Coastal Community Outreach and Education

Final Report 2005 – 2006

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EXECUTIVE SUMMARY

This year Prince William Sound Science Center's (Science Center) education program was able to significantly increase its involvement with the coastal communities of Prince William Sound through creating new educational and outreach opportunities. A Science Center educator coached four Cordova high school students and accompanied them to the national National Ocean Sciences Bowl competition in Monterey, California this May. Staff coordinated a weekend of workshops for twenty high school students in the Youth Area Watch. Participants worked with local scientists from the Alaska Department of Fish and Game, Copper River Watershed Project and the Science Center assisting scientists in collecting data for current research projects.

The Marine Science Education Kits developed in partnership with the Imaginarium were used during Outreach Discovery trips to the communities of Tatitlek and Chenega Bay and involved forty students. The kits were also used during the Science Center's summer science camp, winter and summer festivals and presentations to Cordova elementary and junior high school, engaging a total of over five hundred students in the activities.

Educators took a lead role in planning and organizing three festivals in Cordova, facilitating increased science-based activities for a variety of participants. The Iceworm Science Festival took place in early February, where junior high and high school student displayed their Science Fair projects. Science Center staff maintained tables at the Cordova Community Earth Day Festival and the Alaska Oceans Festival, also helping to facilitate additional festival events. The Copper River Wild! Salmon Festival celebrated wild Alaskan salmon through art, music and a variety of science-based educational activities.

A total of three adult weekend workshops were held during the summer, giving participants the opportunity to explore the natural resources of the region with expert scientists. Sixty-six adults participated in the workshops' open activities while forty-two people participated in the field intensive section of the workshops.

The Coastal Community Outreach and Education project was successful in developing new relationships with regional and national educators and increasing programs to regional youth, educators, locals and summer visitors. An estimated total of 500 adults and 500 youth participated in elements of this project.

BACKGROUND AND INTRODUCTION

The Prince William Sound Science Center's Coastal Community Outreach and Education project expanded the scope of its education programs through increased outreach and new programs for youth and adults. For 15 years the Science Center and its partners have developed a diverse education program, "Science of the Sound", focusing its efforts on a range of ages and audiences. In order to expand the scope of these programs, Science Center educators were successful in exploring program development options with outside organizations, including the Copper River Watershed Project, the Imaginarium, the UAF Marine Advisory Program and the St. Elias Erosion and Tectonic Project. Programs developed were successful in serving a wide range of audiences, including high school students, teachers, and adults, focusing on the current research and science of the region. Appendix 1 summarizes a complete list of organizations, agencies ands institutions that collaborated with Science Center educators to develop and implement these programs.

PROJECT OBJECTIVES

The Coastal Community Outreach and Education (CCOE) project sought to develop new relationships with regional and national educators and increase programs to regional youth, educators, locals and summer visitors (Table 1).

Table 1: Summary of project goals and specific tasks

Goals	*Complete?*
Organize and coordinate high school science programs that allow students to explore regional science activities	**YES**
Develop and implement a series of weekend workshops available for continuing education or college credit targeting teachers and adults.	**YES**
Specific tasks	
Coach students in the regional National Ocean Science Bowl competition	**YES**
Facilitate high school science based field trips	**YES**
Participate in Youth Area Watch Program	**YES**
Assist in organization of 2006 Science Festivals	**YES**

PROJECT ELEMENTS

National Ocean Sciences Bowl

For the third consecutive year, a Science Center educator was able to mentor and coach the local *National Ocean Sciences Bowl* team. The National Ocean Sciences Bowl fosters cooperative learning experiences for high school students in marine sciences through a variety of state and national competitions. The 2006 team, known as the Flatfish, was composed of four Cordova high school students and was considered the "team to beat." Accordingly, the Flatfish won first place in the Alaska competition for their research paper and presentation. However, due to harsh winter conditions and avalanches that prevented travel to the quiz bowl portion of the competition in Seward, Alaska, they were disqualified. After petitioning the coordinators of the National Competition, the Flatfish were invited to attend and represent Cordova and present their research paper at the national competition in Monterey, California (Figure 1). Their presentation, "An Ecosystem Management Plan for Pacific Halibut in the Prince William Sound" was given to an audience of over 200 students, coaches, families and regional coordinators. The Flatfish also gave out samples of Copper River Salmon to promote wild fisheries in Alaska. Another highlight for the team was being featured in the Alaska Tsunami Bowl promotional video.

Figure 1: The Cordova Flatfish high school students (left to right), Mckenzie Herring, Leif Stavig, Lee Collins, Chris Hager fielding questions on their project. Photo by K. Alexander.

