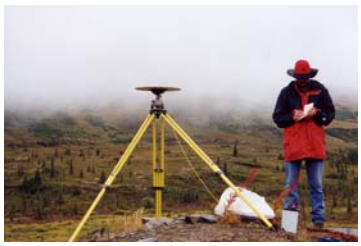
Handbook for Researchers (version 10/28/08)

Denali National Park and Preserve encourages scientific studies and research that help park managers understand and protect the parks natural and cultural resources, provide quality visitor experiences, and sustain traditional ways of life.

The following pages are provided to help guide researchers planning to conduct research at Denali.

(a)



(b)

(a) 1961 Archaeological excavation (Photo credit: DENA Archives. 19.15)

(b) 2002 Using GPS to measure earth movements near the Denali Fault (NPS Photo)

Table of Contents

Important Contact Information for Researchers:

Who should I contact to find out more?

Research Administrator: (907) 683-6352
Research and Collecting Permits
- Research Permit and Reporting website
- Applications and renewals
- Research proposal formats for quickest reviews

Research logistics and requests from researchers for
- Backcountry camping permits
- Housing in the park
- Road Permit (if approved) to drive a private vehicle on Denali Park Road beyond Savage River

Finding additional contact information
- Park staff in subject areas to serve as research liaisons
- Other information

Museum Curator: (907) 683-9536
Collections as part of research
Curatorial responsibilities
Short or long-term loans to house specimens or objects at a place other than Denali
Requests to use the Denali museum collections

Wilderness Coordinator: (907) 683-9539

Backcountry Information Desk: (907) 683-9510 (summer), (907) 683-9586 (winter)

Center for Resources, Science, and Learning
- Assistant Superintendent for Resources, Science, and Learning (907) 683-9581

Murie Science and Learning Center:
- Facilities Manager (907) 683-1269
- Educational Coordinator (907) 683-6440

All photos in this document are NPS photos unless otherwise noted.

Research Needed by Park Managers at Denali

Research needs for Denali
All these projects are viewed as needed or useful for Denali.

High-priority research that the park may support logistically
These research projects are underlined.

Research for which data already exist
These projects are followed by an asterisk.

Physical Resources
Impacts of Off-Road Vehicles (ORV's), including snowmachines, on soil compaction*
Impacts of social trail development – erosion and runoff
Glacial history
Glacier change / climate change effects on glaciers*
Surging glaciers*
Climate trend modeling, with comparisons to regional and global trends*
Paleontological inventory (timing relationships, locality studies, Cantwell formation bio-stratigraphy)*
Detailed geological mapping*
Tectonic and fault relationships, timing, and characteristics*
Water quality improvements since the end of mining activities*
Natural recovery of mined lands (plants, rivers)
Analyses of remotely sensed and related spatial data*
Arctic haze, transport of industrial pollution, visibility change analysis*
Effect of Coal-fired electric generation on air quality
Refinement of soil inventory in regions of plant range extensions*

Biological Resources
Development of wildlife survey techniques
Development of improved species survey techniques
Development of animal tracking technology
Test of aerial transect wolf surveys
Development of bear survey techniques
Abundance and distribution of flora and fauna*
Abundance, distribution and population dynamics (including survival) of Dall's sheep*
Meso-carnivores, including furbearers (wolverine to weasels)
Population dynamics of arctic ground squirrels
Abundance and distribution of snowshoe hare and willow ptarmigan
Distribution of beaver colonies and the effects on landscape change*
Wood frog abundance, distribution, and trends*
Fish species distribution*
Salmon spawning stream distribution*
Salmon stock trends
Terrestrial invertebrate inventory, distribution, trends
Insect (choose a species) inventory, distribution, trends
Monitoring techniques for wolf and bear prey species to help determine population dynamics*
Migratory bird studies:
--species of conservation concern including Olive-sided Flycatcher, Rusty Blackbird, Blackpoll Warbler, and Arctic Warbler
--studies based on recommendations made by Boreal Partners in Flight
Resident bird studies:
--identifying the factors that influence the abundance of distribution of species (choose one species or guild)
--abundance and distribution of White-winged Crossbill and Redpolls in relation to cone crops
Abundance, distribution, and populations trends of Gyrfalcons*
Abundance, distribution, and population trends of forest-nesting owls

