

# Summit Guide - 2011

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Summit Station was established in 1989 as the Greenland Ice Sheet Project 2 (GISP2) drill site. Since that time it has developed to support a wide range of scientific research on a year-round basis. The fields of meteorology, glaciology, atmospheric chemistry, and astrophysics are all represented. In addition, the station serves as a base for long-term environmental observations. This diversity of purpose exemplifies the importance of Summit Station as a research platform, but also creates some unique operational challenges. Research projects can sometimes employ conflicting methodologies, and even the operational requirements of the station itself can have detrimental impacts on some of the research being conducted.

Summit is situated inside the southern boundary of the North East Greenland National Park and located near the apex of the Greenland ice sheet at an elevation of 10,500 feet. The effective pressure altitude ranges from 11,000 to 12,000 feet. Weather conditions range from -108° F in the winter to approximately 32° F in the summer. Winds in the summer are generally mild, but can exceed 40 knots during storm events. Winter is the time of year when major storms often occur, with wind speeds recorded in excess of 70 knots.

The purpose of this document is to acquaint researchers with the system in place for facilitating a quality research environment at Summit Station. This is achieved by identifying responsibilities and the processes through which we can ensure a cooperative and mutually rewarding experience. Short and long-range plans are in effect to improve the station infrastructure, but the primary agent of change is you. By recognizing how your activities affect other research projects and modifying our behavior accordingly, we can continue to maintain a world-class research facility, and create an unparalleled example of environmental stewardship.

## Planning Process

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Begin planning for your project at Summit Station by contacting the CH2M Hill Polar Services (CPS) Summit Science Project Manager. CPS will work closely with you to determine your needs and keep logistics within the scope of NSF funding. Depending upon the level of complexity of your project, planning will be an ongoing process that will likely be finalized just a couple of weeks before your project deploys for the field.

After your initial contact with CPS, the next step is to insure that your project meets the Government of Greenland's permitting requirements. Visit [www.nanoq.gl/expeditions](http://www.nanoq.gl/expeditions) to view requirements and download forms from the Ministry of Domestic Affairs for conducting scientific research in Greenland. Almost all scientific research projects require government approval; you can find the guidelines and criteria on this webpage. Also, contact your Project Manager to determine if your project will fall under the existing CPS permit that covers Summit Station.

# Cargo

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Cargo movement to Summit during the summer months is on flights via the New York Air National Guard (NYANG) 109th out of Scotia, NY. All cargo destined for Summit is routed through Kangerlussuaq prior to shipment with the NYANG to Summit. Cargo arriving in Kangerlussuaq can arrive via commercial air from Europe or via the NYANG from Scotia, NY. Researchers will be asked to conform to the NYANG 109th's schedule. All cargo requirements and special needs should be communicated as early as possible to your Project Manager, as space on these flights is often very limited.

At Summit, a cargo line is provided for storing shipping containers, gas cylinders, and spare materials. Limited indoor heated storage for supplies and spare parts can be provided for items that cannot be frozen. Please work with your Project Manager to identify your needs for indoor storage prior to arrival at Summit. Researchers should plan to remove all of their supplies from Summit at the end of their deployment. Only priority items approved by the Project Manager can remain over the winter season or beyond the length of the science campaign.

All hazardous cargo must be identified to your Project Manager prior to shipment. Researchers are responsible for hazardous cargo arrangements and must provide MSDS to the Summit Station manager upon arrival. All hazardous cargo must be removed by the researchers upon completion of project or discontinuation of use.

# Station Layout

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Summit Station is a remote research camp that exists solely to support science needs. The station houses a variety of structures that are designed to support a highly variable population that ranges from a skeleton crew of five during the winter to peak summer population of greater than 40.

The Big House is a 26-foot-wide by 56-foot-long building that serves as the center of station activity. It contains the kitchen, dining area, communications office, and has a full bathroom and laundry facility.

The Green House structure is made of two 8-foot-wide modules with a 16-foot connecting link between them. It contains a laboratory, science office, emergency kitchen, bathroom, laundry, two bedrooms, and a lounge. The Berthing Module—the main living quarters, and connected to the Green House—has six rooms, including a small common area.

