

Final Report

**2013 Summer Science K-12 Program
Kaktovik, Alaska**

prepared for



Dave Payer

U.S. Fish & Wildlife Service

Fairbanks, Alaska

by

Carrie Harris and Ken Dunton

The University of Texas Marine Science Institute

750 Channel View Drive

Port Aransas, TX 78373



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Summer Science Program Summary

The annual Kaktovik Summer Science Camp was taught at the Harold Kaveolook School in Kaktovik, AK from August 5-9th, 2013. The University of Texas Marine Science Institute (UTMSI) and the U.S. Fish and Wildlife Service (USFWS) sponsored the camp. Marilyn Cook, a Master teacher from Port Aransas, TX, and Carolynn Harris, a UTMSI graduate student, directed the camp. They were assisted by Heidi Helling (USFWS), Brenda Dolma (Friends of Alaska's Refuges), Stephanie Smith (UTMSI), and Tracy Burns (a resident of Kaktovik, teacher at the Kaveolook School and former Summer Science student). In addition, Roy Churchwell, a Ph.D. graduate student at the University of Alaska Fairbanks, joined the camp for an afternoon as a visiting birding expert. Eight to fourteen children, ages 4-10 years, attended the camp for at least one day (Table 1).

The 2013 Summer Science Camp targeted younger children (under 10). A

Students	
Elijah Burris	Billy Fred Killbear
Flossie Lampee	Edwin Solomon
Jaylee Kaleak	Collin Solomon
Markus Gallagher	Danny Gordon
Mya Aishanna	Lenora Going
Skylar J-Soply	Lydia Going
Troy Soplu	Kaden Kulukhon

variety of science themes were introduced to the children. These included observing the natural world, asking "good questions", and thinking like a scientist. This was accomplished through arts and crafts activities, games, simple experiments, storybooks, and outdoor activities (Table 2). In addition, each child entered data and observations

(often as pictures) in a Field Notebook throughout the week.

Each morning, we took the children outside so they could record the temperature (in Fahrenheit and Celsius) in their field notebooks and observe the type of clouds seen in the sky. The older children helped the younger ones to read the thermometer and record data. These activities taught the kids the importance of repeated observations. The data collected were eventually uploaded to NASA's Student's Cloud Observations Online (S'COOL) website, where they are used to help ground-truth NASA's cloud cover satellites.

On Monday, we walked to Kaktovik lagoon and showed the students how to seine for critters. The children helped collect animals (mostly mysids) and algae from the net, which were then put into a 20-gallon aquarium at the Kaveolook School. The children examined them under a microscope and also enjoyed observing the animals in the aquarium the rest of the week (**Fig. 1**). On Tuesday morning, we did a lesson on the difference between zooplankton and phytoplankton. Afterwards, each child created his or her own plankton from arts and crafts supplies and

we "raced" them in a tub filled with water (**Fig. 2**). The plankton that sunk the fastest won! On Tuesday afternoon, we taught students to use binoculars and they

	Main Activities
Monday	Thermometer use, cloud types, seining in Kaktovik lagoon, aquarium set up
Tuesday	Plankton race, Binocular lesson, bird watching
Wednesday	Flatfish movement activity, fishing game, fish printing
Thursday	Blubber glove experiment, "Blubber is beautiful" song, polar bear puppets
Friday	Draw pictures for field guide, discuss disappearing glaciers, watch Tracy Burns' video "Weather or Not"
Friday Night	Open House

practiced in the classroom by spotting colorful paper birds that had been hung

the night before. Roy Churchwell took the students on a birding walk around Kaktovik and taught them to identify common birds such as Glaucous gulls and snow buntings (**Fig. 3**).

All activities on Wednesday focused on fish. We started with a flatfish movement activity, in which students pretended they were flounder larvae that grew into adult flounder. They also competed in a fishing game, in which students tried to catch the most flounder (gold fish) and the least bycatch (oyster crackers and gummy worms) from the ocean floor (a bucket filled with rice). In the afternoon, students created beautiful fish-printed pillowcases after learning about the Japanese art of Gyotaku (**Fig. 4**). On Thursday, the children learned why so many arctic animals have blubber. The highlight was doing a “blubber glove” experiment by submerging their gloved hands (one glove contained Crisco or “blubber” and one that did not) into a bucket of ice-water to see which hand got cold faster. On Friday, we introduced the topic of climate change and showed a slideshow of Alaska glaciers that are receding. Tracy Burns also showed her film “Weather or Not”, which shows footage of Kaktovik’s eroding coasts and of village elders speaking about the consequences of coastal erosion. The students loved seeing their island and elders that they knew on film.

The camp culminated in an Open House, held at the Kaveolook School, on Friday night, which was attended by parents, community members, and visitors of Kaktovik (**Fig. 5**). The students were able to show-off everything they worked hard on during the week, including their Gyotaku pillowcases, field notebooks,

hand puppets, and plankton models. The students also made a Field Guide of the animals found in Kaktovik, which was donated to the school library (**Fig. 6**).

Future Recommendations

We hope to offer an engaging summer science camp to the children of Kaktovik again in Summer 2014. The camp was originally designed for students in grades 5-8, but has recently been expanded to high school students (2011 and 2012) and lower elementary school students (2013).