Abundance, distribution, and population trends of shorebirds
Abundance and distribution of short-eared owls (one of the only raptors listed on the National Partners in Flight species of concern list)
Non-vascular plant inventory and guide*
Studies and research utilizing the Denali museum collections*
Effects of climate change
Effects of climate change on subsistence species
Carbon balance, mycorhizal activity related to global warming
Aquatic invertebrate abundance and distribution, related to climate change
Plant species range expansion and invasion, due to climate change*
Vegetation changes related to climate change*
Changes in wetlands and wetland species in relation to climate change (including boreal wetland birds, e.g., grebes, scaup, and rusty blackbirds)
Changes in alpine areas and response of alpine-associated fauna in response to climate change (e.g, Dall's sheep, arctic ground squirrel, hoary marmot, pika, and white-tailed ptarmigan)
Behavioral response of obligate hibernators (arctic ground squirrel and hoary marmot) to climate change
Behavioral response of pika to climate change
Anthropogenic change*
Shorebird use along roads with different levels of development
Gull behavior near and away from rest stops
Density of songbird nest predators in campgrounds and in non-campground areas
Snowmachine effects on moose energetics
Exotic species removal and prevention*
Effects of shallow gas exploration and development on park resources
Presence and level of persistent organic pollutants in migratory raptors (merlin, peregrine falcons) [in cooperation with USFWS]*
Landscape level characterization studies
Phenology studies*
Permafrost characterization and trends
Analysis of seasonal and long-term landscape change at a parkwide scale (infer change over large spatial scales using remotely sensed data and data from sites measured intensively*

Cultural Resources
Documentation of the scientific legacy of Denali National Park and Preserve*
History of Kantishna Mining District*
History of mountaineering on Mt. McKinley*
Archaeological surveys*
Aboriginal land use in the park*
"Early man" studies, travel and hunting routes*
Oral histories, collection of historical items (photos, journals, etc)*
Cataloging Adolph Murie's field notes and photographs

Social Science
Visitor experience and expectation studies – specific to user classes (climbers, cruisers, backcountry users, family, international visitors)*
Changing patterns of use and visitor experiences
Road character impacts on visitor experiences
Perceptions of wilderness to backcountry users*
Studies on what is the "Denali" experience
Climber experience studies
Studies of sport hunting in Preserve
Visitor impressions of park soundscapes
Attitudinal studies of park management
Visitor satisfaction of camping, lodging, and backcountry opportunities – changing patterns of visitation*
Wildlife viewing expectations, patterns, and changes
Visitor demographic trends
Winter use interests and development opportunities
Trends in flightseeing and overflight activity, visitor expectations, etc
Analysis of additional recreational opportunities

Fire and Fuels Management
Relationship of climate change on fire regime - fire occurrence, extent, and severity
Evaluate smoke transport models in Interior Alaska
Empirically test fire break effectiveness
Fire return intervals for the various biomes of Denali*
Risk models for fire potential, incorporating values at risk, fuels, and fire behavior
Validation of fire danger weather indices and fire behavior models utilized in Alaska*
Empirical testing of fuels treatment for developing improved treatments*
Documentation of short and long-term effects of fire and suppression on subsistence resources and their habitats
Effects of repeated fires on biota
Effects of severity, moisture and seasonality of burns on successional pathways*
Effects of increased fire frequency relating to warmer climates on vegetation and fuels composition*
Effects of fire including burn severity on aquatic systems

Integrative Work
Relationhip of climate with species distribution and abundance
Relationships among monitoring components
Synthetic understanding of lake systems (climate, limnology, biology)
Effects of Off-Road Vehicles (ORV's) on hunted species
Analyses (relationships) of data collected in soil and ecological inventory
New technologies for resource management

Applying to Conduct Research or Science Education Studies at Denali

How do I apply to conduct a resource study at Denali?

