



Soils Inventory

Background

The Alaska Regional Inventory and Monitoring Program manages the soil inventory, along with inventories of base cartography and vegetation, for national parks in Alaska. The state encompasses 16 park units that make up 65% of the acreage managed by the National Park Service throughout the country. A regional approach is taken for inventorying soils in the vast, remote parks of Alaska. Nine other inventories, which complete the set of inventories that form the baseline of biological and physical information in national parks, are managed through a combination of national, network, and park efforts.

Soil influences ecological processes that drive vegetation patterns, regional hydrology, nutrient dynamics, and habitat development. Soil inventories provide a snapshot of information on the condition and status of soil in a given area and provide valuable information about the influences soil has on landscapes and ecosystems. When conducting soil inventories, scientists study five factors that influence and form soil in order to identify and classify them: climate, topographic relief, biological activity, time, and parent material. Field work consists of digging 1–2 m holes, examining physical and chemical properties of the soil, and recording findings. Observations are also recorded for vegetation, landforms, surface hydrology, susceptibility to erosion or disturbance, thickness of permafrost, and effects of wildfire.



Photo: NPS

An inventory technician digs a soil pit in Yukon-Charley Rivers National Preserve. Both methods used to complete the soil inventory include significant amounts of field work.

Methods

Soil inventories in Alaska take advantage of two methodologies. The first uses expertise from the Natural Resources Conservation Service (NRCS), Palmer, Alaska field office. This method is well established and nationally standardized, and it is similar to NPS Soil Resources Inventories commonly performed in the conterminous United States.

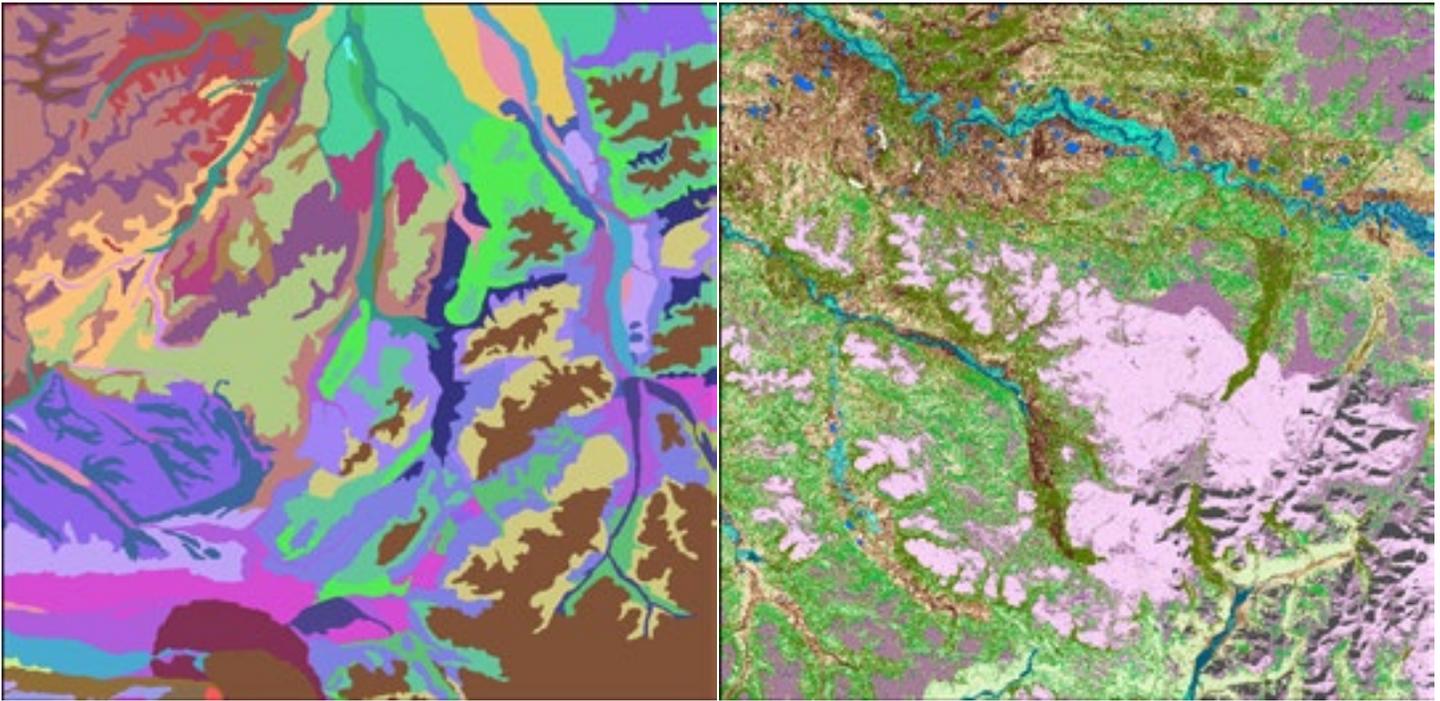
The second method relies on environmental consulting firms to perform Ecological Landscape Surveys (ELS). This method merges satellite image processing techniques and statistical analysis with soils data from field surveys to build computer-based ecological models through which park-wide soils information (soil landscapes) can be extracted. By employing these methods in parallel the Inventory Program is able to shorten the timeline for conducting soil inventories in Alaska.