Although the camp was offered to younger children in 2013, we received a lot of positive feedback from the older children who fondly remembered their science camp experiences from years past. For example, one older student described the Kaktovik Summer Science Camp in an essay of his favorite Barter Island activities. He read his essay on the KBRW radio station, which was broadcast to the entire North Slope, on 4 December 2013.

Next year, we recommend providing the camp to an age group similar to the original demographic, which includes the 7th-12th graders. In addition to having expressed interest in being part of the camp again, there are enough children in this age group to create a lively camp environment.

As in years past, camp students will learn how to keep a detailed field notebook in which they will keep track of all camp lessons and activities. We plan to repeat activities that have been consistently well received, such as geocaching and birding around Barter Island, making fish-printed pillowcases, and learning about fish anatomy. We also hope to set up an aquarium in the classroom, as was

done in 2013 for the first time, so students can keep plants or critters to examine under a microscope throughout the week.

Acknowledgements

We would like to again express our sincere appreciation to Dave Payer for his unwavering logistic and personal support of this program over many years and the USF&WS Arctic Refuge for providing housing in Kaktovik. Master teacher Marilyn Cook demonstrated amazing creativity, patience, understanding, and leadership as an instructor. We thank our enthusiastic teaching assistants, Heidi Helling (USFWS), Brenda Dolma (Friends of Alaska's Refuges), Stephanie Smith (UTMSI), and special guest Roy Churchwell for imparting their wisdom and knowledge to the kids of Kaktovik. Finally, we are extremely grateful to Tracy Burns, who has become a critical resource for us and to her native Kaktovik community. Her deep cultural understanding of Kaktovik and the children of Kaveolook School has enabled us to effectively engage local children and excite them about discovery and the nature of science.



Figure 1. Lenora examines sand grains, polar bear hair, and marine algae under a dissecting microscope.



Figure 2. Danny prepares to “race” his plankton creation.



Figure 3. Roy Churchwell takes the students bird watching in Kaktovik.



Figure 4. Flossie enjoying the Japanese art of Gyotaku, or fish-printing.



Figure 5. Students watching Tracy Burns' film, "Weather or Not". The image on the screen is village elder Robert Thompson.



Figure 6. Visitors peruse the classroom during the Science Camp Open House.

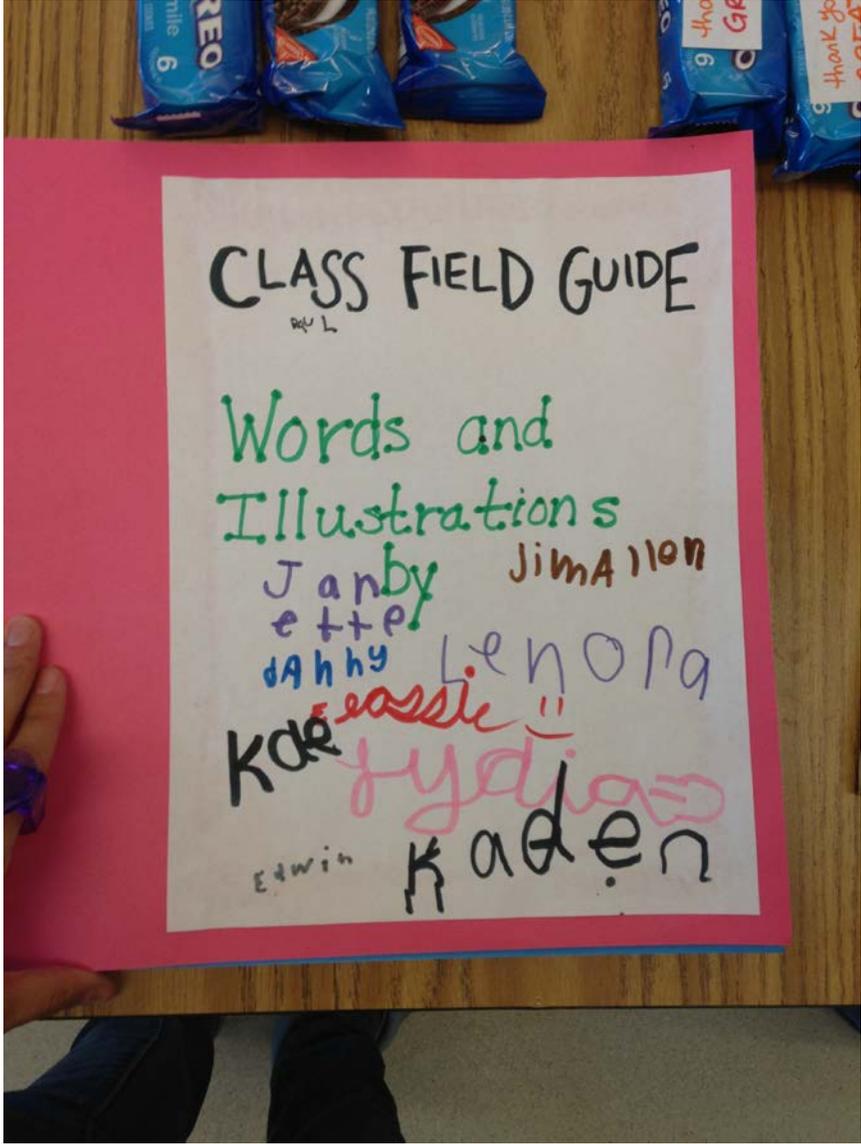


Figure 7. The cover of the student-created Field Guide, which was donated to the Harold Kaveolook School Library.