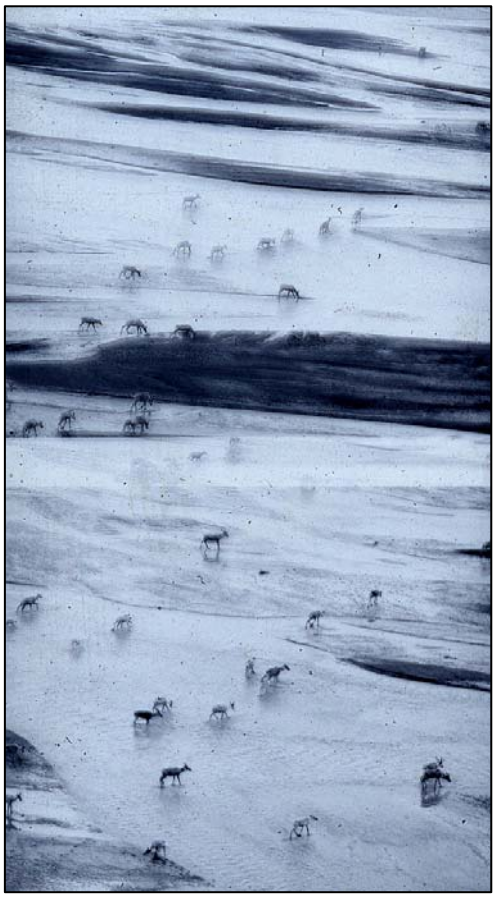
Any scientist wanting to conduct research in any national park must fill out an application and submit a study plan or proposal. To expedite this process, the National Park Service has developed a website known as the Research Permit and Reporting System (RPRS). Scientists can file an application using the RPRS website http://science.nature.nps.gov/research. The study plan can be uploaded onto the website (preferred), or transmitted to the park by email, hardcopy, or fax. The proposed project will receive the quickest review if both the application and the proposal follow the guidelines listed on the RPRS website and Denali's guidelines for proposals.

What do I need to include in my study plan?

The study plan must describe the objectives and the rationale for working in Denali, and provide enough detail about the study locations and methods including logistics so Denali Park staff can adequately review the study plan for any administrative or compliance concerns, assess how the proposed project fits in with the overall science goals of the park, and set the conditions of the research permit, if approved and issued. Projects are evaluated for impacts, not scientific merit; however, project information will be valuable to the park, if the science is sound. It is encouraged that potential researchers discuss their proposals and field sites with an appropriate Denali staff member and ask for current information that could enhance research studies.

Reviews of research projects will be more likely to be positive, with quick turn-around times, if researchers…

- Follow the guidelines for proposals given on the RPRS website
- Provide adequate justification for why the project should be conducted in Denali and not elsewhere
- Provide maps or coordinates showing study sites
- Provide clear description of methods for Denali
- Agree to ride the bus or hike to study sites OR provide adequate justification for why a permit for aircraft or road access is needed
- Include in the study plan any requests for housing and administrative backcountry permits
- Have considered minimum tool and minimum requirements according to wilderness law for any proposed activities in wilderness
- Plan no permanent structures
- Limit or avoid digging or collecting
- Obtain, in advance, special permits as required for work with sensitive species (state, federal permits)
- Present ideas for an educational outreach project



For a complete list of tips for research proposal, see "Are you thinking of applying to conduct research at Denali?"

When do I need to apply?

Researchers should apply as early as possible to ensure the required paperwork is completed well before the intended start date. According to National Park Service code, all research in the park must operate under a valid research permit. Researchers must have approved permits signed by the Assistant Superintendent in order to conduct research in Denali.

Permit applications for most projects submitted two months in advance of the proposed starting date can be assured of being processed without delaying the project start date. However, if the research involves access by aircraft, wildlife capture, extensive collections, or substantial disturbance, permanent structures, or other issues requiring detailed compliance, allowing more time is advised.

