

*Please review all of the following information, including the gear allocations and field team members, to ensure accuracy. This plan is an agreement between VPR and your group, documenting the logistics support you will receive.*

• Project Information •

<b>Lead Principal Investigator</b>	Dr. Konrad Steffen
<b>Institute</b>	University of Colorado, Boulder, Cooperative Institute for Research in Environmental Sciences
<b>Project Title / Grant #</b>	Greenland Climate Network (GC-Net) (NASAAWS)
<b>NSF Program and Manager</b>	Other Agency - NASA, Dr. Waleed Abdalati
<b>VPR Project Manager</b>	Robin Abbott

• Logistics Summary •

Five members (Konrad Steffen, Jay Zwally, Russell Huff, Jason Box, and Noah Molotch) will take the C-130 from NY to Kangerlussuaq on May 1st 2005. The following day, three members of the expedition (Steffen, Box, Huff) will fly via Twin Otter to Swiss Camp to unload cargo, and then on to Crawford Point AWS where they will perform maintenance and camp for the night. Jay Zwally will travel to Ilulissat with a team from PBS' Nova series to conduct interviews and film footage regarding the Greenland Ice Sheet. On May 3<sup>rd</sup>, Molotch and additional cargo will fly on the Twin Otter from Kangerlussuaq to Ilulissat to pick up Jay Zwally on the way to Swiss Camp. The NOVA film team will accompany the remaining cargo on a Twin Otter flight to Swiss camp the following day. They will film on-site at Swiss Camp for several days before being pulled out by helicopter.

On May 12<sup>th</sup>, a BBC film crew will fly into Swiss Camp. They will spend two days filming and interviewing team members before heading back to Ilulissat.

While at Swiss Camp this spring, the Steffen crew will service the AWS's at JAR1, JAR2 and the small AWS's SM1, SM2, and SM3 as well as the permanent GPS sites. New instruments will be installed at SC and JAR2. They also hope to measure the accumulation variability with ground penetrating radar along profiles of 50 km length up glacier from Swiss Camp.

The team members will be pulled out to Ilulissat by helicopter on May 17<sup>th</sup>/18<sup>th</sup>. Three team members (Steffen, Huff, Box) will continue on to Qaanaaq to meet a Twin Otter for their northern traverse to maintain 11 AWS sites. The cargo for this portion of the season (tower extensions, alu tripod, 3 alu boxes and camping gear) will await Twin Otter pick-up in Thule, having been delivered there by C-130 on May 4<sup>th</sup> or 5<sup>th</sup>. From May 19<sup>th</sup> to May 26<sup>th</sup> the team will travel to their AWS sites, camping along the way as necessary, before returning to Kangerlussuaq and departing on the 109<sup>th</sup> ANG flight May 27<sup>th</sup>.

For the complete VPR online project record for this grant, including science objectives, go to: [http://www.vecopolar.com/arlss\\_reports/arlss\\_projectsdetail.asp?cbPropNum=NASAAWS](http://www.vecopolar.com/arlss_reports/arlss_projectsdetail.asp?cbPropNum=NASAAWS)

• Outstanding Issues •

Issue	Responsibility	Date Completed
Review support plan for accuracy and distribute to all field team members	PI	
Obtain all necessary permits for fieldwork	PI	
Visit all hyperlinks and review all documents referred to in the support plan	Field Team Members	
Contact the GEOSummit Science Coordination Office (SCO) <a href="mailto:sco@geosummit.org">mailto:sco@geosummit.org</a> regarding your project's plans for the season	PI	04/04/2005
<b>Please note this important information for your field team:</b> Bring 2 different forms of picture ID. Passports are now mandatory for entry into Greenland. Be sure to pack them!	Field Team Members	

• Allocations & Services •

**Swiss Camp Project**

Quant/Unit	Item	Comments
1 ea	Electric jack-hammer	For chipping ice. Send back to SFJ on the last Twin Otter flight.
3 ea	Iridium phones (1 with data port)	Will pick up in Kanger
1 ea	Skidoo, Scandic	Was overhauled during off-season
1 ea	First Aid Kit, Expedition	
3	Arctic Oven tents	

