

PROJECT INFORMATION

Lead Principal Investigator	Eric Rignot
Institute	National Aeronautical and Space Administration, Jet Propulsion Laboratory
Project Title / Grant #	HF radar sounding of glaciers in Greenland and Antarctica for force and mass balance calculations (NASARignot)
NSF Program and Manager	US\Federal\NASA, Dr. Thomas Wagner
PFS Project Manager	Susan Zager

LOGISTICS SUMMARY

For this NASA-funded study of glacier acceleration processes, a field team of ~4 will conduct airborne radar surveys over key Greenland glaciers during 2008, 2009 and 2010.

In May of 2008, the team focused on three glaciers: Jakobshavn, Upernavik, and Helheim Glaciers. In 2009, they conducted surveys of glaciers near the communities of Nuuk (the Kangiata-Nunata and others) and Upernavik south of Kangerlussuaq; of the Store Glacier to the north near Uummannaq; of Helheim and Kangerdlugssuaq glaciers on the southeast coast; and of unnamed glaciers near Narsarsuaq, almost at the southern tip of the island.

For 2010, the team will survey glaciers in the southwest (Kangiata Nunata, Sermilik and others) and in the southeast, the largest being Heimdal. Two researchers will travel to Kangerlussuaq via commercial air in mid-March, set up a base of operations at the KISS, and spend a day or so outfitting a Twin Otter with their instruments before beginning the research. Several days into the surveys, the PI will arrive in Kangerlussuaq and continue the airborne research with one colleague while the other departs Greenland via commercial air. When the work is finished, the two remaining researchers will spend a day or so in Kangerlussuaq dekitting the plane. They will then depart Greenland, also via commercial air.

For each year of field work in the Arctic, CPS will provide Twin Otter support, Kangerlussuaq user days and truck use in 2010 as visits to Kanger precede CPS staff presence, lodging in villages as necessary, and safety/communications gear. NSF will recoup these costs via an interagency funds transfer. All other logistics, including any support for GPS installations at the Upernavik Isstrom, will be arranged by the PI and paid 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=NASARignot

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		
Determine if permits are necessary for fieldwork and apply in a timely fashion	PI		
Visit all hyperlinks and review all documents referred to in the support plan	Entire Field Team		
Provide SAR information and contact list	CPS	15 Mar 10	
Provide cost estimate for interagency transfer	CPS	Feb 2010	Feb 2010
Provide end of season actual costs	CPS		
Complete Critical Success Factors	PI		Completed

ALLOCATIONS AND SERVICES

Allocations from Inventory

Quant/Unit	Item
1	Iridium phone (Basse at KISS will hand off)

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/>.

CPS will provide the following support, and costs will be recouped via an interagency funds transfer between [NASA](#) and NSF. Please see Appendix for an estimated cost.

Other Services

Service	Comments
Truck rental for transport to/from Airport	Basse will assist with truck
Lodging at KISS	Basse is POC
Twin Otter support	Air Greenland

Kangerlussuaq International Science Support (KISS)

Contact for	Name	Email	Primary Phone
Sat phone Internet Meal cards Truck rental KISS facilities	Basse Vaengtoft, KISS Manager	sciencesupport at glv.gl	299 524533 mobile 299 841107 x. 6452 KISS office

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 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
Cases, radar, antenna, rack, batteries via 109 th .	Approx. 900lbs.

SUPPORT SCHEDULE

Approx Date	Location	Activity
10 Mar 10	Stratton AB, NY	Last day for cargo to arrive for 109th Community flight to SFJ
16 Mar 10	US > SFJ	Merritt and Mougino arrive commair in SFJ. Lodging in KISS.
17 Mar 10	NY > SFJ	109 th flies cargo to SFJ
18 Mar 10	SFJ	Begin Twin Otter (TO) charter: Set up equipment, TO installation & certification, possible test flights.
19 Mar 10	SFJ > sites	Fly grid, Merritt and Mougino.
20 Mar 10	SFJ > sites	Switch out Mougino for Rignot. Mougino departs commair SFJ > US. Rignot arrives via commair EUR > SFJ. Rignot & Merritt resume flying grid in the AM.
21 Mar 10	SFJ > sites	Continue flying, Rignot & Merritt.
23 Mar 10	SFJ > EUR	SFJ > CPH via commair, Rignot & Merritt
Early April	SFJ > NY	Cargo to fly with first available 109 th flight back to NY; probably in April