Power is supplied to the station by diesel generators in a module that includes a snow-melting device for water production. Other temporary structures are used around the station to support various science projects as needed.

Flights into Summit Station are via ski-equipped LC-130 (summer) and Twin Otter (winter) aircraft. The aircraft land on a snow runway or “skiway” that CPS maintains with heavy equipment.

# Conducting Research: Roles and Responsibilities

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As a year-round station with many different science interests, there are several different entities who you will be in contact with as you plan and implement your project.

## Science Coordination Office (SCO)

The nature of research conducted at Summit Station is very dynamic and diverse, and for this reason the Science Coordination Office (SCO) was established. The role of the SCO is to ensure that the needs of all researchers are met, and potential conflicts of interest between research projects and operational requirements of the station are minimized. The SCO is comprised of a team of researchers with ongoing projects at Summit, who have a comprehensive understanding of the operational requirements, various research projects, and station infrastructure. Its members advise researchers regarding science requirements and planning science for the unique environment of Summit.

Researchers considering fieldwork at Summit are strongly encouraged to contact the SCO during the proposal stage. It is also advisable to contact CPS during this timeframe. CPS can answer logistics-specific questions and provide each researcher with a project cost estimate that is suitable for inclusion in their proposal.

If contact with the SCO is not initiated during the proposal stage, researchers must contact both CPS and the SCO upon notification of funding. Once notified, CPS will distribute a Requirements Questionnaire to the researchers, who are expected to provide CPS and the SCO with an overview of the operational requirements as detailed in the questionnaire. From the information provided in the Requirements Questionnaire, and direct communication between the Project Manager and researchers, a Season Plan is developed that details the support provided by CPS. This plan is distributed to appropriate field team members, funding agencies, CPS staff, and the SCO. Season Plans are also posted at <http://www.polar.ch2m.com> and are available in hard copy at Summit.

Contact the SCO ([sco@summitcamp.org](mailto:sco@summitcamp.org); <http://www.geosummit.org>) with questions regarding science requirements.

## Summit Science Project Manager

The Summit Science Project Manager works directly with researchers to develop detailed support plans prior to deployment to Summit. The Project Manager also serves as a liaison between the SCO and researchers to ensure there are no conflicts of interest between science projects. Additionally, the Project Manager works closely with the Summit Science Technicians to ensure that science support requirements are met for projects requiring year-round support. Though not on-site for the entirety of the summer season, the Project Manager coordinates with the Station Manager and the SCO to ensure that project needs are met without exceeding the funded and planned scope of work.

Contact the Summit Science Project Manager (Katrine Gorham; [katrine@polarfield.com](mailto:katrine@polarfield.com); ph. 303-349-2884) with questions regarding Summit Station, support for your project, and any changes to project plans.

## Summit Science Technicians

Researchers requiring Science Technician services must request this support at the project planning stage. The researchers must work with the Project Manager to provide comprehensive science protocols. This information will be reviewed by the SCO and CPS to ensure the protocols provide adequate guidance for the Science Technicians and that the level of tasking can be supported with the current staffing level planned for the season. If the support includes collection and retro of samples the protocol must detail specific preparation/handing/shipping directions. If the project will be utilizing specialized equipment or instrumentation, the researchers must provide, in addition to appropriate documentation, adequate supplies and pre-deployment training.

It is recognized that the nature of experimental research sometimes requires continued troubleshooting and development. However, if the time committed to any given project routinely exceeds the anticipated level by 25% or more, it may begin to adversely affect other projects. In such an event, the SCO will assist with making recommendations in an effort to find a solution. All equipment, instrumentation, and science protocols must be completely operational before the Science Technicians can assume responsibility for an experiment.

The level of support the Science Technicians are able to provide is largely determined by the researchers who own the project. Researchers must communicate with the Science Technicians to ensure that support requirements are being met. When contacted by the Science Technicians regarding an experiment, it is the researchers' responsibility to respond promptly.