- **Submit your application/renewal by March 31 for the time period June 1 – September 15**

OR

- **Submit your application/renewal at least two months in advance of your proposed start date**

If you can not submit your application (with study plan) at least two months in advance of your proposed start date, we will do our best to process the materials quickly but we cannot guarantee that your proposed research can be reviewed in time to issue a research permit by the date you intended to begin. Again, discussing the project with park staff will increase odds of project approval, decrease time to project approval, and increase project success.

Can I collect specimens at Denali?

Collecting permits may be granted for limited collecting of objects, whole organisms, or parts of organisms (e.g., leaves). Permits may be granted for collecting animals and releasing them after they have been measured or tagged. Specimens that are not destroyed remain the property of the National Park Service and are cataloged into Denali National Park and Preserve's museum collection. Arrangements must be made in advance in order for specimens to leave the park and be stored elsewhere for short or long time periods.

Researchers follow "Curatorial Responsibilities for Researchers" related to any collections, including

- Describe proposed collections (size, number, etc.) in the application
- Obtain signature from the curator of home institution (fax signature to research administrator using application form) for any collections proposed to be loaned to another institution on a temporary or more permanent basis

What Are the Obligations of Researchers?

Dates of Research

Researchers should include dates they will be in the park in their applications. Researchers should contact the research administrator to confirm or update schedule, prior to arrival.


Photo courtesy of Kent Miller

Safety

To make the research experience safe for researchers, other park visitors, and to ensure the protection of the park resources, researchers must complete appropriate Denali safety orientations at the park prior to field work. These safety orientations may include

- bear safety (for day hiking and overnight stays)
- park road safety (if issued road permit)
- backcountry Leave No Trace ethics (for backcountry camping)

Investigator's Annual Report (IAR)

Each researcher reports results in an Investigator Annual Report (IAR) each year the permit is active. Anyone can access and read Investigator Annual Reports (IARs) for projects conducted in Denali and all national parks by going to the website http://science.nature.nps.gov/research. The website allows viewers to sort the Investigator Annual Reports by park, year, or investigator to find those IARs that would be of greatest interest.

Publications or Final Report

In addition to yearly IARs, researchers supply the park with copies of any publications, dissertations, theses, or reports resulting from the research conducted at Denali. Field notes are required to accompany any collections.

Educational Outreach

Researchers also include an educational component in their projects to help share information with others.

There are unlimited options for the format or approach of the educational component. Examples include giving a program for a general park audience, developing a research-based curriculum for classroom or website use, providing text and photos for a fact sheet, and creating other media. See "Sharing Your Research" for more ideas.


Photo courtesy of Kent Miller

Collections and Curatorial Reponsibilities

See separate document "Curatorial Requirements of Researchers."

Resources Available to Researchers

Collections at the Denali Museum

What is in the Denali Museum?

Denali National Park and Preserve's museum collection is an assemblage of objects, works of art, historic documents, and natural history specimens documenting the human and natural history of Denali. The collection includes biological voucher specimens for natural resource studies conducted within the park, and associated field records; early climbing gear; mining tools and equipment related to the Kantishna mining district; and archeological objects systematically recovered from within the park's boundaries, as well as the field records for them.

The museum collection includes over 6700 individual objects and 68 linear feet of archival material and collections. Natural history specimens number 5059 items, primarily plant specimens and mammal bone samples, bringing the total object count to 245,379.

Can researchers use the museum?

Due to a lack of suitable display space, most of the collection is maintained in a storage facility in the Headquarters area and is not on public display. However, access to the collection for research can be made by appointment. Part of the collection and curation functions are in a facility where there is space to accommodate researchers when using the collection. During 2008, over 200 research requests for information and access were handled.

