

## PROJECT INFORMATION

<b>Lead Principal Investigator</b>	James Butler
<b>Institute</b>	National Oceanic & Atmospheric Administration, Global Monitoring Division
<b>Project Title / Grant #</b>	NOAA Summit Clean Air and Ozonsonde Program (NOAASummit)
<b>NSF Program and Manager</b>	Other Agency - NOAA, Ms. Renee Crain
<b>PFS Project Manager</b>	Katrine Gorham

## LOGISTICS SUMMARY

For this NOAA program, on-site Summit science technicians complete a suite of year-round measurements on behalf of NOAA researchers. These measurements began in the mid-1990s and are ongoing. NOAA representatives visit Summit annually to install/maintain instruments, train science technicians, and conduct measurements. Starting in 2005, NOAA corps members began serving rotations at Summit (when available) working as science technicians during the summer and mid-late winter phases. When NOAA corps officers are not available, NOAA will staff Summit with another qualified technician. Monitoring projects on site include: Carbon Cycle Gas sampling flasks; Black Carbon measurements (continuous); Halocarbons and trace species flask sampling; Station Meteorology; Stratospheric ozonesondes; Stratospheric water vapor sondes; Surface ozone, and an *in-situ* Gas Chromatograph for greenhouse gas measurements.

In 2010, in addition to ongoing measurements, CPS staff will relocate the Temporary Atmospheric Watch Observatory (TAWO) and instrument tower (where the NOAA instruments are housed/mounted) to approximately 1 km south of Summit station. This move, scheduled for July-August, will require the on-site presence of NOAA personnel throughout the summer. In addition to the science technician, three NOAA personnel will help relocate the project's instruments, equipment, and gas cylinders. For a brief period, on-station NOAA population will peak at four.

Prior to the move, in early June, a NOAA researcher will visit the station to review/finalize plans with the summer science technician. Additionally, during mid-late June a NOAA Co-PI will visit the station. Each of these trips will be approximately a week.

In mid-July, the science technician will begin removing instruments from the TAWO and tower, assisted shortly thereafter by the three additional NOAA personnel, one of whom will depart when the NOAA inventory has been moved to warm storage. When the building/tower are relocated to the new site, NOAA personnel will then reassemble and calibrate instruments on the tower and TAWO. The move is expected to be concluded in early August, and all personnel will depart Summit about a week later, after the arrival and subsequent turnover activities are completed with the winter phase I NOAA technician.

CPS support includes coordination of personnel/cargo transport to and from Summit, access to the station's infrastructure, construction support and science technician support when NOAA researchers are not on-site.

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=NOAASummit](http://www.polar.ch2m.com/arlss_reports/arlss_projectsdetail.asp?cbPropNum=NOAASummit)

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	5/10/2010	In progress
Obtain all necessary permits and insurance for fieldwork	PI	5/10/2010	In progress
Visit all hyperlinks and review all documents referred to in the support plan	Entire Field Team	5/10/2010	In progress

Contact the GEOSummit Science Coordination Office (SCO) <a href="http://sco.at.summitcamp.org">sco at summitcamp.org</a> regarding your project's plans for the season	PI	5/10/2010	Completed
Complete medical clearance process 6-8 weeks before desired deployment date	Entire field team	6 weeks prior to deployment	In progress
<b>Note: Passports are required for Air National Guard and international travel. Also, please bring TWO copies of your passport to Greenland with you.</b>	Entire field team	5/10/2010	Okay
Complete Critical Success Factors	PI	5/10/2010	Completed

## ALLOCATIONS AND SERVICES

### Allocations from Inventory

Quant/Unit	Item
Note	Allocations from the inventory were assigned upon initial move-in to the TAWO facility at its current location. No additional allocations are planned for 2010.

