Field season report 2010
North Greenland Eemian Ice drilling (NEEM) 2007-2011:

Second season of NEEM deep ice core drilling and processing

Prepared by Ice and Climate Group, NBI

for

The NEEM Steering Committee and Danish and Greenlandic authorities.

Bedrock was reached Tuesday July 27 at the depth of 2537.36 m. Photo: Sepp Kipfstuhl.

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Preface

This report has been prepared by the NEEM logistics group. The purpose is to provide the NEEM Scientific Steering Committee, the relevant authorities and the NEEM 2010 participants with documentation of the events of the field season. The report contains information on the activities leading up to the field season and activities on the ice sheet. The SITREPs and camp life diary and some pictures are included.

Besides listing the facts, it is our hope that the report can relay some of the special experiences which were part of the multinational efforts on the ice sheet.

The logistical tasks of the field season 2010 required good will and flexibility of planning from the CH2MHill/CPS Polar Field Services and the 109th TAG, NYANG to make the field season a success. The NEEM crew wishes to express their sincere gratitude to Robin Abbott, Kathy Young, Kyli Olson, Mark Begnaud, Ed Stockard, Eric Coplin and Earl Vaughn, CPS, and the New York Air National Guard for their assistance.

Lars Berg Larsen, Jørgen Peder Steffensen, Dorthe Dahl-Jensen

Report on the 2010 activities of the NEEM project

Background.

At the start of the field season 2009, we were behind schedule both in camp construction (main dome, drill trench and science trench) and in deep ice drilling (only drilled to 110 m in a dry hole). However the field season 2009 was very successful with drilling ending at a very comfortable 1750 m, a complete processing line and a complete camp infrastructure. The only drawback was that we had to drill the brittle zone ice in the warmest period of the field season and the brittle ice took significant crack damage as it proved difficult to maintain low temperatures particularly in the drill trench, where temperatures, even with cooling tunnels, reached -4 C in July. Some 650 m brittle ice was stored in the buffer awaiting processing in 2010. The main goals for season 2010 were for drilling to reach bedrock and for processing to treat both the brittle ice and the deep ice. For CFA, it was clear from the onset that a complete coverage could not be achieved, and it was planned to continue CFA measurements in 2011.

Kangerlussuaq (Søndre Strømfjord, SFJ)

NEEM had between 1 and 3 Field Operations Managers (FOMs) in the 2010 campaign and the number of FOMs was determined by estimated work loads. There was only one FOM between flight periods (109th deployments) and up to three during periods with large transfers of personnel or visitors. After several years of struggeling to keep the old main doors of our warehouse 442 from breaking down, the decision was suddenly made as FOM (J.P.S.) managed to run the big red forklift into the gate rails. During autumn 2010 the old gate was removed and a new automatic one installed. At the same time, 442 received a much needed reapir of the roof. In 442 NEEM has an operational 4m x 4m walk-in freezer for ice cores and food. The FOM office (KISS 208) has been leased on a flat rate basis until 2011. Kangerlussuaq International Science Support (KISS) accommodated all participants while in Kangerlussuaq.

NEEM operates the following vehicles in Kangerlussuaq: A 8 ton forklift, a 5 ton forklift, a 8 ton Ford flatbed truck with hydraulic crane, a 1984 Toyota landcruiser , a F-250 Powerstroke pickup truck, a VW Taro 4-wheel drive pickup. In June, the 2007 Toyota landcruiser 100 was returned from NEEM to Kangerlussuaq due to problems with the Mattrax. The Mattrax were taken off and the Toyota now sits on wheels in 442. It will not be registered during NEEM as the cost of registering a new vehicle is very high. The Toyota will serve as a future backup when one of the other vehicles break down or when appropriate Mattrax are found and we have need for the vehicle in the field. The old Ford step van was in need of repair, and since the 109th Aerial Port was given their own vehicles, their need for borrowing it went away and the step van was given away.

The 8 ton was finally reapired this year and was used at the end of the season. CPS has kindly allowed us to use their articulated loaders. We hope we may use these assets also in 2011. During the NEEM program a very good working relationship has developed between NEEM FOMs and the 109th Aerial Port group. Very often, Aerial Port would prefer to pick up our ready pallets fro our staging area at 442 and they have been very kind to lend a hand by placing cargo from NEEM at our warehouse. The FOMs really appreciate this assistance.

The FOM office maintained contact with the field crew by telephone and internet. The HF radio connection serves as a backup.

The 2010 field campaign had several busy periods for the FOMs in Kangerlussuaq, mainly because a lot of people and many DVs had to be handled.

Start of field season.

The Field Season started with the arrival of two FOMs in Kangerlussuaq on 23rd April, with a 4 day delay due to the volcanic eruption at Eyjafjallajoekull than began to shut down North Atlantic air traffic on 13th April. The FOM office was opened, vehicles were activated and licenced. The FOMs unpacked the warehouse and set up communication. On 24th April the put-in crew arrived as planned and the 109th with a two day delay. Due to the cargo backlock in Europe some cargo was delayed, and the put in was postponed from 27th April to 28th April.

Put-in at NEEM and camp opening.

Put in went well and the crew of 16 were at NEEM at 12:05. By 17:50 the main generator was running and all garages were open. Within three days, all camp infrastructure was activated, and main entrances to drill and science trenches were opened. Trenches were in good condition; but the roof in the drill trench continues to slump a bit quicker than anticipated. All weather ports were erected by 9th May and 2010 opening had turned out to become one of the coldest camp opening. Just after camp opening, the steering transducer of the Pistenbully broke. This effectively took the Pistenbully out of action until a new transducer arrived. Skiway grooming was delayed, and even after the Pistenbully was repaired, weather was so unstable, cold and windy that the trouble of getting the skiway ready continued to haunt us until finally it was certified on 10th June.

Eyjafjallajoekull volcanic ash and delays.

There were several delays of cargo, people and flights due to the Eyjafjallajoekull eruption, and the ash situation continued to an issue, so that even on 21st May one flight was cancelled due to an ash cloud (modeled ash cloud) sitting right over NEEM and only NEEM. Delays became more the routine than the exception in 2010. Somehow weather was always fine when the 109th was not in Greenland, and as soon as the 109th arrived in Greenland, weather turned bad. There were even a few cases of delays due to technical problems with the planes.

GrIT traverse and "Go North" expedition

The GrIT traverse only made a one way trip this year and they did not bring any fuel to NEEM, but when they arrived on 12th May (several days delayed) they arrived in the company to a US, NSF sponsored, dogsled expedition, "Go North", with four members and 18 dogs. GrIT had arrived for a planned exchange of crew; but because of flight cancellations, the traverse could not continue onwards to Summit before 16th May (two days after the plane). The "Go North" team decided to terminate their expedition at NEEM instead of continuing to Summit. Three crew members left on the plane 14th May, and one stayed behind with the dogs for a pickup later. It was not until 22nd May that weather, authorities and machines allowed for a complete pickup of the expedition.

Side cave for cold storage.

It was planned to excavate a side cave to the science trench for storing packed ice core boxes until shipment under as cold as possible conditions. The extension cave for ice was excavated in 3 days (30 April to 3 May) by four people, and cooling holes(approx. 400 mm diameter) were augered and outfitted with hoses and blowers 8th to 11th May.

Expanding the CFA system.

Although not part of the original plan, the Steering Committee had decided to support construction of a new, warm CFA laboratory. First, the science trench was extended by excavating an extension to the science trench, then the warm laboratory for physical properties was pushed into the extension to make room for the new, warm laboratory. The laboratory was erected 12th and 13th May and was outfitted with equipment from 16th to 25th May. It took some days to adjust the gas and water lines from the existing CFA laboratory to the new; but the new laboratory was fully operational only a few days after CFA measurements began. For the first time in history, it was possible to measure stable isotopes of ice and greenhouse gases of air bubbles continuously on the same melt line as was used by CFA. Later, an experimental setup to measure phosphate was successfully coupled to the CFA system.

Drilling, processing and Drilling fluid.

After access to the trenches was gained, tower and winch were adjusted, and a borehole camera was lowered into the top of the drilling fluid on 2nd May. Borehole logging with the Danish logger was done 3rd and 4th May, and the hole fluid was filtered. The Swiss test sonar "pinger" was lowered into the hole and tested on 5th May. Drilling was then commenced and continued until all cutters were spent drilling into ice mixed with basal material. Bedrock was declared on 27th July at a final logged depth of 2527.36 m. Processing could keep up with the drillers, and in fact processing line switched three times back to processing the brittle zone, so by the end of the season, all core was processed. It was never required to switch manning and processing plans to a slow processing mode as anticipated in the Field Plan. It turned out, that the ice at the base at NEEM is almost but not quite at the pressure melting point. The drill was only stuck a few times,

and the method of freeing the drill with a few frozen glycol pellets, developed at NGRIP, worked well. At NEEM it was not needed to switch to the use of Alcohol Water Solution (AWS) in the form of "cognac" bombs. The drilling fluid continued to work well, even in warm ice, however, the drillers had many problems drying their clothes, and while many solutions were tried, a final solution was never found.

After the deep drilling was terminated, there was time to drill two shallow cores S2 and S3 with the Danish shallow drill and to test the Danish intermediate drill and winch using a Swiss tower.

Cooks.

This year we had decided to hire assistant cooks during periods of high camp personnel loads. The high loads came because of a high number of associated programs. Also the lead cook for the second half of the season injured his hand so much that he could not function a cook. Luckily, we were able to hire a local cook from Kangerlussuaq, Kasper Rasmussen, and he did well for the rest of the season.

Associated Programs

The vapour sampling tower and system was set up 16th to 19th May and went on line 25th May. It continued to operate until lthe end of the season.

Pit studies were conducted by the Japanese on 16th May to capture Eyjafjallajoekull ash, and 12th and 13th June a Japanese and Canadian team sampled a pit for biology. The U.S. DRI group made a pit study in May, and a Swedish and Danish team made pit studies for 10Be and stable isotopes the 8th August at shallow drilling site S3.

The U.S. PARCA weather station team were frustrated by the early season bad weather and had to leave Thule AB due to expiration of their landing permit; but in a rush to use a weather window, they managed to go to NEEM and maintain weather stations at NEEM, Camp Century, Humbolt and Peterman 7th and 8th May. They even managed to drill a 15 m core for Joe McConnell, which was processed at NEEM 25th May.

The GEUS seismic station was maintained and reset 17th May.

In preparation for drilling at Berkner Island in Antarctica, a New Zealand team went to NEEM in July to set up and test a NZ version of the Hans Tausen drill wih a newly developed tower and winch system. The tests were concluded with a few successful drilling runs in August, just before camp closing.

After deep drilling was over,Bryn Hubbard from U.K. made a successful run of his borehole camera system.

The Ice2Sea program drilled a 30 m core at Camp Century on 10th August.

Distinguished visitors and press.

On 22nd July we had the main distinguished visitor flight. While it was planned to made a Thule fuel shuttle during the visit, it was decided due to marginal weather to cancel the shuttle and the visitors went back to Kangerlussuaq via Thule AB. Four journalists stayed in camp for four days. On 28th July the second DV visit occurred whencamp received visits from a 109th organized group and NSF representatives. The third visit was a small groupled by Frederik Paulsen who came by a chartered Twin Otter on 9th August . This Twin Otter was used to transport a drilling crew for the Ice2Sea project to drill at Camp Century and at Dye-3. The Dye-3 operation later had to be cancelled due to bad weather.

Fuel statistics 2010:

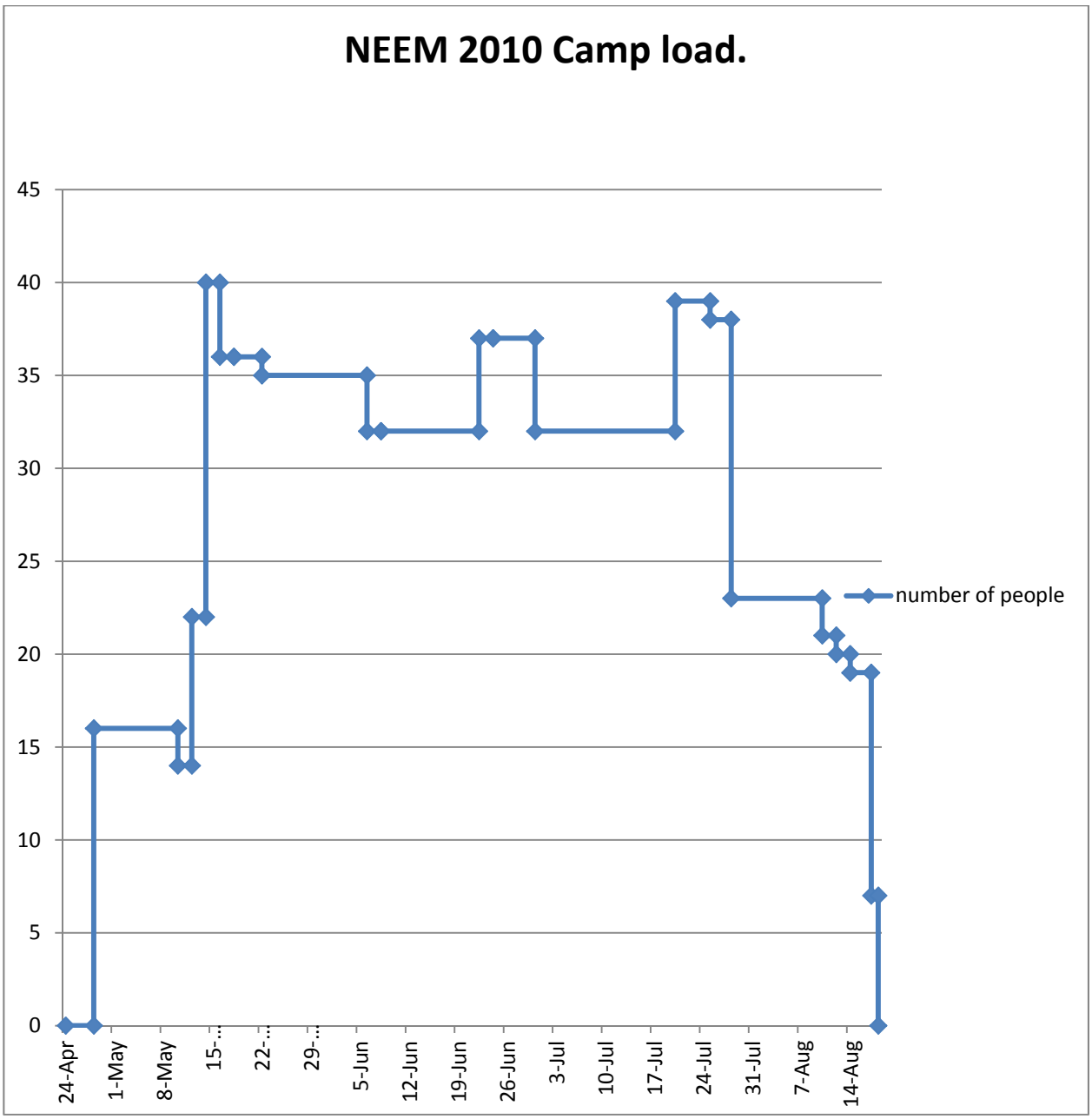
Fuel left in depot at NEEM:	27,000 liter JP-8 and Jet a/1 in three tanks.
	2,000 liter Mogas
	5,600 liter Jet A1 in drums
Fuel delivered at NEEM:	24,510 liter by Traverse and 109th
	800 liter Mogas
Fuel stored at NEEM 2009	34,000 liter (Jet A-1 in tank)
	Mogas 2000 liter
Consumption (118 days):	31,510 liter.
Mogas consumption 2010 at NEEM:	800 liter.
Average consumption per day (105 day):	300 liter fuel and 7.6 liter mogas
Drill fluid at NEEM	6,000 liter ESTISOL and 1,800 liter COASOL
Drill fluid in SFJ	6,400 liter ESTISOL and 0 liter COASOL.
Needs in 2010:	
Fuel	30,000 liter
Mogas	1000 liter
Drill fluid (up by ship 2010)	0 liter ESTISOL and 4,600 liter COASOL.

Loads carried 2010:

A total of 255564 lbs (116,165 kg) was transported to NEEM in 12(16) missions. Below is a table showing the missions. All weights in the table are in lbs.

Flight statistics 2010 (cargo incl. PAX weight):									
Mission	date	up	down	up	down	total	camp	hours	Comment
#		PAX	PAX	cargo	cargo	PAX	PAX sum		
							in camp		
	24-Apr						0		
1 (Scheduled)	28-Apr	16	0	12350	0	16	16	5.4	
Twin Otter (PARCA)	10-May	0	2			-2	14		T.O.
GRIT Traverse and dogs (Go North)	12-May	8	0			8	22		Traverse and dogs
2 (Scheduled)	14-May	27	9	18525	9760	18	40	5	
GRIT Traverse	16-May	0	4			-4	36		Traverse
3 (Scheduled)	18-May	2	2	11350	6400	0	36	5.1	
5 (NSF pick up of dogs)	22-May	1	2	11000	5000	-1	35		Pick up dogs
6 (Scheduled)	6-Jun	17	20	11170	8090	-3	32	5.9	
7 (NEEM and 109th fuel for depot at NEEM)	8-Jun	0	0	6000	0	0	32	2.3	THU fuel
8 (Scheduled)	22-Jun	17	12	15000	10053	5	37	4.9	
9 (Scheduled)	24-Jun	0	0	19355	9878	0	37	5	
10 (Scheduled)	30-Jun	16	21	20000	1575	-5	32	5.5	
11 (Scheduled THU Fuel shuttle and DV)	20-Jul	40	33	34354	13105	7	39	6.8	Thule shuttle DV
12 (Science and Education)	25-Jul	17	18	16560	13320	-1	38	2.6	S & E
13 (scheduled fuel, 109th media and NSF)	28-Jul	25	40	41540	18200	-15	23	5.1	Thule shuttle 109th media NSF
Twin Otter (Ice to Sea)	10-Aug	0	2			-2	21		T.O.
Twin Otter (Ice to Sea)	12-Aug	0	1			-1	20		T.O.
14 (109th DV visit)	14-Aug	1	2	19400	10900	-1	19	0	109th DV
15 (Scheduled)	17-Aug	0	12	18960	12200	-12	7	6.3	
16 (Scheduled)	18-Aug	0	7	0	11000	-7	0	5.3	
		187	187	255564	129481			59.8	
Average load				18254.57	9248.643				

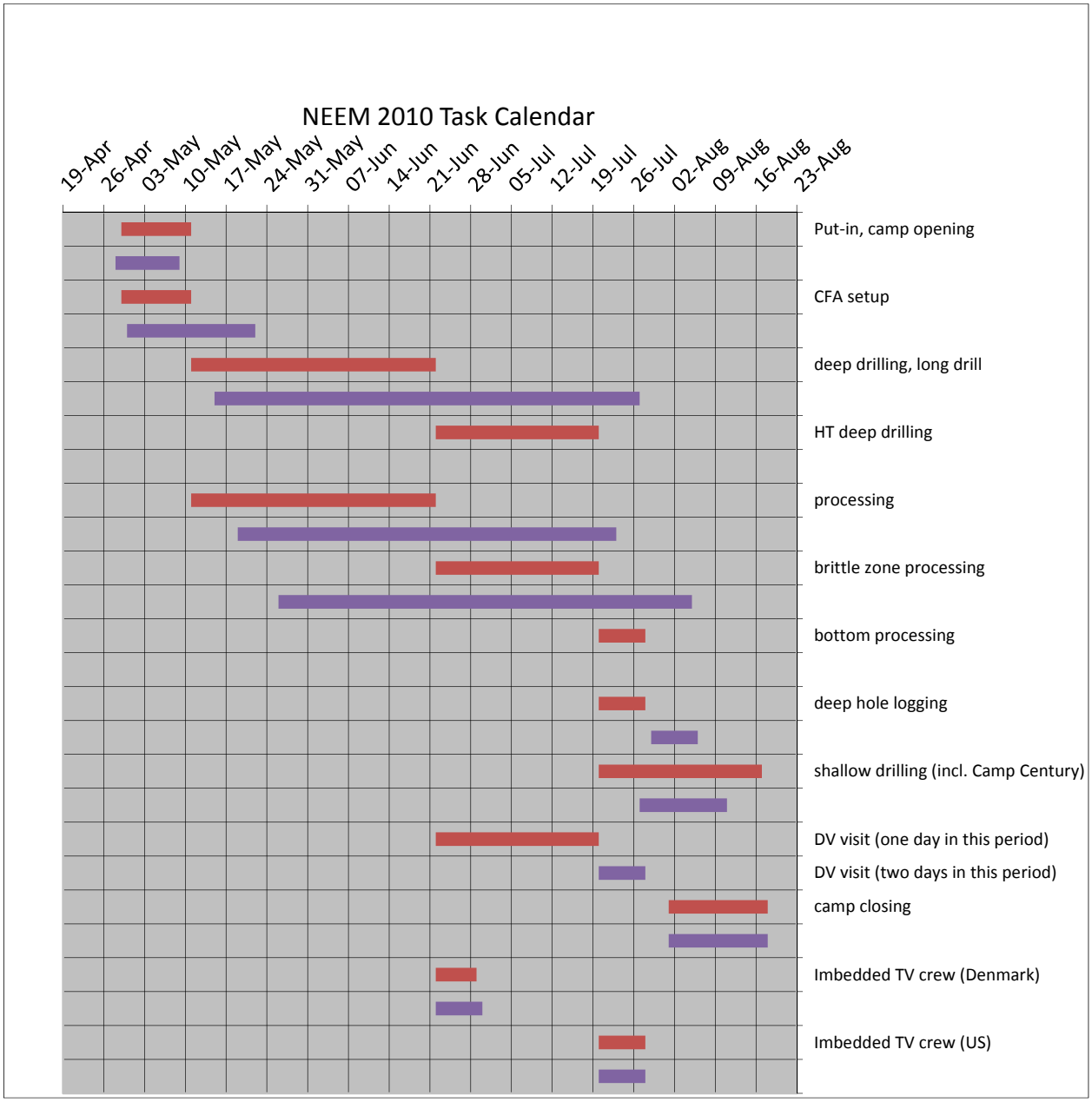
Camp load 2010:



Calender for tasks in camp.

2010 Calendar for tasks in camp:				
Task:	Period planned		Period Actual	
Put-in, camp opening	29-Apr	11-May		
			28-Apr	09-May
CFA setup	29-Apr	11-May		
			30-Apr	22-May
deep drilling, long drill	11-May	22-Jun		
			15-May	27-Jul
HT deep drilling	22-Jun	20-Jul		
processing	11-May	22-Jun		
			19-May	23-Jul
brittle zone processing	22-Jun	20-Jul		
			26-May	05-Aug
bottom processing	20-Jul	28-Jul		
deep hole logging	20-Jul	28-Jul		
			29-Jul	06-Aug
shallow drilling (incl. Camp Century)	20-Jul	17-Aug		
			27-Jul	11-Aug
DV visit (one day in this period)	22-Jun	20-Jul		
DV visit (two days in this period)			20-Jul	28-Jul
camp closing	01-Aug	18-Aug		
			01-Aug	18-Aug
Imbedded TV crew (Denmark)	22-Jun	29-Jun		
			22-Jun	30-Jun
Imbedded TV crew (US)	20-Jul	28-Jul		
			20-Jul	28-Jul

GANNT on tasks in camp.



NEEM actual manning 2010

Sorted by Names	Name	Country	To SFJ	To NEEM	From NEEM	From SFJ	Number of days in camp.	Number of days in KISS
CFA (helper)	Abbott, Peter	UK	27-Jun	30-Jun	20-Jul	22-Jul	20	5
CFA (FIC)	Abram, Nerilie	UK	21-Jun	22-Jun	28-Jul	30-Jul	36	3
FIELD ASSISTANT	Albershart, Louise	US	23-Apr	28-Apr	30-Jun	01-Jul	63	6
DRILLER	Alemany, Olivier	F	27-Jun	30-Jun	28-Jul	30-Jul	28	5
Outreach	Andersen, Torben	DK	21-Jun	22-Jun	30-Jun	01-Jul	8	2
SHALLOW (DK)	Andres, Heather	CAN	27-Jul	28-Jul	17-Aug	19-Aug	20	3
MECHANIC	Arntorsson, Gunnar Magnus	IS	21-Jun	22-Jun	20-Jul	22-Jul	28	3
SWISS SAW	Azuma, Kumiko	J	10-May	14-May	06-Jun	07-Jun	23	5
CFA (gases)	Balslev-Clausen, David	DK	28-Jun	30-Jun	28-Jul	30-Jul	28	4
FIELD ASSISTANT	Berg Larsen, Lars	DK	27-Jul	28-Jul	18-Aug	20-Aug	21	3
FOM	Berg Larsen, Lars	DK	23-Apr			30-Jun	0	68
SHALLOW (DK)	Berggren, Anne Marie	S	24-Jul	28-Jul	17-Aug	19-Aug	20	6
CFA	Bigler, Matthias	CH	26-Apr	28-Apr	06-Jun	07-Jun	39	3
LOGGER/DRILLER	Bjerregaard, Sebastian	DK	21-Jun	22-Jun	28-Jul	30-Jul	36	3
CFA (gases)	Blunier, Thomas	DK	10-May	14-May	06-Jun	08-Jun	23	6
POLLEN	Bourgeois, Jocelyne	CAN	10-May	14-May	30-Jun	01-Jul	47	5
LOGGER/DRILLER	Brand, Tina	DK	19-Jul	20-Jul	17-Aug	19-Aug	28	3
FIELD ASSISTANT	Burton, Timothy	UK	28-Jun	30-Jun	18-Aug	20-Aug	49	4
CFA (gases)	Chappellaz, Jerome	F	27-Jun	30-Jun	28-Jul	30-Jul	28	5
VISITOR	Christensen, Robert Zola	DK	07-May	14-May	14-May	17-May	0	10
DRILLER	Chung, JiWoong	COR	21-Jun	22-Jun	28-Jul	30-Jul	36	3
GRIT TRAVERSE	Courville, Zoe	US	10-May	14-May	16-May		2	4
DRILLER	Curran, Mark	AUS	19-Jul	20-Jul	10-Aug	20-Aug	21	11
FIELD LEADER	Dahl-Jensen, Dorthe	DK	28-Jun	30-Jun	12-Aug	13-Aug	43	3
CFA (gases)	Dallmayr, Remi	F	10-May	14-May	06-Jun	07-Jun	23	5
DRILLER	Delgado, Fernando Valero	D	28-Jun	30-Jun	28-Jul	30-Jul	28	4
DOG SLED	Doering, Aaron	US		12-May	14-May	17-May	2	3
DEP	Dummermuth, Angelika	D	19-Jul	20-Jul	17-Aug	19-Aug	28	3
DRILLER	Duphil, Romain	F	07-May	14-May	03-Jun		20	7
DRILL MECHANIC	Duphil, Romain	F		03-Jun	30-Jun	02-Jul	27	2
DOCTOR	Elliott, Elizabeth	AUS	28-Jun	30-Jun	18-Aug	20-Aug	49	4
CFA (Iso. and vap.)	Falourd, Sonia	F	02-Jun	06-Jun	30-Jun	02-Jul	24	6
VISITOR	Faurskov, Jorn Laslie	DK	07-May	14-May	14-May	17-May	0	10
DOCTOR	Florian, Hans Chr.	GRL	26-Apr	28-Apr	14-May	18-May	16	6

CFA	Gfeller, Gideon	CH	02-Jun	06-Jun	28-Jul	30-Jul	52	6
LOGGER/DRILLER	Gkinis, Vasileios	DK	10-May	14-May	06-Jun	08-Jun	23	6
LOGGER/DRILLER	Grindstad, Aslak	DK	19-Jul	20-Jul	17-Aug	19-Aug	28	3
DRILL MECHANIC	Hansen, Steffen Bo	DK	26-Apr	28-Apr	06-Jun	07-Jun	39	3
DRILL MECHANIC	Hansen, Steffen Bo	DK	28-Jun	30-Jun	20-Jul	22-Jul	20	4
O18 CUTTING	Hansson, Margareta	S	20-Jun	22-Jun	20-Jul	22-Jul	28	4
COOK	Harvey, Sarah	US	26-Apr	28-Apr	30-Jun	01-Jul	63	3
MECHANIC	Hilmarsson, Sverrir Æ.	IS	26-Apr	28-Apr	30-Jun	01-Jul	63	3
MECHANIC	Hilmarsson, Sverrir Æ.	IS	19-Jul	20-Jul	18-Aug	20-Aug	29	3
FOM	Holm Hansen, Lone	DK	23-Apr			11-May	0	18
BOREHOLE	Hubbard, Bryn	UK	26-Jul	28-Jul	17-Aug	19-Aug	20	4
FOM	Hvidberg, Bo	DK	05-Jul			27-Jul	0	22
FOM	Hvidberg, Christine	DK	05-Jul			27-Jul	0	22
COOK	Hviid, Rene	DK	21-Jun	22-Jun	20-Jul	22-Jul	28	3
PACKING	Hwang, Heejin	COR	02-Jun	06-Jun	30-Jun	01-Jul	24	5
CFA (gases)	Jenk, Theo	DK	26-Apr	28-Apr	11-May		13	2
O18 CUTTING	Jenk, Theo	DK		11-May	06-Jun	08-Jun	26	2
DRILLER	Johnsen, Sigfus	DK	21-Jun	22-Jun	20-Jul	22-Jul	28	3
ELECTRONICS	Jønch Andersen, Jeppe	DK	21-Jun	22-Jun	20-Jul	22-Jul	28	3
ECM	Jouzel, Jean	F	26-Jul	28-Jul	17-Aug	19-Aug	20	4
LOGGER/DRILLER	Karlin, Thorbjörn	S	20-Jun	22-Jun	20-Jul	22-Jul	28	4
PACKING	Kawamura, Kenji	J	28-Jun	30-Jun	28-Jul	01-Aug	28	6
CFA (cytometer)	Kettner, Ernesto	DK	10-May	14-May	06-Jun	07-Jun	23	5
PHYSICAL PROP.	Kipfstuhl, Sepp	D	26-Apr	28-Apr	30-Jun	01-Jul	63	3
PHYSICAL PROP.	Kipfstuhl, Sepp	D	19-Jul	20-Jul	18-Aug	20-Aug	29	3
CFA (cytometer)	Kjær, Helle Astrid	DK	02-Jun	06-Jun	22-Jun	24-Jun	16	6
DOCTOR	Kjærgaard, Marie	DK	10-May	14-May	06-Jun	07-Jun	23	5
DEP	Köhler, Peter	D	10-May	14-May	06-Jun	07-Jun	23	5
DRILL OBSERVER	Kuhl, Tanner	US	27-Jul	28-Jul	14-Aug	19-Aug	17	6
U.S. SHALLOW	Kyne, Jay	US		28-Apr	08-May		10	0
DEP	Låpple, Thomas	D	21-Jun	22-Jun	20-Jul	24-Jul	28	5
ELECTRONICS	Leonhardt, Martin	D	10-May	14-May	22-Jun	24-Jun	39	6
CFA	Leuenberger, Daiana	CH	10-May	14-May	28-Jul	30-Jul	75	6
GRIT TRAVERSE	Lever, Jim	US		12-May	14-May	15-May	2	1
SHALLOW (NZ)	Mandeno, Darcy Robert	NZ	19-Jul	20-Jul	17-Aug	19-Aug	28	3
U.S. SHALLOW	McConnell, Joe	US		28-Apr	08-May	10-May	10	2
PACKING (CFA)	McConnell, Joe	US	10-May	14-May	06-Jun	09-Jun	23	7
DOG SLED	Miller, Brant	US		12-May	14-May	17-May	2	3
CFA (FIC)	Mulvaney, Robert	UK	10-May	14-May	06-Jun	07-Jun	23	5
FIELD ASSISTANT	Panton, Christian	DK	10-May	14-May	06-Jun	07-Jun	23	5
SHALLOW (NZ)	Pasteris, Dan	US	19-Jul	20-Jul	25-Jul	26-Jul	5	2
O18 CUTTING	Petersen, Anne Wang	DK	10-May	14-May	06-Jun	07-Jun	23	5

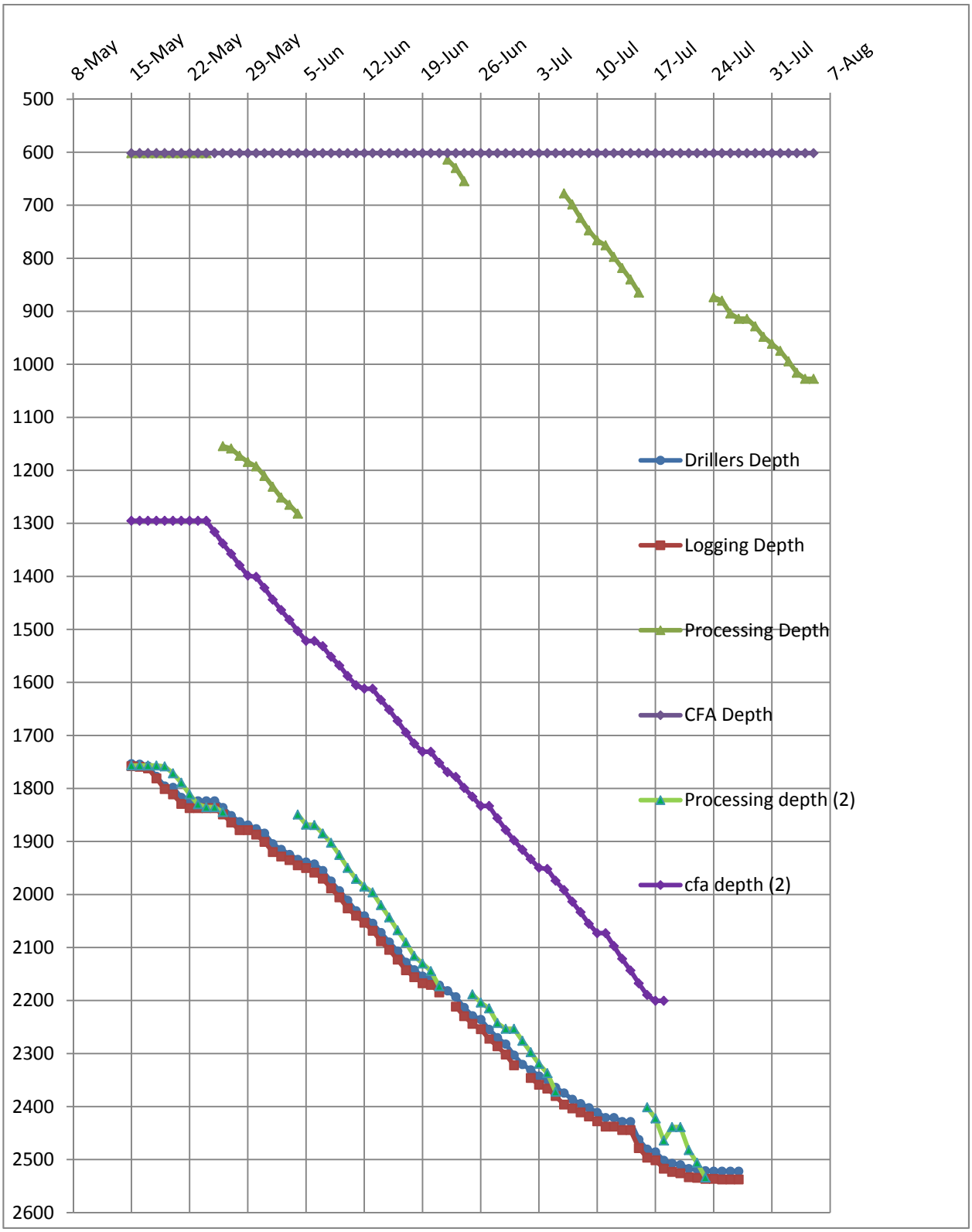
DRILLER	Popp, Trevor	DK	26-Apr	28-Apr	30-Jun	01-Jul	63	3
SHALLOW DRILLING	Popp, Trevor	DK	27-Jul	28-Jul	10-Aug	15-Aug	13	6
DOG SLED	Porsild, Mille	US		12-May	22-May		10	0
SHALLOW (NZ)	Pyne, Alex	NZ	19-Jul	20-Jul	17-Aug	19-Aug	28	3
COOK	Rasmussen, Casper	GRL		25-Jul	17-Aug		23	0
Ass COOK	Ravnebjerg, Louise Wolff	DK	02-Jun	06-Jun	30-Jun	01-Jul	24	5
O18 CUTTING	Reutenauer, Corentin	DK	28-Jun	30-Jun	28-Jul	30-Jul	28	4
ECM	Rosen, Julia	US	21-Jun	22-Jun	28-Jul	30-Jul	36	3
DRILL MECHANIC	Rufli, Henry	CH	19-Jul	20-Jul	18-Aug	20-Aug	29	3
PHYSICAL PROP.	Samyn, Denis	S	02-Jun	06-Jun	30-Jun	02-Jul	24	6
PHYSICAL PROP.	Sato, Motoyuki	J	10-May	14-May	06-Jun	07-Jun	23	5
DRILLER	Schildt, Adrian	CH	10-May	14-May	22-Jun	24-Jun	39	6
COOK ass.	Schmidt Jensen, Trine	DK		20-Jul	28-Jul		8	0
DEP	Schmidt, Astrid	DK	02-Jun	06-Jun	22-Jun	24-Jun	16	6
CFA (helper)	Schmidt, Kerstin	D	02-Jun	06-Jun	22-Jun	24-Jun	16	6
CFA	Schüpach, Simon	CH	10-May	14-May	22-Jun	24-Jun	39	6
ELECTRONICS	Schwander, Jakob	CH	26-Apr	28-Apr	06-Jun	07-Jun	39	3
SOUND LOGGER	Schwander, Jakob	CH	19-Jul	20-Jul	25-Jul	26-Jul	5	2
PACKING	Severinghaus, Jeff	US	26-Apr	28-Apr	14-May	17-May	16	5
ELECTRONICS	Sheldon, Simon	DK	26-Apr	28-Apr	14-May	17-May	16	5
ELECTRONICS	Sheldon, Simon	DK	19-Jul	20-Jul	18-Aug	19-Aug	29	2
Outreach	Skaarup, Gertie	DK	21-Jun	22-Jun	30-Jun	01-Jul	8	2
Ass COOK	Skrydstrup, Martin	DK	28-Jun	30-Jun	28-Jul	30-Jul	28	4
ECM	Slangen, Aimee	NL	02-Jun	06-Jun	22-Jun	24-Jun	16	6
Ass COOK	Sørensen, Maibritt W.	DK	10-May	14-May	06-Jun	07-Jun	23	5
BIOLOGY	Sowers, Todd	US	03-Jun	06-Jun	06-Jun		0	3
LINE SCANNER	Sowers, Todd	US		06-Jun	22-Jun	26-Jun	16	4
ISOTOPES Vapour	Steen-Larsen, H.C.	DK	10-May	14-May	03-Jun		20	4
DRILLER	Steen-Larsen, H.C.	DK		03-Jun	30-Jun	01-Jul	27	1
FIELD LEADER	Steffensen, Jørgen Peder	DK	26-Apr	28-Apr	22-Jun	24-Jun	55	4
FOM	Steffensen, Jørgen Peder	DK	18-Jul			22-Aug	0	35
LINE SCANNER	Stowasser, Christoffer	DK	10-May	14-May	30-Jun	01-Jul	47	5
CARPENTER	Svavarsson, Adalsteinn	IS	26-Apr	28-Apr	06-Jun	07-Jun	39	3
FIELD LEADER	Svensson, Anders	DK	21-Jun	22-Jun	29-Jun		7	1
PHYSICAL PROP.	Svensson, Anders	DK		29-Jun	28-Jul	30-Jul	29	2
LOGGER/DRILLER	Teste, Gregory	F	02-Jun	06-Jun	20-Jul	23-Jul	44	7
FOM	Thing, Henning	DK	22-Jun			10-Jul	0	18
CFA (FIC)	Thomas, Liz	UK	02-Jun	06-Jun	30-Jun	01-Jul	24	5
LINE SCANNER	Tison, Jean Louis	B	21-Jun	22-Jun	20-Jul	22-Jul	28	3
DRILLER	Triest, Jack	UK	10-May	14-May	06-Jun	07-Jun	23	5
CFA (helper)	Twarloh, Birthe	D	10-May	14-May	06-Jun	07-Jun	23	5
SWISS SAW	Uetake, Jun	J	02-Jun	06-Jun	30-Jun	03-Jul	24	7

DOCTOR	Uhl-Jensen, Simon	DK	02-Jun	06-Jun	30-Jun	01-Jul	24	5
O18 CUTTING	v.d.Veen, Carina	NL	02-Jun	06-Jun	30-Jun	01-Jul	24	5
CFA (cytometer)	Vallelonga, Paul	DK	21-Jun	22-Jun	28-Jul	30-Jul	36	3
SWISS SAW	van der Wel, Gerko	CH	28-Jun	30-Jun	28-Jul	30-Jul	28	4
DOG SLED	Verdegan, Andrea	US		12-May	14-May	17-May	2	3
ECM	Vinther, Bo	DK	10-May	14-May	03-Jun		20	4
LOGGER/DRILLER	Vinther, Bo	DK		03-Jun	22-Jun	24-Jun	19	2
DRILLER	Wang Shimeng	CHN	02-Jun	06-Jun	22-Jun	24-Jun	16	6
CFA	Wegner, Anna	D	21-Jun	22-Jun	28-Jul	30-Jul	36	3
PHYSICAL PROP.	Weikusat, Ilka	D	27-Jun	30-Jun	20-Jul	22-Jul	20	5
LINE SCANNER	White, Jim	US	19-Jul	20-Jul	28-Jul	30-Jul	8	3
O18 CUTTING	Zabori, Julia	S	19-Jul	20-Jul	17-Aug	19-Aug	28	3
O18 CUTTING	Zhang Tong	CHN	02-Jun	06-Jun	22-Jun	24-Jun	16	6
SHALLOW (DK)	Zheng, James	CAN	27-Jul	28-Jul	17-Aug	19-Aug	20	3
	Totals	117 individuals					3239	702

Ice core drilled in the season 2010:

Site	Position	Depth	Comment
NEEM Main		from 1757.84 m to 2537.36 m	
2010 S2	77 25.471N 51 07.266W	100 m	S Be10
2010 S3	77 25.471 N 51 07.266 W	88 m	J DEP, Ca metals and heavy metals

2010 deep core progress, logging, processing and CFA analysis



SITREPS:

NEEM - SITREP no. 1, Sunday 25 April 2010

This SITREP covers the period April 19-25, 2010 (inclusive).

Movement of personnel:
April 23: Lars Berg Larsen (DK) and Lone Holm Hansen from CPH to Kangerlussuaq/SFJ by Air Greenland and Louise Albershart from Schenectady to SFJ by 109th .

Movement of Cargo:
The following shipments have arrived in Kangerlussuaq/SFJ:
AWB631-26296583, 2 colli, 827 kg (CIC)
AWB117-25188024, 39 colli, 1500 kg (UB)
8AWB882-00221200, 1 colli, 50 kg (Iceland)
AWB631-26411512, 60 colli, 1685 kg (CIC)

Activities:
The NEEM field office in Kangerlussuaq has been opened with 4 days delay by the first FOMs from Copenhagen, Friday April 23. The office and the warehouse (442) were found in good shape. The main activities have been related to setting up the office with various hardware and getting the vehicles running. Currently, internet, network, printers, and phones are operational, but the NEEM FOM mail is not yet working. We expect it to be fixed on Monday 25. Contact to FOM: lbl@gfy.ku.dk and lone@nbi.dk. The vehicles are running. The FOMs have been busy collecting cargo that has arrived during the week. Due to the volcano in Iceland the last cargo for the put in arrived late – that is Saturday 24. First put in pallet is ready.

The 109th arrived Friday 23, also with a delay of two days.

Weather in Kangerlussuaq(SFJ): Sunny with few clouds. Very little snow, and temperatures between + 8 and - 4 C.

NEEM Field operations office,
Lars Berg Larsen and Lone Holm Hansen

NEEM - SITREP no. 2, Sunday 02 May 2010

This SITREP covers the period April 26 – May 02, 2010 (inclusive).

Movement of personnel:
April 26: Jørgen Peder Steffensen (DK), Sverrir Hilmarsson (IS), Adalsteinn Svavarsson (IS), Steffen Bo Hansen (DK), Simon Sheldon (DK), Jakob Schwander (CH), Trevor Popp (DK), Jeffrey Severinghaus (US), Sepp Kipfstuhl (D), Matthias Bigler (CH), Theo Jenk (DK), from CPH to Kangerlussuaq/SFJ by Air Greenland.

