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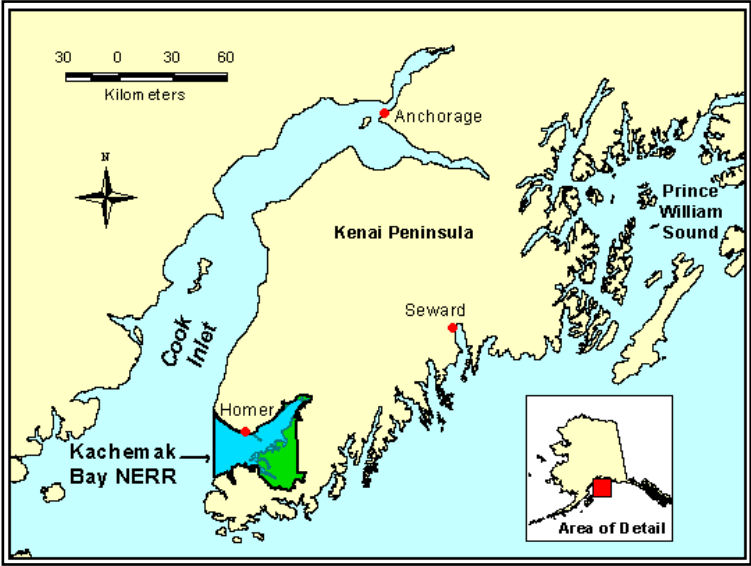
The Reserve

Located where salt and freshwater mix, estuaries are among the most productive natural systems on the planet. In 1972, the U.S. Congress established the National Estuarine Research Reserve System (NERRS) to provide opportunities for long-term estuarine research and education, and a basis for more informed management and use of these coastal resources.

The NERR System currently encompasses 28 unique and protected estuaries, the largest of which is the Kachemak Bay NERR (KBNERR) – a representative fjord estuary located in Homer, Alaska – known locally as the Kachemak Bay Research Reserve (KBRR). Like other NERRs, KBRR is a state / federal partnership which brings together the Alaska Department of Fish and Game - Sport Fish Division and the National Oceanic and Atmospheric Administration. We also work closely with our local communities and colleagues from around the state.

Welcome to the **Pulse of the Bay**. This publication is designed with you in mind. Our goal is to share current research, education, and stewardship news of the Kachemak Bay NERR.

We encourage you to become involved in our many research and education projects and programs. And if we can assist you in any way, please contact the Reserve office at (907) 235-4799 or dfg.dsf.kachemak-bay@alaska.gov.



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The Reserve includes approximately 1,500 km² (371,000 acres) of terrestrial and aquatic habitats, including 320 miles of shoreline, extending from the Fox River Flats at the head of the Bay to Point Pogibshi and Anchor Point at the mouth. Kachemak Bay and adjoining Cook Inlet are known for their amazing tidal ranges – Kachemak Bay has an 8.7-meter (28.5-foot) tidal range that results from the complex geomorphology of the Gulf of Alaska and Cook Inlet.

Enhancing understanding and appreciation of the Kachemak Bay estuary

The KBRR Team

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Science Educator

**KBRR's Graduate
Research Fellow Student
Raphaelle Descoteaux**

From the helm...

I'm smiling as I write this, because the Kachemak Bay Research Reserve team is achieving a long sought-after goal of providing to you – our partners and supporters – a quarterly Reserve newsletter! Through this newsletter, we're committed to keeping you informed of new and on-going Reserve research projects, education programs, and training opportunities. We're also excited to highlight the wide range of partners and volunteers we work with throughout the year. And, we'll provide you with interesting facts about things we're learning about Kachemak Bay and the surrounding coastal environment.

We're using this first edition to reacquaint each of you with who we are and the types of work we do, which – believe me – is an amazingly diverse list. In future editions, we'll highlight new projects, keep you up-to-date on existing activities, and let you know what will be happening over the coming months.

With this edition, as with all future editions, I would love to hear your feedback. You can reach me by email at terry.thompson@alaska.gov or give me a call at (907) 226-4656.

Terry Thompson

Terry Thompson
Reserve Manager

Our Research



Angie Doroff
Research Coordinator

Kachemak Bay is remarkable for its diverse marine life, spectacular wilderness landscape, and its accessibility by road. What can easily escape both the casual visitor and life-long resident, however, is that this coastal embayment is dependent on distant marine currents and upwelling in the Gulf of Alaska and North Pacific Ocean for bringing many of the nutrients, phytoplankton, plant spores, invertebrate larvae, and fish that are found here.