## Summit Station Manager

The Summit Station Manager has the final authority on all safety and operational issues. The Station Manager will establish the weather conditions, and may restrict or prohibit travel or other activities accordingly. Any concerns or requests should be addressed to the Station Manager. The Station Manager will often redirect researchers to their Project Manager, as appropriate.

# Services, People & Living

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## Accommodations

Most researchers and staff sleep in Arctic Oven tents. The tents are assembled on plywood floors to provide greater insulation and protect the tent from damage during shoveling. Participants are provided with sleeping pads and foam insulating board for added warmth and comfort. Indoor rooms are reserved for seasonal staff and science technicians.

## Food

Summit Station is staffed with a cook. Meals are provided six days a week, excluding breakfast, which is self-serve. On Sunday, staff and researchers are asked to assist with meals to provide the cook with a day off (typically, people cook their own food or have left-overs). The Station Manager will assign 'house mouse' duty on a rotating schedule to both staff and researchers. Those assigned are expected to dedicate a significant portion of the day to chores, cleaning, and kitchen assistance.

## Phone

There are Iridium, VoIP, and VSAT phones available at Summit. For non-emergency use CPS requests that researchers only use the VoIP phones, as these are the most economical. Phones are available at several locations around Summit Station; however, researchers are asked to limit personal phone use to 10 minutes per week, as the phones are located in public areas and primarily reserved for priority science and business needs.

## Computer/Internet

A guest computer is available for researchers and staff to use on a shared basis. Participants who bring their own laptops should ensure that a wireless card compatible with the IEEE-802.11 standard is installed on their computer.

Rather than develop a strict policy governing internet use, CPS offers the following guidelines:

- Science and business needs always take priority over personal use.
- Be aware that bandwidth is limited. Do not use video Skype, download videos, or other recreational internet usage that will compromise the available bandwidth.
- If possible, schedule activities that consume heavy bandwidth during periods of low usage. If that is not possible, make other participants aware of your plans so they can attempt to reschedule their usage.
- Be considerate of others. Limit your time on the network and guest computer so others can share the resource.

If the system is abused it becomes unusable for everyone and compromises critical science needs. If this occurs CPS will institute strict policies to regulate usage.

## Money

Danish Kroner is the currency used throughout Greenland. However, there is no need to bring money – either Danish Kroner or US Dollar – to Summit as there are no venues available for purchasing goods.

## Medical

CPS contracts with Medical Advisory Services (MAS) to provide emergency and non-emergency medical consultation to Summit Station staff. Beacon OHSS (Operational Health and Safety Systems) staffs Summit Station with a full-time, on-site paramedic during the summer months. The station is stocked with a full field-medical kit.

In addition to these services, several staff members on station possess Wilderness First Responder credentials.

Upon arrival in Kangerlussuaq, anyone experiencing symptoms of illness should be evaluated for fitness prior to departure for Summit. Please alert the Kangerlussuaq Operations Manager if you feel that a medical condition has developed that could compromise your travel to Summit. Even a moderate head cold can greatly diminish a participant's tolerance to altitude.

Upon arrival at Summit, the Station Medic will request some basic medical information from you regarding allergies, conditions to be aware of, etc. Be sure to bring a sufficient supply of prescribed medications for the duration of your stay.

## Altitude Sickness

Summit Station is located at a physical elevation of over 10,500 feet. Altitude sickness is a serious concern and can potentially result in evacuation. For that reason, CPS recommends that all participants traveling to Summit Station consult with their physician regarding *Diamox*, a prescription medication for preventing altitude sickness.

You will not have a chance to acclimatize before arriving at Summit. Follow these suggestions to minimize the risk of altitude sickness:

- Do not drink alcohol for a few days before arrival
- Avoid fatty or greasy foods
- Eat a large quantities of carbohydrates for a few days before arrival
- Drink as much non-alcoholic liquid as possible for a few days before arrival
- Get adequate rest prior to and during travel

The night before flying to Summit, and especially the morning of your flight, continue to eat as much carbohydrate-loaded food (for example, potatoes and bread) as possible. Consider drinking a carbohydrate-loaded beverage the evening before, and the day of, your flight. Bring the beverage with you to drink the first few days at Summit Station. Carbohydrate loading is one of the best methods to minimize the risk of altitude sickness.

