

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

<b>Lead Principal Investigator</b>	Joseph McConnell
<b>Institute</b>	Desert Research Institute (DRI), Division of Hydrologic Sciences
<b>Project Title / Grant #</b>	Biomass Burning, Dust, Sea Salt, Volcanic & Pollution Aerosols in the Arctic during the Last 2 Millennia: High Resolution Aerosol Records from NEEM & an Array of Archived Ice Cores (0909541)
<b>NSF Program and Manager</b>	NSF/OD/OPP/ARC/VANS, Dr. Henrietta Edmonds
<b>PFS Project Manager</b>	Robin Abbott

## LOGISTICS SUMMARY

This grant supports the PI's participation in recovery/analysis of Greenlandic ice cores by the international NEEM drilling project, for which the lead American PI is Jim White, U Colorado. In addition to work at the NEEM camp, the PI will collect cores to update aerosol records at sites adjacent to two Automated Weather Stations to be visited by Konrad Steffen—Humboldt and Tunu. If there is time when they are at Summit, he will also drill a core there.

The PI will complete this work during one season of field work, in 2010. First, in April/May, a team of two (a researcher and an ICDS driller) will join U Colorado Koni Steffen's group on a leg of his yearly Twin Otter-supported AWS maintenance traverse. The team will assemble in Kangerlussuaq and then spend several days on the traverse. At Humboldt and Tunu (and at Summit Station if time permits during the Steffen's AWS servicing stop), the McConnell team will drill/pack a shallow (30 m) core. The samples will be returned to Summit or NEEM for onward transport by C-130 to Kangerlussuaq.

When this work is completed, in early May, the PI and colleague will return to Kangerlussuaq. The colleague will depart while the PI will regroup and fly to the NEEM drilling site via ANG.

The PI's responsibility is to assist with collection of approximately 200 - 400m of ice core adjacent to the main NEEM borehole. He also will cut the core, in consultation with other researchers, and prepare selected samples for shipment to the National Ice Coring Laboratory, in Denver, Colorado. The PI will depart Greenland around the first of June, returning one researcher to the field in mid-July for about a month to finish with the above activities.

Ice cores from both the Traverse (~18 boxes) and also NEEM (~45 boxes) will be stored in Kangerlussuaq freezers, where eutectics will be inserted into each box by the research team. They will then be flown from Kangerlussuaq to Scotia on a C-130 cold deck flight along with other researchers' ice cores and frozen samples. Upon arrival in NY, a freezer truck will meet the airplane and drive the frozen samples to each designated location. The Desert Research Institute will be ready to receive ~63 boxes from Greenland in 2010.

CPS will provide ANG coordination; Twin Otter support for AWS visits; accommodation in Thule and Qaanaaq; Kangerlussuaq meal tickets; core boxes/eutectics; in-transit core storage in Kangerlussuaq and Scotia; commercial freight for core boxes/frozen core to Reno, Nevada; and camping/safety/communication gear. ICDS will provide drilling support. All on-site NEEM support and in-transit KISS lodging will be provided by the University of Copenhagen. All other logistics will be paid by the researchers from 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=0909541](http://www.polar.ch2m.com/arlss_reports/arlss_projectsdetail.asp?cbPropNum=0909541)

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		
Obtain all necessary permits for fieldwork	PI	In Process	
Visit all hyperlinks and review all documents referred to in the support plan	Entire Field Team		
Complete medical clearance process 6-8 weeks before desired deployment date	Joe McConnell Jay Kyne	In Process	12 March 2010
7" lay flat tubing and 1 ea sleeping bag will be shipped to NY for Twin Otter traverse	PI	For 21 Apr 109 <sup>th</sup> flight	Completed
<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		
Two freezer trucks will drive samples from NY to designated institutions. Tentative dates are 1 July, and 22 August. CPS and PI will discuss/determine delivery dates later	CPS and PI		
Complete Critical Success Factors	PI		Completed

## ALLOCATIONS AND SERVICES

### Allocations from Inventory for Twin Otter Traverse

Quant/Unit	Item
4 ea	Sleeping pads (2ea Thermarest / 2ea Ridgerest)
1 ea	Jerry Can, 5 gal size (to be filled with gasoline/benzine)
1 ea	Sleeping bag, -40degree for 1 team member (Jay Kyne)
1 ea	Iridium Phone with remote medical call-in support
15 ea	New straps for Ice Core boxes (some boxes shipped only had 1 strap)

