

Project Title: Youth Engagement with Fisheries, Marine Mammal, and Ocean Sciences in Alaska

Applicant: Ketchikan Gateway Borough School District

Address: 2610 Fourth Avenue. Ketchikan, AK 99901

Principle Investigator: Asst. Superintendent Melissa Johnson

Co-Investigator: Program Coordinator Keenan Sanderson

Program Duration: September 1st, 2023 through March 31st, 2024

Programmatic Priority #5: Local and Traditional Knowledge: Projects that enhance science-based management of fishery resources and marine mammals of the region through local and traditional knowledge.

Funding Type: Grant

Total Cost of Project: \$16,640

Project Summary

The Ketchikan Gateway Borough School District (KGBSD) recognizes the critical importance of marine health and natural resources as it has upon our community. Ketchikan has a long-standing history of subsistence/commercial/sport fishing, marine tourism, marine engineering, and cultural ties as it relates to the ocean environment. Due to the uncertainty of environmental changes within our localized area and across the globe, we find it imperative that our students be engaged with the issues that are relevant for our community. To accomplish this, we are building our Ocean Sciences Program at the high school level to inspire interest and educate our youth in these issues that we care deeply about.

Our Ocean Sciences Program has three critical parts to grow students in the ways of marine scientists: 1. We teach students western science and traditional ecological knowledge on topics that are related to the Ketchikan and Southeast Alaska areas. 2. We connect our students with a variety of “experts” in western science and traditional ecological knowledge. These experts represent state/federal agencies, universities, private entities, and tribal governments. 3. We foster individual and group growth in all of our students through implementing research projects on topics that students are interested in.

In this project, we will bring 15 high school students together with marine biologists and other students from around southeast Alaska at the Sitka Whalefest Research Symposium and training event. Here they will learn about current marine mammal and other related research from experts around the world. Additionally, this program will take task students with collaborating with one-another to create literature review research papers on topics that they feel is important to them. With these research papers, students will then conduct formal academic presentations to University of Alaska Fairbanks faculty and graduate students in Seward, AK. These presentations will also be conducted for the student body of Ketchikan High School as well as the community at-large.

Through implementation of this program, we will be providing additional opportunities that will guide them to future careers in marine sciences for Alaska. Through our engagement with the University of Alaska Southeast and the University of Alaska Fairbanks, students will be able to learn about postsecondary education marine education opportunities. These opportunities can turn into careers in fisheries managers, oceanographers, marine biologists, among many other occupations that would benefit our community, state, and country. Regardless of what career path our students choose, they will be able better advocates for environmental health and sustainability in renewable natural resources such as fish, shellfish, wildlife, and energy.

Project Narrative

Ketchikan is a rural coastal community in southern southeast Alaska. The vast majority of our community's structure, culture, economy, and livelihood is shaped around the oceanic environment that encompasses our island. It is ever present within our daily lives how much the ocean changes our community. The Ketchikan Gateway Borough School District (KGBSD) sees the value of teaching our youth on the importance of our natural environment in and around our community, and it is evident within the teaching curriculum and education opportunities of our students. Every year we bring our elementary students out along our beaches in Ketchikan for "Beach Day" where part of the day's activities is to learn about the structure of the intertidal zone and the many organisms that can be found there. In our middle schools, students will spend 3 days on a remote island with nothing more than a backpack full of clothes, visqueen to make a makeshift tent, and a coffee can with basic survival tools. Students must be able to identify organisms along the beach and in the forests, harvest, process, and cook them to sustain them until they are picked up after three days. In our high schools, we our district offers a variety of classes that teaches students about the complexities of the natural environment from the local to global scale. This classes include marine biology, oceanography, maritime, and forestry.

One program within our district that has been recently developed is our "Ocean Science Program" at the high school level. Students come to this program to learn and develop skills to become future experts in fisheries, marine biology, and oceanography fields. Activities within this program include hands-on citizen science both in the lab and in the field on projects that are relevant to Ketchikan, direct learning about marine biology, oceanography, and fisheries concepts through lectures and reading, and field trips to various ocean science entities around the state of Alaska.