### Other Services

Service	Comments
User days Kangerlussuaq	
User days Summit, including meals	The researchers will sleep in tents provided by CPS. Researchers will provide their own sleeping bags and ECW gear. The science technicians (Koster, Wolter, Cohen, Clarke, and Maerz) will be provided with communal, double, or single indoor berthing, as assigned by CPS.  All 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 <a href="mailto:manager@summitcamp.org">manager at summitcamp.org</a> to prep the cook for special diet requirements.
ANG travel: NY-Kanger-Summit-Kanger-NY	
Cargo Services	
Access to TAWO	As per discussions with PI, there will be no snow removal around TAWO to improve access. The PI understands that access to the facility will be more laborious (involve hand shoveling) during the upcoming winter.
Special Electrical Services	Uninterruptible power supply (UPS) in TAWO, to be maintained by CPS.
Flask Crates, Special shipping considerations: Flasks should return from Scotia to Boulder via commercial air carrier cargo (or via NOAA FedEx acct.).	To accommodate limited flask crate supplies, NOAA will occasionally need to ship flask crates during turnover flights. Fragile and Do Not Freeze shipping instructions to be specified by PI as applicable.
Gas Cylinders: Nitrogen, Helium, P5	Gas cylinders will be ordered and paid for by NOAA. Shipping to ANG base paid by NOAA. NOAA will provide all regulators for the cylinders. CPS will stage cylinders at TAWO or in balloon barn as appropriate. Other cylinders should be stored on deck at TAWO or on the cargo berm.
Summer Planned Electrical Power Outages	CPS science technicians are empowered to coordinate and conduct all shutdowns and startups related to planned power outages. These will be entered into an instrument log noting each outage.
Storage Space: Flask Cases	CPS will provide warm storage in the Science Vestibule (~20 cu ft) for the storage of the HATS and CCGG flask cases.

DISC Shop – Balloon Launch Facility	CPS will provide balloon launch and helium storage space (minimum four cylinders) in the NE corner of the DISC shop.
TAWO Facility	The field team will use the TAWO facility and TAWO tower for their science operations. The CPS construction team will deconstruct and move the facility to the new designated location in accordance with the timeline outlined in the support schedule. The researchers will be responsible for ensuring that all instrumentation, equipment, and cylinders are removed from the tower by July 19 <sup>th</sup> and from the facility by July 26 <sup>th</sup> . The facility will be connected to power at the new location by August 9 <sup>th</sup> . The researchers may begin setting up their instruments prior to August 9 <sup>th</sup> as long as they are compliant with the construction team's needs/requests and are aware that power may not be available. 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. The CPS team will be responsible for maintaining the oxygen gas sensor.
Safety protocols	The researchers will adhere to all safety protocols outlined for those using the TAWO Facility. This includes reading and signing off on relevant Activity Hazard Analysis (AHAs) prior to completing tasks. Additionally, the researchers will adhere to the established clean air protocols and travel policies.

## 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, if traveling to Summit, 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 Buenning](#).

(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
Sampling Crates (C-130)	~ 600 lbs / 300 cu ft
Balloons and Ozonesondes (C-130)	~150 lbs / 50 cu ft
Misc Science Parts (C-130)	~ 300 lbs / 50 cu ft
Gases (C-5)	50 cylinders / 2 pallets