### Other Services for Twin Otter Traverse

Service	Comments
Arrange with NICL to ship 21 ice core boxes w/foam inserts; 6 core tubes per box for 4" core	Flown to Thule on 10 March flight and are located in CPS warehouse #628
Eutectics provided in Kangerlussuaq to be used to pack ice core boxes upon arrival from the field	6ea per box /+10F, 24 oz eutectics; Total=126 ea
Clearances arranged for 109 <sup>th</sup> Air Guard flight and for Thule Air Base	
Accommodations booked in Thule	2 rooms at the North Star Hotel
Accommodations booked in Qaanaaq	POC – Hans Jensen at the Qaanaaq Hotel
5 flight hours for the Twin Otter traverse work - to be used as a contingency if necessary	To be coordinated with Koni Steffen in case extra flight time supporting McConnell is required
Arrange for 5ea ice core boxes; 6 core tubes per box for 4" core, available at Summit by 1 May	Shallow core will be collected at Summit if time permits during NGRIP AWS visit.
Retrograde of 30m traverse core to Scotia	

### Allocations from Inventory for NEEM field work

Quant/Unit	Item
1 ea	Arctic Oven - 8 x 8 tent (for May and July use)
2 ea	Sleeping pads (1ea Thermarest / 1ea Ridgerest) (Required in May for PI, and July for student)

For more information on satellite phones, radios, manuals and other field communications support, please visit the CPS communications Web site at <http://www.polar.ch2m.com/> .

Other Services for NEEM field work

Service	Comments
Supply 45ea boxes with foam insert/no tubes to go to NEEM. Each box should have 2 straps.	300m NEEM core for DRI
4-5 spacers per box should be fabricated in Kanger = 220 spacers total	Will be sent to NEEM
Eutectics provided in Kangerlussuaq to be used to pack ice core boxes upon arrival from the field	6ea per box /+10F, 24 oz eutectics ; Total= 270ea
Shipment of the 200-400m core NEEM>DRI.	Dates TBD

## 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 **user** requiring access to the Cargo Tracking System, login: mcconnj; password: mcconnj

(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/Comments
21 boxes with 6 core tubes per box	Shipped to Thule on 10 March flight
32 ea Ice Core boxes - 4 ea pallets shipped to Stewart for C5	Boxes can go into allocation inventory in Kangerlussuaq
7 inch lay-flat tubing from United States Plastic Corp	PI making arrangements for this purchase/delivery (for Otter traverse)
3 ea boxes – DNF - SP2 equipment for NEEM	~400lbs / 25 cubic feet. DNF and scheduled to fly north on the early May flight.
1 ea Sleeping bag will be brought by the PI	
Food for the traverse work will be provided by the Steffen project	
Ultra pure air – 2-3 ea cylinders, for project at NEEM	Bought by researchers – to be delivered to Stratton Air Base on 16 April.
The drilling equipment shipped from IDDO in Madison	Will fly to Greenland on 21 April flight

for Otter traverse work: -long red bag1: 80# 10cu -long red bag2: 80# 10cu -head box1: 40# 2cu -head box2: 40# 2cu -SideWinder: 110# 8cu -2kW gen: 50# 5cu -tools,etc: 60# 5cu - Total with personal gear ~550lbs	
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## SUPPORT SCHEDULE

Approx Date	Location	Activity
4/21/2010	NY > Kanger	One team member arrives on 109 <sup>th</sup> in Greenland to prepare for fieldwork (Jay Kyne)
4/26/2010	NY > Kanger	One team member arrives on 109 <sup>th</sup> in Greenland (Joe McConnell)
4/27/2010	SFJ>GITS> Thule	Air GL Twin Otter departs for northern AWS sites (2ea McConnell pax; 4ea Steffen pax)
4/28/2010	Thule > Humboldt > NEEM > Qaanaaq	At Humboldt ~4 hrs ground for McConnell drilling; drop off ice core boxes at NEEM
4/29/2010	Qaanaaq > Petermann > Thule	Steffen AWS day
4/30/2010	Thule > Tunu N > NEEM or Summit	Drop off all pax at Tunu N to overnight; McConnell stays for drilling; Otter continues to Summit or NEEM to RON
5/1/2010	TBD > TunuN > NASA E > SUM	RON at Summit
5/2/2010	Summit > NGRIP > SFJ	McConnell and Kyne will stay at Summit to collect a shallow core if time permits. TBD during the traverse depending on Steffen's schedule.
5/3/2010	Kangerlussuaq	Weather day for arriving in SFJ
5/11/2010	Kanger > NEEM	McConnell flies to NEEM
5/06 or 5/11/2010	Kanger > NY	Kyne departs Greenland
6/03/2010	NEEM>Kanger	McConnell departs NEEM along with traverse samples. He will repack his traverse samples in Kangerlussuaq, putting eutectics in each box. Samples will be stored in a -20C freezer until the 109 <sup>th</sup> cold deck flight to NY.
6/10/2010	Kanger > NY	McConnell departs Greenland (may also be a flight on 9 June)
7/21/2010	NY > Kanger	One team member arrives on 109 <sup>th</sup> in Greenland to assist at NEEM (Dan Pasteris).
8/17/2010	NEEM > Kanger	Pasteris returns from NEEM with NEEM core samples. He will repack his NEEM samples, replacing the spacers with eutectics. Samples will be stored in a -20C freezer until the 109 <sup>th</sup> cold deck flight to NY on approx 22 August.
8/22/2010	Kanger > NY	Pasteris departs Greenland

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).

