Field season report 2009
North Greenland Eemian Ice drilling (NEEM) 2007-2011:

First 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.

From the royal visit 30th May.

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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 2009 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 2009 required a lot of 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, Mark Begnaud, Ed Stockard 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 2009 activities of the NEEM project

Background.

Due to warious factors, camp construction in 2008 was behind schedule and quite a few loose ends remained to be dealt with, before deep ice core drilling and core processing could begin in 2009. In was planned to spend the first three to four weeks of 2009 to finish outfitting the main dome, the drill trench and the science trench.

The field season 2008 was spent almost entirely by camp construction. There were a few shallow ice core drillings and a firn air program; but the bulk of man days were spent in construction.

Drillers did only have time to drill down to below the firn/ice transition, ream the hole to large diameter and insert the casing before the season was over. By the end of 2008 season the NEEM borehole was only 100 m deep. In the planning we had hoped for three weeks of drilling after casing the hole to reach a depth of 400 m.

Kangerlussuaq (Søndre Strømfjord, SFJ)

NEEM had Field Operations Managers (FOMs) throughout the 2009 campaign, and made good use of the logistical assets from the NGRIP project. The lease of warehouse 442 has been renewed, and 442 is now leased until 2016. 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 Toyota landcruiser (which was part time lent out to the IPY office operated by Danish Polar Center), a F-250 truck, a VW 4-wheel drive pickup and a Chevrolet step-van.

The 8 ton forklift has not been operational this year. CPS has kindly allowed us to use their articulated loaders and flat pallet truck (K-loader). We hope we may use these assets also in 2010.

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

The 2009 field campaign was quite busy for the FOMs in Kangerlussuaq, mainly because a lot of people and many DVs had to be handled.

We had decided to turn the skiway almost 45 degrees from a SE/NW direction to a N/S direction; but it took a while to get get new skiway up to standards and cargo had to be delayed due to load

restrictions. Eventually the complications were overcome by a coordinated effort involving an outstanding help from 109th .

It was planned to have 2-3 FOMs during busy periods and this worked well.

Start of field season.

The Field Season started with the arrival of the first FOM in Kangerlussuaq on 20th April and assistants arrived 24th April. The FOM office was opened and vehicles were activated and licenced. The warehouse 442 was found in good condition and the FOM unpacked the warehouse and picked up arriving cargo at the terminal. Snow and slush on the ground made the 442 yard muddy.

Put-in at NEEM and camp opening.

The put-in crew of 11 flew to NEEM on 28th April and landed on site at 11:50 local. The camp was found in good condition although the amount of snow drift was surprising. The 1.5 m hills under garages and dome were level with the surface. Most heavy vehicles and the main generator were running at 20:00. There were four main tasks for the put in crew: Making the trenches ready for drilling and processing, finishing construction of the main dome infrastructure, upgrading and documenting the electrical distribution grid in camp and expanding camp with 6 weatherports.

Final touches to the main dome.

Because of the delays in 2008 the infrastructure of the main dome was far from finished and some features had to be rebuilt. Extra PU foam had to be used to seal quite a few cracks along the floor to avoid draft. All plumbing of the glycol central heating system was moved above the floor inside the dome. Hot water tanks were moved to the top shelf in the kitchen. Several more shelves were setup in the kitchen. The central leg holding the floor had to be lowered 5 cm to remove strain on the floor. The connection between main snow melter and dome was revised, and in the future, the snow melter will be disconnected and moved to the cargo line each winter. The final touches kept 2 -3 people busy in more than two weeks; but by mid May the dome was fully operational with new table, shelves and water taps.

Opening of the trenches.

Similarly to the dome, a lot of infrastructure had to be built in parallel to installing the drill. The drill workshop was outfitted with tables and shelves, the drillers cabin had to be adjusted, steel safety grates were mounted on the floor, railings along the drill trench in the floor were built, and the finally a roof skylight (camp nickname: submarine) was built on the roof over the drill site. Until late May, people had to use the small elevator for cargo and the ladder in the science trench. Large items were loaded into the drill trench through the roof with the Pistenbully crane. By late May the scaffold staircase and main elevator were installed and the inclined trench to the drill trench sealed off. The small elevator and ladder in the science trench now served as emergency

exit. In the period of trench opening, full priority was given to the drill trench before outfitting the science trench (this is seen in the plot of tasks below) .

Upgrading the electrical systems.

Due to the delays in 2008, the electrical system in camp was not set up in a systematic way. Immediately after put in, the entire grid was revised, documented and labeled. RFI surge protection was installed everywhere. A systematic power structure was built in the main dome, drill and science trenches. The work took more than two weeks for one person. We discovered the hard way that the power outlet board at the main generator was not fuse protected. During snow cleaning operation along the tents and garages, the power cable was cut twice causing the 130 kVA generator to stall. A new fused power distribution board was immediately ordered, and in the future, cables have to remain buried until they reach inside tents and garages.

Building weatherports.

The system of building weather ports at marked power outlets is working really well. The weatherports are picked up on the cargo line. The floor boxes are laid out on three level 4 x 4 inch beams on a groomed surface right next to the power outlet. In windy and cold conditions, one weatherport per day can be built; but if weather permits, three weatherport can be setup in one day, including bunkbeds, tables and chairs. One 12' x 20' weather port was used as fresh food storage. The other two 12' x 20' weather ports contained 3 bunk beds for three to 6 people. The two 10' x 15' weatherports contained 2 bunk beds for 2 to 4 people and finally the 10' x 12' weatherport contained one bunk bed for 1 to 2 persons. It is the intention to take down all six weatherports each winter.

Turning the skiway.

Due to problems with wind direction data, the skiway had been laid out 45 degrees off the prevailing wind direction. At the Arctic Planning conference in Schenectady, Oct. 2008, it was agreed to make a turn of the skiway in several stages. We had to keep the "old" skiway operational, because it was certified, until the "new" skiway could become certified. We knew that we had to make a lot of grooming before a new skiway could become operational, and because we already had a good foundation for the apron and load pad, we decided only to turn the skiway and keep using load pad and apron. First step was made a few days after arrival as the future "new" skiway was marked up as a "ski landing area" according to 109th regulations. This would allow routine take offs from the "new" skiway and landing was possible, but only in perfect weather conditions. Over a period of 3 weeks we groomed two skiways at the same time, and after five landing and take-offs, the "old" skiway could be closed and all markers moved to the "new" ski landing area which now was marked as a skiway. The turning was complete as the "new" skiway received a full skiway certification by 1st of June.

Weather.

It is our impression the it blows more and it snows more at NEEM than at NGRIP. We feel we have to move a lot of snow; but part of the reason for that is that camp structures are laid out 45 to the prevailing wind. Making things a bit worse, it appears that most storms come from the SW and this is basically along the rows of structures. Several flights this season were delayed by 1 – 3 days due to weather; but all missions were flown in each of the 109th deployment weeks in Greenland. As the flight time from Kangerlussuaq is 2.5 hours, quite a few times weather changed for the worse after the planes had been called; but due to the skill of the 109th and a little luck we did only have one plane on 9th July that did not make a landing due to weather.

Fuel transfer and tanks.

All through the season we worked on getting the fuel pump and tank system fully operational. The idea of having tanks and a fuel pump is to save transporting drums back and forth and to provide the 109th with the flexibility to fuel and de-fuel in camp. It proved to be a problem to find exactly the right hose adapters for tanks, pump, hoses and LC-130. However by 13th May we were ready to receive a fuel shuttle from Thule. The LC-130 brought 7,500 liter and 11,500 liter fuel in two return trips to Thule AB, only 50 minutes flight away. Our Swedish Airforce fuel pump, transferred 11,500 liter in 15 minutes from the tanks of the plane to our fuel tanks. The system works. Now we only have to find ways to meter the fuel transferred, as the fuel gauges of the aeroplane are not precise. The fuel shuttle was particularly important as the GRIT overland traverse do not operate this year.

Communication.

In 2007 and 2008 our communication relied on the Inmarsat BGAN system. It worked; but there were several periods during the day when connection was weak and often broken. By January 2009 Inmarssat announced that they would move the satellite above our sector so we decided to buy and try a new system. At Flade Isblink in 2006, our colleagues from CReSIS, Kansas, had a prototype Iridium multiplexer data transfer system and we enjoyed the convenience of internet access. By spring 2009 a similar system became available, the Iridium OpenPort system. The system was installed in and on the cupola of the main dome, and it was a success from day one. The system allowed for our local camp servers and our wireless points to gain acces to the internet, so immediately we had to set up account systems and rules for communication to prevent our Iridium bill from going ballistic. On the other hand with internet access, fault finding of equipment, ordering of spareparts and downloading of manuals became so much easier.

Summary of Deep Drill activities NEEM 2009.

This section is not a full drilling report. To obtain details, please see the daily reports, where drillers reports are given. Preparations for drilling began one day after arrival. The floor was finished, the tower aligned and a skylight over the drill trench constructed. Then drillers arranged the cabin and finished the drillers workshop. On 5th May the drillers were ready for mounting the HT drill on the antitorque; but during the pull test, the winch control broke down.

6th May the backup control was installed and the drillers performed a pull test again. This ruined the second winch control, and now the drillers were unable run the winch. After some investigation, it was discovered that the cause was a damaged motor where one coil showed intermittent faults. This could be provoked by striking the motor with a hammer. The fault must have appeared after over winter testing in Europe of the motor and controller in combination. Luckily, a spare motor had been purchased in spring and was available in Kangerlussuaq. The new motor and the "old" controller from Europe arrived on the flight 12th May. Still the winch did not work; but here the fault was caused by broken ceramic resistors, and after repair the winch worked nicely. As luck had it, the days between 6th May and 12th May were spent by finishing the drill fluid mixing staition, repairing the drill electronics and upgrading the driller software. All in all, after some anxious days, drilling could begin 12th May.

Drilling began using the HT drill and after 15th May at 120 m depth the hole below the casing was long enough for use of the EPICA drill from Grenoble. Fluid was added to the hole and the first 2 m cores were drilled with the EPICA drill on 20th May. Adjusting and tuning the drilling process continued until 1st June at 200 m depth, and then the new NEEM drill was installed. This drill was used the rest of the season.

From the beginning of June it became increating difficult to maintain cold temperatures in both the science trench and particularly the drill trench. The opening from the drill trench to the staircase and elevator was too large and cold air excaped through the hatches, also the snow cover on the roofs was too thin and the snow walls could not compensate for dissipated energy from drilling operation and from the warm laboratories in the science trench. It was decided to excavate cooling tunnels and to mount blowers in them to provide extra cold firn air to the trenches. This helped; but during July and August the drill trench became very warm (up to -6 C) and this time coincided with drilling of the brittle zone, and we are convinced that the warm temperatures did harm the brittle core.

Drilling was stopped on 14th August at 1757.84 m. This is 1655 m drilled in on season and it means that NEEM schedulewise is back on the track. It is now possible to reach bedrock in 2010.

Science trench and CFA measurements.

Although work in setting up the science trench was postponed, work here soon caught up. Core processing began 28th May and soon processing was running in parallel to drilling. CFA measurements began 5th June, and this was no problem, as the science trench was setup to

operate processing and CFA independently. On 21st june logging of fresh cores was halted at 500 m as the cores began to develop cracks due to brittleness. All fresh cores were carried into the core buffer in the coldest part of the science trench to resat two weeks before handling. After a two week interval, core processing reached 500 m and core logging was continued. Processing and logging ran in parallel to 600 m, when the ice became too brittle. Processing was halted; but logging continued at the pace of drilling with a two week delay. By mid July the drillers were about to exit the brittle zone, so ice core logging was sped up and run in 24 hour shifts to catch up with the attained drillers depth. By 20th July drilling and logging was again at the same depth and the brittle zone was past. Full processing of the post brittle zone core could begin.

Firn air sampling and shallow coring.

BAS radar survey.

The radar survey program of British Antarctic Survey was completed within schedule from 24th June to 1st July. A snowmobile and a Nansen sled was required from NEEM camp.

Bead experiment.

An experiment to track biological contamination was successfully concluded. The experiment was made on 4th August by Todd Sowers and Steffen Bo Hansen in the 2009 S2 borehole. Later the experiment was repeated at 1650 m depthe on 13th August.

Seismic station.

The GEUS seiamic station was maintained and data down loaded on 1st July by NEEM camp staff.

Firn air sampling

As in 2008 firn air was sampled in two parallel holes where the Danish shallow drill performed alternate coring in the two holes. The project was successfully completed 30th July after 10 days of work 2 km from camp.

Fuel statistics 2009:

Fuel left in depot at NEEM:	35,420 liter JP-8 and Jet a/1 in three tanks.
	2,000 liter Mogas
Fuel delivered at NEEM:	52,760 liter by 109th
	2,000 liter Mogas
Fuel stored at NEEM 2008	11,500 liter (1,900 liter Jet A-1 in tank 9600 liter DFA in drums)
	Mogas 800 liter
Consumption (118 days):	29,640 liter.
Mogas consumption 2008 at NEEM:	800 liter.
Average consumption per day (114 day):	260 liter fuel and 7 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 2009:

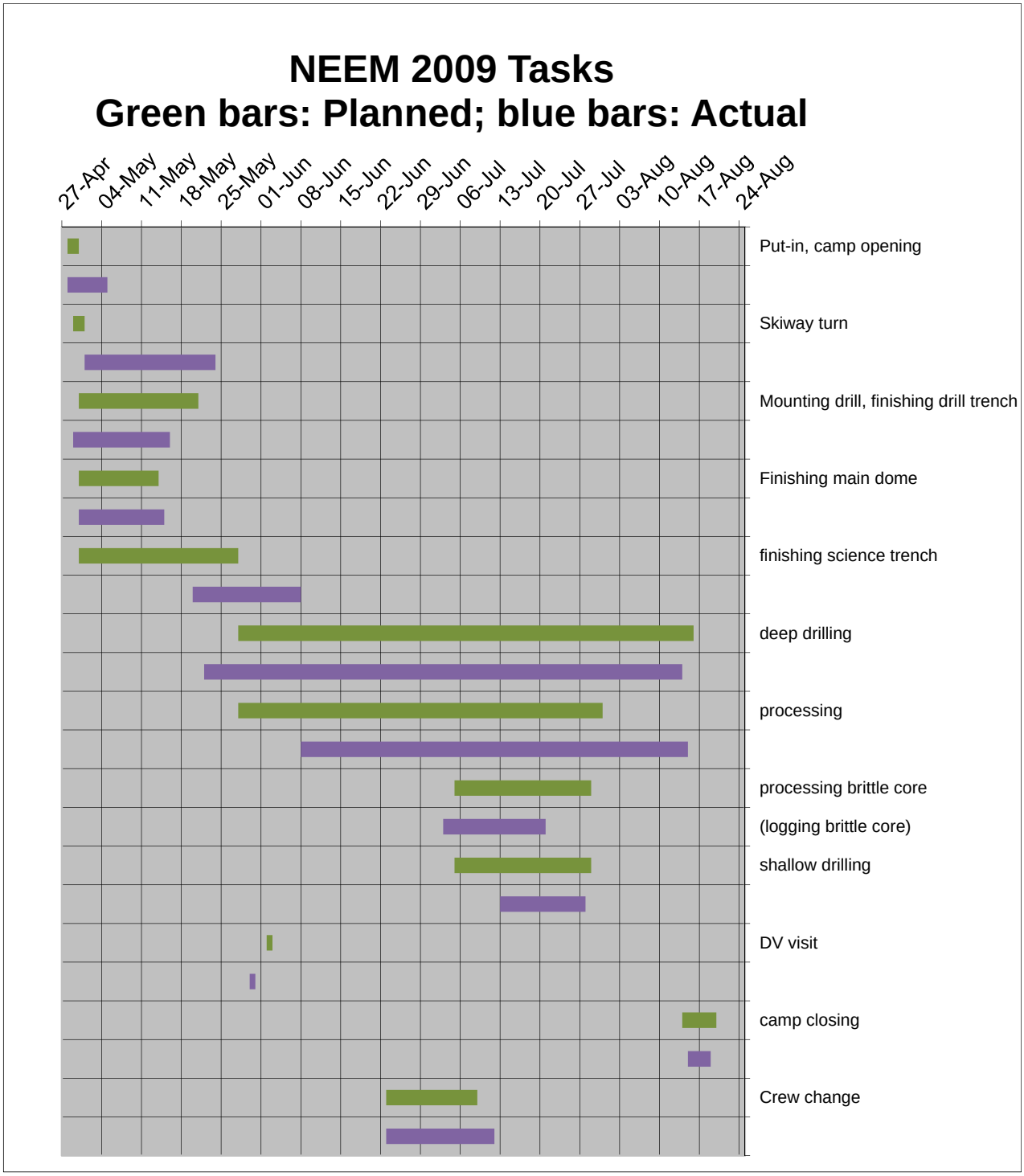
A total of 299735 lbs (136,250 kg) was transported to NEEM in 15(16) missions. Below is a table showing the missions. All weights in the table are in lbs.

Flight statistics 2009 (cargo incl. PAX weight):											
Mission #	date	month	up PAX	down PAX	up cargo	down cargo	total PAX	camp PAX sum in camp	hours	Comment	
1	28	April	11	0	11172	0	11	11	5.2		
2	12	May	0	1	13010	350	-1	10	5.2		
3x2	13	May	0	0	34600	0	0	10	4.5	2x Thule shuttle	
4	18	May	15	2	17983	700	13	23	4		
5	20	May	0	0	18210	7700	0	23	5.2		
6	30	May	33	12	13535	2700	21	44	0	Royal visit	
7	31	May	12	32	18850	7200	-20	24	6.8	Royal visit	
8	4	June	17	9	19767	7984	8	32	5.1		
9	22	June	4	2	12600	8140	2	34	0	109th press	
10	23	June	21	24	20998	10560	-3	31	5.2		
11	10	July	18	20	22962	10750	-2	29	5.2		
12	12	July	15	8	23230	5400	7	36	5.1		
13	30	July	37	39	35198	14045	-2	34	7.5	Thule fuel shuttle	
14	18	Aug	2	29	17600	19720	-27	7	5.3		
15	19	Aug	0	7	20020	20020	-7	0	5.5		
Sums			185	185	299735	115269	0		69.8		
Average load					19982.33						

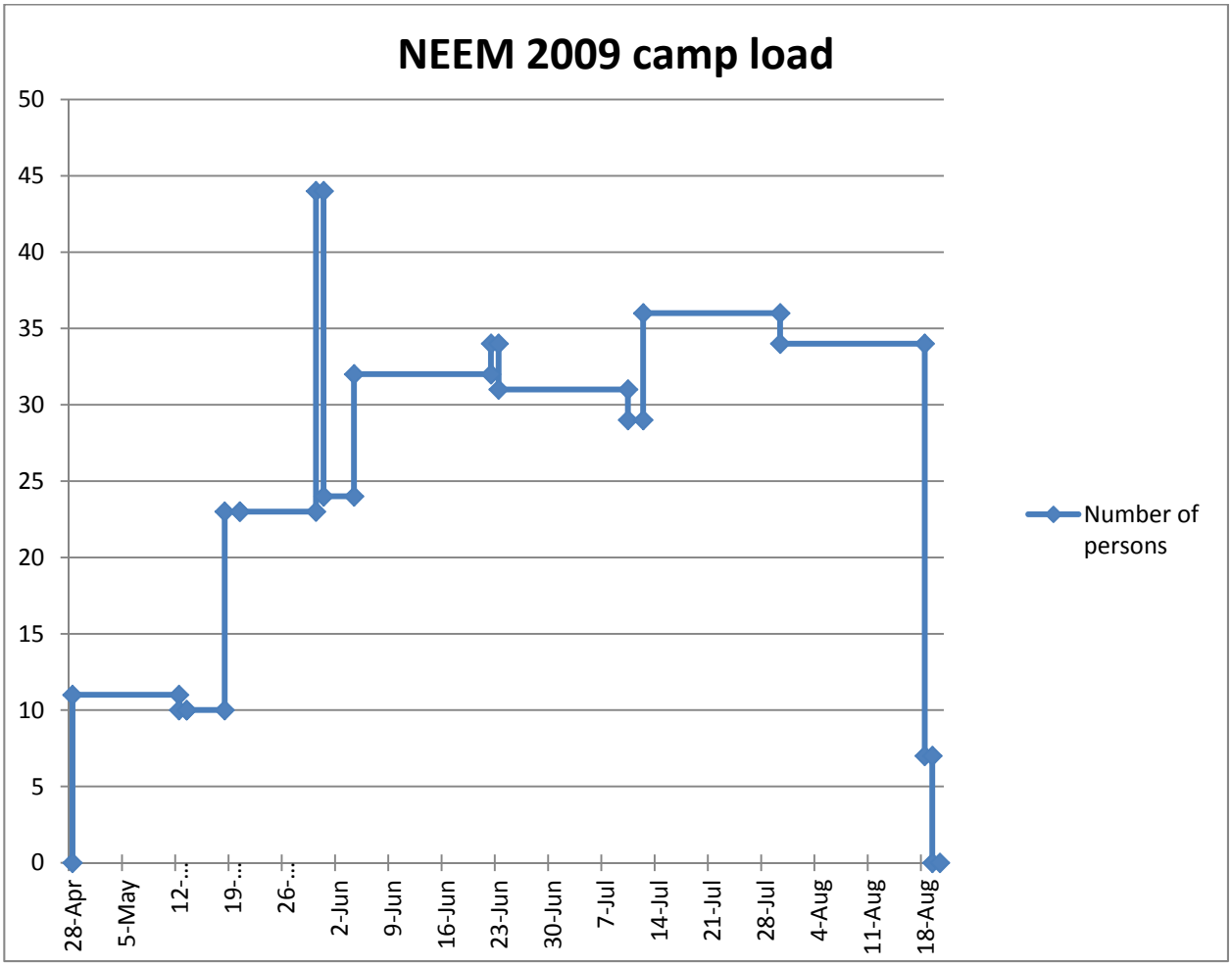
Calender for tasks in camp.

2009 Calendar for tasks in camp:				
Task:	Planned period		Actual period	
Put-in, camp opening	28-Apr	30-Apr		
			28-Apr	05-May
Skiway turn	29-Apr	01-May		
			01-May	24-May
Mounting drill, finishing drill trench	30-Apr	21-May		
			29-Apr	16-May
Finishing main dome	30-Apr	14-May		
			30-Apr	15-May
finishing science trench	30-Apr	28-May		
			20-May	08-Jun
deep drilling	28-May	16-Aug		
			22-May	14-Aug
Processing	28-May	31-Jul		
			08-Jun	15-Aug
processing brittle core	05-Jul	29-Jul		
(logging brittle core)			03-Jul	21-Jul
shallow drilling	05-Jul	29-Jul		
			13-Jul	28-Jul
DV visit	02-Jun	03-Jun		
			30-May	31-May
camp closing	14-Aug	20-Aug		
			15-Aug	19-Aug
Crew change	23-Jun	09-Jul		
			23-Jun	12-Jul

GANNT on tasks in camp.



NEEM 2009 camp load:



NEEM actual manning 2009

NEEM 2009 Actual manning

Sorted by name	Name	Country	To SFJ	To NEEM	From NEEM	From SFJ	Number of days in camp.	Number of days in KISS
FIELD ASSISTANT	Albershardt, Louise	US	11-May	18-May	23-Jun	25-Jun	36	9
DRILLER	Alemany, Olivier	F	22-Jun	23-Jun	30-Jul	02-Aug	37	4
ELECTRONICS	Andersen, Jeppe Jønch	DK	02-Jun	04-Jun	12-Jul	13-Jul	38	3
DRILLER	Azuma, Nobohiko	J	12-May	18-May	23-Jun	25-Jun	36	8
DEP	Behrens, Melanie	D	22-Jun	23-Jun	10-Jul	11-Jul	17	2
DOCTOR	Benn, Marianne	DK	12-May	18-May	04-Jun	05-Jun	17	7
CFA	Bigler, Matthias	CH	12-May	18-May	23-Jun	25-Jun	36	8
DEP	Bohleber, Pascal	D	02-Jun	04-Jun	23-Jun	25-Jun	19	2
POLLEN	Bourgeois, Jocelyne	CAN	02-Jun	04-Jun	23-Jun	25-Jun	19	4
ELECTRONICS	Boysen, Aksel	DK	08-Jul	10-Jul	18-Aug	20-Aug	39	4
LOGGER	Brand, Tina	DK	22-Jun	23-Jun	12-Jul	13-Jul	19	2
ECM	Brücher, Tim	DK	22-Jun	23-Jun	12-Jul	13-Jul	19	2
LOGGER	Buchardt, Susanne Lilja	DK	01-Jun	04-Jun	12-Jul	13-Jul	38	4
PHYSICAL PROP.	Buiron, Daphne	F	08-Jul	10-Jul	30-Jul	03-Aug	20	6
DRILLER	Buizert, Christo	DK	29-Jul	30-Jul	18-Aug	20-Aug	19	3
PLUMBER	Bundgaard, Henrik	DK	27-Apr	28-Apr	18-May	19-May	20	2
FIELD ASSISTANT	Burton, Timothy	UK	22-Jun	23-Jun	19-Aug	21-Aug	57	3
PHYSICAL PROP.	Capron, Emilie	F	29-Jul	30-Jul	18-Aug	21-Aug	19	4
FOM	Hvidberg, Christine	DK	06-Jul			31-Jul	0	25
SHALLOW CORE	Courteaud, Julien	F	08-Jul	12-Jul	30-Jul	02-Aug	18	7
SHALLOW CORE	Courville, Zoe	US	07-Jul	12-Jul	30-Jul	31-Jul	18	6
O18 CUTTING	Cvijanovic, Ivana	DK	22-Jun	23-Jun	10-Jul	13-Jul	17	4
FOM FL	Dahl-Jensen, Dorthe	DK	26-May	31-May	01-Jun	01-Jun	1	5
FIELD LEADER	Dahl-Jensen, Dorthe	DK	06-Jul	10-Jul	19-Aug	25-Aug	40	10
DRILL OBSERVER	Dahnert, Kristina	US	11-May	18-May	04-Jun	06-Jun	17	9
CFA	Davies, Siwan	UK	02-Jun	04-Jun	23-Jun	25-Jun	19	4
DRILLER	Duphil, Romain	F	08-Jul	12-Jul	18-Aug	20-Aug	37	6
DRILLER	Ellehøj, Mads Dam	DK	22-Jun	23-Jun	10-Jul	13-Jul	17	4
DOCTOR	Elliott, Elizabeth	AUS	08-Jul	10-Jul	18-Aug	20-Aug	39	4
SHALLOW CORE	Etheridge, David	AUS	08-Jul	10-Jul	30-Jul	01-Aug	20	4
CFA	Federer, Urs	CH	29-Jul	30-Jul	18-Aug	20-Aug	19	3
DOCTOR	Florian, Hans Christian	DK	27-Apr	28-Apr	14-May	16-May	16	3
CFA	Frey, Markus	UK	22-Jun	23-Jun	12-Jul	11-Jul	19	0

RADAR	Gillet, Fabien	UK	22-Jun	23-Jun	10-Jul	11-Jul	17	2
LINE SCANNER	Gnikis, Vasileios	DK	22-Jun	23-Jun	18-Aug	21-Aug	56	4
O18 CUTTING	Goossens, Thomas	B	28-Jul	30-Jul	18-Aug	24-Aug	19	8
CFA	Goto-Azuma, Kumiko	J	29-Jul	30-Jul	18-Aug	22-Aug	19	5
ECM	Grindsted, Aslak	DK	08-Jul	10-Jul	30-Jul	03-Aug	20	6
FIELD ASSISTANT	Guski, Lars	DK	08-Jul	12-Jul	30-Jul	01-Aug	18	6
Outreach	Hamilton, Cheri	US	29-May	31-May	04-Jun	06-Jun	4	4
DRILL MECHANIC	Hansen, Steffen Bo	DK	27-Apr	28-Apr	04-Jun	05-Jun	37	2
DRILL MECHANIC	Hansen, Steffen Bo	DK	29-Jul	30-Jul	18-Aug	21-Aug	19	4
FOM	Hansson, Margaretha	S	27-May			31-May	0	4
LOGGER	Hansson, Margaretha	S		31-May	23-Jun	25-Jun	23	2
COOK	Harvey, Sarah	US	25-Apr	28-Apr	23-Jun	25-Jun	56	5
MECHANIC	Hilmarsson, Sverrir Æ.	IS	24-Apr	28-Apr	23-Jun	24-Jun	56	5
MECHANIC	Hilmarsson, Sverrir Æ.	IS	08-Jul	10-Jul	19-Aug	21-Aug	40	4
COOK	Hinman, John Brandon	US	18-Jun	22-Jun	18-Aug	21-Aug	57	7
FOM	Holm Hansen, Lone	DK	24-Apr			18-May	0	24
FOM	Holm Hansen, Lone	DK	01-Jun			26-Jun	0	25
O18 CUTTING	Holm Hansen, Lone	DK		18-May	01-Jun		14	0
FOM	Hvidberg, Bo	DK	06-Jul			31-Jul	0	25
DOCTOR	Iversen, Susanne	DK	02-Jun	03-Jun	23-Jun	24-Jun	20	2
DRILLER	JiWoong Chung	COR	01-Jun	04-Jun	30-Jul	01-Aug	56	2
DRILLER	Johnsen, Sigfus Johann	DK	12-May	18-May	23-Jun	25-Jun	36	8
SHALLOW CORE	Keegan, Kaitlin	US	07-Jul	12-Jul	30-Jul	31-Jul	18	6
CFA	Kettner, Ernesto	DK	01-Jun	04-Jun	23-Jun	25-Jun	19	5
CFA	Kettner, Ernesto	DK	08-Jul	10-Jul	18-Aug	20-Aug	39	4
PHYSICAL PROP.	Kipfstuhl, Sepp	D	12-May	18-May	23-Jun	25-Jun	20	8
LINE SCANNER	Kipfstuhl, Sepp	D	29-Jul	30-Jul	18-Aug	22-Aug	19	5
CARPENTER	Kristinnsson, Olafur	IS	27-Apr	28-Apr	04-Jun	05-Jun	37	2
CFA	Kuramoto, Takayuki	J	20-Jun	23-Jun	10-Jul	12-Jul	17	5
MECHANIC	Ladegaard, Jørn	DK	01-Jun	04-Jun	30-Jul	04-Aug	56	8
FOM	Larsen, Lars Berg	DK	20-Apr			25-Jun	0	66
FIELD ASSISTANT	Larsen, Lars Berg	DK	29-Jul	30-Jul	19-Aug	21-Aug	20	3
O18 CUTTING	Lerche, Henriette	DK	01-Jun	04-Jun	23-Jun	25-Jun	19	5
DOCTOR	Lewis, Nerys	UK	22-Jun	23-Jun	12-Jul	13-Jul	19	2
LOGGER	Li Chuanjin	CHN	29-Jul	30-Jul	18-Aug	20-Aug	19	3
SWISS SAW	Miyamoto, Atsushi	J	08-Jul	12-Jul	30-Jul	01-Aug	18	6
DEP	Moeller, Lars	D	06-Jul	12-Jul	18-Aug	20-Aug	37	8
PHYSICAL PROP.	Montagnat, Maurine	F	22-Jun	23-Jun	10-Jul	12-Jul	17	3
ELECTRONICS	Moret, HansPeter	CH	27-Apr	28-Apr	18-May	19-May	20	2
CFA	Mulvaney, Robert	UK	02-Jun	04-Jun	23-Jun	25-Jun	19	4
PACKING	Muscheler, Raimund	S	22-Jun	23-Jun	10-Jul	11-Jul	17	2
PACKING	Orsi, Anais	US	07-Jul	12-Jul	30-Jul	31-Jul	18	6
FIELD ASSISTANT	Panton, Christian	DK	12-May	18-May	04-Jun	05-Jun	17	7
O18 CUTTING	Petrenko, Vas	US	07-Jul	10-Jul	30-Jul	05-Aug	20	9