SUPPORT SCHEDULE

Approx Date	Location	Activity
2/3/2010	Kanger	Phase III Science Technician (Wolter) arrives in Kangerlussuaq via commercial air
2/5/2010	Kanger-Summit	Phase III Science Technician (Wolter) arrives at Summit via Twin Otter
2/16/2010	Summit-Kanger	Phase II Science Technician (Koster) departs Summit via Twin Otter
2/18/2010	Kanger	Phase II Science Technician (Koster) departs Kangerlussuaq via commercial air
4/23/2010	NY-Kanger	Summer Science Technician (Cohen) flies NY to Kangerlussuaq via ANG
4/24/2010	Kanger-Summit	Summer Science Technician (Cohen) arrives at Summit via ANG
6/2/2010	NY-Kanger	NOAA researcher (Dutton) flies NY to Kangerlussuaq via ANG
6/4/2010	Kanger-Summit	NOAA researcher (Dutton) arrives at Summit via ANG
6/9/2010	Summit-Kanger	NOAA researcher (Dutton) departs Summit via ANG
6/10/2010	Kanger-NY	NOAA researcher (Dutton) returns to NY via ANG
6/21/2010	NY-Kanger	Summer Science Technician (Clarke) and NOAA Co-PI (Schnell) fly NY to Kangerlussuaq via ANG
6/23/2010	Kanger-Summit	Summer Science Technician (Clarke) and NOAA Co-PI (Schnell) arrive at Summit via ANG
6/29/2010	Summit-Kanger	Summer Science Technician (Cohen) and NOAA Co-PI (Schnell) depart Summit via ANG
7/1/2010	Kanger-NY	Summer Science Technician (Cohen) and NOAA Co-PI (Schnell) return to NY via ANG
7/12 – 7/19	Summit	Science Technician (Clarke) removes NOAA instrumentation from TAWO tower
7/19/2010	NY-Kanger	NOAA researcher (Johnson) flies NY to Kangerlussuaq via ANG
7/21/2010	Denmark-Kanger	Two NOAA researchers (Vasel and Vasel) arrive in Kangerlussuaq via commercial air.
7/22/2010	Kanger-Summit	Three NOAA researchers (Vasel, Vasel, and Johnson) arrive at Summit via ANG
7/19 – 7/26	Summit	NOAA team removes instrumentation, equipment, and cylinders from the TAWO facility
7/19 – 7/26	Summit	Construction team moves TAWO tower to new location
7/28/2010	Summit-Kanger	NOAA researcher (Johnson) departs Summit via ANG
7/30/2010	Kanger-NY	NOAA researcher (Johnson) returns to NY via ANG
7/26 – 8/2	Summit	NOAA team re-installs instrumentation on TAWO tower at new location
7/26 – 8/2	Summit	Construction team moves TAWO building to new location
8/2 – 8/9	Summit	NOAA team begins moving instrumentation and equipment into the TAWO building while working around the construction team
8/2 – 8/9	Summit	Construction team finishes work on TAWO building at new location
8/9/2010	Summit	Power is turned on to the TAWO building at new location
8/12/2010	NY-Kanger	Phase I Science Technician (Maerz) flies NY to Kangerlussuaq via ANG
8/13/2010	Kanger-Summit	Phase I Science Technician (Maerz) arrives at Summit via ANG
8/20/2010	Summit-Kanger	Summer Science Technician (Clarke) and two NOAA researchers (Vasel and Vasel) depart Summit via ANG
8/22/2010	Kanger-NY	Summer Science Technician (Clarke) and two NOAA researchers (Vasel and Vasel) return 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
Katie Koster	Kangerlussuaq Summit	11/3/2009 11/5/2009	2/18/2010 2/16/2010	<a href="mailto:kvkoster@gmail.com">kvkoster at gmail.com</a>
Wolter, Sonja	Kangerlussuaq Summit	02/03/10 02/05/10	04/30/10 04/29/10	<a href="mailto:sonja.wolter@noaa.gov">sonja.wolter at noaa.gov</a>
Cohen, Lana	Kangerlussuaq Summit	04/23/10 04/24/10	07/01/10 06/29/10	<a href="mailto:cohen.lana@gmail.com">cohen.lana at gmail.com</a>
Dutton, Geoff	Kangerlussuaq Summit	6/2/2010 6/4/2010	6/10/2010 6/9/2010	<a href="mailto:geoff.dutton@noaa.gov">geoff.dutton at noaa.gov</a>
Schnell, Russ	Kangerlussuaq Summit	6/21/2010 6/23/2010	7/1/2010 6/29/2010	<a href="mailto:russel.c.schnell@noaa.gov">russel.c.schnell at noaa.gov</a>
Clarke, Andy	Kangerlussuaq Summit	6/21/2010 6/23/2010	8/22/2010 8/20/2010	<a href="mailto:clarkean@gmail.com">clarkean at gmail.com</a>
Johnson, Bryan	Kangerlussuaq Summit	7/19/2010 7/22/2010	7/30/2010 7/28/2010	<a href="mailto:bryan.johnson@noaa.gov">bryan.johnson at noaa.gov</a>
Vasel, Brian	Kangerlussuaq Summit	7/19/2010 7/22/2010	8/22/2010 8/20/2010	<a href="mailto:brian.vasel@noaa.gov">brian.vasel at noaa.gov</a>
Vasel, Loreen	Kangerlussuaq Summit	7/19/2010 7/22/2010	8/22/2010 8/20/2010	<a href="mailto:loreenvasel@gmail.com">loreenvasel at gmail.com</a>
Maerz, Adam	Kangerlussuaq Summit	8/12/2010 8/13/2010	11/12/2010 11/10/2010	<a href="mailto:maerz@colorado.edu">maerz at colorado.edu</a>