Youth Area Watch Program

A Science Center educator coordinated the fall workshop for the Chugach School District *Youth Area Watch Program*. This program involves students from the communities of Cordova, Homer, Tatitlek, Chenega Bay, Whittier, Valdez and the Copper Basin and focuses on assisting students to make a contribution to research and long-term monitoring projects in oil spill affected Prince William Sound and Cook Inlet by working with scientists. The workshop involved local scientists from the Copper River Watershed Project, Prince William Sound Science Center and Alaska Department of Fish and Game (ADF&G) who shared their work monitoring fish populations and habitat in the Copper River Watershed (Figure 2). Twenty high school students participated from the

communities of Tatitlek, Chenega Bay, Valdez, Cordova, Whittier and McCarthy in a weekend of workshops in Cordova.

Science Center Research Ecologist, Dr. Mary Anne Bishop presented an overview of her Copper River Delta ecological monitoring project and reviewed the many sampling procedures used to study estuarine ecology. Students then ventured into the field with a Science Center educator and the Science Center's Fisheries Biologist, Brad Reynolds to try their own hands at some of the sampling techniques, including invertebrate core sampling and fish seining. Students processed their core samples in the Science Center lab and received a guided tour of the Fairweather, a NOAA research vessel. Brad presented a review of salmon life cycles and introduced the juvenile salmon migration project. ADF&G Fisheries Biologist, Lauren Padawer discussed the use of otoliths in salmon research and management while Brad led a demonstration in the lab of collecting juvenile salmon otoliths and scales.

The Copper River Watershed Project's FishWatch Project Manager, Becky Clausen met with the students at Eyak River boat ramp to introduce the FishWatch program. After participating in the collection of water quality data at Eyak River, the students conducted a human use survey, submitting datasheets to the Copper River Watershed Project on how many sport fishermen were using the Copper River Delta.

Upon completion of the weekend field trip, the students returned to their respective communities to develop long-term monitoring projects in their local communities and ecosystems. Some of the students are building their projects from existing monitoring programs they were introduced to over the weekend, including monitoring water quality using FishWatch equipment and tracking intertidal invertebrates in the mudflats using core samples.

Figure 2: Science Center Fisheries Biologist Brad Reynolds shows Youth Area Watch participants a salmonoid. Photo by K. Alexander.

Marine Science Education Kits

Two educators traveled to Anchorage in December to receive training from Imaginarium staff in the use of the *Marine Science*

Education Kits. In the fall of 2005, these kits were developed in partnership with Anchorage-based science activity center, the Imaginarium and the Science Center. The kits contain curriculum materials for a variety of hands-on activities and a general assembly for grades K-8. Examples include "Living On The Edge" which is a series of intertidal activities for K-2nd graders, and "Poke-a-Squid" which explores the adaptations of mollusks through a dissection of a squid (Figure 3). Science Center educators put the kits to good use during their trips to the villages of Tatitlek and Chenega Bay with the Outreach Discovery Program. During 13 classroom visits, Science Center educators incorporated lessons from the Imaginarium kits into hands-on science activities, reaching an audience of approximately 40 students in remote communities in Prince William Sound. In addition to using the kits at Chenega Bay and Tatitlek schools, Science Center educators in conjunction with Imaginarium staff utilized the kits with an additional 25 local high school and 300 local elementary school students, 100 adults and students at the Cordova Earth Day Festival and 32 summer science campers (Table 2).

Table 2: Summary of Imaginarium presentations and use of Marine Science Education Kits.

		Location			
Program Title	*Grade level*	*Cordova*	*Tatitlek*	*Chenega Bay*	*Festivals and Science Camp*
"Floating Food"	5 -8		**X**		**X**
"Floating Food"	4 - 11			**X**	
"World o' Water"	K - 12		**X**		
"Poke-a-squid"	9 - 12		**X**		
"Poke-a-squid"	7- 11			**X**	
"Living on the Edge"	K - 4		**X**	**X**	
"Ocean Investigation"	7 – 8	**X**			**X**

Figure 3: Cordova high school students experimenting with the effects that salinity has on density, an Imaginarium science kit. Photo by A. Marquette.

2006 Science Festivals

The 3rd annual *Iceworm Science Festival*, which hosts a variety of science events, was held in early February and celebrated another

successful year with increased local participation and new events. Science Center educators coordinated the judging of the junior high and high school students' science fair projects. The recruitment of educators and scientists to judge the projects provides a great opportunity for the students to interact with members of the community and to defend their research. Another highlight of the festival was the presence of educators from the Imaginarium from Anchorage. The Imaginarium's staff facilitated engaging science demonstrations, hands-on activity stations, the Star Lab and debuted the high school portion of the Marine Science Education Kits. Science Center educators were trained in the use of the 9-12 grade materials thus completing their comprehensive training.

Figure 4: A Science Center educator explains a demonstration at the Community Earth Day Festival. Photo by A. Marquette.

