



THE SEAN PEN

A Newsletter of the Southeast Alaska Network

New Collaboration Advances Adaptive Monitoring Design for Sea Otters in Glacier Bay

Sea otters, once extirpated from southeastern Alaska as a result of overexploitation for the fur trade, are now undergoing rapid population expansion into Glacier Bay. In collaboration with partners including the SWAN, USGS, and USFWS, we are undertaking an exciting new effort that will form the foundation for long-term monitoring of sea otters as a keystone species of the Glacier Bay marine ecosystem.

As the first step towards this goal, Colorado State University researchers were enlisted through the Rocky Mountain CESU to help optimize program design. The primary objectives of this new collaboration are to (1) use existing survey data collected by USGS to construct a contemporary model and adaptive sampling framework to estimate sea otter abundance while accounting for sampling error and underlying ecological processes; (2) evaluate the potential to improve



Sea otter populations are expanding in southeastern Alaska.

model performance by incorporating additional data sources to inform model parameters; and (3) to develop a corresponding adaptive monitoring framework that aims to maximize staff safety while minimizing model uncertainty and implementation cost to optimize program performance and sustainability.

Weather Station Installations Fill Critical Climate Data Gaps in Glacier Bay

A multi-year effort of planning and compliance for weather and climate monitoring in Glacier Bay culminated in August with installation of the first two of eight stations planned to fill broad climate data gaps. A hard-working team from the network, Glacier Bay, Klondike Gold Rush, and Parks Canada installed one station at the head of Nunatak Cove, and one at roughly 1,000 feet elevation, up the ridge separating Queen and Rendu Inlets. These represent the first two of eight stations planned for installation in Glacier Bay over the next several years. Operation of these new stations, together with existing stations will serve as the foundation of our long-term commitment to weather and climate monitoring. The latest station

observations, as well as the locations of planned future installations, are available at:

[Glacier Bay NP&P vicinity with latest observations](#)

[Klondike Gold Rush NHP vicinity with latest observations](#)



The hearty crew (above) packed in the weather station for installation. The station installed at Nunatak Cove (left).

Staff Updates

Jamie Womble (jamie_womble@nps.gov; 907-364-1577) with the Southeast Coastal Cluster and Glacier Bay is leading sea otter monitoring protocol development.

Cory Thole (cory_thole@nps.gov; 907-983-9263), with Klondike Gold Rush, will assist the network as Park Lead in weather/climate and water quality monitoring.

Lou Taylor-Thomas (907-697-2693) was recently hired into a shared position with Glacier Bay to serve as Park Lead for weather/climate monitoring.

Jim Lawler (jim_lawler@nps.gov; 907-644-3699) is the new regional I&M coordinator.

Nina Chambers (nina_chambers@nps.gov; 907-644-3695) is the new science communication specialist shared between the networks and region.



Monitoring Kittlitz's Murrelets

Glacier Bay is a summertime hotspot for a large portion of the global

Kittlitz's murrelet population. We've been counting the birds every summer since 2009, which makes it the only existing long-term monitoring program of Kittlitz's murrelets in the world. Results so far indicate the populations are highly variable in number from year to year. We are developing a project to investigate the rates of murrelet misidentification to minimize and account for this source of error within abundance estimates to improve survey accuracy and precision.

Water Quality Monitoring Data Available

Water quality monitoring instruments were operational for the sixth consecutive year in the Indian (Sitka) and Salmon (Glacier Bay) rivers; the Taiya River (Klondike Gold Rush) sonde was operational for its fifth season. The core water quality parameters (temperature, dissolved oxygen, conductivity, and pH) were monitored from mid-April to early November at each site. In addition, turbidity was measured at the Taiya River to monitor the effect of glacial outflow on water clarity. All water quality data are available on our website for download.



Craig Murdoch installs a water quality sonde in the Salmon River, Glacier Bay.

Publications

- Bower, M. R., L. A. Decker, A. L. Nowakowski, and C. L. Williams. 2014. Indicators of browsing pressure suggest constraints on riparian willows: a case study from the Bighorn National Forest, Wyoming. *Rangelands* 36(6):22-30.
- Esslinger, G. G., D. Esler, S. Howlin, and L. A. Starcevic. 2015. Monitoring population status of sea otters (*Enhydra lutris*) in Glacier Bay National Park and Preserve, Alaska - Options and considerations. USGS Open-File Report 2015-1119.
- O'Neel, S., E. Hood, A. Bidlack, S. W. Fleming, M. L. Arimitsu, A. Arendt, E. Burgess, C. J. Sergeant, A. H. Beaudreau, K. Timm, G. D. Hayward, J. H. Reynolds, and S. Pyare. 2015. Icefield-to-ocean linkages across the north Pacific coastal temperate rainforest ecosystem. *Bioscience* doi:10.1093/biosci/biv027
- Sergeant, C. J., E. N. Starkey, K. K. Bartz, M. H. Wilson, F. J. Mueter. In review. A practitioner's guide for exploring water quality patterns using Principal Components Analysis and Procrustes. *Environmental Monitoring and Assessment*.
- Sergeant, C. J., and W. F. Johnson. 2015. Southeast Alaska Network freshwater water quality monitoring program: 2014 annual report. Natural Resource Report NPS/SEAN/NRTR—2015/927. National Park Service, Fort Collins, Colorado.
- Sergeant, C. J., S. T. Hoekman, W. F. Johnson, and A. L. Schaefer. 2014. Monitoring Kittlitz's and marbled murrelets in Glacier Bay National Park and Preserve: 2014 annual report. Natural Resource Technical Report NPS/SEAN/NRTR—2014/925. National Park Service, Fort Collins, Colorado.
- Sergeant, C. J., J. A. Armstrong, and E. J. Ward. 2014. Predator-prey migration phenologies remain synchronized in a warming catchment. *Freshwater Biology* 60:724-732.

QUICK UPDATES

- The **landform and landcover** vital sign will be replaced by a national land cover monitoring protocol being led by the IMD Central Office, based largely on the continued development and refinement of the NPScape toolset.
- A final **vegetation map** for Klondike Gold Rush was produced, completing this inventory for network parks.
- Baseline **soils inventories** continue in Glacier Bay.
- Information synthesis efforts underway include a **Natural Resource Condition Assessment** for Glacier Bay and **State of the Parks** reports for both Sitka and Glacier Bay.
- **Airborne, marine, and freshwater contaminants**, are being combined under a single protocol umbrella to improve efficiency and integrate a suite of currently disparate projects into a more cohesive environmental contaminants monitoring program.
- More in-depth analysis of results from our **oceanography, Kittlitz's murrelets, and freshwater water quality** vital signs will be initiated this year. Goals include detection of patterns and trends across longer time frames and evaluation of program performance in relation to monitoring objectives.
- A third year of preliminary data collection on **intertidal communities** was completed by Ocean and Coastal Resources branch staff.

Southeast Alaska Network

3100 National Park Road
Juneau, AK 99801

Mike Bower

Program Manager
michael_bower@nps.gov
907-364-2621

Chris Sergeant

Ecologist
christopher_sergeant@nps.gov
907-364-1591

Bill Johnson

Data Manager
bill_johnson@nps.gov
907-364-2624