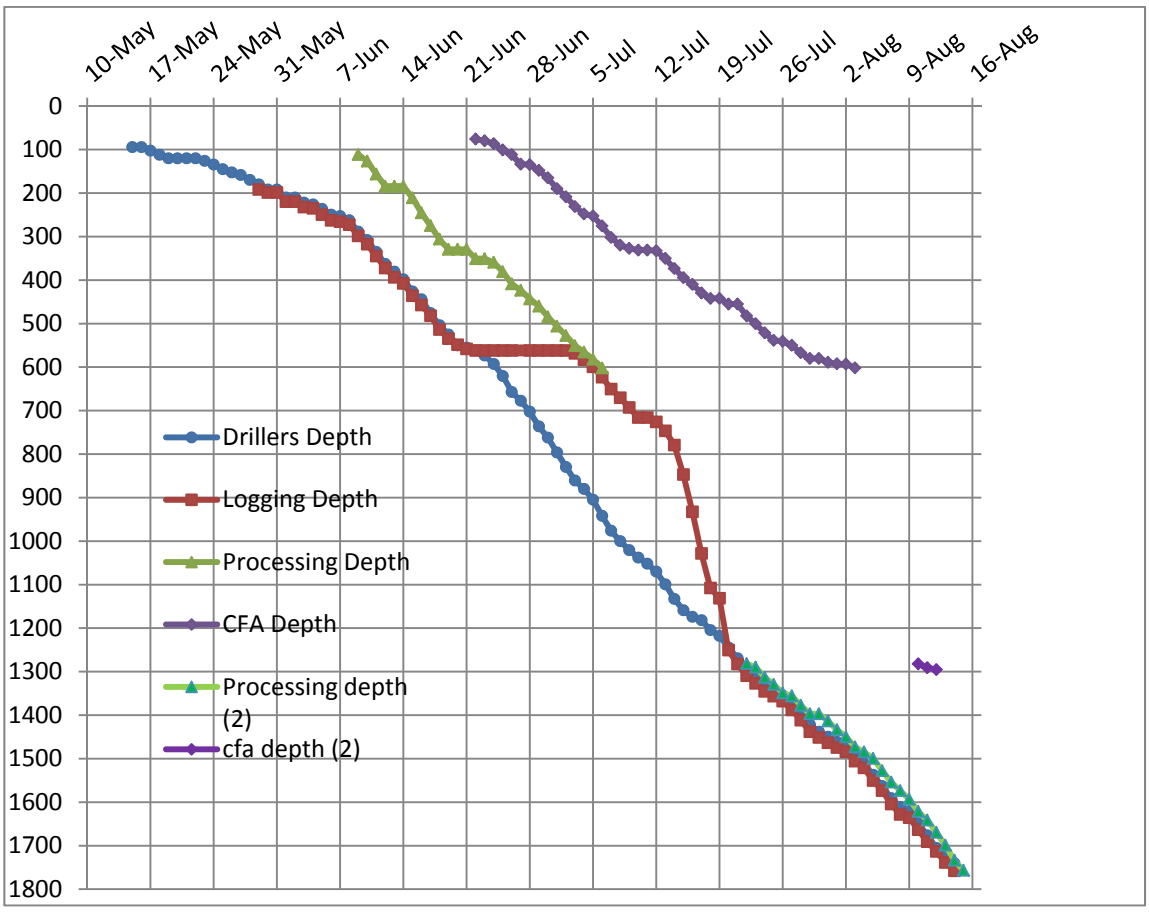
O18 CUTTING	Pol, Katy	F	08-Jul	12-Jul	30-Jul	31-Jul	18	5
DRILLER	Popp, Trevor	DK	27-Apr	28-Apr	04-Jun	05-Jun	37	2
DRILLER	Popp, Trevor	DK	08-Jul	10-Jul	19-Aug	21-Aug	40	4
DRILL MECHANIC	Possenti, Philippe	F	22-Jun	23-Jun	30-Jul	02-Aug	37	4
DRILLER	Pyne, Alex	NZL	01-Jun	04-Jun	12-Jul	13-Jul	38	2
FOM	Rasmussen, Dorte Elisabeth	DK	29-Jun			10-Jul	0	11
FOM	Rasmussen, Sune Olander	DK	19-Jun	22-Jun	23-Jun	10-Jul	1	20
COOK	Ravneberg, Louise Wolff	DK	08-Jul	12-Jul	19-Aug	21-Aug	38	6
ECM	Rosen, Julia	US	27-Jul	30-Jul	18-Aug	25-Aug	19	10
SHALLOW CORE	Rubino, Mauro	I	08-Jul	12-Jul	30-Jul	01-Aug	18	6
DRILL MECHANIC	Rufli, Henry	CH	12-May	18-May	23-Jun	25-Jun	36	8
CFA	Sang-Bum, Hong	COR	22-Jun	23-Jun	10-Jul	11-Jul	17	2
O18 CUTTING	Sapart, Celia	NL	01-Jun	04-Jun	10-Jul	11-Jul	36	4
DRILLER	Schildt, Adrian	CH	08-Jul	12-Jul	18-Aug	20-Aug	37	6
CFA	Schneider, Robert	CH	29-Jul	30-Jul	18-Aug	20-Aug	19	3
CFA	Schuepbach, Simon	CH	12-May	18-May	30-Jul	01-Aug	73	8
DRILLER	Schwander, Jakob	CH	27-Apr	28-Apr	04-Jun	05-Jun	37	2
LINE SCANNER	Simonsen, Sebastian Bjerregaard	DK	01-Jun	04-Jun	23-Jun		19	0
FOM	Simonsen, Sebastian Bjerregaard	DK	23-Jun			12-Jul	0	19
CFA	Simonsen, Sebastian Bjerregaard	DK		12-Jul	30-Jul	03-Aug	18	4
LOGGER	Sjolte, Jesper	DK	08-Jul	12-Jul	18-Aug	20-Aug	37	6
DRILLER	Solgaard, Anne Munch	DK	08-Jul	12-Jul	18-Aug	20-Aug	37	6
BIOLOGY	Sowers, Todd	US	27-Jul	30-Jul	18-Aug	21-Aug	19	6
SWISS SAW	Sperlich, Peter	DK	12-May	18-May	23-Jun	26-Jun	36	9
DRILLER	Steen-Larsen H.C.	DK		03-Jun	23-Jun	26-Jun	20	2
ECM	Steen-Larsen, H.C.	DK	12-May	18-May	03-Jun		16	0
FIELD LEADER	Steffensen, Jørgen Peder	DK	24-Apr	28-Apr	23-Jun	25-Jun	56	6
FOM	Steffensen, Jørgen Peder	DK	27-Jul			21-Aug	0	25
ELECTRONICS	Stocker, Bruno	CH	27-Apr	28-Apr	04-Jun	05-Jun	37	1
LINE SCANNER	Storm, Anna Sturevik	S	11-May	18-May	10-Jul	10-Jul	53	7
LINE SCANNER	Stowasser, Christoffer	DK	29-Jul	30-Jul	18-Aug	20-Aug	19	3
CARPENTER	Svavarsson, Adalstein	IS	29-Jul	30-Jul	19-Aug	21-Aug	20	3
ECM	Svensson, Anders	DK	02-Jun	04-Jun	23-Jun		19	0
FIELD LEADER	Svensson, Anders	DK		23-Jun	12-Jul	13-Jul	19	2
CFA	Thilthorpe, Louise	UK	08-Jul	10-Jul	18-Aug	20-Aug	39	4
SWISS SAW	Uetake, Jun	J	29-Jul	30-Jul	18-Aug	22-Aug	19	5
DRILLER	Valero-Delgado, Fernando	D	22-Jun	23-Jun	10-Jul	11-Jul	17	2
SWISS SAW	Vinstrup, Mai	DK	22-Jun	23-Jun	10-Jul	13-Jul	17	4
LOGGER	Vinther, Bo	DK	12-May	18-May	23-Jun	25-Jun	36	8
DRILLER	Wang Shimeng	CHN	29-Jul	30-Jul	18-Aug	20-Aug	19	3
CFA	Wegner, Anna	D	02-Jun	04-Jun	10-Jul	11-Jul	36	3
DRILLER	Wilhelms, Frank	D	22-Jun	23-Jun	10-Jul	11-Jul	17	2
CFA	Wolff, Katrin	D	06-Jul	10-Jul	30-Jul	01-Aug	20	6
CFA	Wyss, Suzanne	CH	22-Jun	23-Jun	18-Aug	20-Aug	56	3

PACKING	Xiao Cunde	CHN	01-Jun	04-Jun	23-Jun	26-Jun	19	6
PACKING	Zheng, James	CAN	27-Jul	30-Jul	18-Aug	21-Aug	19	6
							3058	739

Ice core drilled in the season 2009:

Site	Position	Depth	Comment
NEEM Main		from 102.35 to 1757.84 m	
Firn/air	2 km from NEEM	91 m	parallel drilling.
NEEM2009S1	Close to firn air	136 m	parallel drilling.

2009 deep core progress, logging, processing and CFA analysis



Situation Reports (SITREPS):

NEEM - SITREP no. 1, Sunday 26 April 2009.

This SITREP covers the period April 20-26, 2009 (inclusive).

Movement of personnel:

April 20: Lars Berg Larsen(DK) from CPH to SFJ by Air Greenland.
April 24: Sverrir Hilmarsson(IS), Lone Holm Hansen(DK) and Jørgen P. Steffensen(DK) from CPH to SFJ by Air Greenland.
April 25: Sarah Harvey(US) from Schenectady to SFJ by 109th LC-130.

Movement of Cargo:

The following shipments have arrived in SFJ:
20 pieces 1442 kg from CPH, AWB 631-2620 0241
44 pieces 1263 kg from Bremerhaven, AWB 020-9369 7494
2 pieces 60 kg from CPH, AWB 631-2620 0252
4 pieces 101 kg from Berne, AWB 117-2327 3051
7 pieces 91 kg from NIPR, Tokyo, AWB 117-2163 5250
25 pieces 673 kg from CPH, AWB 631-2620 0230
50 pieces 2079 kg from CPH AWB 631-2620 0215
2 pieces 1160 kg from CPH, AWB 631-2620 0226
4 pieces from Corea by DHL
Food 200 kg from U.S by 109th

Activities:

The NEEM field office in Kangerlussuaq has been opened by the first FOM from Copenhagen Mondag April 20. The office and the warehouse (442) was 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. The vehicles are running fine. The FOM has been busy collecting cargo that has arrived during the week.

With the arrival of three more people on Friday, work on cargo has begun. Due to a late spring a lot of snow and ice was everywhere, and Saturday temperatures rose and turned the cargo yard into muddy slush. All vehicles were taken out of the warehouse (442) so that sorting of cargo and pallet building can be done inside 442. The Deployment Commander of the 109th for the coming week arrived Saturday. It is still the plan to make the put-in at NEEM on Tuesday. The maximum weight of the cargo and PAX is set at 11,000 lbs. Sunday was spent building two cargo pallets and trimming the weights to meet the set maximum. The cargo only needs slight trimming, and all first priority cargo will go on the first plane. The 109th are having an inpection week this coming week, therefore we plan to have all cargo ready, weighed and packed by Sunday evening.

Weather in Kangerlussuaq(SFJ) is sunny with some clouds. Snow is still everywhere, and temperatures are between +2 and -10 C.

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 2, Sunday 03 May 2009.

This SITREP covers the period May 03-10, 2009 (inclusive).

Movement of personnel:
April 27: HansPeter Moret (CH), Bruno Stocker (CH), Jakob Schwander (CH), Henrik Bundgaard (DK), Steffen Bo Hansen (DK), Trevor Popp (DK), Olafur Kristinnsson (IS), from CPH to SFJ by Air Greenland. Hans Christian Florian (GRL) from Tasiilaq to SFJ by Air Greenland.

April 28: Jørgen Peder Steffensen (DK), Sverrir Hilmarsson (IS), Sarah Harvey (US), HansPeter Moret (CH), Bruno Stocker (CH), Jakob Schwander (CH), Henrik Bundgaard (DK), Steffen Bo Hansen (DK), Trevor Popp (DK), Olafur Kristinnsson (IS), Hans Christian Florian (GRL) from SFJ to NEEM by the 109th

Movement of Cargo:
The following shipments have arrived in SFJ:
33 pieces 1975 kg from Bern, AWB 117.2327 3062
1 piece 8 kg from Italy, Air bill 535 0336972

April 28. 3968 kg Drilling equipment, spare parts, communication equipment and food
from SFJ to NEEM by 109th

Activities:
Put in on Tuesday April 28, hrs. 11:50 went according to schedule. After a very short ground time – about 25 min. – the skier left the NEEM site in first attempt using ATO's. The plane was able to return directly to Kangerlusuaq. The camp was found intact but with quite a lot of snow drifts. Science- and drill trenches were both in fine condition. The Pistenbully and the main generator were running at 7 pm on day of arrival.

During the week camp activities have had two focus points. Two to three drillers have been working in the drill trench. A skylight allowing the drill tower to tilt to vertical has been built. The drill tower has been aligned. Drill workshop has been opened. Drillers cabin has been pulled out from the wall and the snow above it has been trimmed. A new table has been built in drill trench. Winch motor and winch control have been installed, and Sunday the winch was running fine. Drillers are now ready to begin installing the drill. The rest of camp personnel have been working on camp infrastructure. The centre pole in the main dome was lowered by 5 cm to take off strain. All electrical connections in the main dome were rewired and most outlets are now RFI protected. The cook has now two stoves in the kitchen. Electrical installations in science trench and drill trench have been updated. All tents and structures now have electrical power. New radiators have been mounted in the main dome. By Sunday, the main dome had central heating using waste heat from the main generator. The cooks snow melter is in operation, providing drinking water to camp. Carpenter construction has been going on in main dome, drill trench and on drill trench roof. A new ski landing area was marked (18-36 true). New Iridium based internet system has been established, and is working well. NEEM weather station has been setup and is working well. Routine maintenance has been done on main generator. One snowmobile now fitted with electrical engine heater. One weatherport, the cooks food store, has been erected, and the cook has made a food inventory.

NEEM iridium numbers:
Main iridium handheld: +8816 214 64908
New system NEEM captain: +8816 777 02566
New system NEEM crew: +8816 777 02567

SFJ iridium number: + 8816 21442 402

Weather at NEEM: has been mixed. Two days were so windy and with blowing snow, that outside work was difficult. Temperatures from -35 C to -15 C. Winds from East to South at 4 m/s to 15 m/s. Mostly blue sky, sometimes thin overcast.

NEEM camp population: 11

Weather in Kangerlussuaq: (SFJ), sunny with some clouds. Little snow.
Temperatures are between +5 and -10 C.

NEEM Field operations office,
Lone Holm Hansen
Lars Berg Larsen

NEEM - SITREP no. 3, Sunday 10 May 2009.

This SITREP covers the period May 04-10, 2009 (inclusive).

Movement of personnel:
None

Movement of Cargo:
The following shipments have arrived in SFJ:
60 pieces, 1848 kg from Cph, AWB 631.26200263
2 pieces, 370 kg from Cph, AWB bill 631.26200274

Activities:

NEEMs skiway (direction 130 degrees, true) has been groomed, and is ready to receive planes. Camp has also made a new skiway (direction 180 degrees true). It is the hope, that the new skiway eventually will become the NEEM skiway, as it should be facing more into the prevailing wind as the old one.

The snowmelter was set up near the main dome and hooked onto the hot water System and it is now possible to melt a lot of snow. Placing it near the main dome makes it easier to maintain the water pipes.

A complete central heating system is now in operation and the main dome is warm and pleasant with temperatures up to +20°C even at outside temperatures of -31 °C. Also the main water supply and drain system is now working making it possible to have shower and to operate the dishwasher.

Drill electronics and console was mounted and the drill computer tested. There were some problems with a broken power supply for the drill motor, but this is fixed now. There are a few issues with the data transfer from drill to surface and vice versa. Camp is working on this.
Twice during the week the power cable was cut with the snow blower. This could be repaired. Also during the week two winch controllers broke down due to some fault in the winch motor. The winch controllers cannot be repaired without spare parts, and camp needs a new winch motor. Next week, a new motor and two replacement controllers will arrive. If these parts make it to camp with the flights next week, drilling will not be delayed. The anti-torque section of the drill was mounted but unfortunately a pull test was not completed due to the break down of the winch control.

The electrical system in camp has been revised, and lots of outlets have been installed in the science and drill trenches.

A lot of carpenter and plumber construction work has been done in the main dome, with setting up sinks, toilets and drains, and building shelves and cupboards and sealing the building with PU foam. The carpenter has also been busy building rails, and shelves for the drillers.

Weatherports have been built and beds have been set up. Camp is ready to receive a population of 24 next week.

All are well in camp.

* *

GPS fixes for start and end of new skiway:
North end: N 77 degrees 27.969 min, W 51 degrees 2.793 min, alt. 2484 m
South end: N 77 degrees 25.941 min, W 51 degrees 2.471 min, alt. 2484 m
Skiways runs 358 and 178 degrees true.

Weather at NEEM: has been mixed. Two days were so windy and with blowing snow, that outside work was difficult. Temperatures from -34 C to -19 C. Winds from East to South at 4 m/s to 15 m/s. Mostly blue sky, sometimes thin overcast.

NEEM camp population: 11

Kangerlussuaq Activities:
Preparations of cargo for next weeks two missions to NEEM

Weather in Kangerlussuaq: (SFJ), sunny with some clouds. Little snow. Friday very strong wind. Temperatures are between +5 and -10 C.

NEEM Field operations office,
Lone Holm Hansen
Lars Berg Larsen

NEEM - SITREP no. 4, Sunday 17 May 2009.

This SITREP covers the period May 11 - 17, 2009 (inclusive).

Movement of personnel:

May 11: Anna Sturevik Storm (S), from CPH to SFJ by Air Greenland.
Louise Albershardt (US), Kristina Dahnert (US), from Schenectady to SFJ by 109th LC-130.

May 12: Henry Rufli (CH), Mathias Bigler (CH), Simon Schüpbach (CH), Sepp Kipfstuhl (D), Christian Panton (DK), H.C. Steen-Larsen (DK), Marianne Benn (DK), Sigfus Johann Johnsen (DK), Bo Vinther (DK), Peter Sperlich (DK), Nobuhiko Azuma (J), from CPH to SFJ by Air Greenland.

May 14: Hans Christian Florian (GRL) from NEEM to Thule to SFJ by the 109th.

May 15 Hans Christian Florian (GRL) from Thule to Kangerlussuaq by 109th.

May 16 Hans Christian Florian (GRL) from Kangerlussuaq to Nuuk by Air Greenland.

Movement of Cargo:

The following shipments have arrived in SFJ:

33 pieces, 1975 kg from Bern, AWB 117-23273062
02pieces, 19 kg from Cph, AWB 631.26200285
10pieces, 161 kg from Cph, AWB bill 631.26200296

Activities:

One of the main issues in the beginning of the week was to make ready the aircraft fuel pump and to prepare the skiway in order to have it upgraded to heavier loads. First arrival did not turn out satisfactory for the pilots but second and third was fine and the skiway was finally upgraded. During the week we had three 109th arriving, one with cargo and two with fuel, which means that we now have fuel for two months - that is all in all about 19.000 liter.
We received the new winch motor and winch control from last year and lowered it into the drill trench with crane. Firstly it did not work and it was discovered that it was due to three cracked resistors. After replacing the resistors and finding the right settings for the new motor the winch control worked.
Later on during the week the drillers performed a pull test to 1.8 tonnes with success. The winch worked and the drills attachment to the cable held.
After having cleaned the hole some 100 m down by removing debris from drilling last year, the first ice core was drilled on Friday. Drilling with the HT drill down to 102,35 m (~111 m below 2008 surface).

Monday the short HF radio and Yagi quarter wavelength antenna – 17m long - was set up.
Indoor shelves and tables were made for the kitchen and new water taps mounted. Also the laundry machine was installed and electrical supply to the main dome upgraded. Carpenter work was carried out in the drill trench as well.

Weather at NEEM:

Variable from overcast to blue sky, haze and fog, - 36 C to -8 C, 5-38 knots
mainly from S and SSE to E. Visibility: 200 m – to unrestricted. Snow and blowing snow. Blizzard started Wednesday and strong winds dominant the rest of week.

NEEM camp population: 10.

Kangerlussuaq Activities: Busy week buying spare parts and goods in Kangerlussuaq and ordering from Cph. Sorting cargo and building pallets with goods to be sent by the next planes. First three field members arrived Monday and another eleven on Tuesday. Departure was scheduled to Thursday; but due to weather and technical problems with the plane, the flight had to be postponed to Monday 18th of May.

Weather in Kangerlussuaq: (SFJ), in the beginning of the week rather cloudy and cold. End of week very sunny and high temperatures.
Temperatures between +15 and -7 C and snow is now only to be seen on hill sides facing North.
No mosquitoes

NEEM Field operations office,
Lone Holm Hansen
Lars Berg Larsen

NEEM - SITREP no. 5, Sunday 24 May 2009.

This SITREP covers the period May 18 - 24, 2009 (inclusive).

Movement of personnel:

May 18: Anna Sturevik Storm (S), Louise Albershardt (US), Kristina Dahnert (US), Henry Rufli (CH), Mathias Bigler (CH), Simon Schüpbach (CH), Sepp Kipfstuhl (D), Christian Panton (DK), H.C. Steen-Larsen (DK), Marianne Benn (DK), Sigfus Johann Johnsen (DK), Bo Vinther (DK), Peter Sperlich (DK), Nobuhiko Azuma (J) and Lone Holm Hansen (DK) from SFJ to NEEM by the 109th.

Henrik Bundgaard (DK) and HansPeter Moret (CH) from NEEM to SFJ via Thule and SUMMIT to SFJ by the 109th.

May 19 Henrik Bundgaard (DK) and HansPeter Moret (CH) from SFJ to CPH by Air Greenland.

Movement of Cargo:

May 18: 6625 kg Science equipment and food from SFJ to NEEM by the 109th.
May 20: 8260 kg Construction materials, drill liquid and food from SFJ by 109th.

Camp Activities:

Finally people waiting in Kangerlussuaq for four days made it to camp. The number of people in camp went from 10 to 23. And a lot of work was done in and around the camp after five days of bad weather.
The last weatherports were erected and the camp is now fully established. Arriving cargo and cargo covered by snow drifts has been dug out, sorted and retrieved. Many parts of the cargo line have been pulled to surface, and removal of 3 m high snow drifts between buildings is in progress. Construction work in drill trench is finished, drill trench is now fully equipped for wet deep drilling. Friday, focus in

construction moved to the science trench. Set up of new tables, excavation of a Physical properties cave ("Sepp-cave"), extension of the CFA-lab and ECM setup was made in the science trench.
Work on a new temporary inclined trench began in order to install staircase, elevator and a new cook's freezer. Sunday, the main power distribution panel was exchanged, while camp for six hours was running on backup power.

The skiways were maintained and NEEM camp has receiving two airplanes this week. Camp has been maintaining two skiways so far: The old one used for landing and the new one as a takeoff skiway. After Wednesday's flight, the old skiway is closed, and camp has begun transferring flagging from the old to the new skiway. Next flight week there will only be the new skiway.

Drilling:

The drilling this week started out with the HT drill in dry mode. Then the EPICA drill was assembled and made ready while a camera was lowered into the borehole for inspection of the hole and the casing. The HT drill diverted from the pilot hole from last year, and at 98 m the new hole was completely clear of the old one. The inclination of the new hole is 0.7 degrees, which is a very good start indeed. Wet drilling could begin and drilling fluid was pumped into the borehole. Tests showed the best mixing ratio for Estisol/Coasol to be rather 65/35 than 75/25 as planned. More Coasol has been ordered. Due to a larger diameter of the borehole, the chip chamber fills up faster but the EPICA drill made several stable runs in wet mode yielding more than two meter cores. Drilling properties of new drill fluid is very good. The chip removal systems of the drills work well, and lost chips float to the surface of the fluid column. We have two complete and operational winch controls ready, and a third one is being repaired.
The second winch control is repaired and available as backup.

Driller's depth: 134.44 meters

Science activities:

A water vapor sampling station has been set up and is running. Data has been downloaded from the seismic station and sent to Copenhagen. Apparently, the station has a problem acquiring GPS satellite clock signal. Measurements of ECM on the new core have established a firm link to last year's pilot core. The two cores overlap by 5 m, and by matching layers of volcanic acidity, the depth scale of the new core has been fixed relative to the 2008 snow surface with few cm precision.

Weather at NEEM:
Variable from overcast with snow showers to blue sky, also some days with haze and fog, - 23 C to -9 C, 2-23 knots mainly from S and SSE to E. Visibility: 200 m to unrestricted. Most days windy with blowing snow; but the weekend was really beautiful.

NEEM camp population: 23.

Kangerlussuaq Activities: Preparations for the two flights into the camp this week.

Weather in Kangerlussuaq: (SFJ), in the beginning of the week frost in the morning, later in the week very nice weather with sun. Catabatic winds from the ice sheet lifting the sand and dust.
Temperatures between +18 C and -5 C sunny and windy.
No mosquitoes

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 6, Sunday 31 May 2009.

This SITREP covers the period May 25 - 31, 2009 (inclusive).

Movement of personnel:

May 26: Dorthe Dahl-Jensen (DK) from CPH to SFJ by Air Greenland.

May 27 Margaretha Hansson (S) from CPH to SFJ by Air Greenland.

May 29 Cheri Hamilton (US) from KSCH to SFJ by the 109th.

May 31 H.R.H. Crown Prince Frederik (DK), H.R.H. Crown Princess Victoria (S), H.R.H. Crown Prince Haakon (N), Morten Roland Hansen (DK), Anders Karlqvist (S), Pål Prestrud (N), Minik Rosing (DK), Marybeth Murray (CAN), David Holland (CAN), Mathez Edmond (US), Christian Puglisi (N), Veronica Melå (N), Mette Mailand (DK), Jan Bacher Dirchsen (DK), Thomas Marott (DK), Anders Löfstedt (DK), Anders Hermansen (DK), Bjarno Sørensen (DK), Jacob Øberg (DK), Trond Øxnevad (N), Pierre Johansson (S), Poul Hawken (US), Steffen Bo Hansen (DK), Kirsten Baltzer Kahr (DK), Henrik Myhr-Nielsen (N), Konrad Steffen (US), Cheri Hamilton (US), Margaretha Hansson (S), Dorthe Dahl-Jensen (DK), Heidi Røsok (N), Jonas Ekströmer (S), Jørgen Chemnitz Narup (GRL), Janus Pavia Maag Eigaard (DK) from SFJ to NEEM by 109th.

Anders Löfstedt (DK), Anders Hermansen (DK), Bjarno Sørensen (DK), Trond Øxnevad (N), Steffen Bo Hansen (DK), Kirsten Baltzer Kahr (DK), Henrik Myhr-Nielsen (N), Heidi Røsok (N), Jonas Ekströmer (S), Jørgen Chemnitz Narup (GRL), Janus Pavia Maag Eigaard (DK), Mette Mailand (DK) from NEEM to Thule Air Base by 109th.

June 1 Anders Löfstedt (DK), Anders Hermansen (DK), Bjarno Sørensen (DK), Trond Øxnevad (N), Steffen Bo Hansen (DK), Kirsten Baltzer Kahr (DK), Henrik Myhr-Nielsen (N), Heidi Røsok (N), Jonas Ekströmer (S), Jørgen Chemnitz Narup (GRL), Janus Pavia Maag Eigaard (DK), Mette Mailand (DK) from Thule Air Base to NEEM by 109th.

H.R.H. Crown Prince Frederik (DK), H.R.H. Crowns Princess Victoria (S), H.R.H. Crown Prince Haakon (N), Morten Roland Hansen (DK), Anders Karlqvist (S), Pål Prestrud (N), Minik Rosing (DK), Marybeth Murray (CAN), David Holland (CAN), Mathez Edmond (US), Christian Puglisi (N), Veronica Melå (N), Mette Mailand (DK), Jan Bacher Dirchsen (DK), Thomas Marott (DK), Anders Löfstedt (DK), Anders Hermansen (DK), Bjarno Sørensen (DK), Jacob Øberg (DK), Trond Øxnevad (N), Pierre Johansson (S), Poul Hawken (US), Steffen Bo Hansen (DK), Kirsten Baltzer Kahr (DK), Henrik Myhr-Nielsen (N), Konrad Steffen (US), Lone Holm Hansen (DK), Dorthe Dahl-Jensen (DK), Heidi Røsok (N), Jonas Ekströmer (S), Jørgen Chemnitz Narup (GRL), Janus Pavia Maag Eigaard (DK) from NEEM to SFJ by 109th.

Movement of Cargo:
May 30: 2770 kg Science equipment and food from SFJ to NEEM by the 109th.
May 31 8920 Liter (15.925 lbs @ 0,812 kg/l) JP-8 from TAB to NEEM by the 109th.

The following shipments have arrived in SFJ:
13 colli, 293 kg from CPH, AWB: 631-26200300
2 colli, 42 kg from CPH AWB: 631-26296513
6 colli, 340 kg from BAS, Cambridge, AWB 117-19737163

Camp Activities:

DRILLING:
Assembly of the long drill continues and it is required to make more fine adjustment of the hollow shaft to properly mount the pump. In the mean time, drilling went on in a normal mode with the EPICA/NGRIP drill throughout the rest of the week. Both winch control boxes are now mounted along the drill trench wall for easy switch over if a backup is needed. Drillers are happy about the new software that monitors and displays data from the drill, transfers driller commands to the drill down hole and displays cable load and winch speed. During the week there was a very productive collaboration between the drillers and the programmer of the software.
The pump/hollow shaft configuration works well with the new drill fluid as any excess chips in the borehole do not accumulate at the bottom but stay suspended and float to the top of the liquid column. Cleaning of the bore hole fluid can therefore be accomplished by lowering a filter unit into the top of the fluid column to fish out the excess chips.

Speed tests in the fluid show that travel down hole is not significantly slowed by the higher viscosity of the new fluid. Therefore cutter configuration was changed to give a 132 mm diameter borehole rather than the anticipated 134 mm. The advantage of this configuration is that fewer chips are produced in each run and the consumption of drill fluid is reduced.
Driller's depth*:* 191.70 m.

LOGGING:
The ice core logging has proceeded into the core drilled in fluid. It appears to be relatively easy to wipe the cores clean from drill fluid with paper towels. The cores can be marked by a pencil. The logging software works fine. A preliminary ECM measurement revealed the 1259 AD volcanic eruption in the ice core 182.9 m.
Logged ice cores: depth 200 m.
SCIENCE:
A water vapour isotope and gas sampling site has been setup 50 m S of the drill trench east end. Air sampling is done at different heights using our 13 m high tower. The laser based equipment is setup in a tent and is working fine. The measurements are running satisfactory.
SKIWAY:
Approaches of the old skiway has been taken down. Work was carried out on the approaches, the taxi ways and the apron, which is now extended east to new skiway. Several hundred markers and flags were repaired and bundled and placed on the new airfield which is now fully marked. The length of the skiway is now 12.000 feet with in lead flags in both each 12.000 feet. Total length of whole skiway structure is 36.000

feet. The first plane to land on the new skiway was the DV flight May 30.

SCIENCE TRENCH:
Setting up of CFA equipment in the warm lab. continues. More tables and saws in science trench have been set up and now only a few tables more are needed. Core buffer has been modified and is now able to receive 4 m core troughs.
CONSTRUCTION:
All week an intensive work has been carried out by several people to excavate a very deep shaft at the end of the inclined trench for the new elevator and staircase and to remove the remaining snow wall between the drill trench and the elevator shaft. It was tough to gain the last meters in the bottom of the shaft. All snow had to be cut by chain saw and the blocks removed. This involved a lot of hard lifting and hauling. The elevator was installed in the shaft with the crane and is now ready for use. The Shaft and inclined trench were covered with a roof to give cover for drifting snow.
In the main dome, a door to the shower room has been mounted.
DV-VISIT:
On 30th May camp hosted a DV visit. As many DVs spent the night in camp, camp population rose to 44 on the night between 30th May and 31st May. The visitors were Scandinavian representatives of the International Polar Year(IPY) national committees and a press group. Senior IPY scientists from Norway, Sweden and Denmark accompanied the protectors of IPY: H.R.H. Crown Prince Haakon of Norway, H.R.H. Crown Princess Victoria of Sweden and H.R.H. Crown Prince Frederik of Denmark. The visit went really well, and the Field Leader wishes to express his gratitude to camp staff, who put a lot of effort into the visit and to the New York Air National Guard for flawless flight operations.

OTHER ACTIVITIES:
Large snow drifts were removed and the central camp area is now flat. Later, it was groomed with beam groomer.
After the plane had arrived on Saturday lots of food was unpacked and distributed into fresh store and freezer – the cooks freezer will be established in the inclined trench which leads down to the new elevator.

Sofas have been assembled and a lounge with sofa group and tables on the 2nd floor is now set up. The Field Leader office was moved to the 3rd floor.
All during the week a lots of preparations for the DV visit at the end of the week was carried out. Camp needed to be cleaned up, flags put up in Main Street and a tour of the camp to show all activities for the visitors was scheduled.
WEATHER AT NEEM:
Beginning of week mainly clear and unrestricted visibility. At end of week overcast, warm and with snow fall reducing visibility down to 400 m. Wind from 3 knots speeding up to 18 knots at the end of the week. Wind direction beginning of week mainly from S turning NE and later on NV via S. End of week SW.

NEEM camp population: 24.

Kangerlussuaq Activities: This week the overall activity was the preparations for the Royal visit. The Kangerlussuaq International Science Support (KISS) building was the turning point for all activities; The accommodation, press conference, science presentations, NEEM/flight briefing etc. The big challenge was to brief and issue 34 people with polar survival gear upon their arrival early morning from Illulisat and have everybody ready in two hours for the departure to NEEM.
Thanks to the help of the 109th, CH2MHILL, the Police, GLV and the local people in whole Kangerlussuaq the visit was a great success everybody enjoyed.

Weather in Kangerlussuaq: Very nice weather with sun most of the week. Windy in the afternoons

Temperatures between +18 C and +2 C
No mosquitoes

NEEM Field operations office,
Lars Berg Larsen
Lone Holm Hansen

NEEM - SITREP no. 7, Sunday 7 June 2009.

This SITREP covers the period June 1 - 7, 2009 (inclusive).

Movement of personnel:

June 1: Sebastian Bjerregaard Simonsen (DK), Henriette Lerche (DK), Jeppe Jønch Andersen (DK), Susanne Lilja Buchardt (DK), Jørn Ladegaard (DK), Xiao Cunde (CHN), JiWoong Chung (COR), Celia Sapart (NL) and Alex Pyne (NZ) from CPH to SFJ by Air Greenland.

Dorthe Dahl-Jensen (DK) from SFJ to CPH by Air Greenland.

June 2: Robert Mulvaney (UK), Siwan Manon Richardson (UK) Anders M. Svensson (DK), Ernesto Kettner (DK), Pascal Bohleber (D), Anna Wegner (D) and Susanne Iversen (DK) from CPH to SFJ by Air Greenland.

Jocelyne Bourgeois (CAN) from SCN to SFJ by the 109th.

June 4: Sebastian Bjerregaard Simonsen (DK), Henriette Lerche (DK), Jeppe Jønch Andersen (DK), Susanne Lilja Buchardt (DK), Jørn Ladegaard (DK), Xiao Cunde (CHN), JiWoong Chung (COR), Celia Sapart (NL), Alex Pyne (NZ), Robert Mulvaney (UK), Siwan Manon Richardson (UK) Anders M. Svensson (DK), Ernesto Kettner (DK), Pascal Bohleber (D), Anna Wegner (D) and Susanne Iversen (DK and Jocelyne Bourgeois (CAN) from SFJ to NEEM by the 109th.

Christian Panton (DK), Steffen Bo Hansen (DK), Marianne Benn (DK), Kristina Dahnert (US), Cheri Hamilton (US), Olafur Kristinsson (IS), Trevor Popp (DK), Jakob Schwander (CH) and Bruno Stocker (CH) from NEEM to SFJ by 109th.

June 5: Christian Panton (DK), Steffen Bo Hansen (DK), Marianne Benn (DK), Olafur Kristinsson (IS), Trevor Popp (DK), Jakob Schwander (CH) and Bruno Stocker (CH) from SFJ to CPH by Air Greenland.

June 6: Kristina Dahnert (US) and Cheri Hamilton (US) from SFJ to SCN by the 109th.

Movement of Cargo:

June 4: 7285 kg drill fluid and Mogas from SFJ to NEEM by the 109th.

2720 kg empty pallets two old skidoos from NEEM to SFJ by 109th.

CAMP ACTIVITIES:
Thursday was the first major crew change of people in the camp, 9 people out and 17 in.
The camp had a Blizzard in the beginning of the week then snowfall and drifting snow rest of week which complicated the flying operations. Wednesday's mission was postponed to Thursday due to bad weather. A brief opening in the difficult snow and weather conditions made it possible to land and 9 PAX and 3 retro pallets was bought to Kangerlussuaq.

DRILL:
The new NEEM drill was deployed for the first time this week. Compared to the old NGRIP/EPICA drill, the new drill is outfitted with several new changes which have been developed for the new drilling fluid and should make the drill capable of drilling ice cores of more than 3 m per run. The premier run gave a 3.5 m long ice core came out in a one piece. A speed test was carried out in order to determine travel time down the borehole. Unfortunately this test created a kink on the cable and 90 meters was cut of the cable before drilling could continue. Later speed tests showed, that the travel speed of the drill is not significantly influenced by the viscosity of the fluid. Consequently, the drillers have reduced the diameter of the hole from 134 mm to 132 mm. This reduces the amount of chips produced and reduces the amount of drill fluid needed. The rest of the week has been used to fine tune the new drill in order to find the best configuration for routine drilling.

