

Please review all of the following information, including the gear allocations and field team information, to ensure accuracy. This plan is an agreement between CH2M HILL Polar Services (CPS) and your group, documenting the logistics support you will receive.

PROJECT INFORMATION

Lead Principal Investigator	Von Walden
Institute	University of Idaho, Geography
Project Title / Grant #	Collaborative Research: Integrated Characterization of Energy, Clouds, Atmospheric State, and Precipitation at Summit (ICECAPS) (0856773)
NSF Program and Manager	NSFOD\OPP\ARCAON, Dr. Martin Jeffries
PFS Project Manager	Katrine Gorham

LOGISTICS SUMMARY

This collaborative project between 0856773 (Walden, U of Idaho), 0904152 (Turner, U of WI), and 0856559 (Shupe, CU) plans an intensive cloud experiment at Summit with fieldwork from late spring 2010 through late spring 2014. In addition to installing instruments at Summit, the project will maintain a technician at the Station year round for the duration of the fieldwork. This technician will complete intensive balloon launches with the assistance of on-site Summit technicians.

A field team of two conducted a short reconnaissance trip during the summer 2009.

In May 2010, a field team of six will fly to Greenland. The ICECAPS team will install their suite of instruments in the facility and begin calibrating/operating their experiments. Three field team members will depart Summit in early June, two will depart several days later, and one team member will stay on at Summit Station as the ICECAPS technician until the end of August.

The ICECAPS project will provide an on-station science technician year-round. This science technician will rotate in/out of Summit on the same schedule as the year-round CPS staff and will comply with the CPS safety program.

As an add-on to the ICECAPS project, a team of two will deploy to Greenland via the ANG in late April 2010 with a LiDAR instrument that will compliment the suite of measurements made by ICECAPS. After spending approximately two weeks for measurements at the Kellyville radar site near Kangerlussuaq, the LiDAR team will travel to Summit Station, working there from mid-May to early June. At the end of this period, they will depart Summit and return to the US via the ANG logistics chain.

CPS will provide ANG coordination for the field team and cargo; in transit user days in Kangerlussuaq; access to the Summit Station infrastructure and services, including construction support for finishing the Mobile Science Facility; provision and shipment helium and LN2; science technical services. The PIs will make all other arrangements and pay for them through the grant.

For the complete CPS online project record for this grant, including science objectives, go to: http://www.polar.ch2m.com/arlss_reports/arlss_projectsdetail.asp?cbPropNum=0856773

For up-to-date information on the project's schedule, please view the online Greenland calendar (<http://www.polar.ch2m.com/> > Greenland > Calendars/Schedules).

OUTSTANDING ACTIONS AND NOTES

Issue	Responsibility	Date Due	Date Completed
Review support plan for accuracy and distribute to all field team members	PI	4/7/2010	In progress
Obtain all necessary permits for fieldwork	PI	4/7/2010	Completed
Visit all hyperlinks and review all documents referred to in the support plan	Entire Field Team	4/7/2010	In progress
Contact the GEOSummit Science Coordination Office (SCO) sco at summitcamp.org regarding your project's plans for the season	PI	4/7/2010	Completed
Complete medical clearance process 6-8 weeks before desired deployment date	Entire field team	4/7/2010	In progress
Note: Passports are required for Air National Guard and international travel. Also, please bring TWO copies of your passport to Greenland with you.	Entire field team	4/7/2010	Okay
Complete Critical Success Factors	PI	4/7/2010	Completed

ALLOCATIONS AND SERVICES

Allocations from Inventory

Quant/Unit	Item
1	3- Person Survival Bag
1	First Aid Kit
1	Fire Extinguisher
1	VHF Radio Base Station and Radio.
1	Microwave oven
1	Coffee and hot water maker
1	Water Cooler
2	Waste Baskets
1	Broom and dustpan
1	Small Table
3	Chairs

Other Services

Service	Comments
CPS will provide 150 l of liquid nitrogen (LN2).	The LN2 will be flown via ANG from Scotia on the June 2 nd Northbound flight and on to Summit on June 4 th .
User days Kangerlussuaq	
User days Summit, including meals	<p>With the exception of the year-round science tech, the researchers will sleep in tents provided by CPS. The year-round science tech will be provided with either communal indoor or private tent berthing.</p> <p>ICECAPS personnel will use the Big House facilities for meals and observe regular meal times. They should notify the camp manager and chef if they plan to eat outside normal meal times. Any special diets or food allergies should be reported to the chef upon arrival at Summit. If possible, the science group can send an early email to manager at summitcamp.org to prep the cook for special diet requirements.</p>