This spring, Science Center educators helped coordinate and facilitate Cordova's third annual *Community Earth Day Festival*, held in conjunction with the Alaska Health Fair. Several local organizations joined the Health Fair exhibitors to provide a wide array of educational activities for kids attending the festival (Figure 4). Activities included Earth Day button making with the Cordova Public Library, a stream erosion model presented by the Copper River Watershed Project and oceanography demonstrations and intertidal organism identification led by the Science Center educators. Representatives from the U.S. Forest Service Cordova Ranger District, Cordova Clean-Up, Serendipitea, the Science Center's Lingering Oil Education Project and the high school chemistry class also volunteered their time to interact with the festival-goers.

During the summer of 2006 Science Center educators participated in the *Alaska Oceans Festival* in Anchorage. An estimated 6,000 people attended the festival, where Science Center representatives had the opportunity to share information about the Science Center's research and education programs, as well as facilitate youth activities that informed participants about the ecology of Prince William Sound and the Copper River Delta. Representatives spent 5 hours tabling at the festival with approximately 300 visitors including 250 adults and 50 children.

A Science Center educator took the lead on coordinating the *Copper River Wild! Salmon Festival*, a community event that celebrates wild Alaskan salmon through

art, music, and education. Science Center educators coordinated an afternoon of education events that included workshops by Alaskan artists Ray Troll and Pat McGuire, the ADF&G Mobile Aquatic Fish Lab, and hands-on activities and informational displays developed by individuals from the Science Center, ADF&G, US Forest Service, Native Village of Eyak, Cordova District Fisherman United and the Copper River Watershed Project. The displays and the Aquatic Fish Lab were available to participants throughout the entire festival weekend. An estimated 550 participated in the events, with over 150 attending the educational events alone (Figure 3).

Figure 3: ADF&G fisheries technician, Dayna Norris demonstrates to Copper River Wild! Salmon Festival attendees the technique for sampling salmon otoliths. Photo by L. Butters.

Adult Weekend Workshops

A total of three *Adult Weekend Workshops* were coordinated by Science Center educators, tripling its programs for adult weekend workshops. The summer started with an Edible Seaweed workshop taught by Dolly Garza from the Ketchikan office of the Marine Advisory Program. Thirty-seven people attended a Friday evening slide show, where Dolly introduced the common edible seaweeds found in the Gulf of Alaska. Samples of dried seaweeds were available to taste at the end of the lecture. The next morning, 26 people joined Dolly for an identification field trip, with stops along Orca Inlet. It was helpful to see live samples of the seaweeds and the impressive diversity of species present. Twelve participants feasted on an edible seaweed luncheon after the field trip.

In July, a 3-day Barrier Island Ecology Workshop was held that took participants to Egg Island, a barrier island of the Copper River. Dr. Mary Anne Bishop led a Friday evening lecture and slide show to introduce the ecology of the Copper River Delta to the 12 participants in attendance. USFS Wildlife Biologist, Erin Cooper compiled and distributed materials to the participants on barrier island formations. In the field on Egg Island, Science Center Shorebird Biologist River Gates and Erin led in-depth field explorations related to the bird and plant communities of the Egg Island, respectively (Figure 5). Ten people traveled to Egg Island, three of whom took the course for continuing education credit offered through the University of Alaska, Anchorage.

Figure 5: Science Center Shorebird Biologist River Gates shows the Barrier Island Ecology Workshop participants the extent of the project research. Photo by K. Alexander.

In late July, the Science Center coordinated a workshop with Terry Pavlis, Professor of Geology at the University of New Orleans and leader of the St. Elias Erosion and Tectonic Project (STEEP) occurring on the coast of the Gulf of Alaska. Terry led a Friday evening lecture titled "Natural Disasters of the Copper River and Mississippi River Deltas". Seventeen participants attended the lecture during which Terry gave an overview of the atmospheric phenomena that led to the massive destruction by hurricane Katrina and of the research being conducted by the STEEP team near the Bering Glacier. He also led a Saturday field trip for 6 participants to look for evidence of tectonic events on the Copper River Delta. Stops included two rock outcroppings along Orca Inlet, Sheridan Glacier and Alaganik Slough.

Table 2: Number of participants in the Adult Weekend Workshops

	Number of participants	
Workshop title	***Field component***	***Evening presentation***
Edible Seaweed	26	37
Barrier Islands Ecology	10	12
Natural Disasters	6	17
Total	***42***	***66***

SUMMARY OF EVALUATIONS

Evaluation of education program helps guide future education efforts, provides direct feedback to educators and is an important component to the Science Center's innovative education programs. The following is a sampling of quotes taken directly out of narrative evaluations forms that were given to teachers and workshop participants.

"You provided great hands-on activities that engaged the students, but also required students to think and verbally articulate ideas and responses."