In this after-school program, students go into much deeper depth on the issues of our local and global oceans. For example, this year students learned about the crash about the ooligan and king salmon on the Joonax (Unuk) river and how that has impacted local traditional and commercial harvesters. In years past, student have looked at other topics that are important to Alaska such as Bristol Bay Sockeye salmon, bycatch in the Walleye Pollock Trawl Fishery, and melting sea ice in the Arctic Ocean. Students work together to create scientific literature review research papers on these topics and shared widely within our community as well as University of Alaska Fairbanks faculty. The students also craft academic presentations that again are presented to the residents of our community and to University of Alaska Fairbanks.

One aspect of our program that we want to expand into is connecting our students with a wide variety of professionals from around the state to further foster their interest into the world's oceans. Our objective is to have these students meet and engage with people from all sorts of entities including but not limited to: the Alaska Department of Fish & Game, the National Oceanic and Atmospheric Administration, the US Fish & Wildlife Service, the US Forest Service, the Alaska Board of Fisheries, the North Pacific Fisheries Management Council, and representatives from the private sector in ocean sciences.

Approach

Long-Term Community Goal:

The long-term community goal is to foster interest and passion in our youth to learn about fisheries, marine biology, and oceanography so our students may be able to contribute to the management of our natural resources in the future.

All over Alaska, a number of issues related to organism population of many marine species as well as concern for environmental degradation to the ocean through anthropogenic and non-anthropogenic causes. Our community is no different. Populations of a variety of species in Ketchikan has seen significant declines that is impacted subsistence harvesters, commercial fishers, and those involved with the non-resident sport harvest sector. Ketchikan is also at the threat of invasive species, and this is evident with our neighboring community of Metlakatla having European Green Crab found in many of their harvesting areas. Additionally, our community is preparing for a potential open pit mine operation near the headwaters of the Joonax river. All of these things, among many other issues, is something that our students must be aware of at a young age so that they may be able to contribute to these issues later on in life.

Objectives

The project objectives below will enable Ketchikan youth to gain knowledge and skills needed to kick start potential careers within marine natural resources through science, advocacy, and/or management in the state of Alaska. The district will continue and create relationships with a variety of entities in both the public and private sectors to give these students the best education possible in relation to Alaskan ocean sciences.

Objective #1: By the end of the 2023-2024 academic school year, the students within our Ocean Sciences Program will have connected with Alaskan marine scientists at the Sitka Whalefest Research Symposium and Training.

Objective #2: By the end of the 2023-2024 academic school year, students within our Ocean Sciences Program will have constructed and developed a literature review paper on an issue that is relevant and critical to our community in Alaska. In groups of 4-5 students, students will be presented a research question that they must respond to through a 15-page peer review paper. The question has yet to be determined for the 2023-2024 academic school year. An example of a question could be “what is a fisheries issue related to your area and how should that issue be addressed?” A potential paper that these teams could write on would be “Solutions to Bycatch in Alaska’s Largest Fishery, prioritizing conservation for future generations” among countless other potential topics that are entirely student led. Additionally, each group of students will present their research in multiple events to their student peers at their school, the community at-large, and to faculty at the University of Alaska Fairbanks College of Fisheries and Ocean Sciences.

Expected Outcomes

Outcomes for objective #1: By connecting students with scientists from all around the state of Alaska at the Sitka Whalefest Research Symposium and Training, we expect that students will be able to learn from their current research so they may be able to take that knowledge back for projects that they will write about in the future. Additionally, for students who are seriously considering a career in marine sciences, students can choose to communicate further to see how they may be able to follow in the footsteps of those who have careers they want to follow to some degree. Students here will be able to get hands on training on various scientific techniques that are organized by faculty from the University of Alaska Southeast and the Sitka Sound Science Center. Upon the completion of this program, all students will obtain one college credit through the University of Alaska.

Outcomes for objective #2: By students constructing their own research on topics that they are interested in, students will be better equipped to in the future to do this on their own on any issue that they find important to them. Students will be better prepared post high school to further their education in marine sciences. A skill that often times not practiced at the secondary education level is research writing and academic presenting. Students that are able to pull a project of this nature together will give them an edge when applying for universities, scholarships, and peers. Since these students will be presenting their research to University of Alaska Fairbanks faculty, they will be able to connect with that fisheries and marine science program before graduating high school, and therefore encourage more students to get into that program in-state. Our community generally agrees that we would like to see our students go out to get an education but come back to work in our community on issues we find important. We feel like the University of Alaska Fairbanks College of Fisheries and Ocean Sciences accomplishes this perfectly.