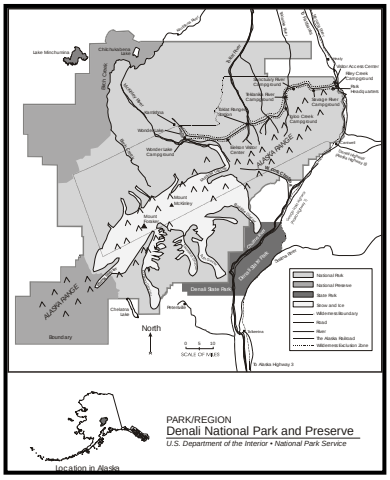
Murie Science and Learning Center

The Murie Science and Learning Center (MSLC), which is located in the entrance area of the park, is able to provide to researchers with approved research permits the following on a space-available basis:

- transient researcher office space, with access to phone and internet (wireless service)
- limited longer-term workspace for researchers-in-residence
- housing at MSLC field camp tent cabins

Access will be provided during normal hours of operation of the MSLC, and after hours by arrangement. There is limited non-heated storage space available. In the future there may be funds available to assist researchers-in-residence. Ask about this possibility. Contact the MSLC Education Coordinator to discuss possible education outreach products, such as exhibits and posters.

Geographic Information Systems (GIS)



Denali's GIS includes several hundred layers or themes of information (hydrology, elevations, buildings, roads, etc.) that can be overlain by the computer to form composite maps. In addition to producing maps and other visual products, the associated databases can be queried in a variety of ways to analyze the features appearing in the maps. The system is managed on a central workstation and used by park staff on their desktop computers.

The park maintains the entire NPS GIS dataset for the state of Alaska locally (over 100gb of data and over 18,000 coverages). The dataset is kept current through updates that are conducted nightly over the internet.

Recent notable additions to the park's GIS dataset include

- a complete soils layer and associated database for the park based on 6 years of field data
- high-resolution (1 meter) satellite imagery of the park for the road corridor (data for the entire park will be collected over the next 2 to 3 years resulting in a map with far more accuracy than USGS Topo Quads)

Layers of the GIS are available to researchers or others by going to the website http://science.nature.nps.gov/nrdata. GIS layers filed there can be sorted by park unit, type of file, category or subject matter.

Resources Technical Library

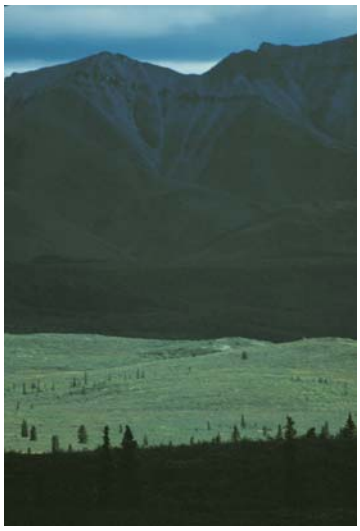
Final reports (dissertations, publications, books, and articles) resulting from or associated with research and resource studies are housed in Denali's Resources Technical Library at Park Headquarters. This library also includes limited background material relating to natural and cultural resources of Denali and Alaska.

Arrangements can be made to use these materials by contacting the Research Administrator. Library users can make use of a ProCite database to search volumes by author, title, year, or key words. Information linking the report to the research study is also available. Some materials are available electronically.

Administrative Files and Research Records

Administrative files of scientific and resource studies in the park, 1900 – present, are arranged by study number in fireproof file cabinets in the resources building at Headquarters. These files contain research applications, proposals and study plans, permits, correspondence, and interim reports. A computer database is maintained about the research studies. The database can be searched by author, approximate start year, study number, or key words in the title. Contact the Research Administrator for further information. Archived documents and collections are housed in the Denali National Park Museum or are loaned temporarily to other institutions.

Local Housing



For researchers with approved permits, limited housing opportunities may be available at simple apartments, rustic cabins, dorms, or tent camps within the park. Inquire for descriptions of potential housing, location, and availability.

Researchers can also request to camp in the backcountry with an administrative backcountry camping permit. This type of permit allows researchers to enter backcountry management units outside the backpacker quota (limit) for that unit. It may be possible to arrange to stay in Denali park campgrounds at reduced fees.

Several local campgrounds, motels, and hotels are open year-round. Contact the Healy Chamber of Commerce (907) 683-4636, or visit the web at http://www.denalichamber.com.