Sarah Harvey (US) from Schenectady to SFJ by 109th

Hans Christian Florian (GRL) from Nuuk to Kangerlussuaq/SFJ by Air Greenland

April 28: Jørgen Peder Steffensen (DK), Sverrir Hilmarsson (IS), Adalsteinn Svavarsson (IS), Steffen Bo Hansen (DK), Simon Sheldon (DK), Jakob Schwander (CH), Trevor Popp (DK), Jeffrey Severinghaus (US), Sepp Kipfstuhl (D), Matthias Bigler (CH), Theo Jenk (DK), Jay Kyne (US), Joe McConnell (US), Louise Albershardt (US), Sarah Harvey (US), Hans Christian Florian (GRL) from Kangerlussuaq/SFJ to NEEM by the 109th.

Movement of Cargo:
The following shipments have arrived in Kangerlussuaq/SFJ:
797 kg, US Science gear, (US)
2500 kg, food, from Schenectady to Kangerlussuaq by 109th

240 kg, 5 colli, (AWI)
AWB 117 1973 7340, 427 kg, 12 colli, (UK)
AWB 631 2641 2223, 952 kg, 30 colli (DK)
AWB 631 2641 2385, 152 kg, 4 colli (DK)
AWB 117 2659 3210, 261 kg, 20 colli (J)
From Cph. to Kangerlussuaq by Greenland Air

April 28. 4014 kg drilling equipment, communication equipment, wood and food from Kangerlussuaq/SFJ to NEEM by 109th.

Activities:
Due to late arriving cargo the put in was postponed from Tuesday to Wednesday, April 28. The extra day made it possible for Joe McConnell and Jay Kyne to join the put in team, and in this way ease the pay load of the Twin-Otter which was scheduled to arrive later.

Wednesday, put in went smoothly and according to schedule and the plane landed at 12:05 local. After a short ground time the skier left NEEM in first attempt and using only half of the skiway. The plane was able to return directly to Kangerlussuaq.

Within 2 hours camp had power and the main generator was installed and running at 17.50. The camp was intact but with lots of snowdrifts. Science- and drill trenches were both in fine condition although the roof in the drill trench is sinking a bit faster than anticipated as the wall over the connecting tunnel in drill trench is slumping. The days were spent erecting a weatherport over elevator and stair case, levelling out the snowdrifts, establishing cooks water supply, main snow melter and central heating, which are all working by the end of the week. All communications (Iridium based internet, HF radio) are working. By Sunday all infrastructure is working and the camp is fully functional.

Skiway:
Skiway flags have been checked and lifted. Grooming of the skiway has not yet started due to forecasted blizzard. Sunday, the Pistenbully experienced technical problems and is at the moment out of order.

Drilltrench:
1½ m of snow covered the roof over the packing end of the science trench due to the proximity of the main dome. Over drill trench there was 60 cm snow on the roof. The skylight (submarine) has been installed. In the trench preparation for the drilling operation has been ongoing. A new linear motor has been installed on the tower. Inspection of the borehole has been carried out with a camera to check the chip formations. They are now preparing for the logging of the borehole.

Science trench:
Work with the new ice core storage is proceeding very well and snow blocks have been moved to the surface. In the CFA lab people have been unpacking equipment and preparing for installation of

equipment.

New NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Temperatures between -11 and -33C., 6-12 knots

NEEM camp population: 16

Kangerlussuaq activities: First days of the week most of the time was spent on receiving the first field participants and preparing pallet and documentations for the first put in. After put in, transporting cargo from the airport to the warehouse, planning and preparing for the next flight (documents), updating the web, replying e-mails etc. have been some of the main activities.
The FOM e-mail is now working – neem-fom@gfy.ku.dk

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

Weather in Kangerlussuaq/SFJ: Until Friday bright sunshine with some clouds by the end of the week. Saturday a few showers. Temperatures around -5C to +8C.

NEEM Field operations office,
Lars Berg Larsen and Lone Holm Hansen

NEEM - SITREP no. 3, Sunday 09 May 2010

This SITREP covers the period May 03 - 09, 2010 (inclusive).

Movement of personnel:
May 07: Robert Zola Christensen (DK), Jørn Faurskov (DK), Romain Duphil (F) from CPH to Kangerlussuaq/SFJ by Air Greenland.

Movement of Cargo:
The following shipments have arrived in Kangerlussuaq/SFJ:

AWB xxxxxxxxxxx, 1200 kg, 20 colli (DK)
From Cph. to Kangerlussuaq by Air Greenland.

Activities:
During the week building up the camp and preparing for the season have been main issues. Cook's 12 x 20 Weatherport, 2 units 10x15, 1 unit 10x10 and 2 units 12x20 were built and camp is now ready to accommodate all people coming in next week. Food was arranged in the cook's storage tent, snow drifts removed from inside storage garage (old NGRIP garage), as it is not completely tight. The Flexmobile was repaired and fuel moved to camp from tanks. Retro cargo was made ready for flights the coming week.

In the trench new tables and shelves were made for new warm laboratory. The ice storage cave was finished and drilling of cooling holes in the cave arrived at 10 m length.

Monday, the PARCA crew made a 2 hrs stop between Kangerlussuaq and Thule due to bad weather in Camp Century. Joe and Jay left with them and the number of participants in the camp was now 14. Friday the PARCA crew made 2 visits and Saturday 1 in the early morning. In total the Twin Otter received 16 drums of fuel.

Skiway:
The new Pistenbully had an error in the electronic system (a faulty steering transducer). Grooming of the skiway was carried out with the old Kässbohrers. Grooming of the apron started on Wednesday and by Saturday the grooming was completed.

Drill trench:
In the drill trench two parallel linear motors were mounted on tower and the chips melter was mounted. A box to capture the drill fluid aerosol coming from the vacuum cable cleaner was made. Logging table was aligned. A test of borehole bottom sonar was performed close to the bottom of the hole and a fine echo was received. Borehole logging completed and drill electronics section no. 2 was made ready. During the week several filter runs were made by the drillers all the way to the bottom of the hole, 1756m down. In total 97 kg of ice chips has been removed from the hole.

Temperature logging in 2009 firn air bore hole carried out Saturday.

Science trench:
Un-packing in CFA laboratory and setting up the lab. By Saturday setup of 1st stage of CFA was completed and by Saturday water based chemistry was introduced. Diamond dust was collected and physical properties studies will be carried out.

New NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Temperatures between –32 and –10 C, 3-24 knots, snow showers in the beginning of the week.

NEEM camp population: Reduced to 14 as Joe McConnell and Jay Keyne left Monday with the Twin Otter

Kangerlussuaq activities:
Transporting cargo from the airport to the warehouse, planning and preparing for the next flight (documents), updating the web, replying e-mails, making pallets etc. have been some of the main activities.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

Weather in Kangerlussuaq/SFJ: Cloudy and the night between Tuesday and Wednesday some snow. End of week high temperatures and sunshine. -5 - +18 C. From calm weather to light sandstorms.

NEEM Field operations office,
Lars Berg Larsen and Lone Holm Hansen

NEEM - SITREP no. 4, Sunday 16 May 2010

This SITREP covers the period May 10 - 16, 2010 (inclusive).

Movement of personnel:

May 10: Maibritt W. Sørensen(DK), Marie Kjærgaard(DK), Martin Leonhardt(D), Christian Panton(DK), Adrian Schildt(CH), Jack Triest(UK), Vasileios Gkinis(GR), Bo Vinther(DK), Christopher Stowasser(D), Kumiko Azuma(J), Peter Köhler(D), Joe McConnell(US), Motoyuki Sato(J), Simon Schüpbach(CH), Daiana Leuenberger(CH), Robert Mulvaney(UK), Ernesto Kettner(D), Birthe Twarloh(D), Thomas Blunier(CH), Remi Dallmayr(F), Hans-Christian Steen-Larsen(DK), Jocelyne Bourgeois(CAN) and Anne Wang Petersen(DK) from CPH to Kangerlussuaq/SFJ by Air Greenland.
Zoe Courville(US) from Schenectady to SFJ by 109'Th

May 11 Lone Holm Hansen(DK) from SFJ to CPH by Air Greenland

May 14: Maibritt W. Sørensen(DK), Marie Kjærgaard(DK), Martin Leonhardt(D), Christian Panton(DK), Adrian Schildt(CH), Jack Triest(UK), Vasileios Gkinis(GR), Bo Vinther(DK), Christopher Stowasser(D), Kumiko Azuma(J), Peter Köhler(D), Joe McConnel(US), Motoyuki Sato(J), Simon Schüpbach(CH), Daiana Leuenberger(CH), Robert Mulvaney(UK), Ernesto Kettner(D), Birthe Twarloh(D), Thomas Blunier(CH), Remi Dallmayr(F), Hans-Christian Steen-Larsen(DK), Jocelyne Bourgeois(CAN), Anne Wang Petersen(DK), Zoe Courville(US), Jørn Leslie Faurskov(DK), Robert Zola Christensen(DK) and Romain Duphil(F) from SFJ to NEEM by 109'th.

Hans Christian Florian(GL), Jeffrey Severinghaus(US), Simon Sheldon(UK), Robert Zola Christensen(DK), Jørn Leslie Faurskov(DK), Jim Lever(US-GRIT), Aaron Doering(US-GoNorth), Brant Miller(US-GoNorth) and Andrea Verdegan(US-GoNorth) from NEEM to SFJ by 109'th.

Movement of Cargo:

May 10 400 kg Food/Freshies/Resupply/Canadian Science from Schenectady to SFj by 109'Th.

May 14 AWB 108 2015 5601, 150 kg French Science from CPH to SFJ by Air Greenland.
AWB 117 2518 8225, 225 kg Swiss Science from CPH to SFJ by Air Greenland.
4700 Science equipment and food from SFJ to NEEM by 109'Th.
1400 kg Garbage/GRIT equipment/Go-North equipment from NEEM to SFJ by 109'Th

Activities:

The camp has prepared to receive the 27 people scheduled to arrive on the Tuesday flight.
Unfortunately the weather closed in with snow, blowing snow and whiteout and the flight was cancelled.
The poor weather condition in camp caused another cancellation on Wednesday.
In the meantime the camp could welcome first the GRIT traverse going from Thule to Summit with a Stop-over and crew exchange at NEEM. Half an hour after arrival of GRIT another 26 individuals (22 sledge dogs and 4 drivers) arrived from the GoNorth Greenland outreach expedition.
Again Thursday the plane to NEEM was cancelled, this time due to unusual weather conditions in Kangerlussuaq, however the conditions at NEEM turned out not be good for flying the camp got hit by a blizzard in the evening.
Finally the plane made it to NEEM on Friday. All the new people started right away to work on their tasks, soon the camp wireless internet was up and running and the new warm laboratory was installed in the Science trench.
Around camp cleanup and moving snow after 4 days with snow and stormy weather was done during the weekend.

Skiway:

It was not a good week for the NEEM skiway. Since the Put-in April 28 the conditions has not been very good to prepare the Skiway. Though it has be groomed numerous times the last four days prior to the arrival of next plane the site had snow and blowing snow from all directions causing severe drifts on the landing and loading area. Due to the short time from the blizzard ended and to the plane arrived only a couple of tracks was done primary to increase the contrast of the landing area. This resulted in no upgrade of the payload but it got certified to minimum weather

conditions. It also hampered skiway preparation that the Pistenbully was out of action, because of a faulty steering transducer. The Friday plane brought the spare part, and the Pistenbully is in action again.

Drill trench:
The drillers did several cleaning runs of the borehole and a total of 226 kg chips have been retrieved.
The new installed linear motor to tilt the drilling tower is so strong that further installations was needed to secure the drilltower.
On Saturday ice core drilling started and a nice 1.11 m long core was drilled. It was not a complete run and The antitorque and tower needed adjustment. It was followed by a 3.45 m core.
After this two drill teams was formed and training started.

Science trench:

Work setting up the CFA laboratory continued throughout the week.
After receiving more science equipment and people more instruments was added. But due to science Equipment still waiting in Kangerlussuaq the science trench is still incomplete. A new storage cave was excavated and an additional cooling system was installed in the new core box cave and insulated ventilation was made on new and existing warm labs to keep the trench cool later the season.

Associated programs:
Temperature logging of shallow hole 2009-S2 was successfully done by Jeff Severinghaus.

NEEM Camp Population: Reduced to 35 (+22 dogs) as the GRIT traverse left with four people on Sunday on route to Summit.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Temperatures between –29 C and –18 C, wind; calm to 26 knots, snow showers and bad weather in the beginning of the week. Thursday evening within 5 minutes the wind turned 180 deg and picked up to 25 knots. In the weekend the weather cleared up with blue sky.

Kangerlussuaq activities:
Lots of people were waiting in Kangerlussuaq this week. Due to the bad weather at NEEM everybody was ready every morning but on hold until the afternoon where the flight was cancelled because of no improvement in weather. People used the afternoons to do trips to the ice, hiking and biking around the area but also preparing cargo and food for NEEM.

Weather in Kangerlussuaq/SFJ: Very nice weather when people arrived, sunny, no wind temperature around 18 C Wednesday afternoon temperature dropped below freezing and we had snow during the night and the following Thursday morning. This created an unusually situation here in Kangerlussuaq. First the Airplanes could not take off due to the snow. When it cleared, de-icing of the airplanes was required. However due to holiday in Greenland it was not possible and when the sun later melted the snow the crew ran out of flight time and the NEEM flight was cancelled. Anyway the weather at NEEM was bad as well.
In the weekend temperature around 6 C, windy with blowing sand.

NEEM - SITREP no. 5, Sunday 23 May 2010

This SITREP covers the period May 17 - 23, 2010 (inclusive).

Movement of personnel:

May 17	Jeffrey Severinghaus(US), Simon Sheldon(UK), Robert Zola Christensen(DK) and Jørn Leslie Faurskov(DK) from SFJ to CPH by Air Greenland.
	Aaron Doering(US-GoNorth), Brant Miller(US-GoNorth) and Andrea Verdegan(US-GoNorth) from SFJ to Schenectady by 109'Th.
May 18	Ed Stockhard(US-CPS) and Mark Begnaud(US-CPS) From SFJ to NEEM by 109'Th
	Ed Stockhard(US-CPS) and Mark Begnaud(US-CPS) From NEEM to SFJ by 109'Th
	Hans Christian Florian(GL) from SFJ to Nuuk by Air Greenland
May 22	Kathy Young(US-CPS) from SFJ to NEEM by 109'Th
	Kathy Young((US-CPS) and Mille Porsild(DK-GoNorth) from NEEM to SFJ by 109'Th

Movement of Cargo:

May 17	AWB 108 201 55601, 15 kg French Dangerous Goods from CPH to SFJ by Air Greenland.
May 18	4975 kg Science gear/Wooden Beams/Food from SFJ to NEEM by 109'Th
	2725 kg Ice cores /Empty drums from NEEM to CPH
May 20	1365 kg Ice cores from SFJ to CPH by Air Greenland.
May 21	10 kg Danish Dangerous Goods from CPH to SFJ by Air Greenland.
May 22	3635 kg Drill liquid/spare parts from SFJ to NEEM by 109'Th
	2950 kg dogs/GoNorth eq./ empty drums from NEEM to SFJ by 109'Th

Activities:
This week the cargo line was cleaned up and snowdrifts were again removed from the camp.
Retro cargo was prepared for the two airplanes that arrived this week.
One plane was the scheduled NEEM cargo plane with the remaining science equipment.
Due to delays and changed travel plans from the GoNorth dog sledge team the scheduled June 4 pull-out plane at Summit Station was moved forward and one dog team member and 22 dogs were pulled-out from the NEEM site instead late this week.
In the trenches work on the cooling system continued and curtains between the trenches, a door to new ice box cave were installed. Temperatures are now; Drill trench: -20C, Science trench: -23C and box storage -26C

Skiway:
Even though the PB300 was back in operation on the skiway there has not been enough time to level the rollers created by snow drifts the week before and landing load has not increased.
The second flight arrived just after another snowfall which did not help the situation. The airplane however was able to get airborne in first attempt without rockets.

Drill trench:
Monday was the first day of real drilling however in education mode. Tuesday the two 8 hour teams started and good ice cores were produced. Minor adjustment had to be done both to the electronics and the deep drill. While the old pump was replaced three cleaning runs gave 22 kg chips. Several new booster configurations were tried during the week.
This week production: 79m
Driller's depth: 1823.44m
Logging depth: 1836.95m

Science trench:
The last of the science equipment was installed in the trench and the Labs.
Wednesday everything was ready for the processing and procedures were trained. This year, we have decided to cut and process the ice cores in length of 1.10 m (two bags). This way the ice core buffer storage was optimized.
On Saturday the complete CFA was running and all chemical components were measured, next the Gas Lab will be coupled to the melt line.

Processing this week: 99 bags or 54.45 m. (ECM and DEP indicate that onset of IS 11 is at 1810m, some 10 m lower than in preliminary model)
Processing depth: 1811.15m

Associated programs:
Canadian sampling for pollen has begun.
Setting up water vapour sampling site.
Maintaining seismic station.
Joe McConnell pit study.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Temperatures between –24 and –14 C, 1 -18 knots, nice weather in the beginning of the week then snow showers and bad weather in the end of week.

NEEM camp population: Reduced to 34 the last GoNorth dog team member and the dogs left camp Saturday.

Kangerlussuaq activities:
Friday this week we experienced another new situation, sitting on the runway prior to clearance for takeoff skier 61 was called back to the parking area and the flight to NEEM was cancelled. Somehow the Icelandic ash cloud found its way only to NEEM. The next day the mission to NEEM went fine.
Preparing cargo and documents for the two flights.
Cleaning up in warehouse and clothing containers.

Weather in Kangerlussuaq/SFJ: Very nice weather most of all week, Sunny but in the afternoons some wind and blowing sand. Day temperatures up to 20 C, night about 5C to 8C

First mosquitoes arrived Saturday two weeks earlier than normal.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 6, Sunday 30 May 2010

This SITREP covers the period May 24-30, 2010 (inclusive).

Movement of personnel:

No movement of personnel

Movement of Cargo:
May 24 AWB 117 - 2724 3543, 65kg IMAU from CPH to SFJ by Air Greenland.
May 28 AWB 631-2641 5605, 295 kg UCPH from CPH to SFJ by Air Greenland.

Activities:

This week the two red dome weatherports were moved up to the surface (they were more than 1 m below surface; but in 2008 they were built on a 2m mound).
Else it has been general service of equipment and cleaning of the area from snowdrifts.
In the trenches curtains and doors were installed in front of core buffer and in the interconnecting tunnel.

Skiway:
End of week the work on the skiway started in preparation for the coming week flight.

Drill trench:
The week started with a two time core barrel loss in the borehole. The core barrel released it self both times at around 1000 m depth. In driller's analysis, this was due to a decrease in borehole diameter below 1000 m in combination with the introduction of new cutters with a slightly higher diameter. The core barrel was recovered and the bore hole was then reamed to nominal diameter. Later the hole was cleaned by some filter runs. Since then, no self releases of the core barrel.
Midweek the drillers was at a stable mode that produces coarse enough chips for efficient transport and packing in the chip chamber, while at the same time allow drilling without exceeding the current limitation of the drill motor.
Rest of the week beautiful ice core was produced. At the same time preparations for the crew change next week in the drill teams was prepared with different system and application tests. Some work has gone into tuning both electronic sections, and they are both working.

This week production: 64,92m
Driller's depth: 1876.07m
Logging depth: 1887.07m

Science trench:
A very good week for the CFA people after the final finish in the two labs. The online water isotope measurements are running, the black carbon measurement is running (viewed online from the Main dome) and the DK and F methane measurements work.

The core handlers and processors had a more troubled week. Thursday it was decided to go ahead and process the brittle ice, which has been stored since last year.
A meeting was held and it was decided that processors will continue cutting the core according to the cutting scheme, except for the O-18 bag samples, which are taken from the outside of the SC-piece. The CFA pieces are stored in our square trays, and the CFA group will later select all pieces long enough for CFA and measure them. It means, that even though the CFA profile will not be continuous, it is possible to get the best coverage possible. It was also decided that all gas pieces from the brittle zone will be packed in one box, while processors will record the length of the longest intact piece in each bag, so that the gas group, at a later stage, can select samples for appropriate analyses.

The 15 m Humboldt shallow core was processed including O-18, 5 cm cuts

CFA production this week: 118,55m
CFA depth: 1400.95m

Processing depth (ECM, DEP, Cutting): 1844.55 m (14.70m processed)
Brittle zone processing depth: 1154.45 m (BAG 2100) to 1192.40 m (BAG 2168), 37.95 m processed.

Drill trench: -18C
Connecting tunnel: -22C
Core buffer: -20C
Sciencetrench: -20C
Ice cave: -26C

Associated programs:
Water vapour sampling test with kite and atmospheric logger
Old and new reference GPS stations are up and running.

Experiments with acoustic depth sounder in bore hole.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Temperatures between –28 and -14 C, 2 -20 knots, Snow showers, fog and haze beginning of week, nice weather end of week with sun and little wind. Friday the wind was gone and bottom inversion caused temperatures to drop from -18 C to -26 C in 45 minutes.

NEEM camp population: 34

Kangerlussuaq activities:
A relatively quiet week in Kangerlussuaq.

Weather in Kangerlussuaq/SFJ: Very nice weather most of all week, Day temperatures up to 20 C
Lots of mosquitoes, repellent needed

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 7, Sunday 6 June 2010

This SITREP covers the period May 31- June 6, 2010 (inclusive).

Movement of personnel:

June 2 Louise Wolff Ravnebjerg(DK), Simon Uhl-Jensen(DK), Gregory Teste(F), Carina v.d.Veen(NL), Aimee Slangen(NL), Jun Uetake(J), Astrid Schmidt(DK), Heejin Hwang(COR), Denis Samyn(B), Gideon Gfeller(CH), Liz Thomas(GB), Helle Astrid Kjær(DK), Kerstin Schmidt(D) and Sonia Falourd(F) from CPH to SFJ by Air Greenland

Wang Shimeng (CHN) and Zhang Tong(CHN) from NUUK to SFJ by Air Greenland.

June 3 Todd Sowers(US) from Schenectady to SFJ by 109'Th.

June 6 Louise Wolff Ravnebjerg(DK), Simon Uhl-Jensen(DK), Gregory Teste(F), Carina v.d.Veen(NL), Aimee Slangen(NL), Jun Uetake(J), Astrid Schmidt(DK), Heejin Hwang(COR), Denis Samyn(S), Gideon Gfeller(CH), Liz Thomas(GB), Helle Astrid Kjær(DK), Kerstin Schmidt(D), Sonia Falourd(F), Wang Shimeng(CHN), Zhang Tong(CHN) and Todd Sowers(US) from SFJ to NEEM by 109'th

Adalsteinn Svavarsson(IS), Steffen Bo Hansen(DK), Jakob Schwander(CH), Matthias Bigler(CH), Maibritt W. Sørensen(DK), Marie Kjærgaard(DK), Christian Panton(DK), Jack Triest(GB), Anne Wang Petersen(DK), Kumiko Azuma(J), Peter Köhler(D), Joe McConnell(US), Sato Motoyuki(J), Robert Mulvaney(GB), Vasilieos Gnikis(GR), Birthe Twarloh(D), Thomas Blunier(CH), Remi Dallmayr(F) and Theo Jenk(CH) from NEEM to SFJ by 109'th.

Movement of Cargo:
June 1 AWB 117 - 2724 3543, 65 kg IMAU from CPH to SFJ by Air Greenland.
AWB 631 9689 687, 180 kg from Sisimut to SFJ by Air Greenland

June 2 AWB 631-2641 5605, 295 kg UCPH from CPH to SFJ by Air Greenland.
265 kg from Sisimut to SFJ by Air Greenland

June 3 995 kg from Schenectady to SFJ by 109'Th

June 5 AWB 117 19737373 31 kg BAS from CPH to SFJ by Air Greenland
AWB 117 26518682, 31 kg Uni.Bern from CPH to SFJ by Air Greenland

June 6 2900 kg Cargo from SFJ to NEEM by 109'Th
1175 kg cargo/ice cores from NEEM to SFJ by 109'Th

Activities:
This was another flight week with one scheduled flight to NEEM. Due to technical problems with some of the three planed airplanes coming from New York to SFJ it was a very late arrival for only two of the airplanes on Wednesday June 2. And on the following Thursday mission to NEEM was aborted on final approach at NEEM due to other technical issues and the Skier had to return to SFJ on three out of four engines. With one airplane arriving late the evening before and another plane leaving the same day for the Danish Air show 2010. It was not possible to get a Friday mission to NEEM. A Saturday mission was possible but since most people already missed their Copenhagen Air Greenland flight and next would be Monday June 7 earliest. It was decided to wait until Sunday to do the crew change. This was in favour of getting extra time to work on the skiway and the weather to improve. We had a successful mission to NEEM on Sunday June 6. The only problem, however was that the plane needed so much fuel, that camp fuel reserves are now very low.
A General Camp activity was preparing the skiway and the cargo for the retro flight. Moving last fuel tank to apron.

Skiway:
All week the skiway, taxiway and apron has been worked on. And again when a flight was coming up the weather was going down. The skiway has been worked on under difficult conditions with blowing snow, fog and high temperatures.

Drill trench:
Unstable drilling continues the start of the week, long cores was produced but the runs left to many chips in the borehole creating trouble for the next run. A different configuration was tried but high current in the drill motor slowed down the drilling. Finally the configuration from end of 2009 with open hollow shaft, lower valve and same cutting pitch was tested again. This brought some stability in the drilling and produced runs between 2.7 and 3.5 meters. Later the week some fine tuning was done and some filter runs when needed but in general nice ice were brought to the surface.

This week production: 66.50 m
Driller's depth: 1942.57 m
Logging depth: 1958.55 m

Science trench:
A very productive week in the science trench where the challenging brittle ice was processed. And again the CFA was running nicely all week and a test with three bags poor ice quality and three bags better quality brittle ice was tested. It was concluded that CFA was feasible even in brittle ice.

CFA production this week: 120.90 m
CFA depth: 1521.85 m

Processing depth (ECM, DEP, Cutting): 1868.90 m. Brittle zone interval processed: 1192.40m – 1281.50 m.

Drill trench: -15C
Connecting tunnel: -21C
Core buffer: -21C
Science trench: -17C
Ice cave: -24C

Associated programs:

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Temperatures between –28 and -4 C, 5 -23 knots, nice weather in the beginning of the week, deterioration later in the week with snow showers, fog and haze. Warm temperatures late in the week

NEEM camp population: 33

Kangerlussuaq activities:
Busy week in Kangerlussuaq with late arriving airplanes and cargo, two day delayed military ground and airplane handling crews (done by CPS, KISS and NEEM) Three day delayed crew to NEEM.

Weather in Kangerlussuaq/SFJ: Very nice weather most of all week, Day temperatures up to 20 C
Lots of mosquitoes.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 8, Sunday 13 June 2010

This SITREP covers the period June 7- June 13, 2010 (inclusive).

Movement of personnel:

June 7 Adalsteinn Svavarsson(IS), Steffen Bo Hansen(DK), Jakob Schwander(CH), Matthias Bigler(CH), Maibritt W. Sørensen(DK), Marie Kjærgaard(DK), Christian Panton(DK), Anne Wang Petersen(DK), Kumiko Azuma(J), Peter Köhler(D), Sato Motoyuki(J), Robert Mulvaney(GB) and Birthe Twarloh(D) from SFJ to CPH by Air Greenland.

Jack Triest(GB) from SFJ to Aasiaat by Air Greenland
Remi Dallmayr(F) from SFJ to Ilulissat by Air Greenland

June 8 Vasilieos Gnikis(GR), Thomas Blunier(CH), and Theo Jenk(CH) from SFJ to CPH by Air Greenland.

June 9 Joe McConnell(US) from SFJ to Schenectady by 109'th.

Movement of Cargo:

June 7 2870 kg UCPH, from Skrydstrup to SFJ by 109'Th
June 8 2720 kg (3370 litre) JP-8 from Thule to NEEM by 109'Th

Activities:
On June 8 the NEEM camp was offered an opportune flight en route from Thule to SFJ with fuel on the courtesy from the 109'th in order to replace some of the extra fuel needed to get the previous air planes airborne during times with very difficult weather conditions i.e. fresh snow and high temperatures (-3.8 C). The Camp received the fuel load and the airplane took off without difficulties, however the NEEM skiway is still troubled with undulations that only permit landing at the site with minimum payload.
Surface work has been concentrated on the skiway and in removing undulations.

Skiway:
Daily repair and grooming on the skiway with both the Tiller and the beam.

Drill trench:
A week with stable drilling producing ice cores in full core length and fine core quality. The 2000 m mark was celebrated midweek.

This week production: 111.88 m
Driller's depth: 2054.45 m
Logging depth: 2068.28 m

Science trench:
Also in the science trench the new people did very well and again a productive week. Only minor repair and maintenance was done on the French Picarro, the CFA and the Fast IC had a short stop. But in the end of the week everything is back into the routines. Discrete isotope samples are now taken from microtoming and measurements are made in the gas and isotope lab. The phosphate measurement in CFA was setup and is now running sporadically.

CFA production this week: 90.20 m
CFA depth: 1612.05 m

Processing depth (ECM, DEP, Cutting): 1995.95 m
Drill trench: -13C (cooling tunnel some times switched on)
Connecting tunnel: -19C
Core buffer: -20C (cooling tunnel some times switched on)
Science trench: -17C
Ice cave: -24C

Associated programs:
Ongoing Canadian and Japanese pit studies for biological material in a snow pit.
Successful deployment of beads in the drilling fluid at the bottom of the borehole for studies of contamination by and penetration of the fluid into the ice cores.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
A relative warm week at NEEM with temperatures between –15 and -2 C, calm to 15 knots, mostly grey and cloudy with several strong snow showers.

NEEM camp population: 33

Kangerlussuaq activities:

All the delayed people got out of Kangerlussuaq within two days. Organizing retro cargo from both the camp and from the returning Joint Committee Air Plane participating in the Danish 2010 air show in Skrydstrup.

Weather in Kangerlussuaq/SFJ: Very nice weather most of all week, in the weekend temperature were dropping close to freezing during the night.
Mosquitoes

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 9, Sunday 20 June 2010

This SITREP covers the period June 14 - June 20, 2010 (inclusive).

Movement of personnel:

June 20: Margaretha Hansson (S) and Thorbjörn Karlin (S) to Kangerlussuaq from CPH by Air Greenland

Movement of Cargo:

No movement of cargo

Activities:
A quiet week between to flight periods. Daily routine work has been carried out all this week.
Maintenance of main generator. Removing snowdrifts. Improving skis on the fuel sledges.

Skiway:
The skiway, apron and taxiway have been groomed extensively. The groomers have been working on the skiway every day, sometimes two vehicles at the same time, except when weather did not permit work. Due to very high temperatures and a lot of snow it has been quite a fight improving the skiway. By Sunday evening the skiway is ready for flights next week.

Drill trench:
In the beginning of the week it was tricky to find the optimal drilling pitch to obtain negative cutter load without getting too high current in the motor. Different cutters were tried before the stable drilling continued. Some problems with the software communication are a nuisance, but do not slow drilling. A problem with the winch controller was fixed on Sunday. Drillers are drilling with higher pitch, which allow for negative cutter load and brings the inclination under control.

This week production: 102.10 m
Driller's depth: 2155.76 m
Logging depth: 2170.38 m

Science trench:
A routine week in the science trench where a 400 m production so far this season was celebrated in the CFA. In processing the 94,000 year reference horizon has been passed, which is the lowest radar horizon that can be identified using the NGRIP record.

CFA production this week: 118.80 m

CFA depth: 1730.85 m

Although it has been warm on the surface, temperature control is still maintained in the trenches by switching the cooling tunnels on when needed. Insulation of the ventilation air ducts from the CFA laboratories has helped together with mounting plastic curtains in the connecting tunnel and between core buffer and science trench.

Processing depth (ECM, DEP, Cutting): 2144.45 m
Drill trench: -13C (cooling tunnel some times switched on)
Connecting tunnel: -19 C
Core buffer: -20C (cooling tunnel some times switched on)
Science trench: -17C
Ice cave: -24C

Associated programs:
At the water vapour sampling site the machines was working fine and many experiments conducted.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
Again a rather warm week at NEEM with temperatures between –18C and -1.7C (-1.7 C at 02.00 Saturday morning), mostly 2 knots to 18 knots and grey and cloudy with several snow showers. The night between Friday and Saturday camp was hit by a blow. Mean wind went up to 28 knots, with gusts up to 37 knots. Most of Saturday the wind was strong, and it snowed most of the time. Camp got 7.5 cm new snow in 24 hours.

NEEM camp population: 33

Kangerlussuaq activities:
Nice and quit week in Kangerlussuaq, maintenance and repair on vehicles.

Weather in Kangerlussuaq/SFJ: Cloudy and rain showers, end of weekend very nice warm and sunny. Temperatures 12C to 22C
Mosquitoes

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 10, Sunday 27 June 2010

This SITREP covers the period Monday June 21 – Sunday June 27, 2010 (inclusive).

Movement of personnel:
June 21: Anders Svensson (DK), Gunnar Magnus Arntorsson (IS), René Hviid (DK), Jeppe Jønch Andersen (DK), Jiwoong Chung (KOR), Sigfus Johnsen (IS), Sebastian Bjerregaard Simonsen (DK), Thorbjörn Karlin (S), Margaretha Hansson (S), Julia Rosen (US), Jean Louis Tison (B), Thomas Rudolf Laepple (D), Anna Wegner (D), Nerilie Jane Abram (UK), Paul Vallelonga (AUS), Torben Andersen (DK), Gertie Skaarup (DK) from CPH to SFJ by Air Greenland.

June 22 Henning Thing (DK) from CPH to SFJ by Air Greenland.

Anders Svensson (DK), Gunnar Magnus Arntorsson (IS), René Hviid (DK), Jeppe Jønch Andersen (DK), Jiwoong Chung (KOR), Sigfus Johnsen (IS), Sebastian Bjerregaard Simonsen (DK), Thorbjörn Karlin (S), Maragreta Hansson (S), Julia Rosen (US), Jean Louis Tison (B), Thomas Rudolf Laepple (D),Anna Wegner (D), Nerilie Jane Abram (UK), Paul Vallelonga (AUS), Torben Andersen (DK), Gertie Skaarup (DK) and Yann Hulmann (CH-Journalist) from SFJ to NEEM by 109'th.

Jørgen Peder Steffensen (DK), Martin Leonhardt (D), Adrian Schildt (CH), Simon Schüpach (CH), Wang Shimeng (CHN), Zhang Tong (CHN), Aimee Slangen (NL), Astrid Schmidt (DK), Helle Astrid Kjær (DK), Kerstin Schmidt (D), Bo Vinther (DK), Todd Sowers (US) and Yann Hulmann (CH) from NEEM to SFJ by 109'th.

June 24 Jørgen Peder Steffensen (DK), Martin Leonhardt (D), Adrian Schildt (CH), Simon Schüpach (CH), Wang Shimeng (CHN), Zhang Tong (CHN), Aimee Slangen (NL), Astrid Schmidt (DK), Kerstin Schmidt (D), Bo Vinther (DK) from SFJ to CPH by Air Greenland.

Bob Hawley (US) from SFJ to NEEM by 109'th
Bob Hawley (US) from NEEM to SFJ by 109'th

June 26 Todd Sowers (US) from SFJ to Schenectady by 109'th.

Movement of Cargo:

June 22 1790 kg Food/science gear and 2700 kg JET-A1 from SFJ to NEEM by 109'th.
2847 kg from NEEM to SFJ by 109'th.

June 24 5170 kg and 3628 kg JET A1 from SFJ to NEEM by 109'th.
4490 kg (1 Toyota Landcruiser and 1 pallet of garbage) from NEEM to SFJ by 109'th

Activities:

This was week with the first step for the main crew change of the season with a one week possible overlap for people on the various positions (camp, drillers and science personnel)
The camp received a flight on the June 22 with the first people and next week another flight is scheduled. The flight mission went well in good weather and low temperatures. An extra flight on top of the two planned missions was needed to the camp. This was due to critical stock of fuel in the camp and accumulated cargo/drilling liquid in Kangerlussuaq badly needed for the drilling operation. The reason for this was the reduced payload/landing weight at the site due to the poor condition of the skiway as maintenance was upset by very difficult weather conditions so far this season. After the skiway was certified for almost maximum landing weight an extra mission to the camp went successful and the camp received the needed fuel and drilling liquid.

Skiway:

Cooperating weather as well as skiway repair and grooming with tiller and beam resulted in improved skiway conditions and after the June 22 visit by the 109'th, the skiway was upgraded

Drill trench:

Monday-Friday the drilling continued with stable and routine drilling producing ice cores in full core length and fine core quality. Saturday, the drill entered the Eemian ice at logging depth c. 2250 m, approx. 50 meters earlier than modelled.

This week production: 102.22 m
Driller's depth: 2254.36 m
Logging depth: 2272.60 m

Science trench:

The production line in the science trench performed at an optimal level all week despite the crew shift. The highly advanced CFA setup is operated around the clock by two 12hours shifts of three persons processing around 10 meters of ice per shift.

CFA production this week: 102.30 m
CFA depth: 1833.15 m

Processing depth (ECM, DEP, Cutting): 2214.85 m

Associated programs:

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
A relative warm week at NEEM with temperatures between – 15 and -4°C, calm to 20 knots, mostly scattered, high clouds.

NEEM camp population: 37

Kangerlussuaq activities:
Preparation of cargo for the camp.

Weather in Kangerlussuaq/SFJ: A couple of days with low clouds and rain showers. Otherwise very nice weather with 12-19°C. Only a few mosquitoes.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field operations office,
Lars Berg Larsen
Henning Thing

NEEM - SITREP no. 11, Sunday 4 July 2010

This SITREP covers the period June 28- July 4, 2010 (inclusive).

Movement of personnel:

June 27 Olivier Alemany (F), Jérôme Chapellaz (F), Ilka Weikusat (D), Peter Abbott (UK) from CPH to SFJ by Air Greenland.

June 28 Dorthe Dahl-Jensen (DK), Martin Skrydstrup (DK),Elizabeth Elliott (AUS), Steffen Bo Hansen (DK), Timothy Burton (UK), Fernando Delgado (D), Corentin Reutenauer (F), Gerko van der Wel (CH), Kenji Kawamura (J), David Balslev-Clausen (DK) from CPH to SFJ by Air Greenland.

June 30 Dorthe Dahl-Jensen (DK), Martin Skrydstrup (DK),Elizabeth Elliott (AUS), Steffen Bo Hansen (DK), Timothy Burton (UK), Fernando Delgado (D), Corentin Reutenauer (F), Gerko van der Wel (CH), Kenji Kawamura (J), David Balslev-Clausen (DK), Olivier Alemany (F), Jérôme Chapellaz (F), Ilka Weikusat (D), Peter Abbott (UK) from SFJ to NEEM by 109'th.

June 30 Lars Berg Larsen (DK) from SFJ to CPH by Air Greenland.

June 30 Sverrir Hilmarsson (IS), Sarah Harvey (US), Louise Albershart (US), Trevor Popp (US), Sepp Kipfstuhl (CH), Jocelyne Bourgeois (CAN), Louise Wolff Ravnebjerg (DK), Simon Uhl-Jensen (DK), Carina van den

Veen (NL), Jun Uetake (J), Heejin Hwang (COR), Denis Samyn (B), Liz Thomas (UK), Sonia Falourd (F), Romain Duphil (F), H.C. Steen-Larsen (DK), Christoffer Stowasser (CH), Torben Andersen (DK), Gertie Skaarup (DK) from NEEM to SFJ by 109'th.

July 1 Sarah Harvey (US), Louise Albershart (US), Jocelyne Bourgeois (CAN) from SFJ to Schenectady by 109'th.

July 1 Sverrir Hilmarsson (IS), Trevor Popp (US), Sepp Kipfstuhl (CH), Louise Wolff Ravnebjerg (DK), Simon Uhl-Jensen (DK), Carina van den Veen (NL), Heejin Hwang (COR), Liz Thomas (UK), H.C. Steen-Larsen (DK), Christopher Stowasser (CH), Torben Andersen (DK), Gertie Skaarup (DK) from SFJ to CPH by Air Greenland.

July 2 Sonia Falourd (F), Denis Samyn (B), Romain Duphil (F) from SFJ to CPH by Air Greenland.

July 3 Jun Uetake (J) from SFJ to CPH by Air Greenland.

Movement of cargo:

June 30 4433 kg (9765 lbs) shallow drill, luggage, 16 drums of drill liquid and 6000 lbs of fuel from SFJ to NEEM by 109'th.

June 30 1842 kg (4057 lbs) frozen ice core and 1400 kg (3083 lbs) pallets, nets and garbage from NEEM to SFJ by 109'th.

Deposition of environmentally hazardous items with the municipal authority in Kangerlussuaq:

June 28 50 kg metal scrap, 200 litres waste oil, 1400 kg household garbage from NEEM.

Activities: The scheduled flight SFJ-NEEM-SFJ June 29 was postponed until June 30 due to bad weather and suboptimal skiway condition at NEEM. On June 30, skier 92 did take-off from SFJ 09:57 in rain and low clouds. Landed NEEM at 12:12. Due to bad weather at the coast airports the skier shut off all four engines. Remained on ground until 16:07 when it took off unaided and using only 1/3 of the skiway. Headed for Summit ice camp where it fuelled and waited for flyable weather in Kangerlussuaq. Arrived SFJ at 21:10. The flight took 14 new Neemians to camp and brought 19 old Neemians out. The change of camp crew meant some briefing and adjustment time at camp.

Skiway: Wind and new snow during the first half of the week required frequent repair and grooming on the skiway with both tiller and the beam. During the skier 92 visit June 30, the skiway was in prime condition.

Drill trench: Drilling rather stable delivering around 3 m long cores. We do 6 to 7 runs a day under normal conditions. The chips recovery is less than 100%. Moving the upper ring 60 cm higher on the shaft is not solving the problem. Liquid density seems to be close to the density of the warm , -8 deg C ice, leaving lost chips close to bottom. A few runs have been disturbed by ice under the shoes and by leaving the core at bottom in first attempt. The drilling is highly affected by shifts in the ice physical properties.The ice is getting softer and frequently the core catchers produce long grooves in the ice cores.

This week production: 95.24 m
Driller's depth: 2342.36 m
Logging depth: 2365.95 m

Science trench:

The science trench had a small exchange of people and it only took a day to get into full speed again. All instruments are working well and the science results are being followed with excitement. The discrete water isotope Picarro is online again and we are slowly producing O^{18}, D and excess climate curves of the deep ice. During the next week we hope to be able to inform the NEEM society on the findings in the deep ice. The temperatures in the drill trench and science trench are slowly increasing

and effort has been made to cool the trenches. In the drill trench the cooling tunnel has been switched on and an additional funnel has been installed near the roof to push the top warm air up and out of the surface tent where the staircase entrance is. In the science trench the cooling tunnels in the core storage and the ice box storage areas have been switched on.

CFA production this week: 118.8 m
CFA depth: 1951.95 m

Processing production this week (ECM, DEP, Cutting): 122.1 m
Processing depth: 2336.95 m

Drill trench: -18C
Connecting tunnel: -19C
Core buffer: -24C
Science trench: -17C
Ice cave: -24C

Associated programs:

The surface snow sampling program continues.

NEEM iridium numbers:

Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:

A relative warm week at NEEM with temperatures between –17 and -2 C, calm to 15 knots, mostly scattered clouds and sunny.

NEEM camp population: 32

Kangerlussuaq activities:

All 14 NEEM-bound pax got out of Kangerlussuaq one day delayed. Home-bound 19 pax got out of Kangerlussuaq on various flights within three days. 39 incoming ice core boxes from NEEM got into deep freezer within one hour of arrival. FOM Lars Berg Larsen left for CPH and FOM Henning Thing took over. Cleaned and reorganized warehouse and immediate surroundings. Handed environmentally hazardous goods over to municipal authorities.

Weather in Kangerlussuaq/SFJ:

Mixed weather most of week with frequent rain showers, thick fog and low clouds. Fairly reasonable numbers of mosquitoes.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office, Henning Thing

NEEM - SITREP no. 12, Sunday 11 July 2010

This SITREP covers the period July 5- July 11, 2010 (inclusive).

Movement of personnel:

July 5 Christine Hvidberg (DK), Bo Hvidberg (DK) from CPH to SFJ by Air Greenland.

