Noorvik students race each other on snowshoes during last spring’s Iñupiaq Days. Getting kids outdoors for play, subsistence activities, or just looking around is good for their minds, bodies, and spirits.

Kids Outdoors: Good for Their Health!

For many of us, spending time in the outdoors makes us happier, more relaxed, and healthier. The same is true for children. Studies show that children who spend time outdoors in nature are more creative and curious, have higher self-esteem, and are more fit. Children in the outdoors also gain valuable experience with the land and resources so important to cultural and spiritual well-being in our region.

Partnering with other organizations to get kids outdoors is one of the priorities of the Selawik Refuge.
Can’t teach old fish new tricks? That may be true, but scientists are using new tools to learn more about sheefish. U.S. Fish & Wildlife Service biologist Ray Hander and his Selawik crew, Frank Berry Jr. and Patrick Foster Sr., set up the Selawik River’s first full-fledged sonar system in September 2012 to learn more about the river’s highly prized sheefish.

Sonar works by sending out sound waves (which travel better than light or radar in water) and listening for signals that bounce back when the waves bump into solid objects. The sonar camera used on this project picks up acoustic signals from swimming fish and converts them into images that can be viewed on a computer. From these underwater images the crew was able to count sheefish moving downstream after spawning.

The sonar was set up in a narrow stretch of river several bends above the mouth of Qiruilaq (Kerulu Creek) in the upper Selawik River, about 45 air miles east of Selawik village. This tool helps scientists monitor the number of spawning sheefish. This is worthwhile not only because sheefish are a highly valued subsistence food, but also because the “thaw slump” on the upper Selawik River (see page 6) might be muddying their spawning habitat, located 26 miles downstream. By comparing the number of spawning fish now with the number before the slump, biologists and managers can get a better idea of whether the slump is affecting sheefish.

Biologists also collected small ear bones (otoliths) from 200 sheefish to find out the age of the spawning fish. By thinly slicing the otolith and looking with a microscope, scientists can see growth lines in the bone, one of which forms each year in a fish’s life. Meat from these harvested fish was cut, dried and distributed to people in Selawik.

Knowing the age of the fish is important because this tells us if sheefish are continuing to hatch and reach maturity in the years since the slump. Sheefish in our region typically reach maturity at 8-12 years old, so those hatched at the start of the slump (in 2004) should now be returning to the upper Selawik River to spawn. Collecting ear bones for aging can tell us if those fish are in fact returning.

Combining the sonar counts with the age information will help...
An ear bone, or otolith, (top left) has a small slice removed from it, showing age rings of the fish it came from.

Fishing the upper Selawik River: not a bad way to spend a work day!

The sonar is set up underwater in the upper Selawik River where the river is a suitable depth and width and where it is far enough below the spawning grounds.

determine if there are years when Selawik River sheefish did not successfully reproduce because of silt from the slump or for any other reason. This important research will likely be relevant in other areas of the Arctic, where slumps like the one on the Selawik River are expected to become more common with a warming climate and melting permafrost.

Funded through 2014, the sonar project will have several years of data by the time it is finished. Although subsistence fishermen and scientists know much about sheefish, there are still mysteries worth looking into about the behavior and ecological needs of these impressive fish.

Thanks to the Native Village of Selawik for their support and assistance on this entire project! This work would not be possible without the knowledge and outdoor skills of Selawik residents.

All sheefish in the upper Selawik River in fall are preparing to spawn, such as the one shown above. Fisheries crew members caught sheefish for a research project to learn how the thaw slump has affected sheefish survival.

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Who's Looking Out for the Future of the Caribou Herd?

Caribou are central to our lives in northwest Alaska, providing food, skins, bones, and antlers. Their presence is a welcome sight to us all.

What you might not know about caribou is that a group of people are looking out for the future of this important resource, meeting regularly to exchange information with each other and with agencies and biologists. This group, called the Western Arctic Caribou Herd Working Group, was formed more than 15 years ago through the efforts of tribal and agency staff who envisioned a more cooperative and inclusive approach to caribou management.

With 20 members, the Working Group is a broad spectrum of stakeholders with direct interest, knowledge, and concern about the Western Arctic caribou herd. Most of the group’s members are subsistence hunters from rural villages in the Northwest Arctic, North Slope, Koyukuk, and Seward Peninsula areas. The group also includes representatives from sport hunters, conservationists, hunting guides, reindeer herders, and transporters.

The Working Group does not have authority to make or change regulations or directly manage caribou. It is an advisory group that tries to provide unified recommendations from its diverse members to the Alaska Board of Game and Federal Subsistence Board.

One important feature of the Working Group is that management agencies and biologists are NOT voting members. The Working Group works closely with agencies such as the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, National Park Service, and Bureau of Land Management, but its recommendations are solely its own.

The Working Group meets annually in December, usually in Anchorage, to exchange traditional and Western scientific information and to make recommendations for research, monitoring, and regulations related to Western Arctic caribou. The group also supports education about the herd and fosters communication among all who value these caribou.

Caribou populations naturally go up and down. Since 2003 the number of
caribou in the Western Arctic herd has declined by 4-6% per year, a possible cause for concern. Based on recent data, biologists believe this decline is likely to continue. This is where the Working Group can shine, giving hunters a chance to exchange information with one another and to provide on-the-ground knowledge to agencies to promote a more inclusive decision-making process.

If the herd continues to decline and changes in hunting regulations are needed, the Working Group is ready to consider options and craft recommendations to the Alaska Board of Game and Federal Subsistence Board that best meet the needs of subsistence users, other members of the public, and the resource.

Please contact your representative on the Working Group (see box above) if you have questions or want to know more about the Working Group’s recent meetings.

The "trend" of the herd means whether the number of caribou is declining, increasing, or stable.

For instance, a declining herd with a population of 200,000-265,000 triggers a “conservative” management level which might involve some limits on harvest. More restrictions on hunting would be put in place with a declining herd that falls below 200,000 animals. A declining herd with a population below 130,000 animals triggers "critical" management and highly restricted harvests.

For more info, check out the plan on the Working Group’s web page.
Winter Trail Stakes Get A Makeover

A new style of trail stakes has been adopted by the Northwest Arctic Borough, similar to the kind in use on the North Slope. These are already in place between Kotzebue and Noorvik, and between Noorvik and Selawik.

Set into the ground, the stakes should stay upright from year to year. The flexible stakes are safer for snowmachine drivers and less likely to get tangled in the antlers of curious caribou or moose. To aid travelers unfamiliar with the trails, the stakes are marked with the name of the destination village. Willows will continue to be used on trail sections across frozen waterways.

Several of the region’s major winter trails cross the Selawik National Wildlife Refuge, including those from Selawik to Noorvik, Kiana, Ambler, and Buckland. It is a priority of the Selawik Refuge to continue to support the trail maintenance spearheaded by the Northwest Arctic Borough.

Selawik Refuge has purchased new stakes to mark the Selawik-Buckland trail, and the Borough is providing stakes to mark the Selawik-Ambler trail. This winter the stakes will be set in the snow. Next summer crews will travel along the routes by helicopter to put the stakes into the ground more permanently. Our hope is that residents will have sections of marked trails ready to go next year after the winter’s first snow!

"Thaw Slump" Update: Growing in Size But More Stable

The enormous landslide, or "thaw slump," that took place on the upper Selawik River in 2004 continues to expand. However, much of the eroding sediment is now being deposited on the floor of the slump, slowly "filling in" the hole, instead of being washed into the river. This is good news for water quality and for the sheefish spawning grounds 30 miles downstream.

Dr. Ben Crosby, a geologist at Idaho State University, has been studying the slump for the past several years. In 2012 he measured the slump’s headwall at 42 feet, considerably lower than the 82-foot height measured three years earlier. The lower headwall is evidence that the slump floor is filling in and becoming flatter. The total area of the slump is almost 13 acres, more than twice the size it was in 2007. Dr. Crosby estimated the total amount of sediment eroded by the slump at 760,100 cubic yards—or enough to cover 10 basketball courts 436 feet deep!

When the slump first occurred, the sediment it released completely blocked the river, which has since carved itself a new river bed along the far bank. Selawik elders say that before 2004 the channel hugged an undercut bank on the slump side.

Grass, shrubs, and other plants are starting to grow on the slump floor and on the silty new river bars. This helps stabilize the erosion, but long rainy spells or other events could start carrying the silt back into the river.

The photos at right show interesting changes in the slump from 2006 to 2012, and remind us of how the forces of nature shape the land in sometimes surprising ways!
The Complexities of Snow

Snow comes in many forms, as anyone who lives in the north knows. Not surprisingly, Iñupiaq has a much more descriptive vocabulary than English for types of snow. Among these are: *pukak* (granular or sugar snow), *misruligruaq* (falling snow mixed with rain), *qiqsruqqaq* (glazed snow), *maquyak* (soft spring snow, making traveling difficult), *aniu* (packed snow), and *qayukłak* (rough-surface snow from windstorms).

Scientists are far behind the Iñupiat in understanding the complexities of snow. Selawik Refuge has been working with universities, other agencies, and local communities to help scientists improve their understanding of snow and its qualities in our area.

Snow conditions are important for several reasons. The amount of snow, for instance, affects breakup, spring flooding, the likelihood of wildfires early in summer, the ability of animals to move around, and the depth of ground frost in winter. Snow with hard ice layers can create hardship for caribou by making it difficult for them to paw to the ground for food.

Because science relies on data, we have been looking at ways to document and measure snow conditions that would be useful in long-term monitoring of Western Arctic caribou, climate change, river levels, and habitat. The snow study we started last year with snow depth markers and i-buttons met with mixed success. We are using what we learned to revise those methods to come up with a better approach. One of the challenges we discovered is that layers in the snowpack continue to change over the winter (for instance, as temperatures change or as fresh snow turns into old snow), making it difficult to precisely measure or describe them.

Through all this, the deep understanding of snow by Iñupiaq elders has increased our appreciation for the complexities of snow, a substance that profoundly shapes our lives and arctic world for many months of the year. Stay tuned for future updates!
More Unusual Weather in Our Future?

Northwest Alaska has experienced unusual weather in recent months, including a very wet summer and a very dry winter (as of early January). These followed an unusually cold winter last year, and an unusually snowy winter two years ago. Are these all connected to a changing climate?

It is hard to answer that with certainty, but scientists predict that climate change will not only lead to warmer temperatures overall, but also to more extreme and unpredictable weather, perhaps similar to what we’ve been seeing lately.

Other parts of the world have similarly had extreme weather in recent months. These include a record hot summer in much of the U.S., excessive rain and flooding in Britain, heat waves and wildfires in Australia, and frigid temperatures in China, Russia, and northern Europe.

Arctic sea ice offered another startling climate-related event in 2012: summer sea ice covered a smaller part of the Arctic Ocean than ever before recorded. See the box below for details.

Summer Weather 2012

In 2012 Alaska had a cooler and wetter summer than normal overall. Kotzebue was only slightly cooler than usual (average June-August temperature was 1.2°F below normal), but was unusually wet in July and August. Our total summer rainfall (June-Aug) was 91% above average (8+ inches rather than the usual 4+ inches), including “a once in a 100-year rainfall event” in mid-August. Climate change may bring more of these unusual weather events.

Is "Climate Change" the Same as "Global Warming"?

Global warming refers to the worldwide rise in temperature near the Earth’s surface. It is caused mostly by greenhouse gases, especially carbon dioxide, building up in the atmosphere from human use of oil, natural gas, coal, and wood.

Global warming is changing climate patterns, but warming is only one part of climate change. Climate change includes changes in rain and snowfall, wind patterns, length of seasons, severity of storms, ice cover, and other effects that occur over several decades or longer.

2012 Sets New Record for Low Extent of Summer Sea Ice

Sea ice covered a smaller portion (24%) of the Arctic Ocean this past summer than ever before recorded. In mid-September the main pack ice was more than 500 miles north of Barrow. This followed a winter with MORE ice than usual in the Bering Sea as a result of the long cold spells in early 2012. The extreme change between the two seasons indicates a lot of young, thin pack ice. Some scientists think the arctic might be ice-free in summer by the end of this decade—which is not good news for ice seals, polar bear, and walrus.

High water this summer in rivers and along the coast flooded many camps.
Early January and So Little Snow?

Think “winter” and one color likely comes to mind: white. But the Northwest Arctic was unusually brown long into winter, seeing very little of the white stuff known as snow until mid-January.

How little snow did we get? By the end of December 2012, only 4 inches of snow had fallen in Kotzebue. Average for that time is 25 inches on the ground. In other words, the winter of 2012-13 started off with 83% below normal snowfall. Last winter, in contrast, Kotzebue received almost 63 inches (more than 5 feet!) of snow by January 1.

What are the impacts of so little snow? One is to limit overland travel by snowmachines across rough terrain, creating challenges for local residents who need to hunt, gather firewood, or travel to other communities. Another is thicker ice. Without the insulating effect of snow, ice layers grow thick when air temperatures are cold.

Some wildlife, such as caribou and moose, can reach food and move around more easily without deep snow. Other critters that burrow into the snow for insulation, such as ptarmigan and voles, have a harder time keeping warm without a thick blanket of snow.

Ugruk and Natchiq Threatened By Climate Change

Bearded seals (ugruk) and ringed seals (natchiq) in Alaska have recently been added to the endangered species list under the category of “threatened.” Threatened means a species is likely to become endangered in the future. Endangered means a species is at risk of going extinct.

The major challenge for bearded and ringed seals is the loss of adequate sea ice and snow cover, which they rely on for resting, molting, and the birth and rearing of pups. Sea ice and snow cover are both predicted to decline in the Arctic for at least the next 100 years.

The "threatened" designation does NOT change Alaska Natives' ability to harvest these animals. Subsistence hunting can continue as is, and is not considered a threat to these seals. If ice seal numbers decline over time to very low levels, regulations could possibly change.

National Marine Fisheries Service works with the Ice Seal Committee, an Alaska Native organization, to co-manage ice seals in Alaska and to ensure that sustainable harvest by Alaska Natives continues. For more information, see http://alaskafisheries.noaa.gov/protectedresources/seals/ice.htm.
What Swallows Can Tell Us

Selawik in the summer is green, grassy, and alive with birds. Among the most noticeable birds are swallows, perching on powerlines, swooping to catch mosquitoes, and nesting in boxes built by local residents. One researcher aims to use swallows in an innovative way to learn more about contaminants around the village of Selawik.

Swallows were given their name because they fly around with their mouths open, "swallowing" insects. Mosquitoes are one of their main foods in Alaska.

Swallows eat a variety of flying bugs, especially mosquitoes. Mosquitoes hatch from pools of water. If these pools are contaminated by a nearby landfill, the newly-hatched mosquitoes can carry the contaminants as well. As swallows eat these mosquitoes, the contamination can spread to the birds and their chicks.

To find out whether contaminants are entering the environment this way, researchers are proposing to put up swallow houses in the spring near the Selawik dump sites. In late summer, samples would be collected from several chicks before they fly away. Researchers would analyze contamination found in the swallow chicks, comparing these to chicks raised outside of town in cleaner habitat.

This type of project has been done successfully in other northern areas to determine a “fingerprint” of contaminants moving up the food chain. The approach is unusual in that it recognizes that contaminants can enter the environment through pathways other than water, something many scientists hadn’t appreciated until recently.

Dr. Angela Matz, a U.S. Fish & Wildlife Service contaminants biologist, and Dr. Da Chen, Assistant Professor of Zoology and Wildlife Research at Southern Illinois University, are the main researchers for this project. They will request approval for the project from the Native Village of Selawik before any work is done.

Contaminants from a landfill can also drain into the environment through waterways. To determine if the Selawik waste disposal sites are having an impact on fish, this project also proposes to sample nearby small fish or water bugs to see if they have absorbed contaminants.

Some of the specific contaminants that would be tested for in laboratory analysis include heavy metals like lead, mercury and cadmium (from old batteries, appliances, and vehicles) and fire retardants called PBDEs that come from household waste like plastics, mattresses, and furniture.

We hope that documenting contaminant levels and pinpointing how and where they get into the environment can help secure funding that will lead to a more permanent and sustainable waste disposal system for the people (and birds and fish!) of Selawik.
Welcome Chester!

Selawik National Wildlife Refuge welcomes Chester Ballot, who joined our staff as the Administrative Officer in early November.

Born in Selawik and raised in Kotzebue, Chester has had a distinguished career with Maniilaq Association as their Native Services Director and Contract Officer and with Bureau of Indian Affairs in Nome as their Tribal Operations Officer and Administrative Officer. Chester has also had leadership positions with the Native Village of Kotzebue and OTZ Telephone.

He is a veteran of the U.S. Army and currently serves on several boards in northwest Alaska, including Kikiktagruk Inupiat Corporation, OTZ Telephone Cooperative Board, and Kotzebue Broadcasting (public radio). We count ourselves lucky to have someone as talented and experienced as Chester join our crew!
Know the Land

The Inupiat have long inhabited the Selawik River valley, an area that Congress designated a national wildlife refuge in 1980. Many places throughout northwest Alaska hold deep meaning and tradition for local residents. Standard maps bear few of the Inupiaq names for these places. Here are two important sites in the Shungnak area.

Aŋutigruaq

A major landmark in the skyline south of Shungnak is Aŋutigruaq, the highest peak (4,130 ft) in a set of hills along the Kobuk River. In English the peak is known as "Old Man Mountain." Upper Kobuk residents look to Aŋutigruaq to foretell the weather, noting if the mountain top is cloudy, clear, or shows signs of wind.

Ukallit Iŋgii

Ukallit Iŋgii is a distinctive landmark on Shungnak's western horizon. Called "Rabbit Mountain" in English, this hill can be seen for miles around, marking the low-lying divide between the Kobuk and Selawik river valleys. It is commonly used as a point of reference by winter travelers in the upper Kobuk and Selawik areas.