**Swiss Camp Procurements by VPR for 2005**

Quant/Unit	Item	Comments
3ea	Gasoline/Benzine – 55 gal drum	Need at put-in
2 ea	Propane (100 lb cylinder– European)	Need at put-in
2 gallon	Two-cycle oil for skidoo fuel mix	
4	12 oz synthetic chain case oil	For new skidoo

**Northern & Southern AWS Traverse**

Quant/Unit	Item	Comments
1 ea	Coleman Stove	
1 gallon	Coleman fuel	
1 ea	Cook Set for 4 people- pans, plates, cups, forks, knives, spoons	
3ea	Iridium phones (1 with data port)	Will use the Swiss camp phones
1 ea	First Aid Kit, Expedition	Will use the Swiss Camp Kit

For more information on satellite phones, radios, manuals and other field communications support, please visit the VPR communications website at <http://vpr.sri.com>.

**Other Services by VPR**

<b>Project Allocations</b>	<b>Comments</b>
Book Air Greenland ticket to/from Ilulissat (Zwally)	Steffen project pays
Book hotel in Ilulissat for NOVA filming (Zwally)	VPR pays
5 hrs helo support for NOVA filming (Zwally)	VPR pays
Kenn Borek Twin Otter support for May 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> for put-in and NOVA visit	NSF pays through KB air agreement; Steffen project reimburses VPR for non-NOVA portion
Book Hotel Hvide Falk for May 17 <sup>th</sup> /18 <sup>th</sup> (Zwally, Steffen, Box, Huff, Molatch)	Steffen project pays
Book Hotel Qaanaaq for May 19 <sup>th</sup> -23 <sup>rd</sup> (Steffen, Box, Huff, Twin otter crew)	Steffen project pays
Clearances have been made for 109 <sup>th</sup> flights and to enter Thule Air Base in case the need arises.	
Air Greenland Twin Otter support for May 20 <sup>th</sup> – 27 <sup>th</sup> AWS traverse flights	VPR pays; Steffen project reimburses for non-NSF supported portion

• **Location Information** •

Please visit <http://www.vecopolar.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 got to <http://www.vecopolar.com> and navigate to Greenland > Calendars/Schedules.
- For Customs requirements refer to the *Greenland Guide*, available at <http://www.vecopolar.com> under Greenland.

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

<b>OSU – Jason Box</b>
1 x 2.3 cubic ft 'small' edak metal box
2 x 4.4 cubic ft 'medium' edak metal box
1 x 8.8 cubic ft 'large' edak metal box
+ 2 x 6 cubic feet cardboard boxes (containing solar pannels/enclosures, if they do not fit in metal boxes)
12 ft length bundle of alu poles (150 lb)
5.5 ft length canvas bag containing tripod (45 lb)
8 ft length canvas bag containing tripod (60 lb)
<b>total weight</b> : 818 lb (including boxes and personal cold wx gear clothing), not including passengers to Swiss Camp. (1/4 total weight is batteries for 4 camera systems)
<b>total cube</b> : 45 - 51 cubic feet total (not including pax)
<b>CU – Koni Steffen</b>
All equipment, instruments, and food for the field season was shipped to Scotia on 7 April. The shipment contained 55 pieces/boxes. A packing list was provided to VPR and all items will be entered into CTS.

• Support Schedule •

**Swiss Camp**

Five members (Konrad Steffen, Jay Zwally, Russell Huff, Jason Box, and Noah Molotch) will take the LC-130 from Schenectady to Kangerlussuaq on May 1, 2005. Three members of the expedition (Steffen, Box, Huff) will fly by Twin Otter to Swiss Camp on 2 May, to unload cargo then continue to Crawford Point AWS where they will spend the night. The remaining expedition members will fly to Swiss camp on 3 and 4 May, along with a NOVA Educational Program film team who will spend two days on site. During the research project's stay at Swiss camp, they will service the AWS's SC, JAR1 JAR2 and the small AWS's SM1, SM2, and SM3. New instruments will be installed at SC and JAR2. Further, they plan to measure the accumulation variability with ground penetrating radar along profiles of 50 km length up glacier from Swiss Camp.

