritime Refuge on a new K-12 program called *Water Birds in Winter*. We have six schools with students in grades 2 – 9 signed up for this program between January and March. Students and their teachers will join KBRR and Refuge staff on the beach just below Lands End to learn why and how some waterfowl species overwinter in Kachemak Bay. Students will keep warm by playing habitat and migration games along the beach, learn how to use binoculars to ID birds, and wrap up with a good look at some of the beautiful Long Tailed Ducks and wintering loons through scopes.

Upcoming Programs:

- Our next public lab will be *Translating the Science of our Landscape II* on April 8, in collaboration with UAA and our soon-to-be partners at the Alaska Natural Heritage Program. This lab will be adapted for eight classes in grades 3 – 6 after the public lab.
- Summer *Discovery Labs* will include this same lab, as well as labs focused on sport fishing in Kachemak Bay, the Reserve's involvement with Alaska GulfWatch research, life in the Kachemak Bay estuary, and the science of ocean acidification. We hope you can join us for one or more of these engaging events.

Community Monitoring Programs

Catie Bursch is on seasonal from January through March 2015. In her absence, Jasmine Maurer will be working through mid-March 2015 to develop and import information from the Harmful Algal Bloom program into a database.

- **Harmful Algal Bloom program:** A new database has been created to house all the HAB data from 2009 to present and into the future. This database also will incorporate phytoplankton samples from Kasitsna Bay Lab and the Homer ADF&G office. With all the data in one place looking for trends

and asking questions regarding phytoplankton blooms in Kachemak Bay can now be done with increased accuracy and efficiency.

Coastal Training Program

Stacey Buckelew was on seasonal leave from January 4-February 4; therefore, activities during this quarter are limited.

- On December 11, 2014 CTP hosted a Wetland Workgroup Meeting. There were 18 participants from local and regional agencies and community organizations that shared information and updates on ongoing wetland research and management efforts. Participations were responsive to this workgroup as a venue for share and receiving information, as well as providing the opportunity to further collaborative networks. Beginning in April, KBRR and the Alaska Marine Conservation Council will partner to host a similar work group focused on the marine ecosystem. The main purpose of the marine workgroup is to serve as a foundation to continually improve the scientific basis for management actions in Kachemak Bay. Our goal is to work across all regional partners to coordinate monitoring and research efforts to provide credible, high quality and accessible scientific findings for our partners, decision-makers and ultimately, the public.
- CTP is co-leading the planning for the 2015 Kachemak Bay Science Conference, which will be held March 4-7, 2015 at the Alaska Islands and Oceans Visitor Center in Homer, Alaska. This conference will be merged with the Kenai Peninsula Fish Habitat Partnership's science symposium in an expanded event. The Kachemak Bay Science Conference is a forum for presenting scientific and traditional ecological knowledge relevant to Kachemak Bay and its surrounding coasts and waters in order to foster an informed and engaged community of environmental researchers, educators, and decision-makers. The goal of this conference is to provide new information and syntheses to the broad community interested in and working on related issues. The conference program will feature oral and poster presentations that provide scientific information and ideas relevant to the topic sessions. The conference focus this year is "Science to Management". The conference will boast a series of plenary speakers, field trips, trainings, as well as presentations. For more details stay tuned to: kbayscience.org.
- CTP is on the executive committee for the Woodard Creek Coalition, which recently received support from the NPS Rivers, Trails, and Conservation Assistance Program for technical assistance on a watershed project that focuses on restoration, stewardship, trails and urban greenbelts. An important component of the Coalition's goal of restoring Woodard Creek is to remove as many culverts as possible and "daylight" the creek. The Coalition will hold its first community open house meetings on February 26 from 6:30 to 8:30 pm to gather feedback and interest in the planning process.

KBRR Information & Education publications – late 2014 and 2015

Carrasco, S. E., B. B. Chomel, V. A. Gill, A. M. Doroff, M. A. Miller, K. A. Burek, R. W.

