



SUMMIT STATION



STATION NAME AND OWNER

Summit Station is funded by the US National Science Foundation (NSF) and operated by CH2M Polar Services (CPS) with guidance from the Science Coordination Office (SCO).

LOCATION

Summit Station (72°36'N, 38°25'W), is a research platform located near the summit of the Greenland ice sheet at an altitude of 3210 m a.s.l. It is located within Greenland's North-East National Park which protects the inland ice and glaciers issuing therefrom as well as adjoining coastal land areas.

BIODIVERSITY AND NATURAL ENVIRONMENT

Located near the summit of the Greenland ice sheet, Summit Station's location features ease of access to a high elevation, high latitude and low water vapor location that allows researchers to

measure components of the earth system that would otherwise not be accessible. The facility is currently the highest elevation research station located north of the Arctic Circle.

HISTORY AND FACILITIES

Summit Station began as the base camp for the drilling of the GISP2 ice core in 1989. Since then, the station has hosted both summer campaign science and, since 1997, year-round monitoring observations of cryospheric processes, both chemical and physical. After the initial "experimental" winter seasons in 1997-98 and 2000-2002, the station has been continuously occupied since 2003. The station consists of three primary structures, with temporary shelters erected seasonally. It serves a seasonal population of up to 50 staff and researchers during the months of April-August, with a skeleton staff of 5 for the remainder of the year.





GENERAL RESEARCH AND DATABASES

A wide variety of research projects have been conducted at Summit since 1989. Initially established as a 'camp' for the collection of the Greenland Ice Sheet Project II (GISP2) ice core, seasonal campaigns were established to measure atmospheric components to improve the interpretation of the ice core records. The value of the location was readily recognised and further intensive measurement campaigns were initiated on a seasonal basis. Since that time Summit Station has become an Arctic 'flag-ship' station as part of the Arctic Observing Network (AON) and the International Arctic Systems for Observing the Atmosphere (IASOA) network. The Greenland Environmental Observatory at Summit (GEOSummit) was established in response to a demand for a facility capable of providing year-round resources and support for research on the summit of the Greenland Ice Sheet.

Project summaries, a list of publications and contacts by which to access Summit-derived datasets can be found at the GEO-Summit website www.geosummit.org



HUMAN DIMENSION

The nearest local community of Ilulissat is 593 km west of Summit with approximately 4500 inhabitants of Greenlandic descent. Summit Station cooperates with other field stations in the area such as the Danish East Greenland Ice Core Project (EGRIP) and many international research institutes.

ACCESS

Access is provided via Kangerlussuaq, Greenland, on Hercules LC-130 aircraft operated by the New York Air National Guard 109th Airlift Wing (NYANG-109) and/or ski-equipped Twin Otter flights operated by Norland Air that utilize a 4877 m groomed "ski-way" for on-site flight operations. The station can also be accessed over-land but not typically used as means of general transportation. The Greenland Inland Traverse (GrIT) follows a roughly 1200 km route from the Thule Air Base, carrying fuel and cargo that reduces the use of aircraft. This also reduces cost to the program and aircraft emissions at Summit Station, a clean air/clean snow research site.