1 May 2005: 5 PAX Schenectady – Kangerlussuaq with C-130

2 May 2005: 3 PAX (Steffen, Box, Huff) with cargo for Swiss Camp and AWS tower extension for CP1

SFJ – Swiss Camp	289	unload cargo
Swiss Camp – CP1	95	3 PAX stay overnight to extent AWS tower
CP1 – SFJ	352	empty flight back
<b>Total</b>	<b>736</b>	<b>~ 3.2 hours</b>

3 May 2005: 2 PAX with cargo for Swiss Camp, 3 PAX from CP to SC

SFJ – Swiss Camp	289	2 PAX (Zwally, Molotch, unload cargo)
Swiss Camp – CP1	95	empty
CP1 – Swiss Camp	95	3 PAX (Steffen, Box, Huff) flight to SC
Swiss Camp – SFJ	289	empty drums and propane, maybe skidoo
<b>Total</b>	<b>768</b>	<b>~ 3.3 hours</b>

3 May 2005: Cargo flight to Swiss Camp (if we don't get all the cargo to the camp with previous flights)

SFJ – Swiss Camp	289	unload cargo
Swiss Camp – SFJ	289	with empty propane/or skidoo
<b>Total</b>	<b>578</b>	<b>~ 2.6 hours</b>

17/18 May 2005: Swiss Camp to JAV, 5 PAX and cargo (**Helicopter**)

JAV - Swiss Camp	77	empty
Swiss Camp – JAV	77	2 PAX (Molotch, Zwally) and cargo
JAV - Swiss Camp	77	empty
Swiss Camp – JAV	77	1 PAX (Steffen) and Cargo
JAV - Swiss Camp	77	Empty
Swiss Camp – JAV	77	2 PAX (Box, Huff) and cargo
<b>Total</b>	<b>462</b>	

19 May 2005: Air Greenland Flight Ilulissat – Kangerlussuaq (Zwally, Molotch)

20 May 2005: 2 PAX (Zwally, Molotch) return to USA with C-130

**Northern & Southern AWS traverse**

The Steffen field team will visit 11 AWS sites during the 2005 maintenance traverse. The cargo for the northern traverse (tower extensions, aluminum tripod, 3 aluminum boxes and camping gear) will be sent with a C-130 flight to Thule on May 4<sup>th</sup>. The AWS traverse needs a number of fuel stops along the Greenland coast (Qaanaaq, Thule, Upernavic) and on the ice (Summit), which will be organized in advance.

Three members (Steffen, Huff, Box) will take part in the AWS traverse. They will bring North Face sleeping tents, maps and cooking gear along for the camping on the ice during the tower overnight work.

19 May 2005: Greenland Air Flight, Ilulissat – Qaanaaq (Steffen, Box, Huff)

20 May 2005: GITS AWS service from Qaanaaq, 3 PAX (Steffen, Box, Huff), Twin Otter

QAA – GITS	306	4 hour ground time
GITS - QAA	306	return
<b>Total</b>	<b>612</b>	<b>~ 2.7 hours</b>

21 May 2005: Petermann service from Qaanaaq, 3 PAX (Steffen, Box, Huff), Twin Otter

QAA – Petermann AWS	408	4 hour ground time
Petermann AWS - QAA	408	return
<b>Total</b>	<b>816</b>	<b>~ 3.5 hours</b>

22 May 2005: Sunday –Day OFF

23 May 2005: NGRIP – NASA-U from Qaanaaq, 3 PAX (Steffen, Box, Huff), Twin Otter

QAA – NGRIP AWS	830	4 hour ground time
NGRIP – NASA-U AWS	254	3 PAX stay overnight
NASA-U - Upernavic	243	empty
<b>Total</b>	<b>1327</b>	<b>~ 5.3 hours</b>