Driller's depth Sunday: 252.90 m. 61.20 m drilled during the week.
SKIWAY:
Groomed the skiway several times this week due to unusually high snowfall and drifting snow. Skiway maintained after the Thursday flight.
SCIENCE TRENCH:
Logging of ice cores continue. Sunday logging depth: 265.65 m.
Physical property Lab. moved in place and scientific instruments are being installed. The setup of the CFA lab equipment continued all week. The processing line is ready for core processing.
CONSTRUCTION:
Finished installing entrance staircase and elevator and covered afterwards with white weather port. The inclined trench to drill trench is roofed and will be closed. It will be used as cook's freezer.
WEATHER AT NEEM:
Blizzard, snowfall and overcast until Thursday evening. Fine weather Friday to Sunday. Temperatures between -30 C and – 7 C. Wind 5 to 21 knots, mostly from ESE to WSW.
Science activities:
Replaced a bad GPS antenna for the Seismic station. It is now logging data again.
Sampling of air and water vapour continues.
NEEM camp population: 32

Kangerlussuaq Activities: Preparation of one flight mission to NEEM this week and the first crew exchanges this season.

Weather in Kangerlussuaq: Beginning of the week rain, overcast and sunny in between.
Temperatures between +18 C and +2 C
Mosquitoes

NEEM Field operations office,
Lars Berg Larsen
Lone Holm Hansen

NEEM - SITREP no. 8, Sunday 14 June 2009.

This SITREP covers the period June 8 - 14, 2009 (inclusive).

Movement of personnel:

No movement of personnel

Movement of Cargo:

The following shipments have arrived in SFJ:

1 coli, 230 kg from LGGE, AWB: 631-26307514

CAMP ACTIVITIES:

Monday this week the science trench was ready to receive ice cores and the first ice cores were processed in a fully manned science trench. After few days of training and run-in, daily processing rates reached around 30 m per day. Saturday and Sunday, the firn core from 2008 was processed in order to provide CFA cuts all the way to the top.

Temperature in the trenches comes close to -14 C (drill trench) and -17 C (Science trench) due to outside temperatures and equipment generating heat, it was decided cooling was needed. Work started on a 15 m tunnel into the firn in the rear end of the drill trench in order to pump cold air out into the drilltrench. The firn temperature in the tunnel is close to -30 C.

DRILL:

Minor adjustments to the drill has been carried out through the week. The new deep drill is now fine tuned to a mode where almost each run produces 3 meter of ice core on average. As the drillers put it:

"After final adjustment of the pump Monday, drilling has been utterly stable for the rest of the week. Slight reduction of the pitch to 2.4 mm was, however, needed Wednesday to ensure more stable drilling current."

SKIWAY:

Grooming practice on sides of apron and taxi ways. No other work on skiway this week

SCIENCE TRENCH:

All equipment installed in the science trench. Few adjustments to DEP and line scanner.

More equipment was added to the CFA line.

CONSTRUCTION:

On the snow surface a hill was made for the old NGRIP garage. The garage cannot be built right now due to pieces forgotten in Kangerlussuaq.

Science activities:

Snow pit studies was done 200 m south of camp for Pollen, 10Beryllium, stable isotopes and snow chemistry.

WEATHER AT NEEM:

Nice weather in general, little overcast to blue sky, unrestricted visibility. Temperatures between -24 C and – 10 C. Wind 1 to 12 knots, mostly from S to SSE.

NEEM camp population: 32

Kangerlussuaq Activities: Emptying and reorganizing shipping containers.

Weather in Kangerlussuaq: Wery nice weather mainly sunshine.
Temperatures between +18 C and +7 C
More mosquitoes

NEEM Field operations office,
Lars Berg Larsen

NEEM - SITREP no. 9, Sunday 21 June 2009.

This SITREP covers the period June 15 - 21, 2009 (inclusive).

Movement of personnel:

June 18 Brandon Henman (US) from CPH to SFJ by Air Greenland

June 19 Sune Olander Rasmussen (DK) from CPH to SFJ by Air Greenland

June 20 Takayuki Kuramoto (J) from CPH to SFJ by Air Greenland

Movement of Cargo:

The following shipments have arrived in SFJ:

14 coli, 358 kg from UCPH, AWB: 631-26296524
1 coli, 5 kg from AWI, AWB: 631-26297740
19 colli 304 kg from CSIRO, AWB:117-2105822
2 colli 47 kg from CNRS LGGE, AWB: 9508194872

Camp activities:

The whole week the camp has been in a nice stable production mode in the science and drill trench.
On the surface routine maintenance of some of the vehicles and clean up in and around camp.

Skiway:

In the weekend work started on the skiway in order to bring to the right level for the planned airplane instrumental approach certification next week.

Drilling:

Whole week very stable drilling producing about 25 m icecore on a daily base. Hole inclination close to 1 deg and corebreaks range from 700 kg to 900 kg.
Nice one piece 3.5 m icecore are drilled but approaching brittlezone core tends to break from handling.
4 drillers fully trained on the console.
Driller's depth*:* XXX:XX m.

Construction:

In order to cool down the trenches a 15 meter tunnel in each trench are dug into the wall. Sucking air from the tunnel to the trench has lowered the temperature from -12C to -18C in the drill trenches.

Science Trench:
A lot adjusting and fine tuning of the fixed trough and saws to prevent the cores to break further.
End of week the measurements in the CFA laboratory started this week. The Swiss part of the system works, except yet for sulphate. The water Picarro works on-line; but the gas Picarro did not get any gas, as the first core sections analysed are firn, and the gas escapes. The U.K. fast Ion Chromatograph works, although both suppressors leak and was replaced. The laser in the flow cytometer for dust studies broke down just as measurements began.
Logged ice cores depth: XXX m.

Other science activities:
Physical property measurements started.
Tephra sampled and studied in microscope
Weather at NEEM:
Again a week with very nice weather blue sky and little wind. In the end of the week a slight change with fog, snow and overcast. From unrestricted to 1 mile visibility. Temperatures between -23 C and – 8 C. Wind 3 to 14 knots, mostly from S to SSE.
NEEM camp population: 32

Kangerlussuaq Activities: Preparation of cargo, receiving pax and organizing science presentation for media group in cooperation with CH2MHILL and scientists in KISS.

Weather in Kangerlussuaq: Very nice weather the beginning of the week. Rain and Snow in the end of the week. Temperatures between +18 C and 0 C
Even more mosquitoes

NEEM Field operations office,
Lars Berg Larsen
Sune Olander Rasmussen

NEEM - SITREP no. 10, Sunday 28 June 2009.

This SITREP covers the period June 22 - 28, 2009 (inclusive).

Movement of personnel:

June 22 Sune Olander Rasmussen (DK) and Brandon Hinman (US) from SFJ to NEEM by the 109th (109th media mission flight)

Suzanne Wyss (CH), Sang-Bum Hong (KOR), Fernando Valero Delgado (D), Frank Wilhelms (D), Melanie Behrens (D), Nerys Menna Lewis (UK), Mads Dam Ellehøj (DK), Ivana Cvijanovic (Serbia), Tim Brücher (D), Mai Winstrup (DK), Tina Brand (DK), Vasileios Gnikis (Greece), Maurine Montagnat Rentier (F), Philippe Possenti (F), Olivier Alemany (F), Raimund Muscheler (D), Markus Michael Frey (D), Fabien Gillet-Chaulet (F), and Timothy Charles Burton (UK) from CPH to SFJ by Air Greenland

June 23 Suzanne Wyss (CH), Sang-Bum Hong (KOR), Fernando Valero Delgado (D), Frank Wilhelms (D), Melanie Behrens (D), Nerys Menna Lewis (UK), Mads Dam Ellehøj (DK), Ivana Cvijanovic

(Serbia), Tim Brücher (D), Mai Winstrup (DK), Tina Brand (DK), Vasileios Gnikis (Greece), Maurine Montagnat Rentier (F), Philippe Possenti (F), Olivier Alemany (F), Raimund Muscheler (D), Markus Michael Frey (D), Fabien Gillet-Chaulet (F), Timothy Charles Burton (UK), and Takayuki Kuramoto (J) from SFJ to NEEM by the 109th

Jørgen Peder Steffensen (DK), Sverrir Hilmarsson (IS), Sarah Harvey (US), Sigfus Johnsen (IS), Louise Albertshardt (US), Bo Møllesøe Vinther (DK), Hans Christian Steen-Larsen (DK), Matthias Bigler (CH), Henry Rufli (CH), Nobuhiko Azuma (J), Peter Sperlich (D), Josef Richard Kipfstuhl (D), Sebastian Bjerregaard Simonsen (DK), Henriette Lerche (DK), Ernesto Kettner (D), Jocelyne Bourgeois (CAN), Xiao Cunde (CHN), Pascal Bohleber (D), Susanne Iversen (DK), Robert Mulvaney (UK), Siwan Manon Richardson (UK), Margareta Hansson (S), and Sune Olander Rasmussen (DK) from NEEM to SFJ by the 109th.

June 24 Sverrir Hilmarsson (IS) and Susanne Iversen (DK) from SFJ to CPH by Air Greenland.

June 25 Lars Berg Larsen (DK), Jørgen Peder Steffensen (DK), Sigfus Johnsen (IS), Bo Møllesøe Vinther (DK), Matthias Bigler (CH), Henry Rufli (CH), Nobuhiko Azuma (J), Josef Richard Kipfstuhl (D), Henriette Lerche (DK), Ernesto Kettner (D), Pascal Bohleber (D), Robert Mulvaney (UK), Siwan Manon Richardson (UK), and Margareta Hansson (S) from SFJ to CPH by Air Greenland.

Sarah Harvey (US), Louise Albertshardt (US), and Jocelyne Bourgeois (CAN) from SFJ to SCN by the 109th.

June 26 Hans Christian Steen-Larsen (DK), Peter Sperlich (D), Lone Holm Hansen (DK) and Xiao Cunde (CHN) from SFJ to CPH by Air Greenland.

Movement of Cargo:

June 22 2000 kg of fuel and 3510 kg of empty ice core boxes, food, spare parts, scientific equipment from SFJ to NEEM by the 109th
3700 kg of trash and spare equipment to be stored in SFJ from NEEM to SFJ by the 109th.

June 23 7540 kg of food, mogas, plywood, scientific equipment, core troughs, and gas pumping tubes from SFJ to NEEM by the 109th
2500 kg of boxes with ice core samples and refuse from NEEM to SFJ by 109th.

The following shipments have arrived in SFJ:
Container from UCPH by ship, including 2 boxes from IMUA and 2 from Jan Kaiser
1 box, 18 kg, from CEA LSCE by FedEx, AWB no. 866072952143
1 box, 18 kg, from AWI, AWB no. 631-26298075
1 box, 25 kg, from USwansea by TNT
2 colli, 61 kg, from UBern, AWB no. 117-23927013

Shipment sent from SFJ
6 colli, 190 kg, to UCPH, AWB no. 631-01836365

Camp activities:

The beginning of the week was dominated by the work related to receiving the two Skiers Monday and Tuesday and preparing and unpacking cargo to and from the flights. The Monday flight was a media visit, where a US press delegation was invited by the 109th to Greenland. It was a pleasure for us to present our work to the visitors. On the Tuesday flight, 2/3 of the crew changed, so the first days after the crew change

were spent on teaching the newcomers everything about drilling, cutting and analysis, and camp life. Late week has been characterized by good progress in drilling, cutting, and analysis.

Skiway:
The skiway is in very good condition. Both Skiers took of using only half the skiway without ATOs in first attempt. The skiway has been certified for bad weather approaches, so landing is now possible under 300/1 conditions: cloud base 300 ft or more and visibility 1 mile or more. We thank the 109th for a highly successful and professional week of flying.

Construction:
No major construction work this week,

Drilling:
Drilling is going very well. Before the Tuesday flight, the drillers had to drill short cores due to lack of core troughs. After the delivery of the troughs and run-in and training of the new drillers, production has been high. The drill team started working in shifts from Friday, so now drilling takes place roughly from 8 am to midnight.
Runs in excess of 3 meters are common and the cores usually have several cracks (3-5) when pushed out but the core remains intact in the core tray. The drillers have improved the extraction of the core from the barrel by reducing thermal shock on the core troughs with strips of duct tape but in the brittle ice cracks still occur.
Driller's depth: 702.40 m, production this week is more than 150 m despite crew change and short cores in the beginning of the week.

Logging:
Logging has been on hold all week due to the brittle zone. Last bag before brittle zone: 1021. Depth: 561.55 m.

Science Trench:
Ice core processing is going well. This week both the Vesuvio ice and the Christmas night snow was process in the science trench.
Processed depth: 443.30 m.
The CFA lab has finished analyzing the shallow core from 2008 and is now analyzing the main core. During his last 12 hours in camp Matthias Bigler managed to make the CFA sulphate analysis function. All 10 CFA chemical analytical channels are thus fully operative.
CFA depth: 134.75 m.
C-axis analysis with French fabric analyzer has been started.

Other science activities:
Started BAS radar measurements.
A double pit for inspecting firn stratigraphy was 'dug' by Timothy and the snow blower.
The seismic station was inspected and leveled.
A five meter deep pit for chemical analyses was dug and sampled by our Korean participants 3 km East of camp.

Weather at NEEM:
Again a week with generally nice weather. Very changeable winds, with the strongest winds from southerly directions. Snow showers just after the Monday Skier left camp and also at other times. Temperatures from -20°C to -7°C

NEEM camp population: 31

Kangerlussuaq activities:
It has been a busy week with 2 flights to NEEM and almost 50 persons passing through either on their way up to or home from NEEM. The field office manning changed mid-week, and we are now tidying and organizing the office and warehouse after a busy week. At the same time, we and starting the work to get food and equipment ordered for new flight period. We have re-arranged the HF radio antenna on the roof.

Weather in Kangerlussuaq:
Nice weather all weak, sometimes windy and dusty. Temperatures between 5°C and 18°C. Many mosquitoes.

NEEM Field operations office,
Sebastian Bjerregaard Simonsen
Sune Olander Rasmussen

NEEM - SITREP no. 11, Sunday 5 July 2009.

This SITREP covers the period June 29 – July 5, 2009 (inclusive).

Movement of personnel:
June 29 Dorte Elisabeth Rasmussen (DK) from CPH to SFJ by Air Greenland.

Movement of Cargo:
The following shipments have arrived in SFJ:
8 colli, 68 kg, from NIPR, Japan, AWB no. 117-21635331
Correction to SITREP no. 10:
2, not just one, containers arrived from UCPH by ship

Camp activities:
The beginning of the week

Skiway:
The skiway has lived a quiet life this week, only being touched by human skiers.

Construction:
No major construction work this week.

Drilling:
Drilling is running in a stable mode.
The drill has needed repairs a few times, with one significant problem:
Wednesday, the plastic electrical connections plate cracked in the anti-torque section, leaving a piece of plastic down hole but which was later successfully fished out. A new plate was made from similar plastic material and drilling continued. On Thursday, the new plastic plate cracked during the first run of the day,

but a large loose piece was luckily trapped in the anti-torque springs so a fishing trip was not required. The plate was re-clamped and drilling continued. This plastic becomes brittle with the present combination of cold temperature, drill fluid and pressure in the hole. Another part of different design and different plastic material has been made ready for backup.
Maintenance was carried out on the drill fluid transfer and mixing pump which decided to stop.
Driller's depth: 904 m, production this week is 202 m.
The shallow drill is being prepared for operation next week.

Logging:
Logging was restarted at 561.55 m depth. The cores we are now logging have been stored for more than ten days in the core buffer to relax. We bring the cores back to the logging table in the drill trench and log and cut them into 1.65 m long sections. So far, the logging and the sawing does not introduce new cracks in the cores. The logging will go on throughout the brittle-zone, but if the separation into 1.65 m sections repeatedly introduces breaks in the cores we will stop sawing the cores and just fit the drilled core sections together. We are now using rain gutters to protect and hold together the brittle ice core in the core buffer.
Logging depth: 598.95 m.

Science Trench:
Processing close-to-brittle-zone-ice requires a lot of patience. The Swiss saw is running at lowest possible speed whereby the number of breaks in the cores is minimized. We will continue processing until we make too much 'damage' to the ice. Over the last week, the ECM and the saw cuts have more and more frequently introduced breaks in the core, but still the processed core quality is generally sufficiently good.

The CFA laboratory is running in a stable mode. The Picarro water isotope instrument has been installed in an insulated box on top of the CFA laboratory and receives a continuous melt water stream from the CFA melt head. The first experiments and calibrations are looking good. This type of instrument may potentially be able to provide continuous on-line ice-core water-isotope profiles in the future, so we are enthusiastic about the possibilities, but keep our expectations low for this first test season of the new instrument.
Processing depth: 581.90 m. CFA depth: 252.45 m.

Other science activities:
BAS radar measurements are finished. The BAS radar is a phase-sensitive radar for precise measurements of the displacement of internal layers of the ice sheet. Two lines perpendicular to the ice divide (10 km upstream and downstream of the camp) were surveyed last year, each line consisting of 33 points of measurements. Two bamboos were left at each point for precise repositioning of the instrument. This year's measurements show good resemblance with those of last year and vertical velocity profiles of the ice down to 1000 m depth are obtained by comparing the two sets of measurements. Furthermore, GPS measurements have been made on one line for comparison with the radar measurements.
Korean pit has been extended and sampled for isotopes and chemistry.

Weather at NEEM:
Another week with generally nice weather.
Early week mostly clear. Mid-week overcast and some snow. Late week again clear skies. Temperatures from -20°C to -8°C. Sunday rising temperatures, forecasted to rise even further.

NEEM camp population: 31

Kangerlussuaq activities:
The main activity of Monday was unpacking of containers with drilling fluid which was a significant task due to the fact that the containers were tightly packed with drums and had been loaded with lifting gear we do

have in Kangerlussuaq. The empty containers have been aligned in front of the warehouse and now house the field gear which has been sorted and thoroughly rearranged. We have tidied up in front of the warehouse.
Pallets with drilling fluid have been built for the coming mission period, and we have worked on getting supplies for the camp.

Weather in Kangerlussuaq:
Changeable weather with showers to and including Friday, then improving. Temperatures around 10°C, rising late week. Mosquito level moderate / high.

NEEM Field operations office,
Sebastian Bjerregaard Simonsen
Dorte Elisabeth Rasmussen
Sune Olander Rasmussen

NEEM - SITREP no. 12, Sunday 12 July 2009.

This SITREP covers the period July 6 – July 12, 2009 (inclusive).

Movement of personnel:

July 6 Christine Schøtt Hvidberg (DK), Bo Hvidberg (DK), Dorthe Dahl-Jensen (DK), Lars Moeller (D), Katrin Wolff (D) from CPH to SFJ by Air-Greenland.

July 7 Vas Petrenko (US), Anais Orsi (US), Zoe Courville (US), Kaitlin Keegan (US) from SCN to SFJ by the 109th.

July 10 Dorthe Dahl-Jensen (DK), Sverrir Hilmarsson (IS), Elizabeth Elliot (AUS), Axel Boiesen (DK), Trevor Popp (DK), Vas Petrenko (US), Aslak Grindsted (DK), Daphne Buiron (F), Katrin Wolff (D), Louise Thilthorpe (UK), David Etheridge (AUS), Ernesto Kettner (DK), Ian O'Reilly (UK media), Katja Nyborg (DK media), Zoe MacDonald (UK media) from SFJ to NEEM by the 109th.

Frank Wilhelms (D), Maurine Montagnat Rentier (F), Mads Ellehøj (DK), Fernando Valero-Delgado (D), Celia Sapart (NL), Ivana Cvijanovic (DK), Anna Elisabet Sturevik Storm (S), Mai Winstrup (DK), Melaine Behrens (D), Raimund Muscheler (S), Anna Wegner (D), Hong Sang-Bum (COR), Takayuki Kuramoto (J), Fabien Gillet (UK), Ian O'Reilly (UK media), Katja Nyborg (DK media), Zoe MacDonald (UK media) from NEEM to SFJ by the 109th.

Anna Elisabeth Sturevik Storm (S) from SFJ to CPH by Air-Greenland.

July 11 Frank Wilhelms (D), Fernando Valero-Delgado (D), Celia Sapart (NL), Melanie Behrens (D), Raimund Muscheler (S), Anna Wegner (D), Hong Sang-Bum (COR) from SFJ to CPH by Air-Greenland.

July 12 Louise Wolff Ravneberg (DK), Lars Guski (DK), Romain Duphil (F), Anne Munch Solgaard (DK), Adrian Schildt (CH), Jesper Sjolte (DK), Katy Pol (F), Sebastian Bjerregaard Simonsen (DK),

Atsushi Miyamoto (J), Lars Möller (D), Anaïs Orsi (US), Zoe Courville (US), Kaitlin Marie Keegan (US), Julien Courteaud (F), Mauro Rubino (IT) from SFJ to NEEM by the 109th.

Tim Brücher (DK), Markus Frey (UK), Susanne Lilja Buchardt (DK), Anders Svensson (DK), Nerys Menna Lewis (UK), Jeppe Jønch Andersen (DK), Tina Brand (DK) and Alex Pyne (NZ) from NEEM to SFJ by the 109th.

Maurine Montagnat Rentier (F), Takayuki Kuramoto (J) from SFJ to CPH by Air-Greenland.

Movement of Cargo:

July 10 400 lbs of 2" x 4" wooden beams, 14304 lbs (2 pallets) of drilling fluid, 568 lbs of plexiglass and flexible walls, 3640 lbs of food and field gear from SFJ to NEEM by the 109th.

1300 lbs of field gear, 3600 lbs of ice core samples in boxes, 1350 lbs of empty drum pallets from NEEM to SFJ by the 109th.

July 12 8930 lbs of scientific equipment, food, field gear, plywood and steel gratings, and 11000 lbs of fuel from SFJ to NEEM by the 109th.

1300 lbs of field gear, 2560 lbs of empty drum pallets from NEEM to SFJ by the 109th.

The following shipments have arrived in SFJ:

8 colli of 299 kg from UCPH, AWB 631-26296535.
1 colli of 16 kg from CEA Saclay, Gif-Sur-Yvette, Fedex tracking no. 866072951802-0407

Camp activities:

The week has been dominated by the flights and by exchange of the camp personnel. New people have been trained in the cfa, logging and drilling teams. Pallets with science equipment and drilling fluid has been received and Ice pallets and empty drum pallets have been build for retro to Kangerlussuaq. Weather was reported to the FOM office, and the skiers were received in camp.

Skiway:

The skiway has been groomed and prepared for the flight missions this year. The skiway is now fully upgraded to flight conditions with 1 mile visibility and a cloud ceiling of 300 ft. The full weight of the skier at take off in Kangerlussuaq is 145 klbs.

Construction:

Only minor constructions this week. The core buffer has been prepared to store as much ice as possible so we can store all the brittle ice from 600 m to 1220 m in the buffer. The snow wall behind the buffer has been moved back and a platform constructed so the top shelves can be used.

Drilling:

Drilling is running in a stable mode. Training and exchange of drillers have slowed the production this week. Also very careful handling of the brittle ice is needed as any stress on the ice cores results in severe breaks. A celebration was made when the depth of 1000 m was reached.
The shallow 3 inch drill has been assembled for the firn-air program and the electronic repaired.
Driller's depth: 1069. 89 m, production this week is 165.89 m.

Logging:
Logging proceeds in the brittle zone. After being stored for 2 weeks in the core buffer, it is possible to log the brittle ice cores and cut the ice in 1.65 m sections. The logging is very time consuming due to the many breaks and the logging teams have been expanded so we can try to catch up with the drilling before we start drilling in the more plastic ice found below the brittle zone.
Logging depth: 725.9 m.

Science Trench:
No processing because we are in the brittle zone. New cfa teams have slowed the amount of ice processed but already after a few days the teams are working in 24 hour shifts again.
CFA depth: 332.75 m.

Other science activities:
Sunday morning the last scientists for the air-firn program and the physical properties of the firn arrived. The firn-village has been established again 2 km from the NEEM camp and equipment moved to the site.

Weather at NEEM:
After winds up to 30 knots on Monday the weather has in general been sunny and clear during the days, but with groundfog rolling in early night and staying until the sun burns it away late morning before noon.

NEEM camp population: 36

Kangerlussuaq activities:
Main activity Monday and Tuesday was finishing pallets with drilling fluid and building new pallets with drilling fluid (total 4.5 pallets). Tuesday we received the 109th, and planned the flights to NEEM this week. Tuesday and Wednesday we built pallets with food, scientific equipment, building materials and ordered items, and received the personnel going to the NEEM camp. Two flight missions to NEEM were planned, but we ended up with a total of four missions, (Thursday, Friday, Saturday and Sunday night/early morning), where two missions had to return to SFJ without landing at NEEM. Weather conditions with high daily temperatures and varying night/morning groundfog made landing conditions unstable. We received people from the NEEM camp and assisted them with finishing cargo and travel to Europe.
Pallets with drilling fluid have been built for the coming mission period, and we have worked on getting supplies for the camp.

Weather in Kangerlussuaq:
Warm and sunny with clear blue sky. Sunday cloudy with showers. Temperatures in the beginning of the week up to 25 °C, generally around 20 °C. Mosquito level declining from moderate to low.

NEEM Field operations office,
Christine Hvidberg
Bo Hvidberg

NEEM - SITREP no. 13, Sunday 19 July 2009.

This SITREP covers the period July 13 – July 19, 2009 (inclusive).

Movement of personnel:

July 13 Mads Ellehøj (DK), Ivana Cvijanovic (DK), Mai Winstrup (DK), Fabien Gillet (UK), Tim Brücher (DK), Markus Frey (UK), Susanne Lilja Buchardt (DK), Anders Svensson (DK), Nerys Menna Lewis (UK), Jeppe Jønch Andersen (DK), Alex Pyne (NZ), Tina Brand (DK) from SFJ to CPH by Air-Greenland.

Movement of Cargo:

No movement of cargo.

Camp activities:

This week the camp has been working in routine again after new teams were trained last week. Drilling, CFA and logging has proceeded with good progress. The first core with no breaks was drilled Sunday afternoon hopefully marking the end of the brittle zone. There have been much activity in the firn-gas village 2 km from camp, with shallow drilling and air sampling.

Skiway:

No work on skiway this week.

Construction:

A third garage to be used for storage has been built. The new core buffer was finished with the beams that the shelves are placed on. The top office in the Main dome was equipped with table, side supports, a platform and a sofa. A new outdoor toilet was dug out and set up.

Drilling:

Drilling is running in a stable mode, after some problems and maintenance during the week. In the first days of the week, drilling was stable with a steady inclination of 1.9 degrees. After some days, this configuration became unstable, resulting in inclination of 2.2 degrees and packing of chips. Friday night/Saturday morning was spent on a thorough maintenance of the drill. During this, a core barrel was lost in the hole, but successfully recovered in the first fishing run. After the maintenance, the drill worked excellent, and drilling is now back in stable mode again.
The shallow 3 inch drill was used in the firn-air village to drill one shallow core at 50 m for firn-air sampling, and started drilling a second shallow core at site NEEM2009S1 (present depth 15 m).
Driller's depth: 1217.74 m, production this week is 147.85 m.

Logging:

Logging proceeds in the brittle zone. The brittle ice cores have been stored some time before they are logged and cut in 1.65 m sections. The logging has been done on a 24 hour schedule in order to catch up with the drillers as the end of the brittle zone is near.
Logging depth: 1131.29 m.

Science Trench:

No processing because we are in the brittle zone. CFA has been running in a 24 hour schedule.
CFA depth: 442.2 m.

Other science activities:

The firn-village was established last week 2 km from the NEEM camp. This week air sampling has been done down to 50 m depth. Pit samples has been taken, and the shallow bore hole at site NEEM2008S2 has been temperature logged.

Weather at NEEM:

Warm and sunny all week with temperatures at noon up to 0 deg C.

NEEM camp population: 36

Kangerlussuaq activities:
Main activities in Kangerlussuaq have been cleaning up after the previous weeks flight period and maintenance of the cars. We have washed field gear, repaired and cleaned down clothes, and cleaned up in the field gear containers, and made an inventory of the field gear. We are working our way through the list of issues related to servicing all of the different vehicles. The blue Toyota Landcruiser is done, except from changing left rear spring (not urgent). We have been in contact with participants in the media/DV visit to the NEEM camp in next flight period to get their personal data and booking details for their stay in Kangerlussuaq. We have ordered back-up equipment for the FOM laptop. It is now installed and running a regular backup schedule.

Weather in Kangerlussuaq:
Warm and sunny with blue sky most days. Temperatures are generally around 20 °C. Mosquito level is low to moderate.

NEEM Field operations office,
Christine Hvidberg
Bo Hvidberg

NEEM - SITREP no. 15, Sunday 2 August 2009.

This SITREP covers the period July 27 – August 2, 2009 (inclusive).

Movement of personnel:

27 July: J.P.Steffensen (DK) from CPH to Kangerlussuaq by Air Greenland.

27 July: James Zheng (CAN), Todd Sowers (US), Julia Rosen (US), Steve Holloway (US-DV), Daniel Cohen (US-DV), Frederic Patterson, jr. (US-DV) and Heidi Marie Cullen (US-DV) from Schenectady to Kangerlussuaq by 109th.

28 July: Thomas Goosens (B), Nils O.Andersen (DK-DV), John Renner Hansen (DK-DV), Helle Houkjær (DK-DV) and Lone Skafte Jespersen (DK-DV) from CPH to Kangerlussuaq by Air Greenland.

29 July: Jun Uetake (J), Kumiko Goto-Azuma (J), Sepp Kipfstuhl (D), Robert Schneider (CH), Wang Shimeng (CHN), Li Chuanjin (CHN), Christo Buizert (DK), Christoffer Stowasser (DK), Emilie Capron (F), Adalsteinn Svavarsson (IS), Steffen Bo Hansen (DK), Lars berg Larsen (DK), Urs Federer (CH), Kaori Saito (J-DV), Wolfgang Karg (D-DV), Mario Garcia (US-DV), Anne Thompson (US-DV), Jeff Kleinman (US-DV), Torsten Jansen (DK-DV), Marc de Kaiser (B-DV), Ines Trams (D-DV), Frank Hennecke (D-DV) and Peder Stenson (S-DV) from CPH to Kangerlussuaq by Air Greenland.

30 July: James Zheng (CAN), Todd Sowers (US), Julia Rosen (US), Thomas Goosens (B), Jun Uetake (J), Kumoko Goto-Azuma (J), Sepp Kipfstuhl (D), Robert Schneider (CH), Wang Shimeng (CHN), Li Chuanjin (CHN), Christo Buizert (DK), Christoffer Stowasser (DK), Emilie Capron (F), Adalsteinn Svavarsson (IS), Steffen Bo Hansen (DK), Lars berg Larsen (DK), Urs Federer (CH), Steve Holloway (US-DV), Daniel Cohen (US-DV), Frederic Patterson, jr. (US-DV), Heidi Marie Cullen (US-DV), Nils O.Andersen (DK-DV), John Renner Hansen (DK-DV), Helle Houkjær (DK-

DV), Lone Skafte Jespersen (DK-DV), Kaori Saito (J-DV), Wolfgang Karg (D-DV), Mario Garcia (US-DV), Anne Thompson (US-DV), Jeff Kleinman (US-DV), Torsten Jansen (DK-DV), Marc de Kaiser (B-DV), Ines Trams (D-DV), Frank Hennecke (D-DV), Peder Stenson (S-DV), Gorm Steffensen (DK) and Nanna Steffensen (DK) from Kangerlussuaq to NEEM by 109th.

30 July: Simon Schuepbach (CH), JiWoong Chung (COR), Jørn Ladegaard (DK), Philippe Possenti (F), Olivier Alemany (F), Katrin Wolff (D), David Etheridge (AUS), Mauro Rubino (I), Daphne Buiron (F), Aslak Grindsted (DK), Vas Petrenko (US), Atasushi Miyamoto (J), Julien Courteaud (F), Katy Pol (F), Lars Gutski (DK), Sebastian Bjerregaard (DK), Anais Orsi (US), Zoe Courville (US), Kaitlin Keegan (US), Steve Holloway (US-DV), Daniel Cohen (US-DV), Frederic Patterson, jr. (US-DV), Heidi Marie Cullen (US-DV), Nils O.Andersen (DK-DV), John Renner Hansen (DK-DV), Helle Houkjær (DK-DV), Lone Skafte Jespersen (DK-DV), Kaori Saito (J-DV), Wolfgang Karg (D-DV), Mario Garcia (US-DV), Anne Thompson (US-DV), Jeff Kleinman (US-DV), Torsten Jansen (DK-DV), Marc de Kaiser (B-DV), Ines Trams (D-DV), Frank Hennecke (D-DV), Peder Stenson (S-DV), Gorm Steffensen (DK) and Nanna Steffensen (DK) from NEEM to Kangerlussuaq by 109th.

31 July: Anais Orsi (US), Zoe Courville (US), Kaitlin Keegan (US), Steve Holloway (US-DV), Daniel Cohen (US-DV), Frederic Patterson, jr. (US-DV) and Heidi Marie Cullen (US-DV) from Kangerlussuaq to Schenectady by 109th.

31 July: Katy Pol (F), Christine Hvidberg (DK) and Bo Hvidberg (DK) from Kangerlussuaq to CPH by Air Greenland.

1 August: Simon Schuepbach (CH), JiWoong Chung (COR), Katrin Wolff (D), David Etheridge (AUS), Mauro Rubino (I), Atasushi Miyamoto (J), Lars Gutski (DK), Nils O.Andersen (DK-DV), John Renner Hansen (DK-DV), Helle Houkjær (DK-DV), Lone Skafte Jespersen (DK-DV), Kaori Saito (J-DV), Wolfgang Karg (D-DV), Mario Garcia (US-DV), Anne Thompson (US-DV), Jeff Kleinman (US-DV), Torsten Jansen (DK-DV), Ines Trams (D-DV), Frank Hennecke (D-DV) and Peder Stenson (S-DV) from Kangerlussuaq to CPH by Air Greenland.

2 August: Philippe Possenti (F), Olivier Alemany (F), Julien Courteaud (F) and Marc de Kaiser (B-DV) from Kangerlussuaq to CPH by Air Greenland.

Movement of Cargo:

The following shipments have arrived in SFJ:

1 collo of 249 kg with with shelving parts
7 colli of 144 kg spare parts.

27 July: 1000 kg (2200 lbs) food from Schenectady to Kangerlussuaq by 109th.

28 july: 2994 kg in 69 boxes, ice core samples from Kangerlussuaq to CPH by Air Greenland.

30 july: 7590 kg (16690 lbs) timber, plywood, drilling fluid, food and spare parts from Kangerlussauq to NEEM by 109th. 11100 kg (13500 liter) JP-8 from Thule AB to NEEM by 109th. 2840 kg (6245 lbs) empty pallets and ice core samples from NEEM to Kangerlussuaq by 109th.