ANG travel: NY-Kanger-Summit-Kanger-NY	
Cargo Services	
Gas Cylinder procurement and delivery	CPS will procure and stage gas at the facility for the researchers' use. There will be a minimum of one month reserve (20 cylinders) of Helium on site.
Science Technical Services	10-15 hours/week
Gas piping and regulators	CPS will provide a regulator and tubing for filling radiosonde balloons with helium.
Mobile Science Facility (MSF)	The construction team will set up the Mobile Science Facility, which will be located east of the Big House and main camp. The facility will be connected to power as well as have network access and a temperature controlled interior. The Facility set up will not be complete upon arrival of the field team on May 12 th . The Facility will be completed by June 1 st . Starting on May 19 th the researchers may begin setting up their instruments as long as they are compliant with the construction team's needs/requests, and are aware that power and internal temperature control may not be available. The MSF will be relocated by ~100 ft every 6-12 months and the researchers will be responsible for ensuring that all of their instruments and equipment is well secured in order to prevent damage during the move. The researchers acknowledge that this space can/will be shared with other science projects. In the event that this space is shared, CPS will develop a space plan and review it with the PIs.
Balloon Launch Area	Space will be provided in the shop for balloon launch operations. This space will include a work bench, fill area, and storage space for cylinders and other supplies. The researchers acknowledge that this will be shared space and other science and operations projects will also be using this area. A more customized space will be developed in 2011 if significant improvements to 2010 plan are required.
Safety protocols	PI's will adhere to all safety protocols outlined for those using the Mobile Science Facility by the CH2M Hill safety engineer.

LOCATION INFORMATION

Please visit <http://www.polar.ch2m.com/> and navigate to the Greenland menu for en route and location-specific Greenland information. Prior to deployment, your entire field team should be familiar with the content of the *Greenland Guide* and with the guidelines provided in the *Summit Users' Guide*. Both are available electronically via our Web site's Greenland menu.

CARGO AND CUSTOMS

All cargo required for your project should arrive in Scotia, NY, **no later than 2 weeks prior** to the desired northbound Air National Guard (ANG) flight, must be entered into our online Cargo Tracking System, and must be properly registered with Customs.

For the most current ANG flight schedule go to <http://www.polar.ch2m.com/> and navigate to Greenland > Calendars/Schedules.

If you are a **new user** requiring access to the Cargo Tracking System, contact [Jason Buening](#).

(If you need **technical support** with the Cargo Tracking System, contact [Mike Dover](#) .

Customs instructions are available on our Web site at <http://www.polar.ch2m.com/> (go to Greenland > Customs). More information is available via the *Greenland Guide*, under Greenland on the CPS site.

The following is our current understanding of your overall cargo requirements:

Cargo List

Items	Weight/Cube
MPL, 2 boxes (C-130)	150 lbs / 22.6 cu ft
PAERI Instrument, 5 boxes (C-130)	735 lbs / 46.5 cu ft
PAERI Instrument, 3 boxes (C-5)	320 lbs / 16 cu ft
Radiosondes, 10 boxes (C-5)	420 lbs / 35 cu ft
Balloon Parachutes, 2 boxes (C-5)	60 lbs / 11.2 cu ft
Latex Balloons, 6 boxes (C-5)	300 lbs / 15.6 cu ft
MMCR equipment and instrument, 5 boxes (C-5)	1460 lbs / 303 cu ft
Supply Box (C-5)	130 lbs / 16 cu ft
Archive Equipment, 3 boxes (C-5)	420 lbs / 76 cu ft
Radiosonde system/antenna, 2 boxes (C-5)	110 lbs / 9.5 cu ft
SODAR, 2 boxes (C-5)	170 lbs / 16.5 cu ft
CAPABL, 9 boxes (C-5)	1400 lbs / 140 cu ft
Ceilorometer, 3 boxes (C-5)	270 lbs / 29 cu ft
MWR, 2 boxes (C-5)	350 lbs / 37 cu ft
HATPRO and HF (C-5)	320 lbs / 170 cu ft
POSS+Radiosonde antenna, box (C-130)	60 lbs / 11 cu ft

