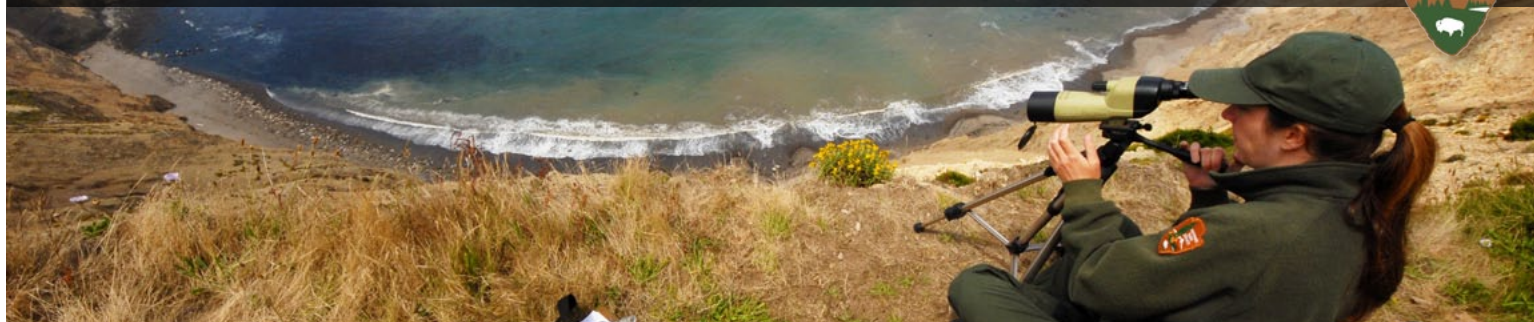




Monitoring In the Context Of Climate Change

Resource Brief

Above: The I&M program monitors harbor seals at Point Reyes NS and Golden Gate NRA. Changes in harbor seal populations may reflect changes in ocean conditions related to climate change. Photo by Jessica Weinberg.

Below: A Prairie Falcon nestling at Pinnacles National Park. Prairie Falcon populations depend not only on adequate habitat for themselves, but also for their prey, making them good indicators of environmental change. Photo by Gavin Emmons.



Below: Adequate habitat for coho juveniles depends in part on rainfall. Too little causes their streams to dry out prematurely, while too much can reduce water quality. Photo by Jessica Weinberg.



Global climate change may be altering ecosystems in the San Francisco Bay Area - changing fundamental processes such as temperature regimes and streamflow patterns. The National Park Service Inventory and Monitoring (I&M) Program conducts monitoring to track changes in plant and animal communities that will help illuminate the effects of climate change on our parks.

Freshwater Hydrology and Water Quality Monitoring

Streams and ponds in the San Francisco Bay Area Network support many aquatic species, including endangered coho salmon and threatened California red-legged frogs. Climate change could degrade habitat for such species by altering the amount of water and water chemistry in their habitats, and by changing drought patterns. The I&M program tracks trends in freshwater hydrology and water quality network-wide.

Monitoring Aquatic Animals

The abundance of federally-endangered coho salmon in California streams is at about 1% of historical levels. Ecosystem changes associated with climate change - including unreliable ocean conditions for migrating smolts and changing rainfall patterns that affect stream habitat for juveniles- may inhibit coho survival and recovery. The I&M program tracks coho of different age classes in streams at Golden Gate National Recreation Area and Point Reyes National Seashore. The I&M program also monitors the abundance of California red-legged frogs in ponds at Pinnacles National Park.

Vegetation Community Monitoring

The San Francisco Bay Area is iconic for its mosaic of vegetation communities. These communities consist of suites of co-existing plant species. Effects of climate change may alter the location and abundance of these communities or create entirely new combinations of plant species. The I&M program is tracking changes in plant species within high-priority plant communities throughout Bay Area National Parks.

Avian Community Monitoring

Because they respond quickly to changes in resource conditions, changes in bird populations may indicate changes in the plant communities or climatic conditions upon which they depend. The I&M program tracks changes in songbird communities in riparian habitats at Point Reyes NS and Golden Gate NRA. In addition, the program monitors changes in populations of Prairie Falcons at Pinnacles NP and endangered northern spotted owls and western snowy plovers in the northern Bay Area.

Monitoring Marine Indicators

The I&M program monitors marine indicators that are vulnerable to climate change via changes in ocean temperature, more frequent El Niño events and habitat loss due to sea-level rise. These include invertebrate and algal communities in the rocky intertidal zone, as well as harbor and elephant seals that breed on park beaches.

For More Information

San Francisco Bay Area Inventory and
Monitoring Program Manager
Daniel George, daniel_george@nps.gov

SF Bay Area National Parks Science and Learning
<http://www.sfnps.org/climate>

San Francisco Bay Area Network
<http://science.nature.nps.gov/im/units/sfan/>