In these changing times, the Reserve's coastal habitats face new challenges - sea level rise, changes in fresh and marine water temperatures, frequency of storm events, long-term drying trends, rapid loss of coastal glaciers, and coastal uplift.

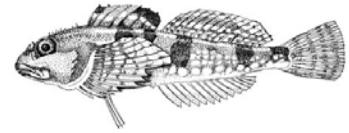


Anchor River work – May 2011

KBRR is uniquely positioned to study these and other potential effects of climate change on the estuary and the local ecology. By understanding the ways in which the Kachemak Bay estuary functions and adapts over time, Reserve scientists hope to predict how coastal systems respond to variations in climate and human-induced disturbances. Because factors that influence estuaries often occur slowly and across broad geographic areas, the Reserve System relies on sustained, long-term monitoring to identify patterns which can provide scientific insight into observed changes.

Research & Monitoring

- ≈ System-Wide Monitoring Program (SWMP) – [click here to view abstract for this project](#)
- ≈ Winter habitat of juvenile salmon in the Anchor River – [click here to view abstract for this project](#)
- ≈ Juvenile salmon rearing & migratory habitats of the Fox River Flats estuary - [click here to view abstract for this project](#)
- ≈ Headwater stream research analysis - [click here to view abstract for this project](#)
- ≈ Assessing coastal uplift & habitat changes in a glacially influenced estuary - [click here to view abstract for this project](#)
- ≈ Alaska marine invasive & harmful species: monitoring, research, & response planning – click here to view abstracts for monitoring projects > [Harmful Algal Blooms](#) / [European Green Crab](#) / [Invasive Tunicates](#)
- ≈ Graduate Research Fellowships – click here to view abstracts for recent GRF students' projects > [Tammy Neher](#) / [Raphaelle Descoteaux](#)
- ≈ Seabird diet research (*with USFWS*) - [click here to view abstract for this project](#)



Catie Bursch & community volunteers
in China Poot Bay – August 2011

Research Highlight

Investigating the Influences of Sea & Land Level Changes on Coastal Habitats for Better-Informed Decision-Making

Currently in the Kachemak Bay Research Reserve, coastal uplift continues from the great 1964 earthquake and coastal rebound from melting of immense ice fields. These factors have influenced our habitat and our coastal communities in many ways that have largely gone undocumented.

Our coastal communities rely on the nearshore habitat for transportation, safe harbor infrastructure, and food resources. In 2009, fueled by recent articles from SE Alaska on isostatic rebound from melting glaciers and personal observations of changes in Kachemak Bay, community leaders approached the Research Reserve and asked for help in understanding what is happening in our area. Research Reserve scientists have been actively addressing coastal processes in the region (bluff erosion, changes in the extent of glaciers, and salt marsh vegetation dynamics) for some time; however, to provide data for land use planning in our community, both land and sea level change data were needed.

The University of Alaska - Fairbanks has documented significant uplift (10mm/yr) of the bedrock land surface, a rate faster than the rate of global sea level rise. In order for coastal managers to use these data, we needed to increase the precision of the models and answer questions on relative sea level change. We recently received a 3-year grant to provide an estimate of the variability in coastal uplift around the Bay based on underlying geomorphology and to gain a greater understanding of surface sedimentation, erosion, compaction processes, and the net effect of these changes on important coastal ecosystems in Kachemak Bay. This research will allow us to synthesize information on these coastal processes, provide useful projections of coastal uplift and sea level rise for planning purposes, and develop recommendations for future monitoring to meet the needs of our coastal decision makers and local residents.

Science Education & Outreach

Staff at the Research Reserve provide integrated education, outreach and training programs linked to regional research efforts that are designed to strengthen understanding, appreciation and stewardship of the Kachemak Bay environment.

Residents, visitors, and students of all ages participate throughout the year in the Reserve's flagship education program - Discovery Labs – held in our lab classroom. Since their inception in 2004, our Discovery Labs have attracted 26,945 visitors! Topics featured at these fun and engaging events run the gamut from biological and physical sciences related to marine resources to terrestrial and watershed biology of the coastal uplands. We rely heavily on, and greatly appreciate, our community volunteers and partners for assisting with these public labs.