SUPPORT SCHEDULE

Approx Date	Location	Activity
Apr 1	Stewart ANGB	Shipping deadline for ICECAPS cargo bound for Summit via C-5.
April 21	Kangerlussuaq	LiDAR team arrives in Kangerlussuaq (will work at Kellyville until Summit deployment).
April 26	Stratton ANGB	Shipping deadline for ICECAPS cargo bound for Summit via C-130.
May 10	Kangerlussuaq	ICECAPS cargo from Scotia to Kangerlussuaq.
May 10	Kangerlussuaq	Four ICECAPS team members Scotia to Kangerlussuaq.
May 12	Summit	Four ICECAPS team members Kangerlussuaq to Summit. (DNF cargo must be stored in Shop until transfer to Mobile Facility.)
May 19	Summit	Remaining ICECAPS team and LiDAR team arrive at Summit.
June 4	Kangerlussuaq	ICECAPS and LiDAR teams (5 total) leave Summit, except Shupe and Olson.
June 5	Stratton ANGB	ICECAPS and LiDAR team (4 total) return to NY via ANG. Walden returns to NY via commercial aircraft.
June 8	Kangerlussuaq	Shupe and Olson leave Summit. ICECAPS science tech stays on station for the remainder of the summer.
June 9	Stratton ANGB	Shupe and Olson return to NY via ANG.
June 13	Summit	ICECAPS winter phase I science technician arrives at Summit for turnover.
Aug. 20	Kangerlussuaq	ICECAPS summer science technician leaves Summit.
Aug. 22	Stratton ANGB	ICECAPS summer science technician returns to NY via ANG.

For the most up-to-date information on the project's schedule, please view the online Greenland calendar (<http://www.polar.ch2m.com/> > Greenland > Calendars/Schedules).

FIELD TEAM INFORMATION

Name	Location	Date In	Date Out	Email
Von Walden	Kangerlussuaq	05/10/10	06/05/2010	vonw at uidaho.edu
	Summit	05/12/10	06/04/2010	
Matthew Shupe	Kangerlussuaq	05/10/10	06/10/2010	matthew.shupe at colorado.edu
	Summit	05/12/10	06/09/2010	
Brad Halter	Kangerlussuaq	05/10/10	08/22/2010	moscowbrad at hotmail.com
	Summit	05/12/10	08/20/2010	
Christopher Cox	Kangerlussuaq	05/10/10	06/07/2010	ccox at vandals.uidaho.edu
	Summit	05/12/10	06/04/2010	
Duane Hazen	Kangerlussuaq	5/17/2010	06/07/2010	duane.hazen at noaa.gov
	Summit	5/19/2010	06/04/2010	
Erik Olson	Kangerlussuaq	5/17/2010	06/10/2010	eriko at ssec.wisc.edu
	Summit	5/19/2010	06/09/2010	
Ryan Neely	Kangerlussuaq	04/21/2010	06/07/2010	rrniii at gmail.com
	Summit	05/19/2010	06/04/2010	
Michael O'Neil	Kangerlussuaq	04/21/2010	06/07/2010	michael.o'neill at noaa.gov
	Summit	05/19/2010	06/04/2010	

PROJECT CONTACT INFORMATION

Research Team

Role	Name	Email	Phone / Fax
Collaborator	Matthew Shupe	matthew.shupe at colorado.edu	303 497.6471 / 303 497.6181
Collaborator	David Turner	dturner at ssec.wisc.edu	608 262-3822 /608 262-5974
Principal Investigator	Von Walden	vonw at uidaho.edu	208 885.5058 /

CPS Team Members

Contact for	Name	Email	Primary Phone
Summit science planning & support	Katrine Gorham	Katrine at polarfield.com	Denver: 303.349.2884
Greenland science planning & support	Robin Abbott	Robin at polarfield.com	Denver: 303.748.8507
Greenland science planning & support	Susan Zager	Susan at polarfield.com	Denver: 720.320.6159
Kangerlussuaq base operations	Kathy Young	Kathy at polarfield.com	Denver: 720.320.6160 Greenland: 011.299.524218
Scotia (Stratton Air Base) operations & customs	Earl Vaughn	Earl Vaughn at gmail.com	Scotia cell: 518.605.0979
Sat phones & comms	Roy Stehle	Roy.Stehle at sri.com	Menlo Park: 650.859.2552
Remote Medical (kits & service)	Kyli Olson	Kyli at polarfield.com	Denver: 303.489.2151
Medical/Dental Clearance (PQ)	Robbie Score	Robbie at polarfield.com	Denver: 303.906.0093

CPS Offices

Denver	Kangerlussuaq	Scotia
Polar Field Services 8110 Shaffer Parkway Suite 150 Littleton, CO 80127 Tel: 303.984.1450/1439 Fax: 303.984.1445	CH2M HILL Polar Services Attn: Name of Employee/Researcher Postboks 1015 DK-3910 Kangerlussuaq, Greenland Tel: 011.299.841598 Fax: 011.299.841599	Earl Vaughn C/O 109 th Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.344.2635 Cell: 518.605.0979 Fax: 518.344.2537

Summit Station

Winter	Summer
Polar Field Services Attn: Name of Employee/Researcher 8110 Shaffer Parkway Suite 150 Littleton, CO 80127 Tel: 303.984.1450/1439 Fax: 303.984.1445	CH2M HILL Polar Services Attn: Name of Employee/Researcher - Summit Station C/O Earl Vaughn 109 th Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.344.2635 Fax: 518.344.2537