Kasten, B. A. Byrne, T. G. Goldstein, J. A. K. Mazet. (2014) Exposure to *Bartonella spp.* is common in Alaskan sea otters. Vector-borne and Zoonotic Diseases. Vol. 14(12) 831

Stewart, N.L., B. Konar, A. Doroff. (2014) Sea Otter (*Enhydra lutris*) foraging in a heterogeneous environment in Kachemak Bay, Alaska Bulletin of Marine Science 90:921-939.

Sarah B. Traiger, Brenda Konar, Angela Doroff, and Lauren McCaslin. (2015) Distinguishing sources of foraging pits using pit dimensions and shell litter in nearshore soft substrate. Poster presentation, Alaska Marine Science Symposium, Anchorage AK.

S. Newsome, T. Tinker, V. Gill, Z. Hoyt, A. Doroff, L. Nichol, and J. Bodkin (2015) The Interaction of Intraspecific Competition and Habitat on Individual Diet Specialization: a Near Range-wide Examination of Sea Otters. Spoken presentation Alaska Marine Science Symposium, Anchorage AK. _Accepted Oecologia IpNV special issue.

Coowe Walker et al. (2014). Genetic Variation Of Populations Of Juvenile Coho Salmon And Dolly Varden Within And Among River Basins On The Lower Kenai Peninsula. Final report to State Wildlife Grant.

Caleb J Robbins¹, Ryan S King¹, Alyse D Yeager¹, Coowe M Walker², Jeff A Back¹, Dennis F Whigham³ (2014). Low-Level Addition Of Dissolved Organic Carbon Increases Nitrogen Uptake And Bacterial Biomass Production In An Alaskan Headwater Stream. Poster presentation at the JASM meeting Portland, OR.

Cook, Stephen, King, Ryan, Robbins, Caleb M Yeager, Alyse, Walker, Coowe, Whigham, Dennis (2014) Macroinvertebrate Abundance Dramatically Increases In Response To Low Level Organic Carbon Additions In An Alaskan Headwater Stream. Poster presentation at the JASM meeting Portland, OR.

Walker, Coowe, King, Ryan, Whigham, Dennis (2014) Headwaters Stream Rearing Habitats Semi-Annual Report. Alaska Sustainable Salmon Fund Grant.

Upcoming Programs

- “Science to Management”: a joint conference with the Kenai Peninsula Fish Habitat Partnership on March 4-7, 2015 at the Alaska Islands and Ocean Visitor Center, Homer. The Kachemak Bay Science Conference is a forum for presenting scientific and traditional ecological knowledge relevant to Kachemak Bay and its surrounding coasts and waters in order to foster an informed and engaged community of environmental researchers, educators, and decision-makers. The goal of this conference is to provide new information and syntheses to the broad community interested in and working on related issues. The theme of this conference is “Science to Management”. Registration is free and open to the public. For a full schedule visit: www.kbayscience.org

Together with the conference we are pleased to offer the following events:

KEYNOTE SPEAKERS

David Montgomery

Thursday, March 5; Reception: 6 pm followed by Talk 6:45 – 7:45 pm

Islands and Ocean Auditorium

David Montgomery was the recipient of a MacArthur “Genius Grant” Award in 2008 and is a professor in the Department of Earth and Space Sciences at the University of Washington. His research interests range from the co-evolution of the Pacific salmon and the topography of the Pacific Northwest to the environmental history of Puget Sound rivers, interactions among climate, tectonics, and erosion in shaping mountain ranges, and giant glacial floods in eastern Tibet. He is the author of *Dirt: The Erosion of Civilizations*, *King of Fish: the Thousand-Year Run of Salmon*, and the forthcoming *The Rocks Don't Lie: A Geologist Investigates Noah's Flood*.

Join for a community conversation about the “Alaska chapter” of his book *King of Fish: the Thousand-Year Run of Salmon* from 8 to 9 pm.