Both methods rely on extensive field observations and soil sampling, provide ecological descriptions, and use similar soil taxonomy classifications. Each provides reliable and consistent scientific information for subsequent soil monitoring activities, park management, and resource protection.



Photos: NPS

Soils vary widely across the landscape of national parklands in Alaska from a well developed rocky soil at an alpine site, left, to a thick peaty soil from a bog showing an upward transition from sedge peat to sphagnum moss, right.



The pair of images show a section of soil maps for two national parks in Alaska. The Soil/Ecological Site Inventory method was used to survey soils in Denali National Park and Preserve, left, and the Soil Landscapes method was used in Gates of the Arctic National Park and Preserve, right. While the two methods are slightly different, they produce similar, compatible products.

Status

To date, baseline soil inventories have been completed or are underway for 91% of the area in Alaska's national parks. Park units in Alaska receive one of the two methods described above.

Soil/Ecological Site Inventory (NRCS) mapping has been completed for Denali National Park and Preserve and Yukon-Charley Rivers National Preserve; both parks are located within the Central Alaska Inventory and Monitoring Network. NRCS-style soil inventories are currently underway for Glacier Bay National Park and Preserve, Klondike Gold Rush National Historical Park, and Sitka National Historical Park.

Soil surveys using the Soil Landscapes method have been completed for parks in the Arctic Network, which includes Bering Land Bridge National Preserve, Cape Krusenstern National Monument, Gates of the Arctic National Park and Preserve, Kobuk Valley National Park, and Noatak National Preserve. Soil Landscape surveys have also been completed in Wrangell-St. Elias National Park and Preserve in the Central Alaska Network. Soil Landscapes surveys have been completed for Lake Clark National Park and Preserve and are now underway in Kenai Fjords National Park. Inventories for the remaining parks in the Southwest Alaska Network—Alagnak Wild and Scenic River, Aniakchak National Monument and Preserve, and Katmai National Park and Preserve—are planned for completion at a later date.

As part of the baseline soil survey, several products are produced for all national parks in Alaska. They include descriptions of soil characteristics, maps showing soil types, and general information about landscapes and terrain. Reports and additional resources are available on the inventories website.

Soils Inventory

Applications of Soil Inventories

Soil inventories provide basic information needed to manage soil sustainability in parks. Soil inventories provide park managers with the ability to predict the behavior of a soil under alternative uses and determine its potential as an erosion hazard, for ground water contamination, suitability for native plant communities, and its potential for preservation of cultural sites and landscapes among other applications (National Park Service, 2009). Soil inventories also serve as the baseline information for monitoring of soil resources by the Vital Signs Monitoring Program. Data from soil inventories is currently being used to develop models of future permafrost coverage in Alaska's national parks.

Products are available through the Integrated Resource Management Applications database (irma.nps.gov).

<http://science.nature.nps.gov/im/units/akro>

National Park Service. 2009. Strategic plan for natural resource inventories: FY 2008 –FY 2012. Natural Resource Report NPS/NRPC/NRR—2009/094. National Park Service, Fort Collins, Colorado.

Program contact: Parker Martyn
(907) 644-3697
Parker_Martyn@nps.gov
<http://science.nature.nps.gov/im/units/akro/>