July 10 Henning Thing (DK) from SFJ to CPH by Air Greenland.

Movement of cargo:

July 5 1842 kg (4057 lbs) frozen ice core in 39 boxes from SFJ to CPH by Air Greenland.

July 8 108 kg (3 colli) from SFJ to UCPH by Air Greenland. 88 kg (3 kolli) from SFJ to IMAU by Air Greenland.

Camp activities:
This week the camp has returned to working in normal routine again after the exchange of personnel last week. Drilling has continued with a steady production at almost 10 meter per day, processing caught up with the drilling on Monday, and the rest of the week has been dedicated to processing of the brittle ice that was drilled last year. CFA has proceeded with good progress. A science meeting was held in camp to present and compare preliminary data, but it is still too early to draw conclusions on the new data. Friday night the antenna at the main dome broke, but it was replaced by the back-up antenna, and the camp communication line is now up again.

Skiway:
No work on skiway this week.

Drilling:
The drilling started out Monday with a production of 14 m and 3 meter long cores, but through the week it has generally been difficult to produce long ice cores, and the drilling has been slowing down. Saturday drilling went very well again. Sunday evening the drill got stuck at the bottom of the borehole. 2.3 kg of frozen glycol was put down the borehole and the drill was free after 2 hours and 30 minutes.

This week production: 71.35 m
Driller's depth: 2420.95 m
Logging depth: 2437.73m

Science trench:
The ice core processing caught up with the drilling last Monday, and from Tuesday, the rest of the week has been used to process the brittle ice that was drilled last year, and has been kept over winter in the core buffer. The brittle ice has many breaks that limit some of the measurements The ice might not be suited for the CFA measurements to be performed at NEEM next yearThe processing of the brittle ice has proceeding very efficiently with 20-25 meters per day.
CFA production this week: 121 m
CFA depth: 2072.95m

Processing production this week (ECM, DEP, Cutting): 156.2 m
Processing depth: 2336.95-2372.15m and 655.05- 775.50m

Drill trench: -14C
Connecting tunnel: -18C
Core buffer: -21C
Science trench: -15C
Ice cave: -23C

Associated programs:
No work on associated programs.

NEEM iridium numbers:

Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
It has been a week with great weather at NEEM: stable cold temperatures, sunshine and a clear blue sky. Daytime temperatures between -5C and -6C, and night temperatures between -15C and -17C.

NEEM camp population: 32

Kangerlussuaq activities:
Monday ice core boxes were shipped to Denmark by Air Greenland. The cars are being serviced in order to be ready for the next flight period with DV visit. Sleeping bags and polar equipment has been cleaned. We have relocated cargo in the warehouse and started preparation of pallets for next flight period. We have started preparing the DV visit and compiling orders from camp of supplies. We have had an exchange of personnel in the FOM office during the week.

Weather in Kangerlussuaq/SFJ:
A nice and sunny week with day temperatures around 15C. Sometimes a few clouds coming in, but no rain. Mosquitos are still around, but relatively low.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office,
Christine Hvidberg
Bo Hvidberg

NEEM - SITREP no. 13, Sunday 18 July 2010

This SITREP covers the period July 12- July 18, 2010 (inclusive).

Movement of personnel:

July 11 Lucia Sala (IT) from CPH to SFJ by Air Greenland.

July 16 Lilo Berg (D) and Lise Barnéoud (F) to SFJ by Air Greenland.

July 18 Jørgen Peder Steffensen (DK), Rune Steffensen (DK), Svend Steffensen (DK), and Silvia Schön (D) from CPH to SFJ by Air Greenland.

Movement of cargo:

July 15 44 kg (2 kolli) Scientific equipment from Aberystwyth University to SFJ by Air Greenland.
4 kg (1 kolli) Scientific equipment from Piccaro Instruments to SFJ by Air Greenland.

July 16 724 kg (11 kolli) from UCPH to SFJ by Air Greenland.

Camp activities:
This week the camp has continued working in normal routine. The drilling got back on track again after the problems last week, and even broke this year record of the daily production. Snow and snowdrifts has influenced the camp maintenance, and drift snow had to be removed from several places in camp, and skiway was groomed towards the end of the week.

Skiway:

Grooming of skiway started Friday after the first snow storm, and was continued all Sunday in preparation of the next week flight period with DV visit to the camp.

Drilling:
Part of Monday was used to filter the hole after the drill was stuck in the hole on Sunday. The drilling got back into a very productive mode, and on Thursday the drilling broke this year record on drilling production in one day. Friday afternoon, drilling was stopped and a sonic logger was lowered to the bottom of the borehole in order to obtain a precise determination of the bedrock depth. The borehole was also temperature logged. The temperature at bottom of the borehole was -4.2 deg C so depending on the ice thickness there might be basal melt or not.

This week production: 70.56 m
Driller's depth: 2491.51 m
Logging depth: 2507.29 m

Science trench:
Processing of the brittle core drilled last year continued this week. The processing continued with a speed of about 30 meters per day. Friday was the last day of processing the brittle core, and Saturday, the processing of the deep freshly drilled core from this year was resumed. Also on Saturday, the CFA team reached their goal of processing down to 2200 meter depth. The deeper ice and the brittle ice for CFA will be stored at NEEM and will be CFA processes in 2011. The CFA team has in total processed 930 meter of ice core this year.

CFA production this week: 127.6 m
CFA depth: 2200.55 m

Processing production this week (ECM, DEP, Cutting): 66.5 m of deep ice core, 90.75 m of brittle ice core, including brittle zone bags 2116-2119.

Processing depth: 864.6 m in the brittle ice, and in the deep ice 2438.70 m.

Drill trench: -13C
Connecting tunnel: -18C
Core buffer: -20C
Science trench: -14C
Ice cave: -21C

Associated programs:
Brought shallow drill equipment to site S2.(77 deg 25.471 min N; 51 deg 07.266 min W)

NEEM iridium numbers:
Primary no.: +8816 777 02735
Secondary no.: +8816 224 34860
Night no: +8816 414 39 863

Weather at NEEM:
It has been a week with a change in weather from clear and cold conditions to warmer temperatures, overcast and clouds in the beginning of the week, snow and snow drifts on Thursday and then more snow showers, warmer temperatures and stronger winds with snow drifts. Day and night temperatures in the last part of the week between -7C and -8C.

NEEM camp population: 32

Kangerlussuaq activities:
We have prepared the DV visit, and arranged accommodation, meals, rental cars, polar gear, collected information on travel times and clearance data, and made a plan for the three day DV visit. We have also communicated with the visitors and sent information on the visit. We have processed the requests from camp. We have ordered and acquired

food, medical supplies, and other supplies for the camp in preparation of the next weeks flight period. Numbered Iceboxes and repaired hole in floor in warehouse. We have ordered a new door for the warehouse, and had the Toyota Landcruiser evaluated.

Weather in Kangerlussuaq/SFJ:
This week also brought a change in weather to Kangerlussuaq. The first days were overcast with temperatures around 15C, later changing to thick cloud cover and rain and Daytime temperatures down to 10C. Towards the weekend the weather cleared again and became sunny and warm with temperatures at 15-20C again. Mosquitos are still around, but low.

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Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office,
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NEEM - SITREP no. 14, Sunday 25 July 2010

This SITREP covers the period July 19- July 25, 2010 (inclusive).

Movement of personnel:

July 19 Simon Sheldon (DK), Tina Brand (DK), Aslak Grindsted (DK), Sepp Kipfstuhl (D), Sverrir Æ. Hilmarsson, Mark Curran (AUS), Henry Rufli (CH), Angelika Dummermuth (S), Julia Zabori (S), Alex Pyne (NZ), Darcy Robert Mandeno (NZ), Jesper Langballe (DK), Robert Corell (US), Birgitte Bønlykke Olsen (DK), Marianne Orbesen (DK), Eric Crosson (US), Uffe Hansen (DK), Lilo Berg (D), Silvia Schön (D), Nils O. Andersen (DK), Ralf Hemmingsen (DK), Thomas Bjørnholm (DK), Yves Frenot (F), Jakob Schwander (CH), Jens Ramskov (DK), and Stéphane Foucart (F) from CPH to SFJ by Air Greenland.

Nicolas Chateauneuf (F) and Emmanuel Beke (F) from Illulisat to SFJ by Air Greenland.

Dan Pasteris (US), Jim White (US), David B. Stroud (US), Robert Freeland (US), and Dan Satterfield (US) from Schenectady to SFJ by 109'th.

July 20 Simon Sheldon (DK), Tina Brand (DK), Aslak Grindsted (DK), Sepp Kipfstuhl (D), Sverrir Æ. Hilmarsson, Mark Curran (AUS), Henry Rufli (CH), Angelika Dummermuth (S), Julia Zabori (S), Alex Pyne (NZ), Darcy Robert Mandeno (NZ), Dan Pasteris (US), Jim White (US), Jesper Langballe (DK), Robert Corell (US), Birgitte Bønlykke Olsen (DK), Marianne Orbesen (DK), Eric Crosson (US), Uffe Hansen (DK), Lilo Berg (D), Siliva Schön (D), Nils O. Andersen (DK), Ralf Hemmingsen(DK), Thomas Bjørnholm (DK), Yves Frenot (F), Jakob Schwander (CH), Jens Ramskov (DK), Stéphane Foucart (F), Nicolas Chateauneuf (F), Emmanuel Beke (F), David B. Stroud (US), Robert Freeland (US), Dan Satterfield (US), Lucia Sala (IT), Lilo Berg (D), Lise Barnéoud (F), Silvia Schön (D), Bo Hvidberg (DK), Erik Hvidberg (DK), Niels Hvidberg (DK), Trine Schmidt Jensen (DK), Mark Doll (US) from SFJ to NEEM by 109th.

Gregory Teste (F), Gunnar Magnus Arntorsson (IS), Jeppe Jønch Andersen(DK), Sigfus Johnsen(DK), Thorbjörn Karlin(S), Margaretha Hansson(S), Jean-Louis Tison(B), Thomas Läpple(D), René Hviid(DK), Steffen Bo Hansen(DK), Ilka Weikusat(D), Peter Abbott(UK), Jesper Langballe (DK), Robert Corell (US), Birgitte Bønlykke Olsen (DK), Marianne Orbesen (DK), Eric Crosson (US), Uffe Hansen (DK), Lilo Berg (D), Silvia Schön (D), Nils O. Andersen (DK), Ralf Hemmingsen (DK), Thomas Bjørnholm (DK), Yves

Frenot (F), Jens Ramskov (DK), Stéphane Foucart (F), Nicolas Chateauneuf (F), Emmanuel Beke (F), Lilo Berg (D), Lise Barnéoud (F), Silvia Schön (D), Bo Hvidberg (DK), Erik Hvidberg (DK), Niels Hvidberg (DK), Mark Doll (US) from NEEM to SFJ by 109th.

Jeppe Jønch Andersen (DK) from SFJ to CPH by Air Greenland.

July 22 Gunnar Magnus Arntorsson(IS), Sigfus Johnsen(DK), Thorbjörn Karlin(S), Margareta Hansson (S), Jean-Louis Tison(B), René Hviid(DK), Steffen Bo Hansen(DK), Ilka Weikusat(D), Peter Abbott(UK), Jesper Langballe (DK), Robert Corell (US), Eric Crosson (US), Uffe Hansen (DK), Lilo Berg (D), Siliva Schön (D), Nils O. Andersen (DK), Ralf Hemmingsen (DK), Thomas Bjørnholm (DK), Yves Frenot (F), Jens Ramskov (DK), Stéphane Foucart (F), Silvia Schön (D) from SFJ to CPH by Air Greenland.

July 23 Birgitte Bønlykke Olsen (DK), Marianne Orbesen (DK), Gregory Teste(F), Nicolas Chateauneuf (F), Emmanuel Beke (F), Lilo Berg (D), and Lise Barnéoud (F) from SFJ to CPH by Air Greenland.

July 24 Läpple, Thomas (D) from SFJ to Illulisat by Air Greenland.

Anne Marie Berggren (S) from CPH to SFJ by Air Greenland.

July 25 Martha Canipe(US), TupaarnaqcEvaldsen(GR), Charlotte Fabricius(DK), Cecilia Groth(GR), Sofie Larsen(DK), Laura Lukes(US), Svend Nielsen(DK), Inuuteq Olsen(GR), Uffe Pedersen(DK), Jette Poulsen(DK), Roberta Score(US), Paul Scott(US), Nathan Wiegman(US), Zachery Wistort(US), Christine Schøtt Hvidberg(DK), Joseph Hurley (US), Casper Rasmussen (DK) from SFJ to NEEM by 109th.

Martha Canipe(US), TupaarnaqcEvaldsen(GR), Charlotte Fabricius(DK), Cecilia Groth(GR), Sofie Larsen(DK), Laura Lukes(US), Svend Nielsen(DK), Inuuteq Olsen(GR), Uffe Pedersen(DK), Jette Poulsen(DK), Roberta Score(US), Paul Scott(US), Nathan Wiegman(US), Zachery Wistort(US), Christine Schøtt Hvidberg(DK), Joseph Hurley (US), Jakob Schwander (CH), Dan Pasteris from NEEM to SFJ by 109th.

Movement of cargo:

July 20 3150 kg scientific equipment and food from SFJ to NEEM by 109th.
920 kg boat motors and GRIT equipment from SFJ to Thule AB via NEEM by 109th.
1910 kg ice cores from NEEM to SFJ by 109th

July 25 1540 kg drill fluid, food, long NZ drill box, 2070 kg fuel from tanks to NEEM from SFJ by 109th.
4140 kg ice core boxes (78 boxes) from NEEM to SFJ by 109th.

Camp activities:
This week has been one of the most eventful weeks at NEEM. Several big events came on top of each other. The annual DV visit occurred on Tuesday together with a crew exchange, but the planned flight to Thule for fuel had to be cancelled due to incoming bad weather and technical problems with the plane. Therefore the DV visit became a bit shorter than planned. Tuesday night a blizzard hit camp, and this storm continued to Friday afternoon. The planned visit overnight by young U.S., Danish and Greenlandic students had to be cancelled; but on Sunday the plane managed to go to NEEM with the students and this gave them a short but memorable experience. Indeed, the patience of the students paid out, as the first core with basal material came up with the drill on Thursday and the students were among the first to see basal ice at NEEM. As work in the trenches continued independent of weather, the first ice core with basal material came up in the middle of a snow storm. Basal material is a tell-tale sign that the bottom is close. With all the visitors in camp, much time was spent for filming and interviews.

Skiway:

The skiway was groomed with beam and tiller in preparation for the flight on Tuesday. Then the storm cancelled all grooming, and the skiway had to be groomed again Friday and Saturday because of substantial amounts of new snow. The skiway was upgraded from 135,000 lbs to receive landing weight of 140,000 lbs.

Drilling:
The drilling started out Monday with a production of 15.83 m; but Tuesday daily production went down due to very long drilling times as the cutters slipped. This continued Wednesday, and the Swiss sonic bedrock sounder was deployed. Initially, the data suggested that bedrock might be 65 m away, but as the first silty ice came up Thursday morning, data was re-examined and the result was that bedrock was very close. The rest of the week drillers found a new routine, where damaged cutters and core catchers from the basal material were sharpened in alternate runs: One run to drill and one run to retrieve the core. Daily production went down to 1 m per day as drillers struggled to force the drill downwards. A particularly nasty spot was passed as drillers managed to drill just past a large stone embedded in the core.

This week production: 30.00 m
Driller's depth: 2521.98 m
Logging depth: 2537.29 m

Science trench:
The CFA team finished the work of the season with some calibration runs, and then CFA packing continued throughout the week. Deep ice processing continued until Friday when the final processing depth was reached. Then processing switched to brittle ice processing.

CFA measurements have finished for this year at 2200.55 m.

Processing production this week (ECM, DEP, Cutting): 95.15 m
Brittle zone processing this week: 864.6 m to 880.0 m
Final deep processing depth: 2533.85 m

Drill trench: -14C
Connecting tunnel: -19C
Core buffer: --18C
Science trench: -15C
Ice cave: -24C

Associated programs:
No work on associated programs.

NEEM iridium numbers:
Primary no.: +8816 777 02735
Secondary no.: +8816 224 34860
Night no: +8816 414 39 863

Weather at NEEM:
This week was dominated by bad weather. Clouds came in Monday and Tuesday evening wind picked up to 25 knots with snow fall and drifting snow and this lasted until Friday evening. Saturday weather cleared, and Sunday a 2 month low of -20 C was reached. Daytime temperatures between -4C and -7C, and night temperatures between -7C and -20C.

NEEM camp population: 38

Kangerlussuaq activities:
The whole week was dominated by organising DV and student visits. Presentations about NEEM were given three times. Visitors were taken on excursions and visitors were outfitted for the field trips. A dinner was hosted for the visitors. Another complicating factor was organising the flights. Due to bad weather at NEEM and technical issues with

the planes, plans had to be re-scheduled all the time. The NEEM FOMs wish to thank the CPS staff for very helpful collaboration.

Weather in Kangerlussuaq/SFJ:
A mixed week with some sunny days; but also cool days with heavy clouds and some rain. Temperatures between 15 C and 10 C. Mosquitoes are gone.

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Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office,
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NEEM - SITREP no. 15, Sunday 1 August 2010

This SITREP covers the period July 26- August 1, 2010 (inclusive).

Movement of personnel:

July 26 Jean Jouzel (F) and Bryn Hubbard (UK) from CPH to SFJ by Air Greenland.

Jakob Schwander (CH) from SFJ to CPH by Air Greenland.

Dan Pasteris (US) from SFJ to Schenectady by 109th.

July 27 Christine Hvidberg (DK-FOM) and Bo Hvidberg (DK-FOM) from SFJ to CPH by Air Greenland.
Tanner Kuhl(US), Heather Andres(CAN) and James Zheng(CAN) from Schenectady to SFJ by 109th
Lars Berg Larsen(DK) and Trevor Popp(DK) from CPH to SFJ by Air Greenland.

July 28 Anne Marie Berggren (S), Jean Jouzel (F), Bryn Hubbard (UK), Tanner Kuhl(US), Heather Andres(CAN), James Zheng(CAN), Lars Berg Larsen(DK), Trevor Popp(DK), Renee Crain(US), Mike McKibben(US), Morten Thrane Leth(GRL), Rhett Butler(US), Rune Steffensen(DK), Svend Steffensen(DK), Gorm Steffensen(DK), Nanna Steffensen(DK), Eric Copeland(US), Jay Burnside(US), Monte Ingram(US), Scott Klandic(US), Randy Olsen(US), Dane Terry(US), John McIntyre Jr(US-109th), Timothy De Ver Dye(US-109th), Wesley Ralph Pope(US-109th), Roberto J.C.Gonzalez-Homs(US-109th), Fred W.Baker III(US-109th), Joseph Christopher Donahue(US-109th), Mannie Garcia(US-109th),Melanie Conner(US-109th) and Maj. Robert Bullock (US-109th) to NEEM from SFJ by 109th.

July 28 Daiana Leuenberger(CH), Gideon Gfeller(CH), Anders Svensson(DK), JiWoong Chung(COR), Sebastian Bjerregaard(DK), Julia Rosen(US), Anna Wegner(D), Nerilie Jane Abram(UK), Paul Vallelonga(DK), Martin Skrydstrup(DK), Olivier Alemany(F), Fernando Valero Delgado(D), Corentin Reutenauer(DK), Gerko van der Wel(NL), Kenji Kawamura(J), David Balslev-Clausen(DK), Jerome Chappellaz(F), Jim White(US), Lucia Sala Simeon(F), David B. Stroud(US), Robert Freeland(US), Danny Ernest Satterfield(US), Renee Crain(US), Mike McKibben(US), Morten Thrane Leth(GRL), Rhett Butler(US), Rune Steffensen(DK), Svend Steffensen(DK), Gorm Steffensen(DK), Nanna Steffensen(DK), Trine Schmidt Jensen(DK), Eric Copeland(US), Jay Burnside(US), Monte Ingram(US), Scott Klandic(US), Randy Olsen(US), Dane Terry(US), John McIntyre Jr(US-109th), Timothy De Ver Dye(US-109th), Wesley Ralph

Pope(US-109th), Roberto J.C.Gonzalez-Homs(US-109th), Fred W.Baker III(US-109th), Joseph Christopher Donahue(US-109th), Mannie Garcia(US-109th),Melanie Conner(US-109th) and Maj. Robert Bullock (US-109th) from NEEM to SFJ by 109th

July 30 Julia Rosen(US), Jim White(US), David B. Stroud(US), Robert Freeland(US)and Danny Ernest Satterfield(US) from SFJ to Schenectady by 109th

Daiana Leuenberger(CH), Gideon Gfeller(CH), Anders Svensson(DK), JiWoong Chung(COR), Sebastian Bjerregaard(DK), Julia Rosen(US), Anna Wegner(D), Nerilie Jane Abram(UK), Paul Vallelonga(DK), Martin Skrydstrup(DK), Olivier Alemany(F), Fernando Valero Delgado(D), Corentin Reutenauer(DK), Gerko van der Wel(NL), David Balslev-Clausen(DK) and Jerome Chappellaz(F) from SFJ to CPH by Air Greenland

Aug 1 Kenji Kawamura(J) from SFJ to CPH by 109th

Movement of cargo:

July 28 5010 kg NZ drill, scientific equipment, food, DK-winch and 1590 kg fuel from SFJ to NEEM by 109th.
9100 kg fuel from Thule AB to NEEM by 109th.
3640 kg U.S. ice core samples, ice cores and scientific equipment from NEEM to SFJ by 109th.

Camp activities:
This week work has switched from deep drilling to processing of brittle core and shallow ice core drilling. Also, during the last crew exchange of the season, camp staff has been reduced as the CFA team and several drillers left camp. Processing of brittle ice continues, and processers now also log the shallow cores. The last crew exchange was combined with a much needed fuel flight to Thule and visits by NSF representatives and 109th press people. Against many odds, the 109th managed to fly to camp with a very full plane and getting airborne with a record load of more than 20,000 lbs including several pallets of ice cores. Camp has now fuel to continue until pull out. In the drill trench, drillers are cleaning up and packing down. The testing of the New Zealand intermediate drill, a Danish intermediate winch and a Swiss elevated tower began.

Skiway:
Skiway was groomed Saturday.

Drilling:
Deep drilling reached a record low in weekly production: 0.10 m, as the last core of 0.10 m was drilled Monday. As no more penetration could be obtained, and as the electronics section shortened at the bottom (most likely due to water glycol in the drill liquid), termination of NEEM drilling at bedrock was declared Tuesday. Deep drilling is now terminated.

This week production: 0.10 m.
Driller's depth: 2522.08 m, final depth
Logging depth: 2537.35 m, final depth

Science trench:
Brittle ice processing continues, and this is time consuming as processors are working in the worst quality ice. It takes time to ensure the integrity of the ice core by keeping all pieces of the puzzle in place. Processing of shallow cores in-between constitute a welcome break in the tedium of brittle zone processing.

Brittle ice processing production this week (ECM, DEP, Cutting): 81.40 m
Processing depth: 961.40 m

Drill trench: -15C
Connecting tunnel: -19C
Core buffer: -20C

Science trench: -15C
Ice cave: -24C

Associated programs:
With the arrival of the delayed NZ equipment on Wednesday, the NZ crew is now busy setting up their 4'' intermediate drill for field testing.
The DK-3'' shallow drill has been drilling hole 2010 S2 to 100.14 m
Work on assembling the new DK intermediate winch and Swiss elevated tower.
Work on readying the U.K. logger for the deep hole. The U.K. logger uses it's own winch with a cable length of 600 m.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
It has been a week stable weather at NEEM: Sunshine and a clear blue sky with ground fog in the night. Daytime temperatures between -3C and -6C, and night temperatures between -12C and -20C.

NEEM camp population: 23

Kangerlussuaq activities:
A busy week with handling a major crew exchange. Luckily, the flight planned for Wednesday did occur on that day (almost a first time this season), and everybody could arrive and leave Kangerlussuaq on time. Our freezer is full of ice, and the first shipment to Europe of 54 boxes is due Monday at Noon. 12 boxes of gas samples are stored in a freezer run by CPS at -26 C. This ice will go separately Tuesday Noon. The U.S. CFA equipment has already been shipped to the U.S. All other cargo is collected in the warehouse awaiting shipment at the end of the season.

Weather in Kangerlussuaq/SFJ:
Some showers but mostly sunny; but quite windy. Day temperatures between 8C and 15C. Mosquitoes are gone. Many mushrooms and blue berries.

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Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office,
Jørgen Peder Steffensen

NEEM - SITREP no. 16, Sunday 8 August 2010

This SITREP covers the period August 2- August 8, 2010 (inclusive).

Movement of personnel:

No movement of personnel

Movement of cargo:

August 2 2339 kg ice core from SFJ to CPH by Air Greenland.

August 3 620 kg ice core gas samples from SFJ to CPH by Air Greenland.

Camp activities:
This week work has been dominated by activities on the surface: Shallow ice core drilling, testing of the new DK intermediate winch and Swiss elevated tower, setting up of the NZ drill, NZ drill tests, pit studies and sampling, measuring strain-net around NEEM up to 60 km away. In the trenches: Processing of shallow cores and NEEM main core brittle zone ice and logging the deep hole with U.K. logger. Snow has been removed from the roof of science trench and drill trench, items have been brought from the cargo line to over winter shelter and carpenters storage garage has been made ready for packing down. Due to bad weather all surface activities have been halted since Friday evening. Several small tents, including the outhouses, had to be rescued in the strong wind. On Thursday a necessary major repair on the main generator was done. After much preparation, camp switched to smaller backup generators, while the engine and the alternator were taken apart to replace a leaking seal. During repairs, the main dome did not have heating and running water and work in the trenches was stopped. At 16:10 repairs were completed and the main generator is now on-line again. In preparation for the mobile shallow drilling campaign at Camp Century and Dye-3, the crew trained in fast assembly and disassembly of the DK shallow drill.

Skiway:
Skiway was in good shape until the storm hit. It will be groomed as soon as weather permits.

Drilling:
Deep drilling has been terminated.

Driller's depth: 2522.08 m, final depth
Logging depth: 2537.36 m, final depth

Science trench:
Brittle ice processing continued until Wednesday, where the crew switched to shallow ice core processing.

Brittle ice processing production this week (ECM, DEP, Cutting): 66.00 m
Processing depth: 1027.40 m
Left in the buffer for next year is now the ice from 1027.4 m to 1154.40 m, bags 1869 – 2099.

Shallow core NEEM 2010 S2 has been processed to 100.65 m

Drill trench: -15C
Connecting tunnel: -20C
Core buffer: -20C
Science trench: -15C
Ice cave: -24C

Associated programs:
After assembly of the tower and drill, a 5 m deep trench was excavated behind the mechanics garage and the drill put in place with the Pistenbully crane. The first cores with the NZ drill were drilled on Friday.

The DK-3'' shallow drill has been drilling hole 2010 S3 to 81.00 m. Core sections are split between a Japanese dielectric program (S.Fujita) and a Canadian Hg (mercury) program (J.Zheng). A 2 m pit at this drill site has been sampled for high-resolution water isotopes and cosmogenic 10-Be.

Work on assembling the new DK intermediate winch and Swiss elevated tower. The intermediate winch with 780m of cable was tested with the Swiss elevated tipping tower. The system has been successfully tested with tensions up to 6000N. The tests suggest that the descent and ascent speed for the 4 inch HT drill in a 130 mm bore hole will be 1.5 m/s. The intermediate drill can carry 1400m of cable.

After fixing some problems with the logger winch, the U.K. logger has been in action from Tuesday to Friday. Three separate digital optical televiewer (OPTV) logs were successfully recorded from the NEEM hole to a depth of 630 m. These revealed numerous features, including natural phenomena such as repeated, discrete clear ice layering and included bubbles, and drilling-related artefacts such as anti-torque grooving and variations in cutting pitch. In addition to these OPTV logs, several 20 KHz sonic logs were successfully recorded, revealing the acoustic structure of the upper 630 m of the borehole.

NEEM iridium numbers:
Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:
The week began with fine weather at NEEM: Some clouds; but mostly sunshine and some ground fog. Daytime temperatures between -5C and -9C, and night temperatures between -14C and -21C. Wind from various directions with speeds of 3 kt to 11 kt. Friday a blizzard hit camp with overcast, snow and blowing snow. Temperatures rose to -6 C without day/night cycle. Winds at 20 kt– 30 kt with stronger gusts from SW. The blizzard is expected to pass by Sunday evening.

NEEM camp population: 23

Kangerlussuaq activities:
During the week, we have worked on readying overwintering cargo for the pull out week and cleaning and sorting out field clothes. Monday and Tuesday we shipped a lot of ice cores to Denmark. This ice has been received in good order in Denmark and is now in freezers. The freezer in Kangerlussuaq has now capacity to take all ice during pull out. Also, we are involved with coordination of the flights by a Twin Otter next week.

Weather in Kangerlussuaq/SFJ:
Mostly sunny and nice. Day temperatures between 8C and 15C. Mosquitoes are gone. Less mushrooms and blue berries.

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Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office,
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Inger Seierstad

NEEM - SITREP no. 17, Sunday 15 August 2010

This SITREP covers the period August 9- August 15, 2010 (inclusive).

Movement of personnel:

August 10 Popp, Trevor (DK) and Curran, Mark (AUS) from NEEM to Camp Century by Norland Air Twin Otter.
Popp, Trevor (DK) and Curran, Mark (AUS) from Camp Century to Qaanaaq by Norland Air Twin Otter.

August 12 Dahl-Jensen, Dorthe (DK) from NEEM to Qaanaaq by Norland Twin Otter.
Dahl-Jensen, Dorthe (DK), Popp, Trevor (DK) and Curran, Mark (AUS) from Qaanaaq to Ilulissat by Flugfelag Island Dash-8.

August 13 Dahl-Jensen, Dorthe (DK) from Ilulissat to Copenhagen by Air Greenland

August 14 Popp, Trevor (DK) and Curran, Mark (AUS) from Ilulissat to Kangerlussuaq via Dye-2 by Norland Air Twin Otter.

Seierstad, Inger (DK) from Kangerlussuaq to NEEM by 109th
Seierstad, Inger (DK) and Kuhl, Tanner (US) from NEEM to Kangerlussuaq by 109th

August 15 Popp, Trevor (DK) from Kangerlussuaq to CPH by Air Greenland

Movement of cargo:

August 10 500 kg DK shallow drill from NEEM to Camp Century by Norland Air Twin Otter.
500 kg DK shallow drill and 250 kg ice core from Camp Century to Qaanaaq by Norland Air Twin Otter.

August 12 375 kg DK science equipment SFJ to CPH by Air Greenland.
500 kg DK shallow drill from Qaanaaq to Ilulissat by Norland Air Twin Otter.
250 kg ice core from Qaanaaq to Ilulissat by Flugfelag Island Dash-8.
3000 kg food from Schenectady to Kangerlussuaq by 109th.

August 13 1200 kg fuel depot from Kangerlussuaq to Dye-2 by 109th

August 14 500 kg DK shallow drill from Ilulissat to Kangerlussuaq via Dye-2 by Norland Air Twin Otter.
250 kg ice cores from Ilulissat to Kangerlussuaq by Flugfelag Island Dash-8.
80 kg LGR instrument from Kangerlussuaq to Reykjavik by Flugfelag Island Dash-8.
3820 kg drill fluid, timber, plywood, food, spares, U.S. ice core boxes and 5000 kg fuel from Kangerlussuaq to NEEM by 109th.
1910 kg ice cores, 1550 kg CFA water, compressed gases, shelves, 660 kg empty drums and 840 kg core troughs and NZ drill box from NEEM to Kangerlussuaq by 109th.

August 15 170 kg LGR equipment from Kangerlussuaq to Akureyri by Norland Air Twin Otter.

Camp activities:
In the beginning of the week, work was dominated by activities on the surface: Shallow ice core drilling and NZ drill tests. In the trenches: Sampling and processing of shallow ice cores. On Tuesday a Twin Otter flew a two man crew to Camp Century with the DK-shallow drill where a 30 m core was drilled and a 2m pit sampled. The planned drilling at Dye-3 on Saturday had to be cancelled due to bad weather a Dye-3. In camp, the rest of the week was dedicated to packing cargo and ice for shipment and to preparing camp for close-down. Friday the first weatherport was packed down. NEEM received two visits from distinguished visitors this week: Wednesday, a private party visited camp in their own chartered plane and on Saturday the 109th brought a group of U.S. visitors to camp. All scientific activity in camp is now terminated.

Skiway:
The Skiway has been groomed in zig-zag and lengthwise with the beam groomer and subsequently tilled. On the mission August 14, the Skiway maintained its 140,000 lbs ACL rating. After the Saturday mission the skiway was tilled and skiway markers checked for the winter.

Drilling:
Deep drilling has been terminated.

Driller's depth: 2522.08 m, final depth
Logging depth: 2537.36 m, final depth

Science trench:
Processing of the NEEM deep core has been terminated.
Left in the buffer for next year is now the ice from 1027.4 m to 1154.40 m, bags 1869 – 2099.

Shallow core NEEM 2010 S3 has been processed and sampled to 87.30 m

Associated programs:

The U.K. optical logger has been in action in the S3 drill hole.
The water vapour sampling site is packed down completely.
GPS reference stations packed down.

Firn Temperature Array:

During the week leading up to Sunday 15th August an over wintering temperature array was set up. A hole was drilled using the DK hand Auger to 10m below 2010 snow level placed 25m from the AWS. The array consists of 7 temperature sensors placed at 10m, 7.5m, 5.0m, 2.5m, 1.0m, surface and 2m above surface. To help the system cope with the winter temperatures the logging equipment was buried 2m below the surface. The battery packs are being charged by the combination of a mini wind turbine & a solar panel.

NZ Ice Drill Testing: Summary of testing operations.

The NZ drill equipment arrived at NEEM camp on 28 July. The winch, base frame and mast were assembled under shelter in the Carpentry Workshop and minor modifications of a few components were required to complete the assembly. The drill system was set up over a 4.5 m deep mast slot cut in the snow outside near the mechanical garage to replicate operations in a drill trench. The drill mast is operated with electric/hydraulics for tilting and also mast traverse that can be used for drilling as well as breaking the core.

Initial coring of the firn was carried out with a 2.1 m long poly flighted dry core barrel with superbanger connection. This gave mixed results with progressively shorter core recovery as the firn became denser. The cuttings did not lift well on the high angle flighting and also became packed around the superbanger coupling which requiried unacceptably high motor current.

To further test the drill motor, mast and winch operation, components of the Hans Tausen drill which were on site (outer barrel, chips chamber and 4 inch dry core barrel) where connected to the NZ motor and antitorque section. Good consistent and stable drilling was achieved with firn cores ranging from 1.2-1.5 in length from the 1.6 m barrel. Drill motor amps remained stable through these runs at about 1 amp showing the drill motor and controller were performing adequately.

The winch and mast system performed well, some minor tuning is required with the hydraulics to improve cold temperature performance. The mast traverse facility provides better drill descent control than slow winch speeds and this was the preferred mode for drilling.

The time available for testing and initial drilling issues did not allow the drill to be relocated to the short coring site to drill a science core. The drill was disassembled and repacked in just over two days. Some equipment departed NEEM on 14 August and the majority is scheduled to leave on 17 August.

Summary of inorganic Hg sampling and sample processing on site NEEM

One hundred and seventeen bags (a total 147 minus 27 bags for Fujita san and first surface 3 bags missing) as well as a 1.6-meter pit (with a 10-cm resolution) were taken for inorganic Hg studies. On site sample processing was carried out for bags from #4 to #71 in a 10' x 10' tent-field lab. Decontamination processing went smoothly except the last day (Friday) when air temperature was a bit higher than normal (higher than -10^{o}C).

A total of about 300 samples were decontaminated and taken for the top bags of core sections (before Bag 71) and the pit. Another 60 bags of cores will be taken back to south for decontamination in September or October this year. A total of 600 samples with be reached for total Hg studies from this field season.

For the S3 short core, on site ECM and weighing were also done almost immediately after each core section was retrieved. ECM files have been copied to the folder of Science.

NEEM iridium numbers:

Primary no.: +8816 224 34860
Secondary no.: +8816 414 39 863

Weather at NEEM:

The week began with fine late summer weather at NEEM: Mostly sunshine and some ground fog. Daytime temperatures between -10C and -13C, and night temperatures between -23C and -25C. Wind from SE with speeds of 2 kt to 11 kt. Thursday evening clouds moved in, an low overcast persisted Friday and Saturday Temperatures rose to -8 C at day and -12 at night. Winds at 8 kt– 10 kt from SE.

NEEM camp population: 19

Kangerlussuaq activities:
During the week, we have worked on readying overwintering cargo for the pull out week and cleaning and sorting out field clothes. Thursday was busy dealing with a large food shipment from the U.S. And Friday and Saturday was spent coordinating flights to NEEM by 109th and servicing Twin Otter and Dash-8 flights. A depot was deployed at Dye-2. Ice cores have been received and they are now stored in the freezer. Isotope equipment has been sent directly to Iceland.

Weather in Kangerlussuaq/SFJ:
Mostly sunny and nice. Day temperatures between 8C and 15C. Many mushrooms and blue berries found.

Tel.: +299 84 11 51
Mobile: +299 52 41 25
Kangerlussuaq/SFJ iridium number: +8816 2144 2402

NEEM Field Operations office,
Jørgen Peder Steffensen
Inger Seierstad

NEEM - SITREP no. 18, Sunday 22 August 2010

This SITREP covers the period August 16- August 22, 2010 (inclusive).

Movement of personnel:

August 17 Jouzel, Jean (F), Andres, Heather (CAN), Berggren, Anne Marie (S), Zheng, James (CAN), Hubbard, Bryn (UK), Brand, Tina (DK), Grindsted, Aslak (DK), Zabori, Julia (S), Mandeno, Darcy (NZ), Pyne, Alex (NZ), Dummermuth, Angelika (D) and Christensen, Casper (GRL) from NEEM to SFJ by 109th

August 18 Sheldon, Simon (DK), Kipfstuhl, Sepp (D), Hilmarsson, Sverrir (IS), Rufli, Henry (CH), Berg Larsen, Lars (DK), Elliott, Elizabeth (AUS) and Burton, Timothy (UK) from NEEM to SFJ by 109th.

August 19 Andres, Heather (CAN) and Zheng, James (CAN) from SFJ to Schenectady by 109th.

August 19 Jouzel, Jean (F), Berggren, Anne Marie (S), Hubbard, Bryn (UK), Brand, Tina (DK), Grindsted, Aslak (DK), Zabori, Julia (S), Mandeno, Darcy (NZ), Pyne, Alex (NZ), Dummermuth, Angelika (D) and Sheldon, Simon (DK) from SFJ to CPH by Air Greenland.

August 20 Kipfstuhl, Sepp (D), Hilmarsson, Sverrir (IS), Rufli, Henry (CH), Berg Larsen, Lars (DK) and Burton, Timothy (UK) from Kangerlussuaq to CPH by Air Greenland.

August 20 Elliott, Elizabeth (AUS) and Curran, Mark (AUS) from SFJ to Ilulissat by Air Greenland.

August 22 Steffensen, Jørgen Peder (DK-FOM) and Seierstad, Inger (DK-FOM) from SFJ to CPH by Air Greenland

Movement of cargo:

August 16 600 kg fuel depot from Dye-2 to SFJ by 109th.

August 17 1820 kg food and 6820 kg fuel from SFJ to NEEM by 109th.

August 17 1590 kg ice cores, 1650 kg NZ drill and UK logger and 1300 kg house hold waste from NEEM to SFJ by 109th.

August 18 1750 kg Canadian science and samples, 1700 kg DK science and AWI equipment and 650 kg empty drums from NEEM to Kangerlussuaq by 109th.

August 19 1750 kg Canadian science and samples, 1150 kg U.S. ice core samples and firn and 500 kg CFA melt water from SFJ to Schenectady by 109th.

4267 kg ice cores from SFJ to CPH by Air Greenland.

August 19 1500 kg AWI science and equipment, 800 kg CFA meltwater and 150 kg isotope standards packed in AWI container from Ship.

August 20 Swiss freight to Zürich
German freight, French freight, Japanese freight and U.K. freight via Blue Water Shipping in Denmark 1046 kg AWB 631 0184 944 4
Danish freight to CPH 1079 kg AWB 631 0184 943 3

Camp activities:
Camp activities have been centered on packing down and readying cargo for the final pull-out flights. The pull-out flights Tuesday and Wednesday were successful, although they occurred under marginal weather conditions. All scheduled cargo has left camp, and camp is now winterized.

Skiway:
No work on the skiway, except knocking off frost on markers and raising the markers

Weather at NEEM:
The week began with fine late summer weather at NEEM: Mostly sunshine and some ground fog. Temperatures between -7C and -15C. Wind from SE with speeds of 2 kt to 11 kt. Some clouds and fog during first pull out on Tuesday, and Wednesday a system moved in. Low overcast has persisted the rest of the week. Temperatures rose to +1 C at day and -3 at night. Winds at 12 kt from SW.

NEEM camp population: 0

Kangerlussuaq activities:
A very busy week for the FOMs. All cargo from camp had to be repacked and sorted for shipment to many different institutions. Ice cores had to be shipped. And now Saturday and Sunday will be spent packing down at the ware house and readying the office for winter.

Weather in Kangerlussuaq/SFJ:
Sunny and nice. Day temperatures between 8C and 15C.

As of Sunday, August 22 the Field Operations office is closed until next year.

NEEM Field Operations office,
Jørgen Peder Steffensen
Inger Seierstad

NEEM DIARY.

April

Thursday, 29th April 2010.

Camp opens at a quick pace.

Last night we went to bed with electrical power from the main generator and central heating active. This morning snow began to melt o the ground floor, a sure indication that main dome temperatures were above freezing. Today we also got the water system for drinking water activated. Sverrir has been driving big snow machine, the Pistenbully, all day removing snow drifts around the main dome, and a large work gang excavated roof of the entrance section of the drill trench. Later they erected the white weatherport over the entrance and gained access to the drill and science trench. Another group opened the entrance over the core storage. Our cook Sarah has been busy getting an overview of where the food is stashed, and at the same time cooking good food for us. Our two ”guests”, Joe and Jay, are still waiting for their Twin Otter aircraft to show up; but in he mean time, they do their share of work in camp.

What we have done today:

1.Gaining access to the trenches. They are in good shape.

2.Activating the cooks snowmelter for drinking water supply.

3.Central heating in main dome working. Temperature on first floor 10 C and in cupola 15 C.

4.Ali mounted new lid on main snow melter.

5.Removing snow drifts around main dome.

6.Lifing empty drums up to surface in cargo line.

7.Iridium based internet connection now working.

8.HF radio connection works perfectly.

9. Erecting white Weatherport over elevator and stair case.

Ad.1: The wall over the connecting tunnel in drill trench is slumping. This caused the roof over the drill trench to sink a bit faster than anticipated. There is still clearance for the drill tower; but only enough to last this season. If we switch to the HT drill for operations next year, the tower may be shortened.

Weather: Thin scattered overcast to blue sky, - 26 C to -22 C, 8-12 knots from SSE. Visibility: unrestricted.

FL, J.P. Steffensen

Picture captions:

The first glance at NEEM camp from the air as we flew in yesterday.

Red dome and main dome in snow drifts. It is hard to imagine that the red dome was built on a 2 m snow hill two years ago. Note the person on the right for size comparison.

Friday, 30th April 2010.

Camp opening is helped by beautiful weather.

We have beautiful weather, and this is indeed an advantage as we have to put many camp installations into place. The main dome is nice and warm. We have drinking water in the taps, and by tomorrow we should have water for dish washer, laundry machines, bath room and showers. Already now there is activity in the trenches: Modifications are made to the drill tower and a new core storage is under construction. Snow blocks are being cut, lifted up by the elevator and hauled away. Joe and Jay have been lending two sets of very welcome extra hands. At this time last year camp was hit by a blizzard, but this year everything is just fine, and the forecast promises two more nice days.

What we have done today:

1.Extending small elevator to allow for transport of snow blocks.

2.Begin construction of cold ice core storage in packing area of science trench.

3.Mounting main elevator .

4.Finished modifications to main snow melter. It now has a new lid and electrical booster heaters.

5.Mounting main snow melter to water system.

6.Transporting fuel to camp with sled and drums.

7.Moving equipment into CFA lab. CFA lab now heated.

8.Moving equipment into drill trench.