Camp activities:

One of the large turning points of the week was the flight on Thursday with press and DVs and the last crew exchange of the season with 19 NEEM personnel leaving and 17 arriving. The flight included a round trip from NEEM to Thule and back to NEEM with fuel. This allowed for a 5 ½ hour stay of press and DVs. Although the weather was marginal, the flights occurred on schedule, and the plane was able to take off in 1st attempt without using ATOs even with a payload of 16,000 lbs. We thank the 109th for a very successful mission.

This week the drilling passed several points worthy of celebration: Monday the depth of NGRIP 1 (1372 m) was passed, Tuesday the depth of Camp Century (1389m) was passed and Wednesday drilling reached into the ice from the last glacial. The climate transition from Younger Dryas to the Holocene, 11,712 years ago,

was detected by ECM and was found at a depth of 1418.80 m. Processing of the ice core immediate switched mode, and a special climate transition sampling program was started. After the crew exchange on Thursday, new people are being trained in drilling and processing. With the arrival of spare parts, the broken snow mobile has been repaired and the final carpenter work in the main dome has begun.

Skiway:
In preparation for the flight, skiway taxiway and apron were groomed. The flight crew found the skiway in a very good condition.

Drilling:
Drilling during the week has been stable with several small mechanical issues that needed attention. Thursday, Friday and Saturday production has been low due to DV-visit, crew change and week-end. With the arrival of Steffen Bo Hansen, the drillers will now try to fine tune the drill with the aim to bring the inclination of 2.6 degrees down. Core quality has been good all week. Driller's depth: 1470.48 m, production this week is 116.11 m.

Logging:
Logging has now caught up with drilling. Freshly drilled cores are now logged 2 days immediately after drilling. Logging depth: 1483.94 m.

Science Trench:
The new crew is now beginning to do processing on a routine basis. The transition has attracted quite some attention, and the line scanning image of the core showing the appearance of cloudy bands in late glacial ice has been studied in detail. A special sampling program for gas samples started at the transition (Bag 2580=T1). Sunday, processing was reaching down into the GI-1a (Allerød) period. CFA is running in 24 hour schedule.
Processing depth: 1449.80 m.
CFA depth: 592.9 m.

Other science activities:
Monday thru Wednesday, after successful completion of the programs, the firn village was taken down and all equipment moved to NEEM camp. Final depth of the NEEM 2009 S1 core became 136 m as core quality became too bad to continue. Bad core quality was expected, as the coring occurred in a dry hole. Final depth of the NEEM 2009 S2 core where the firn-air program was done was 91m.

Weather at NEEM:
Mostly cloudy with some snow fall and noon temperatures up to -7 deg C. Night temperatures at -12 deg C. Winds between 9 and 18 knots from W, later from S and SSE.

NEEM camp population: 34

Kangerlussuaq activities:
Main activities in Kangerlussuaq office has been to collect and prepare cargo for this week's flight, to handle a massive influx of people (both NEEM personnel and press and DVs) and to arrange briefings and trips to the ice margin for press and DVs. The press crews were from Storm Center (Weather Channel – US), NBC news (US), ZDF and ARD (Germany), Kyodo (J) and a Swedish journalist. This week the FOM office has changed personnel as Christine and Bo Hvidberg left and J.P.Steffensen took over.

Weather in Kangerlussuaq:

Sunny with blue sky most days. Temperatures have been 6-20 °C. Sunday clouds came in and temperatures dropped to 6 deg C. Mosquitoes almost absent.

NEEM Field operations office,
Jørgen Peder Steffensen

NEEM - SITREP no. 16, Sunday 9 August 2009.

This SITREP covers the period August 3 – August 9, 2009 (inclusive).

Movement of personnel:

3 August: Daphne Buiron (F), Sebastian Bjerregaard (DK) and Aslak Grindsted (DK) from Kangerlussuaq to CPH by Air Greenland.
4 August: Jørn Ladegaard (DK) on holiday in Greenland.
5 August: Vas Petrenko (US) from Kangerlussuaq to Summit Camp by 109th (thereby transferring to U.S. Science program)

Movement of Cargo:
No movement of cargo this week.

Camp activities:
This week the very last construction items were completed. The field leader office in the Dome Cupola (4th floor in main dome) was outfitted with shelves and in Garage 3 storage shelves and a sauna has been constructed. Snow has been removed around camps and the establishment of an overwintering cargo line has begun. Pallets with retrograde cargo are being built. Otherwise, the NEEM camp is functioning well for the tasks it has been designed for: Drilling a deep core and support for other scientific activities.

Skiway:
Skiway taxiway and apron are in fine condition. As normal, in weeks without flights, and because of the fine weather, the skiway area has turned into a recreational area. People are walking, skiing and jogging. A special exercise track “mountain trail” has been groomed to satisfy the needs of the crowds. A sofa has been placed on a snow hill W of camp and it is a popular picnic spot.

Drilling:
Drilling during the week has been stable with several small mechanical issues that needed attention. After adjustments to the cutters and pitch and other minor adjustments, most runs produced the 3.3 m cores the drill has been designed for. Inclination is now under control and has gradually dropped from 2.6 degrees to 1.65 degrees. Core quality has been good all week. Driller’s depth: 1620.75 m, production this week is 150.25 m.

Logging:
Freshly drilled cores are logged immediately after drilling. Logging depth: 1635.42 m.

Science Trench:
In the beginning of the week, the science trench ran out of ice to process. This was due to the low production in the days before due to crew change and week-end. The ice cores have to sit two days in the

buffer before processing to insure that the drilling fluid has evaporated from the cores. Therefore, Monday thru Wednesday, the science trench crew worked half time. The other half time was spent doing pit studies and hand augered shallow core studies. Later in the week, the science trench was again in full swing. Results are pouring in, and the ice being processed now is from the last glacial maximum, some 23,000 years ago. The first Dansgaard/Oeschger cycles are supposed to show up soon. Monday the CFA team completed the analysis of the ice below the brittle zone. The rest of the week has been spent measuring some NGRIP samples, pit samples and three hand augered surface cores down to 12 m.

Processing depth: 1593.35 m.
CFA depth: 601.7 m.
Other science activities:
Several GPS positions on the strain net around NEEM have been re-measured.

Biological experiments by Todd Sowers in NEEM2009 S2 hole, using the 3'' shallow drill with fluid, operated by Steffen Bo Hansen has been successfully concluded.

Report on sampling activities of a snow pit and short firn cores

A group of scientists from the science trench and CFA team carried out snow firn sampling on August 4 to 7. A 3.2 meter pit was dug and 5 short firn cores up to 6 meters were retrieved for multi-purpose studies, including microbiology, CFA, mercury, metals and snow stratigraphy. In addition 2 12 m firn cores where retrieved for cfa studies. The cores were drilled 1 m apart. Sampling location was near the firn coring site at N77o25.721' and W51o06.594'. It is planned to further extend the pit to 4 meters during this season for studies of atmospheric contaminants.

Biology: To investigate seasonal variation of bacterial cell concentration. A total of 30 samples were taken. Also, 3 samples were taken from ice layers for purpose of isolation of microorganisms.

CFA: To have CFA data from the surface, to test contamination levels in firn cores and to investigate seasonal-spatial variations of atmospheric components. A total of over 60 samples down to 3 meters plus continuous analyses of the 5m firn core from 2.5 cm to 6.5 meters from surface. For the two 12 m firn cores the CFA 3.5 x 3.5 cm2 sections are prepared and the sections are melted at the cfa melthead for continuous analysis.

Mercury: To compare Hg atmospheric depositions between Greenland and other Arctic regions. A total of 31 samples were taken for analyses of methyl mercury and 42 samples, for inorganic mercury.

Metals/atmospheric contaminants: To investigate the seasonal variations of atmospheric contaminants and as one of the sites for studies of spatial distribution in circum Arctic as well as inter-lab comparison.

Stratigraphy/density: To set up depth-age relationship at the sampling site.

Weather at NEEM:
All week sunny with moderate winds. Noon temperatures up to -5 deg C. Night temperatures now down to -17 deg C. Winds between 5 and 15 knots mainly from S.

NEEM camp population: 34

Kangerlussuaq activities:

Main activities in Kangerlussuaq office has been to rearrange the clothing from last week's visit and to clean out and reorganize the warehouse in Kangerlussuaq. New shelves have been mounted and a lot of old items have been cleaned out. During the week several tests on radios and antennas revealed, that the FOM HF radio in Kangerlussuaq now transmits and receives normally and that the NEEM HF radio transmits normally but the reception in NEEM is hampered by local interference, particularly from the frequency inverter controlling the winch motor. NEEM camp and FOM office now have reliable HF radio communication.

Weather in Kangerlussuaq:
Sunny with blue sky. Temperatures at day 16-20 °C, at night -2 C. Mosquitoes are gone, mushrooms and blueberries a plenty. Due to frost, vegetation is beginning to show traces of autumn colors.

NEEM Field operations office,
Jørgen Peder Steffensen

NEEM - SITREP no. 17, Sunday 16 August 2009.

This SITREP covers the period August 10 – August 16, 2009 (inclusive).

Movement of personnel:
No move of personnel this week.

Movement of Cargo:
60 kg equipment from Kangerlussuaq to CPH by Air Greenland.

Camp activities:
The last shelves have been setup in Garage 3, and immediately the shelves have been filled with items for storage over winter. Snow drifts have been removed around camp, and with snow blowers and the Pistenbully the snow surface above the trenches have been made flat. Snow hills have been made for over winter storage in the cargo line. Normal science and drilling activities continued thru Wednesday, when the CFA laboratory was closed for packing down. Drilling continued until Thursday. Friday some tests were made and Saturday the NEEM hole was logged. Processing and logging continued until Saturday. Sunday, all camp personnel participated in packing down. It is planned to make the pull-out and camp closing on Tuesday and Wednesday next week.

Skiway:
Skiway taxiway and apron are in fine condition, it was groomed Sunday.

Drilling:
Drilling during the week has been stable. Inclination is still under control. Thursday, an experiment to release 1 micron fluorescent beads into the drill fluid at the bottom was successfully completed. Some tests with a new outer barrel were conducted, and Saturday the bore hole logger was deployed. The drilling activities for 2009 are now completed. Core quality has been good all season.
Driller's depth: 1740.39 m, production this week is 119.64 m. The drilling achievement of 2009 is to our knowledge the longest deep drill ice core produced in one summer season.

The bore hole logging is complete. Temperatures show a minimum of -29.068 C at 240 m depth and -22.953 C at 1758 m depth.

Logging:
Freshly drilled cores are logged immediately after drilling. Logging depth: 1757.84 m.

Science Trench:
Work in the science trench has been extremely exiting. The team enjoyed the excitement of passing through several fast climatic transitions which are clearly detected in ECM and DEP and visible with the naked eye in the polished ice core section for the line scanner. For most crew members, this was a first time experience. The team in camp is privileged. While it took more than 2 months to pass through 11,000 years, it took only 10 days to pass through yet another 12,000 years, and this week 15,000 more annual snowfalls passed through the saws in the science trench. All equipment has been working fine, except for a few minor repairs. Now the winterization of equipment that stays and packing of other equipment is in ful swing.

Processing depth: 1756.70 m (bag 3194). End of processing at NEEM 2009.

Before closing the CFA laboratory on Wednesday, a 13.75 m section of the deep ice core below the brittle zone (bags 2331 to 2355) was measured. CFA depth: 1295.25 m.

Other science activities:
Several GPS positions on the strain net around NEEM have been re-measured.
Biological experiments by Todd Sowers in NEEM deep hole, using beads released at depth was successfully concluded.
Snow pit sampling area was closed Tuesday.

Weather at NEEM:
Week began sunny with moderate winds. From Tuesday some cloudiness and ground fog. Later in the week light snow. Noon temperatures up to -8 deg C. Night temperatures now down to -22 deg C. Winds between 5 and 12 knots from SE turning SW.

NEEM camp population: 34

Kangerlussuaq activities:
Shelves have been installed in the warehouse. All pallets for next week's transport are completed. The ice core freezer runs fine at -23 C.

Weather in Kangerlussuaq:
Sunny with blue sky until Saturday. Temperatures at day 15 °C, at night 4 C. Mosquitoes are gone, mushrooms and blueberries are plenty, but are now suffering from a 5 week drought. Due to frost, vegetation is beginning to show traces of autumn colors.

NEEM Field operations office,
Jørgen Peder Steffensen

NEEM - SITREP no. 18, Friday 4 September 2009.

This SITREP covers the period August 17 – August 23, 2009 (inclusive).

Movement of personnel:

August 18: Mathieu Benoist (F-press) and Iker Zabala (F-press) from Kangerlussuaq to NEEM by 109th.

August 18: Mathieu Benoist (F-press), Iker Zabala (F-press), Vasileios Gkinis (DK), Suzanne Wyss (CH), Lars Möller (D), Elizabeth Elliott (AUS), Aksel Boysen (DK), Louise Thilthorpe (UK), Ernesto Kettner (DK), Adrian Schildt (CH), Anne Munch Solgaard (DK), Jesper Sjolte (DK), Romain Duphil (F), Jun Uetake (J), James Zheng (CAN), Julia Rosen (US), Todd Sowers (US), Thomas Goossens (B), Kumiko Goto-Azuma (J), Sepp Kipfstuhl (D), Emilie Capron (F), Robert Schneider (CH), Wang Shimeng (CHN), Li Chuanjin (CHN), Christo Buizert (DK), Christoffer Stowasser (DK), John Brandon Hinman (US), Urs Federer (CH) and Steffen Bo Hansen (DK) from NEEM to Kangerlussuaq by 109th.

August 19: Louise Ravneberg (DK), Adalsteinn Svavarsson (IS), Timothy Burton (UK), Dorthe Dahl-Jensen (DK), Trevor Popp (DK), Sverrir Æ. Hilmarsson (IS) and Lars Berg Larsen (DK) from NEEM to Kangerlussuaq by 109th.

August 20: Elizabeth Elliott (AUS), Urs Federer (CH), Adrian Schildt (CH), Suzanne Wyss (CH), Aksel Boysen (DK), Christo Buizert (DK), Christoffer Stowasser (DK), Romain Duphil (F), Anne Munch Solgaard (DK), Ernesto Kettner (DK), Jesper Sjolte (DK), Wang Shimeng (CHN), Li Chuanjin (CHN), Robert Schneider (CH), Lars Möller (D) and Louise Thilthorpe (UK) from Kangerlussuaq to CPH by Air Greenland.

August 21: Todd Sowers (US) and James Zheng (CAN) from Kangerlussuaq to Schenectady by 109th.
Steffen Bo Hansen (DK), Sverrir Æ. Hilmarsson (IS), Lars Berg Larsen (DK) and Trevor Popp (DK) from Kangerlussuaq to CPH by Air Greenland.
Louise Ravneberg (DK), Tim Burton (UK), Emilie Capron (F), John Brandon Hinman (US), Vasileios Gkinis (DK), Adalsteinn Svavarsson (IS) and Jørgen P.Steffensen (DK), from Kangerlussuaq to CPH by Air Greenland.

August 22: Sepp Kipfstuhl (D), Kumoko Goto-Azuma (J) and Jun Uetake (J) from Kangerlussuaq to CPH by Air Greenland.

August 24: Thomas Goossens (B) from Kangerlussuaq to CPH by Air Greenland.

August 25: Julia Rosen (US) from Kangerlussuaq to Schenectady by 109th.

August 25: Dorthe Dahl-Jensen (DK) from Kangerlussuaq to Nuuk by Air Greenland.

Movement of Cargo:

August 18: 802 kg overwintering supplies and 7,000 kg Jet A-1 fuel from Kangerlussuaq to NEEM by 109th.
August 18: 6,100 kg equipment and ice core samples from NEEM to Kangerlussuaq by 109th.
August 19: 9,100 kg drilling fluid and plywood from Kangerlussuaq to NEEM by 109th.
August 19: 8,400 kg science equipment and trash from NEEM to Kangerlussuaq by 109th.

August 20: 3,011 kg ice samples from Kangerlussuaq to CPH by Air Greenland.
August 25: 1,975 kg ice samples from Kangerlussuaq to Schenectady by 109th.

Camp activities:
The last shelves have been setup in Garage 3, and immediately the shelves have been filled with items for storage over winter. Snow drifts have been removed around camp, and with snow blowers and the Pistenbully the snow surface above the trenches have been made flat. Snow hills have been made for over winter storage in the cargo line. Normal science and drilling activities continued thru Wednesday, when the CFA laboratory was closed for packing down. Drilling continued until Thursday. Friday some tests were made and Saturday the NEEM hole was logged. Processing and logging continued until Saturday. Sunday, all camp personnel participated in packing down. It is planned to make the pull-out and camp closing on Tuesday and Wednesday next week.

Skiway:
Skiway taxiway and apron are in fine condition, it was groomed Sunday.

Drilling:
Drilling during the week has been stable. Inclination is still under control. Thursday, an experiment to release 1 micron fluorescent beads into the drill fluid at the bottom was successfully completed. Some tests with a new outer barrel were conducted, and Saturday the bore hole logger was deployed. The drilling activities for 2009 are now completed. Core quality has been good all season.
Driller's depth: 1740.39 m, production this week is 119.64 m. The drilling achievement of 2009 is to our knowledge the longest deep drill ice core produced in one summer season.
The bore hole logging is complete. Temperatures show a minimum of -29.068 C at 240 m depth and -22.953 C at 1758 m depth.

Logging:
Freshly drilled cores are logged immediately after drilling. Logging depth: 1757.84 m.

Science Trench:
Work in the science trench has been extremely exiting. The team enjoyed the excitement of passing through several fast climatic transitions which are clearly detected in ECM and DEP and visible with the naked eye in the polished ice core section for the line scanner. For most crew members, this was a first time experience. The team in camp is privileged. While it took more than 2 months to pass through 11,000 years, it took only 10 days to pass through yet another 12,000 years, and this week 15,000 more annual snowfalls passed through the saws in the science trench. All equipment has been working fine, except for a few minor repairs. Now the winterization of equipment that stays and packing of other equipment is in ful swing.

Processing depth: 1756.70 m (bag 3194). End of processing at NEEM 2009.

Before closing the CFA laboratory on Wednesday, a 13.75 m section of the deep ice core below the brittle zone (bags 2331 to 2355) was measured. CFA depth: 1295.25 m.

Other science activities:
Several GPS positions on the strain net around NEEM have been re-measured.
Biological experiments by Todd Sowers in NEEM deep hole, using beads released at depth was successfully concluded.
Snow pit sampling area was closed Tuesday.

Weather at NEEM:
Week began sunny with moderate winds. From Tuesday some cloudiness and ground fog. Later in the week light snow. Noon temperatures up to -8 deg C. Night temperatures now down to -22 deg C. Winds between 5 and 12 knots from SE turning SW.

NEEM camp population: 0

Kangerlussuaq activities:
Shelves have been installed in the warehouse. All pallets for next week's transport are completed. The ice core freezer runs fine at -23 C.

Weather in Kangerlussuaq:
Sunny with blue sky until Saturday. Temperatures at day 15 °C, at night 4 C. Mosquitoes are gone, mushrooms and blueberries are plenty, but are now suffering from a 5 week drought. Due to frost, vegetation is beginning to show traces of autumn colors.

NEEM Field operations office,
Jørgen Peder Steffensen

NEEM DIARY.

April

Tuesday,28th April 2009.

Arrival in NEEM camp after winter.

The opening of camp turned out to be a successful but cold affair. At time of landing the wind was at 10 m/s from the South. The crew decided to land North of camp, facing into the wind. After a stay of 35 min. the plane left, as communication between camp and Kangerlussuaq was established. Armed with showels our crew of 11 people began dig into the snow in front of the doors to our buildings and tents. It was a cold affair, but by 20.00 several vehicles were running, and the main generator provided electricity for cooking and heating of the main dome. Sarah served supper, meatballs and pasta, and the crew turned in at 22.00.

It was a strange sight to see camp after almost a year. Everything was standing as we left it, but somehow everything looked eerily different. Even after many years working on the ice, it is still astonishing to see the amount of snow drift that can accumulate over winter. The garages, the dome tents and the main dome were built on 1.5 m snow hills last year. Now, the hills are gone and the buildings are sitting on the surface. The garages even had 2 m snow drifts around them. We have a lot of snow to move in the days ahead.

What we have done today:

1.Arrival at NEEM for 11 people. Put-in flight was very successful.

2.Opening main dome, garages and dome tents.

3.Warming up and starting snow blower, Pistenbully and 16 kW generator.

4.Inspecting all surface structures for damage. No damage found.

5.Excavating hook up point for main generator, levelling snow surface and
pulling main generator into position. Main generator was running at 19.00

6.Pulled tomato shelters into position.

7.Removing snow drifts from out side entrances and inside dome tents.

Ad.1: Skier 93 took off from Kangerlussuaq at 9.20, and landed on the snow 1 mile North of NEEM at 11.50. At 12.25 the plane took off into the wind from eastern end of skiway using rocket start.

Ad.2: We had access to the first red dome tent at 12.10, and the snowmobile parked there started straight away. The main dome was opened at 12.15. Temperature in main dome was -14 C in kitchen and -4 C on top floor.

Ad.3: Once the garage was opened, we used the Herman Nelson heater to warm up the snow blower parked in the dome tent. Once it was out, we could clean entrances to the garages. At 13.15, we started the 16 kW generator, which we used to power the stove in the main dome. The Pistenbully was running at 15.10.

Ad. 7: There was some snow drift inside the dome tents due to small leakages around windows and zippers. Only tiny traces of snow were found in main dome. The main dome appears to be tight.

Weather: Scattered high clouds, - 21 C, 10-20 knots from S. Visibility: 2 miles. Some drifting snow.

FL, J.P. Steffensen

Picture captions:

An aerial shot from the cockpit of the LC-130 Hercules.

Sverrir, Trevor and Henrik on board the LC-130 bound for NEEM

Wednesday,29th April 2009.

Gained access to trenches, cleaning up in camp begins and construction work begins.

After spending a cool night, camp crew ate breakfast at 7.30. Everybody went to their jobs. Bruno and HansPeter worked on all electrical systems in the main dome. Sometimes Bruno performed acrobatic moves rivalling even Tarzan. Sverrir and Hans Christian made good use of the Pistenbully to dig for and haul cargo and to move snow most of the day. Jakob worked in the basement on the main dome foundation. Sarah was cooking excellent dinners, and she manages to produce really good food in the middle of all the clutter inside the main dome. Steffen and Trevor worked underground in the drill trench. Henrik worked on the plumbing system and managed to get the cooks snow melter going. Oli was working on several carpenter tasks. He mounted a new Iridium antenna, and he was helping Henrik with the box for the cooks snow melter. At noon today, temperatures in the kitchen rose above freezing, and in the evening we had +8 C in the kitchen and +16 C on the first floor. Quality of life has improved considerably.

What we have done today:

1.Opening access to science and drill trenches, and activating the elevator to the science trench.

2.Work on establishing new Iridium based internet system.

3.Taking strain off center pole in main dome. Pole lowered by 5 cm.

4.Working on cooks snow melter. In the evening we had drinking water from tap in the kitchen.

5.Excavating and moving the fuel pallets, that were brought in by the last plane in 2008, to camp..

6.Grooming the snow surface at the site for weatherport tent construction.

7.In the drill trench: Pulling drillers cabin out from the wall and trimming the snow around it. Mounting and testing the linear motor on tower

8.Rewiring all electrical connections in the main dome. Most outlets are now RFI protected.

9. In the drill trench: Transporting arriving drilling equipment into trench. Unpacking and organizing equipment

Ad.1: The science and drill trenches were found in good shape however, some settling of the walls due to the connecting tunnel and the recess excavated behind the drillers cabin has caused the drill trench roof to sink in these areas. Temperature in trenches: -30 C.

Ad.2: As Inmarsat decided to move it's satellites in March, we could not be sure to have communication through this system. We have purchased an Iridium based internet system.

Ad.3: The center post in the main dome does not sink at the same rate as the rest of the foundation. When we arrived, we observed a slight uplift at the center. Jakob went down under the dome, and managed to jack up the center pole. A piece was cut off at the foot plate to reduce it's area. After removing the jacks the center pole settled 5 cm and is now flush with the rest of the dome.

Ad. 4: We have decided to keep the cooks snow melter form last year, and keep a new one as backup.

Weather: Thin overcast to blue sky, - 24 C to -21 C, 8-15 knots from ESE. Visibility: 1/2 mile to unrestricted.

FL, J.P. Steffensen

Picture captions:

View from top of Main dome: Red domes and main generator.

Henrik and Oli lift crates onto the lift into the abyss of the science trench.

Thursday,30th April 2009.

An 18 hour blizzard passes.

On Wednesday Lars, our FOM in Kangerlussuaq, informed us that our forecaster predicted a storm coming our way. Wednesday night we closed all tents and prepared our equipment for a blow. This morning the wind picked up, and it continued to strengthen until early in the afternoon when it reached 28 knots from SSE. Strong wind and blowing snow made us all work inside or, in case of the drillers and electricians, below ground. In the evening, the wind abated and we could see several new large snowdrifts. It was the birthday of our carpenter, Olavur. Sarah made a very nice cake, and we sang some birthday songs.

What we have done today:

1.Aligning the drill tower. The extension was a bit off, but it is straight now.

2.Mounting electrical system in the science trench.

3.Work on plumbing in main dome. The pipes under the floor are now gone.

4.Making pieces for the drill trench skylight in the garage.

5.Routine maintenance on main generator.

6.Organising camp medical supplies.

7.Iridium based internet connection now working.

8. Watching new snow drifts form.

Ad.1: Several sections of the drill tower were not aligned. The drillers adjusted the joints using shims, and now the tower is straighter.

Ad.2: In preparation of the scientific work in a few weeks time, Bruno and HansPeter spent all day mounting electrical installations at all future work places.

Weather: Thin overcast to blue sky, - 18 C to -14 C, 16-28 knots from SSE. Visibility: 1/2 mile. Blowing snow.

FL, J.P. Steffensen

Picture captions:

The main dome in blizzard.


A lonely person makes his way through the wind.

May

Friday,1st May 2009.

A beautiful and crisp day.

This was a beautiful day, and we could work outside. The drillers worked on final adjustments of the drill tower. It can now be tilted from horizontal to vertical. The tower is too high to fit under the roof, therefore a slot has been cut so the top of the tower can go to through the roof. The slot has subsequently been covered with a box with a polycarbonate window on top. This provides some skylight into the drill trench. Seen from the side, the box resembles the conning tower of a submarine. It is therefore nicknamed “the submarine”. This construction has been planned all along. The electricians have made good use of the future warm lab in the science trench. They have turned it into a temporary workshop for electrical components in the science trench.

What we have done today:

1.Working on electrical installations in science trench. The future CFA laboratory is temporarily turned into a warm workshop.

2.Work on central heating in main dome. New radiators are mounted.

3.Opening the drill trench roof and lowering winch controls and winch motor into drill trench with the Pistenbully crane.

4.Using survey equipment, marking out new ski landing area (18-36 true).

5.Preparing for construction of weatherports.These have been packed down over winter and we are now raising them again.

6.Making shelves in kitchen.

7.Building submarine skylight over top of drill tower.

8. Final adjustments to tower and top sheave. Tower is now straight and can be tilted to vertical.

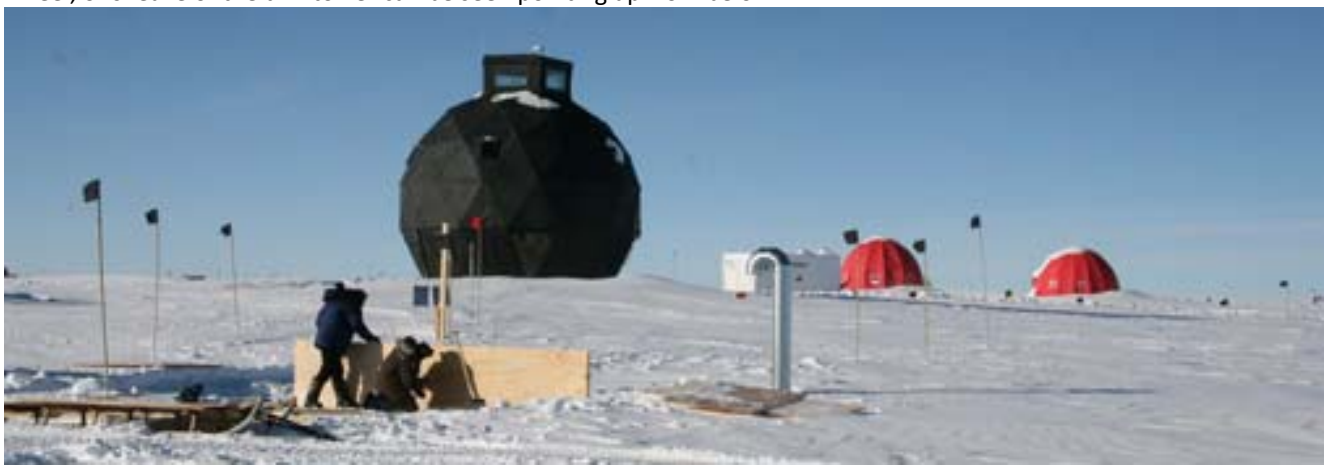
Weather: Blue sky, - 25 C to -20 C, 10-15 knots from ESE. Visibility: unrestricted. A fine day.

FL, J.P. Steffensen

Picture captions:

A view from the top of the main dome showing snowdrifts around a garage.

Sverrir, Oli and Hans Christian mount sections of “the submarine” skylight on the drill trench roof. To the left, the top wheel, or sheave of the drill tower can be seen pointing up from below.



Mounting of the skylight with the main dome in the background.

Saturday,2nd May 2009.

First Saturday in camp.

It has been a rather windy day, but we managed to erect a weatherport for the camp food supplies. We were able to transfer all the food left behind last year in the main dome kitchen to the weatherport. All of a sudden we got a lot of floor space in the dining area. Carpenter, plumber, electricians, mechanic, drillers, cook, doctor and Field Leader have been active all day, and people were quite tired at the start for this seasons first Saturday night. Luckily, spirits were high, and people all participated to make this Saturday night nice.

What we have done today:

1.Rewiring the electricity supply for drill trench.

2.Work on the new winch control.

3.Erecting food store weatherport. Moving food supplies from main dome.

4.Mounting radiator in bathroom. Moving warm water tank to top shelf in kitchen.

5.Adjusting and fixing drill tower foundation.

Weather: Blue sky, - 28 C to -25 C, 15-20 knots from ESE. Visibility: 2 miles to unrestricted. Haze in the morning. Wind picking up in the evening.

FL, J.P. Steffensen

Picture captions:

Sarah at work in the kitchen.

Sunday,3rd May 2009.

Big changes.

Today brought several big changes. In the drill trench, the winch control is now working fine. This is a major step in the preparations for drilling. Now, the drillers can begin to mount the drill itself. In the main dome, the central heating was put on-line and suddenly the dining area and kitchen became really comfortable. The central heating uses waste heat from the main generator cooling system. The NEEM weather station was set up, and now everybody can

follow the weather from the Field Leaders console. Sarah has been really busy cooking and preparing food orders for the next plane and making food inventory. After dinner several people watched a movie.

What we have done today:

1.Winch control is installed and now working fine.

2.Drill fluid pump station now installed.

3.Central heating system now finished and heating the main dome.

4.NEEM weather station installed.

5.Work on installing main snow melter.

6.Work on railings around the inclined trench.

7.Installed electrical engine heater in one snowmobile.

8. Work on food inventory and food order.

Weather: Blue sky, - 32 C to -21 C, 4-20 knots from SE to E. Visibility: from 1 mile to unrestricted. Windy with blowing snow in the morning. At 2 pm the wind decreased and Sunday evening was beautiful but cold.

FL, J.P. Steffensen

Picture captions:

Hans Christian operates the snowblower to remove snowdrifts around one of the red dome tents.

Monday,4th May 2009.

Nice day for outdoor work.

Sverrir with the Pistenbully and Hans Christian with the snow blower moved a lot of snow today. It made camp look a lot nicer. Henrik was really dedicated, and managed to setup the snowmelter and hook it onto the hot water system. Now a lot of snow is melting, and we begin to hope for a shower and wash soon. Oli set up a railing and some lids around the 8 m deep excavation in the drill trench floor. Jakob, Trevor and Steffen setup the drill electronics and drill console and began mounting the drill itself. HansPeter and Bruno took care of insuring a proper power supply. A mains cable was cut by the snow blower close to the garage. This is one of the things that may happen. FI relays and

circuit breakers tripped as they should, and the damage was repaired in short time.

What we have done today:

1.Setting up snowmelter near the main dome.

2.Mounting drill electronics and console. Testing drill computer.

3.Removing snowdrifts around main dome and red dome tents.

4.Removing snow around garage.

5.Constructing railings and lids around the inclined trench.

Ad.1: The water pipes from the snow melter to the main dome are difficult to maintain. We have therefore decided to place the snow melter next to the main dome in such a way that it can be removed at the end of the season.

Ad.2: Drill electronics and computer are working fine.

Ad.4: During the snow removal around the garage, the snow blower hit the power cable for the garage and the food store, the cable was repaired after 1.5 hours.

Weather: Blue sky, - 33 C to -22 C, 3-5 knots from SE. Visibility: Unrestricted. A beautiful cold day.

FL, J.P. Steffensen

Picture captions:

Removing snowdrifts around generator and main dome.

Tuesday,5th May 2009.

Mishaps do happen.

Today the drillers mounted the top section of the drill. This is called the anti-torque. The anti-torque consists of three sharp curved spring blades that easily slide up and down the borehole, but the spring blades prevent any rotation as they firmly grip the inside wall of the hole. As an ice core drill is suspended in a cable, the anti-torque provides the anchoring needed for the drill motors to turn the drill head and cutters below. It is also in the anti-torque that the cable is fixed to the drill. In order to test if the cable is properly fixed, the drillers perform a pull test before the drill is lowered into the hole. Today was the day for the pull test. But just before it could be completed, the winch control broke down, and we had to install a backup. This works. Tomorrow the drillers will perform the test. Also today, Hans Christian managed to cut another major power cable with the snow blower. This happened while clearing snow away

around the other garage. Again, this time the cable was not where it was supposed to be, and we now hope for no more repetitions. Later, in the evening while talking after dinner, we realized that the two mishaps might be connected. The cut by the snow blower of the mains cable created a power surge at the generator, causing several fuses to blow, and the lights to go out in the drill trench and exactly at this time, the winch control broke down. We are now looking forward to receive the new main generator power distribution panel that is on order. This panel provides the protection needed to avoid this situation.

What we have done today:

1.Winch control broken down. A new control installed and is working fine.

2.Mounting the anti-torque section of the drill.

3.Removing snow around second garage. Another cable cut.

4.Groomed old skyway and ½ apron with Pistenbully and tiller.

5.Final adjustments on the heating system and water supply to main dome.

6.Laid foundations for two weatherports.

7.Made GPS fixes for start and end of new skyway.

