National Park Service
U.S. Department of the Interior

Denali National Park and Preserve

Central Alaska Network Inventory & Monitoring Program

What Denali and the other two parks in the Central Alaska Network share in common are their vast landscapes of relatively unaltered ecosystems.

Applying good science to resource management is our best hope to restore and retain the rich heritage found in our National Park System.

What's out there in our national parks? Are these natural resources changing over time?

These questions and many more are the heart of what scientists working with the National Park Service's Inventory and Monitoring (I&M) Program are trying to address. Park administrators who make decisions about park lands can draw from timely and reliable I&M Program information. By basing decisions on sound science, park managers will be better able to ensure that future generations will enjoy parks, wild and intact. In so doing, parks will be meeting the mandate of the 1916 Organic Act, which established the National Park Service (NPS) and directs that park lands will be "unimpaired for the enjoyment of future generations."

In 1998, when Congress passed the Omnibus Management Act, the National Park Service was given "clear authority and direction for the conduct of scientific study" and was directed "to use the information gathered for management purposes…" As a result, the NPS drafted the Natural Resource Challenge to "revitalize and expand natural resource programs, strengthen partnerships with the scientific community, and share knowledge with...the public." The NPS developed and funded the I&M Program as part of the Natural Resource Challenge.

National I&M Program

Nationally, the Inventory and Monitoring Program organized parks into 32 networks. Each network is made up of parks that share similar geography and natural resources. Each network is responsible for selecting and monitoring the key physical, chemical, and biological resources of its parks. The primary goal of the Inventory & Monitoring program is to understand relationships within network ecosystems and to monitor them for change.

Much like heartbeat and blood pressure are indicators of human health, key environmental "vital signs" such as water quality, species abundance, and climate are indicative of park health. Vital signs vary among the networks, reflecting the special characteristics of each region. Coordination among scientists from the National Park Service and other agencies helps networks focus research efforts, gather data, and distribute findings to administrative, educational, and public entities.

Alaska's parks are grouped into four networks: the Arctic, Central Alaska, Southwest Alaska, and Southeast Alaska Networks.

Parks in the Central Alaska Network

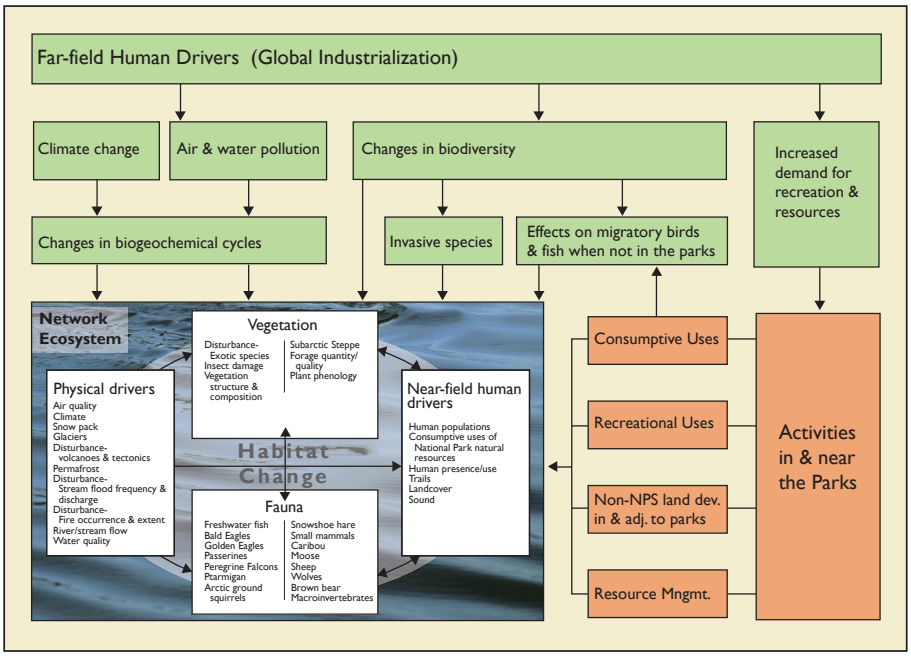
The Central Alaska Network (CAKN) is composed of Denali National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Yukon-Charley Rivers National Preserve. CAKN represents 25% of the 21.7 million acres of land in the National Park Service system. The most significant shared feature of these parks is their largely wild and unaltered landscapes. These parks provide the opportunity to witness and document natural processes at large spatial and temporal (time) scales.

Central Alaska Network parks will monitor 37 vital signs of ecosystem health, including snowshoe hare populations (top), climate, plant phenology (middle), and glaciers (bottom).

Monitoring vital signs

The Central Alaska Network views communication across the disciplines critical to monitoring the vast ecosystems of these three parks. For example, information about physical "drivers" of ecosytems (such as climate, snow pack, or glacier thickness) will be available to those studying other ecosystem components affected by these drivers, such as insect damage, plant phenology (seasonal changes), vegetation structure, or fish or mammal population dynamics. Through this holistic view of park health, the I&M Program can both provide a reference point for comparisons with altered environments outside park borders, and integrated information for a variety of management, scientific, and educational purposes.

Of the 37 vital signs, which the Central Alaska Network has selected for monitoring, nine vital signs relate to physical drivers (e.g., air, soil, water, disturbance), six relate to vegetation (e.g., exotic species, vegetation structure, plant phenology), fifteen relate to animals (e.g., freshwater fish, ptarmigan, caribou, macroinvertebrates), and seven relate to local human drivers (e.g., human populations, human presence, and consumptive uses of resources). The CAKN I&M Program chose to focus on vital signs that would signal habitat change in order to predict and possibly model future landscapes. If managers have access to some projections of what changes are likely, they can develop better strategies for resource protection.



This model of network ecosystems in Central Alaska Network parks summarizes how the vital signs that will be monitored (physical drivers, vegetation, fauna, and human drivers) may be influenced by global and local changes.

The Central Alaska Network (the map shows the three parks) is one of 32 networks established nationwide, in order to understand national park ecosystems and monitor them for change.

A principal investigator has been assigned to each vital sign. The investigator's first task is to develop a detailed set of instructions, or protocol, for how to monitor that vital sign. The CAKN will implement 11 vital signs in 2006 based on their historic connection to other monitoring projects and their feasibility (economic and logistical). Cooperating scientists from other institutions or agencies will develop and implement the protocols for monitoring the other 26 vital signs over the next five years (2007-2010). The *Central Alaska Network Vital Signs Monitoring Plan* (2005) lists and explains CAKN's vital signs and their implementation schedule across the three parks.

Denali and Long-Term Ecological Monitoring

Because of Denali's role as a Long-Term Ecological Monitoring (LTEM) prototype park from 1991 to 2002, Denali has played an important role in the development of CAKN's ecosystem and landscape approach to monitoring. Lessons learned from Denali's Rock Creek Watershed, and from sampling using a grid to integrate multiple resource components, have been applied to the development of CAKN protocols. Denali's LTEM program was integrated into the CAKN I&M Program in 2004.

For more information

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or visit the following websites:
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