9. Mounting a new linear motor on the drill tower.

Ad.2: After measurements were completed, a construction meeting was held in the science trench. We saw, that there is room for the new Viessmann lab. without moving the elevator. All afternoon a work crew has been cutting blocks and lifting them out of the trench. The tunnel is now 5 m deep. When finished, it will be able to hold 50 ice core boxes at low temperatures.

Weather: Thin scattered clouds to blue sky, - 28 C to -21 C, 6-11 knots from SSE. Visibility: unrestricted, sometimes slight fog.

FL, J.P. Steffensen

Picture captions:

The rebuilt main snow melter is put in place next to the main dome..

Sverrir and Ali mounting the snow melter.
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May

Saturday, 1st May 2010.

Our first Saturday evening in the field of 2010.

Saturday night at NEEM camp is always anticipated with pleasure. It is the evening off, and dinner is special. People take a shower and people dress up: Necktie for men and dresses for women is compulsory. We need at least once a week to demonstrate to each other that we are civilised persons. However, first Saturday is normally an exception because water supply is not yet established. This year is an exception. Everybody had a good shower and could celebrate Saturday evening in style. Sarah had made steaks so all 16 had a good evening.

What we have done today:

1.Installation of main snowmelter, showers and dishwasher.

2.Lifting and revising skiway flags.

3.Mounting skylight, the “submarine” over drill trench .

4.Excavating ice core storage cave.

5.New linear motor installed on tower. The tower now tilts to vertical.

6.Un-packing in CFA laboratory.

7.Setting up drill electronics.

8.Troubleshooting malfunction on Pistenbully.

9.Saturday evening.

Ad.1: After only 72 hours in camp, we have all systems in camp up and running.

Ad.8: We have a malfunction in the steering, so we cannot use the Pistenbully right now. Luckily, we got all heavy lifting for camp opening done. We are presently in contact with the company to solve the problem.

Weather: Blue sky all day, - 33 C to -23 C, 3-9 knots from SE. Visibility: unrestricted.

FL, J.P. Steffensen

Picture captions:

A good sign. Our doctor, Hans Christian, has little to do.

Our skiway with number “2” flags after revision.

Sunday, 2nd May 2010.

Enjoying the comforts of camp life and preparing for bad weather.

After a slow start, enjoying the warmth of the main dome, water in the taps, the dishwasher and the ability to relieve one self in door, people went to work. Ali constructed a pulley system. Hans Christian and Lou revised skiway flags. Sverrir and J.P. tried to fix the Pistenbully. Sarah cooked and worked on food orders. Jeff, Sepp, Theo, Jay and Joe excavated. Simon, Steff, Jakob and Trevor worked in the drill trench and Matthias worked in the CFA lab. The forecast from Marc de Kaiser is a bit gloomy. By tomorrow afternoon we may be hit by a blizzard that will last until Tuesday evening, and today we saw some signs that something is brewing. Clouds came in, our barometer has dropped and the temperatures became un-seasonally high. We have prepared for some snow drift.

What we have done today:

1.Successful deployment of borehole camera to 177 m depth.

2.Lifting and revising flags on taxiways and apron.

3.Working on food order for coming flight periods .

4.Excavating ice core storage cave, now 9 m deep.

5.Cleaning up in camp in preparation of possible blizzard tomorrow.

6.Un-packing in CFA laboratory.

7.Making a pulley system for the lid of the main snow melter..

8.Troubleshooting malfunction on Pistenbully. Not solved yet.

9.Film night. Today’s show: Borehole video on the travel of 177 m into the abyss of the bore hole.

Ad.1: The borehole video offers a fantastic glance into the top 100 m of the drill fluid. Fuzzy clumps of ice chips sit on the wall of the hole like growing mushrooms. At intervals, ice cobwebs cover the hole, but the camera can easily penetrate them. Also at intervals the fluid is milky with chips other wise it is clear.

Weather: Significant change today. At Noon temperatures increased to -13 C. Mostly overcast, - 30 C to -13 C, 9-13 knots from SE. Visibility: 2 km decreasing to 500 m due to fog. Several snow showers.

FL, J.P. Steffensen

Picture captions:

Theo and Jeff in the new ice cave. It is now almost complete.

Trevor and Simon with the borehole camera. The camera is the small steel cylinder hanging from the cable.

Monday, 3rd May 2010.

Unexpected visitors..

The morning went as planned but at Noon a Twin Otter suddenly flew over camp. It was the PARCA crew that was scheduled to arrive here on Tuesday. They were coming from Kangerlussuaq to do service on a weather station at Camp Century before landing in Thule. As the weather at Camp Century was bad, they decided to check out NEEM. They landed, and after a two hour stay they flew onwards to Thule taking Joe and Jay with them. They plan to come again tomorrow if weather permits. However the forecast is not so good. The Pistenbully is still not operational. The error is electronic which is frustrating as the thing is full of wires. We are exchanging e-mails with the company.

What we have done today:

1.Receiving Air Greenland Twin Otter.

2.Borehole logging in progress.

3.Working on food order for coming flight periods .

4.Finished mounting two parallel linear motors on tower.

5.Ice storage cave finished.

6.Un-packing in CFA laboratory.

7.Building cooks 12 x 20 weatherport.

8.Troubleshooting malfunction on Pistenbully. Not solved yet.

9.Moving out house.

Ad.1: The Twin Otter arrived 12.15 and departed 14.10. The pilots and the PARCA crew had a snack. The twin Otter got 2 drums of fuel. The PARCA weather station was serviced, and Joe and Jay left camp for Thule together with their drilling equipment.

Ad.2: Borehole logging was interrupted due to a small fault on the depth counter. The drillers are fixing it now, and try again tomorrow.

Ad.3: As weight is an issue this year for transportation of cargo to/from the U.S. we have been requested to limit our food orders. Considerable time has been spent on converting U.S. units: lb, gal., oz., fl. oz, pint, quarts, dz and half dz in the spread sheets of food orders to meaningful units that allows for adding weights. The author wonders why the U.S., a child of the revolutionary movement in Europe, still sticks to the old units of the British Empire.

Weather: Broken thin clouds, -21 C to -11 C, 4-18 knots from S and SE. Visibility: 2 km decreasing to 500 m due to snow showers.

FL, J.P. Steffensen

Picture captions:

Air Greenland Twin Otter at NEEM camp.

Tuesday, 4th May 2010.

A blusterous day.

Today turned out to become really windy. At Noon the mean wind reached 24 knots and wind gusts to 30 knots. The main dome began to vibrate slightly. Snow drift is significant and we will have some snow to remove. Never the less, it was possible to work a little outside as temperatures were very warm: -10 C. The snowblower was in action keeping the entrances to the garages and workshops clear. In the trenches, work progressed unaffected by the weather. Almost needless to say: Todays flights were cancelled.

What we have done today:

1.Mounting the drilling chips melter.

2.Borehole logging completed.

3.Repairing the depth counter.

4.Taking food from sauna to cooks weatherport.

5.Trimming snow roof over physical properties laboratory.

6.Removing snow drifts from inside storage garage.

7.Troubleshooting malfunction on Pistenbully. Some indications of a faulty steering transducer.

Ad.6: The old NGRIP garage, now storage tent is not completely tight. Some large snow drifts were inside.

Weather: Scattered thin clouds, -14 C to -10 C, 10-24 knots from SE and SSE. Visibility: 2 km decreasing to 500 m due to blowing snow.

FL, J.P. Steffensen

Picture captions:

A blizzard situation.

Wednesday, 5th May 2010.

The cold returns.
We have worked on many things today. The skiway was groomed in preparation of next week's flights. We erected two weatherports, and in the trenches Jakob carried out an experiment with a new acoustic device, while others straightened tables and work on the chip melter. As the weather front has passed, the cold is returning rapidly. This afternoon, we witnessed one of natures grand displays: A halo. Most of the afternoon it was visible, and the complex pattern of light in the sky covered the entire sky. We were many frustrated photographers, because none of us could capture the beauty in one image.

What we have done today:

1.Working on the ice chips melter.

2.Test of borehole bottom sonar completed.

3.Aligning logging table.

4.Grooming skiway and part of apron with beam groomer.

5.Trimming snow roof over physical properties laboratory.

6.Repair on Flexmobil.

7.Malfunction on Pistenbully found: a faulty steering transducer.

8.Building 2 units 10 x 15 weatherports.

Ad.2: Jakob performed a test of his acoustic sounder close to the bottom of the hole. A fine echo was received.

Weather: Few thin clouds, -29 C to -14 C, 3-15 knots from SE and SSW. Visibility: unrestricted decreasing to 1 km due to ice fog. Beautiful display of halo phenomenon for several hours this afternoon.
FL, J.P. Steffensen

Picture captions:

A representation of the halo.

Thursday, 6th May 2010.

Is this Greenland or Antarctica?

As it is cold now and this cold has arrived suddenly after a few days of warm temperatures, we observe a lot of condensation in the air. As the condensation occurs in clean and very cold air, diamond dust is formed. Diamond dust has the name because the air seems to glitter with tiny sparks of light, as if indeed diamond dust has been spread in air. When the concentration is high we observe halos, as described yesterday. Diamond dust consists of very small ice crystals, less than 1 mm in size, and the crystals are not snowflakes. It is a very common phenomenon in Antarctica; but in Greenland it is less frequent. Sepp managed to collect some of these crystals for study, and we are looking forward to see some pictures of them soon. Jeff has erected a tent at the firn air borehole from last year, 2 km from camp, and he has spent all day measuring temperatures in the hole.

What we have done today:

1.Making filter runs in borehole down to 600 m.

2.Temperature logging in 2009 firn air bore hole in progress.

3.Making tables and shelves for new warm laboratory.

4.Grooming skiway, taxi ways and apron with beam groomer.

5.Moving fuel to camp from tanks..

6.Physical properties studies of diamond dust.

Ad.1: In these initial runs with the filter, 11 kg of chips were recovered..

Weather: Few thin clouds, -31 C to -21 C, 4-12 knots from S and SSE. Visibility: 1-2 km due to ice fog all day.

FL, J.P. Steffensen

Picture captions:

It feels cold to work outside in these temperatures.

Friday, 7th May 2010.

NEEM air port and gas station.

Our colleagues from CIRES Colorado are maintaining their network of automatic weather stations on the Greenland Ice Sheet. They use a Twin Otter aircraft. Our colleagues from DRI in Arizona use this opportunity to follow along and drill some shallow ice cores at the sites. Before the season it was agreed that they would use NEEM as a hub for the work in the area. They should have completed this work a week ago. However due to technical problems with the plane, they were delayed several days. Then they came Monday and picked up Joe and Jay so they could start from Thule. But bad weather came and they were delayed 4 more days, and the landing permit of the plane in Thule expired. This morning they were desperate and luckily the weather has been good. They have visited NEEM camp twice today. They have drilled an ice core at Humbolt, and at time of writing they have visited Peterman and are presently at Camp Century. They intend to return to NEEM at 0300 Saturday morning, and continue their flight to Summit after refuelling. This has kept some of the NEEM staff on watch all day (and night) as there is a risk for fog. The rest of NEEM camp personnel went about their normal duties and had a good productive day.

What we have done today:

1.The drillers made 5 filter runs today..

2.Made a box to capture the drill fluid aerosol coming from the vacuum cable cleaner.

3.Tables and shelves for the new laboratory almost finished.

4.Grooming skiway zig-zag and lengthwise. Skiway foundation grooming completed.

5.Receiving Twin Otter two times.

6.Laying foundation for the remaining 3 weatherports..

7.The setting up of the CFA laboratory has progressed to the point where water based chemistry is introduced.

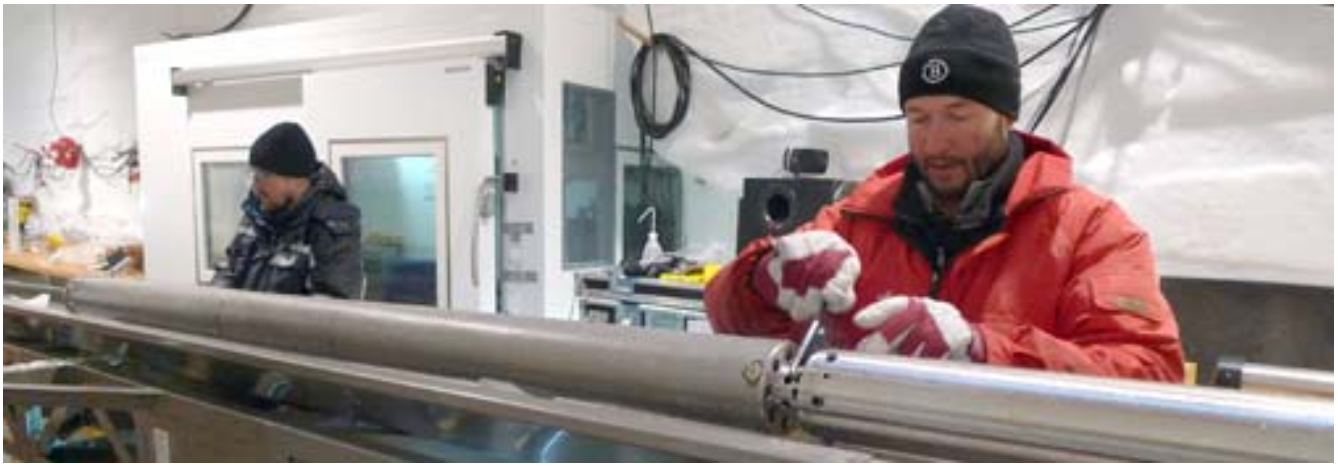
8.Arranging food in the cook storage tent.

Ad.1: Drillers did the last filter run all the way to the bottom of the hole, 1756m down. They retrieved a full filter. In total 45 kg of ice chips have been removed from the hole.

Weather: Blue sky all day, -32 C to -22 C, 5-12 knots from S and SSE. Visibility: unrestricted.

FL, J.P. Steffensen

Picture captions:



Trevor and Simon at the borehole filter in drilling trench.

Saturday, 8th May 2010.

A beautiful day on the ice sheet.

Finally, the PARCA crew made it. This morning they flew South. As temperatures began to rise through the day, it became very pleasant to erect two weatherports and fininsh skeway grooming. As it was Saturday, several people played in the afternoon with a ski kite. It was fun to watch the kite skiers zoom along on the snow. A good many of camp staff went to the sauna and subsequent snow bath and shower. Trevor and Lou prepared an American dinner. We had hamburgers and pie for desert.

What we have done today:

1.The drillers made 3 filter runs today..

2.Borehole temperature measurements in firn air borehole.

3.Drilling of cooling holes in new ice cave.

4.Erecting two weatherports: 10 x10 and 12 x 20.

5.Received the Twin Otter early in the morning.

6.Finished grooming skiway. Skiway evaluation.

7. Setup of 1st stage of CFA completed.

8.Saturday evening. Many visits to the opened sauna.

Ad.1: The drillers continue to get chips out of the hole. Now a total of 75 kg has been retrieved.

Ad.3: Drilling went to two meters, as it turned out, that the drill extensions did not fit. Theo spent the rest of the day modifying the joints so that they all could fit.

Ad 5: After a long nights work, the Twin Otter came back to NEEM at 6.03. The flight crew and scientists had breakfast and something warm to drink, and the Twin Otter got fuel. At 8.30 they flew off to NGRIP to take down the weather station there, and since there was fog at Summit, they flew back to Kangerlussuaq. They arrived in Kangerlussuaq late

in the afternoon. We have been happy to assist the PARCA crew as much as we could in this much delayed program. From NEEM camp, the Twin Otter received a total of 16 drums of fuel.

Weather: Blue sky all day, -32 C to -14 C, 10 knots from S and SSE. Visibility: unrestricted. Temperatures increasing again.

FL, J.P. Steffensen

Picture captions:

Construction of weatherports. We have to remember to put the bunk beds in before the tent is covered. The door is too small.

Sunday, 9th May 2010.

We prepare for the flights next week.

Next week we have planned for two flights. Camp is basically ready to receive the big influx of camp personnel where population will grow from 14 to 37. There are still a couple of details that we need to attend to. Sverrir and Lou have been working on making retro cargo ready. J.P. has tried to remove bumps from the skiway, and Ali, Sepp, Hans Christian and Jakob have erected the last weatherport. In the drill trench, Simon has made the second electronics section for the drill ready. We now have a spare. Steff and Trevor continue to filter ice chips from the borehole, and Theo drills cooling holes. Matthias is ready to receive the influx of new instruments and personnel in the CFA laboratory, and Jeff has measured temperatures in the borehole from last year. Finally there is Sarah, and she continues to cook lovely meals for all of us.

What we have done today:

1.The drillers made 4 filter runs today..

2.Borehole temperature measurements in firn air borehole.

3.Drilling of cooling holes in new ice cave, at 10 m length, an adaptor broke. It is being fixed.

4.Erecting last weatherport: 12 x 20. All weatherports are now up.

5.Grooming skiway and apron to remove rollers.

6. Making retro cargo ready for flights next week.

7. Making drill electonics section no.2 ready.

Ad.1: The drillers continue to get chips out of the hole. Now a total of 97 kg has been retrieved.

Weather: Broken high clouds to blue sky, -20 C to -10 C, 4-10 knots from S. Visibility: unrestricted.
In the evening fog with visibility down to 200 m.

FL, J.P. Steffensen

Picture captions:

A freshly groomed skiway

Monday, 10th May 2010.

The day for the arrival of a lot of people is approaching.

There is a special atmosphere in camp today. Everybody is anticipating the arrival of 23 people tomorrow. It is going to be good, no doubt; but the kind of peaceful intimacy shared among the 14 strong put-in crew, is going to end. We are ready to receive the new members of camp crew. Everything is ready, but we fell a little as if we have the silence before the storm. Very soon this camp will explode with activity, as camp life goes into a new mode. All science equipment will be set up, and drilling and processing will commence in a week. And then it has been really warm today, -5 C, our newcomers might as well arrive here in their normal clothes instead of polar equipment.

What we have done today:

1.The drillers made 7 filter runs today.

2.Borehole temperature measurements in firn air borehole.

3.Drilling of cooling holes in new ice cave.

4.Preparing for the arrival of many new NEEMers.

5. Making retro cargo ready for flights.

6.CFA laboratory setup.

Ad.1: The drillers continue to get chips out of the hole. Now a total of 172 kg has been retrieved.

Ad.4: With 37 people in camp, we need some more structure to camp life. Duty rosters have been made, as well as lists of berthing, instructions and descriptions of duties.

Weather: Overcast, in the evening fog, later clearing, -18 C to - 5 C, calm-12 knots from S and SSE. Visibility: mostly unrestricted, when fog 200 m. Very warm and sticky weather.

FL, J.P. Steffensen

Picture captions:

Matthias at work in the CFA laboratory.

Theo cutting at the entrance to the new cave to make room for a door.

Tuesday, 11th May 2010.

Flight to NEEM cancelled today.

This morning, weather was really doubtful. A low overcast removed all contrast, and we had periods of fog. At 1100, we launched a balloon to measure the height of the cloud base, it was 1000 feet. This is too low for air operations, so we cancelled the flight. It turned out to be a very good decision, as weather turned from doubtful to really bad. All afternoon and evening camp has been pelted with snow and blowing snow. After 1700 we have had white-out. White-out occurs when there is no contrast what so ever due to overcast, snow and blowing snow. All around it is just the same diffuse white color. Luckily we have some structures to navigate by, else you would be lost. Snowmobile driving is outright dangerous, as you could drive into a pit or hit a snowdrift without seeing it.

What we have done today:

1.The drillers made 6 filter runs today.

2.Borehole temperature measurements in firn air borehole completed.

3.Blowers installed in cooling holes in new ice cave. They are operational.

4.Work on stabilising the drill tower.

5. Excavating the drilling fluid from last year. It has been pulled to the surface and in place at the drill trench

6.Unmounting the old line scanner. A new will arrive soon.

7. Mounting logging device on main generator to monitor generator load and camp energy consumption.

8. Levelling area for new laboratory.

9. Made box for drying drillers boots.

Ad.1: The drillers continue to get chips out of the hole. Now a total of 214 kg has been retrieved.

Ad.4: The linear motors to tilt the tower are so powerful, that they are able to lift the tower off its foundation. Drillers will install end stop switches to avoid problems.

Weather: Overcast, -12 C to - 7 C, 12 - 22 knots from SSE turning to WSW and picking up. Visibility: In the morning periods of unrestricted and dense fog, after 1300 snow, becoming snowy and windy, after 1700 white-out.

FL, J.P. Steffensen

Picture captions:

A lonely being in blowing snow.

Wednesday, 12th May 2010.

Flight to NEEM cancelled again today; but we've got visitors anyway.

The bad weather from yesterday did not really leave us today. Although the wind had abated, a cloud cover hung over the ice sheet and it snowed all day. We had to cancel the flight again. According to weather forecast we should have good chances tomorrow for a plane. We cancelled the flight at Noon, and one hour later the U.S. Greenland traverse (GRIT) arrived from Thule. They have been driving for 2 weeks. Half an hour later, two dogsled teams arrived to NEEM. We now have a tractor train and two dogsleds and 18 dogs in camp. It is a pleasant visit, and our guests really enjoyed to sit in a building, having a shower and spending time in our sauna.

What we have done today:

1.The drillers made 2 filter runs today. Last run to the bottom. The hole is now clean.

2.Received GRIT traverse team and dogsled team.

3.New out house erected..

4.Work on stabilising the drill tower.

5. Grooming skiway after last nights wind and snow. We got 6 cm of new snow.

6. Levelling area for new laboratory.

7. A complete changing room for drillers outer clothes is ready in the white weatherport.

Ad.1: The drillers are now finished getting chips out of the hole. A total of 226 kg has been retrieved.

Ad.4: Several new fittings have been made to securely bolt the tower base to the timbers of the floor.

Weather: Overcast, -14 C to - 11 C, 5 - 15 knots from SSW turning to WNW. Visibility: 1-2 miles all day. Light snow all day.

FL, J.P. Steffensen

Picture captions:

Our visitors: A tractor train and dogsleds.

Thursday, 13th May 2010.

Plane is cancelled again !

The world is white. The snow is white. The air is white. The Sun is nowhere to be seen and out there our skiway markers are little black spots making a dotted line in the middle of the white. The line tells us what horizontal is and where the horizon is supposed to be. Now we have cancelled flights for three days, and we don't like the waiting one bit, but that's how it is: Polar work is done at the mercy of the elements. However, in camp we use the structures to navigate by, and people go about doing their jobs. We are not worried. We are safe. The only concern is that the next supply of coffee is on the plane, and our supply is getting a bit thin. At 2100 a blizzard came. It came in 5 minutes, and now everything is blurred out by blowing snow.

What we have done today:

1.Maintenance on belts of the Flexmobile.

2.Work on stabilising the drill tower finished. New bolts hold the tower firm.

3. Levelling tables in the science trench.

4. Setting up in the CFA laboratory.

5. Made door for new ice storage cave.

Weather: Overcast, -17 C to - 14 C, 5 - 15 knots from N turning to NE. Visibility: 1-2 miles. Light snow. At 2100 a sudden (within 5 minutes) change to: -21 C, 25 knot from SW and blowing snow.

FL, J.P. Steffensen

Picture captions:

Three days waiting for flights does something to people: It looks like a European airport under the Icelandic ash cloud.

Friday, 14th May 2010.

Finally we succeeded in receiving a plane!

Today it happened. Weather cleared up, and we were able to call in a plane. However, the snow from the past few days, and the snap blizzard yesterday had wrecked havoc on our skiway. It was sunk..In the morning, we did everything we could to groom the skiway into shape, but you can only groom so much in a few hours, and there was no time to let the skiway rest and harden. It was difficult for the plane to get airborne, and in the end it had to use rockets for the final push into the air. Now we are back to square one, as the air crew could not upgrade the skiway for higher loads – and we need those higher loads. Tomorrow we will work on the skiway again. On a more happy note, all our new camp members finally made it to NEEM. All of a sudden NEEM is crowding with a lot of people, bringing with them new energy to camp. We now enter the process of setting up equipment in the science trench, so we will be able to begin processing next week. The drillers are mounting the drill, and quite soon they will drill the first core of the season.

What we have done today:

1.Receiving Skier 53 (94).24 NEEM'ers arrived and 3 left. We are now 34 in camp.

2.Begin mounting of the drill..

3. Unpacking arriving cargo.

4.Repairing broken Pistenbully. New steering transducer arrived with the plane.

5.Several groups: Drilling, CFA, gas laboratory and ice core processing had group meetings to organise work of the coming days.

Weather: blue sky, -23 C to - 18 C, beginning at 20 knots going to 5 knots from SW turning to E. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Everybody applauded as Skier 94, after several tries, finally managed to get airborne with rockets. You can see the flames just below the star symbol.

Saturday, 15th May 2010.

Saturday in a crowded camp.

All the new people are settling in. Many small tents dot the ground in our tent village, as many prefer the privacy of a tent and the experience of sleeping on the snow. For Saturday night, the dining room was extra crowded, as we had 4 people from the GRIT traverse and one from the dogsled project as guests. Everybody had a fine evening, and a lot of people joined in the mid-night dance, featuring the Danish group “Sweet hearts”. Weather is back to normal temperatures and there is not much wind. We had two vehicles in action on the Skiway most of the day to repair the ravages of the blizzard on Thursday.

What we have done today:
1.Drilled the first core of the season.
2.Unpacking science equipment.
3.Constructing the warm laboratory for on-line gas measurements.
4.Installed funnel for new laboratory.
5.Settting up, camp servers, wire-less LAN and NEEM e-mail system.
6.Grooming the entire skiway, taxi way and apron with beam groomer. The whole skiway was then treated with dozerblade and tiller.
7. Nice Saturday night dinner. Christoffer, Anne, Maibritt and Peter were cooks.

Ad.1: Drillers made one run where the drilled a nice 1.11 m long core. The run was not completed due to anti-torque failure. This is normal, and the anti-torque was subsequently adjusted. After the run, the tower needed some adjustment.

Weather: blue sky, -26 C to - 18 C, 5 knots from SSE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

The first ice core of the season. A one meter section, on the logging table..

Sunday, 16th May 2010.

Sunny Sunday.

Things progress at a tremendous rate, however, we cannot begin core processing before we have all equipment, and the remaining equipment is on the next plane, which is now scheduled for Tuesday. The bad weather last week did not only hit us, but also other ice sheet sites, so the 109th are behind schedule. But today the weather was fine, and people enjoyed being on the ice sheet. The GRIT traverse left today at Noon, we all said good-bye to the four participants. They now head for Summit Camp. It was indeed a pleasure to have them visit, and we wish them a safe journey.

What we have done today:

1.Drilled. One run yielding a 3.45 m core.
2.Unpacking science equipment.
3.The new warm laboratory is now fully installed with tables and shelves.
4.Working on insulating the ventilation funnels of CFA and gas laboratories.
5.Fixing small bugs in the drillers program..
6.Logging ice cores and discussing procedures.
7.Cleaning up in the cargo line.
8. Japanese pit-study in progress.
9.Setting up water-vapour sampling site.

Ad.1: Drillers made one run where they drilled a nice 3.45 m long core. The run was normal, and the Drillers, Trevor and Steff, had drillers classes. An extra support for the tower has been made.

Ad 6: We have agreed to process the core this year in 1.10 m sections. Thus the loggers will make a cut every 1.10 m. In each trough in the core buffer, there is room for 2 x 1.10 m. We can thus use the core buffer to full capacity.

Weather: blue sky, -28 C to - 18 C, 5-9 knots from SE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Alli and Theo mounting shelves in the new gas laboratory.

Monday, 17th May 2010.

While we wait for the next plane tomorrow.

Today was the first day of real drilling. While still in the education mode, the new drillers are learning fast. Now 15 m core is waiting in the buffer. Processors are unpacking equipment and paperwork and are eager to begin. However, we need the last pieces of equipment which are scheduled on the plane tomorrow. This equipment can be in place in one day, so we expect processing to begin on Wednesday or Thursday. On the plane tomorrow is also fresh vegetables and other food stuff. We look forward to it. We cross our fingers, that weather holds, and that the air crew finds the skiway in good order.

What we have done today:

1.Drilling and logging.
2.Drilling school.
3.Setting up equipment in new warm laboratory.
4.Fixing problem with drillers centrifuge and drillers electronics.
5.Seismic station maintained and operational. It has been levelled and centered.
6.Cleaning up in the cargo line, and removing snow drifts from camp.
7 Japanese pit-study continues.
8.Setting up water-vapour sampling site.
9. Setting up CFA laboratory.

Ad.1: Drillers report:
Production in the drill trench is ready. Two shifts have been formed consisting of Trevor, Martin, and Vasileios in the mornings and Romain, Adrian, and Jack in the evenings with the exceptionally strong support of Jakob and Steff handling the big issues as they arise. After 24 filter runs picking up 226 kg of excess chips from the 585 runs from last season we are drilling in a clean hole. Most of the chips were picked up in the upper 800 meters of the borehole meaning the chips either float or remain suspended in the liquid, leaving the bottom relatively clean while drilling. In 6 drilling runs beginning Saturday afternoon we are picking up and average of 21.7 kg of chips per 3.5 meters of ice drilled. So far drilling has been smooth. The reasons for two short runs were easily solved. One was due to an anti-torque rotation as we conservatively set the blades a little too weak for the first run. The second due to an electronics failure in the surface modem, that has been repaired. The drill configuration has been set to exactly match the configuration that we successfully ended with last year.
Today, 4 runs for 11.00 meters. Driller's cable depth 1757.8.
Weather: blue sky, -24 C to - 14 C, 8 knots from SE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Jakob has taken this beautiful shot of our skiway.

Tuesday, 18th May 2010.

A successful flight today.

Our second flight this flight period arrived today. The plane brought all the rest of the equipment and food! Tonight we were treated with fresh vegetables for dinner, a welcome change from frozen peas, beans, carrots and broccoli. The equipment in camp is now complete, and ice core processing line is soon ready to cut up the ice core in individual samples and perform measurements. One third of the core cross section, all the way along the core will be packed and sent to Copenhagen as archive piece. The rest will be consumed as samples for more than 10 different laboratories in Europe, North America and Asia. The drillers are running on a two shift operation, and the processors soon have to move on to keep up with the drillers.

What we have done today:

1.Drilling and logging. Fresh cores contain cloudy bands, most likely from Stadial 9, some 39,000 years ago.

2.Setting up equipment in warm laboratories.

3.Receiving Skier 21 (96). We've got equipment and food, and we sent out ice core (from last year) and 52 empty drums.

4.Cleaning up and removing rollers on the skiway with tiller and dozer blade.

5.Setting up ECM. All equipment now ready.

6 Japanese pit-study completed.

7.Setting up water-vapour sampling site.

8. Unpacking arriving cargo.

Ad.1: Drillers report:
Today good drilling was gradually replaced by excellent drilling with six runs producing 19.45 meters of core. The first day of full shifts went smoothly, driller teams are getting to know each other and gradually run times and efficiency are improving. Surface modem performed fine after the repair yesterday evening. Improvements are being made to the software as needed by Christian. Occasional slow trip times down the borehole, possibly due to low friction at the top valve allowing the valve to close itself on the way down, seemed to be eliminated with Steff replacing the seal at the top valve.
Drilled 19.45 meters. Driller's depth 1777.18 meters.
Weather: blue sky, some occasional thin high clouds, -24 C to - 14 C, 5-10 knots from SE and E. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Sarah, Anne and Maibritt are busy in the kitchen with all the new food.

Wednesday, 19th May 2010.

All hands on deck.

All people in camp are now working in their different positions/jobs. In two warm laboratories, people are crowding to setup all their equipment, in the science trench all processors were today going through all aspects of core processing, and he first cores were processed. The drillers work in shifts, and the two problem solvers, Steff and Jakob, fixed things. Things in camp are beginning to settle into a routine, and there is a constant flow of people in and out of the main dome. Lou and Sverrir have been helping Mille from the dog sled expedition to pack down her gear. It is planned that Mille and her dogs will be picked up from NEEM on Friday.

What we have done today:

1.Drilling and logging. We have past the clear ice from Interstadial 9, and gone through Stadial 10. Some cloudy bands show wavy patterns (micro folds).

2.Setting up equipment in warm laboratories.

3.Packing down gear from the dog sled expedition.

4.Processing school and ice core processing.

5.Logging temperatures in drill trench and science trench

6.Setting up water-vapour sampling site.

7. Setup extra table in science trench.

Ad.1: Drillers report:
Six runs today produced 18.50 meters. Most runs suffered high current (>11 A) after about 2 meters of drilling. An attempt to slightly increase the cutting pitch by about 0.5 mm also resulted in drilling at too high of a current. In the final run damage was observed in the pump. Steff will repair and replace in the morning. Also we suspected that the hollow shaft was beginning to clog so a new procedure will be introduced to completely melt and dry the entire hollow shaft overnight at the conclusion of each evening shift.
Driller's depth 1795.44 meters.
Ad.4: Processed 3 bags, last bag 3197, 1758.35 m, and cut SC piece from bag 2331 to bag 2355 for CFA measurements.

Ad.5: Temperature in: Drill trench -20 C, science trench -23 C, in new cave -26 C.

Weather: blue sky or high thin clouds, -18 C to - 11 C, 1-5 knots from SE. Visibility: Unrestricted. With almost no wind and sunshine it was almost t-shirt weather.

FL, J.P. Steffensen

Picture captions:

Ernesto and Thomas setting up equipment in the new gas laboratory.

Thursday, 20th May 2010.

Will Mille be picked up tomorrow?

In the last week we have had visitors. Mille, who is Danish but lives in the U.S., will hopefully be picked up tomorrow. The three other members of the dogsled expedition left NEEM a week ago, and tomorrow Mille and her 22 dogs and two sleds will be picked up. We hope that weather will behave so they can get home. It takes quite some logistical planning to arrange transport of live animals. Life in camp continues, and quite a few are learning many new things.

What we have done today:

1.Drilling and logging.

2.Setting up equipment in warm laboratories.

3.Making load plans for the dog sled expedition.

4.Processing ice cores.

5.Repairing broken snow blower.

6.Troubleshooting the water vapour isotope machine at sampling site.

7. Cut snow from roof in connecting tunnel.

8. Installing LAN cable from main dome to science trench.

9.Routine power down of camp for 20 min. around 11.00 for oil change and service.

Ad.1: Drillers report:
A new pump was installed today. The pump body was deformed, likely in part due to damage from misalignment when inserting the hollow shaft into the outer tubes. This now retired pump served us well over 1700 meters of drilling. While the new pump was being mounted on the clean hollow shaft we did three filter runs in the borehole collecting 22 kg of chips. It appears we are losing about 0.5 to 1 kg of chips per 3.5 meters of ice drilled. One test run with pressure tube 2 failed due to borehole electronic failure. One run with the new pump yielded 2.56 meters of core today.
Driller's Depth 1797.92 meters. Logging Depth 1811.2 meters
Ad.5: A broken safety pin was replaced.
Ad.4: Processed 24 bags, last bag 3221, 1771.55 m.
Weather: blue sky or high thin clouds in the morning, later overcast and snow, -22 C to - 13 C, 1-14 knots from E turning to WSW. Visibility: In the morning unrestricted, later down to ½ mile due to snow.

FL, J.P. Steffensen

Picture captions:

Lou and Sverrir help Mille to disassemble a dog sled for air transportation.

Friday, 21st May 2010.

NEEM air port closed due to Icelandic ash cloud.

This is the most incredible tale. We expected a plane this morning. Weather was fine, so we called in a plane. Then they called from Kangerlussuaq and told us that our airport was closed due to Icelandic ash. NEEM was today the only spot in Greenland where the ash was! We include the ash cloud map from today in our pictures. Somehow nature has demonstrated a strange sense of humour. The ash cloud was only present on top of NEEM in a 100 km radius. Luckily, weather was fine so our day passed in a growing routine. We now try to get a plane in tomorrow morning.

What we have done today:

1.Drilling and logging.

2.Setting up equipment in warm laboratories.

3.Processing ice cores.

4.Removing snow drifts in camp and grooming main street.

5.Canadian sampling for pollen in the ice chips has begun.

6. Mounted plastic curtains in the connecting tunnel.

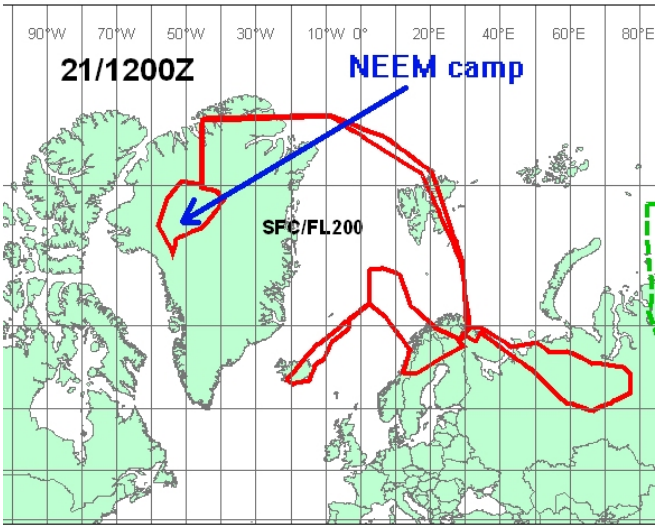
7. Installing LAN cable from drillers cabin to drillers workshop.

Ad.1: Drillers report:
We drilled 19.12 meters in six runs on Friday. We have tried various configurations of boosters positions and centering rings on the hollow shaft to improve chips transportation. Two full runs with a full diameter one turn booster just below the center junction with no central shaft centering ring showed the most promise. Pressure tube "2" is being repaired.
Driller's depth 1817 meters. Logger's depth 1829 meters
Ad.3: Processed 32 bags, last bag 3253, 1789.15 m.
Weather: blue sky or high thin clouds, -23 C to - 13 C, 5-17 knots from SSE and S Visibility: In the morning some fog, later unrestricted.

FL, J.P. Steffensen

Picture captions:

The dogs had to wait another day, so Trevor kept them company by baying at the Moon with them.



Map showing the extent of the ash cloud from Eyjafjallajökull. We couldn't believe our bad luck.

Saturday, 22nd May 2010.

Finally, the dog sled expedition was picked up.

Today, mille and her dogs were picked up. It was a close call, as weather was not really for flying. The pilots found a gap in the clouds and landed at Noon. The plane shut down the engines, so that we could collect the dogs and load them into their kennels onboard the plane with no stress. Camp personnel were thanked for their help and support to Mille and her dogs during their stay in NEEM camp. It is Saturday, and the Swiss were responsible for dinner. Matthias, Jakob, Daiana, Adrian and Theo made a lovely dinner. It became a nice evening with conversation, music and dancing.

What we have done today:

1.Drilling and logging.

2.Setting up equipment in warm laboratories.

3.Processing ice cores.

4.Receiving Skier 61 (90). Plane picked up dog sled expedition.

5.Joe McConnell sampled in pit..

6.Saturday night. Our Swiss colleagues have been cooking. .

7. First CFA run successful. The group measured all chemical components. Now they need to hook the melt line up to the gas laboratory

Ad.1: Drillers report:
Three runs Saturday produced 6.48 meters. The first short run was due to ice under the cutter shoes and the next two runs encountered chip transport difficulties and high current after about two meters. Core breaks range between 900 and 1600 kg. Cutting pitch is on the order of 2 mm.
Driller's depth 1823.44 meters. Logging depth 1836.95 meters
Ad.3: Processed 20 bags, last bag 3273, 1800.15 m.
Weather: Overcast all day. -16 C to - 6 C, 5-18 knots from S and SSW. Snow showers most of the day. Visibility: between 0.5 mile to 5 miles due to snow.

FL, J.P. Steffensen

Picture captions:

From the distance, NEEM camp looks like a small village on the ice sheet, and the main dome looks like a cartoon bomb from Bug Bunny.

There is still a lot of snow to be removed from around the tents

Sunday, 23rd May 2010.

Gone fishing.

Today is one of those days where many things go wrong. In the morning, the drillers changed cutters, and in the first run they lost the core barrel on the way down. It had become unlocked. While the drill is designed to be able to disengage the core barrel at the bottom in case of a stuck drill, it should not do it by itself. Drillers then had to mount the special core barrel retrieval tool and fish the core barrel back up. On the surface, several adjustments were made, and the drill made ready for a new run. Events repeated themselves, and the core barrel wound up on the bottom once more. During the evening shift, the core barrel was back on the surface. Drillers have been analyzing the situation, and the results can been seen in drillers report. And I have an excuse to make: I failed to mention Simon as a co-cook for Saturday night dinner, sorry Simon.

What we have done today:

1.Drilling and logging.

2.Setting up equipment in warm laboratories. Working on connecting the two warm laboratories with melt water flow lines.

3.Processing ice cores.

4.Repairing snow blower. A safety pin and a belt has been replaced.

5. Carpentry work for warm laboratories.

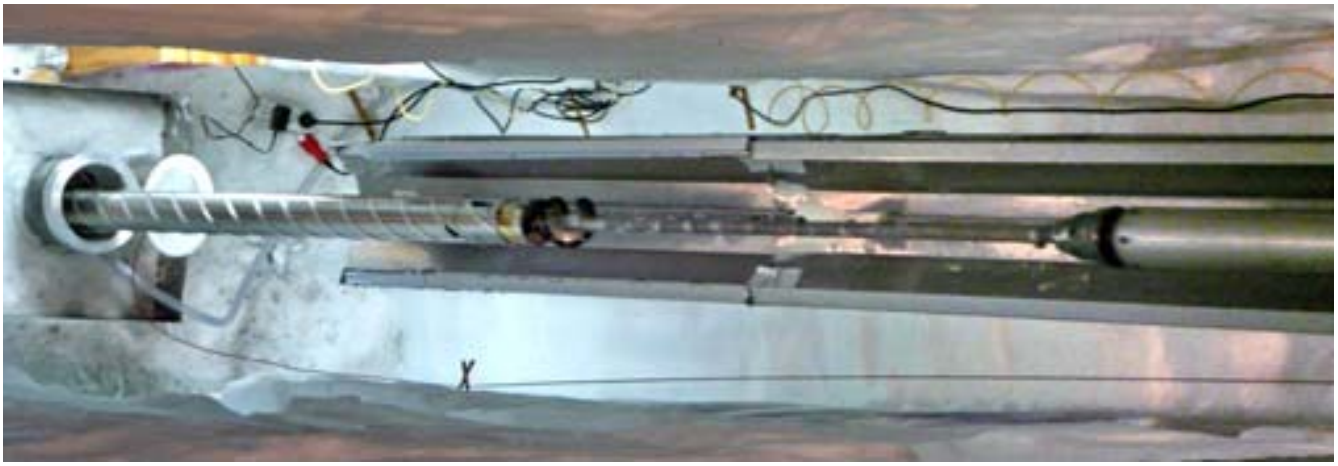
Ad.1: Drillers report:
We strongly suspect, that the new cutters, which are 0.5 mm larger than the previous set, touch the sides of the hole during decent. This creates a torque that may unlock the core barrel. As the new cutters are made for 132 mm diameter hole, the hole is slightly too narrow. We therefore consider to enlarge the diameter of the hole below 1000 m depth.

Driller's depth 1823.44 meters. Logging depth 1836.95 meters
Ad.3: Processed 20 bags, last bag 3293, 1811.15 m. ECM determination of onset of IS 11 is 1810 m.
Weather: Fine all day. -10 C to - 5 C, 10 knots from S. Visibility: Unrestricted. Much too warm for the season.

FL, J.P. Steffensen

Picture captions:

Activity in drillers cabin. Romain at the controls to the left. Adrian follows closely the events, and Trevor (to the right) checks the books about previous runs.



Note: this picture should be vertical. After a fishing round, drillers were able to grab the core barrel with our lock tool and get it back to the surface. The picture is taken as the core barrel (with the spirals) comes out of the hole (to the left).

Monday, 24th May 2010.

A smart way to move a house.

The two dome tents were sitting 1.5 m below surface due to snow accumulation and snow drift. In May 2008, they were erected on 2 m high snow hills! We moved Red Dome 2 today. We lifted the tent away over floor and furniture with the crane. Then furniture was removed, followed by removal of the plywood floor. The hole was backfilled to present surface, the floor was re-laid, the furniture put back and finally the tent was lowered back on top. In the drill

trench, drillers are enlarging the diameter of the hole in the deep part. The diameter is increased by 0.5 mm. Drillers believe that the narrow hole has created a slight torque on the core barrel, causing it to unlock. CFA people are happy today, it appears that they are about to enter production mode.

What we have done today:

1.Drilling and logging.

2.Setting up equipment in warm laboratories. Working on connecting the two warm laboratories with melt water flow lines.