Ad.7: GPS fixes are:
North end: N 77 degrees 27.969 min, W 51 degrees 2.793 min, alt. 2484 m
South end: N 77 degrees 25.941 min, W 51 degrees 2.471 min, alt. 2484 m
Skiways runs 358 and 178 degrees true.

Weather: Thin overcast, later blue sky, - 34 C to -20 C, 7-18 knots from E. Visibility: 1 mile to unrestricted. Some blowing snow in the morning.

FL, J.P. Steffensen

Picture captions:

A view from the top window of drill trench. Trevor and Jakob push the drillers cabin in place. To the left, a section of the tower can be seen.

Wednesday,6th May 2009.

Two steps forward and one backward.

Let's begin with the step backward. As the drillers prepared for the pull test, to see if the cable is properly attached to the top of the drill, our second winch control broke down. Now we are unable to operate the winch.
It turned out, that the cut cable and the failure of the winch control yesterday were not related. As the damage was analyzed, we found out that the failure today, and the failure yesterday of the first control had the same source – the winch motor. Due to some fault in the motor, it ruined both our controls. However, as we have an extra motor coming next week and we have ordered new winch controls, the situation is not creating a delay, as the drillers have plenty of other tasks to keep them busy.

Now to the two steps forward. We now have a complete central heating system in operation. The main dome is nice and cozy. We've also got the main water supply and drain system working, which allowed for several to take their first shower in camp, and to operate the dishwasher.

We all agree, it has been a fine day.

What we have done today:

1.Made ready for pull test. Second winch controller broke down.

2.Diagnosing winch controls.

3.Mounting new window in drillers cabin.

4.Grooming skiway in zig-zag with tiller.

5.Added markings to new ski landing area.

6.Established main water supply.

7.Fixing the drain system. People can now take a shower and we can run the dishwasher.

8.Removing cold air flow from floor by applying PU foam.

9.Moved our outhouse.

Weather: Haze and blowing snow, later blue sky, - 30 C to -20 C, 10-20 knots from SE. Visibility: 1 mile to unrestricted. Some blowing snow in the morning.

FL, J.P. Steffensen

Picture captions:

A pleasant evening in the dining area.

Thursday,7th May 2009.

Grandparents camp.

Sverrir was told today, that he has become grandfather to a newborn boy in Iceland. Actually, several in camp have the age to be grandparents, grandaunts or granduncles. One member is mid-thirties. That is Trevor. We call him “boy” or “junior”. Then we have Oli and Henrik in the mid-forties. They are the young ones. The rest of the crew is between 50 and 59, except for Bruno, who is slightly older than 59. When we get new people up next week, the average age will drop below 50. Until then, NEEM is a “granny” camp.
We spent some time today discussing with Copenhagen on how to coordinate and proceed with getting new winch components up next week and how to insure, that this time it will work. We believe we have found a good solution, and we are confident we can solve the problems.
Otherwise everybody went to their tasks, some below ground and some on the surface. After several air leaks along the outside wall have been sealed, the temperatures in the main dome are now +20 C even at outside temperatures of -31 C.

What we have done today:

1.Discussing with Copenhagen about how to proceed with procurement and shipment of new winch motor and new winch controls.

2.Erected a weatherport, “Stapi”, named after a small village on Snæfellsness in Iceland close to Jules Verne’s entrance to the interior of the Earth.

3.Grooming old skiway in zig-zag. There are still some bumps from snow drifts caused by the skyway flags being too low.

4.New shelves set up in kitchen.

5.Work on installing a second toilet in main dome.

6.Filling more PU foam along edge of kitchen floor .

7.Calibrating the load cell on the drill tower.

8.Floor gratings for drill trench floor hoisted into trench with the crane.

9.Working with drill electronics..

Weather: mostly blue sky, - 30 C to -19 C, 6-12 knots from ESE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

A moment of zen on the ice sheet.

Friday,8th May 2009.

Preparations for flights next week begin.

Focus of camp activites are beginning to shift from construction and installation to preparation for the flights next week. Sverrir and J.P. have been grooming the skiways all day. And another weatherport was built. Hans Peter and Jakob have been working on activating the drill electronics section. As they started the motor, a component inside the drill electronics failed. They had to take the electronics section of the drill apart with the help of Steffen. Trevor was testing the drill fluid mixing station. Henrik and Oli were busy being plumber and carpenter. Bruno was working on making the spinner for drill chips easy to operate.

What we have done today:

1.Testing on-board drill electronics. The Dc-Dc converter in drill motor power supply was broken. It will be replaced.

2.Grooming old and new skyway.

3.Erected 12 x 20 weatherport.

4.Installing drain system for new toilet.

5.Making a Labview based driver for the load cell electronics.

6.Work on new wiring for the chip spinner.

7.Took motor off winch and measured the sprocket wheel. This is in preparation for mounting a new motor next week.

8.Operated the fluid mixing station.

9.Mounting shelves and work bench in drill trench. Remaining leaks along the floor in main dome sealed with foam.

Weather: mostly blue sky, - 33 C to -22 C, coldest day in NEEM. On average below -26 C, 10-14 knots from ESE.
Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

In the drill trench. The drill tower is laying down. The workshop is seen in the background.

Saturday,9th May 2009.

A blusterous day with snow drift.

Today was indeed windy. From the morning we had wind at 20 kt and it picked up to reach maximum at 28 kt by 1 PM. Visibility was restricted to 300 m, and temperatures around -20 C made it not feasible to work outside. Work inside the main dome, inside the garages and below ground continued unaffected by the wind. This is a huge change compared to last year, where we in weather like this were forced to huddle inside the few tents we had and sit the weather out. Work continued on the drill electronics, and a wash basin was installed in the new toilet. It was Saturday. We showered and dressed up, and had a nice candle light dinner with steaks and “burning love”, a Danish meal.

What we have done today:

1.Exchanging the DC-DC converter in motor power supply of the drill.

2.Working with drill computer and re-establishing contact with the drill.

3.Work on plumbing in main dome.

4.Work on the drill chip spinner.

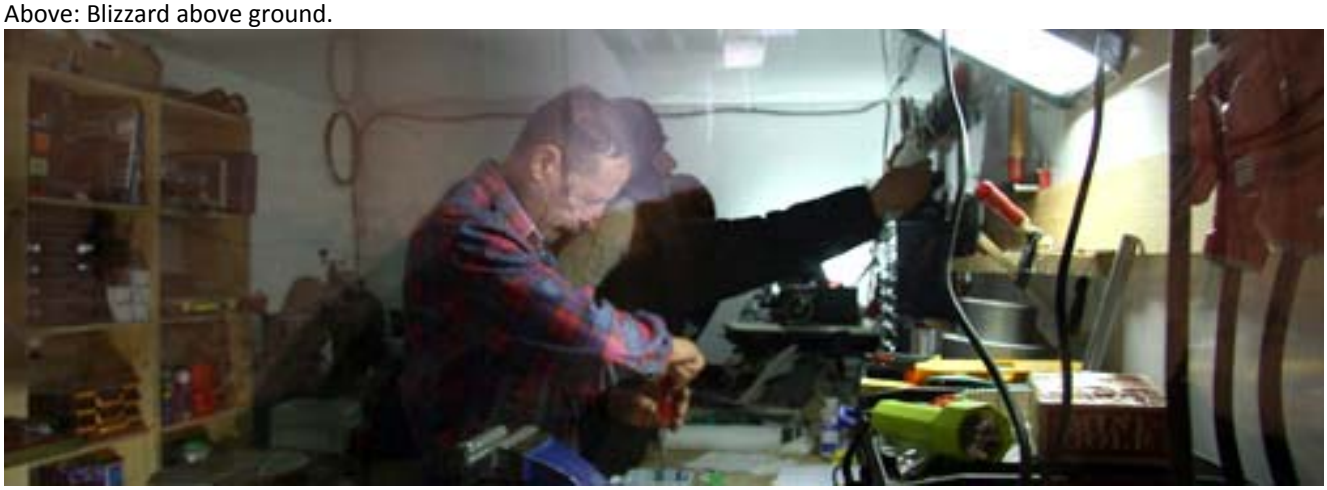
5.Laying some floor boards in drill trench.

Weather: overcast, later clearing, - 29 C to -20 C, 8-28 knots from S later SE. Visibility: 300m, in the evening unrestricted.

FL, J.P. Steffensen

Picture captions:

Above: Blizzard above ground.



Below: Quiet work in workshop in drill trench.

Sunday,10th May 2009.

A beautiful day. What a contrast to yesterday.

Sunday morning, the crew starts working a little later than normal. Nevertheless, we achieved quite a lot. The drillers now have contact with the drill, and some time was spent on optimizing the communication. They have been discussing with people back home on which version of the software was the best. The weather allowed us to spend the whole day on the skiway with two vehicles in action. We are now almost ready to receive the first aircraft on Tuesday. After dinner, the generator was powered down for a routine oil change so our mechanic and plumber moved the water pump outside, and the rest of the crew installed bunk beds in tents and weatherports.

What we have done today:

1.Working with drill computer and drill software. The drill motor runs again.

2.Work on the drill fluid mixing station. One pump needs some repair.

3.Assembling bunk beds in weatherports and red domes. We have now beds for arriving crew next week.

4.Grooming old skiway. It is now finished.

5.Grooming taxiways and apron to full width.

6.zig-zag grooming with beam on new ski landing area.

7.Mounting hoses and adapters on aircraft fuelling system.

8.In the evening, main generator power down, and routine oil change.

9.Made items for drillers: Filters and sieves.

10. Moved water pump outside the main dome.

Ad 10: Ever since we got the water supply running, we have been annoyed over the noise from the water pump. It is now placed in an insulated box outside the main dome.

Weather: blue sky, - 33 C to -23 C, 1-5 knots from S later NE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Grooming the skiway with camp in back ground.

Some ice cores, planted in the snow at the air sampling site from last year still stick out of the snow, quite weather beaten.

Monday,11th May 2009.

Preparing for a plane tomorrow.

The last preparations for the plane tomorrow were made today. It is planned, that the plane will land at NEEM with cargo and then fly to Thule for pick up of fuel. Then the plane will return to NEEM with fuel to be pumped into our storage tanks. Finally the plane returns to Thule where the crew will spend the night. Sverrir and Hans Christian worked on making the aircraft fuel pump ready. There were great frustrations in the garage as the adapters delivered did not fit in the configuration. Finally, Sverrir found a temporary work-around, so the pump is ready. While this was going on, the final grooming of skiways was done. The shortwave radio and an antenna were setup. The transmitting part of the antenna is 17 m long. Now, we will see how the day tomorrow evolves. It is important to us, that the pilots are satisfied with the skiways, because this will allow us to bring in more cargo each flight.

What we have done today:

1.Made aircraft fuel pump ready with new hoses and adapters.

2.Groomed new Ski Landing Area with tiller. The new skiway is more even than the old one.

3.Carpenter made sieves and filters for the drillers.

4.Setup HF radio and Yagi quarter wavelength antenna.

5.Spinner for ice drill chips now ready.

6.Assembly of drill electronics in pressure tubes. We have now two working sets of electronics.

Weather: blue sky turning into haze or fog, - 36 C to -25 C, 5-10 knots from E later S. Visibility: Unrestricted, later 2 miles. The coldest day so far.

FL, J.P. Steffensen

Picture captions:

As ice crystals fill the air, beautiful light phenomena can be seen.

Tuesday,12th May 2009.

Two great frustrations and one good advance.

It never becomes routine to receive an aircraft in camp. It is always an anxious time. To our great frustration, the

pilots did not find the skiways as good as we thought them to be. We have now groomed the skiways again, and we now hope, that the crew tomorrow will be more satisfied. We received the new winch motor today and our winch control from last year which has been checked in Copenhagen. When it didn't work, the drillers were disappointed. However HansPeter became the hero of the day, as he discovered three cracked resistors. They were replaced, and now it works.

What we have done today:

1.Received visit from Skier 71 under marginal conditions.

2.Lowered new motor and winch control into the drill trench with crane.

3.Checked new motor and winch control. The winch control did not work. The error was located to three broken ceramic resistors.

4.Made shelves in the kitchen.

5.Unpacked arriving cargo.

6.Groomed skiways after arriving aircraft.

7.Installing laundry machine.

Ad.1: The plane arrived on schedule; but the weather conditions were marginal with reduced visibility. The skiway appeared hard and relatively even; but the pilots were not satisfied. We must continue to operate with reduced cargo capacity. It appears that the crew was frustrated about other things such as the poor visibility, and the poor calibration of the pressure and wind sensors of camp. However, the plane left from the new skiway without using rockets. Unfortunately, the plane had to return to Kangerlussuaq due to issues with the landing gear. We now plan to receive fuel from Thule tomorrow..

Ad.3: The winch control, we received today, is in fact the old one from last year. It didn't work. HansPeter located the fault. It was three blown ceramic resistors that are meant to control the voltage to the logic of the control. The resistors were replaced, and the control now works.

Weather: Haze or fog, later blue sky - 32 C to -25 C, 8-15 knots from SSW later E. Visibility: 1 mile, later unrestricted. With -32 C and 14 knot mean wind, the wind chill reached -50 C. It was tough to work outside this morning.

FL, J.P. Steffensen

Picture captions:

Drillers handle new core barrel for the drill in the drill trench.

A piece of the broken part of the winch control.

The broken resistors.

Wednesday,13th May 2009.

A day of successes.

Yesterday it was decided to receive a plane from Thule with fuel. As most of the Greenland ice sheet stations had bad weather, NEEM was the only site with still god weather, and therefore the Hercules plane in Thule offered us two fuel deliveries in one day. The flight time from Thule to NEEM is a little more than an hour, so within 4 hours we received two loads of fuel. Our fuel pump did a good job, and we now have fuel for two months operation. Hans Christian flew out on the second plane, as he has to make a connection to his hometown of Tasilaq. We are now ten in camp. HansPeter and Jakob had a break though in programming the winch control. They found the right settings for the new motor, and now everything works. At suppertime the forecasted blizzard came; but we were prepared. Wind and snow does not hurt us, and with temperatures rising to completely new and warm -12 C, we could sit inside our warm dome and just enjoy the spectacle of the weather outside

What we have done today:

1.Received Skier 73 two times in splendid weather.

2.Operating aircraft fuel pump with succes.

3.Said good bye to Hans Christian.

4.Made furniture parts in garage for mounting in kitchen.

5.Planning with Copenhagen and Kangerlussuaq on how to proceed on the issue of the missing winch control spare parts..

6.Finally achieved the right program settings for the old winch control to operate the new motor. The winch control and motor now work. Tomorrow we will mount the new motor on the winch, and begin to mount the final parts of the drill.

7.Parked all smaller vehicles indoor, cleaned up camp and closed all structures in preparation for the forecasted blizzard..

Ad.1: We received around 7,500 liter fuel on the first shuttle and around 11,500 liter on the second. The 11,500 liter were transferred from the aircraft fuel tanks to our tanks in 15 minutes. Our old skiway got an upgrade and the crew was happy with the progress on the new skiway. It will need some grooming before a full hardness can be attained.

Weather: Blue sky, after 8 PM overcast - 35 C to -11 C, 10-20 knots from SSE later S. Visibility: Unrestricted, later 300 m. The blizzard hit us after 8PM with clouds snow and wind. Temperatures rose by 10 degrees in few hours.

FL, J.P. Steffensen

Picture captions:

Transfer of fuel from Skier 73 to NEEM camp.

Thursday,14th May 2009.

We work inside and below. Outside is a mess.

All through the day we have been forced to stay out of the weather. The wind reached its maximum in the afternoon with speeds of 38 knots. Being outside in the wind wasn't so bad, as it was much warmer than we are used to; but once outside, you got plastered with snow in your face so it was hard to see where you were going. Obviously, the planned flight today was cancelled. In the drill trench, the drillers performed a pull test to 1.8 tonnes. The winch worked and the drills attachment to the cable held. Later, our short drill was mounted, and tomorrow the drillers will send the drill into the hole for a cleaning operation before the long deep drill is mounted for real ice core drilling.

What we have done today:

1.Completed the pull test. The "Hans Tausen" drill is now being mounted. The drill is named after the Hans Tausen ice cap in Peary Land, where it was first used in 1995.

2.Mounting new water taps in kitchen..

3.Mounting new tables and shelves in kitchen.

4.Upgrading electrical supply to main dome..

Weather: Overcast - 11 C to -8 C, 20-38 knots from S. Visibility: 200 m. Snow and blowing snow.

FL, J.P. Steffensen

Picture captions:

Drifting snow in camp. Where does the ice end and where does the sky begin?

Friday,15th May 2009.

The first ice core drilled.

Outside, the mess continued; but later in the day the wind abated a bit, and we were able to see the effects of the blow. New snowdrifts have formed, several of them more than 1 meter high. We are planning to have flights coming in a few days. Both the U.S. Summit camp and we at NEEM are behind schedule in flights due to the bad weather that has hit the Ice sheet in the past three days. To top it off, one Hercules plane is sitting in Kangerlussuaq with a landing gear issue. They might be able to fly tomorrow, but if weather permits, the 109th will first fly to Summit. This suits us fine, as our skiways badly need grooming because of all the fresh snow. As we are in a run-in phase of upgrading our skiways to heavier loads, it is important to us that we have done all we can, before the 109th attempt landing again. As soon as the wind goes down and the snow drift ends, we will start grooming.
We drilled the first ice core today. The short drill has since yesterday been used to clean the hole at the bottom some 100m down. The task has been to remove debris from drilling last year. As we went through the debris we drilled into the ice proper. As soon as our short drill has drilled a hole deep enough to hold the length of the deep drill, we will change to the deep drill.

What we have done today:

1.Cleaned hole with Hans Tausen drill.

2.Drilled the first ice core.

3.Made carpenter work in drill trench.

4.Upgrading electrical supply to main dome.

5.No work outside. Too much blowing snow.

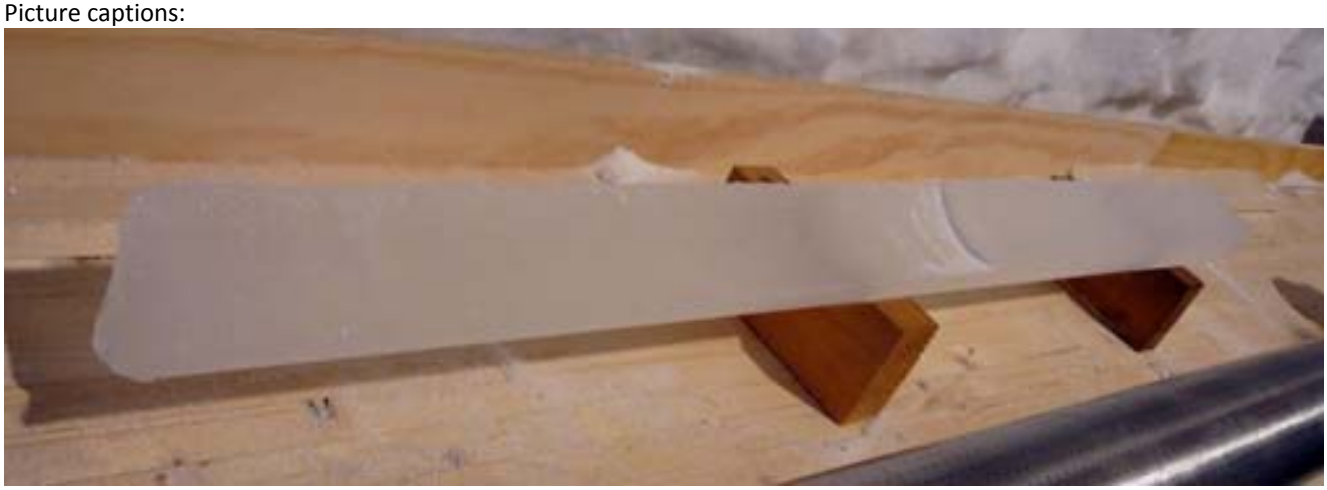
Ad.1: This is how the drillers report looks today:

"With the winch control and drill electronics working fine, the Hans Tausen Drill was mounted to begin clearing the chips that filled the bottom 13 meters of the borehole following last season's reaming operation. Three runs with a 134 mm diameter cutter configuration successfully brought up about 40 liters of loose chips. With the fourth run the drill began to penetrate the side wall and virgin ice was brought to the surface reminiscent of the refrozen "moon" cores produced at the bottom of NGRIP as we deviated gradually from the original borehole. We believe the sidewall penetration began when the cutters encountered the ledge left by the transition between two reamer diameters (reamer 3 and 2). Next, we mounted the conical reamer in place of the drill head with the hope that the drill would be deflected back into the original borehole. After two runs, believing we were back in the original bore hole, we remounted the drill head configured with 127 mm cutter configuration for a run which produced a 1.32 m "moon" core. This "moon" core also contained the ledge from the transition between the next set of reamers (2 and 1). It is now clear that within another meter of penetration a complete new borehole will be established at a driller's depth of about 90 m (~99 m below May 2008 surface defined as zero depth). Preliminary indications are that this new borehole has an inclination of about 0.3º which we believe is more plumb than the original borehole. The way forward is to continue down this new path with the Hans Tausen drill with 134 mm cutter configuration and reassess the inclination as we go. If acceptable we will then proceed with setting up the final infrastructure in the trench to handle these first ice cores of 2009 and begin preparations for the test phase of the new deep drill. The overlap between the new borehole and the bottom of S1-2008 should be approximately 7 meters and precise depth registration should be straight forward with ECM."

Weather: Variable from over cast to blue sky, - 24 C to -12 C, 10-38 knots mainly from S and SSE. Visibility: 200 m. to 1 km. Snow and blowing snow.

FL, J.P. Steffensen

Picture captions:



Our first core on the table. The core is moon shaped because it is drilled from the transition between the large diameter hole from last year and the smaller diameter of the hole this year.

Saturday,16th May 2009.

Drilling into the ice below the casing.

Although weather has cleared, the snow still blows.Tomorrow, we will be forced to go out on the skiways to groom them anyway. We have cleaned the main dome and removed a lot of crates. We have worked in the drill trench. Drilling goes well. Right now, we are in the delicate process of drilling into the ice proper below the casing that was inserted last year. This has to be done in steps as the hole at the termination of the casing is funnel shaped. When we have drilled 11-13 m into the ice proper, we can be sure that our long drill can get a "foot hold". Then there will be a pause in drilling as we change from the HT drill to the long "real" drill.

What we have done today:

1.Drilling with HT drill. Depth 103 m.

2.Making filter for clothes dryer.

3.Cleaned main dome and removed crates.

4.Installing emergency switches at several stations at the drill site.

5.Building and lining up logging/extraction table.

6.No work outside. Too much blowing snow.

7.Celebrating Saturday evening.

Ad.1: This is how the drillers report looks today:

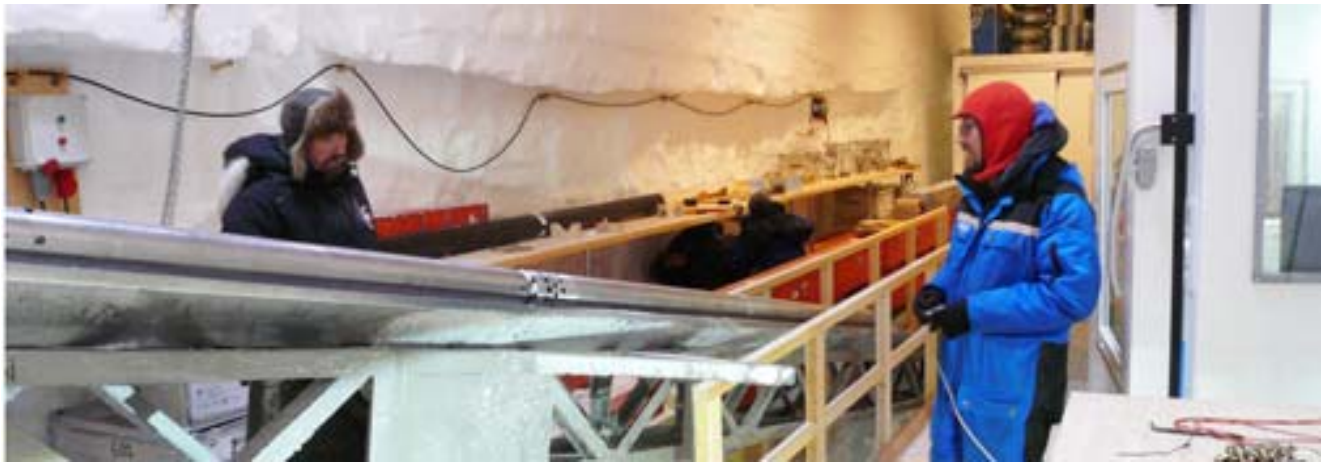
"We continue with the HT drill in the dry mode with 134 mm cutter configuration. These wider cutters produce more chips than the system is designed to take in dry mode and thus caused packing around the drill head that would require aborted runs due to high motor current. A stable mode was found by giving cable slack for 4 cm at a time and then waiting to allow the drill head to clear itself. A full chip chamber resulted in ~1 meter core lengths. There are no more "moon" cores as we have completely exited the old borehole. The antitorque skates have cleared the bottom of the casing. They had to be incrementally adjusted after each run to their nominal diameter to overcome side forces and the narrowing of the borehole was we pass through the various reamed sections as the full length of the drill began to enter the new 134 mm diameter borehole. Inclination is 0.5º so the hole is very plumb. Driller's depth is 93.72 meters (~103 m below 2008 surface)."

Weather: Haze and thin overcast in the morning, later blue sky, - 26 C to -14 C, 12-20 knots mainly from S and SSE. Visibility: 500 m. to 4 km. Blowing snow.

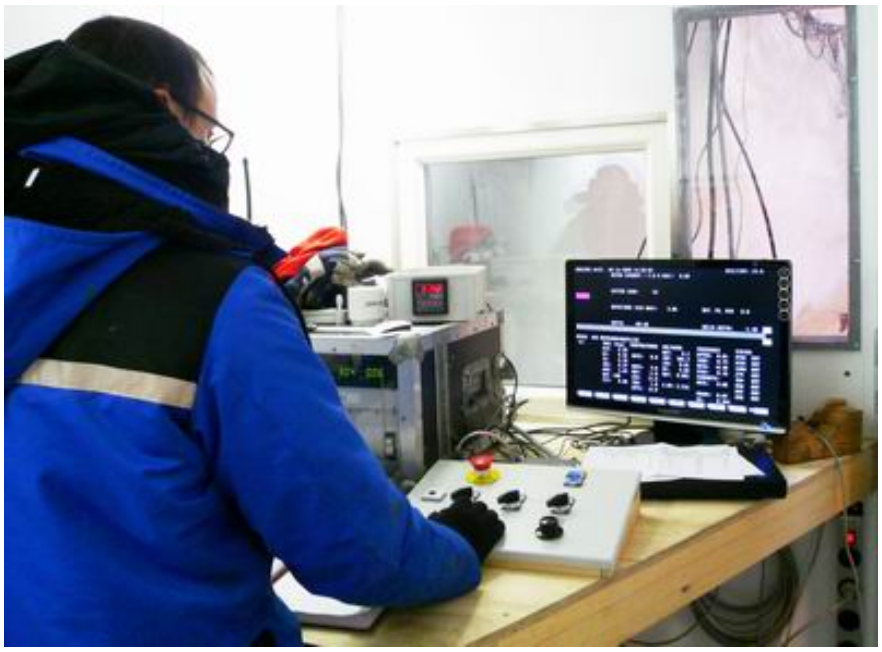
FL, J.P. Steffensen

Picture captions:

Trevor and Steff extract a 1 meter core from the HT drill.



Trevor and Steff while tilting the tower from horizontal to vertical.



Trevor in the control cabin.

Sunday,17th May 2009.

Now we hope for a plane tomorrow.

After a late Sunday morning start, people went to their tasks. The drillers did a fine job, and they are satisfied with today's outcome. We are now hoping the weather will give us some respite so that we may have a plane tomorrow. We have 15 people waiting in Kangerlussuaq, and some have been waiting a week! We have groomed our skiways all day, and we have coordinated cargo and schedule with our FOM (Field Operations Manager), Lars, CPS (U.S. National Science Foundation contractor for Summit and other camps) and the 109th (the LC-130 squadron of the New York Air National Guard). Sarah, our cook, told us today that we are out of fresh produce. We therefore also hope the plane makes it tomorrow for the simple reason, that it would be nice to have milk, apples and tomatoes again.

What we have done today:

1.Drilling with HT drill. Depth 111 m.

2.Repairing Flexmobil.

3.Organizing electrical installations in drill trench.

4.Building and lining up logging/extraction table.

5.Work on food orders and food inventory.

6.Grooming skiways.

Ad.1: This is how the drillers report looks today:

“Smooth drilling in HT dry mode continued today. With 134 mm diameter cutter configuration, the HT drill in the dry mode can produce 1 to 1.1 meter cores without over packing the chip chamber. Stable drilling throughout the run requires some patience in giving cable slack and very little cutter load to allow the head to clear excess chips. Squeezing it much more makes it difficult to extract the ice core, taxes the drill motor with high and unstable current demand, and results in an extremely packed chip chamber. The HT drill has proven once again to be an extremely efficient and versatile tool for many modes of drilling. We will continue with this mode for another 10 meters and then begin the switch to a version of the long drill. We are now below the depth reached in the 2008 pilot hole and thus have completely cleared the old borehole.
Driller’s depth: 102.35 meters (~111 meters below 2008 zero surface). ”

Ad.2: A broken oil hose to the cabin heating was replaced.

Ad.7: After spending an hour excavating the Pistenbully, we began grooming with the tiller. The new skiway has been groomed almost to full width, and the old skiway has been groomed 2/3 down along the center line. Constant blowing snow and poor visibility and contrast made grooming difficult. However, we believe that our skiways are more even than before.

Weather: Haze in the morning, later broken ceiling with clouds/fog banks rolling in, - 18 C to -11 C, 16-20 knots mainly from SSW. Visibility: 300 m. to 2 km. Blowing snow all day.

FL, J.P. Steffensen

Picture captions:

When the air is full of ice crystals, a halo may form around the Sun.

Monday,18th May 2009.

A plane arrives and camp experiences a revolution.

Today the plane arrived bringing 15 new members to camp. Two people, HansPeter and Henrik left, so for the 8 remaining of the in-put team, it was no less than a revolution. So many people! However, with the new people came new energy and they brought nice weather too. We used both things. The afternoon was spent cleaning up in camp. Piles of cargo sitting in snow drifts and cargo from today was sorted and distributed. Camp now looks less messy. Today was the first day in 5 days where we could work outside in a constructive manner.

What we have done today:

1.Received Skier 71 in marginal weather conditions.

2.Received 15 new members of camp, and said good bye to two. We are now 23 in camp

3.Finished drilling with HT drill.

4.Deployed bore hole camera.

5.Broke down and unpacked arriving cargo pallets.

6.Cleaned up camp for cargo in snow drifts after 5 days of blowing snow.

Ad.1: This is how the drillers report looks today:

"Continued with smooth drilling with the HT drill in dry mode. We have now reached a depth that the full length of the EPICA drill will fit entirely into the new borehole. The HT drill will be dismounted and we will work next with the EPICA drill. We welcomed three new drillers
Driller's depth is 111.80 meter. "

Ad.1: Weather this morning was dominated by snow squalls. For 15 minutes, we could have sunshine and good visibility. 15 minutes later, we would have overcast and snow with low visibility. We kept our fingers crossed, and as the plane came in to land, the weather was fine. The crew was happy with our skiways, and the whole operation was successfully concluded.

Weather: Snow squalls in the morning, later clearing, - 18 C to -9 C, 8-19 knots mainly from SSW. Visibility: 300 m. to 5 km. Some blowing snow.

FL, J.P. Steffensen

Picture captions:

A picture from our bore hole camera from about 90 m depth. To the right is outline of the bottom end of our fibreglass casing, and the hole continues down into the ice sheet proper.

Tuesday,19th May 2009.

Large activity.

A lot of things are happening now. The many new people really make the camp move. One group erected three

weatherports and our camp is now fully established. There is noise and activity in the kitchen during meals, and the feeling is good and positive. We have a lot of things to be glad about: Preparations for drilling is moving ahead as planned, and we are about to be ready with construction work on the surface. Time is approaching, where we will build up the ice core laboratories in the science trench. We just have to make the last few things, and receive another plane tomorrow, and them most people begin to work under ground.

What we have done today:

1.Borehole camera deployed a second time, an a film vas recorded.

2.Repairs on electrical system in drill trench.

3.Built 3 weatherports. Camp structures now complete.

4.Put a large welding tent on top of entrance to science trench.

5.Organized cargo back for Kangerlussuaq.

6.Hoisted heavy and outsized items down through the skylight in the drill trench.

7. Grooming skiways.

Ad.1: This is how the drillers report looks today:

"Today we took advantage of the dry borehole and deployed the down hole camera. The bottom of the casing was clearly visible. Below the casing the borehole was smooth, including the entire transition from the point where the drill diverged from the original borehole to where the new borehole was fully established. Meanwhile, preparations were made for mounting the EPICA drill, new cold temperature hoses were installed for the drill liquid pumping station, safety features were implemented into the winch control, and items for the trenches were lowered via the crane through the drill trench roof."
Weather: A clear, but windy day , - 17 C to -12 C, 10-22 knots mainly from S and SSW. Visibility: Unrestricted. .

FL, J.P. Steffensen

Picture captions:

Building the last weatherports.

Wednesday,20th May 2009.

We receive the last plane for the put-in period.

Today we received the last plane with cargo for camp construction. Skier 71 arrived under the same weather conditions than on Monday; but the crew made it and we received precious cargo. From that point on, however, things went down-hill. We had 9,900 lbs cargo for Kangerlussuaq, e.g. empty pallets, old snowmobiles and rubbish from camp, and this was loaded on the plane. It was not the same plane as on Monday, and this plane simply refused to take off. It only succeeded after dumping all our cargo to get lighter. This was most annoying.
Camp work continues to progress at a tremendous rate. 23 people accomplish a lot more than 11; but we also received help: Weather was really good all day.

What we have done today:

1.Installing ventilation system in drill trench.

2.Mounting EPICA drill and making ready for adding fluid into the hole..

3.Cleaning in the main dome.

4.Receiving Skier 71 with cargo. Our meteorology station now works well.

5.Making inventory on arriving food..

6.Work on water vapour sampling station.

