

Summit Station Users' Guide Standard Operating Procedure Greenland, Summit Station #005

Introduction:

Summit Station supports 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 interesting 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.

The purpose of this document is to acquaint **researchers** with the system in place for facilitating a quality research environment for all. 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 our activities affect other research projects and modifying our behavior accordingly, we can achieve not only a world-class research facility, but create an unparalleled example of environmental stewardship.

All persons intending to live and work at Summit Station should be familiar with the "Greenland Guide", an on-line resource that provides important information about Summit and other locations within Greenland.

<http://www.polar.ch2m.com/Files/PDFs/GreenlandGuide2009.pdf>

Conducting Research at Summit Station

Science Coordination Office (SCO)

Because the research being conducted at Summit Station is so dynamic and diverse, the Science Coordination Office (SCO) was established to ensure that the needs of all researchers are met, and potential conflicts of interest between research projects and the operational requirements of the station are minimized.

The SCO is comprised of researchers with ongoing projects at Summit, who have a comprehensive understanding of the operational requirements of the various research projects, as well as the station infrastructure. Questions relating to conducting scientific investigations at Summit should be addressed to the SCO. It is the responsibility of the SCO to respond promptly to all queries from the research community.

SCO e-mail: <mailto:sco@summitcamp.org>

SCO web site: <http://www.geosummit.org>

Researcher Responsibilities

The SCO is a valuable resource to researchers wishing to work at Summit. Its members advise researchers regarding science requirements. They can also provide input relating to developing a successful science plan for the unique environment of Summit. For that reason, researchers considering fieldwork at Summit are strongly encouraged to contact the SCO during the proposal stage. It is also advisable to contact CH2MHill Polar Services (CPS) during this timeframe.

CPS can answer logistics-specific questions and provide each researcher with a cost estimate for the support of their proposed research that is suitable for inclusion in their proposal.

If contact with the SCO is not made during the proposal stage, researchers funded for conducting research at Summit Station **must** contact both CPS and the SCO upon notification of funding. At this time the researcher should be prepared to provide CPS and the SCO an overview of the operational requirements of the research, including:

- Number of personnel on site
- Dates of deployment
- Space requirements (for equipment and personnel, inside and outside)
- Location requirements (where are equipment and activities going to be?)
- Power requirements for equipment and instrumentation
- Science Technician support requirements
- Special operational or logistical requirements

CPS will move forward with support for researchers *only after* confirmation from the SCO that these criteria have been met. The operational requirements of the research will form the basis for CPS's development of an annual Support Plan for each research project. This plan will be distributed to appropriate field team members, funding agencies, CPS staff, and the SCO. Support Plans will also be posted at <http://www.polar.ch2m.com> and will be available in hard copy at Summit.

Once on site at Summit Station, each research group must appoint a single point of contact (POC) for the group. All science support requirements must be coordinated through the Station Manager via the POC.

Science Technician Support

Researchers requiring Science Technician support from CPS staff at Summit Station must provide a copy of their Science Protocol, along with a description of the level of support required for the season to the SCO and CPS at least 60 days prior to deployment to the field. This information will be reviewed by the SCO and CPS to ensure the protocol provides adequate guidance for the Science Technicians and that the level of tasking can be supported with the current staffing level planned for the season. Science Project Protocol documents will be available electronically, as well as in hard copy at Summit. If samples are to be collected and returned to the researcher's home institution, the protocol must include specific instructions stating:

- How many samples will be required for the season

- When Samples are to be returned
- Packaging instructions
- Shipping address
- Special handling instructions

If the research project will be utilizing specialized equipment or instrumentation, the researcher must provide:

- Adequate documentation on the operation and maintenance of the equipment
- Manufacturers service manuals where applicable
- Flow charts, schematics, and troubleshooting guides where applicable
- Contact information for the researcher and/or manufacturer of the equipment
- Ensure adequate supplies are on hand (parts, filters, clean gloves, tools, personal protective equipment, etc.)
- Current and compatible computer programs where applicable
- Training for Science Technicians as required

The review of science protocols by the SCO will enable CPS to establish the level and scope of tasking for the Science Technicians. CPS can then determine if any additional staffing is required in order to adequately support research requirements. The SCO will also assist CPS if issues arise with research projects that require far more time and effort than was initially stated. It is recognized that the nature of experimental research sometimes requires a bit of troubleshooting and development. However, if the amount of time spent on any given project routinely exceeds the anticipated level by 25% or more, it may begin to adversely affect other projects. The SCO will assist with reviewing the situation and making recommendations to the Principal Investigator (PI), in an effort to find a solution to problems of this nature. The resolution of issues of this type may require that the PI send a technician with a higher level of training on the equipment to Summit in order to troubleshoot and repair the instrument and/or associated components. ***All equipment, instrumentation, and science protocol for a given experiment must be 100% operational before CPS Science Technicians can assume responsibility for the project.***

The level of support CPS Science Technicians are able to provide is largely determined by the P.I. on the research project. Researchers must communicate with the Science Technicians to ensure that research requirements are being met. When contacted by one of the Science Technicians regarding a problem with equipment or issues of protocol, respond promptly to assist in resolving the matter.