Jeanne Williams, Primary Teacher, Tatitlek School

"*Kate Alexander did a fabulous job organizing this workshop. Erin Cooper showed extensive knowledge about the plants and ecology of Egg Island. River Gates was captivating with her enthusiasm and passion for the birds that are the subject of her research."*

Anonymous, Barrier Island Workshop participant

OUTREACH AND NEWSLETTER ARTICLES

The following outreach pieces were written about the variety of Coastal Community Outreach and Education activities through the year.

Alexander, Kate 2006. "Science Bowl team returns from national tourney" The Cordova Times. Thursday, May 25, 2006. Volume 92, Number 14.

Alexander, Kate 2006. "Avalanches rob Cordova Flatfish" The Cordova Times. Thursday, February 23, 2006. Volume 92, Number 1.

Butters, Lindsay 2006. "Cordova Celebrates the 36th Anniversary of Earth Day" The Breakwater. Prince William Sound Science Center newsletter. Spring 2006.

Butters, Lindsay 2005. "Traveling Oceanography Kit to Debut in Prince William Sound". The Breakwater. Prince William Sound Science Center newsletter Winter 2005.

Landaluce, Joy 2006. "Copper River Wild! Salmon Festival a grand success" The Cordova Times. Thursday, July 20, 2006. Volume 92 Number 22.

Landaluce, Joy 2006. "Essay winners head to Washington, D.C." The Cordova Times. Thursday March 23, 2006. Volume 92 Number 5.

Schneider, Doug 2006. "Flatfish will attend national oceans science competition" The Cordova Times. Thursday March 16, 2006. Volume 92, Number 4.

Stavig, Leif 2006. Youth visit unique Copper River watershed" The Cordova Times. Thursday August 17, 2006. Volume 92, Number 26.

CONCLUSION

The Science Center education staff is pleased with the achievements of our education programs during the 2005-2006 season. We were able to meet our objectives of organizing science-based opportunities for high school students as well as creating a series of adult weekend workshops. In addition, Science Center educators facilitated student and adult activities with local scientists bridging the gap between current research and science education.

Through classroom visits, festivals, adult workshops and youth summer camp programs, we were able to reach an audience of one thousand youth and adults in a variety of educational settings. Our programs continue to strengthen with the help of our existing program partners, and are increasingly dynamic with the addition of new partners. Our goal for the coming year is to maintain these partnerships and continue to produce quality programs for all ages. In addition, we will continue to expand our advertising efforts to ensure that our programs reach a broad audience both in the state of Alaska and in the Lower 48.

ACKNOWLEDGEMENTS

The Coastal Community Outreach and Education project's capacity is greatly enhanced by the diligent and cooperative work of so many organizations and members of the community. Special thanks to our program partners including the Copper River Watershed Project, Alaska Dept. of Fish and Game, US Forest Service, Cordova Ranger District, Imaginarium, Native Village of Eyak, Cordova Family Resource Center, Cordova and Chugach School Districts, Cordova Arts and Pageants, Cordova District Fisherman United and KCHU. The adult weekend workshop programs greatly benefited from the expertise of its teachers including Dolly Garza, Terry Pavlis, Erin Cooper, Dr. Mary Anne Bishop and River Gates. Ray Troll and Pat McGuire generously donated their time and art to the success of the Copper River Wild! Salmon Festival. Fishing and Flying provided air support for the Barrier Islands Ecology Field Trip. Financial support was contributed by ConocoPhillips Alaska, Inc., the Prince William Sound Oil Spill Recovery Institute, Alaska Department of Fish and Game Wildlife Conservation Division, Alaska Sea Grant and contributors to the Carol Treadwell Scholarship Fund.

Appendix 1: List of organizations, agencies and festival website links..

Agencies:

US Forest Service, Cordova Ranger District — US Forest Service Cordova Ranger District

Alaska Department of Fish and Game — ADF&G Mobile Aquatic Fish Lab

Alaskan non profit organizations

Imaginarium — Imaginarium

Copper River Watershed Project — Copper River Watershed Project

Cordova Family Resource Center — 907.424.4357

Native Council

Native Village of Eyak — Native Village of Eyak

Educational Institutions

University of New Orleans, St. Elias Erosion and Tectonic Project (STEEP) — STEEP

UAF Marine Advisory Program — UAF Marine Advisory Program

Public School District

Cordova School District — Cordova School District

Chugach School District — Chugach School District

Other

Cordova District Fisherman United — Cordova District Fishermen United

Serendipitea — 907 424 8327

Festivals and competitions

Iceworm Festival — Iceworm Festival

Cordova Earth Day and Health Fair — Alaska Health Fair

Alaska' s Ocean Festival — Alaska's Ocean Festival

Copper River Wild! Salmon Festival — Copper River Wild! Salmon Festival

National Ocean Sciences Bowl — National Ocean Sciences Bowl: Alaska region