7. Made 4 retrograde cargo pallets ready.

8. Excavating inclined trench into drill trench with snow blower.

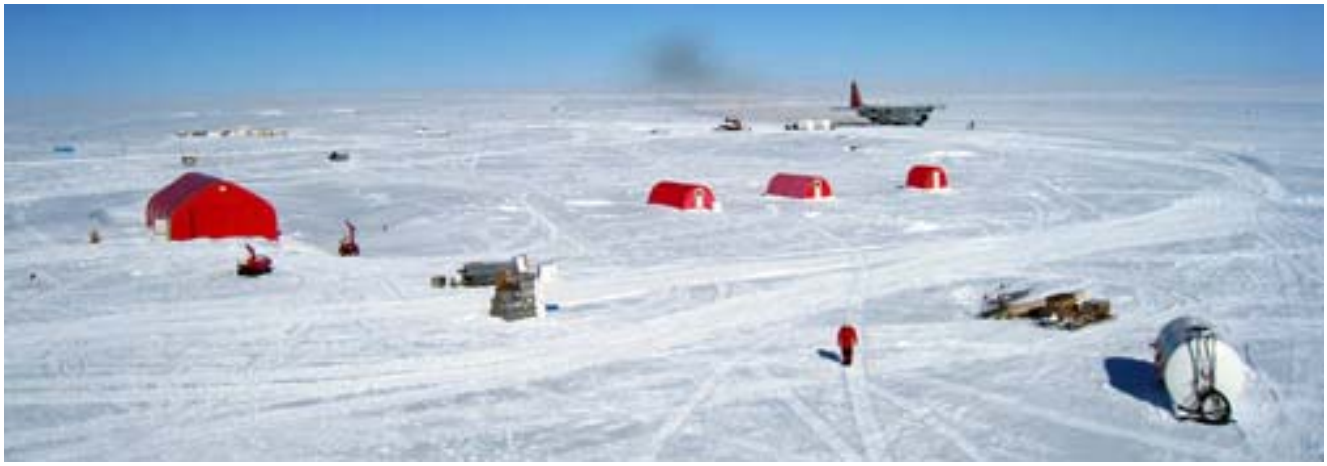
Ad.1 and 2: This is how the drillers report looks today:

“The EPICA drill was assembled, mounted with the primary NEEM pressure tube and motor section, and lowered into the borehole. The new borehole accommodated the long drill to the bottom without a problem. Meanwhile the new drilling software was upgraded, tested, and will now be used to operate the drills. The old NGRIP software still functions as before and will be used as a backup. 350 liters of drilling liquid was prepared to be dumped into the borehole to begin wet drilling. However, the amount of Coasol (densifier) relative to Estisol (base liquid) was found to be greater than predicted to achieve the desired 935 kg/m^3. Slight modifications by the manufacturer to the production of Estisol, which apparently has reduced both its density and its viscosity, seem to be the cause. An experiment is underway overnight to determine the proper mixing ratios of the two liquids before continuing.”

Weather: Cloudy with snow showers in the morning, later clearing, - 21 C to -11 C, 2-14 knots mainly from SSW, later SE. Visibility: 3 km to unrestricted..

FL, J.P. Steffensen

Picture captions:



Today's plane needed fuel to leave camp.

Thursday, 21st May 2009.

We have the best weather ever this season.
.
A number of important steps were taken today. The drillers poured fluid into the borehole in preparation of deep ice core drilling. One of the broken winch controllers was repaired. We now have a backup. The last finishing touches were made to the drill trench, and now it is ready.Weather was fine, it was a pleasure to work outside. Some were grooming the skiway, some were installing beds and yet some were excavating trenches. All in all it was a productive day.

What we have done today:

1.Inspecting skiway. Grooming away ruts from yesterday's plane. Writing report on flight operations.

2.2nd floor of main dome turned into workshop for construction of water vapour sampling station.

3.Setting up bunk beds in three weatherports.

4.Working on inclined trench to drill trench.

5.Ice core pull out table ready.

6. Logging table almost ready.

7. One broken new winch controller repaired. We now have two working winch controllers.

8. Work on composition of drill fluid mixture. Result: A mixture of 65-35 needed.

Ad.5,7 and 8: This is how the drillers report looks today:

"The second winch control was repaired by Jakob. It was hooked up and tested and is available as a backup. The proper mixing ratio for the two drill liquids is approximately 65:35 (Estisol:Coasol). 350 liters of this mixture have now been dumped into the borehole. The 134 mm diameter borehole requires 14.1 liters of drill liquid per meter (not including losses on the surface and in the chips). The rest of the day was spent preparing the trench to receive long cores. The core receiving table was finished, the core barrel pull out table was adjusted and aligned with the tower, construction of the core logging station (which will now be in the drill trench) was started, and the ventilation system was opened and activated. Modifications to the drill software were also made."
Weather: Clear all day, fog in the evening, - 23 C to -13 C, 10-14 knots mainly from S. Visibility: 1 km (due to fog) to

unrestricted..

FL, J.P. Steffensen

Picture captions:

Snow blower in action on this beautiful day.

Friday, 22nd May 2009.

A long ice core.

It has been a blusterous day. Snow began to move after Noon. For Henry it was quite annoying. He is currently excavating a 6 m deep trench with the snow blower, and when snow is on the move, it will find the first depression to fill up, which was Henry's. In the end he decided to abandon this "Sisyfos"work and, as soon as he did, the wind abated.Sarah has got a new mixer, a biggy weighing 100 kg. She was so happy, she immediately showed what it could by making homemade pizza. In the drilling trench, they have drilled 10 m ice core with the EPICA drill today. Cores of more than 2 m length were drilled. Trevor exclaimed: "We haven't drilled a two meter core since 2000". Come to think about it, it is in fact true. 2000 was the last year we used our long drill at NGRIP. In 2001, 2003 and 2004 we used the HT drill, because of warm ice at the base at NGRIP. At Flade Isblink in 2007 we used the HT drill, and this year at NEEM – until now.

What we have done today:

1.Drilling.

2.Installing tables in CFA room.

3.Excavating inclined trench to drill trench.

4.Work on electrical installations.

5.Moving snow in camp (removed snow drifts).

6.Water vapour sampling site ready.

7.Cutting away section of side wall in science trench.

8.Organizing mattresses, pillows etc. for bed in new weatherports. Made bed count in camp.

9. Repairing no. 3 winch controller.

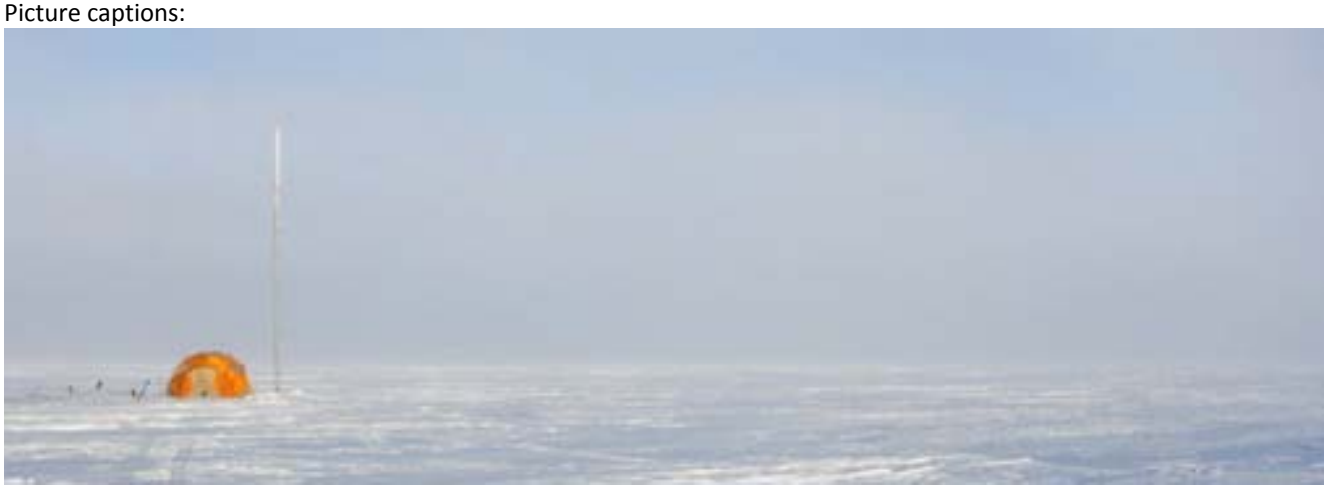
Ad.1: This is how the drillers report looks today:

"We had a good and wet day in the drill trench. Wet drilling began today with the EPICA drill in the new drill liquid. For the first four runs we used the same 134 mm cutter configuration with a pitch of 4.5 mm as we had with the dry drilling. In this mode the 4 meter long chip chamber was full after a maximum core length of about 2.4 meters due to the excess chips produced with these wide cutters. The drill produced nice course chips and the drilling liquid performed beautifully transporting chips efficiently leaving a clean borehole after each run. In an effort to stabilize drilling motor current and to drill with a negative cutter load, we reduced the cutting pitch to 3 mm for a final run. This run produced a 2.2 meter core and a full chip chamber, but had a long drill time and still required slight positive cutter load (4-8 kg). A more aggressive cutter pitch seems a better mode so far. With each run the drilling software was optimized and the new display and control is well liked by the drillers. All drilling today was done with the backup winch control giving us two perfectly functioning winch controls. The core extraction table and logging tables were completed in the drill trench.
Driller's Depth 120.0 meters (~131 meters from 2008 surface) "

Weather: Clear all day, fog in the evening, - 19 C to -12 C, 12-23 knots mainly from SSW. Visibility: 1-3 km. Fog and blowing snow. Windy day.

FL, J.P. Steffensen

Picture captions:



The new water vapour sampling site.

Saturday, 23rd May 2009.

We can now drill 2 m ice cores each run.

With the drill trench fully operational, the drillers have turned their attention to learning to handle the drill fluid, to observe how the drill fluid interacts with the drill, and to tuning the various components of the drill. The drillers are satisfied with the progress. Construction work has now moved into the science trench. In the CFA cabin, tables and shelves have been mounted as well as the setup for the CFA melt head. The plan of where the various workstations will be has been finalized, and we are now setting up and adjusting the tables and saw positions. The beautiful day allowed for activities on the surface. Construction of the staircase and elevator is progressing. Then it was Saturday night. Sarah had an afternoon off while H.C. and Peter made supper, grilled steaks, and Lone and Marianne made desert.

What we have done today:

1.Drilling.

2.Setting up ECM bench and measuring ECM to establish the starting point for NEEM 2009 Main core.

3.Excavating a cave for physical properties cabin.

4.Making a CFA buffer.

5.Setting up Barbecue.

6.Removed large snow drifts in camp.

7.Setting up tables and shelves in CFA lab.

8.Adjusting table for O18 cutting.

Ad.1: This is how the drillers report looks today:

"The morning was spent improving liquid handling procedures and protection and improving the set up in the driller's cabin. Afterwards, three cutter/shoe combinations were used for drilling to tune in the EPICA drill; using 3 mm pitch shoes, 4.5 mm pitch shoes, and adding a 0.2 mm shims to the 4.5 mm pitch shoes. Each configuration gives stable drilling, full core lengths, and a full chip chamber, but the best results so far come from the 4.5 mm pitch shoes. With this configuration we get the best negative cutter load and we get the best chips, while the smaller pitches give very fine chips. However, the pitch we measure on the core is less than 4.5 mm. While the cable is shorter we can control the mean pitch by holding back slack, which will not work when the cable gets longer. A few runs resulted in antitorque rotation. The 'pilehøjde' of the antitorque blades has been increased to 38 mm to account for the larger diameter borehole.
Driller's depth is 125.75 meters."

Weather: Clear all day, - 22 C to -11 C, 4-14 knots mainly from S and SSW. Visibility: Unrestricted. Beautiful.

FL, J.P. Steffensen

Picture captions:

Saturday night barbecue in front of the main dome. The grill is an old oil sump from one of the tracked vehicles.

Sunday, 24th May 2009.

Sunny Sunday

This Sunday morning the main power of camp was disconnected, as Bruno exchanged the main power distribution panel on the generator hut. It took from 7 AM to about 1 PM. In the mean time, our 16kW backup generator powered the main dome. Everything went fine, and as soon as the exchange was completed, we were able to get back to work in the trenches. It was a fine day again, and work progressed at a steady pace. In the last days, the amount of snow blocks that has been taken from excavations in the science trench, has grown to a formidable hill. Several camp members used the nice, sunny evening to build an snow hut (To call it an igloo would be an insult to igloos). They were having great fun.

What we have done today:

1.Drilling.

2.Exchanging power distribution outlet on generator hut.

3.Excavating a cave for physical properties cabin.

4.Measuring ECM on new core from this year. A match of two volcanic layers between the 2008 core and the 2009 core has been established..

5.Working on roof for elevator and staircase.

6.Removed large snow drifts in camp.

7.Setting up tables and shelves in CFA lab.

8.Taking down flags on ½ old skiway and setting them up on new skiway.

9.Work on assembling the new NEEM drill.

Ad.1: This is how the drillers report looks today:

"Activities today took place in three parallel tracks. Trevor, Krissy, and Nobby continued with the EPICA drill for five runs using the same configuration each time (4.5 mm pitch shoes, 134 mm diameter cutter configuration, antitorque skates set to 38 mm pilehøjde). Smooth drilling was the norm with one antitorque slip when motor current limit was reached during the last run. At present we limit the length of the runs to two metes to accommodate core troughs for storage while the loggers establish the new depth reference based on ECM matching. We tested the cable cleaner device designed by Jakob and early indications are that it effectively dries the cable of excess liquid. One great property of the drilling liquid is that excess chips we do not collect float and therefore do not impair drilling down hole. When necessary these chips are easily collected with the bottom filter. Meanwhile Steffen and Sigfus continue to put together the new long drill. Finally, Jakob continues to repair the winch control inverters and has remounted the original inverters into their original boxes.
Driller's depth is now 134.44 meters."

Ad.4: We have matched the ECM signal from last year's pilot hole to the new main hole. As the drill diverted away from the old hole, we now have an overlap of 5 meter between the two cores. A match of two volcanic signals (1646 AD and 1641 AD) in both cores, has resulted in a depth scale adjustment from drillers depth to core depth of 1 cm!! The new NEEM main core begins with Bag 180 (98.45 m below 2008 surface).

Weather: Clear all day, - 22 C to -11 C, 5-6 knots mainly from S and SSE. Visibility: Unrestricted. Beautiful.

FL, J.P. Steffensen

Picture captions:

Setting up flags on new skiway.

Monday, 25th May 2009.

Another glorious day on the ice.

The camp is changing shape. Sverrir has removed all snow drifts around garages, and they are now level with the surface. Also, the old skiway is gone, and the new is fully marked but it runs in a different direction. Perspectives change as an anchor point in this white ocean changes position. And I have an excuse to make, the ugly igloo I mentioned yesterday was not intended to be an igloo. It's a dinosaur, a fully bred braciosaurus made from snow blocks. So much for mister know-it-all, Field Leader. I offer my humblest apologies to the artists. Tonight Sarah served sushi and red curry chicken with wasabi, soy sauce and stir fried vegetables, later H.C. made Danish layer cakes, and people decided to celebrate Sverrirs non-birthday.

What we have done today:

1.Drilling.

2.Logging ice cores. Last Bag logged: 223, depth 122.65 m

3.New skiway fully marked. We are now working on the approaches, the apron and taxi ways. The old skiway taken down.

4.Excavating for elevator and staircase.

5.Building up in the CFA laboratory.

6.Removed large snow drifts in camp. The Western side of camp is now flat.

7.Setting up tables and saws in science trench.

8.Excavating cave for physical properties studies..

9.Work on assembling the new NEEM drill.

Ad.1: This is how the drillers report looks today:

"Two slush runs with the borehole filter produced 10 kg of chips (wet weight) left in the hole after 13 runs with the EPICA drill. Drilling continued in a normal mode with the EPICA throughout the rest of the day with one slight modification to the drill head. A 0.02 mm shim was placed under the shoes to reduce the cutting pitch. Work continued on assembly of the Long Drill. Some precision adjustments by Steff are needed to make all the parts fit together properly. Both winch control boxes are now mounted along the drill trench wall for easy access if a back up is needed. Slowly the drill trench infrastructure is getting tuned in for efficient work while the drill is on the surface. Driller's depth is now 145 meters."

Ad.2: The ice core logging has proceeded into the core drilled in fluid. It appears to be relatively easy to wipe the cores clean with paper towels. The cores can be marked by a pencil. The logging software works fine.

Weather: Clear all day, - 22 C to -11 C, 3-5 knots mainly from S. Visibility: Unrestricted. Beautiful.again.

FL, J.P. Steffensen

Picture captions:

Excavation of trench for elevator and staircase.

Tuesday, 26th May 2009.

Glorious weather continues.

We are so lucky with the weather. For several days, we have little wind, and this is good as we are excavating a very deep trench which could very quickly fill up with snow if we had strong winds. Hopefully, we will be able to cover the trench with a roof before the wind and snow drift comes again. Lone and Marianne have been hauling snow blocks several days, so today they were assigned to bamboo cutting duty, which they promptly turned into an industry. Lou is playing around on the skiway with the Pistenbully. She is a skilled driver. Lou and J.P. have had lengthy "shop talks" on grooming techniques and snow texture and hardness.

What we have done today:

1.Drilling.

2.Logging ice cores. Last Bag logged: 300, depth 165.00 m

3.Approaches of the old skiway taken down. Apron extended East to new skiway. New northern taxiway to West end of apron.

4.Excavating for elevator and staircase.

5.Building up in the CFA laboratory.

6.Groming in camp with beam groomer.

7.Setting up tables and saws in science trench.

8.Cutting bamboo and repairing markers and flags.

9.Work on assembling the new NEEM drill.

10.Grooming skiway and part of apron and new taxiway with tiller.

Ad.1: This is how the drillers report looks today:

"The testing phase continued in the drill trench. We bench tested and then mounted the secondary pressure tube to the EPICA drill. It works generally fine with the new software with only minor modifications needed for better communications down hole and setting motor current limits. The pressure seals held under the liquid. Because of a different motor the motor turns at ~55 rpm (versus ~75 rpm in the primary section). After three runs and a hard (and strange shaped) core break, we removed the lower valve and replaced the seal on the upper valve of the hollow shaft in order to increase the drill stability. However, all subsequent runs were terminated by high motor current and antitorque rotation. We noticed minor damage to one of the cutters so perhaps these problems were due to a foreign object at the bottom of the hole.
Driller's depth is now 152.23."

Ad.2: The difference between drillers depth and logged depth is due to an off-set because the drill is below surface, and the drillers set zero depth below the floor of the drill trench.

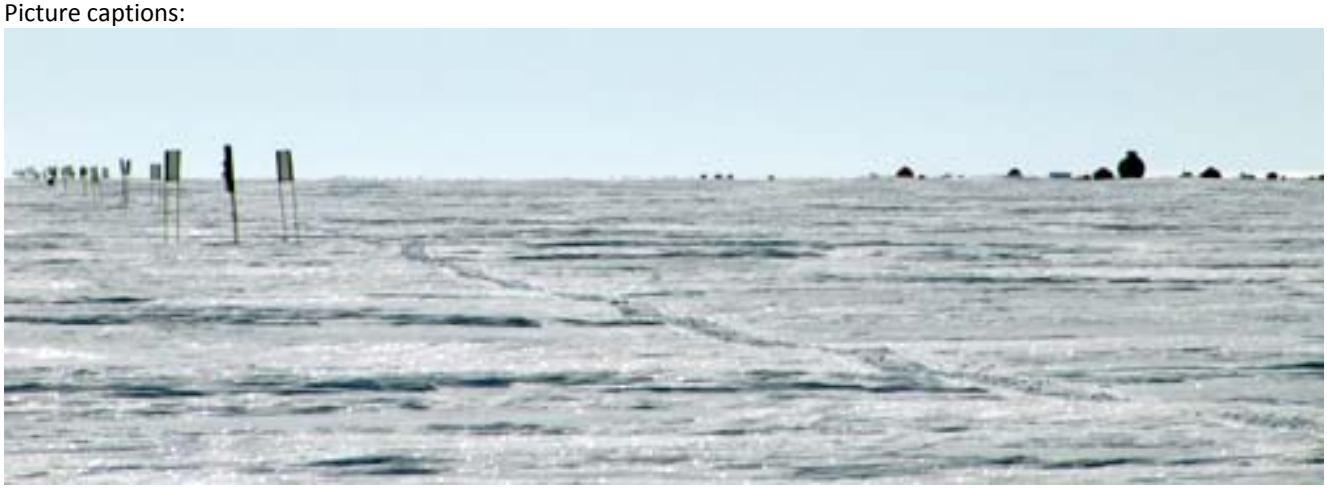
Ad.4: It is tough to gain the last meters in the bottom of the shaft for the elevator and staircase. All snow has to be cut by chain saw and the blocks removed. This involves a lot of hard lifting and hauling. Henry and Sepp are particularly hard working.

Ad.8: Lone and Marianne turned the cutting of bamboo into an industry. Several hundred markers and flags were cut and carefully bundled. We have now markers for the whole airfield.

Weather: Clear all day, - 23 C to -13 C, 2-5 knots from S, later NE. Visibility: Unrestricted. Beautiful.again.

FL, J.P. Steffensen

Picture captions:



A view of camp from the approach of the old skiway, just before it is taken down..

Wednesday, 27th May 2009.

We got a roof on, and the weather begins to act funny.

Sarah prepared delicious musk-ox for dinner.

What we have done today:

1.Drilling. We got a record core length of 2.77 m

2.Logging ice cores. Last Bag logged: 308, depth 169.40 m

3.All markers for new skiway are up. Everything is groomed with tiller. Only a faint trace in the snow of the old skiway remains.

4.Excavating for elevator and staircase.

5.Building up in the CFA laboratory.

6.Elevator installed in trench with crane.

7.Setting up tables and saws in science trench. Now only a few tables remain to be set up.

8.Putting roof on elevator shaft and stairwell and trench. The crew worked until 23.00..

9.Rearranging 2nd and 3rd floor in main dome.

Ad.1: This is how the drillers report looks today:

"Close inspection found that one of the three screws that hold the inner pump sleeve fast to the outer barrel was missing and presumed to be in the borehole. It was a good candidate for the troubled runs that closed out yesterday's drilling. The magnet was mounted to the drill head to fish it out. The magnet run surfaced without a screw, but at the same time Nobby found the small screw in the chips from the final run brought up the previous night. With a clean borehole the drilling continued the EPICA drill. The lower valve was remounted to the pump and the hollow shaft opened resulting in a return to the good mode of drilling we experienced before this valve was removed. A modification made to the pump at NGRIP that closed the hollow shaft to the surrounding environment within the superbanger had not been installed on the pump installed on the EPICA drill. The pump/hollow shaft configuration we have now works well with this drill liquid because any excess chips in the borehole do not accumulate at the bottom but stay suspended or float to the top of the liquid column.
Driller's depth is 158.10 m.."

Ad.9: We have assembled sofas and have made a lounge with sofa group and tables on the 2nd floor. The Field Leader office has been moved to the 3dr floor.

Weather: Clear in the morning, at Noon overcast and snow, some clearing in the evening but still snow, - 23 C to -11 C,calm-10 knots from NE, later turning via S to NW. Visibility: 500 m to 5 km. Snow.

FL, J.P. Steffensen

Picture captions:

A scene from laying roof on the elevator trench..

Thursday, 28th May 2009.

Snow blocks, snow blocks and more snow blocks.

As the 6.5 m deep shaft for the elevator and staircase was nearing its completion, we realised that we had to switch places of the elevator and the staircase. This meant more snow blocks to be cut, loaded on a sled cart and towed away. The people working with snow blocks are getting a little tired of lugging blocks. They are most likely not inclined to play with LEGO as the first thing when they return to civilisation. But work is progressing, and tomorrow the staircase will be installed.

What we have done today:

1.Drilling.

2.Logging ice cores. Last Bag logged: 320, depth 176.00 m

3.Repairing the elevator. Elevator running fine again.

4.Removing snow wall from elevator and staircase room to drill trench.

5.Building up in the CFA laboratory.

6.Removing snow drifts from east side of camp and grooming main street with beam groomer.

7.Modifying core buffer to receive 4 m troughs.

8.Making program for DV visit..

Ad.1: This is how the drillers report looks today:

“Pressure tube #1 gives more stable performance and was reinstalled with the EPICA drill. Problems with the pump continued so the borehole camera was deployed down the outer core barrel to inspect the inner sleeve. The camera showed that one finger of the inner sleeve may be slightly damaged. However, with the proper alignment of the pump relative to the damaged sleeve it is still usable, thus no repair is necessary at this time so the focus can remain on preparing the long drill. Speed tests in the liquid show that travel down hole is not slowed by the viscous drill

liquid. Therefore cutter configuration was changed to give a 132 mm diameter borehole rather than 134 mm. The advantage of this configuration is that fewer chips are produced.
Driller's depth is 169.76 m."

Ad.3: the elevator stalled due to two relays that didn't take the cold well. Bruno has repaired it.
Weather: Clear all day, - 26 C to -16 C, 5 knots from ENE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Henry builds a wall from snow blocks at the entrance to the inclined trench.

Friday, 29th May 2009.

Anxiety grows as DV visit moves closer.

Many activities in camp today reflects the planned DV visit tomorrow. People are beginning to be a bit apprehensive on the imminent arrival of 31 visitors. One thing that still can be a joker is the weather. The days of low winds and sunshine are apparently over for this period. A few clouds were spotted to the south this morning, and by mid afternoon, thin clouds came, and the wind picked up to 20 knots from WSW which is almost right across our skiway. Not good for flying tomorrow. However the wind direction is so unusual, that it should turn soon. Luckily, we are putting the finishing touches to the stairwell and the elevator, so any adverse effects from snow drifts will be limited.

What we have done today:

1.Drilling.

2.Logging ice cores. Last Bag logged: 347, depth 190.85 m

3.Grooming skiway, taxiway and apron..

4.Elevator and staircase are now ready for use.

5.Building up in the CFA laboratory.

6.Cleaning up in camp..

7.Erecting flag line.

8.Replacing broken fuses in Pistenbully.

9.Mounting door to shower room.

Ad.1: This is how the drillers report looks today:

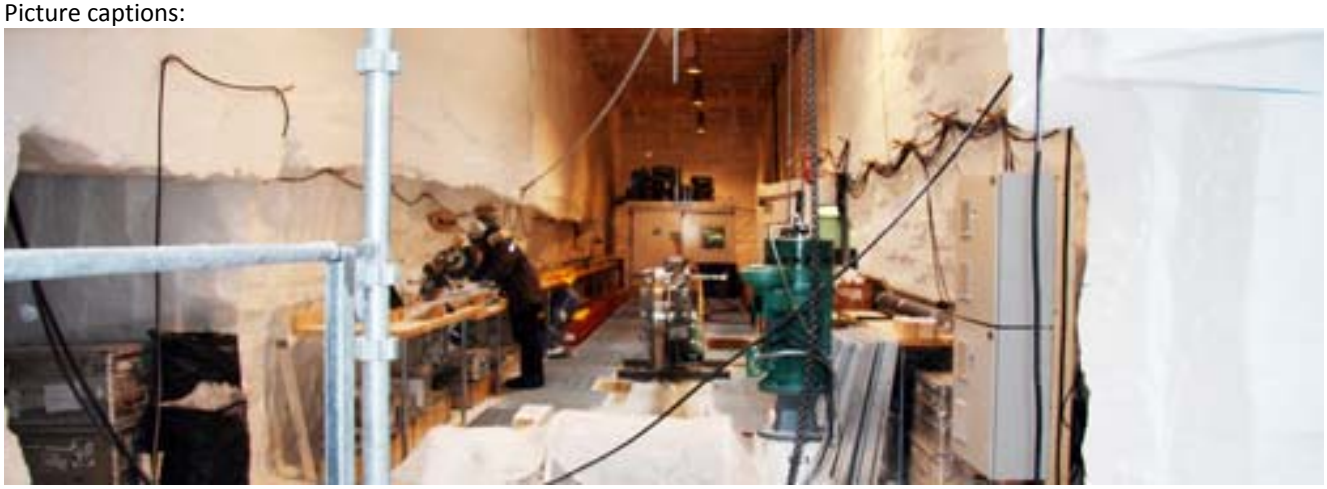
"Two slush runs with the borehole filter produced 15 kg of excess chips from the hole. Tower maintenance was necessary to straighten the tower relative to the base and fix the slush pan rail. The pump/inner sleeve is holding up with proper alignment and normal drilling with the EPICA resumed producing ice cores between 2 and 2.5 meters. Assembly of the long drill continues and requires more fine adjustment of the hollow shaft to properly mount the pump.
Driller's depth is180.00 meters."

Ad.8: Last night, power was lost in the garage. This morning the vehicles were cold due to lack of electrical heating. The Pistenbully did not start; but after some fuses were replaced, we got it running.

Weather: Clear in the morning, later thin overcast, - 26 C to -14 C, 5-18 knots from ENE turning to WSW as wind picked up. Visibility: Unrestricted down to 1 km.

FL, J.P. Steffensen

Picture captions:



A new view into the drill trench from the staircase (the rods to the left).

Saturday and Sunday, 30th and 31st May 2009.

A grand and successful weekend.

At 14.00 Saturday afternoon NEEM camp had an invasion. A group of 31 people visited the camp of which 18 spent Saturday night in camp. Camp population soared to 44 and the main dome was crowded. Camp was well prepared for the visit. The last few days were spent in preparation for the event. As the plane was flying to camp, the weather began playing tricks on us. Luckily, the plane made it in, and the event could begin. The group consisted of Scandinavian representatives of the International Polar Year (IPY) organisations and invited scientists from the U.S. and Canada; but most importantly the group also included the protectors of IPY in Norway, Sweden and Denmark: H.R.H. Crown prince Haakon of Norway, H.R.H. Crown princess Victoria of Sweden and H.R.H. Crown prince Frederik of Denmark. With such eminence present, the visit attracted the press, and the NEEM project got good publicity. After the official part of the visit was over, camp prepared for a Saturday night dinner and a delightful evening in the company of our guests. Camp crew and guest mingled in conversation and on the dance floor. The party ended early

Sunday morning. Sunday morning, the plane arrived 10.45 to pickup our guests. Again weather was not the best, and as the U.S. Summit camp reported bad weather, the planned visit there was cancelled. At 12.10 the plane flew off to Kangerlussuaq, and everybody in camp crashed after the departure. Never has NEEM camp been as quiet as Sunday afternoon. Everybody felt exhausted but enriched by the visit. I wish to express my deepest gratitude to the field crew, who did an outstanding job to make this visit a success, to our guests, who showed sincere appreciation of our work and by their relaxed attitude made everybody feel comfortable and finally to the New York Air National Guard (the 109th) who made this visit possible.

What we have done in two days:

1.Drilling.

2.Logging ice cores. Depth 200 m

3.Preparing visit of Distinguished Visitors (DVs).

4.Receiving Skier 02. A fortunate break in the weather permitted the plane to land.

5.Unpacking food delivery and distributing into fresh store, and freezer (a snow cave).

6.Cleaning up in camp..

7.Arranged a tour of camp activities for our visitors..

8.The 1259 AD volcanic eruption located in the ice core by ECM at 182.9 m depth.

9.Celebrating Saturday night.

Ad.1: This is how the drillers report looks for Saturday:

"A good day with the EPICA drill. Reducing the pitch to 3.2 mm produced four stable runs with core lengths of 2.5 meters. The final run was witnessed by more than 30 people crowded around the drill.
Driller's depth is 191.70."

Weather: Overcast most of the day with few breaks, - 22 C to -12 C,4-18 knots from SW. Visibility: ½ km to 8 km. Snow squalls passed camp until evening.

FL, J.P. Steffensen

Picture captions:

A very rare occasion on the ice sheet: H.R.H. Crown Prince Haakon of Norway, H.R.H. Crown princess Victoria of

Sweden, “NEEM princess” Sarah, our cook, and H.R.H. Crown prince Frederik of Denmark.

June

Monday,1st June 2009.

The new NEEM drill on it’s maiden voyage.

Today’s big event was the first run with the new NEEM drill. Compared to the old NGRIP/EPICA drill, the new drill is outfitted with several new constructions which have been developed for the new drilling fluid and should make the drill capable of drilling ice cores of more than 3 m per run. Almost everybody in camp witnessed the great moment, and the drill worked! A long beautiful ice core came out, and the faces of the drillers revealed that the run went really well. The whole camp is happy about the outcome, as the very existence of the camp depends on what goes on at the bottom of the hole. When the more than 3.5 m long ice core came out in a beautiful piece, the people who are going to take samples from the core were happy too, as good core quality is important for many good samples for the analysis of the climate of the past.

What we have done today:

1.Drilling.

2.Logging ice cores. Last Bag logged: 399, depth 219.45 m

3.Setting up equipment in science trench.

4.Cutting and moving of snow blocks in physical properties cave now completed.

5.Building up in the CFA laboratory.

6.Making camp fuel inventory..

7.Making refinements on logging table.

Ad.1: This is how the drillers report looks today:

“Today seven runs with the EPICA drill and one run with the NEEM drill produced 19.94 meters. The NEEM drill was fully assembled and its inaugural run took place after dinner. All drillers participated and many from camp witnessed the production of a 3.55 meter core with steady and stable drilling. The pull out was quite hard requiring up to 600 kg from the hand winch to pull the chip chamber and the core barrel from the outer barrel. The upper part of the chip chamber was hard packed with chips. We will install more centering rings along to hollow shaft to try to alleviate the pressure at the upper end due to packing. We preformed a speed test on the way down that unfortunately gave a kink in the cable at about 86 meters. The cable will be cut and re-terminated in the morning.
Driller’s depth is 210.09 meters.”

Weather: Windy, overcast and blowing snow most of the day, later clearing and less wind, - 20 C to -14 C, 10-20 knots from SW. Visibility: Unrestricted down to 1/2 km.

FL, J.P. Steffensen

Picture captions:

Group photo form this weekend's visit.

Tuesday, 2nd June 2009.

Many are preparing to leave.

Tomorrow is the planned flight for a crew change. 10 are scheduled to leave, and 17 are scheduled to arrive. After the exchange tomorrow camp will be fully manned. It is easy to feel the imminent departure of almost half of the camp crew. People are packing and several are running around on last minute jobs. However, the weather is going to give us trouble. Today we have had a blizzard all day, and nothing indicates it will become better tomorrow, in fact the forecast for tomorrow and Thursday look bleak. Well, we'll just have to wait and see...

What we have done today:

1.Repairing the broken cable.

2.Moved physical properties cabin into final position.

3.Removed the old staircase in science trench.

4.Groomed skiway, taxiway and apron.

5.Building up in the CFA laboratory.

6.Worked on documentation of computer system in camp..

7.Last works on the electrical system.

Ad.1: This is how the drillers report looks today:

"We cut away the damaged part of the cable, which was 90m. Then the top of the drill was attached to the new cable termination. Finally, a pull test to 1.8 ton was completed, and the drill is ready for tomorrow.
Driller's depth is 210.09 meters."

Weather: Windy, overcast, snow and blowing snow all day. -17 C to -8 C, 10-18 knots from WSW. Visibility: 1/2 km.

FL, J.P. Steffensen

Picture captions:

Today's view toward the skiway from camp.