3.Processing ice cores.

4.Moving Red Dome 2 to surface.

5 Mounting curtains in front of core buffer.

6.Measuring CFA. Today we measured 9.90 m of the SC piece. All systems online.

Ad.1: Drillers report:
In both cases yesterday, the core barrel released itself after passing 1000 m depth. By analyzing data from our precision survey of the borehole at the start of the season, drillers could see a slight decrease in bore hole diameter below 1000 m. Drillers have therefore spent the day expanding the diameter of the borehole by 0.5 mm to the nominal 132mm diameter. The reaming, as this expansion is called, is obtained by letting the drill go down very slowly, at 3 cm/s, while the drill motor is running. The reaming is expected to end tonight, and tomorrow drillers should be able to resume drilling.
Driller's depth 1823.44 meters. Logging depth 1836.95 meters
Ad.3: Processed 34 bags, last bag 3327, 1829.85 m. Processors have now entered IS 12.
Weather: Fine all day. -14 C to - 6 C, 14 knots from SSE. Visibility: Unrestricted. Much too warm for the season.

FL, J.P. Steffensen

Picture captions:

The moment where the dome tent is being put back over the new floor and furniture.

Tuesday, 25th May 2010.

Doing a lot of good deeds.

The drillers report, that they soon are back on-line. Until then, several processers have participated in a number of little jobs that need to be done anyway. In the CFA laboratory, people are satisfied. In the last 24 hours, the measurements have been running fine. Joe McConnell can now sit in a couch in the main dome and follow his black carbon measurements on-line on his computer. Also, the on-line water isotope measurements are running. We have now completed the move of tents to the surface, and the last set of curtains is being mounted in the science trench.

What we have done today:

1.Reaming and filtering the hole.

2.Running in equipment in gas laboratory.

3.Processing ice cores. Both main core and Joe McConnell's Humbolt core were sampled.

4.Moving Red Dome 1 to surface.

5 Mounting curtains in front of core buffer.

6.Measuring CFA. Today we measured 23.95 m of the SC piece. All systems online. The allocated SC-pieces have been measured, and the team now moves to the CFA pieces in the core storage.

7. Water vapour sampling site now on-line.

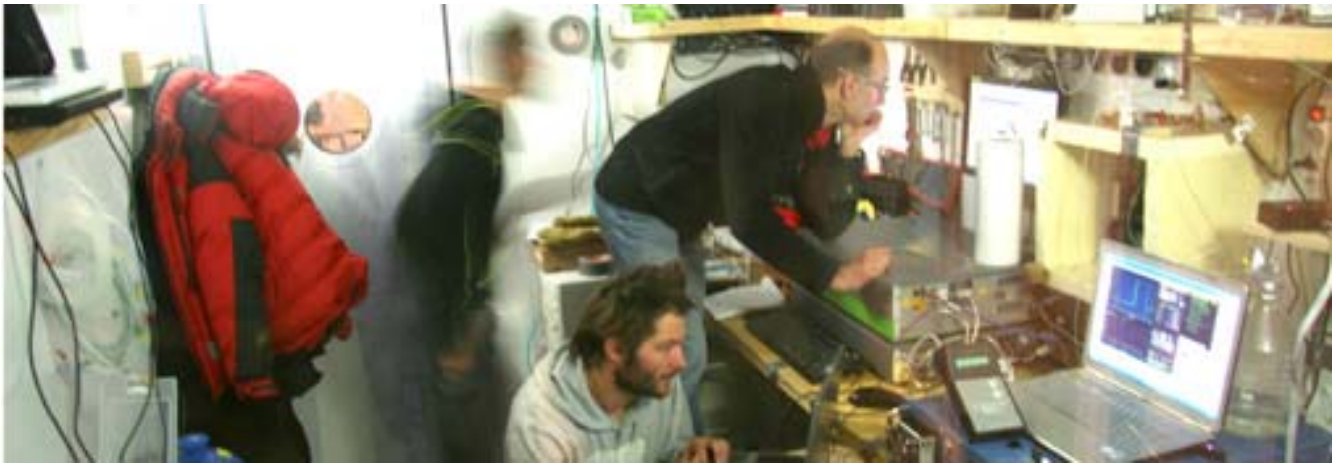
8. The on-line isotope measurements in the new warm laboratory are working.

9. Making plastic sample bag inventory in camp.

Ad.1: Drillers report:
The reaming is now complete. Drillers then mounted the drill and drilled a short core to clean the bottom of the hole and to make sure, there was no damage at the bottom due to the lost core barrels. Then they proceeded to mount electronics section no.2 and the filter for a few filter runs. During these filter runs, electronics section no.2 failed completely, and the drillers now hope, that an intermittent error of section no.2 that has been plaguing section no.2 is now permanent, so it can tracked and be repaired. Drillers will mount section no.1 and continue drilling tomorrow.
Driller's depth 1823.44 meters. Logging depth 1836.95 meters
Ad.3: Processed 10 bags, last bag 3337, 1835.35 m. Cut 5 cm O-18 samples from 15 m Humbolt core.
Ad.5: The curtains already have an effect. Temperatures today in: drill trench -18 C, in tunnel -22 C, in core buffer – 20 C, in science trench -20 C and in ice cave -26 C. Cooling tunnels not yet switched on.
Weather: Overcast, in the evening clearing up . -13 C to - 7 C, 5-15 knots from SSE, later WSW. Visibility: Unrestricted or down to 1 mile during snow showers.

FL, J.P. Steffensen

Picture captions:



Activity in the gas laboratory. Thomas to the right and Remi in the middle are studying the behavior of the instruments. The busy person is Vasileios.

Floor is being laid for the red dome tent. The work was a little difficult due to snow. Christopher is hammering nails, Theo and Peter are carrying plywood, Sverrir knocks the sheets in place and Lou is nailing them.

Wednesday, 26th May 2010.

Now most of the CFA analyses work.

CFA stands for Continuous Flow Analysis. It means that we measure the layers in the ice core as a section of it melts from top to bottom. Today's picture shows the CFA melt head. The bottom end of a square rod of ice core (33mm x 33mm) is seen in the square hole of the white plate. The ice rod is 1,10 m long. In the square hole is a golden hot plate with a drain in the middle and a drain along the edge. As the ice melts, the clean water from the center is analyzed chemically, the concentration of microparticles is measured, and the isotopic composition of the ice is determined. Also during melting, bubbles of trapped atmospheric air from the ancient atmosphere burst and the air is analyzed for green house gases. The water from the drain along the edge is used for analyses, which are insensitive to contamination from handling the core section.

What we have done today:

1.Adjusting drill and drilling.

2.Running in equipment in gas laboratory. DK-methane measurements now work.

3.Processing ice cores.

4.Moving empty boxes to cargo line and removing snow drifts from storage garage.

5.Measuring CFA. Today we measured 22 m. Last bag 2433, 1338.15 m

6. Water vapour sampling. Tests with kite and atmospheric logger.

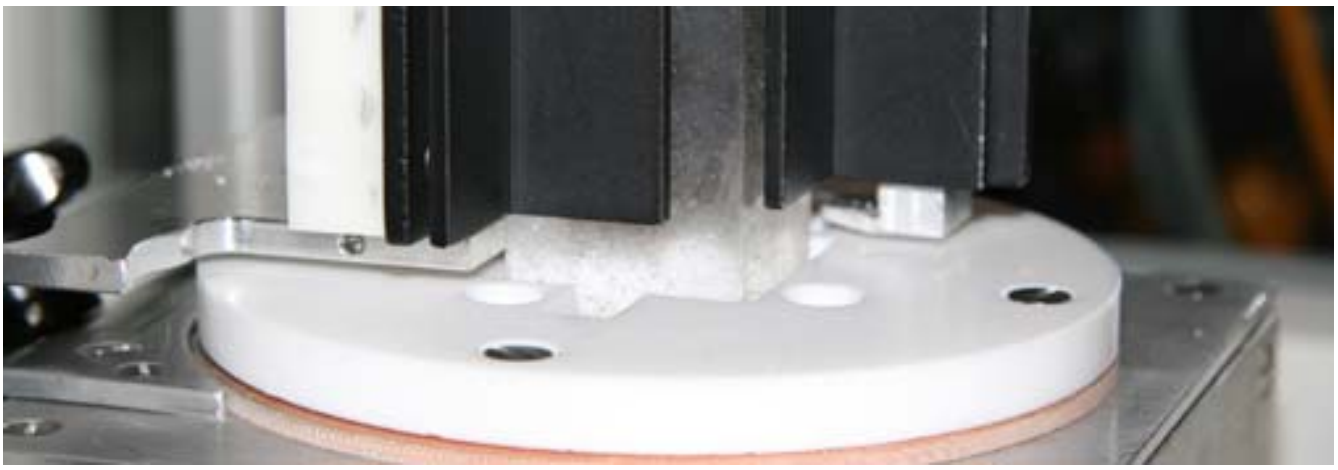
Ad.1: Drillers report:

From 25th may:
Reaming operation finished today to the bottom at 1823.44 meters cable depth. The final push also produced 0.75 meters of ice core. The rest of the day was dedicated to filtering the chips produced. Four filter runs from 1000 to the bottom yielded 37 kg of chips. The drill is mounted and we will make a run first thing in the morning.
Today:
Six completed runs and one in progress at the time of this publication since reaming and filtering have produced more than 12 meters of ice. We are currently seeking a stable mode that produces coarse enough chips for efficient transport and packing in the chip chamber while at the same time allows for drilling below the motor's current limitation. This is apparently a fine balance. The new cutters produced for this year are installed on the drill head and we will tune our operation to accommodate these.

Driller's depth 1836 meters. Logging depth 1836.95 meters
Ad.3: Processed 16 bags, last bag 3353, 1844.15 m.
Weather: Thin overcast and fog/haze all day. -18 C to - 7 C, 12-20 knots from S. Visibility: Between 1 mile and ½ mile.

FL, J.P. Steffensen

Picture captions:



A close-up of the CFA melthead.

In the drillers workshop Steff is making adjustments to the drill.

Thursday, 27th May 2010.

We begin an unpleasant task.

As the two most senior drillers, Jakob and Steff, have to leave next week, the drillers have to perform a number of tests on different settings and combinations of sections of the drill to insure that drillers all summer have enough spare parts and options. We can therefore not expect that drillers will reach full production in the next few days. To give the drillers some peace, we have decided to go ahead and process brittle ice which has been stored since last year. All day, the processors have fought to get familiar with a new material: Ice with a lot of cracks resembling jig-saw puzzles. The cores are intact; but it requires diligence and a good blood circulation in ones fingers to keep all the pieces in place. Alli and Theo joined the processors and during the day, special holders and transport devices were developed, so that the ice may be moved without disintegration of the puzzle. Processors are now developing new routines to increase productivity.

Note on brittle ice:
Ice is compressed snow. It is full of bubbles of air trapped between the original snow crystals. It is this air that provides the global society with valuable and unique information on the content of green house gases in the atmosphere in past climates. The air in the bubbles undergo compression as the ice layers sink, because pressure increases with depth in ice, just as in the ocean. In ice the pressure increases by 9 bar each 100 m depth. In 600 m depth, the pressure is close to 50 bar, and this pressure is so high, that the ice cannot withstand the strain. Spontaneous cracks are formed. We say, the ice is brittle. Ice from even greater depths is even more brittle; but nature is helpful. When pressure reaches 90 bar, the air is literary squeezed out of the bubbles and slides into the ice crystals, where the air molecules form a special chemical compound with the ice called chlathrate-hydrates, or crystal-water. The bubbles gradually disappear and at 1200 m depth, they are gone. The ice core is now crystal clear and strong.
The depth interval between 600m and 1200 m is called the “brittle-zone”.

Chlathrate-hydrates are only stable under pressure, so with time (a few months) bubbles re-appear. The trapped air can also be released by melting which is exploited in our CFA measuring system.

What we have done today:

1.Drilling and logging.

3.Processing ice cores.

4.Removing snow drifts around storage garage..

5.Measuring CFA. All analyses are working. Today we measured 19.8 m. Last bag 2469, 1357.95 m

6. Making special handling tools for processing brittle core.

Ad.1: Drillers report:

Promising day in the drill trench with a production of 15.34 meters. Pressure tube "2" is now in service and produced two full runs to end the evening with good chip recovery. Lower current is used to drill with this motor section with runs proceeding with 7 to 9 amps rather than 10 to 12 (or current limitation) with a similar set up using pressure tube "1". The hollow shaft configuration is set exactly to how we ended last season. In all cases a clean hole and a clean hollow shaft seem to be a requirement for good drilling, as short runs today seemed to be plagued by extra chips in the borehole.

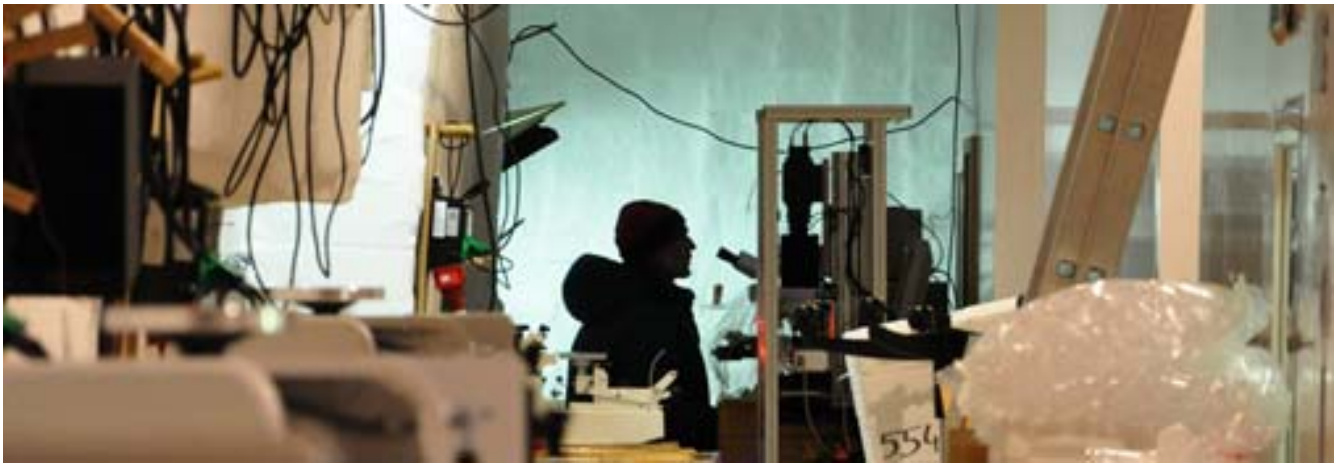
Drillers depth: 1851.34 m

Ad.3: Processed 8 bags, from 2100 to 2107. Brittle zone processing. We have decided to skip the line-scanner in the brittle zone as this device only would pick up the cracks in the ice.
Weather: Thin overcast and fog/haze, in the evening clearing. -20 C to -13 C, 15-18 knots from S, in the evening 4 kt from SSW. Visibility: Between 3 miles and unrestricted.

FL, J.P. Steffensen

Picture captions:

Processors, Maibritt, Marie and Peter, are preparing bags for brittle zone processing.



At the end of the science trench, in a quiet corner, Sepp studies the crystal structure of the ice.

Friday, 28th May 2010.

How to eat an elephant.
The processors in the science trench are learning the art of patience in dealing with the brittle ice. Ever so slowly processing is gaining speed. As Sepp puts it: “They are learning how to eat an elephant: One bite at a time.” Given time and patience, the elephant will eventually be gone. We held some meetings during the day on how to sample and measure the brittle ice. It was decided, that processors will continue cutting the core according to the cutting scheme, except for the O-18 bag samples, which are taken from the outside of the SC-piece. The CFA pieces are stored in our square trays, and the CFA group will later select all pieces long enough for CFA and measure them. It means, that even though the CFA profile will not be continuous, we will get the best coverage possible. We decided also, that all gas pieces from the brittle zone will be packed in one box, while processors will record the length of the longest intact piece in each bag, so that the gas group, at a later stage, can select samples for appropriate analyses

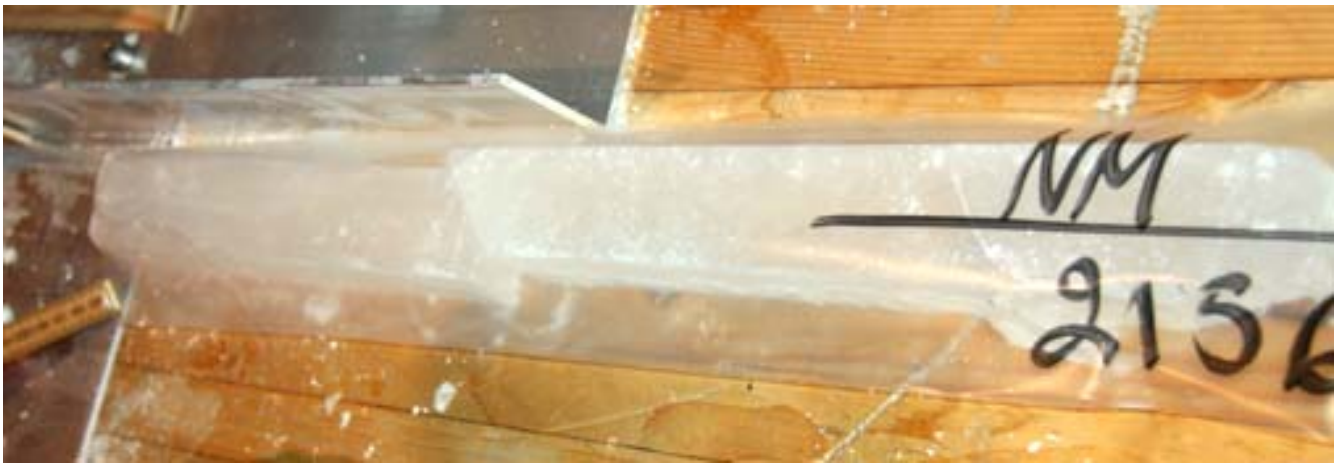
What we have done today:

1.Drilling and logging.
2.Processing brittle ice cores. Processed 24 bags, from 2108 to 2132.
3.Removing snow drifts at workshop garage. Grooming in camp.
4.Measuring CFA. Today we measured 20.9 m. Last bag 2507, 1378.85 m
5.Finished converting Hatz 5kW generator no.3 from 1-phase to 3-phase.

Ad.1: Drillers report:
Two beautiful runs were followed by two runs that appeared to be plagued by extra chips in the borehole. The hallow shaft became plugged during each run after thorough cleaning at the surface each time. It was decided to try once again the configuration that was successful at NGRIP with the hallow shaft closed with a spring loaded valve and the lower valve at the super-banger removed. The first run in this configuration was again plagued by chips, so the filter was sent down the borehole.

Drillers depth: 1862.73 m. Logging depth: 1878.59 m
Weather: Thin overcast and fog/haze, at 22.00 wind was gone and bottom inversion caused temperatures to drop from -18 C to -26 C in 45 minutes. -26 C to -16 C, calm -10 knots from S and SW. Visibility: Between 3 miles and unrestricted.

FL, J.P. Steffensen
Picture captions:



The row of ice pieces from the brittle zone are carefully pushed into a plastic bag.

Saturday, 29th May 2010.

A good Saturday.
Weather today was absolutely gorgeous. Sunshine, very little wind and nice and cold. While morning and Noon passed in usual routine, the afternoon saw quite some traffic in camp: Some were skiing, some walking and some enjoying the Sun. There was a steady flow of people to and from our sauna to fresh up before Saturday night dinner. Dinner tonight was Japanese style with Lead cook Kumiko and assistance from Sato, Jocelyne, Maibritt, Anne and Romain.The theme of dinner talk was that NEEM was on the right track, and that it was very satisfying to see the Worlds most complex CFA system ever brought to the field actually was working.

What we have done today:

1.Drilling and logging.
2.Processing brittle ice cores. Processed 21 bags, from 2133 to 2153.
3.Grooming taxi way and apron with beam groomer.
4.Measuring CFA. Today we measured 19.8 m. Last bag 2543, 1398.65 m
5.Making shelves and cabinets of laboratories.
6.Erecting flag line in main street of camp.
7. Setting up computer info. screen in dining area. Everybody can now follow progress of drilling on-line.

Ad.1: Drillers report:

After one more filter run for good luck two runs produced 6.27 meters for the abbreviated Saturday shifts. Chip recovery is not optimal. The packed pump will need service from Steff on Sunday morning to replace the spring loaded valve doors which came loose on the last run. Cutting pitch is less than 2.0 mm. Pressure Tube “2” is performing nicely with drilling current between 6.5 and 9.5 amps.

Drillers depth: 1868.88 m. Logging depth: 1878.59 m
Weather: Beautiful day and cold too. -28 C to -18 C, 2 -5 knots from SE, S and SW. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Birthe is preparing the next section to be metled in the CFA melter. Note the library of waiting sections in the shelf system in the snow wall.

Sunday, 30th May 2010.

A beautiful Sunday
After the weekend break, drillers always filter the hole to remove ice chips. Jakob used this opportunity to mount his acoustic depth sounder and test it. This instrument is intended for use later in the season to determine the distance between the bottom of the hole and bedrock below. Test results indicate, that the instrument should be able to detect bedrock when drilling is within 50 m from the bed. At the water vapour sampling site, all systems are running, and Hans Christian is following development of weather with keen interest. Present weather with very little wind and bottom inversion is of particular interest.

What we have done today:

1.Filtering hole, and drilling and logging.
2.Experiments with acoustic depth sounder in bore hole.
3.Processing brittle ice cores. Processed 15 bags, from 2154 to 2168.
4.Grooming skiway with beam groomer.
5.Measuring CFA. Today we measured 2.2 m. Last bag 2547, 1400.85 m
6.Removing snowdrifts around workshop garage..

Ad.1: Drillers report:
Jakob and Adrian deploy the echo sounder during the morning and early afternoon while Steff repairs the pump and makes preparations to complete the construction of the 6 m hollow shaft. The filter was put once more down the borehole picked up 7 kg of excess chips in the bottom 100 meters. The first run during dinner time produced 2.3 meters cutting with a pitch of about 1.7mm. For the second run we increased the cutting pitch to try to produce more coarse chips which should be beneficial for efficient chip transport and packing in the chip chamber.

Drillers depth: 1876.07 m. Logging depth: 1887.05 m
Weather: Beautiful day and cold too. -29 C to -18 C, 2 -8 knots from SW, later SE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

With the line of national flags along main street NEEM camp looks beautiful on a sunny Sunday.

Monday, 31st May 2010.

Big brother is watching.

Christian has made an in camp info.system. On electronic bulletin boards in the kitchen and in the lounge we can now

see current weather, some small world news, follow on-line a readout from the drillers cabin on progress of drilling, and new bulletins from camp on flights, power downs, dinner times and other news. In the lounge, drillers off duty loudly comment the progress of drilling of the other crew: “Oh, I think he’s lost it” or “He’s got ice on his shoes. He’s bound to stop and pull back soon”. A little thing like this adds some flavour to camp.

What we have done today:

1.Drilling, filtering hole and logging.

2.Taking down gray welding tent. Moving last fuel tank to apron.

3.Processing brittle ice cores. Processed 33 bags, from 2169 to 2201.

4.Grooming Apron, taxiway and part skiway with tiller.

5.Measuring CFA. Today we measured 20.9 m. Last bag 2585, 1421.75 m

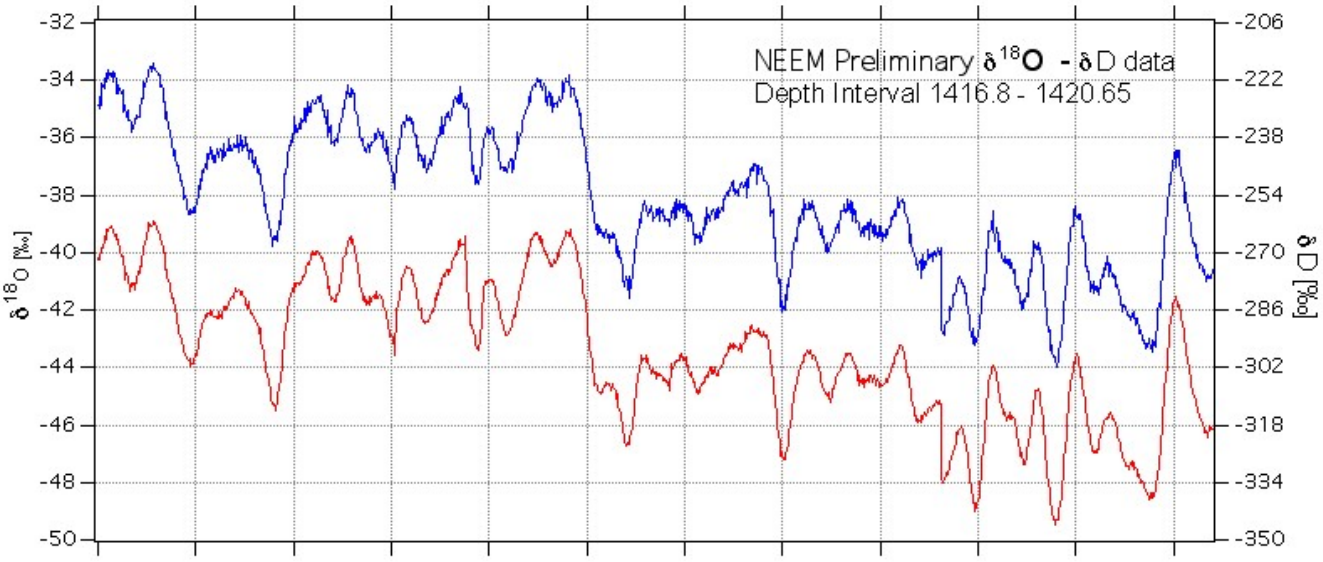
6. Measuring CFA on brittle ice on 6 bags (3.3 m).

Ad.1: Drillers report:
Unstable drilling continues since mounting the new cutters. Long cores can be produced but these runs leave behind too many chips sabotaging the next runs. We mounted Pressure Tube “1” again to test whether we could get more power from it at the 12 A limit. Now as we approach and exceed 12 A the motor RPMs stay near the nominal of 80 rpm. We filtered the borehole before making this change. Nonetheless, three runs with this pressure tube were hampered by high current after 60 to 90 cm of drilling and runs were stopped. Tomorrow we will mount the old cutters and return the drill once again to the configuration used at the end of the 2009 season, with an open hallow shaft, lower valve, and a cutting pitch of about 2.1 – 2.4 mm. Today we produced 9 meters of ice core.
Drillers depth: 1884.50 m. Logging depth: 1900.69 m

Ad.3: During processing today, several errors in ice core logging from last year were discovered. Some bags were cut at either 45 cm or 65 cm lengths, and the bag marks were put at the cuts. However, due to our system of double ice core length measurement using two different independent depth calculations, we have redundancy, and the total ice core depth is not affected. It turned out, that these errors were made on July 20, 2009 where the loggers worked 24 hours to catch up with the drillers.
Ad.5: Today, the CFA team passed into ice from the last glacial period , 11713 years ago. Many parameters showed variations, but several parameters do not show the same degree of variations as at NGRIP or other Greenlandic sites previously studied. Something makes NEEM a bit special, which is scientifically quite fascinating.
Ad.6: There has been some nervousness about the applicability of CFA to the much fractured brittle ice. Last night the CFA group analysed 3 bags of ice with poor quality and three with better quality. In the worst case, some 10 to 15 cm from a 55 cm bag could be measured, in the best case about 45 cm. It was concluded, that CFA is feasible even in brittle ice.
Weather: Blue sky. -28 C to -13 C, 8 knots from SSE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:



A historical plot in ice core science. The curve shows the relative composition of the isotopes Hydrogen and Deuterium (red) and Oxygen-16 and Oxygen-18 (blue) in the melt water from the CFA system. The high values to the left are from ice from our present climate, while the lower values to the right are from ice from the end of last glacial period. This is the first time ever that the termination of the glacial period is seen in isotopic ratios in the field and on-line. All thanks to modern laser technology.

June

Tuesday, 1st June 2010.

Now we are analyzing air from the last glacial period.

Today, the gas people of the CFA team passed into gases deposited in the ice from the last glacial period , 11713 years ago. The content of the greenhouse gas methane in the air bubbles dropped as the analysis picked up the samples of the atmosphere from the last glacial period. The reason why we see the glacial air in CFA one day later (or 15 m deeper in the ice) than we see glacial ice is a bit complicated; but here is a simple version: Up here at NEEM the snow pack is 80 m deep. As long as it is snow, the air can pass through the snow pack and be exchanged with the atmosphere. At little deeper than 80 m, the pressure causes the air to be trapped in bubbles, so in principle, the air in 85 m depth is new, but the ice layers at this depth is 200 years old snow. This means that at any given layer the age difference between the air in the bubbles and the ice is around 200 years, here at NEEM. The age difference is different from site to site, depending on the annual snow fall. Today, the CFA people analysed ice from 200 years before the ice age ended, and thus they ran into bubbles from the end of the glacial.

What we have done today:

1.Drilling and logging.

2.Processing brittle ice cores. Processed 37 bags, from 2202 to 2238.

3.Grooming skiway with tiller.

4.Measuring CFA. Today we measured 22 m. Last bag 2625, 1443.75 m

Ad.1: Drillers report:

Mounting the old cutters again and opening the hallow shaft brought some stability to drilling today. Seven runs produced between 2.5 and 3.5 meter cores each. We are using Pressure Tube "1" for Chip recovery was good. Packing of chips at the central junction or in the pump itself seemed to create the shorter of the runs. Cutting pitch is about 2.4 mm.

Drillers depth: 1904.57 m. Logging depth: 1920 m

Weather: Overcast and snow. -20 C to -10 C, 10-20 knots from S, later SW. Visibility: 1 mile to ¼ mile. Snow and blowing snow.

FL, J.P. Steffensen

Picture captions:

NEEM main dome, our rectangular generator hut and a red dome tent from a new perspective. There are some snowmobiles parked in front of the main door. You may wonder how this picture was taken – it was not a balloon. Explanation follows tomorrow.

Wednesday, 2nd June 2010.

Greetings from Iceland.

Not many weeks ago, the volcano Eyjafjallajökull erupted in Iceland, disrupting air traffic, even here at NEEM. This eruption, however dramatic to behold, is small in the annals of Icelandic volcanic history. Today, the drillers pulled up a core containing a distinct brown ash layer from 1919.75 m depth. We believe this to be the so called "Z2"-event. "Z2" or rather "Volcanic ash zone 2" has been given the name by the geologists studying sediment cores from the oceans. All over the North Atlantic sea bed this ash layer is found. It is also found in lake sediments in Europe and North America and in all Greenland ice cores reaching this far back in time. It is an important time marker, as it can be used to tie all sedimentary records onto the same time scale. In the most recent ice core from NGRIP it has been dated to 55,400 +-2,400 years ago. This eruption has been huge, as it was capable of colouring the entire Greenland ice sheet brown. As far as memory serves this author, the ash layer is believed to come from an eruption in the Katla-complex in Iceland, which by the way is the neighbour to Eyjafjallajökull. Let us all hope, that Katla does not repeat

this in our time, as disruption of air traffic would become the least of our troubles. An eruption of this magnitude would have adverse effects on climate and harvest of a large portion of the Northern Hemisphere lasting several years.

What we have done today:

1.Drilling and logging.

2.Processing brittle ice cores. Processed 37 bags, from 2239 to 2275.

3.Grooming skiway with tiller.

4.Building pallet with retrograde cargo.

5.Measuring CFA. Today we measured 19.8 m. Last bag 2661, 1463.55 m

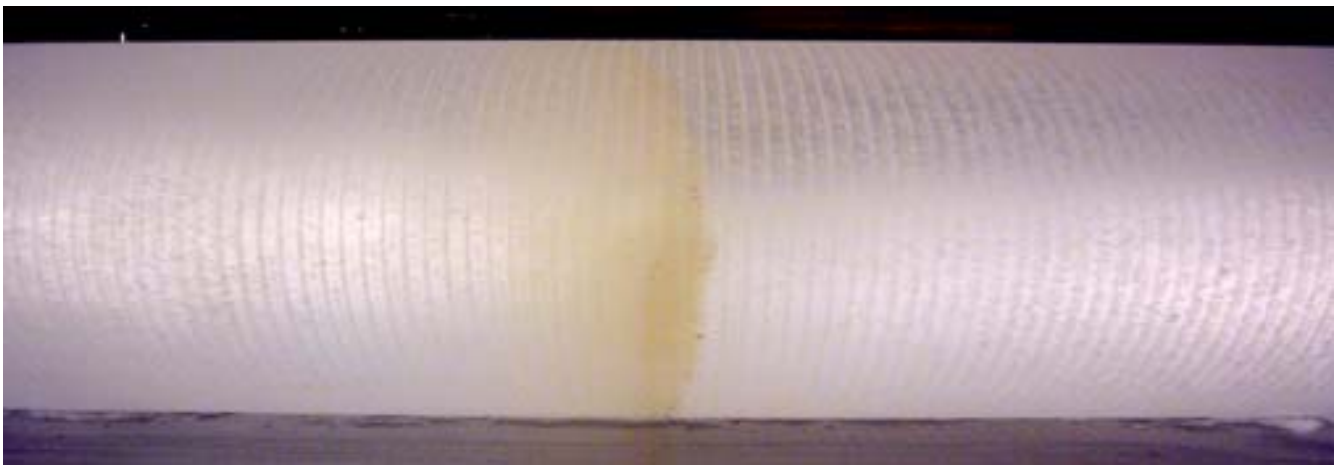
Ad.1: Drillers report:
Three runs this morning produced about 2.7 meters each. We then decided to test the long hallow shaft. We mounted the same pump that has been in use with the two piece hallow shaft. Also we noted that the drill head was slightly askew on the core barrel which was leading to cores with a reduced diameter. Straightening this out led to an increase in cutting pitch with the current configuration (from about 2.2 to 2.9 mm). Both runs with the long hallow shaft were short due to high current because of this cutting pitch. We will reduce the pitch in the morning and continue with the test of the long hallow shaft.

Drillers depth: 1914.98 m. Logging depth: 1928.25 m

Weather: Overcast. -13 C to -9 C, 13 knots from SW. Visibility: 1 mile to ¼ mile. Snow showers and blowing snow.

FL, J.P. Steffensen

Picture captions:



The Z2 ash layer in the ice core. Note: The picture has been stretched horizontally to double length to fit the frame. The picture yesterday was taken with a camera suspended from a kite at 200 m altitude. We use this kite for meteorological measurements.

Thursday, 3rd June 2010.

Luckily NEEM is not a travel agency.

This season we have been unfortunate with weather. This flight period is no exception. Weather was beautiful until the 109th flew to Greenland, and in the past two days we have had overcast, snow and strong winds. We are working again and again on the skiway to keep the snow drifts off. Weather today was really marginal to have flights, but both we and the 109th have a tight schedule (NEEM has 19 people to leave and 17 to arrive), so we decided to call in a plane. All morning weather had been bad but do-able; but as soon as the plane was airborne, weather decided to close in. It began to snow a lot, and the wind picked up, blowing snow around. The 2.5 hours flight time from Kangerlussuaq to here was a nail biting experience. Then a small miracle happened, just when the plane was 15 minutes out, weather cleared up. There was a hole of blue sky right above camp, and the plane made ready to land. It takes about 10 minutes for the plane to line up to the skiway and land. In those 10 minutes murky clouds came rolling in from the west – would they make it before the snow stopped the show? Suddenly the VHF radio sprang to life: "NEEM camp, Skier 42, We have technical issues, and we need to return to Sonde" (Sonde is the radio term for Sondre Stromfjord or Kangerlussuaq) A lot of people in camp were sunk. They were all packed up and ready to go. 15 minutes after the plane had left, the snow squall hit us, and visibility was reduced to 300 m. Words were uttered that are not fit for publication on this home page. Our friends on board the plane had to spend some long hours going back as the crew had to turn off one of the four engines.

What we have done today:

1.Drilling and logging.

2.Processing brittle ice cores. Processed 25 bags, from 2276 to 2300.

3.Rush grooming skiway with tiller.

4.19 people out of 35 packed and made ready to leave NEEM. NEEM prepared for receiving 17 people.

5.Measuring CFA. Today we measured 18.7 m. Last bag 2695, 1482.25 m

Drillers depth: 1924.44 m. Logging depth: 1935 m

Weather: Overcast. -15 C to -8 C, 10-23 knots from S and SW. Visibility: 3 mile to ¼ mile. Snow showers and blowing snow.

FL, J.P. Steffensen

Picture captions:

The information screen of NEEM camp. Top left is weather: Temperature, wind speed, wind direction and wind chill. Bottom left is date, time and some news from the world outside. Top right is the status of the drill. Right now the drill is on the surface, however when the drill is ascending or descending it gives the time of arrival either at the bottom of the hole or at the surface. Bottom right: Information for camp personnel.

Friday, 4th June 2010.

Today finally, the Sun.

Today weather changed for the better. However, we still have no plane, as it has to be repaired. Most of the 19, that were supposed to have left, are missing their flights back home. As the first possible connection back to Europe is Monday and Tuesday, we decided to plan for a flight on Sunday. This way, we have a chance to repair our skiway after the damage from several days of snow and snow drifting. The weather forecast for Sunday is good. People took the opportunity to enjoy the good conditions outside. Some were skiing, some were flying kites and some even went kite skiing, making speeds up to 40 km/h on the snow.

What we have done today:

1.Drilling and logging.

2.Processing brittle ice cores. Processed 30 bags, from 2301 to 2330. This section of brittle ice processing is now complete. Processed normal cores: 9 bags from 3354 to 3362.

3.Evening grooming skiway, apron and taxiway with tiller.

4.Measuring CFA. Today we measured 20.9 m. Last bag 2733, 1503.15 m. The CFA people have passed the onset of Bølling some 14,700 years ago and are working their way down to the layers of ice from the coldest part of the last glacial period.

5.Removing snow drifts around camp.

Drillers depth: 1933.81 m. Logging depth: 1944.80 m

Ad.4: In the last couple of days, the last instrument on the CFA line, a flow cytometer for measuring size distributions of microparticles has been working fine. After quite some frustrations, results are now streaming in.

Weather: Overcast, late afternoon becoming blue sky. -16 C to -9 C, 10-18 knots from SSW turning to SSE. Visibility: ½ mile to unrestricted. Snow showers and blowing snow in the morning.

FL, J.P. Steffensen

Picture captions:

A beautiful example of an ice core containing layers from some 50,000 years ago. Cloudy bands can be seen. Cloudy bands are a telltale sign that these layers are from a cold period in the last glacial period. During the cold periods of the last glacial, the snow in Greenland contained about 10-100 times higher concentrations of e.g. continental dust than today. The concentrations are so high, mainly in snow from spring, that cloudy bands are formed. From the left: Bo, Theo and Christopher.

Saturday, 5th June 2010.

Saturday with the "old" team.

So the "old" team could spend Saturday night together an extra time. Marie our doctor heroically volunteered to cook Saturday nights supper with Christian as a fellow hero doing the deserts. It became a really nice evening where people had a chance to spend a last evening together before 19 NEEM'ers leave tomorrow. They are all looking forward to leaving, not because they dislike being at NEEM, but because, as Alli put it: "When you have set your mind to leave a certain day, then you want to go; but if you had planned to stay a month longer, then you would have no problem staying". Before dinner, some took a walk in the beautiful weather, some went to the sauna together and some were skiing.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 35 bags from 3363 to 3397.

3.Grooming skiway, apron and taxiway with tiller.

4.Measuring CFA. Today we measured 18.7 m. Last bag 2767, 1521.85 m.

Drillers depth: 1938.89 m. Logging depth: 1950 m

Weather: Broken thin, late afternoon becoming blue sky. -15 C to -8 C, 6-16 knots from SSE turning to SSW. Visibility: 3 miles to unrestricted. Light morning haze..

FL, J.P. Steffensen

Picture captions:

It is quite a privilege to have your first ski lessons on the Greenland ice sheet.

Sunday, 6th June 2010.

Today the new team arrived.

Today the new team arrived. 19 left camp and 17 arrived. We are now 33 persons at NEEM. The plane arrived under, the almost proverbial, marginal conditions: Low clouds and poor contrast. But down the plane came with its load of spare parts, food and people; but try and guess whether it wanted to go up again? The pilots had to use 8 attempts before they got airborne, and in between these attempts, they had to go back to camp two times for extra fuel and to dump some of our cargo for Kangerlussuaq. The whole operation lasted 4 hours from 12.00 to 16.00. Daiana put it this way: “If this had been a childbirth, it was performed with clamps”. The plane has made a big dent in our fuel supply. They took 5000 liter. This has to be added to the 3000 liter a previous plane took, so now we have a fuel deficit equivalent to more than total camp consumption in 3 weeks. We have already contacted our man in Kangerlussuaq, Lars, with a request to get more fuel up. The pilots did not have an easy day. They had to fight cross wind on the skiway (the wind was perfectly aligned with the skiway before they came, and turned back along the skiway an hour after they left ,sic.) and an extremely high temperature of -4 C. Normally, we would not call a plane when it is so warm. We have bad experiences operating at temperatures over -10 C, but our forecast said from -15 C in the morning to -8 C late afternoon, and we trusted this because -4 C in early June is very rare. We wish the pilots a good rest tonight. It is very hard work to fight a Ski-Hercules into the air for so long.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 1 bag 3398.

3.Measuring CFA. Today we introduced the new team to the system. CFA will begin tomorrow morning at 4 AM..

4.Receiving Skier 71 (93).

5. Unpacking new supplies and food.

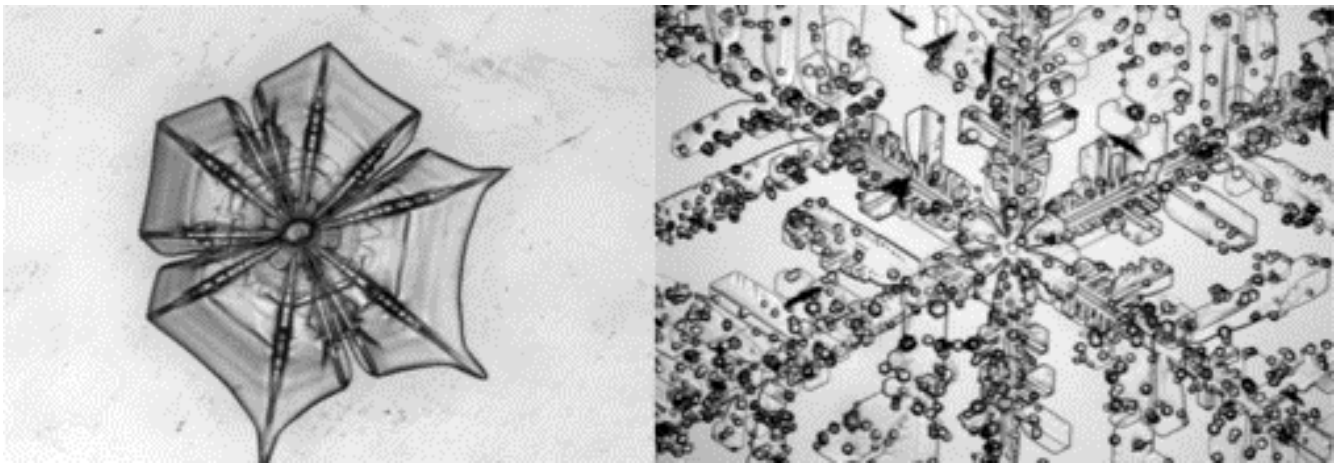
6. Meetings in different work groups to introduce new people to their tasks.

Ad.1: Drillers report:

Over the last three days we continued to work with the new 6 meter long hallow shaft. In general chips transport is less than optimal, which hinders some runs. Long runs are often followed by a series of short runs in part due to chips in the borehole. Tuning of the cutting pitch also has been a delicate process as many attempts to find the sweet spot needed for stable drilling has been elusive. Similar to last season, a low cutting pitch seems to be necessary to complete 3.5 meter runs without reaching the current limit of the motors. We target a pitch of less than 2.4 mm. A final run just before Saturday's dinner produced a 3.24 meter core with a pitch of about 1.6 mm, but with the loss of about 3 kg of the expected chip recovery. For this run we returned to the configuration with an open hallow shaft and a closed valve just below the pump. On the whole it was an encouraging sign before we say goodbye to Jakob, Steff, Jack, and Vasileios. We will work in this drilling mode (doing filter runs as necessary) over the next days while we get used to our new drilling teams. The dudes abide….
Driller's depth 1942.57 meters. Logging depth: 1958.55 m
Weather: Broken thin, late afternoon becoming over cast. -15 C to -4 C, 5-17 knots from S and SSW. Visibility: unrestricted to ½ mile. In the afternoon snow. It has become really warm.