Terrie Klinger

Friday, March 6, 9:00 – 9:30 am

Islands and Ocean Auditorium

Terrie Klinger is the Director of the School of Marine and Environmental Affairs at the University of Washington and Co-Director of the Washington Ocean Acidification Center. She is a marine ecologist who focuses on applying ecological theory to practical management solutions. She works on ecosystem-based approaches to manage natural resources in the ocean, understanding the ecological effects of environmental stressors, such as ocean acidification and habitat loss, and how rocky intertidal communities respond to and recover from disturbance. She has been recognized for her unique combination of marine science and community outreach with the UW's Outstanding Service Award, and was named Naturalist of the Year by the Western Society of Naturalists.

FREE WORKSHOP SERIES

Cook Inlet Response Tool and Data Portal

Wednesday, March 4, 8:30am-3:30pm

Land's End Resort, Quarterdeck

This training is designed for fish, wildlife and natural resource managers to become comfortable with using the Cook Inlet Response Tool (CIRT). CIRT was originally designed for oil spill and other response situations, but is also set up to support management activities at the ecosystem scale, integrating marine, human and climatological systems. The tool enables users to explore and visualize over 100 individual data sets in the Cook Inlet region, including shoreline characteristics and imagery to real-time sensors, forecast models, geographic response strategies, and ShoreZone coastal imagery.

Communicating Science through Video

Thursday March 5, 8:30 am—12:30 pm

Land's End Resort, Quarterdeck

This workshop is designed to demystify the video-making process and introduce participants to science videography using readily available and inexpensive technology. Using only their own iPhone (or a provided GoPro) participants will learn how to shoot and edit a 3-minute video about their science. Beyond the technical, the workshop will also teach the skills of video storytelling.

Navigating Water and Land Use Permitting on the Kenai Peninsula

Thursday March 5, 12:30pm-2:30 pm

Islands and Ocean Auditorium

This workshop trains participants to better plan for the permitting and environmental review process on the Kenai Peninsula. The workshop offers an overview of natural resource laws under the governance of the federal government, the State of Alaska, and the Kenai Peninsula Borough, as well as a discussion of how to efficiently navigate the permit process. This training is intended for landowners on the Kenai Peninsula, local realtors, and other interested planning and land use decision makers. Free lunch provided.

FREE FIELD TRIPS

Anchor River:

Building Collaborations to Safeguard Habitat and Climate Refugia

Thursday March 5, 3:00- 6:00 pm

Join the Kachemak Heritage Land Trust and partners to tour Anchor River holdings that safeguard cold water refugia for salmon. They will discuss how science-based partnerships are important for building species resiliency and protecting river corridors. You will learn about the salmon stream temperature monitoring used to identify thermal impact to salmon habitat. You will

also get your hands wet discovering the importance of cold water seeps to overwintering juvenile salmon. Transportation is provided from Islands and Ocean Visitor Center. Registration is required and space offered on a first-come first-served basis.

Birding the Homer Spit

Thursday March 5, 3:00- 5:00 pm

When the weather outside is frightful, the birding can still be delightful! Winter birding can be a very productive and rewarding opportunity for birders to add unique northern species to their lists. Join the Kachemak Bay Birders for local birding tips to improve your winter birding experience! Transportation will be provided to top birding sport on the Homer Spit. Registration is required and space offered on a first-come first-served basis.

Underwater Exploration with Kasitsna Bay Laboratory

Thursday March 5, 3:00- 5:00 pm

Dedicated to excellence in marine science and education, Kasitsna Bay Laboratory is a place where people can learn about marine and coastal ecosystems. Join Kasitsna Bay Director, Kris Holderied, and UAF professor, Brenda Konar, for a virtual tour of ongoing research projects, including studies on kelp forests, intertidal communities, and nearshore marine ecosystem changes. Also explore the challenges and excitement of coldwater diving and research. Located at Islands and Ocean Visitor Center Auditorium. Registration not required.

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