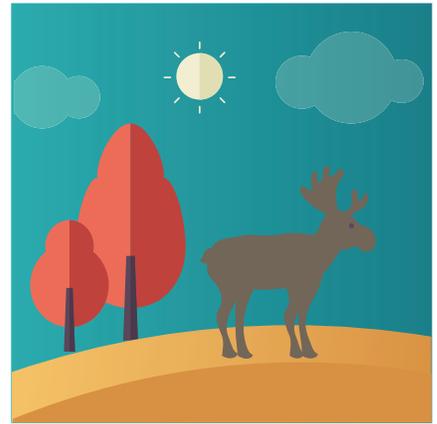
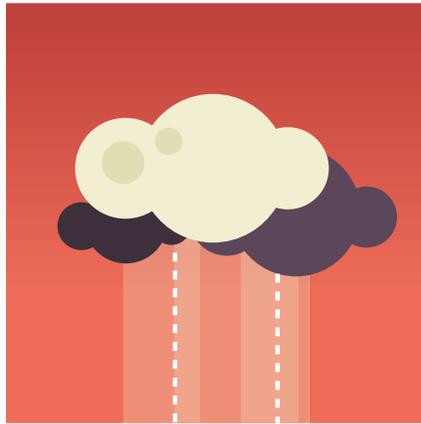


# COASTAL CLIMATE CHANGE IN SOUTHEAST ALASKA

## Students Aid in Documenting Local Observations and Experiences

By Linda E. Kruger and Adelaide Johnson  
USDA Forest Service PNW Research Station



Coastal indigenous people around the world have depended on natural resources from land and sea since time immemorial. However, assessments of potential resource change resulting from ongoing physical change, like we are experiencing today, are rare. Such summaries could increase our understanding of ecosystem dynamics and implications for important resources and could guide land use policies meant to sustain important resources.

“We hope to identify existing and potential future relationships between physical shoreline features and biologic coastal attributes along coastlines affected by isostatic rebound (the ground rising after heavy glaciers melt away), tectonic shift, and sea level rise resulting from climate change.”

---

In response to the need for such a summary, in 2015 we initiated a study supported with funding from the U.S. Forest Service Western Wildland Environmental Threat Assessment Center (WWETAC) and the Pacific Northwest Research Station (PNWRS) Underserved Community Fund. In 2016, we received additional funds from the Chugach National Forest Diversity Fund.

Our research objectives are to:

1. Document physical attributes associated with shoreline ecological communities;
2. Summarize associations between physical attributes and coastal shoreline and aquatic species;
3. Predict resource vulnerabilities based on landscape and shoreline change; and
4. Engage high school students and other community members in discussions about foods gathered along shorelines and the implications of change for foods and gathering opportunities.

We hope to identify existing and potential future relationships between physical shoreline features and biologic coastal attributes along coastlines affected by isostatic rebound (the ground rising after heavy glaciers melt away), tectonic shift, and sea level rise resulting from climate change. Further, we wanted to learn from and share the observations and experiences of local residents, especially Alaska Natives.

To get started, we initiated meetings with community and tribal leaders and high school teachers to discuss research needs and our proposed questions and approach, to gain local support for the project,

and to identify potential high school students to assist with the study. We partnered with the Sitka Conservation Society and other local groups, and over the summers of 2015 and 2016 we identified and recruited high school students to work with us as research assistants. We initially selected six communities in Southeast Alaska—Yakutat, Hoonah, Angoon, Kake, Klawock, and Kasaan. In the second year, we expanded the study to include the Southeast communities of Juneau, Sitka, Petersburg, and Ketchikan, as well as the Prince William Sound communities of Cordova, Tatitlek, and Chenega.

After the students were identified, we went to each community to meet with the students to discuss the study with them. The students then accompanied us into the field to take measurements and make observations along local beaches and rocky coastlines used by the community. While we were in the community, we coached the students on how to talk with elders and other community members to elicit information about their use of local subsistence resources and their personal observations and experiences.

We discussed the approach referred to as “free, prior, and informed consent” (see <http://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1125&context=njihr>) and explained that it was their responsibility to explain to each person they talked to that all information sharing was voluntary, and that names would be kept confidential and would not be reported with their responses. Names and personal information would not be shared or published, they could decline to answer any question if they were not comfortable answering it, and finally they could call off the conversation at any time.

Each student then selected ten local elders and other community residents to talk to about their experiences and observations of change, especially in regard to species used for food and changes in food gathering activities. Many started their conversations with a family member and several had their first conversation while we were there to assist. Notes and recordings from student conversations are being analyzed.

Results from student discussions will be combined with information from ShoreZone ([www.alaskafisheries.noaa.gov/habitat/shorezone](http://www.alaskafisheries.noaa.gov/habitat/shorezone)) and other online data sets. For those unfamiliar with ShoreZone, the goal of the Alaska ShoreZone program is to collect aerial imagery and map the habitat along Alaska's coastline, and to make the imagery and data accessible to everyone on the internet. Similar imagery and data are available for Washington and Oregon coastlines. This standardized system catalogs both physical and

biological resources. You can "fly the coastline" via aerial video, view still photos, and access biophysical data at the interactive website. One of the things we are doing is exploring how well information from ShoreZone matches with what we found during our field visits.

In conducting this research, we linked known coastal information derived from the ShoreZone database with measurements and local observations we made on the ground, and with the information that student interns learned about local residents' observations and experiences of coastal change and changes of species important for food, food webs, and for coastal stability.

One of the goals of the study was to engage students in their community and in the natural environment. Students commented that participating helped them "not feel so left out" and helped them feel more like they were part of something important.



PICTURED: High School interns and college students gathering data in Southeast Alaska/L. Kruger.

“The project has exposed students to different lifestyles, different plants that are used for food, different ways of gathering food, and a variety of attitudes about the environment. Several students were unaware of the amount of food gathering in the community and the number of concerns residents have.”

---

Having something specific to talk to people about helped many students get over being shy and afraid to talk to people. Several students reported that they learned about foods they could gather from local beaches. Students learned from community residents about concerns including pollution, algae blooms, and invasive species.

One student reported, “I learned that more people rely on subsistence resources than I originally thought and they are much more knowledgeable than I ever imagined.” The same student went on to say, “I learned that there is a lot that I have yet to learn about the environment and I could learn a lot of it from the people in my community.”

Most of the students had no idea that the people in their communities were such a great source of untapped knowledge. One student commented, “I think that everyone could learn a lot from each other if the different groups just sat down and shared observations.”

The project has exposed students to different lifestyles, different plants that are used for food, different ways of gathering food, and a variety of attitudes about the environment. Several students were unaware of the amount of food gathering in the community and the number of concerns residents have. “Many residents have stopped eating shellfish due to the increased number of algae blooms which they attribute to warmer water temperatures,” one student reported. Having the students engaged in the study also increased community awareness of and interest in environmental changes that are impacting local foods and other resources.

We are currently preparing summary reports and we will be sharing what we have learned with each community in order to inform residents of observed conditions, reported changes, and potential future change. We hope that the information from the study will be useful to tribes and rural communities facing uncertain effects of climate change and that it will serve as input into adaptation planning and resource management, and as a guide for assessment of research needs for shoreline communities elsewhere.\*

More information on the study is available in an article that was published in a regional newspaper [http://www.capitalcityweekly.com/stories/101415/new\\_1261016671.shtml](http://www.capitalcityweekly.com/stories/101415/new_1261016671.shtml)



PICTURED: Wild black crowberries in Southeast Alaska/shutterstock