Milestone Schedule

Table 1. Tentative milestone schedule for our project.

Milestone	Date
Recruit new students into the program	09/15/2023
Begin process of writing research projects	10/01/2023
Sitka Whalefest Research Symposium and Training	11/02-06/2023
Submit research projects to UAF CFOS Faculty	12/31/2023
Conduct academic presentation to KHS student body and community at-large	02/18/2024
Conduct academic presentation to UAF CFOs Faculty	03/05/2024

Project Management

The Project Manager and Grant Manager will be Assistant Superintendent Melissa Johnson. Melissa will be responsible with managing of funds and submission of any reporting documents. Program coordinator Keenan Sanderson will be responsible for the coordination of all program

activities including but limited to: teaching western science and traditional ecological knowledge to students enrolled in this program, coordinating guest speakers, coordinating lab and field techniques courses, coordinating with the University of Alaska Southeast and University of Alaska Fairbanks for Sitka and Seward events, and guiding students along with their research projects on marine science issues. Justin Ming will also be a significant volunteer in carrying out educator and guiding students along these projects.

Budget Justification

Ketchikan is an incredible place to live and raise our youth. We are uniquely situated in southern southeast Alaska that has access to many opportunities for traditional, commercial, and sport harvesting of marine species, and opportunities for marine transportation, engineering, and marine ecotourism. And while we have all of this, our community has relatively little opportunity to teach students about direct marine and fisheries sciences. We are grateful for our partners at the Southern Southeast Regional Aquaculture Association and Ketchikan office of the Alaska Department of Fish & Game, however there are so many other learning opportunities and career paths in marine sciences they would never be exposed to unless they were able to travel to other communities that has these resources. Therefore, in order to encourage students to one day take on positions within state/federal agencies, private entities, and tribal governments, we feel it is necessary to do just that.

Table 2. Approximate cost for Sitka Whalefest Research Symposium and Training

Budget Item	\$ Amount
Airfare to Sitka for 15 students and 3 adults	\$3,600
Lodging provided by UAS and SSSC	\$0
Cost for college credits for students	\$375
Total	\$3,975

This program has been working with the University of Alaska Southeast and the Sitka Sound Science Center since 2015 for this program. Both entities have generously provided lodging and ground transportation to the students that are involved in this program. The only major cost with being able to participate in the symposium and training is the airfare to get from Ketchikan to Sitka.

Table 3. Approximate cost of event to present research and connect with UAF CFOS

Budget Item	\$ Amount
Airfare to Anchorage for 15 students and 3 adults	\$9,360
Lodging Mostly covered by UAF	\$2,080
Ground Transportation for 4 days	\$1,600
Total \$ Amount	\$13,040

This aspect of the program has been working with the University of Alaska Fairbanks since 2011. UAF has been able support the academic presentations from students through lodging while we are in Seward. However, cost structure different for this event. Airfare is again a major cost associated with this event, and costs significantly more than since we are traveling farther. Due to the nature of flights and general travel, the group will have to stay two nights in Anchorage on either side of traveling to Seward, a cost that cannot be covered by UAF. Ground transportation is another cost with this event as we will have to take vans so we can get to Seward.

Table 4. Total approximate cost of funding this project.

Event	Cost
Sitka Whalefest Research Symposium and Training	\$3,600
UAF CFOS Research Presentations and Mentoring	\$13,040
Total	\$16,640

This project is much more than just a field trip for our students in Ketchikan. This isn't just an excuse to get off the island. This project is designed to be a life-changing experience for students that are interested in these marine science fields. None of our students are forced to be within our program, rather they are all within our program on their own accord. While funding travel does come with some degree of hesitancy on the output that is associated with it, our program has a long-standing history of students moving on after high school to take critical roles in our community as it relates to marine sciences. This school year alone, through this program, two of our seniors have committed to attending the University of Alaska in the College of Fisheries and Ocean Sciences, which has already been offered a summer internship with UAF faculty to study marine processes in Kachemak Bay. Other underclass students have also indicated that this is a potential path for their future. What we are doing here is working, and we will continue to expand into as many areas that we can reasonably do such that our have every opportunity to learn about what is important to them.