Wednesday, 3rd June 2009.

Weather is bad. Waiting didn't help.

Today we had snow and wind all day, and high temperatures too. We held the plane as long as possible, but weather didn't improve. At 12.00 the plane was cancelled. Now we hope that the plane will make it tomorrow. Due to intense snow fall and an unusual wind direction, we have now an entirely new set of snow drifts in camp. Even though we groomed the skiway 4 hours this morning, we still need to do some grooming tomorrow morning. The new snow drifts are soft because of the new warm snow. However, in the drill trench drilling continued and in the science trench, most of the infrastructure is in place. It is quite ironic though, that the equipment in the CFA lab.now produce so much heat that they have tropical temperature inside, and they need a funnel to let the air out.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging.

3.Building in CFA lab.

4.Groomed skiway in preparation of flight in bad weather.

5.Setting up equipment for Physical properties studies..

6.Mounted hoist in drill trench.

7. Maintained the seismic station.

Ad.1: This is how the drillers report looks today:

"Drilling rather unstable, which we blamed on the extremely fine chips. Thus we changed shoes from 3 mm to 4 mm pitch aiming for more coarse grained chips. This resulted in stable drilling of 2.8 m long cores. However, most of the chips were packed below the centering ring on the middle of the 6 m long hollow shaft. We expect a narrow booster mounted below the ring will help move chips into the upper half of the chips chamber. Chips recovery is close to 100%. We drilled 11.76 m in 5 runs;
Drillers depth is 221.81 m."

Ad.7: It turned out, that the GPS antenna on the seismic station was broken. A new has been mounted, and the seismic device has been reset and centered and the station now receives the correct time.

Weather: Windy, overcast, snow and blowing snow all day. -9 C to -7 C, 15-21 knots from WSW. Visibility: ½ to 1.5 km.

FL, J.P. Steffensen

Picture captions:

A freshly drilled ice core sticks out from the bottom of the drill. Krissy is preparing to un-mount the core barrel.

Thursday, 4th June 2009.

Today was a nail biting experience.

It was last chance to get 9 people out in order for them to reach the plane back to Europe without re-booking and buying new tickets. In Kangerlussuaq 17 people were anxiously waiting to go to camp; but weather this morning was just as yesterday: Total cloud cover and heavy snow fall with winds from WNW, a most unusual direction. Sometimes visibility was reduced to 400m due to falling snow. On days with total cloud cover, it is necessary to have at least 2000 feet up to the bottom of the clouds in order for the planes to land safely. When seen from a cockpit, there is no difference between the white color of cloud and the ice sheet surface. But there is a lot of difference between flying in a cloud and flyig into the ice sheet surface. At 9.45 we launched a weather balloon and measured the cloud base to 2,300 feet. At the same time the snow fall was easing, and the wind began to turn. We asked the plane to start from Kangerlussuaq at 10.30. We had committed ourselves. It takes approx one hour to start, and the flying time is 2.5 hours. When the plane was en-route to NEEM, the snow fall began again, reducing the visibility from the necessary 3 miles to 400 m. Nails were bit. 30 minutes before the plane arrived, the snow stopped and the clouds broke to allow for shafts of sun light to penetrate. The plane landed at 15.08, and people could disembark and embark in sunshine. As the plane pulled forward for take-off at 17.00, the snow started again, and we could hardly see the plane disappear. Everything became grey and snowy again, and the weather did not lift until 19.00. Just how lucky can you be! A flight with a LC-130 is no cheap affair, and we pay whether the plane makes it or not.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging.

3.Building in CFA lab.

4.Groomed skiway in preparation of flight in bad weather.

5.Setting up equipment for Physical properties studies.

6.Received Skier 78. We are now 32 in camp.

7. Unpacking arriving cargo.

Ad.1: This is how the drillers report looks today:

"Tests with the narrow booster did not help bring chips into the upper half of the chips chamber. Only 2 m cores possible with packed pump and spirals and high current at the end.
Other boosters will be tried tomorrow.
Drillers depth 225.83 m;total drilling 3.99 m."

Weather: Overcast and snow most of the day. After 18.00 clearing. Wind turned to SE and temperature dropped. -9 C to -22 C, calm-14 knots from WSW, later SE. Visibility: ½ km to unrestricted.

FL, J.P. Steffensen

Picture captions:

Jakob launches a weather balloon to determine the cloud base.

Friday, 5th June 2009.

Fine weather and the newcomers are settling in.

We are many now, and for the three of us: Sverrir, Sarah og J.P. who are the only remaining from the put-in more than a month ago, it is interesting to see how camp changes character once again. The average age has dropped significantly with the arrival of a lot of young people. A lot of new energy has been added, and people have gone to their assigned tasks with enthusiasm. The science trench is now almost ready. We expect to begin systematic analysis and sampling in the weekend.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 453. Depth: 249.15 m.

3.Laying floor and foundations for weatherport to cover staircase and elevator.

4.Groomed skiway to remove tracks from yesterdays plane.

5.Repairing Flexmobil.

6.Maintenance and oil change on generator. The power in camp was switched off for 30 min.

7. Re-adjusted HF antenna.

Ad.1: This is how the drillers report looks today:

"With increasing depth the chips are getting finer and more difficult to deal with. Drill configuration that was stable a few days ago is unstable and useless now. Our remedy is to increase the cutting depth (pitch) to produce more coarse grained chips. This was tried this morning by mounting the 6 mm (nominal) pitch shoes. When finally stable drilling emerged we could drill 2.8 m cores with max 4.4 mm pitch. The booster in the middle is again partly active and helps move chips into the upper half of the chips chamber. Sample of the liquid from the top of a drilled core is normal, 930 kg/m**3 at -28 deg C.
The final run of the day was, however, not very stable. Only the pump and the space below the pump ring were packed. Is it possible that the devious chips are being held back by that ring? Total drilling 9.35 m in 6 runs.
Drillers depth 236.24 m."

Ad.5: Joern is working on his first assignment. One of our Flexmobiles developed an oil leak last year, and it has not been in operation since. Soon it will run again.

Weather: Fine most of the day, whit a brief and weak snow shower. -16 C to -23 C, 5-9 knots from S and ESE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

After supper in lounge. Find the person not sitting with a laptop.

Evening over the ice sheet.

Saturday, 6th June 2009.

We finished the entrance to drill and science trenches on a cold and windy morning.

This morning began cold and windy. With temperatures from -30 C to -25 C and 15 knot wind in the morning, our newcomers got an experience of how weather normally is in the beginning of May. A valiant crew managed to erect a white weatherport on top of the elevator and staircase. The wind made it complicated to put the cover on; but as soon as the cover was on, the wind dropped and temperatures rose to make the afternoon really pleasant. Weather up here is not without a certain irony. At 16.00 the weather pulled another trick out of its sleeve: A wall of cloud came rolling in and engulfed the camp in cloud and snow, much too similar to the weather of last Saturday to Thursday for our taste. This time however cloud cover only lasted two hours, so at 18.00 the sky was clear again. With tent cover on stair case and elevator, we will soon close the inclined trench that leads down to the bottom of the stair case. Peter worked hard on covering the trench with roof. Friday night, he worked until midnight. He is a very hard worker. The roof covered trench will serve as storage for frozen food – "the cooks freezer".

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 477 . Depth: 262.35 m.

3.Erecting white Weather Port over elevator and stair case. A perfect fit.

4.Cleaning up in camp.

5.Extending roof of inclined trench.

6.Construction of shelves in inclined trench for cooks freezer.

7. Repaired a harddisk error in the line scanner computer.

8. Saturday night. Henriette, Anna W. and Celia were Saturday night cooks, and we had a nicely spiced meat stew with rice and Portobello mushrooms. For dessert: Roasted apples with nuts and caramel sauce.

Ad.1: This is how the drillers report looks today:

"An interesting day in the drill trench. The ring above the pump was removed in order to test the suspicion that it could block the finest chips from leaving the pump. The next run gave a 3 m core with constant current until at the very end. ….high current due to packing of the pump. The next run was quite stable until the lower half of the chips

chamber was packed, resulting in 2.8 m long core. We had often observed that the mid shaft polyethylene type booster could be quite inefficient in moving chips to the upper half of the chips chamber. Thus we replaced it with a shiny and smooth 1 turn brass booster. The next run, 3 m long, gave stable current until the end, no packed pump. Pull out was quite easy. Perhaps we are tracking down a stable mode of drilling. The pitch is, however, amazingly low, 2.5 to 3.9 mm, producing very fine chips, which the drill seems to accept after the changes made during the day. Chips recovery is 100 % and inclination unchanged, close to 1 deg. The last run was hampered by loose ice chunks in the hole.
We drilled 13.15 m core in 5 runs; drillers depth 249.62 m."

Ad.7: Jeppe has just made it to camp, when he had to repair a severe harddisk problem on the line scanner. He fixed it, and now the line scanner computer is running.

Weather: Fine most of the day, with a brief, passing but significant change. -30 C to -14 C, 5-15 knots mainly from ESE. Visibility: Unrestricted. Weather was clear until 16.00 as a wall of clouds rolled in. It suddenly was over cast with snow, and the wind turned from ESE to SW. At 18.00 weather cleared again, and the wind turned back to ESE.

FL, J.P. Steffensen

Picture captions:

The white Weather Port on top of the stairs and elevator to the drill and science trench.

Sunday, 7th June 2009.

A quiet day on the ice.

The morning was very quiet; but eventually people began to work. The whole science trench is now ready for action; but some problems with the electronics for the DEP and line scanner makes us wait half a day. Plastic bags, pencils, forms, saws and instructions are ready. People are ready. We begin slowly. People have to learn the different tasks and the saws have to be adjusted to perform cuts precisely according to the planned pattern. Every millimeter counts, when cutting such expensive material as ice cores. At the same time, we have to monitor that each participating laboratory receives samples in the agreed amount and number.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 483. Depth: 265.65 m.

3.In the CFA lab. Peroxide and nitrate processes are now running.

4.Cleaning up in camp. Removing pallets from main street.

5.Building shelves in cooks freezer..

6.Changing broken windows and doors in weatherports.

7. Marking future position of storage garage.

8. Working on a hardware problem on line scanner electronics.

Ad.1: This is how the drillers report looks today:

"A rather difficult day in the drill trench. First run with stable low current, 3 m long core and no packing in the pump. The second run was lost due to semi loose coupling and the third and last run was also aborted due to stuck pump between the fingers of the sleeve. It took some time to figure out what was going on. The borehole camera showed no damage to the sleeve. We need to mount thicker knobs to avoid further pump dislocations. The sharp edges of the brass booster have been filed down in order to avoid damage to the sleeve during mounting of the pump. The cutters are slightly worn and burred and were given polish on a very fine stone. The heads of the screws holding the 6 mm nominal pitch shoes were found to extrude slightly below the shoes. Thus the screws defined the pitch, not the shoes. Rufli filed down the heads. We will thus go back to the 4 mm shoes.
We drilled 3.34 m today in 3 runs; drillers depth 252.90 m."

Weather: Fine all day with changing cloud cover. In the evening thin hazy overcast.. -21 C to -10 C, 8-15 knots mainly from ESE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Lou and Sverrir mark out the position for a storage garage..

Monday, 8th June 2009.

A small revolution.

Today, the science trench was ready to begin processing. With Jeppes repair of the line scanner, all posts reported ready. Bo, Susanne, Anders and Maggan are in charge of instructing the new people in their tasks. A few cores were passed through the different positions, saws were adjusted and little details were corrected. It was a start, and tomorrow the science trench will slowly gather speed and efficiency in processing. The start of processing coincides

with the time where the end of construction is at hand. Today, the shelves in the cooks freezer were finished, and all frozen food was put in place. Now, we just need to put up a small storage garage, and NEEM camp construction will be finished. In the CFA lab. more equipment is being added, it is the hope, that in one week the CFA lab. will be in action.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 495. Depth: 272.25 m.

3.Processed the first cores.

4.Building snow hill for storage garage.

5.Repairing hardware for line scanner. DEP and line scanner now running.

6.Finished cooks freezer. All frozen food in store.

7.Made a big box for rubbish.

Ad.1: This is how the drillers report looks today:

"In the morning, Henry mounted slightly thicker pump knobs, to avoid sticking pump, we believed. The first run was aborted due to loose super-banger coupling. At surface the long shaft could not be pulled out more than 2 cm. In order to understand these pull out problems the outer barrels was disengaged from the chips chamber to expose the pump. The pump and sleeve was in good shape. After some inspection it became clear to Nobby that an internal recess edge in the top of the outer barrel could catch on the pump knobs due to the missing centre ring. Having understood our problems the drill was assembled with a polyethylene booster above the pump for centering, as Steff prefers it, and 4.5 mm shoes with 2/100 mm shims.
We ended the day with 3 good and stable runs, with over 3 m cores each and easy pull out.
We drilled 9.56 m today in 4 runs; drillers depth 262.45 m."
Weather: Fine all day with periods of few scattered clouds. A little windy at Noon. -23 C to -16 C, 10-17 knots mainly from SSE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

A wonderful sight: Busy people in the science trench.

The drill emerges from the deep with a 3 m ice core.

Work in the CFA lab. is not always easy.

Tuesday, 9th June 2009.

We are now drilling and analyzing ice core.

This is the first day in a hopefully long period of ice core drilling, ice core sampling and ice core measurements. We are in a “all hands on deck” situation. While drillers and scientists work in the snow caves, the support staff is reduced to a Cook (Sarah), two mechanics (Sverrir and Jørn), an experienced vehicle operator and all-round assistant (Lou), a Field

Leader (J.P.) and a house mouse (on rotation among scientists). The “what we have done today” list will shorter from today; but it will have another fixed item: Processing.
A short explanation on depths given in the list: The reason why we apparently are able to log ice cores deeper than the drillers depth is because the top of the hole, where the drillers start, is approx. 11 m below the summer 2008 snow surface, which is the depth reference of the ice core depth (loggers depth). When the cores are logged (labeled and assigned depth) they are placed in the core buffer (a shelf system with more than 150 ice core troughs). The processers take cores from the buffer, cut samples, do measurements and pack samples and core sections in insulated crates for shipment. Right now, the processers are almost 200 m behind, but they will catch up.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 542. Depth: 298.10 m.

3.Processing 11 m ice cores. Processed depth: 111.65 m

4.Preparing snow hill for storage garage.

5.In the CFA lab., two more components are ready: Calcium and Ammonium.

6.Made inventory in cooks freezer.

Ad.1: This is how the drillers report looks today:

“The stable drilling mode from yesterday continued during the day. Our pitch goes from 3.5 mm early in the run and ends often at 2.5 mm. Drilling current is normally from 8 to 10 amps. Core brakes are stable and clean, around 700 kp netto, both core dogs engage. Chips recovery 100 %.
Max run length today was 3.51 m. We drilled 26.2 m in 8 runs. Drillers depth is 288.61 m.”
Ad.5: In the CFA laboratory more and more equipment is being added. It is going to be the most advanced Continuous Flow Analysis (CFA) and sampling program ever done on an ice core. A subsection of 33mm x 33mm along the ice core length is melted on a hot plate from start to end. The melt water will be analysed for about 15 chemical impurities, continental dust, cosmogenic isotopes, volcanic tephra, isotopes of chemical impurities, trace metals, green house gases and isotopic composition of the water. As the CFA lab is filled with equipment, the temperature rises in the small cabin to tropical levels. We plan to make a funnel to the surface to lead the heat away.
Weather: Fine all day. -23 C to -11 C, 5-12 knots mainly from SSE. Visibility: Unrestricted. We were able to enjoy afternoon tea outside at our picnic tables.

FL, J.P. Steffensen

Picture captions:

Susanne B., Susanne I. and Sebastian in the new cooks freezer.

Wednesday, 10th June 2009.

We begin to understand farmers.

Although we sit on the Greenland ice sheet and believe ourselves to be “brave polar scientists”, we are for the most part city dwellers back home. We therefore all know too well the standard city persons phrase about farmers: “They are never satisfied with the weather – it either rains too much or it rains too little, or it’s too hot or too cold”. Up here, we begin to understand farmers. We have now got the kind of weather we have been longing for: A long period of stable fine weather and almost no wind. Life is easy on the surface. In the snow caves, however, it is beginning to be too hot, and the ice cores don’t like that one bit. In the dril trench, the temperature reached -14 C, and that is too warm. We need air conditioning in a snow cave on the Greenland ice sheet! We are now putting a team together with the task to dig a 12 m tunnel in the back wall of the drill trench. The tunnel will run in 6 m depth. Once finished, the tunnel will be sealed, and we will suck air from the firn in the tunnel into the drill trench. This method has been used in other drilling programs with success, and it should work all summer. We, from Copenhagen, have not used this method before; but because we have an international team of experienced people, we benefit from shared experience.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 577. Depth: 317.35 m.

3.Processing 15 m ice cores. Processed depth: 126.50 m

4.Pit studies 200 m south of camp. Pollen (Jocelyne), 10Beryllium (Anna S.) and stable isotopes (H.C.)

5.Pulling drum pallets to surface. Organising new cargo line.

6.Removing snow drifts in camp.

7. Made two new shitters.

8.Celebrating Sepp’s birthday.

Ad.1: This is how the drillers report looks today:

"In the morning the pump was again difficult to move through the grooved outer barrel. It turned out that the screws that hold the new knobs are not sunk deep enough and could be squeezed by the outer barrel. New screws and counter nuts solved the problem. The pumping ability of the pump seems to be deteriorating showing generally increasing drilling current and quite erratic drilling behavior in the third run, even with a clean unpacked pump. Earlier we could handle 4 mm pitch, now 3 mm pitch is getting increasingly difficult to deal with.
Reducing the pitch to 2.4 mm by placing 0.02 mm shims under the shoes resulted in stabile drilling and max length runs for the rest of the day.
Most likely the seals in the pump are being gradually worn down.
We drilled 19.1 m in 6 runs; drillers depth 307.78 m."
Weather: Fine all day. -20 C to -12 C, 1-5 knots mainly from SSE and S. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Camp crew (J.P. photographer) at Sepp's birthday celebration..

Thursday, 11th June 2009.

A wonderful landmark achievement at NEEM.

Today has been a fine day not only weatherwise but for the project. Drilling went fine with a production of almost 30 m, and at the same time the ice core analysis and processing line also reached almost 30 m processed ice in one day. We are now running at the nominal rate of ice core drilling and production that this camp has been designed for, and what we had hoped for to achieve. Of course will there be setbacks on some days in the future, but there is also capacity for even higher daily production to compensate, and the drillers have not even gone into two shift drilling. It was a fine work indeed, and I congratulated the entire team at my daily speech at dinner time.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 626. Depth: 344.30 m.

3.Processing 29.7 m ice cores. Processed depth: 156.20 m

4.Pit studies 200 m south of camp. Snow chemistry (Anna W.)

5.Most pallets with drill fluid moved to new cargo line.

6.Repaired Flexmobil. The vehicle is now running nicely..

7. Begun construction of new cooling snow tunnel.

Ad.1: This is how the drillers report looks today:

"Using the set up from yesterday resulted in most stable drilling. Holding slightly back on the pitch results in more uniform chips storage in the chips chamber and even longer cores. Max run length 3.55 m.
We drilled 27.35 m in 8 runs; drillers depth 335.11 m."
Weather: Fine all day. -23 C to -10 C, 5-8 knots mainly from S. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Film night in NEEM main dome..

Friday, 12th June 2009.

Second day of good processing and drilling.

On this fine day, drilling and processing continued at a good rate. Today the core containing the volcanic eruption of 1259 AD was processed. The core, we now process, contains snow that fell when the Norse were thriving in Greenland, at the end of the medieval warm period. In Greenland, the medieval warm period was 1.5 degrees warmer on average than year 1990.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 677. Depth: 372.35 m.

3.Processing 28.05 m ice cores. Processed depth: 184.25 m

4.Grooming practice with repaired Flexmobil.

5.Lifted 2008 cargo line to new snow hill. All pallets with cargo now on surface.

6.Excavated cooling tunnel. It is now 6 m long, and are half way..

Ad.1: This is how the drillers report looks today:

"Stable drilling most of the day. The pitch was getting too large so Henry mounted 0.01 mm shims. Lately we have observed chips on the top of the core. The heavy coasol seems to stick to the fine chips with increasing pressure. One of the runs was heavily disturbed by chips coming down the hole. Normal weight of spun chips for 3.5 m core is 23 kg. The disturbed run gave 25 kg due to the falling chips.
We drilled 27.65 m in 8 runs; drillers depth 362.76 m"
Ad.6: The drillers began excavating the tunnel during the day. Between 20.30 and 23.30, two teams of volunteers continued the excavation.
Weather: Fine all day, late evening overcast and light snow. -20 C to -10 C, 5-10 knots mainly from SSW. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Through a hole in the drill trench roof, blocks from the excavation of the cooling tunnel are hoisted to the surface and driven away.

Saturday, 13th June 2009.

Saturday again.

With the drilling going fine with at good rate of descent and the core processing picking up speed, there was good cause to celebrate Saturday night and spending some time in each others company. The main snow melter had difficulty in keeping up converting snow into water for showers and dish washing. Dinner was a fine affair with everybody clean and dressed up for the occasion. Food was excellent, a lot of Swiss specialities, of course including the notorious Swiss cheese. During dish washing, the dish washer stopped. The trouble was located to a circuit breaker, which hadn't tripped, but one phase was out. Having fixed this, the party could go on. Some people chatted, listened to music, danced or played table soccer, others were using the opportunity to catch up on rest and sleep.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 715. Depth: 393.25 m.

3.Processing 2008 shallow core. Processed depth: 63.25 m

4.Removing Picarro instruments from air sampling site. Preparing to mount two Picarros on roof of CFA lab.

5.The whole western end of camp was levelled and cleaned, and holes from raised cargo were filled.

6.Excavated cooling tunnel.

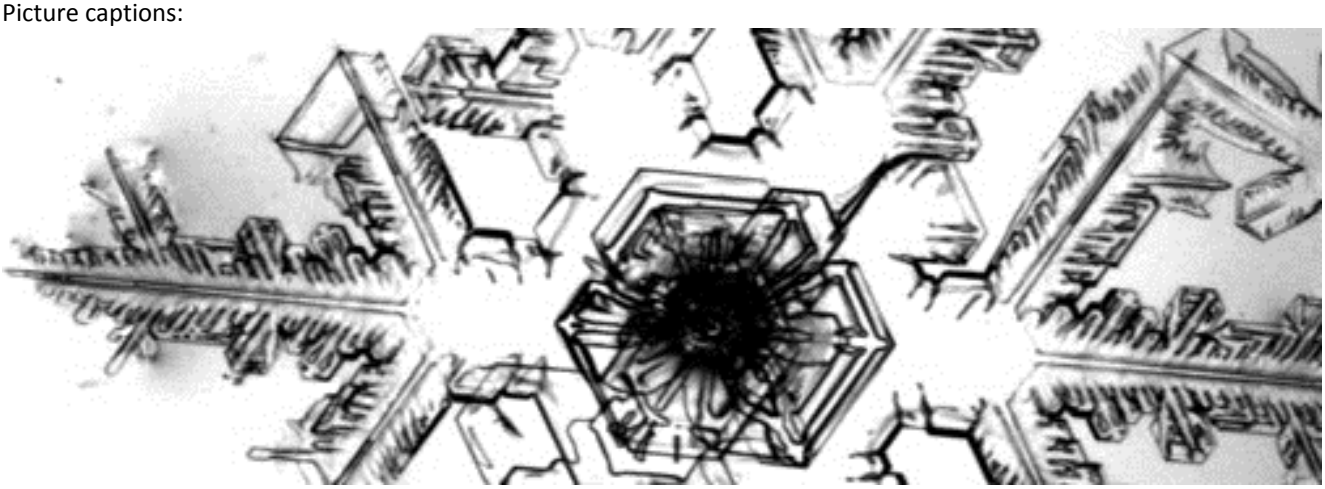
7.Saturday night dinner was prepared by our Swiss group. We had a lot of very fine Swiss specialities.

Ad.1: This is how the drillers report looks today:

"Stable drilling.
We drilled 17.60 m in 5 runs, drillers depth 380.36 m."
Weather: Fine all day. -20 C to -13 C, 5-10 knots mainly from SE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:



A snowflake. Sepp caught falling snowflakes last night, and here is one of the beauties.

Sunday, 14th June 2009.

A beautiful Sunday.

Although work began late, camp was soon up to full speed. Weather was beautiful and the day passed in a fine way. Vi drilled, processed, cooked meals, cleaned up and dug the cooling tunnel.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 741. Depth: 407.55 m.

3.Completed processing the 2008 shallow core. Processed depth: 106.15 m

4.Work on mounting two Picarros on roof of CFA lab.

5..Mounted shades over the windows on the second floor in main dome.

6.Excavation of cooling tunnel finished.

7.Physocal properties lab. In operation.

Ad.1: This is how the drillers report looks today:

"Stable drilling. We drilled 17.66 m in 5 runs, drillers depth 397.94 m.
Evaluation of the past week:.
After final adjustment of the pump Monday, drilling has been utterly stable for the rest of the week. Slight reduction of the pitch to 2.4 mm was, however, needed Wednesday to ensure more stable drilling current."

Weather: Fine all day. -23 C to -11 C, 5-10 knots mainly from S. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Anna Storm brushes a core section in preparation of line scanning.

Monday, 15th June 2009.

A nice routine day.

A rhythm has settled over camp, and it's a good one too. People have found their work rhythm, and everything is working. The people in the CFA lab. are about to start measurements, and when they do, everything runs.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 792. Depth: 435.60 m.

3.Processing. Processed depth: 210.65 m

4.Work in CFA lab., now ready for tests on artificial ice..

5.Service on Pistenbully

6.Cooling tunnel now active. Temperature loggers have been placed to monitor effects.

Ad.1: This is how the drillers report looks today:

"Stable drilling. We drilled 27.91 m in 8 runs; drillers depth 425.85 m.
Hole inclination stable, close to 1 deg."

Ad.2: The 3.55 m long cores tend to break as they are moved from the drill to the logging table. We are changing procedures and have been working on adjusting the alignment of the core handling tables. We hope that extra cooling from the tunnel and a more straight table will help.

Ad.3: There was a short break this morning as the computer for the line scanner had trouble. It was fixed.
Weather: Fine all day. -21 C to -12 C, 5-10 knots mainly from SE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

The busy drill head at the end of the long drill. The cutters are razor sharp. It is from inside the black hole that the core is retrieved.

Tuesday, 16th June 2009.

A busy, but effective day in the caves.

People in the science trench processed almost 35 m core today. This is new NEEM record. No attempt was made to make records; but the ice core quality is excellent and processing work is well organised by Anders, Bo and Susanne. Weather has been splendid for a while now, and quite a few enjoy the evening outside the caves by walking and skiing on the skiway.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 837. Depth: 460.35 m.

3.Processing 34.35 m. Processed depth: 245.30 m

4.Work in CFA lab., first tests on artificial ice are made, and final adjustments are done.

5.Grooming skiway in zig-zag pattern.

6.Cooling tunnel is working.

7.Repairs on the crane on the Pistenbully.

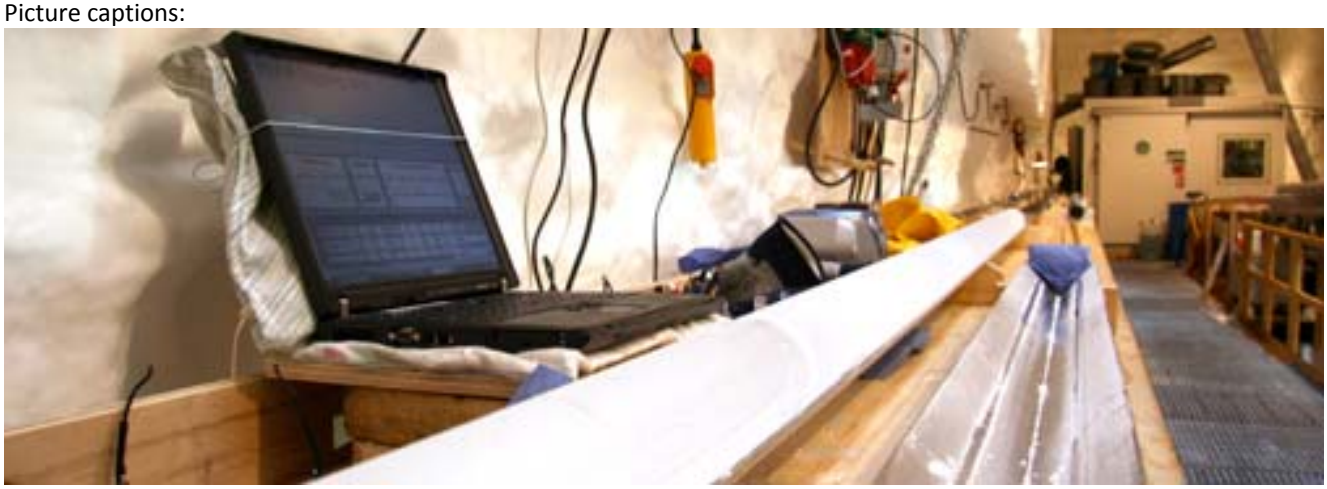
8. Power was switched off at Noon for 15 min for routine maintenance of generator.

Ad.1: This is how the drillers report looks today:

"Stable drilling except when drillers forgot to reset current limit after power outage. First run lost in 8 days. Three drillers have been fully trained on console, Hans Christian (including tuning of drill), Alex and JiWoong. Sebastian is being trained at the moment.
Core breaks range from 700 to 900 kg netto with little damage to core and mostly with bottom.
We drilled 25.10 m in 8 runs; drillers depth 443.84 m. "
Ad.6: Temperature loggers show that the cooling tunnel provides -20 C air. In the last 24 hours, the temperature in the drilling trench went down from -12 C to -18 C, a big improvement. No ice cores broke on the table today. We are now planning to make a similar cooling tunnel in the science trench.
Ad.7: The damaged electronic remote control for the crane has been replaced. However an electrical problem still remains.
Weather: Fine all day. -21 C to -11 C, 5-8 knots mainly from SSE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:



Freshly drilled ice cores at the logging table.

Wednesday, 17th June 2009.

A routine day with fine weather.

In the CFA lab. the final little adjustments are playing tricks, so now the hope is that by tomorrow the lab. should go on-line. At the logging table, they had a successful adjustment of the table, so that cores don't break anymore. Today is the national day of Iceland. It is now 65 years ago Iceland became a republic, as they in 1944 stopped being part of the united kingdoms of Denmark, Faroe Islands and Greenland. As Iceland is in financial turmoil these days, the camp personnel expressed their wishes for Iceland's recovery by shouting: "Áfram Ísland" and three hurrays at dinner.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 888. Depth: 488.40 m.

3.Processing 29.70 m. Processed depth: 275.00 m. The crew celebrated processing of bag 500.

4.Work in CFA lab., some adjustments are needed at the melt head.

5.Grooming skiway length wise.

6.Making platform for processors..

7.Repairing leaking fuel tank and leaking hydraulic system on Flexmobil.

8. Jeppe has made an upgrade of drillers software with new nice features.

9. First tephra samples are being studied in microscope.

Ad.1: This is how the drillers report looks today:

"Stable drilling. The console software has been upgraded by Jeppe, based on HC's wish list and Steff's persistent request. Now we have e.g. distance to bottom, the force between drill and cable when going down to avoid kinks and the video showing the top of casing is now integrated into the advanced screen. Traffic jam on the pull out/ logging table.
We drilled 24.76 m in 7 runs; drillers depth 475.65 m."

Ad.2: The loggers have had a difficult day. The ice cores become more and more sensitive to tiny off sets of the logging table. The cores break if the table is not completely straight. Some time has been spent adjusting the table and the saw. Changed procedures and adjustment of the saw has helped.

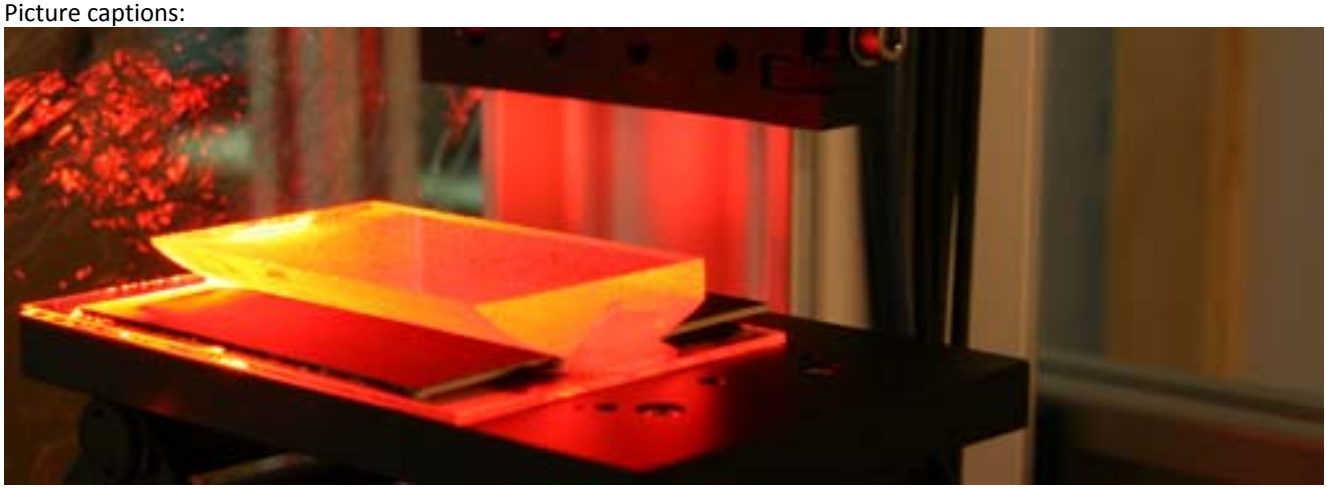
Ad.6: The upper shelves in the ice core storage cannot be reached by people. Sverrir is making a platform so that the two people carrying the ice core can reach and push the core onto the shelf.

Ad.9: Based on the detection of layers with volcanic imprints in the ECM, Siwan has taken samples for tephra studies (volcanic ash). She is now studying the samples in a microscope. She has already found tephra particles.

Weather: Fine, between 14 and 18 local time thin overcast -21 C to -9 C, 3-5 knots from SSE turning E. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:



A slice of ice core is being micro scanned in red light for bubble shape and micro inclusions..

Thursday, 18th June 2009.

A day of successes and disappointments.

The CFA laboratory made their first measurements today! The Swiss part of the system works, except sulphate, which the crew will work on the coming days. The water Picarro works on-line; but the gas Picarro did not get any gas, as the first core sections analysed are firn, and the gas escapes. The U.K. fast Ion Chromatograph works, although both suppressors leak and will have to be replaced. The laser in the flow cytometer for dust studies broke down just as measurements began. Needless to say, that Ernesto was disappointed. He has been ready for several days. The ice core loggers were happy, as they managed to go through the day without any broken cores. Otherwise, the camp looks really nice and tidy. Weather is still nice, and without snow and drifting snow, we have been able to clean up in many places. For supper Sarah served oriental duck.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 971. Depth: 534.05 m.

