



# Marine Contaminants

Glacier Bay National Park and Preserve  
Klondike Gold Rush National Historical Park  
Sitka National Historical Park

## Importance

Contaminants such as heavy metals and fuel are a threat to pristine marine ecosystems. Monitoring marine contaminants reveals important links between oceanic and atmospheric systems and demonstrates the effects of climate change and other anthropogenic influences on high-latitude oceanic systems. As part of a larger effort to monitor the condition of marine waters in the national parks of southeast Alaska, the Southeast Alaska Network (SEAN) monitors intertidal bay mussels (*Mytilus trossulus*) for hydrocarbons (fuel sources), persistent organic pollutants (such as pesticides and flame retardants), and heavy metals. The objectives of this monitoring program are to (1) track status and trends of contaminant levels over time and (2) provide a regularly updated reference data set that will be invaluable in the event of acute contamination event, such as a chemical or fuel spill in these well-traveled waters. The long-term monitoring effort will record and track contaminant levels of bay mussels in all three SEAN parks, following the well-documented national approach of the NOAA Mussel Watch program.

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Photo: NPS

Bay mussels are the target species for monitoring marine contaminants. Mussels are sessile filter feeders in the intertidal zone and live up to 20 years. Because of this, they can provide insight into chronic as well as catastrophic contamination threats. Mussels are easily accessible and relatively inexpensive to sample. In addition, mussels are the target species for a larger marine contaminant monitoring effort by NOAA and can be compared to a large existing national database.

## Program Design

Sixty-five samples of bay mussels (*Mytilus trossulus*) were collected from sites in all three SEAN parks for the initial assessment in 2007. Beginning in 2009, SEAN conducts regular, biennial (every other year) sampling on a selected subset of those sites—four sites at Glacier Bay and one each at Klondike Gold Rush and Sitka. The protocol for the subsequent assessments mirrors that of the NOAA Mussel Watch program. An additional legacy site at Klondike Gold Rush is monitored by NOAA. Beginning in 2013, SEAN will formally join the NOAA Mussel Watch program; NPS staff will collect and prepare samples for submittal to the national Mussel Watch system.

## Status and Trends

Results from the initial assessment of marine contaminants show that the intertidal areas of SEAN parks are pristine and generally have lower levels of contamination than most sites in the lower 48. All but a few samples had low levels of contamination, and the samples with higher amounts of contamination came from targeted areas near potential point sources of pollution and human activity (i.e., “hot controls” at boat harbors and fueling docks). The results of the initial assessment show that marine contaminants in Southeast parks are low and primarily attributable to local rather than regional or global sources.



Because mussels filter the water column, any contaminants present in the water are incorporated into their tissues. This monitoring effort analyzes mussels for heavy metals (e.g., mercury), polycyclic aromatic hydrocarbons (many of which are a by-product of fuel burning), and persistent organic pollutants (e.g., pesticides).