## PROJECT CONTACT INFORMATION

### Research Team

Role	Name	Email	Phone / Fax
Principal Investigator	Joseph McConnell	<a href="mailto:jmconn@at.dri.edu">jmconn at dri.edu</a>	775 673.7348 / 775 673.7363

### CPS Team Members

Contact for	Name	Email	Primary Phone
Greenland science planning & support	Susan Zager	<a href="mailto:Susan_at_polarfield.com">Susan at polarfield.com</a>	Denver: 720.320.6159
Greenland science planning & support	Robin Abbott	<a href="mailto:Robin_at_polarfield.com">Robin at polarfield.com</a>	Denver: 303.748.8507
Summit science planning & support	Katrine Gorham	<a href="mailto:Katrine_at_polarfield.com">Katrine at polarfield.com</a>	Denver: 303.349.2884
Thule science planning & support	Kim Derry	<a href="mailto:Kim_at_polarfield.com">Kim at polarfield.com</a>	Denver: 303.349.6382
Kangerlussuaq base operations	Kathy Young	<a href="mailto:Kathy_at_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_at_gmail.com">Earl Vaughn at gmail.com</a>	Scotia cell: 303.552.6072
Sat phones & comms	Roy Stehle	<a href="mailto:Roy.Stehle_at_sri.com">Roy.Stehle at sri.com</a>	Menlo Park: 650.859.2552
Remote Medical (kits & service) Medical/Dental Clearance (PQ)	Robbie Score	<a href="mailto:Robbie_at_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: 518.331.3103 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
Medical Advisory Service (MAS) <b>(see below for Remote Telemed #)</b>	<a href="http://www.medaire.com/corp_medlink.html">http://www.medaire.com/corp_medlink.html</a>	Office: 480.333.3771
Summit Science Coordination Office (SCO)	<a href="http://www.geosummit.org">http://www.geosummit.org</a> <a href="mailto:sco_at_summitcamp.org">sco at summitcamp.org</a>	John Burkhardt +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 at 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 at 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.

### Medical Advisory Service (MAS) Support

If you need medical advice/assistance, do not hesitate to contact Medical Advisory Service (MAS) using the card included with the medical kit or the information below. Be sure that each team member knows where the kit is located and understands how to use the MAS service in the field. For further information on MAS, please visit our Web site <http://www.polar.ch2m.com/> and navigate to Medical>Remote Medical Services/Kits.

### MAS 24/7 Telemed Service

Worldwide Phone: 1.480.333.3876  
 Fax: 1.480.333.3821  
 Member ID: CH2M HILL Polar Services

### Risk Assessment

See appendix.

## 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
Safe travel, clearances arranged for the field team members to/from Greenland originating in Scotia, NY
Adequate housing and meal arrangements while in Greenland arranged by CPS and Univ of Copenhagen personnel.
Efficient and secure shipment of laboratory and field equipment to/from/within Greenland.
Supply of ice core boxes and eutectics for ice core packing, shipment, and storage.
Secure frozen transport of delicate, temperature sensitive ice cores from Greenland to their destination at DRI/Reno). Freezer truck arrangements will be made by CPS from Scotia, NY > Reno.

## 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

## RISK FACTORS and MITIGATION

Factor	Mitigation and Control
Cold Weather	<ul style="list-style-type: none"> <li>-Team members attend a cold weather injury training course such as Wilderness First Aid or Wilderness First Responder</li> <li>-Proper clothing</li> <li>-Appropriate camping gear, insure sleeping bags are adequately rated</li> </ul>
Drills/augers	Drill/auger training/review from previous years experience
Fixed Wing Travel	<ul style="list-style-type: none"> <li>-SAR plan in place</li> <li>-Attend a pilot briefing</li> <li>-Carry survival bags on the aircraft if doing day trips, or if multiple put in flights insure people travel with survival items from camp supplies</li> </ul>
Heavy lifting/body strains and sprains	-Use proper lifting techniques
High Altitude	<ul style="list-style-type: none"> <li>-Have SAR plan in place</li> <li>-Have oxygen available in high altitude camps</li> <li>-Develop plan to acclimatize</li> <li>-Consult with physician on use of medication for acclimatization</li> </ul>