## Conservation

All resources available at Summit Station come at a high cost – both physically and monetarily. As such, CPS asks that all researchers and staff are cognizant of this and consider their use of resources very carefully. In particular, water at Summit is made with a great deal of effort by melting snow. Plan on washing only one load of laundry per week, and limit your showers to a maximum of once every four days. Bring ample clothing to get through eight days. Hand soap and laundry detergent are supplied.

## Recreation

There are limited recreational facilities and materials available at Summit, including exercise equipment, a video and music library, and books. Skiing or walking the skiway are also popular activities.

## Drugs and Alcohol

CPS does not tolerate alcohol or drug abuse. Any staff or researchers over the age of 21 may consume alcohol and are expected to drink responsibly. Anyone using illegal drugs or abusing alcohol will be sent from Summit Station on the next available flight.

## Vehicle Use and Travel

For safety reasons, the Summit Station area has been defined as either “in-Station” or “outside-Station.” There are different travel requirements that apply to these locations. The details of the travel requirements are contained within the Summit Station Travel Policy, which the Station Manager will review with you upon your arrival. Contact your Project Manager to help understand how your project will be safely supported following the station travel policy.

At Summit Station “pedestrian culture” is encouraged whenever possible. Most areas can be reached by foot, and it is critical to the ongoing success of science at Summit to minimize emissions whenever possible. Small sleds are available for transporting loads by hand. Vehicle use is restricted to essential activities that cannot be accomplished without mechanical assistance.

CPS maintains a small pool of snowmobiles for use by staff and researchers. Snowmobile use must fall within prescribed parameters and be approved by the Station Manager. Projects requiring snowmobile use must coordinate in advance with their Project Manager to ensure that an appropriate machine is available. Unnecessary use of snowmobiles is detrimental to many science objectives, and will not be permitted. All snowmobiles must be considered as tools and are strictly reserved for critical science/work activities. All staff and researchers must receive snowmobile training prior to use.

Operation of equipment in the clean air sector is strictly controlled, and requests must first be approved by the Project Manager and the SCO. Details and guidelines for access to the clean air sector are outlined in the Clean Air Management Plan.

## Travel to Summit

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Visit the CPS website at [www.polar.ch2m.com](http://www.polar.ch2m.com) and review the Greenland Guide prior to your trip. It may also be useful for you to visit <http://www.summitcamp.org> or <http://www.geosummit.org> for information on current research projects, conditions, and services. If you are not a US citizen, consult the US Customs and Border Protection’s website at <http://www.cbp.gov> for information on visas.

Contact your Project Manager if you have any questions prior to departure or en route.

### New York to Kangerlussuaq via ANG

Please refer to the Greenland Guide for details regarding travel and what to expect upon arrival in Kangerlussuaq.

### Kangerlussuaq to Summit via ANG

Upon arrival in Kangerlussuaq you will be briefed regarding the flight plans and schedule for the Kangerlussuaq to Summit flight. Schedules are highly dependent on weather and are subject to change. Updates will be provided by the CPS staff in Kangerlussuaq and it is advisable to regularly check the notice white-board that is located on the first floor of the K.I.S.S. building.

The flight to Summit via LC-130 is approximately two hours. It is important to dress appropriately while on board the aircraft, as you will be subject to Summit weather conditions once you exit the aircraft. Upon arrival you will be directed to walk a short distance to the Big House where the Station Manager and Station Medic will greet you and provide a briefing. With exception of your hand-carry items, all of your cargo will be off-loaded by the Summit staff and ANG crew.

## About This Guide

This guide is meant to give you an overview of what to expect at Summit and to help you plan for your trip. It is not intended to provide all the information necessary for a safe and productive season at Summit. It is not a substitute for a CPS-developed Season Plan. This guide is updated frequently and suggestions/comments are welcome. Please contact Katrine Gorham at [katrine@polarfield.com](mailto:katrine@polarfield.com).