Category	Sub-Category	Summit Station
Website		www.geosummit.org, www.summitcamp.org
Country		Greenland
Opening year		1989 (open seasonally), 2003 (open year-round)
Operational period		Year-round
Permitting issues categories	Permits required for access to the station Permits required for studies Contact (permit issues)	Yes, must comply with Government of Greenland requirements Depends on type of study, location and other factors paian@nanoq.gl
Facility owner and manager	Name of the facility owner Owner status Institution responsible for managing the station Contact (access to station) Website (institution)	US National Science Foundation (NSF) US Government CH2M Hill Polar Services (CPS), contractor to NSF Jason Buenning jason@polarfield.com; Science Coordination Office sco@summitcamp.org; Renee Crain at NSF rcrain@nsf.gov www.nsf.gov, www.cpspolar.com, www.esrl.noaa.gov/gmd/obop/ sum/, armap.org
Other institutions	Name Country	NOAA Earth Systems Research Laboratory USA
Location	Geographical coordinates Altitude of station Min. altitude within study area Max. altitude within study area Nearest town/settlement Distance to nearest town/settlement Map	72°35'N, 38°25'W 3210 m a.s.l. 3210 m a.s.l. 3210 m a.s.l. Ilulissat (4500 inhabitants) and Kangerlussuaq (550 inhabitants) 593 km and 700 km Aerial image, satellite image, Google Earth
Climate	Climate zone Permafrost Years measured Mean annual temperature Mean temperature in February Mean temperature in July Mean annual wind speed Max. wind speed Dominant wind direction Total annual precipitation Precipitation type Ice break up	High Arctic – (located on permanent ice cap) 2003-present (NOAA baseline measurements) -31 °C -42 °C -13 °C 4.1 m/s 36+ m/s S–SW 200 mm Snow –
Station facilities	Area under roof Scientific laboratories Logistic Number of rooms (beds) Number of staff on station (peak/off season) Max. number of visitors at a time Showers Laundry facilities Power supply (type) Power supply	758 m ² Temporary Atmospheric Watch Observatory 17 m ² , Mobile Science Facility 48 m ² , plus 47 m ² in operational buildings. Big House 143 m ² , Science and Operations Building 264 m ² , Greenhouse 200 m ² , Berthing Module 35 m ² , Smobile 51 m ² 1 kitchen/dining/meeting space, 3 offices, 4 laboratories, 8 berthing rooms, 3 bathrooms, 1 living room, 1 infirmary 15/5 50 Yes Yes 110 V 24 hours per day
Scientific equipment	Specific device Scientific services offered	Instrumentation includes aerosol and trace gas sampling, cloud radar, lidars, sodar and radiometers, broadband and UV solar radiometers, interferometer, ceilometer, anemometers, temperature and humidity sensors, barometers and precision GPS base station Two year-round science technicians staffed by NSF, one by NOAA
Medical facilities	Medical facilities Medical suite No. of staff with basic medical training or doctor Distance to hospital (estimated time) Compulsory safety equipment Recommended safety equipment	Standard Yes (staffed with paramedic April-August) 1 paramedic April-August. 2-6 staff with Wilderness First Responder certification year-round 1080 km to Nuuk On station equipment: Satellite phone, VHF radio, HF radio and well stocked medic station, incl. high altitude gamow bag In field: Satellite phone, VHF radio, medical kit, survival kits
Landing facilities	Airstrip (Length × Width) Airstrip surface Helipad Ship landing facilities	5120 m × 61 m. Groomed April-August Groomed snow Groomed snow –
Vehicles at station	Sea transportation Land transportation	Shipping to Kangerlussuaq is possible Snowmobile, foot, ski, and tracked vehicle (Tucker, tractors, etc.)
Transport and freight	Transport to station Number of ship visits per year (period) Number of flight visits per year (period)	Ski-equipped C-130, Basler or Twin Otter; tracked vehicle or skis – 20+ (April-August) with winter crew changes in February and October



Features within study area

- Ice cap or glacier
- Permanent snowpatches
- Mountain
- Valley
- Lake
- River
- Shoreline
- Tree line
- Polar deserts/semi-deserts
- Shrub tundra
- Graminoid tundra
- Forest tundra
- Peatlands
- Wetlands
- Palsa mires
- Deciduous forest
- Evergreen forest
- Human settlements or resource use in the area
- Other

● Yes
○ No

Main science disciplines

- Anthropology, Sociology, Archaeology
- Astrophysics
- Atmospheric chemistry and physics
- Climatology, Climate Change
- Community based monitoring, Citizen Science
- Ecosystem services
- Environmental sciences – Pollution
- Geocryology, Geomorphology
- Geodesy
- Geology, Sedimentology
- Geophysics
- Glaciology
- Human biology, Medicine
- Hydrology
- Isotopic chemistry
- Limnology
- Land-use change, Mapping, GIS
- Marine biology
- Microbiology
- Oceanography, Fishery
- Paleocology
- Paleolimnology
- Soil Science
- Terrestrial biology – Biodiversity
- Terrestrial biology – Ecosystem function

Workshop facilities

- Metal workshop
- Wood workshop
- Plexiglas workshop
- Staff available to assist with constructions

Communication

- Telephone
- Satellite phone
- VHF
- E-mail
- Internet
- Computer
- Printer
- Scanner
- Fax

