

Alaska Sea Grant

ACCOMPLISHMENTS

Provide a detailed accounting of the activities during the past year. Be sure to address the milestones that you have reached.

Current accomplishments:

November 2014

We have finished our data collection and are now analyzing the data. Sarah Traiger presented a talk on the preliminary findings, describing the recruitment and succession across our study sites, at the Western Society of Naturalists meeting in Tacoma, WA, November 13-16, 2014.

August 2014

Outreach activities included presentations by Sarah Traiger on glacial sedimentation and effect on kelp bed health to Homer audiences:

- Presentation to a senior citizen marine science class, May 30, 2014
- Presentation to Coastal Studies Summer Camp, 13-15 year old students, June 19, 2014
- Interactive presentation to Ageya Wilderness Education students, July 15, 2014
- Kachemak Bay Research Reserve Discovery Labs, July 16, 18-19, 2014

Enter new or changed accomplishments:

Sarah Traiger presented a talk, describing the recruitment and glacially-influenced environmental factors across our study sites, at the Kachemak Bay Science Conference in Homer, AK, March 7, 2015.

Outreach:

- Kelp holdfast lab with high school students, October 2-3, 2014
- Presentation to high school students, October 7-9, 2014
- Fairbanks Science Fair Judge, March 26, 2014

ACHIEVEMENTS

If you are submitting a progress report, please describe noteworthy results to date. If you are submitting a completion or post-completion report, provide an overview of results or findings (preliminary or final). Please keep this summary of what you have learned in your project to a paragraph or less. This information will be used to update your project in the online project database and will be viewable by the public.

Melting of arctic and subarctic glaciers carries sediment-laden freshwater to coastal habitats. Glacial discharge can structure and degrade benthic communities through multiple mechanisms that may restrict settlement and alter succession. The goal of this study is to determine the influence of glacial discharge on recruitment (bringing in new individuals) and succession in kelp forest communities. Kachemak Bay is an ideal setting for this study as an estuary with points of glacial discharge along the southern shore, and currents from the Gulf of Alaska at the mouth transporting this discharge around the bay. We have completed our data collection and are currently in the analysis stage of the project. Recruitment of kelp and other bottom-dwelling organisms and community succession were monitored on cleared and uncleared control rocks. Sedimentation, temperature, salinity, light, and nutrients were also monitored. Freshwater discharge at the head of the bay was used as a direct measure of overall glacial discharge in the bay. Additionally, wave exposure, substrate rugosity (bumpy or ridged), mobile invertebrate grazers and predators, and sea otter activity (otter pits) were monitored to determine

correlations between these drivers and algal and invertebrate initial and post-recruitment densities. So far we are finding that recruitment of sessile invertebrates and macroalgae varied greatly across Kachemak Bay, with higher kelp recruitment along the southern shore and barnacle recruitment restricted to the inner bay. However, environmental variables are less distinct among sites than community structure, and resulted in three overlapping groups of sites: southern-outer bay sites with higher irradiance and lower sedimentation rate, inner bay and north-shore sites with low irradiance and high sedimentation rates, and mouth-of-the-bay sites with highly variable irradiance and sedimentation rates. We are now analyzing the data to determine which environmental factors best explain the patterns of recruitment and succession we observed across the bay.

MEDIA & PRODUCTS

List any news or media coverage in newspapers, TV, radio, or the Web, and/or videos or websites created in association with your project. Provide links where applicable.

Sarah Traiger created a short trailer video for the project and posted to YouTube:

<https://www.youtube.com/watch?v=IEv7wOhZhZg>

List and describe products, patents, or copyrights that have resulted from this project; e.g., new fisheries tool or model, new sampling method, new seafood product, new seafood processing method. Do not include print publications here.

PRESENTATIONS

List title, date, place, sponsoring organization, and purpose of all presentations made to scientific, public, or stakeholder groups. Email PDF copies of PowerPoint presentations to Michele Frandsen.

Previously reported presentations

Traiger, S.B. and B. Konar. Effects of Glacial Discharge on Recruitment and Succession in Subtidal Kelp Beds. Presented at the 2014 Western Society of Naturalists Meeting. Tacoma, WA. November 13-16, 2014.

Enter new or changed presentations

Traiger, S.B. and B. Konar. Effects of Glacial Discharge on Recruitment and Succession in Subtidal Kelp Beds. Poster presented at the 2015 Alaska Marine Science Symposium. Anchorage, Alaska. January 20, 2015.

Purpose: Communicate initial findings to the scientific community

Traiger, S.B., Konar, B., Doroff, A., McCaslin, L. Distinguishing sources of foraging pits using pit dimensions and shell litter in nearshore soft substrates. Poster presented at the 2015 Alaska Marine Science Symposium. Anchorage, Alaska. January 20, 2015.

Purpose: Communicate findings to the scientific community

How does glacial melt influence early development of kelp communities in Kachemak Bay? March 7, 2015. Homer, AK. Kachemak Bay Science Conference.

Purpose: Communicate initial findings to the scientific community and general public

Traiger, S.B., Konar, B., Doroff, A., McCaslin, L. Distinguishing sources of foraging pits using pit dimensions and shell litter in nearshore soft substrates. Poster, March 7, 2015. Homer, AK. Kachemak Bay Science Conference.

Purpose: Communicate findings to the scientific community and general public

SUPPORTED STUDENTS

Include both graduate and undergraduate students, thesis/dissertation title, expected date of graduation, and current position and address if known. If students are supported by sources other than Alaska Sea Grant, please provide information on funding as well. Email abstracts and PDFs of theses to Michele Frandsen.

M.S. student, Sarah Traiger (Sarah is switching to the PhD program pending approval from her committee)

Thesis title: Effects of Glacial Discharge on Recruitment and Succession in Subtidal Kelp Beds.

Expected date of graduation: January 2018

Current position: CASE GK12 Fellow

Address: 218 O'Neill University of Alaska Fairbanks, PO Box 757220 Fairbanks, AK 99775

CO-FUNDERS

Was any additional funding from other sources applied to fund the students and/or goals of this project? If so, please provide information on source of funding and amount.

- The Kachemak Bay Research Reserve provided \$2,400 for the study of sea otter and seastar foraging pits
- Tuition and stipend from May 2014 – May 2015 was funded for Sarah Traiger by a CASE GK12 NSF Fellowship

LEVERAGING

Did you submit any proposals for funding for this or a related project? If so, please indicate proposal title, funding source, amount requested, and whether the proposal is pending, awarded, or declined.

We submitted proposals for a related project

- "The role of kelp propagule supply for ecosystem resiliency in an estuarine setting" Alaska Sea Grant, \$12,000; Declined
- "The role of kelp propagule supply for ecosystem resiliency in an estuarine setting" Northern Gulf of Alaska Applied Research, \$10,000; Declined
- "Applying quantitative polymerase chain reaction to the study of kelp microscopic stages in an estuarine setting " North Pacific Research Board, \$132,545; Pending
- "Applying quantitative polymerase chain reaction to the study of kelp microscopic stages in an estuarine setting " North Pacific Research Board Student Competition, \$20,000; Pending
- "Applying quantitative polymerase chain reaction to the study of kelp microscopic stages in an estuarine setting " Lewis and Clark Fund for Exploration and Research, \$5,000; Pending