24 May 2005: Nasa-u to Summit to Kangerlussuaq, 3 PAX (Steffen, Box, Huff), Twin Otter

Upernavic – NASA-U	243	empty, pick up 3 PAX
NASA-U – Summit 378	4 hours ground time, extend AWS tower	
Summit – SFJ	771	return with 3 PAX
<b>Total</b>	<b>1392</b>	<b>~ 5.8 hours</b>

25 May 2005: southern AWS traverse, 3 PAX (Steffen, Box, Huff)

SFJ – Dye2	202	download data, 1 hour ground time
Dye2 – NASA SE	167	download data, 1 hour ground time
NASA SE -Saddle	104	3 PAX and camping cargo stay at AWS site
Saddle – SFJ	295	empty flight back (or closer airport at coast)
<b>Saddle – SFJ</b>	<b>768</b>	<b>~ 3.2 hours</b>

26 May 2005, southern AWS traverse, 3 PAX (Steffen, Box, Huff)

SFJ – Saddle	295	empty flight to AWS site to pick up 3 PAX
Saddle – S Dome	316	4 hour ground stop to extend tower
S Dome – SFJ	508	end of southern AWS traverse
<b>Total</b>	<b>1119</b>	<b>~ 4.7 hours</b>

27 May 2005: 2 PAX (Steffen, Huff, Box) back to USA with C-130

### • Field Team Information •

Name	Location	Date In	Date Out	Email
Steffen, Konrad	Kangerlussuaq	5/1/2005	5/27/2005	<a href="mailto:konrad.steffen@colorado.edu">konrad.steffen@colorado.edu</a>
Steffen, Konrad	Swiss Camp	5/2/2005	5/17/2005	
Steffen, Konrad	AWS traverse	5/20/2005	5/26/2005	
Zwally, Jay	Kangerlussuaq	5/1/2005	5/20/2005	<a href="mailto:jay.zwally@gsfc.nasa.gov">jay.zwally@gsfc.nasa.gov</a>
Zwally, Jay	Swiss Camp	5/4/2005	5/17/2005	
Huff, Russell	Kangerlussuaq	5/1/2005	5/27/2005	<a href="mailto:russell.huff@colorado.edu">russell.huff@colorado.edu</a>
Huff, Russell	Swiss Camp	5/2/2005	5/17/2005	
Huff, Russell	AWS traverse	5/20/2005	5/26/2005	
Box, Jason	Kangerlussuaq	5/1/2005	5/27/2005	<a href="mailto:box.11@osu.edu">box.11@osu.edu</a>
Box, Jason	Swiss Camp	5/2/2005	5/17/2005	
Box, Jason	AWS traverse	5/20/2005	5/26/2005	
Molotch, Noah	Kangerlussuaq	5/1/2005	5/20/2005	
Molotch, Noah	Swiss Camp	5/3/2005	5/18/2005	

• Project Contact Information •

**Research Team**

Role	Name	Email	Phone / Fax
Principal Investigator	Dr. Konrad Steffen	<a href="mailto:konrad.steffen@colorado.edu">konrad.steffen@colorado.edu</a>	303-494-6276/303-492-1149

**VPR Team Members**

Contact for	Name	Email	Primary Phone(s)
Greenland operations	Robin Abbott	<a href="mailto:robin@polarfield.com">robin@polarfield.com</a>	Denver: 303.748.8507 Greenland: 011.299.524218
Greenland operations	Mark Begnaud	<a href="mailto:mark@polarfield.com">mark@polarfield.com</a>	Denver: 720.320.6160 Greenland: 011.299.524281
Sat phones & comms	Roy Stehle	<a href="mailto:roy.stehle@sri.com">roy.stehle@sri.com</a>	Menlo Park: 650.859.2552
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Thule operations	Susan Zager	<a href="mailto:susan@polarfield.com">susan@polarfield.com</a>	Denver: 720.320.6159
Denver operations	Jill Ferris	<a href="mailto:jill@polarfield.com">jill@polarfield.com</a>	Denver: 720.320.6155
Scotia Operations & Customs	Earl Vaughn	<a href="mailto:earl.vaughn@nyscot.af.mil">earl.vaughn@nyscot.af.mil</a> <a href="mailto:yprscotia@direcway.com">yprscotia@direcway.com</a>	Scotia: 518.331.3103