Other

Organization	Internet	Phone
Medical Advisory Service (MAS) (see below for Remote Telemed #)	http://www.medaire.com/corp_medlink.html	Office: 480.333.3771
Summit Science Coordination Office (SCO)	http://www.geosummit.org sco@summitcamp.org	John Burkhart +47 96 82 5011

SAFETY, ENVIRONMENT, HEALTH and PERMITS

Effective January 1, 2010 the Government of Greenland assumed responsibility for the permitting process for research in Greenland. All science teams planning to conduct research in Greenland must complete an **annual application** in order to obtain approval from the Government of Greenland. The application forms are available from the Department of Domestic Affairs, Nature and Environment at <http://www.nanog.gl/expeditions> or by sending an email to ekspeditioner@gh.gl. Applications are submitted directly through the Department of Domestic Affairs, Nature and Environment. Be advised that a new fee of 4000 DKK has been put in place for permits. For assistance with the application process, contact:

Martin Schiøtz
 Head of Section
 Section of Nature
 Department of Domestic Affairs, Nature and Environment P.O. Box 1614
 3900 Nuuk
 Greenland
 e-mail: ekspeditioner@gh.gl

Medical Clearance

Arctic Program participants traveling into the Greenland field generally must pass a National Science Foundation-mandated physical and dental exam. All field team members should plan to complete their Physical Qualification (medical and dental clearance) process 6-8 weeks prior to travelling to Greenland. For more information, refer to CPS' *Greenland Guide*, available at <http://www.polar.ch2m.com/> under Greenland.

RISK ASSESSMENT

See Appendix for Risk Factors and Mitigation.

CRITICAL SUCCESS FACTORS

Please list the factors that are most important for the success of your science. We track these factors in order to measure the success of CPS' support. Examples might be the availability of the helicopter or camp gear.

Factors
Helium and supplies staged/accessible for two radiosonde launch attempts per day starting on May 19th, 2010. The CPS technician will support an average of one launch per day (year-round), as arranged on-site.
Helium available, at least 1 month in reserve (20 cylinders) on site minimum.
Line power supply to MSF facility. Planned power outages will have 24-48 hours of advance warning. During power outages instruments will be powered by UPS (the UPS will be able support the instrument power load for a variable amount of time, depending on the power requirements).
Consistent network throughput of 675 MB / day.
Temperature stability in MSF. If temperature stability does not meet the needs of the PIs, they will work with the construction team to further refine temperature control.
Private-room indoor berthing for ICECAPS tech during the winter (phase I/phase II/phase III). Communal indoor or private tent berthing for the ICECAPS tech during the summer.

GOVERNMENT AND PERFORMANCE REPORTING ACT OF 1993 (GPRA)

NSF/OPP requires your help in complying with the Government Performance and Reporting Act of 1993 (GPRA). One measure of CPS' performance is a "facility-performance metric" which counts the number of productive days your project has in the field while relying on CPS facilities or support. Please keep track of any "lost days" and report these to us at the end of the season.

APPENDIX

RISK FACTORS and MITIGATION

Factor	Mitigation and Control
Foot/ski travel	<ul style="list-style-type: none"> -Have a communication plan in place (carry a radio) -Have a check out policy in place - Follow Summit Station Travel Policy
Gas Cylinder Handling	<ul style="list-style-type: none"> - Review Haz Comm - Review MSDS (Material Safety Data Sheet) - Use proper gear for moving cylinders (hand truck, cargo bag, etc.)
Heavy lifting/body strains and sprains	<ul style="list-style-type: none"> -Use proper lifting techniques
High Altitude	<ul style="list-style-type: none"> -Participate in high altitude training -Have medical call in service available -Have SAR plan in place -Have oxygen available in high altitude camps -Develop plan to acclimatize -Consult with physician on use of medication for acclimatization
Medical fitness for remote work outside ANG flight period	<ul style="list-style-type: none"> -Follow NSF Physical Qualification process
Power Tools	<ul style="list-style-type: none"> -Participate in a power tools training -Review current AHA (Activity Hazard Analysis)

Snowmobile Travel	<ul style="list-style-type: none"> -Participate in a snowmobile training -Use appropriate Personal Protection Equipment/helmets
Structure Fire	<ul style="list-style-type: none"> -Maintain appropriate fire extinguisher units for building
Cold Related Injuries-weather	<ul style="list-style-type: none"> -Wear proper clothing -Appropriate camping gear, insure sleeping bags are adequately rated -Check the forecast before going out of camp/town -Watch the weather while out -Be mindful of hydration, carry sufficient food -Develop and share your travel plans -Have and share an emergency plan for bad weather
Emergency Plan	<ul style="list-style-type: none"> -Compile a list of emergency contacts for your field team and share it with critical participants including your home institution and CPS.