FL, J.P. Steffensen

Picture captions:



Although we have seen far too many this past week, up close snowflakes are really beautiful. These pictures are part of the collection Sepp is making for the study of physical properties of snow and ice.

Monday, 7th June 2010.

The new crew is learning fast.

Today was great learning day for the new staff, and they caught on well, too. Drilling anchor, Trevor, set up teams. Processing anchor, Bo, organized the science trench, CFA anchors, Simon and Daiana, organized the CFA lab while Christopher acted as an anchor in the CFA gas and isotope lab. Everything went smoothly forward, and now the new people just have to settle into the routine of every day camp life, such as: If you want to take a shower, remember to refill the snowmelter, etc.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 29 bags, from 3399 to 3427. New crew is learning fast.

3.Measuring CFA. The new crew is learning fast. Measured 9.9 m. CFA depth: 1531.75 m

4.Grooming skiway with tiller to remove tracks from yesterday.

5. Making snow cave for freezing samples for pollen.

6. Repair of French laser Picarro for water isotopes.

Ad.1: Drillers report:

Drilling has improved. We continue with a low pitch of 1.6 mm and have managed a few full runs. Others are limited to 1.7 – 2.5 meters with penetration problems and apparent clogging of the hallow shaft. The lower part of the pump had to be replaced Monday morning as a second slide screw came loose (the first came loose about 10 days ago). The new "old" pump works well.
Driller's depth 1954.47 meters. Logging depth: 1970.10 m
Weather: Overcast with many strong snow showers. Temp. - 7 C to -3.8 C, 10 knots from SW. Visibility: unrestricted to ½ mile during the many snow showers. In June 2009, the maximum temperature was -7 C, In the past few days this has been exceeded. However, in 2008 we had several periods of warm weather, beginning in the last week of May.

FL, J.P. Steffensen

Picture captions:

The entire NEEM camp in between snow showers.

Tuesday, 8th June 2010.

We got a plane today from Thule with fuel.

Because we were low on fuel due to the need to re-fuel the Skier on Sunday, the 109th graciously offered us fuel on a plane from Thule. It was a really good offer, and we accepted. However, weather continued to be warm, and our skiway was so damaged from Sunday's operations, that the gift of fuel turned out to be not so good at all. The pilots found the skiway condition so bad, that they immediately downgraded our skiway to allow for less payload. As in a board game,we were sent back to "Start". In camp, the new people are already up and running at the same pace as the previous group. As can be seen in the production figures, we are back to full revolutions.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 32 bags, from 3428 to 3459.

3.Measuring CFA. Measured 19.8 m. CFA depth: 1551.55 m

4.Grooming skiway with tiller to to make contrast track for today.

5. Receiving Skier 11.

Ad.1: Drillers report:

The new drilling teams are in full swing. Seven runs today produced more than 20 meters of ice nice ice core. Both pitch and core diameter are stable at 1.6 mm and 97.6 mm respectively. Chip transport after about 1.6 meters continues to be a challenge, but full 3.5 meter core lengths are possible. Despite a clean borehole, thorough cleaning of the interior of the hallow shaft at the surface seems critical between each run. Chips clogging at each of the small filtering holes in the hallow shaft need to be cleared in addition to the interior of the shaft itself. This is a long process, so we are preparing a second complete shaft and pump to exchange between each run if it is deemed necessary.

Driller's depth 1974.80 meters. Logging depth: 1988.25 m

Weather: Overcast with several light snow showers. Temp. - 7 C to - 2 C, less than 5 knots from all directions. Visibility: unrestricted to 1mile during snow showers.

FL, J.P. Steffensen

Picture captions:

Skier 11 transfers fuel from it's tanks to our tank in camp.

Wednesday, 9th June 2010.

Hurray! We reached the 2000 meter mark.

Today the NEEM ice core became member of the exclusive club of multi-kilometer ice cores, and it brings the total number of these deep ice cores in World up to eleven: Dye-3, GRIP, GISP-2, NGRIP and NEEM in Greenland and Byrd, Vostok, Dome C, Dome F, Kohnen and WAIS in Antarctica. The impact on society and the public debate from science on these few cores has been enormous in these Global warming times. It is a proud club to join.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 42 bags, from 3460 to 3501.

3.Measuring CFA. Measured 16.5 m. CFA depth: 1568.05 m

4.Working on skiway with beam groomer and Pistenbully dozerblade.

Ad.1: Drillers report:

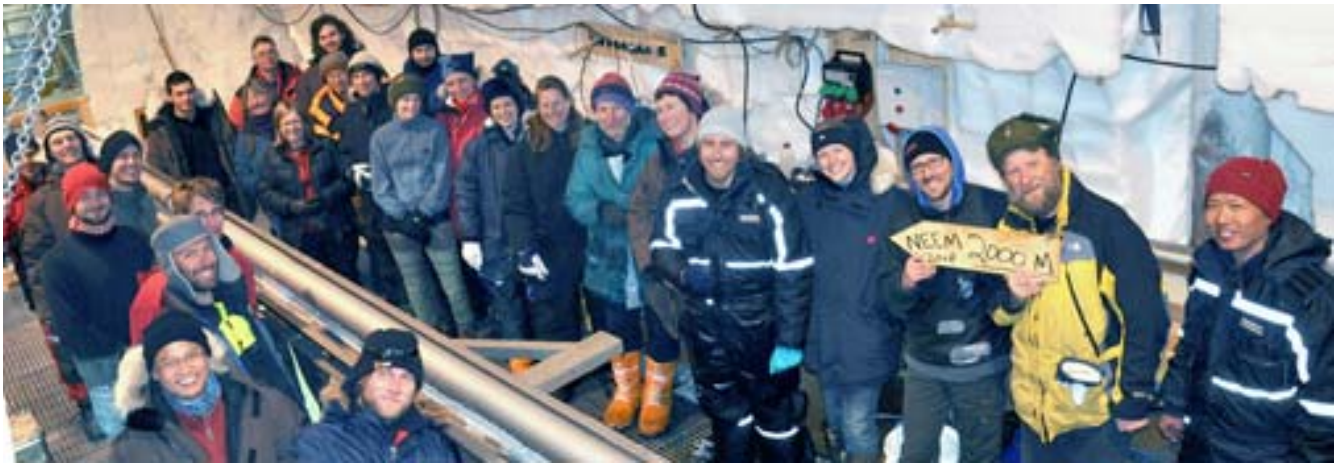
Drillers have now had two days in a row with production of about 20 m. With careful cleaning of the hollow shaft, good stable runs are made. The core containing the 2000 m mark was 3.47 m long, a good sign for the coming days.

Driller's depth 1993.00 meters. Logging depth: 2005.30 m

Weather: Thin scattered clouds and mostly sun shine, in the evening fog. Temp. - 15 C to - 4 C, less than 3 knots from SE and E. Visibility: unrestricted in fog down to ½ mile.

FL, J.P. Steffensen

Picture captions:



Group picture at the celebration of passing the 2 km mark.

Thursday, 10th June 2010.

Sepp's birthday celebrated in a camp where things are going fine.

We celebrated Sepp's birthday after dinner, by having a birthday parade while singing songs, and afterwards we went in for ice cream and cake prepared by our cooks, Sarah and Louise. On the group picture from yesterday, I failed to mention, that we were missing six of our bravest camp members, that were either sleeping, because they are on night shift, or on duty. On Saturday, when everybody is off, we will make a picture with everyone in camp. In the processing, we have encountered a volcanic layer, which looks very much like the one found at NGRIP in 2400.68 m depth. It has the age of 58180 b2k (b2k means before year AD 2000). Here at NEEM it is found at 1941.25 m depth.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 44 bags, from 3502 to 3545.

3.Measuring CFA. Measured 19.8 m. CFA depth: 1587.85 m

4.Working on skiway with beam groomer.

5. Removing snow drifts around main dome.

Ad.1: Drillers report:

Drilling is in a stable mode. Today we made 6 good runs with full chip recovery. 5 runs out of 6 yielded cores of more then 3.35 m.

Driller's depth 2011.03 meters. Logging depth: 2026.20 m
Ad.3: Discrete isotope samples are now taken from the scrapings from microtoming and measurements are made in the gas and isotope lab. The Phosphate measurement in CFA is now setup and work is in progress to solve some issues.

Weather: Overcast with few sunny patches. Temp. - 12 C to - 7 C, calm to 10 knots from southerly directions. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

The Sepp birthday parade. Sepp is sitting to the right on the couch wearing a crown and a broom scepter.

Friday, 11th June 2010.

Now it is beginning to get exiting.

If drilling continues at the present rate, then in the next few weeks it will be revealed what the ice sheet here at NEEM might be hiding at depth. We are still in known territory. Everything we see can be related to the other ice cores from Greenland. The NGRIP ice core is so far the longest in time, reaching some 125,000 years back, until the middle of the previous interglacial, the EEMian. There it stopped, because melting at the base due to geothermal heat had melted away all older layers from below. The NEEM site was selected from radar survey to be where the ice at the base should be much older, so that an ice core from here should reach back through the EEMian and into the second last ice age. However, radar images can be misinterpreted, and we believe that there is some basal melting here at NEEM too. The question is: How much melting? If basal melting is more intense than we think, then we should soon begin to find our ice layers deeper than expected, because melting removes layers from below, causing all layers above to sink. I basal melting is weaker, or it doesn't occur, then our ice layers should soon show up higher in the ice than expected. Right now, it looks fine. Our layers are 5 m above predictions, but it is still too early to say anything conclusive…

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 38 bags, from 3546 to 3583.

3.Measuring CFA. Measured 17.6 m. CFA depth: 1605.45 m

4.Welding stabilizers onto runners of one tank sled .

5. Removing snow drifts between the two workshop tents.

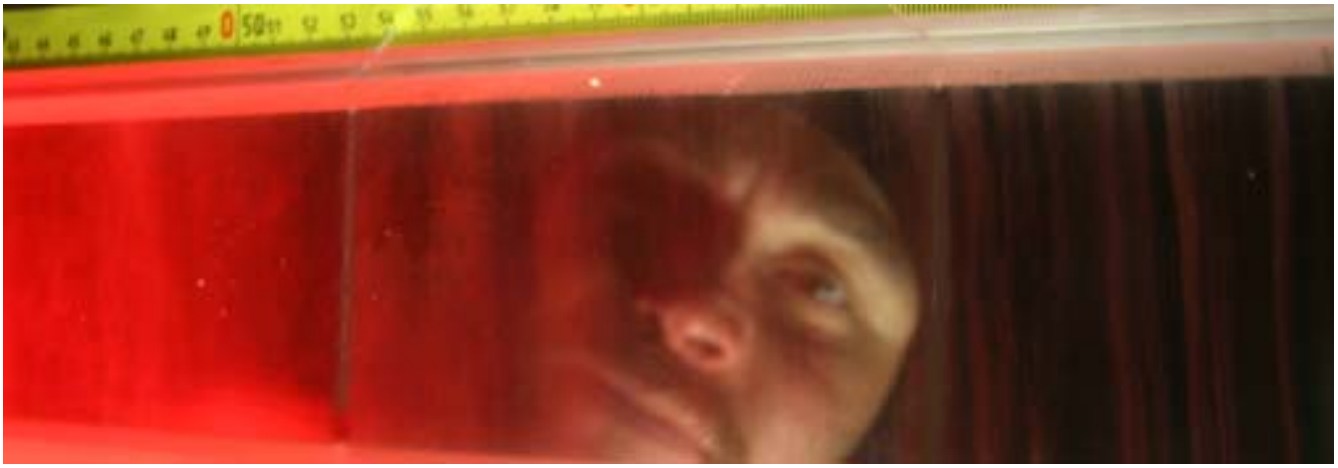
Ad.1: Drillers report:

Drilling is in a stable mode. Today we made several good runs with full chip recovery. In one run the core broke some 50 cm from the top; but we were able to go down and collect the rest in good order.

Driller's depth 2030.83 meters. Logging depth: 2039.95 m.
Ad.2: The onset of IS 19 and the termination of IS 20 have been found at 2009.5 m and 2015 m respectively using the DEP profile.
Weather: Some sun and several strong snow showers. Temp. - 15 C to - 5 C, 10-15 knots from SE and S. Visibility: Unrestricted, during showers down to ¼ mile.

FL, J.P. Steffensen

Picture captions:



Gregory's face can be seen reflected in the polished ice core, together with cloudy bands in the ice. The red light is from our optical scanner.

Martin pushes yet another ice core out of the core barrel after a successful run.

Gregory inspects the polished ice before it goes into the optical scanner.

Saturday, 12th June 2010.

Saturday night with French cuisine.

Weather continues to be really poor. Today we had overcast all day, very warm temperature and little wind. Snow is sticky and on all non-white surfaces pools of water form. It appears, that the weather pattern from last winter with above normal temperatures in Greenland and below normal temperatures in Eastern North America and in Northern Europe continues. In Kangerlussuaq, Greenland, it is now warmer than in Copenhagen, Denmark. At NEEM camp work in the trenches continues independent of weather. We are still able to maintain cold temperatures in the snow caves; but we would like some colder temperature soon. It was the first Saturday evening since last crew exchange, and dinner was prepared by a French/Belgian/U.S. team (Romain, Gregory, Sonia,Denis and Lou).

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 26 bags, from 3584 to 3609.

3.Measuring CFA. Measured 6.6 m. CFA depth: 1612.05 m

4.Grooming skiway with beam groomer .

5. Removing snow drifts between the two workshop tents.

6. Successful deployment of beads in the drilling fluid at the bottom of the bore hole. Subsequent ice cores will now be analyzed for how far contamination from drill fluid penetrates into the ice core.

7. Canadian and Japanese pit studies for biological material in snow.

Ad.1: Drillers report:

We had 3 runs today, including the run with bead deployment.

Driller's depth 2040.26 meters. Logging depth: 2053.15 m.
Ad.3: The production is a bit less today, as a breakdown in the fast IC instrument caused the night shift to stop. The fast IC has been repaired, and production is resumed.
Ad.6: Today we launched micro-florescent beads during drill run 707 to monitor infiltration into the core as part of a microbiological contamination study. All totaled, some 100 billion beads (1 micron) were introduced to the bottom of the hole using the "cognac bomb" delivery technique. The bomb was made into three sausage shaped bags that were inserted into the chip chamber and released using the "Hansen Hook" developed last year. All three bags were successfully ripped and all three hooks recovered along with 3.3m of core. Sections of the core will be returned for infiltration studies using a microscope and GC detection of drill fluid contamination.
Weather: Overcast with varying thickness. Temp. - 7 C to - 3 C, 5-10 knots from SE and SW. Visibility: Mostly unrestricted.

FL, J.P. Steffensen

Picture captions:

The inner part of the chip chamber pulled out of the drill for cleaning. The metal rod is our hollow shaft. Attached to the hollow shaft are two soggy looking plastic bags. These bags contained the fluid with the beads. After deployment of the drill to the bottom of the hole and subsequent starting of a drilling run, the bags were ripped open, allowing the beads to be dispersed in the fluid while drilling. In the back ground: Chinese driller, Wang.

Sunday, 13th June 2010.

A grey Sunday.

Sunday is anyway a short day, so if weather should put a halt to work on the surface, it's the best day for it. And weather did. However, in the trenches work continues. The CFA team operating on a 24 hour schedule, 2 x 12 hour shifts, used the week-end to switch the night team to day and vice versa. Today was maintenance day on the CFA equipment, and tonight they will be at it again.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 17 bags, from 3610 to 3626.

3.Maintaining CFA system. Measured 0.0 m. CFA depth: 1612.05 m

4.Tried to groom skiway with beam groomer.

5. Canadian and Japanese pit studies for biological material in snow.

Ad.1: Drillers report:

We made 5 runs today, yielding good core.

Driller's depth 2054.45 meters. Logging depth: 2068.28 m.
Ad.4: Lou tried to go out to groom today; but the snow was so sticky that the groomer left big clomps of snow in its wake, so she stopped.
Weather: Overcast all day with some light snow showers. Temp. - 6 C to - 4 C, 5-15 knots from S and SSW. Visibility: Mostly unrestricted, sometimes down to 1 mile.

FL, J.P. Steffensen

Picture captions:

A fresh ice core directly from the drill. This 3.5 m long and 98 mm diameter rod of ice in one piece is truly an aesthetic experience. This ice core contains about 500 years of snowfall in a beautiful layered sequence from about 75,000 years ago.

Monday, 14th June 2010.

Does weather show us a light at the end of the tunnel?

Today began as usual in the last five days: Warm, moderate wind and total cloud cover. But at dinner time (19.00) the clouds retracted to the northwest and camp experienced sunshine for the first time in several days. Many camp members rushed out, and soon they had a ballgame going in the middle of camp.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 44 bags, from 3629 to 3673.

3.Measuring CFA. Measured 20.9 m. CFA depth: 1632.95 m

4.Groomed skiway with beam groomer in zig-zag.

5. Removed snow from around carpenter garage.

Ad.1: Drillers report:
The good mode of the last 8 days disappeared when the pitch fell below 1.2 mm for five consecutive runs. We increased the pitch to 2.4 mm now (0.15 mm clearance at the lathe). This improved our situation in two ways. First, we can again drill more than 3 meters per run, but with runs just at the limit of the motor current in pressure tube 1 at their termination. Second, we can now drill with negative cutter load which we hope will improve our borehole inclination. Previously we were obliged to drill with about 10 kg of load.
Driller's depth: 2071.90 meters. Logging depth: 2088.25 m.
Weather: Overcast all day in the evening clearing up. Temp. - 10 C to - 5 C, 10 knots from S then SW and SE. Visibility: Unrestricted, but poor surface contrast due to cloud cover.

FL, J.P. Steffensen

Picture captions:

Sverrir is using the Pistenbully to remove the 4 m snowdrifts around the carpenters garage.

Tuesday, 15th June 2010.

The heart of NEEM camp stood still for 35 minutes.

Today is one of the days where we perform routine maintenance on the main generator. It is a 130 kW diesel generator, and it delivers all electrical power to camp. It is the heart of camp. Everybody has to be forewarned before power is switched off, and we ensure that the drill is on the surface. It gives most people a small break; but in the CFA laboratories there is hectic activity, as they have to watch all their equipment as it runs on back-up battery power. In the kitchen, water has to be stored in pitchers and coffee has to be made beforehand, as all ice core processors gather in the kitchen for a drink during the power cut. You really come to realise how dependent we all are on electrical power. Sverrir and Lou took care of the generator, and it is treated as a little baby. We do have several emergency generators in camp; but they are small (15kW) and are only meant to ensure survival in case of emergency, so great care for the generator is well placed.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 42 bags, from 3674 to 3715.

3.Measuring CFA. Measured 18.7 m. CFA depth: 1651.65 m

4.Groomed skiway and taxiway with beam groomer in zig-zag and along.

5. Welded extra guides on sled for second fuel tank.

6. Maintenance on main generator.

Ad.1: Drillers report:

Seven runs today with a pitch of about 2.2 mm. All were good except one where “there was more ice under the shoes than there was in the core barrel!” (Adrian Schildt). Inclination has been stable over the last two days since drilling with negative cutter load.
Driller’s depth: 2089.86 meters. Logging depth: 2104.39 m.

Ad.6: The main generator was switched off today for 35 minutes in order to perform routine maintenance: Oil change, filter change, battery acid level check and coolant level check.

Weather: Blue sky, in the evening total cloud cover returned. Temp. - 15 C to - 6 C, 10 knots from SE then SW.
Visibility: Unrestricted, but poor surface contrast due to cloud cover.

FL, J.P. Steffensen

Picture captions:

This picture appears rather distorted. It is a panorama from one end of the science trench to the other. The person to the very left is packing samples for green house gas analysis. The white box with the door is the CFA laboratory. The person in the center is preparing optical scan on the device with red light at his left. The table with the bright light is where the ice is polished before scanning. The persons to the right are measuring ECM. And to the very right are the plastic curtains behind which is our core storage.

Wednesday, 16th June 2010.

We are descending in a fine way.

A day like today is actually good. Everybody in the drilling trench and science trench are working in a fine routine and make progress. The experiments on the surface are working fine. The cooks are making fine foods and the surface crew is welding, repairing, moving snow, pumping fuel etc.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 44 bags, from 3716 to 3759

3.Measuring CFA. Measured 20.9 m. CFA depth: 1672.55 m

4. Welded extra guides on sled for third fuel tank. All tank sleds now revised.

5. At the water vapour sampling site, the machines are working fine, and many experiments are conducted.

Ad.1: Drillers report:

We continue with a good mode of 2.2 mm pitch at maximum current by runs' end. Chips recovery is still pretty good, though some chips are found on top of each core. This actually hindered the first run of the morning, along with ice under the shoes at least once. Otherwise the runs are good and inclination has remained stable for another day of eight runs. (note: we have extended the duration of the day's shifts by one hour).

Driller's depth: 2106.76 meters. Logging depth: 2122.82 m.
Weather: Thick overcast and continuous snow. Temp. - 10 C to - 6 C, 3-10 knots from WSW then WNW. Visibility: Mostly around 1 mile, depending on intensity of snow fall.

FL, J.P. Steffensen

Picture captions:

Every day heroes: Sarah and Louise are ready to feed 33 people with pizza.

Thursday, 17th June 2010.

We celebrate several things.

There were two birthdays to celebrate: It is Martins birthday, and he was treated with a birthday song and one of his favourite deserts, apple pie, baked by Sarah and Louise. Then we also celebrated someone somewhat older: The republic of Iceland. The Icelanders decided on this day in 1944 to cease being a kingdom and became a republic. In support of the Icelandic nation all camp members yelled: "Áfram Ísland!" (Go ahead Iceland!) three times. Finally, we celebrated the six CFA people. They have passed the 400m mark in CFA analysis this year. This is good for the NEEM project, as we have now continuous measurements of ice core chemistry, of microparticle concentration, of black carbon, of green house gases and of water isotopes spanning from our climatic period into the coldest part of the last glacial, or some 20,000 years.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 42 bags, from 3760 to 3801

3.Measuring CFA. Measured 22 m. CFA depth: 1694.55 m

4.Working on skiway with Pistenbully.

5. Zig-zag and lengthwise grooming on apron and taxiway.

Ad.1: Drillers report:

The cutters required sharpening and we are adjusting to the new pitch after remounting them. For the first four runs of the day the pitch was about 1.5 mm. We tried to increase this slightly to 2.2 mm to regain our sweet spot capable of drilling with negative cutter load. We landed at 2.5 mm instead for the last three runs which may just be working fine enough, but again at the limit of the power available once we reach about 2.5 meters. We can continue past this mark to gain 2.5 to 3.3 meters per run. We will continue this in the morning.

Driller's depth: 2128.0 meters. Logging depth: 2142.74 m.
Ad.2: Today in the ECM we detected a climate transition which occurred 84.750 years ago. In NGRIP this transition was found at 2687 m depth, and at NEEM it was found at 2086 m depth. Our model prediction of the depth of this layer is 2110 m, so the layer is found 24 m higher than predicted. We should begin to encounter ice from the Eemian around 2260 m. It now begins to be very exiting
Weather: Overcast in the morning, then becoming fine. Temp. - 10 C to - 8 C, 2-17 knots from NW tuning to SE.
Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

The CFA 400m group. From left to right: Liz, Simon, Gideon, Kerstin, Daiana and Helle.

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Hans Christian in the middle of the tent laboratory for water vapour sampling.

Sonia and Hans Christian are setting up sampling equipment in the middle of the snowy weather yesterday.

Friday, 18th June 2010.

First aid course and drills.

Our camp physician, Simon, held a first aid course today and many camp members participated in the course and subsequent drills. The drill today was how to secure and transport a person with suspected head or spine injury from the snow or from our trenches. Some days ago, Simon also worked with the Gamow bag. A Gamow bag is an air tight cocoon, which is inflated and kept pressurized with a foot pump, just like a camping air mattress. It is used for people who suffer from High Altitude Sickness due to the thin air. In serious cases, High Altitude Sickness can lead to High Altitude Pulmonary Oedema (or HAPE), which is water in the lungs that can cause suffocation and death. The Gamow bag is a simple and safe way of treating High Altitude Sickness. The patient is pressurized inside the bag. The increased pressure imitates that the person is brought down to lower altitude, and symptoms disappear. Knock on wood – so far we have not had any situation in NEEM camp that has required any of the above measures.

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 46 bags, from 3801 to 3847

3.Measuring CFA. Measured 20.9 m. CFA depth: 1715.45 m .

4.Grooming Taxiway and apron with tiller.

5. Zig-zag grooming skiway.

6. First aid course on spinal and head injuries.

Ad.1: Drillers report:
Not a routine day today, as we passed 400 meters for the season. Most of the excitement could be traced to the communications with the drill (or lack thereof) which was solved for now with new serial-usb cables. Creative drilling with two active operators during three of these episodes made for nice runs through many alarms, some of which we didn’t know even existed. Then, due to required maintenance to the long hallow shaft we deployed the second pump

and hallow shaft (the one with two three meter sections joined at the middle) that had been made ready again last week. It worked fine, but at first analysis it appears to be less efficient at collecting all of the chips than the six meter shaft and pump. Still, we managed good production today in six runs. Also, all six drillers ate lunch together for the first time in awhile as we decided to take a collective deep breath together before tackling the day's issues.
Driller's depth: 2142.24 meters. Logging depth: 2155.85 m.
Ad.2: Today's fix point from the DEP system: Layer found at NEEM at 2142.5 m is equivalent to NGRIP layer depth of 2768.5 m with approx. age of 93,000 years.
Weather: Overcast with snow and blowing snow, after 18.00 scattered clouds. Temp. - 8 C to – 2.3 C, 12-18 knots from SSE. Visibility: During day poor contrast and 1 km, in the evening unrestricted.
At midnight, it was overcast again with snow and visibility of 500 m. Temperature at midnight: -2.6 C !!

FL, J.P. Steffensen

Picture captions:

Carina checks "the patient" in the Gamow bag, and later "the patient" our camp physician, Simon, reemerges from his cocoon.

Saturday, 19th June 2010.

The wind blows, but stops in time for Saturday night dinner.

Most people got a noisy night between Friday and Saturday. At about 02.00 the wind suddenly picked up, and most of the night the average wind speed was 28 knots, with gusts up to 37 knots. Such wind speeds make all tents noisy with knocking and howling. It was not cold however maximum temperature of -1.7 C was reached at 02.00 just as the wind picked up. Most of the day it was warm, at it snowed intensely. We got 7.5 cm new snow.
Saturday night was celebrated in the usual manner: People washed, went to the sauna and relaxed. Some of the people who didn't relax were Carina, Aimee and Astrid, Saturday evening cooks. Carina and Aimee prepared a meal the Dutch way, and Astrid made desert the Danish way. Also, Trevor and H.C. spent most of the evening in the drill trench doing borehole measurements

What we have done today:

1.Drilling and logging.

2 Processed ice cores: 26 bags, from 3848 to 3873

3.Measuring CFA. Measured 15.4 m. CFA depth: 1730.85 m .

Ad.1: Drillers report:

Two runs of regular drilling. Then the borehole logger was mounted to measure borehole inclination, diameter and temperature. Borehole logging continued until late Saturday evening, and the borehole logger was left overnight at the bottom of the hole for a precise temperature reading.

Driller's depth: 2154 meters. Logging depth: 2167.26 m.
Weather: Overcast with snow and blowing snow, after 16.00 wind speed began to drop. Temp. – 4.8 C to – 1.7 C, 28 knots from S, later calm . Visibility: During day 1/2 mile, in the evening unrestricted.

FL, J.P. Steffensen

Picture captions:

This is how main street of camp looked like most of the day.

Sunday, 20th June 2010.

A routine Sunday.
For drillers and CFA people Sunday has it's own routine. While people wash up and wear clean clothes for Saturday night, then Sunday is where the CFA people and drillers clean their equipment and the borehole fluid. Today weather was a more well behaved than yesterday so we could go out on the skiway and get our grooming done in preparation of the planned flight on Tuesday. It is still warm however, and it may create problems for the flight if temperatures do not drop before Tuesday. The forecast, we received, indicates improvement. We do hope so.

What we have done today:
1.Drilling, measuring borehole, filtering and core logging.
2 Processed ice cores: 26 bags, from 3874 to 3899
3.Calibration and maintenance on CFA system. CFA depth: 1730.85 m .
4. Grooming skiway with beam groomer and tiller.

Ad.1: Drillers report:
Drilling goes fine enough. Only five runs over Saturday and Sunday due to borehole logging during most of Saturday afternoon and evening and Sunday morning and afternoon. Sunday started with a failure in the winch control. The problem was traced to the emergency stop circuit with a blown component in the reset button. This prevented both winch control units from operating. Martin replaced the component with one from our spare control box. Software/communication problem, probably due to serial-USB conversion, remains an issue, but hasn't slowed drilling. Cutting pitch is still about 2.4 – 2.5 mm. We can alternate easily between two hallow shafts without a noticeable difference in performance so far, which makes life better for the drillers.Borehole temperature at 2167 m depth: -13.6 C.

Driller's depth: 2155.76 meters. Logging depth: 2170.38 m.
Weather: Thin overcast. Temp. - 7 C to – 4 C, 5-10 knots from SW during day turning clockwise to E. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

From Saturday night. Carina and Aimee are introducing the Dutch dinner.

Monday, 21st June 2010.

Greenlandic national day. Summer solstice.
Today is summer solstice, and luckily good weather is coming our way. Good weather in our book is clear blue skies and a lot of cold. Temperature is already dropping, and the forecast indicates night temperatures down to below – 20 C. How wonderful! This is indeed good news for the flights this week, and we keep our fingers crossed that weather stays this way for a while. It is also the national day of Greenland, and our cooks Sarah and Louise, prepared many Greenlandic delicacies: Musk-ox, scallops, halibut (smoked and dried) and mattak (the raw outer skin of a whale).

What we have done today:
1.Drilling and core logging.
2 Processed ice cores: 52 bags, from 3900 to 3951. New daily record.
3.CFA measurements. Measured 20.9 m. CFA depth: 1751.75 m .
4.Took down one shelf rack in core buffer to gain access to the brittle ice.

Ad.1: Drillers report:
"Today things went a little bananas. We lost our good mode (but not our good mood, I hope). Long cores were followed by short cores due to poor chips recovery. At the same time inclination took a significant step higher throughout the day. The first signs of this started in my gut and in the data on Saturday and today's data confirmed both. To get a handle on this we have mounted new cutters. These cutters were tried earlier in the season without consistent success, but were modified about three weeks ago according to our experience. Tonight they performed well in their first run. We were able to drill with a negative cutter load of about 12 kg with a pitch of 2.5 mm. We should have a better feeling tomorrow as we say goodbye to some folks and hello to others."
Chief driller, Trevor Popp
Drilled 16.83 m. Driller's depth: 2171.18 meters. Logging depth: 2184.60 m.
Weather: Thin overcast, later blue sky. Temp. – 13 C to – 6 C, 10-20 knots from SE later S. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Group picture of the 33 participants of NEEM team 3.

2010-06-22

Crew exchange and good timing of flight mission

NEEM camp not only receives airplanes but also birds. Unlike the airplanes the smaller birds are however normally not leaving camp again. This particular bird survived for a while inside Main Dome.

Today we had a flight mission and an exchange of personnel in camp. We thank our departed colleagues for leaving a tidy and productive camp in a good spirit. The flight mission was successful due to a combination of hard work in the preparation of the skiway and well-behaving low outdoor temperatures. There was, however, also some luck involved, as a ground fog came in just after the skier landed: had the skier departed just an hour later from Sønderstrømfjord the mission would most likely have failed.
The skier's grounding time was less than one hour including drifting and loading of pallets, transfer of fuel to camp and exchange of passengers. The take-off was successful in first attempt using less than 2/3 of the skiway and without use of assisting rockets (ATOs).

We now hope that the skiway will be upgraded to allow for a higher payload so that we can receive more cargo in coming flight missions. At the moment the camp is a bit low in fuel, drill liquid and other vital items, so today's successful mission is very much appreciated.

What we have done today:
1. Drilling and core logging.
2. Processed ice cores: 22 bags of brittle ice: bag 1095 to 1116.
3. CFA measurements. Measured 17.6 m. Final depth: 1769.35 m.
4. Received skier 22 with fuel, food and passengers in exchange for departing passengers and ice.

Ad.1: Drillers report will follow tomorrow. Driller's depth: 2181.71 meters.

Weather: During the day blue sky and good visibility. At 20:45 a ground fog came in. Temp. -12 °C to -6 °C, wind 3-10 knots from S.

FL, Anders Svensson

2010-06-23

NEEM camp in full operation

NEEM city centre and suburbs. When camp population increases it becomes popular to move 'out of town' in smaller tents.

After yesterdays crew exchange the camp population is now 37 persons which is about the upper limit for an operational camp. Everything is up and running: drilling progresses well towards the exciting Eemian ice which may be reached about 100 m below present drilling depth. Ice core processing is generally following the drilling, but at the moment there is time to process some of the Holocene brittle zone that was left in camp from last year to relax.
CFA (the continuous chemistry analysis) and all of the associated analyses have been making very good progress all season and right now 40,000 year old ice from the last glacial period is analyzed.

The skiway is being prepared and cargo is prepared for a flight operation tomorrow. Many camp activities are being filmed and documented by our outreach participants. Last but not least there is full activity in the kitchen all day long to prepare food for all the hard working people.

What we have done today:
1. Drilling and core logging.
2. Processed ice cores: 28 bags of brittle ice: bag 1117 to 1145.
3. CFA measurements: 8.8 m. Final depth: 1778.15 m.
4. Groomed skiway to prepare for Skier tomorrow.
5. Repaired one out of two broken spinners for ice chips.

Ad.1: Driller's report:
Over the last two days we continued to drill with the new cutters. They perform well with a pitch of 2.7 mm. Chips recovery is still less than optimal which sometimes leads to short runs after long runs. This can occur via ice collecting under the shoes or excess packing around the drill head early in the run.
On one of the hallow shafts we have again tried a configuration with a closed shaft and no lower valve at the super banger. At the moment it seems to work at least as well as the open shaft configuration and we hope it could provide some vacuum cleaning of extra chips if we suspect a dirty hole from a previous run.
The new teams are set with Sigfus, Trevor and Thorbjorn in the mornings and Romain, HC and Ji Woong in the evenings. And we have Sebastian in the wings if we need him.
We have had trouble with both centrifuge spinners over the last two days. Both were down for most of Tuesday and half of today. One is operational again and the other has seen its last days.

Driller's depth: 2193.11 m. Loggers depth: 2211.48 meters.

Weather: Blue sky and good visibility all day long. Temp. -13 °C to -6 °C, wind 3-10 knots from E.

FL, Anders Svensson

2010-06-24

The NEEM airbridge

The season 2009 NEEM had 14 flights carrying in a total 102.225 kg of cargo and 167 people

The main ingredients needed to keep the NEEM project operational are human resources, food, fuel, and drilling liquid. All of this is brought to camp by the ski-equipped LC-130 aircrafts operated by the New York Air National Guard, the 109th. With the air bridge being vital for the success of the project it is most important that flight missions are running smoothly.

There are, however, many potential obstacles for a flight operation. In Greenland, weather is the obvious troublemaker, for examples in the form of high temperatures (prohibiting take-off as the ski friction increases), snow storms, skiway cross winds, ground fog, or low clouds. Technical issues for the airplanes, airport strikes or closing hours are other possible obstacles. This year introduced yet another issue: volcanic ash clouds.

When all of those problems can be avoided the airbrigde is, however, very efficient both in getting cargo up to camp and in returning participants and ice cores to the coast of Greenland. The trip takes 2.5 hours one way.

What we have done today:
1. Drilling and core logging.
2. Processed ice cores: 45 bags of brittle ice: bag 1146 to 1190.
3. CFA measurements. 20.9 m. Final depth: 1799 m.
4. Receiving Skier 42 with fuel, drill liquid, and food.
5. Maintenance of Pistenbully.

Ad.1: Driller's depth: 2213.17 m. Loggers depth: 2229.34 meters.

Another day closer to bedrock in the drill trench. For the most part good runs today, with somewhat disappointing chip recovery from time to time.
We seem to be able to deal with it now by approaching bottom very slowly to avoid ice under our shoes, and making small changes to the hallow shaft configuration (e.g. a ring in the place of a booster on the closed hallow shaft). We are still learning what these small changes mean, but in the meantime we can collect core as long as we avoid ice below our shoes. One run in the evening showed great promise with good chip distribution in the upper part of the hallow shaft after recovering from a total lack of penetration (maybe from ice under the shoes) at the onset of the drilling ending in more than 3.4 meters. Inclination has been more or less stable since we changed the cutters on Monday evening.

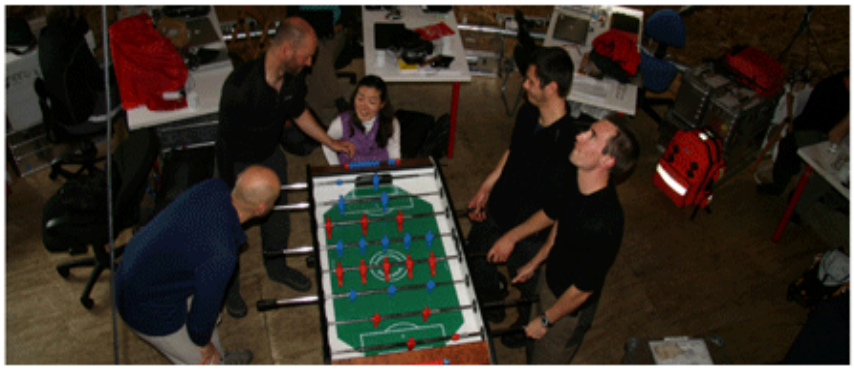
Ad. 4: Skier 42 (alias 95) touched down at NEEM 17.15 local. The plane brought us one pallet of drill liquid, one pallet of food and cargo, and 8000 lbs fuel, plus Bob Hawley that came by for a short visit. As retro, the plane was loaded with the Toyota and a garbage pallet. The skier was airborne in first attempt using 1/2 skiway and no ATOs. Outdoor temperature during takeoff was -6.4 C. The whole operation took exactly 1 hour. Thanks to the 109th for a very smooth operation and to Lou for making this possible through intensive skiway preparation.

Weather: Blue sky and good visibility all day. Temp. −14 °C to −6 °C , wind 3-10 knots from E.

FL, Anders Svensson

2010-06-25

Reaching into the unknown past



Parallel to the world championship in the outside world a local championship is held at NEEM.

The main purpose of the NEEM project is to recover the oldest ice core from the Greenland ice sheet. The oldest existing Greenland ice core is the NorthGRIP core that has an age of 123 ka in the deepest part. This time is in the middle of the previous interglacial period, the Eemian, where Earth's climate was warmer than today and the global sea level was higher than it has ever been since.
Also the NorthGRIP ice core was drilled with the purpose of obtaining the oldest Greenland ice, but due to high geothermal heat and bottom melting at the NorthGRIP site the oldest ice from that location has melted away.
Other deep Greenland ice cores such as the GRIP and GISP2 cores from Summit probably contain even older ice but their layering is disturbed in the oldest part.

Just these days, the NEEM drill is approaching Eemian ice that has never before been recovered in Greenland. Until now it has been possible to match the NEEM and the NorthGRIP cores through their very similar dielectric and isotopic profiles. From now on, however, we are entering the unknown past and nobody knows what to expect. To be continued...

What we have done today:
1. Drilling and core logging. Drillers depth: 2228.81 m. Loggers depth: 2244.01 m.
2. Processed deep ice cores to depth 2188.45 m.
3. CFA measurements. 16.5 m. Final depth: 1815.55 m.
4. Resupplied and documented cooks freezer.

Weather: Overcast during the day, clearing up in the evening. Temp. -8 °C to -4 °C, wind 4-8 knots from S.

FL, Anders Svensson

2010-06-26

Documenting and communicating NEEM

The number of cooks is rapidly increasing at NEEM.

Back in the early nineteen's professor Willi Dansgaard documented the GRIP ice core drilling project in his legendary movie 'The Saga of the Ice'. It's a lot of fun to watch that movie up here in camp because many of the scenes could just as well have been shot at NEEM. The camp setup, the drilling, core processing and daily life was not that different 20 years ago.
Still, there are also differences: we do, for example, no longer smoke in the science trench (where ppb levels of impurities in the ice are measured). Camp communication with the outer world is now mainly by satellite phone rather than by HF radio and telex as in the last millennium.

This week, two outreach persons from the Niels Bohr Institute, Gertie Skaarup and Torben Andersen, are joining us to produce a documentary of life and science at NEEM 2010. They are lucky to be here just as we drill the Eemian ice. Outreach programs are of vital importance for public awareness and educational purposes, so the camp is supporting our visitors as much as possible without delaying daily work. We look very much forward to see the resulting documentary.

What we have done today:
1. Drilling and core logging Eemian ice. Drillers depth: 2235.67 m. Loggers depth: 2253.95 m.
2. Processed deep ice cores to depth 2203.85 m.
3. CFA measurements. 17.6 m. Final depth: 1833.15 m.
4. Saturday night celebration in an Eemian spirit.

Weather: Clear blue sky. Temp. -8 °C to -4 °C, wind 2-8 knots from SSE.

Ad. 4: We had a lovely dinner prepared by a large number of cooks from many nations, directed and organized mostly by our fake Swedish Belgium participant. Thanks!

FL, Anders Svensson

2010-06-27

On the nightshift

The CFA team on the night shift.

At night, while most of NEEM camp is fast asleep, there is full activity in the heated hut for Continuous Flow Analysis (CFA) in the science trench. Anna, Gideon and Paul start their night shift at 8pm, they have 'lunch break' at 2am in the night and continue working until 8am in the morning, when it is time for Daiana, Liz and Nerilie to take over for the dayshift.

The work consists in preparing 1.1 m long sticks of ice core that are slowly melted on a melt head and analyzed for a large number of constituents. The experimental setup is highly advanced and probably one of the most complex analytical instruments ever put on an ice sheet. The analysis involves separation of the air from the melt water stream, splitting of the water stream in to more than 10 different channels, wet chemistry involving more than 35 chemical reagents and standards, laser scattering, absorption spectroscopy, fluorescence detection, gas chromatography and fast ion chromatography.

The result of the analysis are among others continuous high-resolution records of insoluble dust, black carbon, ionic concentrations of sodium, calcium, ammonium, sulphate and nitrate as well as discrete analysis of methane gas concentrations. Along with this, discrete samples are taken for a number of other impurity studies not analyzed in the field. Furthermore, continuous streams of water and gas from air bubbles are lead to an adjacent hut where they are analysed for among others water isotopic composition and gas concentrations, but that's a different story.

In between measurements, there is a protocol for standard calibrations and maintenance that occupies the crew for about 30% percent of the working hours. The production of one nights work is typically 10 m of ice. In this perspective, a 2.5 km ice core is rather long.

What we have done today:
1. Drilling and core logging Eemian ice. Driller's depth: 2254.36 m. Logger's depth: 2272.60 m.
2. Processed deep ice cores to depth 2214.85 m.
3. CFA calibration and maintenance.
4. Preparing skiway for flight mission scheduled for Tuesday.

Weather: Clear blue sky during daytime; at midnight a front came in with complete cloud cover and winds up to 15 knots from SE. Temp. -15 ºC to -6 ºC.

Ad 1: Report from yesterday: We drilled more ice cores today. We tried a configuration with the closed hallow shaft that placed the rings 4.5 meters apart so it somewhat imitated NGRIP. The lowest ring was 18 cm above the pump, the other 4.5 m above that. So far, so good. We did three nice runs over 3.4 meters at 2.6 to 2.9 mm pitch with good chip recovery on the short Saturday.

And on Sunday the good drilling continued. We had four runs with about 3.4 meters or more and a final one that was shorter (1.65 m) due to a disengaged pump. All runs were done with the closed hallow shaft with the 4.5 meter spacing between centering rings. It appears we have again found a more or less stable mode for the moment. The drill teams will enjoy one more day together on Monday before the expected crew change on Tuesday.

FL, Anders Svensson

2010-06-28

Goodbye and hello

Cheers! NEEM participants from five nations.

If weather allows we get another flight mission tomorrow where 19 persons leave NEEM and 14 new arrive. Those exchanges of personnel are at the same time exciting and challenging both professionally and psychologically. In the closed camp society one fast gets to learn each other and get into a working routine. When suddenly half the camp population is replaced, new people arrive with different habits and ideas and the entire camp changes in a way.