**PROJECT CONTACT INFORMATION**

## Research Team

Role	Name	Email	Phone / Fax
Principal Investigator	James Butler	<a href="mailto:James.H.Butler@noaa.gov">James.H.Butler at noaa.gov</a>	303 497.6898 /303 497.6290
Co-PI	Thomas Conway	<a href="mailto:Thomas.J.Conway@noaa.gov">Thomas.J.Conway at noaa.gov</a>	303 497.6681 /303 497.6290
Co-PI	Bryan Johnson	<a href="mailto:bryan.johnson@noaa.gov">bryan.johnson at noaa.gov</a>	303 497.6842 /
Co-PI	Samuel Oltmans	<a href="mailto:Samuel.J.Oltmans@noaa.gov">Samuel.J.Oltmans at noaa.gov</a>	303 497.6676 /303 497.5590
Co-PI	Russell Schnell	<a href="mailto:russell.c.schnell@noaa.gov">russell.c.schnell at noaa.gov</a>	303 497.6733 /303 497.6290
Field Coordinator	Brian Vasel	<a href="mailto:brian.vasel@noaa.gov">brian.vasel at noaa.gov</a>	303 497.6655 /303 497.5590

## CPS Team Members

Contact for	Name	Email	Primary Phone
Summit science planning & support	Katrine Gorham	<a href="mailto:Katrine@polarfield.com">Katrine at polarfield.com</a>	Denver: 303.349.2884
Greenland science planning & support	Susan Zager	<a href="mailto:Susan@polarfield.com">Susan at polarfield.com</a>	Denver: 720.320.6159
Greenland science planning & support	Robin Abbott	<a href="mailto:Robin@polarfield.com">Robin at polarfield.com</a>	Denver: 303.748.8507
Kangerlussuaq base operations	Kathy Young	<a href="mailto:Kathy@polarfield.com">Kathy at polarfield.com</a>	Denver: 720.320.6160 Greenland: 011.299.524218
Scotia (Stratton Air Base) operations & customs	Earl Vaughn	<a href="mailto:Earl.Vaughn@gmail.com">Earl Vaughn at gmail.com</a>	Scotia cell: 518.605.0979
Sat phones & comms	Roy Stehle	<a href="mailto:Roy.Stehle@sri.com">Roy.Stehle at sri.com</a>	Menlo Park: 650.859.2552
Remote Medical (kits & service) and Medical/Dental Clearance (PQ)	Robbie Score	<a href="mailto:Robbie@polarfield.com">Robbie at polarfield.com</a>	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 <sup>th</sup> 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 <sup>th</sup> Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.344.2635 Fax: 518.344.2537

Other

Organization	Internet	Phone
Summit Science Coordination Office (SCO)	<a href="http://www.geosummit.org">http://www.geosummit.org</a> <a href="mailto:sco@summitcamp.org">sco@summitcamp.org</a>	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.nanoq.gl/expeditions> or by sending an email to [ekspeditioner@gh.gl](mailto: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](mailto: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
Preservation of the clean air sector. The researchers will be notified of clean air incursions 24 hours in prior to event.
Available and reliable power at TAWO. The researchers will be notified of planned power outages 24-48 hours in advance.
Continued project support from NSF and PFS for materials transport and personnel transport/food/housing.

## 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
Heavy lifting/body strains and sprains	-Use proper lifting techniques
Snowmobile Travel	-Participate in a snowmobile training -Use appropriate Personal Protection Equipment/helmets
Cold Related Injuries-weather	-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	-Compile a list of emergency contacts for your field team and share it with critical participants including your home institution and CPS.
Communications	-Assure your radio is fully charged before going out and carry a spare battery.
Foot/ski travel	-Have a communication plan in place (carry a radio) -Have a check out policy in place
Gas Cylinder Handling	- Review Haz Comm - Review MSDS (Material Safety Data Sheet)
Hazardous Materials	-Haz Comm SMS (Safety Management Standard) -Identify items for hazardous material transportation -Review MSDS (Material Safety Data Sheet)
Medical fitness for remote work outside ANG flight period	-Follow NSF Physical Qualification process
Power Tools	-Participate in a power tools training -Review current AHA (Activity Hazard Analysis)
Tower Climbing	-Participate in tower climbing training -Use the correct tower climbing equipment at all times -Review Tower Climbing AHA (Activity Hazard Analysis)