3.Processing 30.55 m. Processed depth: 239.45 m.

4.Measurements in the CFA laboratory.

5.Grooming skiway with tiller.

6.Taking armospheric sampling site down.

7.Physical properties studies.

Ad.1: This is how the drillers report looks today:

“Stable drilling except for repair work and tuning of the logging table.
Sebastian has been certified as consol operator.
We drilled 21.14 m in 6 runs; drillers depth 524.82 m.”

Ad.5: Anna W. has been trained on the Flexmobil. She will take care of the grooming for the flight on July 9.
Weather: Fine all day. -19 C to -10 C, 3-11 knots from SSE. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

Sarah and Anna S. enjoying a quiet moment on a sofa with snow foot rests at the end of the skiway. The sofa, 2 km from camp, is a popular spot for enjoying the white expanse of the ice sheet.

Friday, 19th June 2009.

Brittle ice is at hand.

This morning the loggers, Bo and Susanne, were frustrated. The nice line up of the table yesterday was not enough, and the first core fractured on them. No core is lost, but it is frustrating to see a beautiful core crack. Sverrir helped them setting up the saw and table, and the rest of the day passed slowly, but luckily uneventful.
After dinner we had a discussion on the situation. In the discussion participated people with brittle ice experience from Dye-3,GRIP, NGRIP, EPICA Dome C, EPICA DML, Dome Fuji and Wais Divide. As Field Leader it is a privilege to have such a team in camp. In the last 10 years, gas and CFA analysis have become important part of modern ice core analysis, and since the objective of NEEM is to compare our present climate with the previous interglacial, the EEM'ian, our threshold on when to give up cutting the ice and processing the ice is lower than before. At EPICA Dome C, the brittle zone was declared at 585.20 m depth, At Wais Divide and DML it was declared at almost the same depth.

Our plan is to continue logging the ice for processing for two more days. Then we will declare brittle zone and stop logging the core immediately after drilling. The core will be logged after 5 days in the buffer, as experience shows that fitting and cutting in segments then is possible.

Saturday and Sunday, the processing line will be closed except for the CFA lab. We will excavate a cooling tunnel for the science trench, so that this will be in operation when the new team arrives.

The brittle zone. A note: Just as in the ocean, the pressure in ice sheets increases with depth. That is why we need a drilling fluid in the hole to counteract the pressure of the surrounding ice, otherwise our drill would be squashed by ice flow. Glacier ice is compressed snow and thus it contains bubbles of trapped air. It is this air that provides the vital information on atmospheric content of green house gases in past climates. However, with increasing depth, the air pressure in the bubbles increase at the same rate as in the surrounding ice. In the ice drilled today, the pressure in the bubbles is 50 bar, so even small forces on the ice core will cause some bubbles to explode and the ice to crack. The ice is brittle. If we handle the core like eggs, very carefully, and let the ice relax over some days, it becomes less brittle. It may seem, that all is lost when we get deeper and the pressure increases, but we are helped by nature. At 1200 m depth, the brittle zone ends. Pressure in the bubbles is more than 100 bar, and then the air is forced into solid solution in the ice crystals forming the so called clathrate hydrates. The bubbles disappear and the ice core becomes robust and tractable again. Later, in our ice core storage, the ice relaxes, expands a little and the bubbles re-appear without creating cracks in the ice.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 971. Depth: 534.05 m.

3.Processing 30.55 m. Processed depth: 329.45 m.

4.Measurements in the CFA laboratory.

5.Grooming skiway with tiller.

6.Taking armospheric sampling site down.

7.Physical properties studies.

8. Constructing funnel for the CFA lab.

Ad.1: This is how the drillers report looks today:

"Stable drilling except for repair work and tuning of the logging table.
Sebastian has been certified as consol operator.
We drilled 21.14 m in 6 runs; drillers depth 524.82 m."

Ad.8: The CFA lab. produces so much heat, that we needed to funnel it out.

Weather: All day broken overcast of high clouds. -23 C to -11 C, 5-14 knots from S later SW. Visibility: Unrestricted.

FL, J.P. Steffensen

Picture captions:

West side of camp, tidy and clean, as seen from the top of the main dome.

Saturday, 20th June 2009.

Saturday. And still a lot of things got done.

All available hands were busy digging the cooling tunnel in the science trench. Some cut snow blocks, some hauled them out to the elevator in the drill trench, some took them out of the weatherport at the top of the elevator, and some drove the blocks away. A long chain that worked well. The core is getting more brittle. Today one broke when it was pushed out of the core barrel. Still, the drillers and loggers were able to retrieve today's production in a good way. As blinds have been mounted in the main dome, we were able to dine in a pretend night. The darkness gave an altogether different feel to Saturday night. Going outside was a shocking experience. The light from the near midsummer Sun was blinding.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging. Last bag: 997. Depth: 548.35 m.

3.No Processing. Processed depth: 329.45 m.

4.Measurements in the CFA laboratory. Now 24 hours in two shifts.

5.Grooming skiway taxi way and apron with tiller.

6.Excavating cooling tunnel for science trench in front and to the left of core buffer. 6 m has been excavated, and we are half way.

7.Adjusting saws at logging table. The circular saw was exchanged with a Makita band saw, and this gave good results. Loggers say, that Makita is better than circular saw.

8. Weighing and documenting pallets with retrograde cargo.

9. Collecting samples at stable isotope pit.

10. The mounting of blinds in the main dome is completed.

11. Saturday night celebrated in darkness in candle light. We had an Asian dinner prepared by Nobohiko (Japan), JiWoong (Corea) and Cunde (China).

Ad.1: This is how the drillers report looks today:

“Stable drilling. Passed bag 1000!
We drilled 17.49 m in 5 runs; drillers depth 542.18 m.”

Ad.4: The CFA group is now working in two shifts, night and day. The measurements are running and so far they have measured from 7 to33 m depth in the firn core. Melting of the firn became more difficult with depth, due to problems with air at the melt head. The team then jumped to 60m depth. Here melting and measurements went fine, and they are now slowly moving upwards to 50 m depth. The sulfate system is not working at the moment, but this is compensated by the U.K. fast I.C. which now includes sulfate. Some work has been done on tuning the water Picarro to the CFA.

Weather: In the morning broken cloud cover, in the afternoon and evening overcast and snow showers. -15 C to -9 C, 15 knots from SW. Visibility: 5 miles, reduced to less than one mile during snow showers.

FL, J.P. Steffensen

Picture captions:


The NEEM singers perform this summers hit: The NEEM song.

Sunday, 21st June 2009.

Greenland national day and voodoo in camp.

Today is Greenland national day. It also marks the transition to a new form of self governance for the Greenland nation. We celebrated the day and send our best wishes for good fortune to the people and governments of Greenland and Denmark in the new form of Commonwealth.

It was also a day of voodoo. Now, we physicists are normally sceptical to magic. But the loggers today discovered it. At the cutting table a core would crack when lining it up for the saw. Then the loggers, Susanne and Bo, together with Sverrir placed a piece of core trough close to the saw underneath the core. And the core stopped to crack. This sounds understandable; but the point is: The core didn't touch the piece of trough. When dealing with brittle ice, magic is working. The day at the logging table went well, and we decided that as long as the loggers can cut the core into 1.65 m lengths, logging continues fresh from the drill.

What we have done today:

1.Drilling and cleaning hole with the NEEM long drill.

2.Logging. Last bag: 1021. Depth: 561.55 m.

3.No Processing. Processed depth: 329.45 m.

4.Measurements in the CFA laboratory. .

5.Grooming skiway wall-to-wall, taxi way and S-half of apron with tiller. Skiway is flat and hard.

6.Excavation of cooling tunnel complete.

7.Removing snow from back wall of core storage. The core storage can now take 4 m troughs.

8. Celebrating Greenland national day and with musk-ox for dinner and bonfire and a toast to good fortune.

Ad.1: This is how the drillers report looks today:

"Hole cleaning. We used 3 runs with upper valve closed during descent to clean the hole for floating chips. We recovered 20 kg of spun chips and 2.6 m of core. It turned out that the pump gets rapidly packed after the filtering trip to bottom. The best option seems to be to not start the motor, try no drilling and pull up after the drill reaches bottom. A final normal run, 3.50 m core, showed unusually stable current, also at the end of the run.
We drilled 6.09 m in 3 runs; drillers depth 548.30 m."

Weather: In the morning broken cloud cover, in the afternoon and evening overcast and snow showers. Temp. -16 C to -9 C, 5-10 knots from S turning SW. Visibility: 5 miles, reduced to less than one mile during snow showers.

FL, J.P. Steffensen

Picture captions:

Maggan excavates cooling tunnel.

Monday, 22nd June 2009.

We got visitors.

The 109th had asked us if we would host a visit from a U.S. press delegation, and of course we said yes. As we had complete overcast, we had to launch a weather balloon to determine the cloud base. The cloud base was measured to be more than 3,000 feet, so the plane took off from Kangerlussuaq at 9.40. At 12.38 the plane landed in camp, and we gave the visitors a tour of the activities. The visitors happened to be in the drill trench as an ice core was pulled up. At 14.10 the plane left camp with no difficulty at all. 30 minutes later, it began to snow intensely, reducing visibility to few hundred meters. We had been lucky again.

What we have done today:

1.Drilling with the NEEM long drill.

2.Logging is on pause. Last bag before brittle zone: 1021. Depth: 561.55 m.

3. Processing 21.45 m. Processed depth: 350.90 m.

4.Measurements in the CFA laboratory. Measurements now cover from 7 m to 75.90 m.

5.Receiving Skier 02 with a group of press and outreach people.

6.Unpacked food pallet.

7.Groomed away holes in skiway with tiller.

8. Cooling tunnel activated in science trench. Within two hours, temperature dropped from -15 C to -18 C.

Ad.1: This is how the drillers report looks today:

"Stable drilling. Only 2.2 m runs were allowed due to length of available troughs.
Tomorrow most of the drilling team, Henry, HC, Seb, Nobby and Sigfus, will fly back. We wish the ones left behind, JiWoong and Alex and the newcomers, Phillipe, Olivier, Frank, Fernando and Mads all possible luck with our easy going drill. The rollers in the pump should be replaced tomorrow. Inclination has been 1 deg or less for several days.
We drilled 17.89 m in 6 runs; drillers depth 566.16 m."

Ad.2: The loggers are now taking the fresh cores directly to the buffer to allow for the core to relax for 5 days before it is being logged and cut into sections. The cores from bag 1022 until the brittle zone ends will not be processed in 2009.

Ad.5: The 109th paid us a visit today. Along with press and outreach officers, they brought TV crews and journalists. They also brought our new cook, Brandon, who takes over from Sarah tomorrow and Sune, our coming FOM in Kangerlussuaq, who got the opportunity to spend a night in camp. As cargo they brought some fuel, some food and ice core boxes. Finally, the crew evaluated the skiway, and it was certified for bad weather approaches. Thank you! 109th. We are now 34 in camp.

Ad.8: The cooling tunnel is already doing its work. The next crew in the science trench will feel the cold; but so will the ice cores, and they benefit.

Weather: Interesting. Completely overcast all day until 23.00, then suddenly clear. Temp. last night -12 C to -10 C by day. At 23 a sudden drop to -17 C, 5-10 knots from S and SW. At 17 to 20 a three hour blow with 15-20 knots.
Visibility: 3-5 miles most of the day, reduced to less than one mile during intense snow fall starting 14.40. After 23 unrestricted.

FL, J.P. Steffensen

Picture captions:

Skier 02 in the sky overhead.

Tuesday, 23rd June 2009.

A major crew exchange

Over the last two days about 2/3 of the camp population has been exchanged by two flight missions. The exchange involves all camp functions including the cook, the doctor, drillers, ice core processors and the field leader. Many of our new participants are experiencing their first day on the Greenland ice cap, so there is much new to teach and learn during the coming days before camp will be back at full speed. Examples of important tasks to be achieved are how to use an outdoor hole-in-the-snow toilet, how to drive a skidoo, and how to sleep when the sun is shining 24h.

What we have done today:

1. Drilling with the NEEM long drill. Depth: 573.08 m

2. No logging or processing today.

3. The CFA sulphate and pH analyses are now working. CFA depth: 79.75 m.

4. Receiving Skier 71.

5. Packed an ice core box pallet and unpacked received pallets.

6. Groomed away holes in skiway.

Ad.1: This is how the drillers report looks today:

“Today we recovered 6.9 m of core in two runs finishing at a depth of 573.08 m. The first run confirmed that the pump continued to operate well after changing the bronze cam rollers that had became worn and deformed during normal use. We farewelled our senior drillers Sigfus (Master Driller) and Nobby (Master Drill Fluids Engineer) as well as Hans Christian and Sebastian. Welcome to new drillers; Frank, Olivier, Philippe, Fernando, Mads and Song-Bum to the drill trench and we began training with the second successful run of the day.”

Ad.3: During his last 12 hours in camp Matthias Bigler managed to make the CFA sulphate analysis function. All 10 CFA chemical analytical channels are thus fully operative.

Ad.4+5: 20 new NEEM participants arrived and 22 participants departed. Current camp population is 31. We packed an ice core box pallet with 35 ice core boxes that left for the freezer in SFJ. Skier 71 left camp using only half the skiway in first attempt without use of ATOs.

Weather: Sunshine and thin high cloud cover all day. Temperatures ranging from -16 C to -10 C. Wind 12 knots from S along the skiway until late afternoon when dropped to 4 knots.

FL, Anders Svensson

Picture caption:

Friends leaving on an airplane.

Wednesday, 24th June 2009.

Greenland hotspot

Summer has come to NEEM with clear blue sky, no winds and temperatures around -10 deg C during day time. In fact, high temperatures cause a major problem in camp. When ice cores are pulled up from the bore hole they have temperatures around -28 deg C and high temperatures in the drill trench may cause them to break into pieces when they leave the drills core barrel. In order to keep trenches as cold as possible all trench entrances are kept closed and cooling tunnels have been installed from which cold air is sucked from the surrounding firn. Furthermore, cool air is pumped into the trenches from surface during cold nights. In the insulated hut for chemical analysis in the science trench (CFA hut), there is so much electronic equipment installed that temperatures eventually reach +25 deg C and a ventilation system has been installed. It is somewhat bizarre to watch the T-shirt-wearing CFA people through the windows of their subtropical terrarium deep in the ice sheet. On the positive side, it is now possible to enjoy afternoon tea outside main Dome in the sun. At the upper floor of main dome the evening temperatures approach +30 deg C even with open windows. It is simply too warm up here.

What we have done today:

1. Drilling with the NEEM long drill. Depth: 592.76 m

2. Logging is on standby.

3. Ice core processing. Depth: 359.15 m

4. CFA analysis. Depth: 86.35 m.

5. Moving 4m long core troughs from surface to science trench.

6. Started BAS radar measurements.

7. Started c-axis analysis with French fabric analyzer.

Ad.1: Drillers report:
"Another good day in the drill trench as we train the new drillers in the intricacies of the NEEM deep drill. We recovered 18.7 m of core in six runs finishing at a depth of 592.76 meters. We have improved the extraction of the

core from the barrel by reducing thermal shock on the core troughs with strips of duct tape but in this brittle zone ice cracks still occur in the core length.“

Ad. 2: Because we have entered the brittle zone, the freshly drilled ice cores are brought directly to the core buffer in the new 4m troughs without logging. After some relaxation time they will be logged.

Weather: Sun shining from a clear blue sky all day; no wind; day -10 deg C, night -20 deg C.

FL, Anders Svensson

Picture caption:

Field participants behaving on sunny ice

Thursday, 25th June 2009.

Camp is picking up speed

Today was our first regular working day since the major crew exchange Tuesday. Drilling is picking up speed with more than 27 m of new ice core recovered. From tomorrow the drillers will form two teams and work 16h a day. The ice core processing is also accelerating with more than 20 m ice processed today. In the CFA cabin the psychologically important first 100 m of ice has been measured and from now on the CFA analysis will go on around the clock. During the coming weeks the drilling will penetrate the so-called brittle zone where high pressure air bubbles make the ice unstable when brought to surface. The brittle ice will not be processed until next year where it has relaxed and is better suited for cutting in a band saw. Our hope is that the drilling will be able to go relatively fast through the approximately 500 m long brittle zone, where the ice becomes stable again, and the ice core processing can continue.

What we have done today:

1. Drilling with the NEEM long drill. Drillers depth: 620.08 m. 600 m passed today.

2. Ice core processing. Depth: 380.60 m.

3. CFA analysis. Depth: 100.65 m.

4. Continued BAS radar measurements. 21 out of 33 waypoints measured.

5. A 4 m deep pit for chemistry analysis has been dug today by our South Korean participants.

Ad.1: Drillers report:
“Another successful day in the drill trench achieving 27.3 m of core in 8 runs finishing at a depth of 620.08 meters. Training new staff continues to go well and we expect to start drilling two shifts tomorrow.”

Weather: Sun shining from a clear blue sky all day; winds up to 10 kt from SSE; Temperatures day -10 deg C, night -20 deg C.

FL, Anders Svensson

Picture caption:

Celebrating successful analysis of the first 100 m of ice in the CFA lab.

Friday, 26th June 2009.

The NEEM production line

First the ice core is drilled by the long NEEM drill and the drilling team consisting of seven persons. The ice core length is then determined precisely, it is fitted to the previously drilled ice core, and cut into 1.65 m long sections by a two person logging team. Subsequently, the core is 'processed' by a nine person team: The electrical properties of the ice are determined (used to identify acid volcanic layers) and the visual stratigraphy of the ice is mapped. Each 1.65 m ice core section is then split into 80 pieces in seven band saws. The different ice core pieces are used to sample the water isotopic composition (climate), the gas concentrations and gas isotopic composition (greenhouse gases), and the Beryllium-10 concentration (solar activity). A 3x3 cm2 cross-section of the ice core is melted and used for Continuous Flow Analysis (CFA) in which the concentration of dust and more than ten different chemical spices is measured in high temporal resolution by the six person CFA team. Finally, there are sampling programs for volcanic ash particles and pollen, and analysis of the crystalline structure of the ice (three persons). The remaining ice is packed into plastic bags and ice core boxes before leaving camp.

What we have done today:

1. Drilling with the NEEM long drill. Drillers depth: 648.80 m.

2. Ice core processing. Depth: 408.65 m.

3. CFA analysis. Depth: 111.65 m.

4. Continued BAS radar measurements.

5. Finished Korean pit sampling.

Ad.1: Very good progress, but poor core quality for the last runs. More details tomorrow.

Ad. 3: The CFA team passed 100 m depth twice over the last 24 h: first time in the shallow ice core that was drilled for the pilot hole in 2008. Second time in the main core drilled in 2009 that has a depth overlap with the shallow core because the drill deviated from last year's bore hole. A rare occasion for a double celebration.

Weather: High thin cloud cover, wind speed 10-16 knots from S, temperatures day -8 deg C, night -20 deg C, slight snow drift.

FL, Anders Svensson

Picture caption:

Table soccer is a popular after-dinner sport.

Saturday, 27th June 2009.

Volcanic fingerprints in the ice

Today the science trench processed almost 2000 year old ice and the famous Vesuvius eruption from 79 AD was identified in the Electrical Conductivity Measurement (ECM) at 410 m depth. The ECM signal is a proxy for the acidity of the ice. It shows a peak when the ice has high concentrations of sulphuric acid, which is generally an indication of a volcanic eruption. Because of the proximity to Iceland, Icelandic eruptions are the most frequent in the record, but also Alaskan and Japanese eruptions appear frequently. Eruptions from lower latitudes need to be large in order to make it to Greenland and only the largest Southern Hemisphere eruptions can be identified, as for example Tambora, Indonesia, 1815 AD. Only a fraction of the identified volcanoes have left a visible ash layer in the ice. Many of the major volcanic eruptions identified in the NEEM core are, however, investigated for an occurrence of tiny ash particles (micro tephras) that may be invisible to the naked eye. By analyzing the geochemical composition of tephras the source of the ash particles may be identified.

What we have done today:

1. Drilling with the NEEM long drill. Drillers depth: 677.46 m.

2. Ice core processing. Depth: 423.50 m.

3. CFA analysis. Depth: 133.65 m.

4. Continued BAS radar measurements. Radar line to the east of camp is completed.

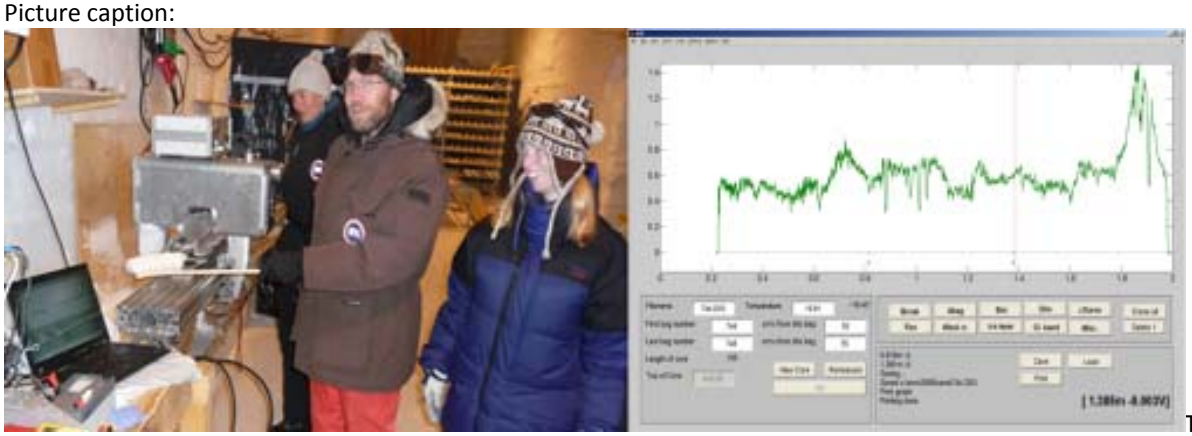
5. Science trench crew prepared delicious dinner.

Ad.1: Drillers report for June 26 (note that drillers report from now on is delayed one day due to late working hours): 'Today we started two drill shifts split in the time period from 0800 to 2400. We recovered 36.9 metres of brittle zone ice core finishing at a depth of 656.98 m. Three plus metre runs are common and the cores usually have several cracks (3-5) when pushed out but the core remains intact in the core tray.'

Weather: Overcast, gentle snow showers, wind speed 9 knots from WSW, temperatures day -7 deg C, night -12 deg C.

FL, Anders Svensson

Picture caption:



To the left the Vesuvius 79 AD eruption is seen as a spike in the ECM record. To the right the acidity spike is indicated on the ECM computer screen by the ice core processors most frequently used tool: the brush.

Sunday, 28th June 2009.

THE Christmas snow processed

This Sunday morning some of the ice that went through the saws of the science trench was exactly 2009 years old. We thus passed the transition from year 1 AD (+1) to year 1 BC (-1), including the snow that fell on Christmas Eve 1 AD (there is per definition no year zero). Although one person from the science trench team felt that she could vaguely identify the contours of a cross in the bubble pattern of the visual stratigraphy of the ice core, the Christmas ice didn't appear much different from the surrounding ice. We localized the Christmas ice in a depth of 424 m from interpolating between the depths of the Vesuvius eruption identified yesterday and a large volcanic eruption of unknown origin that appeared in 52 BC (was identified from the non-destructive Dielectrical Property measurement (DEP) that runs a few days ahead of the main processing line). There were several suggestions for how best to celebrate this special event including playing Bach in the science trench, decorating with Danish flags (Danes tend to celebrate all birthdays with lots of flags), or sharing a sample beaker of Gammel Dansk (rejected by FL).

What we have done today:

1. Drilling with the NEEM long drill. Drillers depth: 702.40 m.

2. Ice core processing. Depth: 443.30 m.

3. CFA analysis. Depth: 134.75 m.

4. Setting up wind sock between skiway and apron.

5. A double pit for inspecting firn stratigraphy was 'dug' by Timothy and the snow blower.

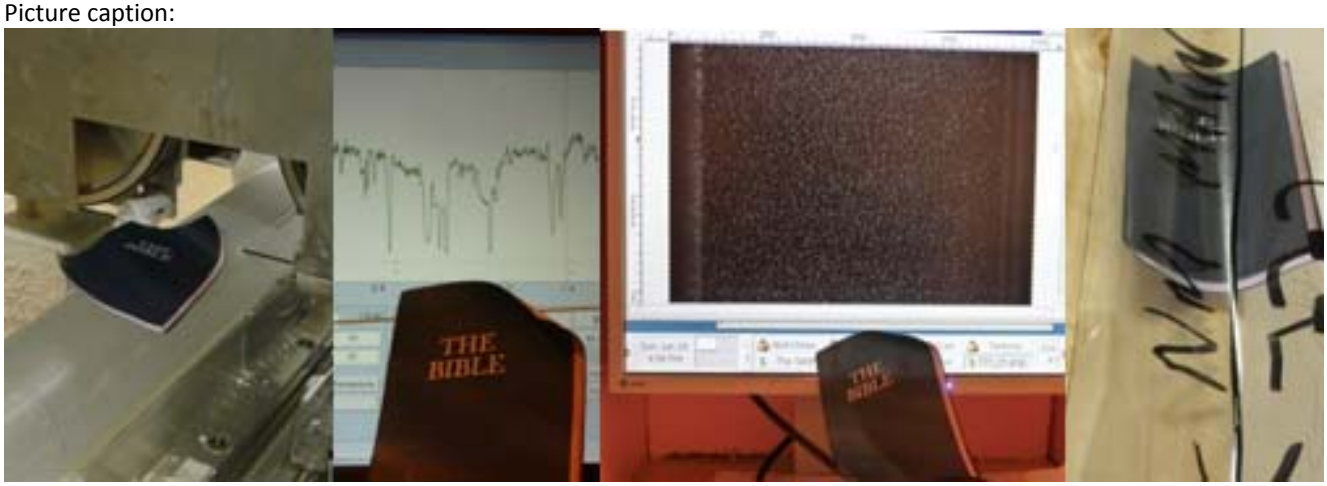
6. The seismic station was inspected and levelled.

Ad.1: Drillers report June 27:
'Saturday was a shortened work day and the two shifts recovered in total 20.48 m of core finishing at 677.46 m. A successful fishing expedition down hole added a little bit of excitement to the last shift and recovered the 60cm errant fish (core) and a further 70 cm of core.'
Ad. 3: The CFA lab had several minor problems that are all solved by now.

Weather: Mostly overcast, temperatures form -8 to -12 deg C, low winds <10 knt from S-SE.

FL, Anders Svensson

Picture caption:



Four snap-shots of the Christmas ice as it passed through the processing line (left to right): 1) in the Swiss horizontal

saw, 2) the ECM signal across the transition, 3) the visual stratigraphy of the ice (white spots are air bubbles), and 4) the packed core ready to enter a box and be shipped out of camp.

Monday, 29th June 2009.

NEEM points of interests

After a hard working day the NEEM camp area offers a variety of evening entertainment. In the case of nice weather, one of the most popular sights is the skiway. After confirmation with the field leader that no air traffic is around, the trip to the skiway can be made on foot, by skiing, or by skidoo. At the southern end of the skiway one can take a rest in the transit area sofa and watch the quiet landscape and the camp at a distance. On the way out there one will pass the newly mounted wind sock and more than 200 skiway flags each mounted on two bamboo sticks according to U.S. Air Force Instruction 13-217 for Drop Zone and Landing Zone Operations. The trip may extend to the end of the lead-in flags which reach 5 miles out. Other sightseeing options are the UK double-pit that allows studying the upper 2.5 m of snow stratigraphy in great detail, the Canadian pit for pollen sampling, the Korean pit for chemical sampling, the Danish pit for temperature logging that will also be sampled for 10Be, and the automatic weather station.

What we have done today:

1. Drilling with the NEEM long drill: 33.78 m. Drillers depth: 736.18 m.

2. Ice core processing: 16.50 m. Depth: 459.80 m.

3. CFA analysis: 13.20 m. Depth: 147.95 m.

4. Continuing BAS radar profile west of camp

Ad.1: Drillers report June 28:
'Drilling continued in a routine way this Sunday after an initial hole cleaning run that also recovered 2 m of core. A total of 23 m was cored and finished at 702.40 metres depth.'

Ad 2: Several science trench saws went on strike today. At the same time the ice is becoming more demanding as we approach the brittle zone.

Weather: Mostly clear sky, evening ground fog, temperatures form -8 to -16 deg C, winds 5-15 knt from S.

FL, Anders Svensson

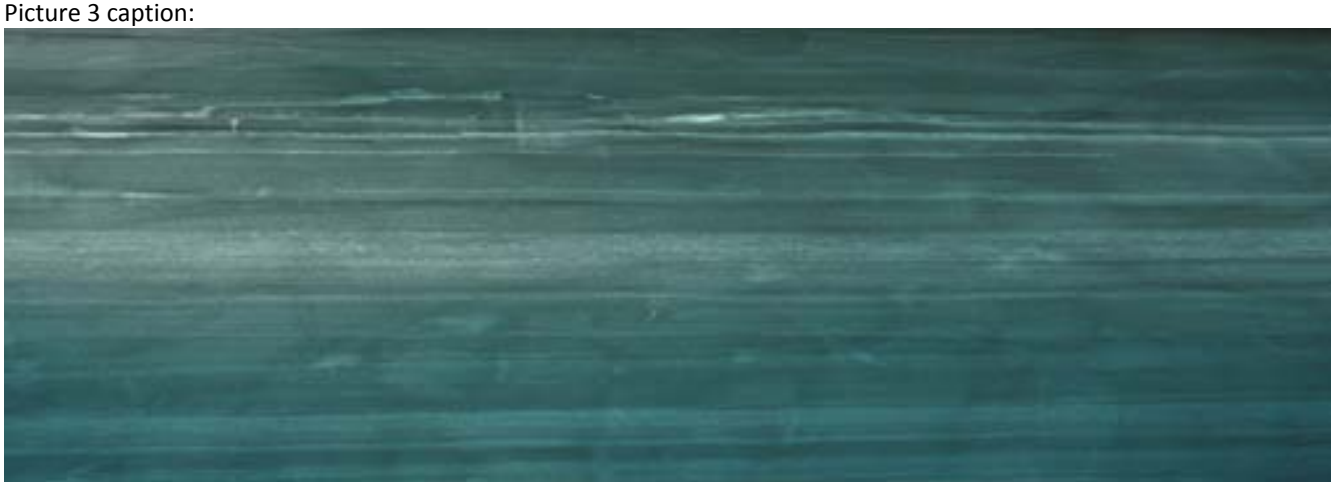
Picture 1 caption:

In case someone would pass by (e.g. a Hercules C-130) it is now easy to determine the wind direction at NEEM.

Picture 2 caption:

Taking a rest on the sofa in the middle of nowhere.

Picture 3 caption:



The upper two meters of the NEEM snow stratigraphy as seen in the double pit made yesterday by Timothy. The sun is shining on the back side of the snow wall through the second pit visualizing the layering. Each layer represents a snow deposition or a storm event and the entire profile probably represents three years of snow accumulation.

Tuesday, 30th June 2009.

Ice crystal measurements

The colourful image to the left shows a 300 micrometer thick ice sample from 440 m depth in the NEEM ice core that was obtained yesterday. The sample is about 9 cm wide and 4 cm high and the top of the sample (upwards) points to the left. The sample is held between crossed linear polarizers whereby individual ice crystals can be identified. Each coloured field is an ice crystal and the colours represent the ice crystal orientations. At this depth the crystal orientations are almost random which is reflected in great colour variety of the image. Ice crystals in ice sheets live their own life: they grow, they rotate, they break apart and they deform. The warmer the ice, the more dynamic the crystals. As crystals sink deeper into the ice sheet they will tend to have a preferred orientation. In a similar image of ice crystals obtained from a greater depth the ice crystals would thus be more uniformly coloured. The figure to the right is a representation of the crystal orientations showing that already at 440 m depth the crystals have a slightly preferred orientation indicated by the red areas in the vertical direction. The individual ice crystals have a layered structure and the ice flow is strongly influenced by the ice crystal orientations. Advanced ice flow models that are used to predict the future state of the Greenland ice sheet take into account the ice crystal orientations and,

therefore, detailed ice crystal measurement are carried out all along the ice core.

What we have done today:

1. Drilling with the NEEM long drill: 25.82 m. Drillers depth: 762.00 m.

2. Ice core processing: 24.75 m. Depth: 484.55 m.

3. CFA analysis: 17.05 m. Depth: 165.00 m.

4. Continuing BAS radar profile west of camp

5. Changing oil on main generator.

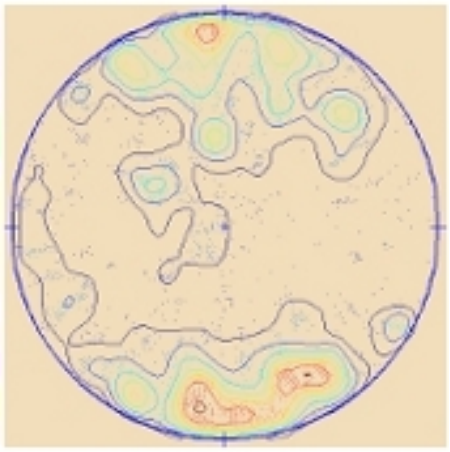
6. Sampling pit for 10Be for Anna Storm.

7. Testing how rain gutters can be used to cover brittle ice cores so they break less apart.

Ad.1:
Today the drill needed some maintenance so drilling was interrupted for several hours.
Drillers report June 29: 'Coring continues to go well in the drilling trench and we drilled 33.78 metres. The finish depth for the day was 736.18 m.'

Weather: Mostly clear sky, broken evening clouds, ground fog at night, temperatures from -8 to -16 deg C, winds 3-12 knt from SW.

FL, Anders Svensson



July

Wednesday, 1st July 2009.

NEEM animal life

Today we had for the first time in more than a week a visitor in camp: a *Pagohpilia eburnean* (see picture) that normally spends its time in selected areas at the coast. On arrival, the bird was served bread crumbs and mackerel in tomato sauce that it ate immediately. We are, however, concerned about the future of our visitor. The smaller birds that arrived to camp, unfortunately, all left in ice core boxes marked Keep Frozen. Larger birds, such as geese, are frequently seen from camp crossing the ice sheet either alone or in groups. So far, we have not had a visit of a polar bear and we certainly do not expect to get one. With more than 300 km to the nearest coastline chances are fortunately extremely low. Someone might claim that the *Homo sapiens* at NEEM do start to show animal-like behaviour after spending some time in the field, but that is a different story.

What we have done today:

1. Drilling with the NEEM long drill: 34 m. Drillers depth: 796 m.

2. Ice core processing: 21.45 m. