



Resource Management Highlights

Summer 2019

Summer is our busy field season and in this newsletter, we have highlighted a number of key resource projects. This summer kicks off with the grand opening of our visitor center exhibits at the Seward Harbor. This year further marks the 30th anniversary of the Exxon Valdez Oil Spill, a sobering reminder of how our remote coastal areas can be impacted and why monitoring baseline information for the park is so essential.



Northwestern Fiord nearshore transect. USGS Photo.

Nearshore Monitoring

To understand current conditions and prepare for catastrophic events such as oil spills, since 2007 Kenai Fjords and the NPS Southwest Alaska Network (SWAN) have been monitoring six nearshore vital signs that include more than 200 species across the food web: black oystercatchers, intertidal invertebrates, eel grass and kelp, marine birds, sea otters, and marine water chemistry. With the selected vital signs and a spatial design that allows broad geographic inference, our monitoring program both detects change and assesses potential reasons for that change. Since 2012, SWAN and the interagency Gulf Watch Alaska Program have also focused on the nearshore benthic food web in the northern Gulf of Alaska. In March 2019, a late winter marine bird and mammal survey was completed in Kenai Fjords. Over-wintering sea ducks such as the Barrow's goldeneye and the harlequin

duck were common observations, but survey data are still being analyzed. June 2019 will be the 13th annual nearshore monitoring effort. Additional sea otter abundance surveys that occur every third year will be flown. We will also partner with Ocean Alaska Science Learning Center for a teacher workshop in the field.

Bats

In 2018, four acoustic monitors deployed in the park's coastal areas of Nuka Bay, McCarty Fiord, Paguna Arm, and Holgate Arm confirmed that bats live on the eastern Kenai Peninsula coast. Bats were also detected feeding over seawater in Verdant and Midnight Coves through recordings taken on the park's *M/V Serac* boat; this is one of the few official records that document bats feeding over seawater world-wide. All of the bats detected were little brown myotis (*Myotis lucifugus*),

although the park has the potential to host more species. This project was initiated to document bats prior to the likely spread of the devastating White-Nose Syndrome that has expanded across the Lower 48 states and Canada. Additional acoustic monitoring and bat captures are scheduled for summer 2019.

Invasive Plants

The park's invasive plant management team is successfully reducing large patches of common dandelion in the Exit Glacier area with herbicide. With fewer dandelions found in annually treated patches, we can apply less herbicide. For example, dandelion patches located south of the park road that were treated annually from 2016-2018 have decreased in size by an average of 76%! This project is a great example of how sustained management activities reduce the extent and impacts of invasive species in the park.

Coastal Marshes and Meadows

In 2018, the NPS Southwest Alaska Network (SWAN) began monitoring park coastal marshes and meadows of Beauty Bay, North Arm, and Harris Bay. In summer 2019, Structure-from-Motion (SfM) aerial photographs will also be collected, and both these data sets will provide a baseline for decadal monitoring. While surveying in the meadow systems, we saw evidence of a rapidly changing landscape, where vegetation succession has occurred following creek channel migration and other disturbances. Revisiting every 10 years will document the dynamism of these marsh and meadow habitats.

Invertebrate Pollinators

A two-year invertebrate pollinator study for nine parks will start this summer focusing on plant phenology (e.g. timing of leaf out, flowering, fruit set, and seed dispersal) and associated pollinator species. This project will likely give new insight on invertebrate pollinators such as native bees across latitudinal and elevational gradients in the nine parks.

June 21-23, 2019

1st Annual Seward Seabird Festival
NPS, Seward Chamber of Commerce, Alaska SeaLife Center, U.S. Fish and Wildlife Service, and local Seward businesses are joining together to establish an annual Seward Seabird Festival, the first festival celebrating Alaska's seabirds. Why Seward? Many visitors come to Seward to view numerous seabird colonies nearby. Resurrection Bay, where Seward is located, is currently the only location where year-round seabird surveys occur in Alaska!

Horned puffins. NPS Photo.



Photos from the timelapse camera overlooking the unnamed ice-dammed lake next to Bear Glacier before and after the glacial lake outburst flood event. Top photo: peak stage height on August 7, 2018. Bottom photo: after drainage on August 13, 2018.

Glacial Lake Outburst Flood

On August 7- 12, 2018, an unnamed ice-dammed lake next to Bear Glacier drained, resulting in a glacial lake outburst flood (GLOF) in Bear Glacier’s proglacial lake. Since 2017, the park and State of Alaska have been actively monitoring this ice-dammed lake with a timelapse camera to better understand the drivers, magnitude, and frequency of these events—a daily photo is emailed to us via satellite. In the August 8, 2018 photo, we observed a decrease in the lake surface height, indicating that a drainage event had begun. This observation enabled us to notify the public and local guiding companies of the imminent flood that was to occur downstream in the proglacial lake. In summer 2019, we will be analyzing the timelapse photos series leading up to this flood, and collecting transducer and elevation data to better quantify rates of hydrological change and flood magnitude.

Cultural Resources

Several mining-related projects are occurring in Kenai Fjords this summer. This summer will be the final year of fieldwork

Frontcountry Area

Exit Glacier Terminus Position

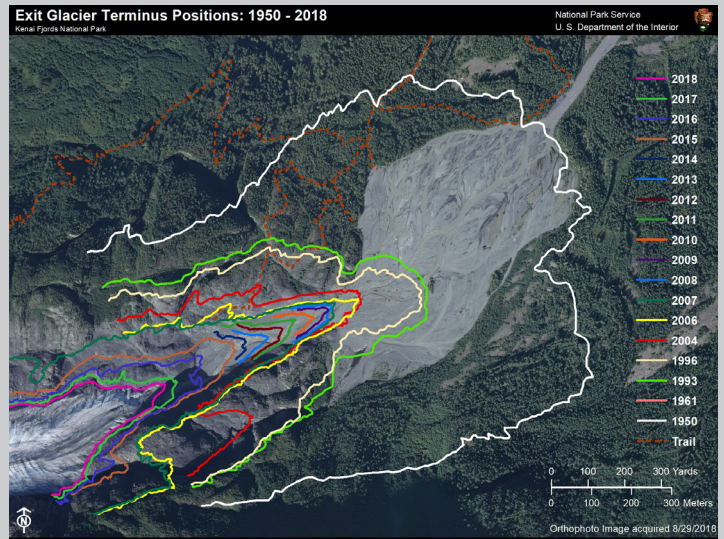
Between October 2017 and October 2018, the Exit Glacier terminus receded 36 meters (118 ft), about half what it was the year before (70 m) and the smallest amount of terminus retreat since 2009 (11 m). The average rate of retreat over the 203-year period for

which we have data (1815-2018) is 13.2 m/ year, but average rate of retreat over the last decade is much higher at 43.3 m/year. Park researchers will continue to map Exit Glacier’s terminus annually.

Visitor and Traffic Statistics

This summer, the park will be fine-tuning vehicle counts in the park’s frontcountry by testing out a new traffic classifier to identify and count different types of vehicles by measuring axel distances on the entrance road; in the past, only overall vehicle numbers were recorded. We will also be continuing to monitor Harding Icefield Trail hiker use.

for the Nuka Bay Historic Mining District Cultural Landscape Report (CLR), including an intensive inventory of previously recorded pre-World War II mine sites. The Cultural Landscape Report will have two parts: a summary of the analysis and a treatment plan for each site. A separate mine project to clean up the Waterfield-Goyne Mine in Surprise Bay will begin this year and focus on removing non-historic debris while leaving significant historic resources in place. This summer, work at Waterfield-Goyne Mine includes the removal of abandoned explosives and clearing



Exit Glacier annual terminus mapping.

Scenario Planning for Frontcountry Plan

In summer and fall 2018, the park conducted scenario planning meetings with park staff, the public, and affiliated tribal groups. Scenario planning recognizes that the future has a level of uncertainty and provides a way to think through actions related to different possible futures. In the meetings, we focused on specific changes in two conditions most likely to affect the management of the park: the rate of Exit Glacier retreat and visitation numbers. This summer, we plan to release the scenario discussion report, and the information will feed into the future Frontcountry Management Plan effort later this year.

a path for contractors to remove the nonhistoric debris at a later date.



Waterfield-Goyne Mine ore bin. NPS Photo.

Nearshore Ecosystem Response to Deglaciation

In 2017, NPS and U.S. Geological Survey initiated an interdisciplinary project to understand the role of glaciers in the nearshore marine environment. Seasonal measurements for oceanographic properties and nearshore biology are taken along the glacier-marine gradient in three types of fjords: tidewater glacier fjords, land-terminating glacier fjords, and fjords with little to no glacier presence. Oceanographic data quantify physical changes related to glacial input (e.g., turbidity, temperature, and salinity). Biological measurements reveal the distribution, productivity, and species diversity along this fjord length (axis), including marine prey sources (e.g., macroalgae and bivalves) and predators (e.g., sea stars, sea ducks, and sea otters). In 2019, the project will expand spatially and temporally to address seasonal variability in oceanographic characteristics and fjord-type. Monthly oceanographic data will be collected during the summer melt season.