**VPR Offices**

Denver	Kangerlussuaq	Scotia	Summit
VECO Polar Resources 8392 S. Continental Divide Rd. #104 Littleton, CO 80127-4268 Tel: 303.984.1450/1439 Fax: 303.984.1445	VECO Polar Resources 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 Fax: 518.884.2904	VECO Polar Resources Attn: Name of Employee/Researcher Postboks 1015 DK-3910 Tel: 321.953.9650 Fax: 321.953.9651

**Other**

Organization	Internet	Phone
Medical Advisory Services	<a href="http://www.mas1.com">http://www.mas1.com</a>	410.257.9504 410.257.9505 410.257.9506
Summit Science Coordination Office	<a href="http://www.geosummit.org">http://www.geosummit.org</a> <a href="mailto:sco@geosummit.org">sco@geosummit.org</a>	N/A

• Safety, Environment, Health, and Permitting •

**Permits**

Please refer to VPR's *Greenland Guide*, available at <http://www.vecopolar.com> under Greenland, for information about permits required to conduct fieldwork in Greenland.

**Medical Advisory Systems (MAS)**

If you find yourself with a need for medical advice/assistance do not hesitate to contact Medical Advisory Systems. When first arriving to your field location please follow MAS' check in procedure to activate the MAS service. A MAS representative will provide detailed instructions for how to use the MAS service in future emergencies. It is crucial that each field team member understand how to use the MAS service in the field. For further information on MAS please visit our website <http://www.vecopolar.com/> and navigate to Medical>Remote Medical Services/Kits.

**MAS Check-In Procedure**

Call 410.257.9504/9505/9506 and be ready to provide the following information:

Your Name

Your contact PI information

Camp information (indicate that you are VECO Polar Resources-supported researchers conducting and the location in which you are conducting remote work)

**Risk Assessment**

<b>Risk</b>	<b>Mitigation</b>
Problems with ground transportation of cargo	Allow ample time to arrive in NY from Boulder and obtain all custom clearances.
Equipment failure	Test systems prior to deployment. Depending on the timing, fly replacement item from SFJ to Ilulissat via commercial GL Air, then Air Alpha helo to Swiss Camp on visitor flights.
Safety – includes weather, accidents, etc	Contact SFJ Met office (299) 841022 for reliable weather forecasts. Always travel in twos. Always carry Iridium phone. Check in with Swiss Camp and Kangerlussuaq. Crevasse rescue training given to all field members.
Air Support delays during AWS traverse.	Alter or omit destinations so you can meet your time schedule with 109 <sup>th</sup> flights or fly back to the States commercially through CPH.
Cargo shipped from SFJ to Thule for Twin Otter AWS traverse flight.	VPR person on flight to Thule to oversee cargo movements. They will make sure all Steffen cargo is stored in Warehouse 628 and give directions and complete list to Thule POC, Jack Stevens for delivery to Air Greenland Hangar prior to being loaded on Twin Otter on the 20 <sup>th</sup> May.
Permitting	Submit early and follow up often.

• **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 VPR’s support.

<b>Factors</b>
<b>NASA SWISS CAMP</b>
Planning field season prior to field deployment
Purchasing fuels and gas for field camp
Cargo shipment via 109th to/from SFJ
Logistics support arranging Twin Otter charter
Logistics support in Kangerlussuaq prior to field work
Communication support during AWS maintenance in the field
Office support at KISS (email, fax, phone)
<b>AWS SUPPORT</b>
Planning field season prior to field deployment
Cargo shipment via 109th to/from SFJ/Thule
Logistics support arranging Twin Otter charter
Logistics support in Kangerlussuaq prior to field work
Field equipment and camp equipment support
Communication support during field project
Office support at KISS (email, fax, phone)
Post-expedition briefing and feed back

• **Government Performance and 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 VPR’s performance is a "facility-performance metric" which counts the number of productive days your project has in the field while relying on VPR facilities or support. Please keep track of any “lost days” and report these to us at the end of the season.