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	Email
Rignot, Eric	Kangerlussuaq	erignot at uci.edu
Mougino, Jeremie	Kangerlussuaq	jmougino at uci.edu
Merritt, Shane	Kangerlussuaq	smerritt at engineering.uiowa.edu

PROJECT CONTACT INFORMATION
Research Team

Role	Name	Email	Phone / Fax
Principal Investigator	Eric Rignot	erignot at uci.edu	818.354.1640 / 818 354.0495

CPS Team Members

Contact for	Name	Email	Primary Phone
Greenland science planning & support	Susan Zager	Susan at polarfield.com	Denver: 720.320.6159
Greenland science planning & support	Robin Abbott	Robin at polarfield.com	Denver: 303.748.8507
Kangerlussuaq base operations	Kathy Young	Kathy at polarfield.com	Denver: 720.320.6160 Kanger: 011.299.524218
Scotia (NYANG 109 th) 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

CH2M HILL Polar Services (CPS) Offices

Denver	Kangerlussuaq	NYANG 109th, Stratton AB
Polar Field Services 8110 Shaffer Pkwy. #150 Littleton, CO 80127 Tel: 303.984.1450/1439 Fax: 303.984.1445	CH2M HILL Polar Services Postboks 1015 DK-3910 Kangerlussuaq, Greenland Tel: 011.299.841598 Fax: 011.299.841599	Earl Vaughn 109 th Aerial Port, Bldg. 20 1 Air National Guard Rd. Scotia, NY 12302-9752 Tel: 518.344.2635 Cell: 518.605.0979 Fax: 518.344.2537

SAFETY, ENVIRONMENT, HEALTH and PERMITS

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
 e-mail: [ekspeditioner at gh.gl](mailto:ekspeditioner@gh.gl)

Risk Assessment

Please see the 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
Air Greenland Charter in place one week before flight.
Twin Otter plane available on April 18 – 22 Apr.
Safe transportation of radar equipment from JPL to Greenland and back.
Lodging and Internet available at KISS.

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.

APPENDICES

Risk Assessment Flight Plan Summary

2010 Risk Assessment

Factor	Mitigation & control
Communications	Carry the appropriate communications system (satellite phone) Assure your phone and/or radio is fully charged before going out and Carry a spare battery.
Emergency Plan	Compile a list of emergency contacts for your field team and share it with critical participants including your home institution and CPS. Share your satellite phone number as a means for others to contact you.
Fixed Wing Travel	SAR plan -- CPS will send to researchers Attend pilot briefing before flights Carry survival bags on the aircraft if doing day trips

Flight Plan (Summary) Flight plan 2010 – Version 2.0 March 5, 2010



Air Charter: March 18th – March 22nd

Ground speed of 130 knots or 240 km/hr

Supplementary internal tank of 135 gallons requested.

Usage of plane GPS antenna requested.

A/c range = 780 nm or 6 hrs with tank; 560 nm or 4.5 hrs without.

Total fuel: 3,170 lbs without tank; Burn rate: 600 lbs/hour

Elevation of a/c above ice sheet surface: 400 to 600 m

Mission 1: RUSSELL GLACIER -1 and -2 (green)

SFJ to SFJ (620 nm each)

Total = 1,240 nm.

Mission 2: KANGIATA NUNATA (red)

SFJ to Kangiata to SFJ, no refuel.

Total = 490 nm

Mission 3: SOUTHWEST (purple)

SFJ to Narssarsuaq (565 nm), refuel in Narssarsuaq, Narssarsuaq to SFJ (565 nm).

Total = 1,130 nm.

Mission 4: STORE GLACIER (blue)

SFJ to Ilulissat to Store Glacier (70deg 30') to SFJ, no refuel.

Total = 560 nm.

Mission 5: SOUTHEAST GREENLAND -1 and -2 (purple/blue)

SFJ to Kulusuk (620 nm), refuel in Kulusuk, Narssarsuaq to SFJ (620 nm).

Total = 1,240 nm