KBNERR's Community Council



Community Members

Donna Aderhold
Ralph Broshes
Derek Bynagle
Charles Francis
Bob Hartley
James Hornaday, Vice Chair
Steve Lewis
George Matz, Chair
Michael Opheim

Agency Members

Marianne Aplin, FWS/AMNWR
Kris Holderied, NOAA
Brenda Konar, UAF
Ginny Litchfield, ADF&G
Roger MacCampbell, ASP
Phil North, USEPA
Ted Otis, ADF&G
Tim Stevens, ADEC
Rick Thompson, ADNR, MLW



Education Coordinator Jessica Ryan (left) & ADF&G biologist Jay Baumer with lab visitor in August 2011

During the school year, we offer standards-based, hands-on Discovery Lab programs for K – 12 students focused on a monthly topic. Topics featured in our 2011-12 environmental education (EE) programs include salmon ecology, sport fishing in Alaska, landscape changes over time (volcanoes, earthquakes, sea level rise, and more), habitat mapping and its value to oil spill response, and developing naturalist skills.

Did you know...

- Two teams of Homer High School students will compete in this year's National Ocean Science Bowl in Seward in March 2 – 4, 2012.
- McNeil Canyon Elementary School's 130 students participated in a September 2011 BioBlitz, creating a snapshot of biodiversity for their school grounds.

News from the Field

Monitoring for Invasive Species: It Takes a Community



Catie Bursch
Community Monitoring
Coordinator

Invasive species negatively impact native populations of fish and game, often causing extinction of local wildlife populations. Invaders are extremely difficult or impossible to remove once established, making early detection and rapid response critical.

The Reserve's monitoring program utilizes community volunteers of all ages to assist in the detection of invasive species. Currently our team of monitors is looking for European green crabs (making their way northward along the Pacific coast and currently on the northern end of Vancouver Island) and the invasive tunicate *Didemnum vexillum* (recently discovered in Sitka).

Learn more about the Community Council and happenings at the Kachemak Bay NERR at <http://kbaycouncil.wordpress.com>

Coastal Training Program: Knowledge to Action



Coastal Training
Coordinator Megan Murphy

The Reserve's Coastal Training Program (CTP) provides information-sharing opportunities and science-based trainings and workshops to Kenai Peninsula decision-makers in order to support sustainable use of our coastal resources and habitats.

This program's training priorities are:

1. Effective science communication and outreach.
2. Watershed management.
3. Community climate adaptation.

CTP is one of many partners coordinating the upcoming March 2012 Kachemak Bay Community Science Conference with a theme of *Healthy Bay = Vibrant Communities*. This event provides a venue for local communities who depend upon the region's diverse resources to share updates on recent efforts to better understand our coastal ecosystem.



Panel of presenters at
Climate Change Adaptation
Workshop in February 2010

Two workshops that focus on enhancing science communication within our communities will be held in conjunction with the conference: 1) March 8th workshop instructed by Nancy Baron (with *Communication Partnership for Science & the Sea* [COMPASS]), targeting scientists, media outlets, and decision-makers and 2) March 9th workshop instructed by Marilyn Sigman (with *Center for Ocean Sciences Education Excellence* [COSEE] Alaska), targeting scientists and teachers. For more information on the conference and associated workshops, as well as upcoming trainings in February (see calendar below), contact CTP Coordinator Megan Murphy at (907) 226-4653 or megan.murphy@alaska.gov.

Spring 2012 Calendar

Discovery Labs

Feb 1	Fish On! Sport Fishing in AK	3 – 5pm
Apr 4	Our Landscape Over Time	3 – 5pm
May 2	Growing Naturalists	3 – 5pm

Conferences

Mar 9-10	Kachemak Bay Science Conference at Islands & Ocean (FREE > register at www.kbayscience.org)	
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Workshops / Trainings

Feb 11	<i>Beyond Becoming an Outdoor Woman (BOW)</i> <i>Ice Fishing Expedition</i> (register with Jessica Ryan)	
Feb 27–28	<i>Planning for Meaningful Evaluation</i> workshop (FREE > registration required by Feb 13)	
Feb 29–Mar 1	<i>Facilitation & Collaboration Training</i> (FREE > registration required by Feb 13)	
Mar 8–9	Communicating science workshops (FREE > register with Megan Murphy)	

Meetings

Feb 18	<i>Nature Rocks Homer</i> meeting at 9am at Islands & Ocean	
Mar 21	Quarterly KBRR Community Council meeting	



Where We Work

The Reserve maintains offices, educational lab classrooms, research lab, seminar and conference rooms, and a small exhibit area in the Alaska Islands and Ocean Visitor Center (AIOVC), a state-of-the-art visitor center built and maintained through a partnership with the U.S. Fish and Wildlife Service's Alaska Maritime National Wildlife Refuge. The Reserve also maintains a separate laboratory workshop and a small bunkhouse.

We're looking for 2 volunteer summer 2012 marine science education interns. Interested university students should contact [Jessica Ryan](#) for application materials by March 18.

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