Station Policies:

Station Manager

The CPS Station Manager at Summit 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 work directly with the SCO to gain approval for activities requested by science groups on site.

Travel Zones

For safety reasons, the Summit Station area has been defined as either “in Station” or “outside of Station.” There are different travel requirements that apply to these locations. Please request the most recent copy of the station map from Manager@summitcamp.org. Your CPS POC will help you understand how your project will be safely supported following the station travel policy.

Vehicle Use

Here at Summit Station we seek to create a “pedestrian culture”. There are few areas that cannot be reached on foot in a short period of time. Small “banana sleds” are available for carrying small to medium loads. Vehicle use is restricted to essential activities that, due to distance or the nature of the work, cannot be done without mechanical assistance.

Snowmobiles

CPS maintains a pool of snowmobiles for use by science personnel, construction personnel, and staff at Summit. Snowmobile use must fall within prescribed parameters, or first be approved by the Station Manager. There is a range of machines available, which means that some are more suitable for a particular purpose than others. All of the CPS snowmobiles currently are powered by gasoline engines, and thus produce emissions. Unnecessary use of snowmobiles is detrimental to many science objectives, and will not be permitted. An electric snowmobile is occasionally available to Summit for testing purposes.

These machines must be considered as tools – not toys. Snowmobile training will be given by the appropriate staff members, typically the Mechanic or Station Manager. Familiarize yourself with the types of machines available, and use the right tool for the job.

Heavy Equipment

Heavy equipment operation must fall within prescribed parameters, or first be approved by the Station Manager. The Station Manager will designate who operates various pieces of equipment and/or vehicles in camp. The mechanic and/or Equipment Operator will provide instruction to camp personnel on the correct use and daily maintenance checks required for operating all vehicles and equipment prior to initial use. Only the Equipment Operator and Station Mechanic will operate the Caterpillar D-6 dozer unless another individual is specified by the Station Manager and trained by the Equipment Operator.

Summit Station currently has two pieces of heavy equipment, a Caterpillar D6 and a Caterpillar 933. Summit also has a Tucker “Sno Cat”, which is classified as a light track vehicle. All of these vehicles utilize diesel engines, and are therefore sources of unwanted emissions. The fact that they are mobile exacerbates the problem, since the emissions can come from virtually anywhere. As such, there will be times when wind conditions require a complete moratorium on equipment operation. The Station Manager will make this determination. All equipment on station can be used to assist

with science operations when necessary. However, operation of equipment in the science sector is strictly controlled, and requests must first pass through the SCO and the Station Manager.

Conclusion

This document is not intended to provide all of the information necessary for experiencing a safe and productive season at Summit. Standard Operating Procedure documents (SOP's) exist for all major categories at Summit. Science Protocols, Emergency Procedures, and Medical Protocol are some examples. The appropriate documentation will be made available to the **researcher** and **employee** as applicable.

Summit Station, Greenland

May 2010

Altitude Advice From Your Remote Services Paramedic



Don't Let Acute Mountain Sickness Affect Your Visit to Summit!

Special points of interest:

- * We are at 10,500 feet in elevation
- * Many are adversely affected by rapid ascents to our station
- * AMS can have an onset as short as 2 hours, sometimes less
- * Early recognition of illness is critical
- * Your medic can assist you rapidly
- * Many chronic medical conditions can be aggravated by AMS. Let your medic know of any medical conditions you are currently under care for

Strategies to Avoid AMS:

- * Drink plenty of water prior to visit. Often, 4-5 liters per day is needed at elevation.
- * If you are able to take such over-the-counter medications as:
 - * Motrin
 - * Aleve
 - * Tylenol
- * These are helpful in preventing the most common AMS side effect, which is headache.
- * Please to do not exert yourself aggressively during the visit. This hastens onset of AMS problems
- * Oxygen is the immediate solution to the beginnings of AMS. We have plenty! Just alert your medic.

Acute Mountain Sickness (AMS) can be experienced by even the most fit of individuals. A rapid ascent is usually the cause of onset. Each member may be affected differently, so we cannot predict how altitude on your visit will affect you. The key is to recognize the early signs and symptoms and let your medic assist you as needed.

You may expect some, or all of the following symptoms during this short visit:

1. Throbbing Headache (most common early sign of AMS!)
2. Nausea or vomiting
3. Dizziness or lightheadedness
4. Fatigue
5. Feels like a "hangover"
6. Sensation of an inner chill unlike normal cold response
7. Shortness of breath on exertion



At any time during the visit, you begin to feel ill or "not yourself", alert your tour guide, the camp manager, or your medic of this. Early care minimizes the effects of acute mountain sickness and its possible progression to more serious conditions. Early recognition is always the



Significant Symptoms to Watch Each Other For:

1. A dry & non-productive cough you did not have at sea level
2. Shortness of breath at rest
3. Rapid heart rate that does not resolve at rest
4. The color of the face, lips, or nail beds is pale, or ashen color
5. Someone is not walking steadily
6. Numbness in the face or hands
7. They seem to not be acting themselves

These are all advanced signs of the more serious aspects of AMS and require immediate medical attention. Remember, at the onset of ANY sign or symptom of AMS, alert a Summit staff member, or the camp medic.