It's very important that the working experience that builds up in camp during the season is transferred from one team to the next. Therefore, a carefully thought manning plan has been prepared, which ensures a smooth exchange of personnel within each area of expertise. One of the great pleasures about the field work is that so many sympatric and skilful colleagues participate in the project often year after year. That creates a good mood. Another fun thing about the project is the international environment that often becomes a source of inspiration and afterthought.

What we have done today:

1. Drilling and core logging Eemian ice. Driller's depth: 2270.01 m (run #800). Logger's depth: 2286.27 m.
2. Processed deep ice cores. 27.5 m. Final depth 2242.35 m.
3. CFA measurements. 23.1 m. Final depth: 1856.25 m.
4. Packing ice core boxes and cargo for flight mission scheduled for tomorrow morning.

Weather: Overcast all day. Poor contrast, but good visibility. Small snow showers. Wind decreasing to 3 kt at night. Temp. -10 ºC to -5 ºC.

FL, Anders Svensson

2010-06-29

How old is the ice?

A very rare visitor came to NEEM today - a falcon.

Due to very high temperatures up to -1.5 °C in the morning we had to cancel today's flight. There will be a new attempt tomorrow.

Today the NEEM drilling passed 2300m depth and everyone is very excited to know how old the deep ice is. Already the freshly drilled core gives a hint about in which climate the snow was deposited. In cold climates, such as a glacial period, the ice contains high concentrations of dust and other impurities which are often seen in the ice as 'cloudy bands'. The freshly drilled ice is completely transparent, indicating that we are now drilling the Eemian interglacial ice.
Another climate proxy is the ice crystal size, which is related to both the impurity content and the temperature history of the ice. In the ice drilled over the last days we've occasionally seen ice crystals that are several cm across, which is also indicating that we are drilling in warm low-impurity ice.
The next climate indicator we get from the DEP and ECM measurements, which are measures of the dielectric properties and the conductivity of the ice, respectively. Comparison of those profiles to the corresponding profiles from the NGRIP ice core shows that we are now in the Eemian.
Probably the most robust climate indicator we get from the water isotopic composition of the ice which is measured in camp some days after the core is drilled.

We're now watching out for changes in those indicators to see if we'll reach Termination II or the onset of the Eemian which is estimated from marine cores and Chinese stalagmites to have an age of about 129,000 before present.

What we have done today:
1. Drilling and core logging Eemian ice. Driller's depth: 2282.25 m. Logger's depth: 2301.79 m.
2. Processed deep ice cores. 11.0 m. Final depth 2253.35 m.
3. CFA measurements. 22.0 m. Final depth: 1878.25 m.
4. Adjusted weather station wind direction indicator.
5. Grooming skiway.

Ad. 4: The direction of Davis weather station anemometer was checked by compass and found to be slightly offset. The direction was adjusted by approx. 15 deg. to make the anemometer point true north. It is now fixed in that direction.

Weather: Overcast with light snow showers in the morning, but clearing up during the day and clear blue sky at night. In the morning absolutely no wind and temperatures up to -1.5 °C. In the evening, wind is 9 kt from ESE and temperature is -13 °C.

FL, Anders Svensson

2010-06-30

Flight logistics

The falcon is still at NEEM. Here a falcon watcher.

Today we had a successful flight mission and exchange of personnel. The plane, Skier 92, had some delay due to a thick fog in Sønderstrømfjord (SFJ), but it finally took off at 10 am and arrived at NEEM shortly after noon. The skier brought in 14 passengers, drill liquid and a shallow drill that will be used to drill shorter cores.

The skier should leave with 19 passengers and was loaded with ice core boxes and cargo. Because of the bad weather conditions in SFJ the plane was scheduled to go back to SFJ via Thule. However, an updated weather forecast showed that weather had also turned bad in Thule. Now the situation became complicated because the plane did not have enough fuel to go to more distant airports and we could not fuel the plane in camp. While this was sorted out camp had 60 persons for lunch that were well catered by several experienced cooks and dishwashers. The solution was to redirect the plane to the Summit camp in Central Greenland, which had good weather and a fuel deposit and stay there until weather improved in SFJ.
By 21 pm the Skier was back in SFJ and the ice core boxes were safely stored in a freezer.

What we have done today:
1. Drilling and core logging. Driller's depth: 2303.08 m. Logger's depth: 2322.16 m.
2. No ice core processing today.
3. CFA measurements. 19.8 m. Final depth: 1898.05 m.
4. Receiving Skier 92.

Weather: Clear blue sky, wind 4-10 kt from ESE, temperatures -16 °C to -8 °C.

Assisting FL, Anders Svensson

July.

2010-07-01

Keeping the ice core cold

Midnight after a beautiful summer day

Summer has come to NEEM and we enjoy the lovely weather drinking coffee outside or taking a hike. The warm summer temperatures do, however, have a major drawback for our project: The trenches where ice cores are drilled and processes are heating up and the ice is getting too warm. Certainly the ice is not melting, but when temperatures are approaching -10 °C or so, certain physical properties of the ice begin to change relatively fast.

The main issue is the gasses in the ice which start to diffuse out of the ice core when they are stored in a too warm environment for too long. To counteract this problem cooling tunnels are dug onto the sides of the trenches from which cold air from the surrounding firn is sucked in. The irony about it is that the currently drilled ice is actually rather warm down in the ice sheet. That's due to the geothermal heat that brings the basal ice close to the pressure melting point. Within the ice sheet, however, the gasses can of course not escape even if it is varm. To make things complicated, the ice core is actually rather cold when it is taken out of the drill. That is because the drill is passing though the ice from the last glacial period which is still preserving the cold temperatures.

A solution to the problem would be to have active cooling of the trenches. Somehow, however, it just doesn't seem right to install a deep freezer in the middle of the Greenland ice sheet.

What we have done today:
1. Drilling and core logging ice. Driller's depth: 2320.44 m.
2. Processed deep ice cores. 22.55 m. Final depth 2275.90 m.
3. CFA measurements. 17.60 m. Final depth: 1895.85 m.

Ad. 1: Drillers report, Thursday 1-7-2010.
Since last Sunday the drilling has been quite stable, most runs deliver 3 m to 3.5 m long cores. The drilling current is typical from 8 amp to 10 amp, the pitch is typical 2.7 mm, the inclination is slightly increasing, being 4.4 deg now in spite of 5 kg to 8 kg negative cutter load. Having increased the strength of the pump springs by 50% on the one piece shaft reduced the current by 1.5 amp. The core breaks have mainly been from 1400 kg to 1600 kg, slight modification on the core dogs seems to have lowered the breaks down to 1100 kg.

A few runs have been troubled by not recovering the core (even by the core dogs groowing through the entire core), by disengaged pump and computer break down. All problems have been taken care of. The stable drilling is clearly due to moving the center rings from the middle of the hollow shafts up 1.3 m which gives 4.5 m free space for the chips. The 1.1 m long upper part of the chips chamber is chips free after each run. It might be a good option to remove the upper rings at all. The chips recovery is from 19 kg to 23 kg per standard run.

The chips are quite coarse in the large crystal Eemian ice. Daily production has been around 17 m.

Drillers Trevor, HC and Roman left camp Thursday.
Drillers (Sigfus, Steff (drill mechanic),Torbjorn, Seb, JiWong, Olivier and Fernando).

Weather: Beautiful day with clear blue sky, low winds from SE and temperatures -18 °C to -7 °C.

Assisting FL, Anders Svensson

2010-07-02

A perfect camp

Kiting in the good weather

The new team has now settled in and the camp is just perfect. Drilling is going super, processing is just chewing through the ice, CFA has never been faster, the surface is superb maintained and the cooks produce miracles. On top of this the weather is wonderful. Too much?? Well wish you could have a look!

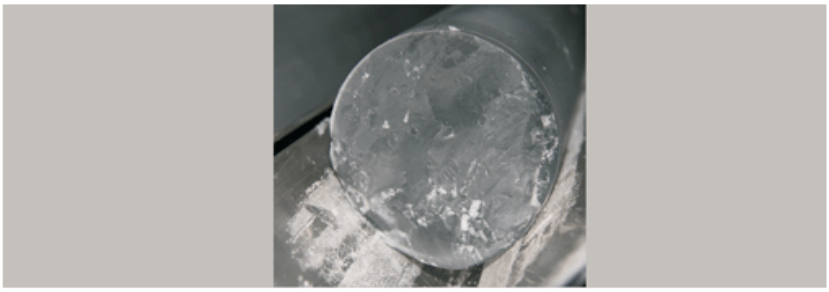
As the summer temperatures are warming we need to start the cooling tunnels to keep the core buffer below -20 °C and the icebox storage below -24 °C. Efforts are being put into cooling the drill trench and the science trench too. The temperature at the bottom of the borehole is now believed to be around -8 °C and we are hoping the stable drill mode with cores with a length around 3 m can continue in the warm basal ice.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Worked on keeping the science and drill trenches cold.
5. Moved excess core troughs to garage.
6. Chopped 4 cm of supporting roof beam to allow drill tower to tip.

Drilling: 10.27 m, drillers depth: 2330.71 m
Logging: 10.37m, loggers depth: 2345.96 m
Processing: bag 4138-4177 (21.45 m), 2297.35 m
CFA: bag 3475-3515 (22.55 m) 1933.25 m

Weather: Beautiful day with clear blue sky and low winds (4 kn) from ESE.
Temperatures: -18 °C to -6 °C.

FL's Dorthe Dahl-Jensen and Anders Svensson



Big ice crystals in ice core break

2010-07-03

Studying the physical properties of ice

Ilka and Jerome are preparing thin sections of ice for ice crystal studies.

Ice core climate records such as temperature proxies, past greenhouse gas concentrations and the impurity content of the ice are the main focus of ice core studies. Besides those, a whole range of properties of the ice itself are also being investigated and a section of the ice core is dedicated to those analyses.

An example is the study of ice crystal dynamics, i.e. how ice sheet ice crystals form, grow, deform, interact and orient themselves as ice layers sink into the ice sheet. The ice crystal information helps to determine the ice flow at the drilling site, which again is applied in ice sheet models to learn how ice sheets react to climate change. Ice crystal studies are also used to investigate how well the ice core stratigraphy is preserved in the deepest part of the core. Another study is concerned with the transformation of snow into firn and the compression of firn into ice. In this process the air bubbles are formed and a thorough understanding of this mechanism is needed in order to make the proper interpretation of the Greenhouse gas records.

At NEEM the ice core physical property studies take place in the deepest part of the science trench, in 'Sepp's Cave', where little ice samples are studied in great detail by microscopes, scanners and fabric analyzers. There is still a lot to be learned about one of the most common materials on Earth.

Drilling: 11.65 m, drillers depth: 2342.36 m.
Logging: 12.72 m, loggers depth: 2358.68 m.
Processing: bag 4178-4217 (22.00 m) 2319.35 m.
CFA: bag 3516-3545 (16.50 m) 1949.75 m.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Cleaned up camp for computer viruses.
5. Enjoyed a lovely German dinner with an Ecuadorian touch.

Weather: Just like yesterday, it has been a beautiful day with clear blue sky, low winds (8 kn) from S and temperatures -18 ºC to -6 ºC.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-04

What kind of ice are we drilling?

Outdoor table tennis. It must be summer time.

Everyone involved with the NEEM project is of course extremely excited to know what kind of ice that is being drilled these days. At this point it is very like that we have ice from the Eemian period. This is based on high oxygen isotope values, large ice crystals and high ECM values. At the same time it is certain that the NEEM record looks quite different from the NGRIP record, which is thought to be undisturbed all the way to bedrock. This we can see from synchronization and comparison of the various records from the two cores.

Right now, we simply don't know the reason for the dissimilarities of the two ice core records. It may be that they are 'true' differences caused by the different drill site locations, local changes in the height of the ice sheet during the Eemian, changes in the position of ice divides, changes in past accumulation patterns etc. There is of course also the possibility that the layering is somehow disturbed in this deep part of the NEEM core like it was the case for the GRIP and GRIP2 ice cores. At this point, we can say nothing for certain.

Drilling: 7.24 m, drillers depth: 2349.60 m.
Logging: 7.27 m, loggers depth: 2365.95 m.
Processing: bag 4218-4249 (17.60 m) 2336.95 m.
CFA: bag 3546-3549 (2.20 m) 1951.95 m.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Making inventory of drill liquid and ice core boxes.

Weather: Still summer time up here. Clear blue sky, low winds from SE and temperatures -16 °C to -5 °C.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-05

Drilling the 'warm ice'

Paul's birthday celebrated today with nice cake and something Austral-Italian.

The ice core currently retrieved at NEEM is 'warm' in two ways: Most likely it is deposited in a climatically warm period, so it is 'warm' in its water isotopic composition. The actual temperature of the ice at the bottom of the borehole is also 'warm', probably around -7 °C, due to the geothermal heat flux that heats the ice sheet from below.

Both types of warm conditions favour large ice crystals, which generally makes it more difficult to break the core when the drill is pulled up. Just today there was a hard core break and large crystal boundaries are clearly visible in most core breaks. Ice close to the pressure melting point can also lead to melting at the drill head due to friction heat, which - in worst case - can get the drill stuck (let it never happen!). Other potential troubles the drillers may face are non-engaging core catchers (the knives that breaks the core when the drill is pulled up) that leaves the ice core at the bottom when the drill goes up and ice packing on the 'shoes' below the knives so that the drill does not penetrate the ice.

In general, however, the drilling is progressing very well, the ice core quality is excellent and the drilled cores are normally 3+ m long, so we cross our fingers that it will continue like that all the way to bedrock, which is expected in approximately 160 m.

Drilling: 14.41 m, drillers depth: 2364.01 m.
Logging: 14.20 m, loggers depth: 2380.15 m.
Processing: bag 4250-4313 (35.20 m) 2372.15 m.
CFA: bag 3550-3589 (22.00 m) 1973.95 m.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Maintained Pistenbully.
5. Moved 2nd core buffer forward.
6. Put up tent on small trench elevator.

Weather: Clear blue sky, low winds from SE and temperatures -16 °C to -5 °C.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-06

Comfortable life

Skier on the prepared trail

It is a week since the last mission to camp and the camp is falling into routine. Life is very comfortable with blue sky and low wind. Tim has used the Pisten Bully to prepare skiing and walking trail and this is much enjoyed especially in the evening after a good sauna.

Drilling: 10.26 m, drillers depth: 2396.25 m.
Logging: 16.10 m, loggers depth: 2396.25 m.
Processing: bag 1191-1232 (23.10 m), 654.50-677.60 m.
CFA: bag 3590-3621 (17.60 m), 1991.55 m.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Short generator maintenance.
5. Enjoyed the prepared camp trails.
6. Enlarges the holes under the outdoor toilets.

Ad. 2: The science trench has caught up with the drillers and we will use a week processing the brittle ice from the core buffer. A change from 2 bag to 3 bag systems and new boxes - quite an intelligence test! 23 m of ice processed the first day is outstanding.

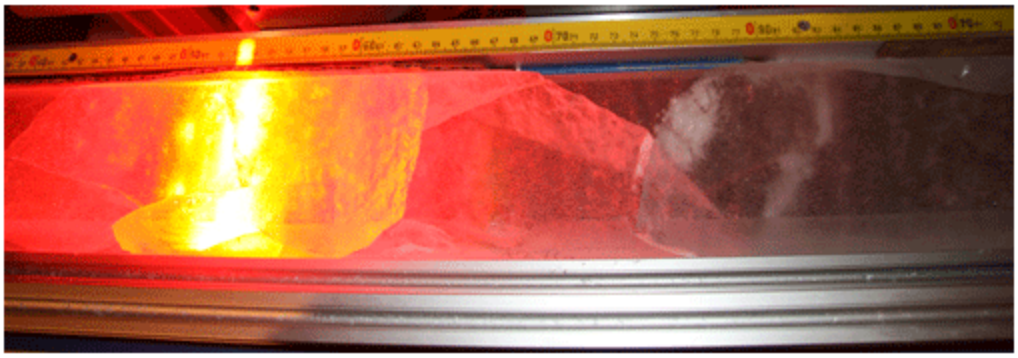
Ad. 3: Discussions have started on the hack time for the packing down of the CFA lab.

Weather: Ground fog in the morning, rest of the day clear blue sky, low winds from ESE and temperatures -16 °C to -5 °C.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-07

Processing the brittle ice



Brittle ice on fire in the line scanner. The internal breaks in the core are clearly visible.

As the ice core processing is progressing faster than the ice core drilling, the processing line yesterday shifted back to process some of the Holocene brittle ice that has been stored at NEEM since last year. This section of the ice core is full of breaks and cracks due to released air bubbles that were under high pressure in the ice.

The brittle ice covers several thousands of years of the Holocene period and special care is taken to process this ice in order to maintain as many continuous records as possible. The many breaks do, however, put limitations on some measurements, such as the CFA analysis that can only be performed on ice with no cracks. Therefore all breaks have to be removed before analysis and some sections will have to be skipped.

The records that are obtained will, however, be the first Greenland Holocene CFA profile obtained ever. It will be a very strong data set as it will describe many different climate proxies in sub-annual resolution. A valuable dataset that does require some patience from the ice core processors.

Drilling: 12.17 m, drillers depth: 2386.44 m.
Logging: 7.11 m, loggers depth: 2403.36 m.
Processing: bag 1233-1270 (20.90 m), 698.50 m.
CFA: bag 3622-3661 (22.00 m), 2013.55 m.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. New artistic staircase to main Dome.

Weather: Clear blue sky, low winds from SE and temperatures -16 °C to -6 °C.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-08

A NEEM science meeting

Tim on his birthday skiing in the beautiful weather.

Today a 'science meeting' was held in camp where many of the available NEEM profiles were presented in preliminary versions. Due to the many online analyses performed in camp and impressive amount of profiles were presented: Model results of the Greenland ice sheet evolution based on the newest NEEM data, methane gas concentrations of the glacial period in unprecedented resolution, bag-mean water isotopes, DEP, ECM and linescan intensity profiles, as well as fabric and grain size results from selected depths.

The big question is of course what to think about the deepest part of the ice core, but it is difficult to be conclusive at this stage.

Drilling: 8.08 m, drillers depth: 2394.52 m.
Logging: 7.43 m, loggers depth: 2410.79 m.
Processing: bag 1271-1319 (25.30 m), 723.80 m.
CFA: bag 3662-3697 (19.80 m), 2033.35 m.

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Celebrating Tim's 50 years birthday.
5. Having a science meeting.

Weather: Clear blue sky, winds around 10 knots from SSE and temperatures -17 °C to -6 °C.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-09

The NEEM post office

Still summer time at NEEM.

Although many analyses of the ice core are made at NEEM, most of the core is actually split into samples that are packed in ice core boxes and shipped to different labs for analysis. Discrete sampling is made for among others stable water isotopes, gas analyses, cosmogenic isotopes, dust and trace elements, and physical property studies. The gas sampling program is a case of its own as the gas piece is sub-sampled and distributed to 10 different labs according to a cutting scheme as complicated and detailed as a Swiss train time table. The hundreds of ice core boxes that are stuffed with thousands of ice core pieces and samples during the season have final destinations in South Korea, China, Japan, Australia, and several locations in the US and Europe. It's a busy post office.

Drilling: 7.78 m, drillers depth: 2402.30 m
Logging: 7.82 m, loggers depth: 2418.61 m
Processing: bag 1320-1359 (22.00 m) 723.80 m
CFA: bag 3698-3737 (22.00 m) 2055.35 m

What we have done today:

1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Making orders for next flight period in 10 days
5. Preparing ice bar and pancakes for tomorrow

Ad 1. Drilling has been slowing down over the last days, as it has generally been difficult to produce long cores. Possibly a sign of warm ice. This evening, however, two long cores were drilled, and the chips appear different from previous runs, so let's see what tomorrow brings.

Weather: Clear blue sky, winds up to 10 knots from SSE and temperatures -15°C to -5°C.

FLs Dorthe Dahl-Jensen and Anders Svensson

2010-07-10

The most fantastic ice bar

The snow bar opens on Saturday night.

Saturday in camp again. During the last days an ice bar has been prepared with a polar bear, shelves for the bottles and seats for the guests. On top of the bar frozen ice hands. The beach bar opened today at 19:30 and the safety was maintained by an Australian life guard. The dinner was prepared by Jean Louis, Jerome, Corentin and Gerko and was absolutely outstanding. THANKS.

Drilling and science has been going well today. The science trench is reaching into the very brittle ice and each core is a puzzle to sample. There are however big undisturbed pieces that can be used for CFA and gas sampling.

Drilling: 9.61 m, drillers depth: 2411.91 m
Logging: 9.12 m, loggers depth: 2427.73 m
Processing: bag 1360-1393 (18.70 m) 766.15 m
CFA: bag 3738-3769 (17.6 m) 2072.95 m

What we have done today:

1. Drilling and core logging ice.
2. Processed deep ice cores.
3. CFA measurements.
4. Replaced Iridium OpenPort antenna on top of Main Dome.
5. Maintenance of main generator at 4pm.
6. Saturday night, ice bar…

Ad. 1. Fishing for core catcher spring in the morning…

Ad. 4. Friday night camp lost the Iridium e-mail connection as there was no communication between the BDE unit in office and the ADE antenna on the roof (status LED flashing red). Saturday morning we replaced the SIM card, the BDE unit, the cable between BDE and ADE, and finally the ADE antenna, which caused the problem. We're now back to the previous configuration, except for the replaced antenna, and the communication is working as before.

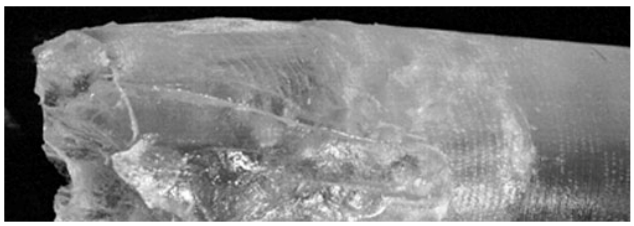
Weather: Clear blue sky, winds up to 6 knots from SSE and temperatures -15°C to -5°C.

Field leaders Dorthe Dahl-Jensen and Anders Svensson.

Anna, Lizzie and Fernando – and the snow polar bear behind – really make the NEEM beach bar unique!

2010-07-11

A stuck drill



The bottom of the core pulled free with the help of glycol.

Since Friday night drilling has been progressing well with most runs retrieving cores of 2 m or more. After several standard runs this Sunday, the drill did, however, get stuck at the bottom of the bore hole at around 19 h. A pull in the cable of up to 2400 kg did not free the drill.

This is the first time the drill got stuck at NEEM, but at the NGRIP site the drill got stuck in the deep warm ice several times (most frequently on Sundays), and a technique to free the drill without damaging the borehole or the ice core has been developed. At 21.15 h 2.3 kg of frozen 'glycol pills' where dropped in the hole. Those pills sink to the bottom of the hole where they melt and dissolve ice around the drill head. A high tension is kept in the cable to ease loosening. At 23.37 h the tension in the cable lowered and the drill was free. At surface, the effect of the glycol is seen on the core break.

An exciting Sunday evening that gave us a warning of the troubles the drilling may face in the coming weeks.

Drilling: 9.04 m, drillers depth: 2420.95 m
Logging: 10.00 m, loggers depth: 2437.73 m
Processing: bag 1394-1410 (9.35 m) 775.50 m

What we have done today:
1. Drilling and logging.
2. Processed deep ice cores.
3. CFA maintenance and calibration.
4. Maintainance on all Picarros and the surface vapour sampling equipment.
5. Inspection of skiway.
6. Preparation of food order lists.

Ad 1. At 20:00 it was not possible to break the core after drilling a core. We pulled with 2400kg without luck. The tension was slacked to 2200 kg and at 21:00 2.3 kg of frozen glycol pellets were dropped down the hole. The frozen glycol melts at -16 °C and thus passed most of the -28 °C cold borehole without melting. We believe the temperature at the bottom of the borehole is around -5 °C and these warm temperatures cause the glycol pellets to melt and act. At 23:37 just when the Sunday movie ended the drill slipped and was pulled to the surface. Why does the drill always get stuck on Sundays?? (written by Dorthe – a more professional story may follow in a few days)

Ad 4. Several of the Picarro's also decided to respect Sunday rest and the whole day was used on repairs.

Ad 5. After 10 days of clear blue sky the skiway is so hard that you barely can see foot prints on surface.

Ad 6. Rene and Lizzie worked hard on preparing the food order for the last month. The SYSCO food lists are quite a challenge the first time you order.

Weather: Clear blue sky, winds up to 8 knots from SSE and temperatures -16 °C to -7 °C .

FL's Dorthe Dahl-Jensen and Anders Svensson

The volley game from Saturday continues...

2010-07-12

The grey processers

The ice core processers are grey of exhaustion processing the worst part of the brittle ice.

The ice core processers are really struggling to cut samples from the very brittle ice. Every core is a puzzle and the internal breaks fracture when the core is cut. All extra hands in the camp help and the daily production is kept high. A salute to the brave team!!

The deep borehole is cleaned from ice chips with a filter and after dinner the first ice cores are produced. We can see the effect of the ice eating glycol but due to the small amount of added glycol the damage is limited. We hope to be back in a good production mode tomorrow.

Drilling: 0.0 m, drillers depth: 2420.95 m
Logging: 0.0 m, loggers depth: 2437.73 m
Processing: bag 1411-1450 (22.0 m) 797.50m
CFA: bag 3770-3813 (24.2m), CFA depth 2097.15m

What we have done today:
1. Filtering borehole and changing drill head to a smaller pitch.
2. Processed deep ice cores.
3. CFA measurements.
4. Assembling DK 3 inch shallow drill.
5. Repacking gas samples to stop sample distribution at 200m depth.
6. Preparation of food order lists

Ad 1. 2 filter runs only gave 3 kg of ice chips. (written by Dorthe. A more professional story might follow tomorrow).

Weather: Clear blue sky, winds up to 8 knots from SSE and temperatures -16°C to -7°C. At 22:00 clouds rolled in.

FL's Dorthe Dahl-Jensen and Anders Svensson

The glycol core is now fitted to the next core (drilled after 19:00). It is amazing that it is possible to fit the cores as well as it is done.

2010-07-13

On track

The core barrel with a freshly drilled core from 2444 m depth is pulled out of the drill. It appears that the ice crystals are smaller than they've been over the last weeks.

After the drill got stuck on Sunday and part of Monday was used to filter the borehole, it is nice to see freshly drilled ice core in the drill trench again today. Most core breaks require rather hard pulling in the cable, and the cores are somewhat shorter than a couple of weeks ago, but with an estimated 100 m to bedrock, every drilled meter counts.

The processing line is still struggling with the Holocene brittle ice but it is planned to swap to process deep ice core again later this week. We are all excited to see what is hiding in the deep and unexplored ice. The CFA team is at full speed and has broken its own record with processing of 24.2 m ice core two days in a row.

At surface, a new 4 m deep outdoor toilet has been dug, so it seems that nothing can stop us now.

Drilling: 7.31 m, drillers depth: 2428.26 m
Logging: 6.52 m, loggers depth: 2444.25 m
Processing: bag 1451-1488 (22.0 m) 818.40 m
CFA: bag 3770-3813 (24.2m), cfa depth 2121.35 m

What we have done today:
1. Drilling and core logging ice.
2. Processed Holocene brittle ice cores.
3. CFA measurements.
4. Extended outdoor toilets.

Ad 1. Drillers report July 13
Once in a while we had an annoying problem leaving the core at bottom.
Adding the third core dog last week solved the problem, the core breaks seemed only to increase a little.
Our main, and increasing problem has been to lose contact suddenly after normal drilling. Chips collected under one of the shoes stop penetration, having drilled from 0.7 to 2.5 m core. By readjusting the drill head on barrel 2 the pitch increased from 2.7 mm to 3.3 mm. This gave several long cores. However, a new problem developed slowly, the rotation stopped suddenly at current limit, 13.2 amps. This seems to be caused by water generated at the drill head in the estimated -5°C ice.
The core in one of these odd runs could not be broken with 2400 kg, 700 kg over a normal break. The winch controller could not hold the tension when we gave slack and the brake was automatically activated generating blue smoke. No error codes were seen on the little screen. 2.3 kg of frozen glycol was dumped in the hole, the drill was free after 2 hours. The pitch was thus reduced back to 2.7 mm, to prevent this to happen again.
Unfortunately the drilling went back to the old mode loosing contact after drilling a short core.
Our next issue is to use only one shoe, which seems not to collect chips and prevent penetration. With this configuration we were able to restart drilling when loosing contact (due to very high pitch). This has never been possible after a short run.

Weather: Mostly overcast, wind has increased to 14 knots from SE and temperatures have been -10°C to -7°C . Pressure is dropping.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-14

Snow, drift, and long ice cores

A 3.2 m long ice core from almost 2450 m depth is ready to be logged by Maggan. Such long cores of the warm ice at this depth are almost more than we can ask for.

Today camp woke up to more windy conditions than we've had for several weeks. It was snowing and as the wind picked up we got some snow drift as well. Temperatures became close to the melting point and we had melting at black surfaces and dripping inside the dome. Because most camp activities take place indoor or in the trenches, we can easily cope with a little snow storm for the moment. Next week is a different story, as several flight missions are planned and we need a well-prepared skiway.

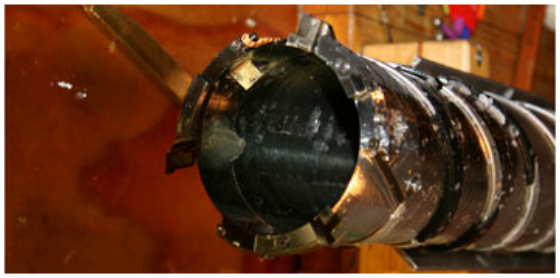
There was very good news from the drill trench this afternoon: Three more than 3 m long ice cores were drilled in a row. The reason for this great improvement in core length was the mounting of a set of special knives, 'step cutters', on the drill head, and, of course, our very experienced crew of drillers. This is most encouraging and we knock on wood that this very productive mode will last.

Drilling: 7.31 m (by 7pm), drillers depth: 2428.26 m
Logging: 6.52 m, loggers depth: 2444.25 m
Processing: bag 1489-1527 (21.45 m) 818.40 m
CFA: bag 3858-3897 (22.00 m), CFA depth 2143.35 m

What we have done today:
1. Drilling and core logging ice.
2. Processed Holocene brittle ice cores.
3. CFA measurements.
4. Emptying and collecting ice core boxes for science trench.
5. Closing holes in tents to avoid indoor drifting.

Weather: A windy day with clouds and snow. The wind has picked up during the day and is at 22 knots in the evening, occasionally up to 27 knots; the direction has turned from SE to SW. The new snow is drifting. Temperatures have been high ranging from -10°C to -3°C .

FL's Dorthe Dahl-Jensen and Anders Svensson



The Swiss 'step cutters' that were modified by Steff in camp can do the job of drilling the warm ice.

2010-07-15

More wind, more snow, much more ice core, and a birthday

A lot of drifting snow in camp today.

Today the snow storm increased and we had wind speeds of up to 28 knots and drifting snow in 5 m height. Meter high snow dunes have formed around major constructions and as there is almost no contrast people are tumbling their way on the short pathway between the Dome and the trenches. The wind appears to be decreasing in the evening.

The good drill mode from yesterday evening has indeed continued with 7 runs retrieving cores of 3.2-3.5 m length and a daily production of incredible 23.71 m - the highest daily productions of this season!

Considering the warm temperatures at the base of the borehole (probably around -5°C) and the troublesome experiences from NGRIP and other drill sites with warm basal ice, the drilling development over the last 24 h is amazing. Bedrock may now be some 65 m away only.

Furthermore, it was Kenji's 40 years birthday today, which was celebrated with a tasty Asian inspired dinner, special 'Japanese flag' and 'sushi' cakes, intercontinental singing, and NEEM drinks.

Kenji preparing a special NEEM drinks after dinner

Drilling: 23.71 m, drillers depth: 2462.29 m
Logging: 23.79 m, loggers depth: 2478.23 m
Processing: bag 1528-1572 (24.75 m) 864.60 m
CFA: bag 3898-3941 (24.20 m), CFA depth 2167.55 m

What we have done today:
1. Drilling and core logging ice.
2. Processed Holocene brittle ice.
3. CFA measurements.
4. Removing drift snow from the small elevator in the science trench.
5. Celebrating Kenji's 40 year birthday.

Weather: A very windy day with fresh snow, snow drift, and low contrast. Wind speed was up to 28 knots from SW during daytime. Temperatures have been dropping from -3°C to -7°C during the last 24h. Wind speed is decreasing and pressure is rising at 12pm.

FL's Dorthe Dahl-Jensen and Anders Svensson

Hello, is there anybody in there? Party ice with bubbles in the drinks.

2010-07-16

Approaching bedrock

With the drilling rapidly approaching bedrock (and a stuck drill last Sunday) the information screen in main dome is watched with great excitement.

Today the snow storm calmed down and we got warm overcast weather. On the surface some of the snow that has piled up around the buildings was removed and preparation of the skiway was initiated for the flights planned for next week.

The drilling is still progressing very well. So well that the base of the ice is likely to be reached within 50 m. Therefore, the drilling was stopped in the late afternoon and a seismic logger (a sonar or a 'pinger') was lowered into the borehole for precise determination of the bedrock depth. The sonar emits an acoustic signal that is reflected by the borehole bottom and by the bedrock/base of the ice. From the travel time in the drill liquid and in the ice, the remaining thickness of the ice can be obtained. By midnight the logger was at the bottom of the borehole, but there were no confirmative conclusions about the ice thickness.

Drilling: 18.21 m, drillers depth: 2480.50 m
Logging: 18.10 m, loggers depth: 2496.33 m
Processing: bag 4314-4366 (29.15 m) 2401.30 m
CFA: bag 3942-3981 (22.00 m), CFA depth 2189.55 m

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice.
3. CFA measurements.
4. Sonar logging of borehole.
5. Removing drift snow from around buildings.
6. Starting to groom skiway.

Weather: Today the wind dropped to a level of 8-10 knots from S. The sun could be seen occasionally but it has mostly been overcast. Temperatures between -5°C and -8°C .

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-17

Borehole logging, 2500 m logger depth, 2200 m CFA depth, and a great Mexican dinner

Nerilie clearly spent too much time in the CFA hut over the last months; here she's gone mad with a big stick. No! We play the Mexican children's game of Pinata in the workshop: the puppet is filled with candy, but to get it, you have to hit the puppet blindfold.

Last night, a second borehole logging was carried out in order to measure the temperature and the pressure at the bottom of the hole. Those values are needed to adjust the liquid pressure with the basal pressure in the borehole. If, namely, there is melt at the base, we would like the basal water to enter the drill hole rather than to drill liquid to flow below the ice. On the other hand, we also would like the basal water not to rise too high into the borehole as it will block the borehole when it freezes.

Due to the many logging activities todays drilling production is somewhat lower than the previous days. Nevertheless, the drilling passed 2500 m logger's depth this afternoon! What a great achievement! The result of the seismic logging last evening was not definitive, but it suggests that bedrock may be some 20 m deeper than the radar prediction of 2545 m.

The CFA team reached their goal of 2200 m depth last night. This depth is in interstadial 24 in the earliest part of the last glacial. The deeper ice and the Holocene brittle ice will be stored at NEEM for CFA processing next season. Altogether, the CFA team has had a very successful season with processing of more than 930 m of Holocene and glacial ice! This implies that there has literally been ice on the CFA melt head some 500 hours over the last months. Congratulations with the impressive production and the great results!

Julia, Lizzie, Tim, and Gunnar prepared a full Mexican Saturday evening treat: Nachos at 7, then Pinata in the workshop (see picture), and three types of enchiladas for main course. Dorthe made a tasty ice cream core for dessert. Que rico!

Drilling: 5.03 m, drillers depth: 2485.53 m
Logging: 4.86 m, loggers depth: 2501.19 m
Processing: bag 4367-4404 (20.90 m) 2422.20 m
CFA: bag 3982-4001 (11.00 m), CFA depth 2200.55 m. Brittle zone bags 2116-2119 also processed.

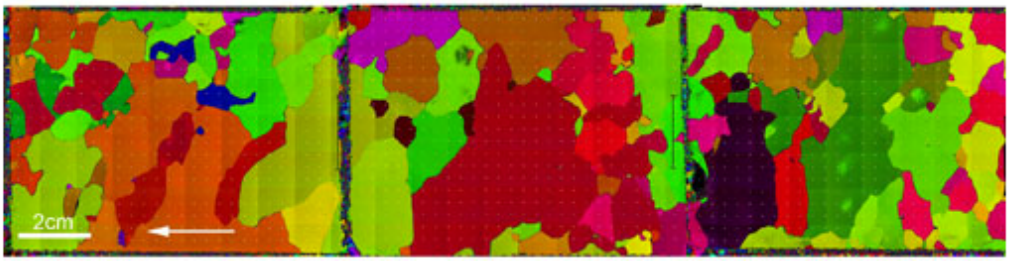
What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice.
3. CFA measurements.
4. Temperature logging of borehole.
5. Enjoying Mexican dinner.

Weather: Unfortunately, the warm windy overcast conditions continue. Wind has been 10-15 knots from SW. Temperatures between -6°C and -8°C.
Occational snow showers. These are not ideal conditions for preparing a skiway.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-18

A quiet Sunday



Large ice crystals in deep NEEM ice at 2364 m depth. The ice crystal outlines are obtained from thin sections of ice core that are held between crossed linear polarizers. The images have artificial coloring that represents crystal orientations. The top of the core points to the left.

A Sunday where drilling has progressed well, with cores of 1-2 m length, processing of the deep ice has been in good progress in the science trench, and the CFA has worked on calibrations and started packing down equipment.

On the surface, the Pistenbully has groomed the skiway and the camp area. With all the snow showers and drifting snow there is a lot of work to be done there. In addition, the shallow drill has been assembled and it was pulled to a new drill location south of camp.

Drilling: 5.98 m, drillers depth: 2491.51 m
Logging: 6.10 m, loggers depth: 2507.29 m
Processing: bag 4405-4434 (16.50 m) 2438.70 m

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice.
3. CFA calibration and packing.
4. Grooming skiway all day.
5. Bringing equipment to shallow drill site S2.

Weather: This morning started out very promising with clear blue sky and low winds from SE. During the day, however, the wind picked up to 18 knots from SW and we have had some snow showers and some snow drift again.
Temperatures from -7 °C to -12 °C and in the evening low broken clouds.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-19

Celebrations

Celebrating 'drillers' 2500 m depth.

Ice core lengths are of course measured in meters. Whenever the drilling, the processing, or the CFA lab passes a round depth, such as 1000 m, it is time for a celebration.

At NEEM we do, however, also measure ice core lengths in 'bags', which are the 55 cm pieces that the ice core is cut into for packing in boxes. Therefore, one can also to celebrate a depth of 1000 bags (550 m) or the processing of 2000 bags in the season.

Today, the drill trench could celebrate 2500 m drilling in cable length – the so-called driller's depth (picture). The driller's depth currently deviates with about 15 m from the logger's depth, which is the 'true' accumulated length of the ice core. The logger's depth of 2500 m was celebrated last Saturday. Today, the science trench celebrated processing of bag 4444.

In this way, almost every day has its smaller or larger celebration. A nice way to make a very long ice core somewhat shorter.

Drilling: 15.83 m, drillers depth: 2507.34 m
Logging: 15.06 m, loggers depth: 2522.38 m
Processing: bag 4435-4480 (25.30 m) 2464.00 m

What we have done today:
1. Drilling and core logging ice.
2. Processed deep ice.
3. CFA calibration and packing.
4. Grooming skiway in the evening.
5. Cleaned up Main Dome.

Weather: During the day, overcast, snow showers, snow drift, wind up to 20 knots from SW, temperatures -7 °C to -10 °C . In the evening, it is clearing somewhat up, there is almost no wind, clouds are broken and temperature is -8 °C .

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-20

A DV visit and crew exchange

Preparations for DV visit

Today we had Distinguished Visitors (DVs) in camp and an exchange of personnel. Skier 93 arrived from Sønderstrømfjord (SFJ) at 12:24 with 40 passengers: 15 new camp participants, 21 DVs, and 4 journalists that will stay in camp for some days. The DVs are a mixture of politicians, university people, journalists, and other NEEM friends.

The plan was that the Skier should go to Thule to pick up fuel for camp, return to NEEM, and then go back to SFJ with ice core boxes and passengers. Due to limited weather conditions the schedule was changed and the Skier went back to SFJ via Thule at 14:54 with 12 NEEM participants and the 21 DVs, leaving a camp population of 39.

Due to this change of plans the DV visit was shortened, camp did not receive fuel, and the ice core boxes could not leave camp. Hopefully, a compensating flight can be arranged over the
coming days. In the evening, we're, however, having another snow storm coming in, so right now it doesn't look promising.

Drilling: 2.39 m, drillers depth: 2509.73 m
Logging: 2.27 m, loggers depth: 2525.65 m
No ice core processing today.

What we have done today:
1. Drilling and core logging ice.
2. CFA calibration and packing.
3. Packing and unpacking ice core box pallet.
4. Receiving Skier 93.
5. Catering and touring visitors around camp.
6. Setting up dome tents in stormy weather.

Weather: Overcast most of the day with wind up to 17 knots from SW and temperatures up to -4 °C . In the evening, the wind is picking up to 25 knots from SSW, we have occasional snowfall and snow drift, temperature is -4 °C , pressure is dropping.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-21

Cooking in the storm

This week without a cook calls for many volunteers in the kitchen – and the food is super! Thanks to all that contribute.

During night the wind picked up to 25 knots and we woke to a stormy morning with the outdoor toilet upside down. The Dome is a warm and cozy building and 3-4 have been busy in the kitchen today cooking excellent meals for us. Most work is in the subsurface trenches and could continue regardless of the weather.

The news of today is that Jakob deployed the sonic logger in the borehole tonight and the data shows that the bedrock still is 65 m away at the depth 2600m. So – bedrock might not be as near as we had hoped. In the science trench the newcomers where introduced to the processing while the cfa team where busy packing.

Drilling: 7.24 m, drillers depth: 2516.97 m
Logging: 7.47 m, loggers depth: 2533.12 m
Processing: 18.15 m (bag 4481-4513), processing depth: 2482.15 m

What we have done today:
1. Drilling and core logging ice.
2. CFA packing.
3. Maintenance of generator
4. Sonic logging.
5. Media filming, photographing and interviewing in camp

Ad 1. The drilling is becoming more difficult with long drill times and shorter ice cores. We drilled ice cores from 0.4 m to 1.7 m using 30 min to 1 hrs to drilling. The drill drills for a while, slips and we can from time to time get the drill to 'bit' again by stopping rotation and waiting a few minutes before restarting the rotations. We believe melt water freezes under the drill shoes and by stopping we let the ice freeze to the bottom. At times we succeed in ripping the ice under the shoes loose when we restart. We decided to try the nano coating of the drill shoes and cutters tomorrow and will do the coating tonight on a clean drill head and let it dry overnight.
We have 1000l of drill liquid left at NEEM. The liquid level needs to be 80m measured with the deep drill when we reach bedrock to give a 0.5 bar underpressure at the bed. Sigfus, Steff and Tobbe left us yesterday and we sorely miss them. Luckily Henry, Simon and Mark have joined us. Alex and Darcy are helping Henry in the workshop while waiting for their NZ drill equipment.

Ad 2. During maintainance an oil leak in the main crank shaft of the generator was discovered. This is serious and might need a 2 day shut down of the generator for repair. The leak and repair possibilities are being investigated by Simon and Sverrir.

Weather: Overcast with wind up to 25 knots from SW and temperatures up to -4 °C. We have snowfall and snow drift, pressure is low.

FL's Dorthe Dahl-Jensen and Anders Svensson

During the storm the outdoor toilet is about to lift

2010-07-22

Reaching basal ice

The first ice core with strong black bands of basal material.

Today the first ice core drilled showed strong bands of basal material. A study of the black material revealed that it mainly was conglomerates of mud. A 4 mm pebble was also found.

This is a sure sign that we are close to bedrock and the excitement at NEEM was big. The event was celebrated at 18:00 with a glass of sparking wine in the drill trench. The drilling continued for the rest of the day and evening recovering quite small cores. The drilling will continue tomorrow.

Drilling: 1.30 m, drillers depth: 2518.27 m
Logging: 1.30 m, loggers depth: 2534.42 m
Processing: 23.65 m (bag 4514-4556), processing depth: 2505.80 m

What we have done today:
1. Drilling and core logging ice.
2. CFA packing.
3. Maintenance of generator
4. Media filming, photographing and interviewing in camp

Ad 1. During the night a nanocoating was applied to the shoes. The step cutters with the nanoshoes where used for the first run. The 70 cm long core had significant amounts of basal material and the cutters and core dogs where severely damaged by the material.

A second drill head with full cutters and asymmetric shoes where used in the second and third run and two small but quite clear ice cores where drilled. In the last run today with the resharpended step cutters an appr. 1 m core was drilled but did not break from the bottom. An attempt was made to recover the ice core with no luck. The pump was dislocated during drilling. There was a lot of basal material between the ice chips so we suspect the ice core has a high content of basal material. Tomorrow a second attempt will be made to recover the core with the shaft #1 and a core barrel with a drill head with full cutters and asymmetric shoes.

Weather: Overcast with wind up to 25 knots from SSW to S and temperatures up to -4 °C . We have snowfall and snow drift, pressure is very low.

FL's Dorthe Dahl-Jensen and Anders Svensson

The NEEM team celebrating the event

2010-07-23

Formula 1 Pit stop for ice core drills

Destroyed ice drill cutter after drilling the ice with mud and pebbles.

The pebbles and mud in the ice wear down the drill cutters and core catchers. Between every run they need to be sharpened. Henry, Alex and Darcy man the driller's workshop and when the drill is on the surface the pit stop starts. The cutters and catchers are repaired or replaced and when done the mechanics disappear into the workshop until the drill surfaces next time. We hope the stock of cutters and catchers will last.

Another very good news today is that the science trench finished processing the deep and old ice. The ice cores with basal material will be cut into bags and packed for transportation.

The science trench is having a double celebration after finishing processing of the deepest ice.

Drilling: 2.73 m, drillers depth: 2521.00 m
Logging: 1.87 m, loggers depth: 2536.29 m
Processing: 28.05 m (bag 4557-4607), Final processing depth: 2533.85 m

What we have done today:
1. Drilling and core logging ice.
2. CFA packing.
3. Grooming of camp area and skiway.
4. Media filming, photographing and interviewing in camp.

Ad 1. The core catchers where observed to be very dull and a run to recover the core standing at the bottom was made with new sharp core catchers and no rotations. A 70 cm core was recovered. Next the step cutters where used to drill further 60-70 cm. We are still trying to catch this approximately 1 m core at the bottom of the borehole.

Weather: Overcast with wind up to 20 knots from SSE to S dropping to no wind at 17:00. The temperature has been from -7 to -4 °C. We have snowfall and snow drift when the wind is high and the pressure is very low.

FL's Dorthe Dahl-Jensen and Anders Svensson

Drilling rocks

Deep rock drilling requires great concentration

Over the last days drilling has been most cumbersome with many broken cutters and several unsuccessful attempts to bring cores to surface. Today a spectacular result of the hard efforts came to surface in the shape of a 5 cm long stone at the side of the core. No wonder that it was a struggle to drill this core. The stone is embedded in a 10 cm wide silty layer, which consist of black and brown particles in the 10-1000 micrometer range.

The science trench processers started the processing of the brittle ice stored in the core buffer again. The ice is badly broken in this zone and has been quite a change from the strong and plastic basal ice.

Drilling: 0.98 m, drillers depth: 2521.98 m
No logging today.
Processing: 8.80 m (bag 1573-1588), processing depth: 873.40 m

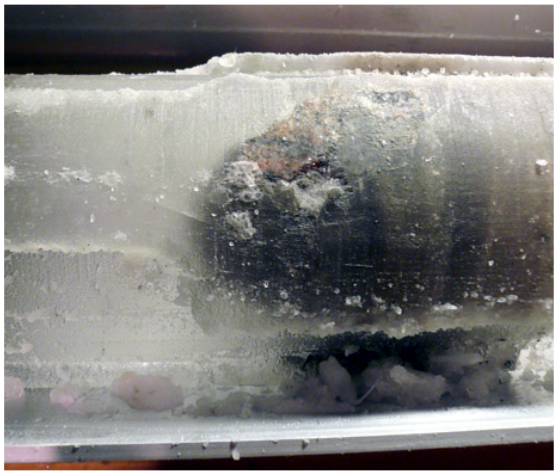
What we have done today:
1. Drilling ice core with rock.
2. CFA packing.
3. Grooming of camp area and skiway.
4. Ice core processing.
5. Media filming, photographing and interviewing in camp.
6. Enjoyed three-course five-star Italian dinner prepared by the CFA team.

Ad 1. The first run today was made with the sharpened step cutters and no core catchers. With some effort we managed to get the cutters to grip and drill a few cm's. The cutters where bady dulled and especially the inner corners where grinded away. In the second run the core catchers where closed with windows in an attempt to let the ice squeezed out in the holes clap the ice core. It was very successfull and we managed to get a 98 cm core up with very high concentration of impurities. Thanks to Steff for the good advise!

We have used 4 drilling attempts including sharpening of the cutters and 3 attempts to pull up the core including sharpening of the catchers before this core was on the surface. We will attempt to use the catchers with windows and good cutters in the next run Sunday morning.

Weather: Today we finally had improving weather conditions. We see the sun again, temperature has dropped to -13 °C at 20:00, wind has decreased to a few knots from SW, and pressure is rising. There are still some clouds around, but it looks promising for a flight mission tomorrow.

FL's Dorthe Dahl-Jensen and Anders Svensson



The 5 cm rock (granite?) embedded in the ice core – did we drill through it?

2010-07-25

Visit by Skier 92

Skier 92 parked on a newly groomed apron in nice cold and sunny weather. Note the 8 propellers on each engine which gives the Skier extra power as compared to the conventional 4-propellar type.

As weather has improved dramatically, we could receive Skier 92 today. The plane arrived with 14 Greenland, Danish and US Science and Education visitors that were given a one hour tour of camp. Camp received fuel and could ship out two pallets of ice core boxes. Intensive grooming yesterday and low night temperatures had hardened the skiway so the plane could take off in first attempt.

In the drill trench the drillers are struggling to penetrate the silty ice and in the science trench the processors are struggling with the brittle ice that appears to go apart more than ever.

Driller's depth: 2521.98 m
Logging: 1.00 m, logger's depth: 2537.29 m
Processing: 6.60 m (bag 1589-1600), processing depth: 880.00 m

What we have done today:
1. Drilling and core logging ice.
2. CFA packing.
3. Processed brittle ice.
4. Receiving Skier 92.
5. Building two ice core pallets.
6. Giving the Science and Education people a tour of camp.

Weather: Blue sky, low temperatures, and low winds all day long. Excellent weather for receiving a Skier. The warmest summertime appears to be over and we have night temperatures down to -20 deg ºC, lowest temperature in two months.

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-26

Sun and ground fog

By midnight, the sun is rather low in the horizon and the ground fog is arriving.

Today we had ground fog and snow in the morning, but later it cleared up and became as nice as yesterday. As the Skier planned for today was cancelled, we had a normal working day with silty ice drilling, brittle ice processing, and pallet building.

The drilling is very difficult as penetration is hampered by the silt in the ice and we have a suspicion of being close to bedrock. A brutal-force technique was applied as a grinder was lowered into the hole to make way through the difficult material. Surprisingly, the next drill run came up with 10 cm of almost clear ice, so we may not be at bedrock yet.

Drilling: 0.10 m, drillers depth: 2522.08 m
Logging: 0.07 m, logger's depth: 2537.36 m
Processing: 24.20 m (bag 1601-1644), processing depth: 904.20 m

What we have done today:
1. Drilling and core logging ice.
2. CFA packing.
3. Processed brittle ice.
4. Building science gear pallet.

Weather: In the morning ground fog and snow, but later mostly blue sky, low winds from S, and temperatures dropping to -20 deg °C at night. After midnight we got ground fog again.

FL's Dorthe Dahl-Jensen and Anders Svensson

PS: Our French readers should have a look in Le Monde tomorrow (27 juilliet, page trois).

2010-07-27

Bedrock!!!

The official termination of the deep drilling project.

After a few runs with no penetration and totally grinded down cutters we made the decision to terminate the deep ice core drilling. We celebrated this with a glass of champagne in the drill trench and every nation present gave a small speech. Later we all went by skidoo to the shallow drill site 3 km from the NEEM camp to enjoy an afternoon of with scones with whipped cream and strawberry jam. We all dressed for a party and had a wonderfull evening with big smiles everywhere. To imagine – it is done!!

No more drilling and logging.
Final logged depth is: 2537.36 m
Processing: 9.90 m (bag 1645-1662), processing depth: 914.10 m

What we have done today:

1. Last drilling attempts.
2. Processed brittle ice.
3. Official termination of drilling.
4. Drilled shallow ice core 2010 S2 to the depth 27 m
5. Tea at the shallow drill site
6. Bedrock party
7. Released the NEEM bedrock press release

CFA team enjoying an afternoon in the fresh snow

Ad.4 the coordinates of the drill site is 77 25.471 N; 51 07.266 W. This 3 inch core is intended for the Swedish Be10 program.

Ad 7. The press release has been submitted to the NEEM-member mailing list. You can also find it here.

Weather: Sunny day with low temperatures down to -20°C at night, low winds from SE. During the night ground fog/low clouds came in.

Tea party at the shallow drill site

FL's Dorthe Dahl-Jensen and Anders Svensson

2010-07-28

Big Skier day

Reflection of Skier 90 in Nevilies sun glasses

After the excitement yesterday it was right back to operations. Skier 90 came to NEEM with 30 passengers – 22 as day visitors. The Skier left for Thule while we spent 4 hours touring our guests in the main dome, the drill and science trenches and the shallow drill site. The guests included a Summit group, 109th press group and NEEM guests.

The skier came back with fuel from Thule and after defueling and loading of 3 pallets and 45 passengers the very heavy skier managed to take off in the third attempt. Well done!

No more drilling and logging.
Final logged depth is: 2537.36 m
No Processing

What we have done today:
1.Received Skier 90 2 times
2. Received 1600 lbs fuel from SFJ and 19.000 lbs from Thule
3. Toured our guests
4. Said goodbye to 23 NEEM's and hello to 8: NEEM population: 23
5. Drilled shallow ice core 2010 S2 to the depth 38 m

Weather: Sunny day with low temperatures down to -16 °C at night and up to -6 °C during day., 10 kt wind from S. During the night ground fog/low clouds came in.

FL Dorthe Dahl-Jensen

NEEM population peaked at 70 today.

2010-07-29

Camp changes gear

Tim repairing the outdoor toilet tents

Yesterdays goodbye to 23 and hello to 8 has changed the activities in camp. The New Zealand team got their drill and they have taken over the carpenters garage to assemble the tower, winch and drill. The DK intermediate winch and the CH elevated tower are being combined in the sauna garage. The camp talk is about screws, bolts, nuts and tipping towers…

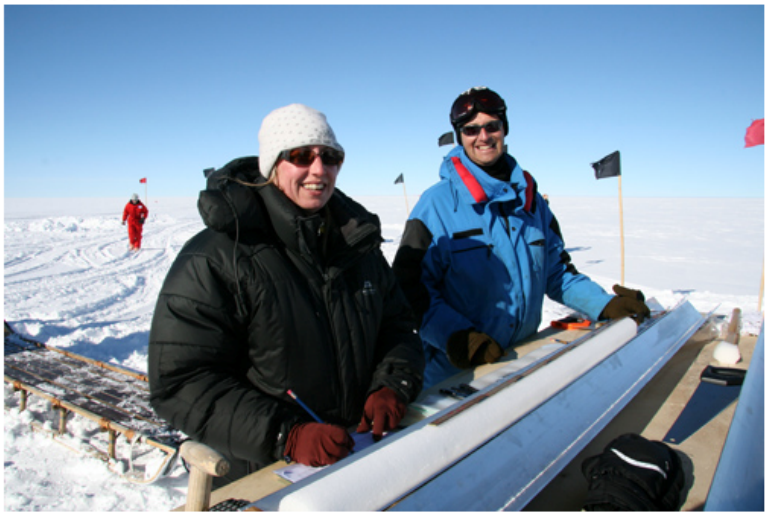
The shallow drilling continues fast and well and the science team struggles with the processing of the very bad brittle ice. Tim used part of the day to repair the outdoor toilet tents with the sewing machine just received in camp.

No more deep drilling and logging.
Final logged depth is: 2537.36 m
Processing: bag 1665-1688 (13.20 m) depth: 928.40m

What we have done today:
1. Drilled shallow ice core 2010 S2 to the depth 66 m
2. Assembling NZ shallow drill
3. Assembling DK intermediate winch and CH elevated tower
4. Filtering deep bore hole for ice chips – only few kg recovered
5. Moving Bryns logging equipment to drill trench
6. Cleaning and making order in the drillers workshop

Weather: Sunny day with between -12 °C and -5 °C. Wind 4-15 kt for SE changing to SW. During night ground fog/low clouds came in.

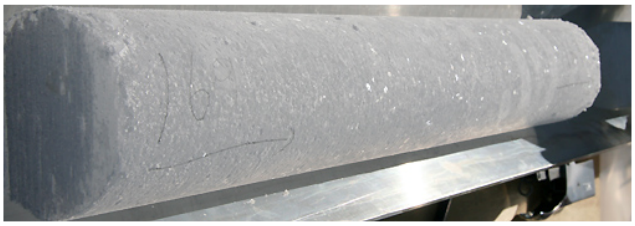
FL Dorthe Dahl-Jensen



Tina and Jerome (who has left camp now) logging the shallow ice cores

2010-07-30

Shallow drilling



The NEEM 2010 S2 shallow ice core bag 169 with crystals sparkling on the surface

The weather has been good and the first shallow ice core NEEM 2010 S2 is reaching it's length of 100m. On the picture is bag 169 (92.40-92.95 m) and the cores are perfect with no breaks of flakes. This shallow ice core is being drilled for the Swedish Be10 program and it will be dated by ECM and stable water isotopes.

After tests of the new DK intermediate winch and the CH elevated tower we will drill a second shallow 3 inch ice core (NEEM 2010 S3). From this core Japan will get 1.5 m for every 8 and the rest will be sampled for Mercury.

The test of the NZ drill starting next week will produce a 4 inch core. The inner 50-60% of this core will be for USA McConnel (NEEM 2010 S1) while the rest has been offered to the French Gas program also requesting ice from a 400m core. The NEEM 2010 S1 core will not reach 400m in 2010 and we plan to continue drilling the ice core in 2011 with the DK HT 4 inch drill. We do not plan to drill further shallow ice cores at NEEM this season.

No more deep drilling and logging.
Final logged depth is: 2537.36 m
Processing: bag 1689-1724 (19.80m) depth: 948.20m

What we have done today:
1. Drilled shallow ice core 2010 S2 to the depth 94 m
2. Assembling NZ shallow drill
3. Assembling DK intermediate winch and CH elevated tower
4. Onset of Bryns logging
5. Cleaning and making order in the drillers workshop

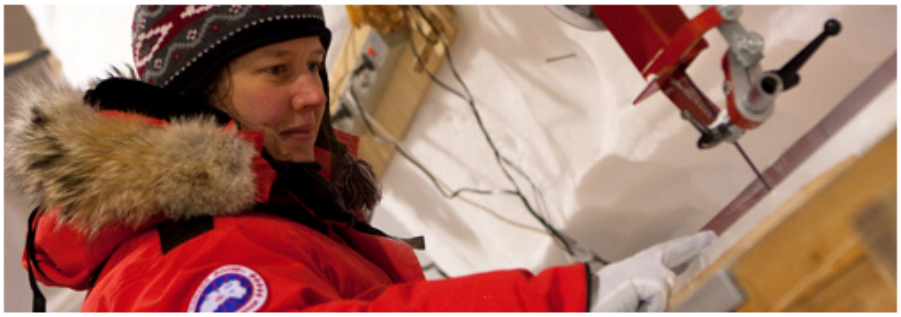
Weather: Sunny day with between -12 deg °C and -5 deg °C. Wind 4-15 kt for SE changing to SW. During night ground fog/low clouds came in.

FL Dorthe Dahl-Jensen

Trevor operating the DK shallow drill

2010-07-31

Saturday and Brittle Ice



Heather cutting the stable water isotope strip of the brittle ice core.

The processing of the brittle ice continues in the science trench. The ice is in many pieces and the processing team are doing a brilliant job in keeping all the pieces together in all the many cutting lines of the ice cores in the science trench. Heather is cutting the strip of for stable water isotope sampling.

At 4pm the shallow drilling the drill assembling and the processing stopped and we prepared for Saturday night. First a Gin and Tonic in Tim's snow cave with party ice from below the finished NEEM 2010 S2 ice core followed by a 'down under barbie' prepared by the Australians and the New Zealanders in camp. A great Saturday night.

No more deep drilling and logging.
Final logged depth is: 2537.36 m
Processing: bag 1725-1748 (13.20m) depth: 961.40m

What we have done today:
1. Drilled shallow ice core 2010 S2 to the depth 100.14 m
2. Assembling NZ shallow drill
3. Assembling DK intermediate winch and CH elevated tower
4. Working on Bryns logger
5. Grooming skiway

Weather: Sunny day with many patches of ground fog. Temperatures between -12 deg °C and -3 deg °C . Wind 3-13 kt for S.

FL Dorthe Dahl-Jensen

One of the worst pieces of brittle ice prepared with a microtoned surface before the ECM measurement

August

2010-08-01

Testing new drills

Alex checking the fit of the core barrels.

The 'orange team' Alex and Darcy from New Zealand are assembling their new drill in the Carpenters workshop. Tanner helps them out as the US drill observer. The work is progressing fine and we assume that we can test the drill in a few days.

In the Sauna garage the 'DK-CH team' Simon and Henry are assembling the elevated tower with the intermediate winch and this system is also nearly ready for testing.

A new phase of camp started today with the building of the winter snow hills for overwintering of the sledges, tanks and generator.

No more deep drilling and logging.
Final logged depth is: 2537.36 m
Processing: bag 1749-1772 (13.20m) depth: 974.60m

What we have done today:
1. Built 4 winter hills of snow
2. Assembling NZ shallow drill
3. Assembling DK intermediate winch and CH elevated tower
4. Working on Bryns logger
5. Processing brittle ice
6. Checked inventory of ice core boxes

Weather: Mostly overcast varying between high and low clouds. Temperatures between -16 °C and -3 °C. Wind 0-9 kt for S.

FL Dorthe Dahl-Jensen

Simon and Henry getting the CH elevated tower and the DK intermediate winch together

Building the winter snow hills – Sverrir's snow castles

2010-08-02

GPS net revisited

Grooming a track for skiing or evening strolls.

Lars started the long skidoo rides to revisit the GPS stakes today. Every year we remeasure the stakes and get to know with what velocity the ice is flowing. The NEEM sites moves 5 m/yr.

The intermediate winch with the elevated tower was tested today outside the Sauna garage and a 1.3 m long ice core was drilled right outside the sauna tent. The science trench rejects the core with reference to a much too high content of human microstructures.

No more deep drilling and logging.
Final logged depth is: 2537.36 m.
Processing: bag 1773-1808 (19.80m) depth: 994.40m.

What we have done today:
1. Measured the inner GPS net.
2. Assembling NZ shallow drill.
3. Assembling DK intermediate winch and CH elevated tower and drilling a sauna ice core:
   Drillers depth: 2.33m
   Loggers depth: 2.37m
   Ice core length: 1.30m
4. Logging with Bryns logger. The winch spills oil and needs a overhaul.
5. Processing brittle ice.
6. Moved part of cargoline to present surface and reduced the amount of cargo to store.

Weather: Overcast varying between high and low clouds. Temperatures between -14 °C and -5 °C. Wind 3-6 kt changing from S to NW.

FL Dorthe Dahl-Jensen

2010-08-03

Bryn's Birthday

Tanner blowing the inclined trench.

Another good and productive day. A 5m deep inclined trench was prepared just behind the mechanic garage for the test of the NZ drill. The brittle ice processors celebrated processing the ice from the depth 1000 m. AND it was Bryn's birthday which was celebrated with a Walsh (we hope) fruitcake and a birthday song after dinner.

No more deep drilling and logging.
Final logged depth is: 2537.36 m.
Processing: bag 1809-1847 (21.45m), depth: 1015.85m.

What we have done today:
1. Measured part of the GPS net further from camp.
2. Assembling NZ shallow drill and made an inclined trench to test the drill.
3. Tested DK intermediate winch and CH elevated tower.
4. Logging with Bryns logger.
5. Processing brittle ice.
6. Celebrated Bryn's birthday.

Weather: Ground fog most of the day. Temperatures between -18 °C and -5 °C. Wind 3-6 kt from S SW.

FL Dorthe Dahl-Jensen

Bryn cutting his birthday cake.

2010-08-04

The NZ intermediate drill comes out of the garage

The Pisten Bully lifting the NZ intermediate drill.

The NZ intermediate drill is ready for a drill test and it is moved to the 5 m deep inclined trench we have prepared for the drill behind the mechanic garage. The Pisten Bully came in handy to lift the drill from the carpenters garage to behind the mechanic garage.

At noon we stopped processing the brittle ice and the afternoon was used packing ice core boxes and preparing for the processing of the NEEM2010 S2 shallow core.

No more deep drilling and logging.
Final logged depth is: 2537.36 m.
Processing: bag 1848-1868 (11.55m), depth: 1027.40 m.

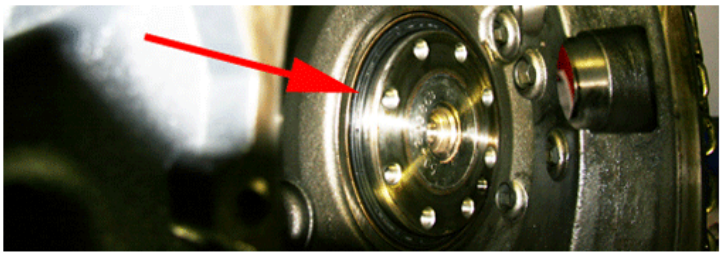
What we have done today:
1. Measured part of the GPS net 60 km from camp.
2. Moved NZ drill to the inclined trench behind mechanic workshop.
3. Trained in disassembling and assembling the DK shallow drill.
4. Logging with Bryns logger.
5. Processing brittle ice until noon.
6. Blowing snow of the science trench and drill trench.

Weather: Clear sunshine. Temperatures between -18 °C and -9 °C. Wind 4-8 kt from SSE.

FL Dorthe Dahl-Jensen

2010-08-05

Generator stop



Picture of the leaking seal in the main generator.

During the last weeks an oil leak has been observed in the very central parts of the generator. The time is correct now for changing the leaking seal (black ring indicated with the red arrow) as the deep drilling is terminated and the good weather together with the end of season tasks allows all to be busy on the surface.
Sverrir, Simon and Tim worked on the generator. The generator needed to be lifted and pulled apart. The space available to do the repair made the task very demanding.

Kasper had prepared a barbeque to keep the power consumption from the main dome kitchen low and the shower, dish washer and washing machine were closed for the day.

The camp was powered with the 12 kVA SDMO generator, the 16 kVA Mase generator and the 4kVA Robin generator. The NZ drill with the 5 kVA Hartz generator and the DK shallow drilling with the 4.5 kVA Honda generator. At 16:10 the generator was online again.

Kasper barbequing hamburgers for lunch.

No more deep drilling and logging.
Final logged depth is: 2537.36 m.
All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099).

What we have done today:
1. Measured the last part of the GPS net close to camp.
2. Connected NZ version of the HT drill to the tower.
3. Drilled the NEEM2010 S3 core to the depth 64.11 m.
4. Logging with Bryns logger.
5. Made a 2 m pit at the shallow drill site.
6. Started to pack the surface vapor sampling equipment.
7. Repaired main generator.

Ad. 3: The bags 13-15; 28-30; 43-45... are packed for S. Fujita while the rest are used sampled for Hg by J.Zheng.

Ad. 5: The pit has been sampled in 2.5 cm resolution for stable water isotopes for the Ice2Sea program and Be10 samples were also taken by Anne Marie.

Weather: Sunshine with some high clouds. Temperatures between -21 °C and -9 °C.
Wind 3-11 kt from S.

FL Dorthe Dahl-Jensen

2010-08-06

High winds stops the shallow drilling

The idyllic shallow drill site before the high winds.

The NEEM2010 S3 core is being drilled at the shallow drill site 3 km from camp. Some cores are taken aside for a dielectric program made by S. Fujita and the rest of the cores are sampled on site for Hg by J. Zheng in the yellow/white tent.

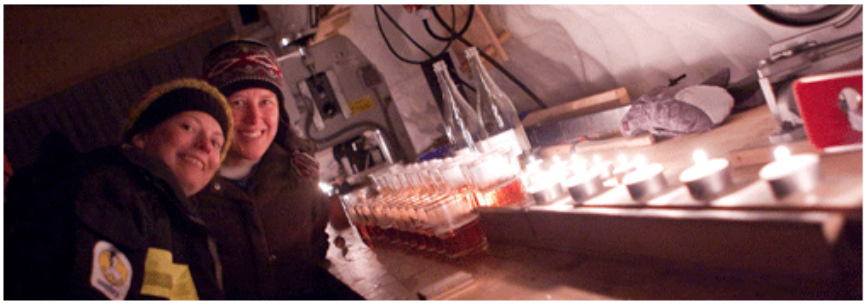
After lunch the wind had picked up to 25 kt and the shallow drilling and sampling was stopped. Later the wind picked further up to 30 kn with gusts up to 40 kt. The camp activities continued mainly inside and in the trenches.

No more deep drilling and logging.
Final logged depth is: 2537.36 m.
All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099).

What we have done today:
1. Measured DEP, ECM and cut stable water isotope samples of NEEM2010S2, bag 3-53.
2. Drilled the first ice cores with the NZ drill at the test site behind the garage.
3. Drilled the NEEM2010 S3 core to the depth 81 m.
4. Logging with Bryns logger.
5. Finished packing the surface vapor sampling equipment.
6. Organizing the carpenters garage for end of season.
7. Removing snow around main dome and weatherports.

Weather: Increasing overcast and snowfall. Temperatures between -18 °C and -6 °C.
Wind 3-30 kt from SW.

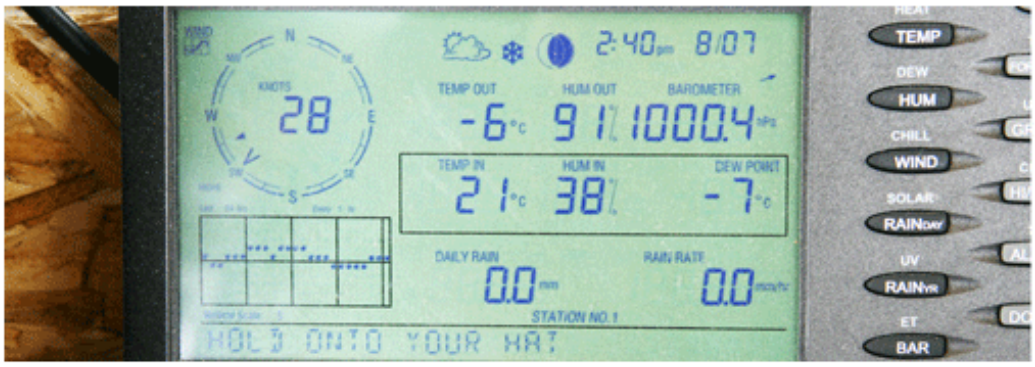
FL Dorthe Dahl-Jensen



Celebrating the end of the brittle ice processing 2010 and the first NZ ice core in the science trench (Thursday evening). Julie and Heather served champagne in candle light.

2010-08-07

Hold onto your hat!



The Davis weather station informs on high winds.

This Saturday morning at 2 am we experienced the highest winds for this season with average wind speeds of 30 kt and high wind speeds (gusts) up to 40 kt. The Davis weatherstation kindly reminds us to hold onto our hats which is also needed!

Surface work was limited and the preparations of curry dishes for Saturday night benefitted from many eager cooks. Our cook Casper had his 22 year birthday which was celebrated with a long warm sauna, advanced Meyer dicing and dancing late into the night.

No more deep drilling and logging.
Final logged depth is: 2537.36 m.
All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099).

What we have done today:
1. Measured DEP, ECM and cut stable water isotope samples of NEEM2010S2, bag 54-119 (64.35m).
2. Prepared cargo lists for the pull out cargo.
3. Prepared the Camp Century and Dye 3 drillings.
4. Rescued outdoor toilet tents and digged small tents free.
5. Prepared Saturday night dinner.
6. Celebrated Caspers birthday.

Weather: Increasing overcast and snowfall. Temperatures between -6 °C and -5 °C. Wind 22-30 kt from SW.

FL Dorthe Dahl-Jensen

2010-08-08

Stormy Sunday

The storm reduces the visibility in camp.

The wind was still high today so activities where restricted to be inside buildings or in the trenches. The day began gently with a very good brunch prepared by Lizzie and Tim. In the science trench the team has become very ambitious and they managed to finish the processing of the NEEM 2010 S2 ice core. Well done!

At dinner time the storm suddenly stopped. Within few hours the wind dropped from 28 kt to 0 kt and the temperature dropped from -5°C to -25°C. Several from the camp took an evening stroll to enjoy the clearing of the sky.

No more deep drilling and logging.
Final logged depth is: 2537.36 m
All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099)

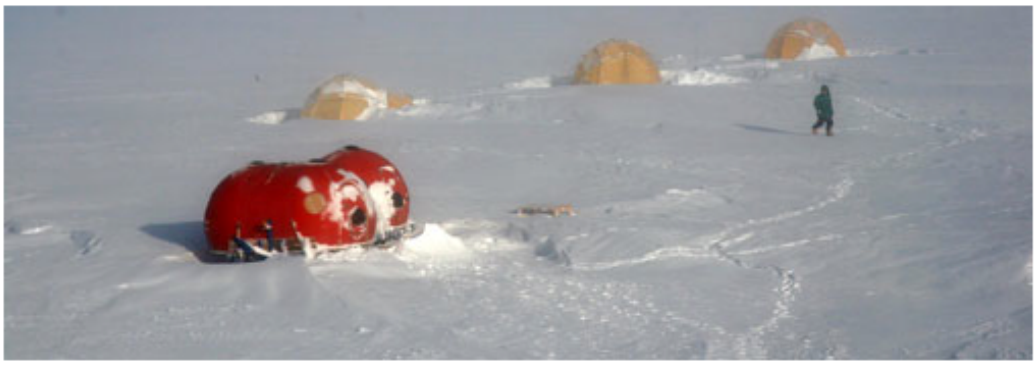
What we have done today:
1. Measured DEP, ECM and cut stable water isotope samples of NEEM2010S2, bag 129-183
   100.65 m).
2. Prepared cargo lists for the pull out cargo.
3. Prepared the Camp Century and Dye 3 drillings.

Weather: Overcast and blowing snow. Temperatures between -5°C and -25°C . Wind 0-28 kt.

FL Dorthe Dahl-Jensen

2010-08-09

Sunny cold autumn weather



A fresh camp reappears after the storm.

We woke to a cold and calm day with a sun halo in the morning ground fog. Footmarks started to appear on the fresh snow surface – all heading towards the main dome. Everyone was busy levelling the camp, grooming the skiway and cleaning and packing in the science and drill trench. Trevor and Mark finished the NEEM 2010 S3 core and packed the DK shallow drill for the Ice2Sea Camp Century and Dye3 shallow ice core drilling operations. James continued the sampling of the core for Mercury while Bryn grabbed the opportunity to log the S3 borehole. At 21:00 in the evening the Norlandair Twin Otter arrived to camp to stay overnight. The plans have been shifted so the Camp Century drilling will happen tomorrow if the weather permits.

No more deep drilling and logging. Final logged depth is: 2537.36 m All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099)

What we have done today:

1. Prepared cargo for the pull out
2. Prepared the Camp Century and Dye 3 drillings
3. Terminated the NEEM 2010 S3 core at the depth 87.30m
4. Sampled NEEM 2010 S3 for Mercury
5. Logged the NEEM 2010 S3 hole with the optical logger.
6. Beam groomed the skiway, taxiway and apron
7. Removed the surface vapour tower and the HF antenna
8. Levelled the snow in camp
9. Cleaned and removed snow behind the tables in the science trench and the drill trench
10. Tested the NZ intermediate drill

Weather: Blue sky with ground fog in the morning and evening. Temperatures between -13°C and -25°C . Wind 0-5 kt

FL Dorthe Dahl-Jensen

2010-08-10

Camp Century Drilling

The beautiful Norlandair ski-equipped Twin Otter.

Today was the day to drill a 30m ice core and sample a 2m surface pit at Camp Century. The ice core overlaps with the last ice core we drilled at Camp Century in 1977 and allows us to extend the climate record to 2010.

The ice core is part of the EU FP7 Ice2Sea project where our part is to examine how the temperature and accumulation has changed in the central parts of the Greenland ice sheet with the global warming.

The ski-equipped Twin Otter left camp at 11:00 local and at 18:00 local a very proud Trevor called from Camp Century to tell that the mission was successful accomplished and they would take off for Qaanaaq in 10 minutes. WELL DONE!

No more deep drilling and logging.
Final logged depth is: 2537.36 m
All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099).

What we have done today:
1. Prepared cargo for the pull out.
2. Drilled a 30m ice core and sampled a 2 m surface pit at Camp Century.
3. Sampled NEEM 2010 S3 for Mercury.
4. Zig zag beam groomed the skiway and tilled the apron and taxiway.
5. Cleaned and removed snow behind the tables in the science trench and the drill trench.
6. Tested the NZ intermediate drill.
7. Packed ice core boxes.
8. Freed all weatherports from snow.
9. Long check of generator.
10. Fuelled Twin Otter with 200l of fuel.

Weather: Blue sky with ground fog in the morning and evening. Temperatures between -13°C and -23°C . Wind 0-11 kt from SE.

Goodbye to Trevor and Mark en route to Camp Century.

FL Dorthe Dahl-Jensen

2010-08-11

Prominent visit and Raclet

Raclet evening served by Henry and Casper.

The Norlandair 3 Twin Otter returned with a very prominent group of guests led by Frederik Paulsen. The weather was perfect for a tour and we used the afternoon presenting our camp and the activities.

We had an aperitif in the ice bar followed by racklet. Henry had brought 8 kg cheese from Bern and our guests had brought good red wine. The meal was excellent! Thanks Rufli and Casper for the meal!.

After dinner we had one hour with science talks followed by a sauna visit. The sauna will close tomorrow so this was the last chance.

No more deep drilling and logging.
Final logged depth is: 2537.36 m
All ice processed except the brittle ice from 1027.40m to 1154.45m (bag 1869-2099).

What we have done today:
1. Prepared cargo for the pull out.
2. Finalized the NZ drill tests.
3. Sampled NEEM 2010 S3 for Mercury.
4. Beam groomed the skiway.
5. Moved the Ca ice chips buckets to the pallets.
6. Entertained visitors.
7. Fuelled Twin Otter with 800l of fuel.

Weather: Blue sky with ground fog in the morning and evening. Temperatures between -13°C and -23°C . Wind 0-6 kt from SSE.

Henry moving snow from the white tent.

FL Dorthe Dahl-Jensen

2010-08-12

Goodbye to our visitors and back to packing down.

People waving goodbye while the Twin-Otter takes off from the apron.

Usually it takes some days for the body to get accustomed to the cold. Though some of our tents are heated, how you sleep the first night on the ice sheet can feel very different depending on type of tent, amount of heat in the tent and type of sleeping bag. However most of our guest had a good nights sleep. We had no wind but temperatures went down in the minus twenties. In the evening before people had a good time and after the scientific presentations by Dorthe and Jean discussions continued into the early hours. Everybody gathered early in the morning for breakfast prior to the 8.30 departure back Qaanaaq. At the same time we had to say goodbye to Dorthe our Field Leader for the last 8 weeks who left the camp as well. The rest of the day we spent preparing for the camp closure next week. In the evening Tim showed his nice slide and movie show about how to climb up and paraglide down the Mont Blanc..

What we have done today:

1. Good bye to Nordlandair 3 with the 10 visitors, 1 NEEM'er and 4 crew
2. Closed and cleaned sauna
3. Sampled NEEM 2010 S3 for Mercury
4. Tilled the skiway
5. Moved core trough to Apron.
6. Hand-augered 10 meter hole for thermistorstring
7. Documented garage 1.
8. Documented freezer.
9. Removed Polar5 reflectors from skiway.
10. Taken down magnetic station.
11. Started packing down NZ drill.
12. Packed down ECM
13. Cleaned drill trench.
14. Maintained seismic station.

Weather: Blue sky with ground fog around noon. Afternoon blue sky, evening clouds moving in from south-west. Temperatures between -10°C and -23°C . Wind 0-8 kt from SW

FL Lars Berg Larsen

2010-08-13

First weatherport packed down

First tent down

The luxury of having relative many camp structures and not that many people and plenty of space is now over. People need to move together since the tents go down one by one...

Today we took the first two tents down. First a four person weatherport then our "fridge-tent" (tent heated to +5°C), almost all the fresh vegetables has been eaten anyway. We stored the rest of "do not freeze" food in our sauna... In there it will not start to freeze the next days.

Everywhere in the camp people are busy packing their gear in boxes. Either it needs protection to stay in camp over the winter or it has to come out. Our New Zealand colleagues needs to get their equipment back home for a short overhaul before it continues to the Antarctic in October for a new drilling project. Ice core drilling equipment is well travelled.

What we have done today:

1. Packed New Zealand drill.
2. Moved food from food tent to Sauna tent for winter storage.
3. Documented food freezer.
4. Taken Stapi weather port down.
5. Documented sledges
6. Finished all documentation in drill and science trenches.
7. Placed thermistor string in 10m hole at AWS 8. Cleaned up in Main Dome
8. Finished work at Hg sampling site.

Weather: Overcast and foggy w/light snow. Temperatures between -7°C and -15°C. Wind 0-6 Kt from SW

FL Lars Berg Larsen

Packing NZ drill

2010-08-14

Prominent guests for morning coffee

"Ice lamb" recipe; a shovel (not in plastic!), charcoal, alu-foil, a tray, four lamb legs, snow pile minimum 1½ meter (2500 m not needed!)

Today we had a couple of prominent visitors from the 109'Th Air National Guard. It was the head of the USAF Air National Guard visiting us. If the US Air Force representative's purpose in Greenland was to see the performance of the 109'Th unit, he picked the right day. All morning the weather behaved well with overcast and little wind, however upon arrival at NEEM one fog bank after another kept rolling into camp. One minute the camp was embedded in clouds with no visibility at all, only to change to a visibility of a mile or two shortly after. Several times we heard the airplane above but no sight of it. After four to five attempts to land a clearing was visible 15 km south of the camp. The Skier then circulated in this opening while it moved into our camp. In the incoming clearing we suddenly saw a Skier "dropping" out of the clouds and perform a beautiful landing.

Then camp received fuel and cargo for the 2011 season and we conducted a guided tour around the camp and in the trenches. Though we are in closing mode it is still possible to get a good impression of the drilling operation and the science behind it all. During the visit the weather cleared to a beautiful day. And when ice cores and science equipment was loaded the plane took off again without any problems.

It was the last Saturday this season, which means it was time for the traditional barbequed Icelandic "Ice lamb". Sverrir was of course the master chef, while a lot of the camp members joined in with different dishes. A very fine way to celebrate the end of the season approaching rapidly.

What we have done today:

1. Moved ice core boxes to the surface and built pallet.
2. Received Skier 71
3. Broken pallets down and moved food to freezer.
4. Moved pallets to cargo line
5. Guided visitors
6. Taken flag line down.
7. Closed and cleaned James' Hg-sampling site and moved stuff to camp.

Weather: Overcast, then fog banks rolling in and out, in afternoon blue sky. Temperatures between -7°C and -18°C. Wind 4-14 Kt from S - SW

FL Lars Berg Larsen

The Chef in action

2010-08-15

No time for rest

Time for a nap but no tents left...

We got boxes and people everywhere! Eventhough it is Sunday the camp is full of activity from early on. Two more weather ports were packed down and we got most of our retro pallets ready. We took advantage of yet another beautiful day today; it was perfect for the outdoor activities. After dinner this evening we had the last movie night. Already at 23.00 the dome was completely quiet and empty. Very unusual... It was Sunday after all...

What we have done today:

1. Moved big items out of trenches
2. Netted pallets
3. Checked and maintained skiway flags.
4. Packed two weather ports.
5. Tilled skiway.
6. Packed GPS reference stations.
7. Vacuum cleaned Main Dome.

Weather: Blue sky. Temperatures between -7°C and -16°C. Wind 0 - 8kt from S - SE

FL Lars Berg Larsen

2010-08-16

Packing down and first pull-out flight.

Departing crew in a NEEM formation.

Monday was spent packing down and cleaning up in camp. We had to keep the entrance to the drill trench open as the last food shipment was due to arrive on Tuesday and we had to take the last ice core shipment out just before the flight arrived.

Tuesday morning became cloudy and foggy. As the plane was en route to NEEM visibility dropped and frost had formed on all our skiway markers. A crew was sent out to knock the frost off the markers, and may have saved the day because visibility was so poor that the plane had to make several attempts to land before they finally succeeded to spot the skiway and land. 12 NEEM'ers left camp, and now only 7 remain.

After the plane departed with a full load and in first attempt, people carried the arriving food to storage and sealed the entrance to the drill and science trenches. Vehicles were parked in the garages, so that only the Caterpillar, a Flexmobile and two snowmobiles are ready for the final pull-out.

In the evening the main snow melter was dismantled.

Weather Monday: Almost no wind, scattered clouds and temperatures between -15°C and -5°C

Weather Tuesday: Clear in the morning, then low clouds and fog during the flight, later slightly clearing. Winds at 4 to 12 knots from SE. Temperatures between -5°C and -9°C.

FL Lars Berg Larsen

FOM J.P.Steffensen

NO ENTRY AUGUST 17

2010-08-18

Last pull out

Taking down the white weatherport, just before the science and drill trenches are sealed for winter.

Due to bad forecasts the departure of the flight to NEEM was scheduled early in the morning. The plane departed at 6 AM local time, and it just managed to get to NEEM ahead of the weather. Just after 6 AM, the main generator was shut down and pulled to the snow hill for over wintering. The three pallets with fuel were pulled away from the apron, three pallets with cargo were loaded onto the plane and the vehicles were parked in the main workshop garage. Last phone call from NEEM was at 9.50 local by handheld Iridium phone. At 12.10 local everybody were back in Kangerlussuaq.

Weather: In the morning scattered clouds; but as the plane approached overcast with slight snow, rising temperatures and dropping barometer. Winds at 14 knots from SE turning SW as weather system approached. Temperatures at night -15°C , at time of pick up -7°C.

FL Lars Berg Larsen

FOM J.P.Steffensen

The very last passengers out of NEEM 2010

2010-08-19

Hectic activity in Kangerlussuaq

Last cleaning up in the ware house.

As everybody are now out of camp, the time has come to prepare the Warehouse and the Office in Kangerlussuaq for closing. But first, all last ice cores and scientific equipment had to be sent off. Many hands were needed to sort out cargo and ice from camp and put it into piles of different destinations. Ice and cargo has been sent to the U.S. and Canada. Ice has been sent to Copenhagen, and cargo has been sent to France, Germany, the U.K., Switzerland, Japan and Denmark. The forklifts and our truck have been in full swing shuttling cargo and ice. Thursday and Friday, most NEEM'ers left Kangerlussuaq, and now only the FOMs remain in Kangerlussuaq to clean up the warehouse and close the office.

Friday evening NEEM hosted the traditional end of season dinner at the rowclub. This is our way of showing our appreciation of the wonderful and constructive collaboration between NEEM, the 109th, CH2MHill Polar Services, KISS manager, Car mechanic and the Air Greenland Cargo Terminal crew in Kangerlussuaq. Thank you all.

Weather at NEEM for the past four days (from PARCA weather station):
Total overcast. 8 knot wind from SW. Temperatures day and night between -3°C and +1°C**(!!!!)** We and the 109th have been so lucky to get our last people out before the weather changed on Wednesday. Otherwise they would still be at NEEM.

Weather in Kangerlussuaq:
Sunny, mild winds from E and temperatures between +4°C and +16°C.

Sunday, the two remaining people left Kangerlussuaq, and this is the last entry of the NEEM field diary 2010. Thank you for your attention. We hope to be back online next year as well.

FOM J.P.Steffensen

Members of the 109th, CH2MHill Polar services and local Kangerlussuaq business affiliates just before the NEEM end of season dinner at the rowing club.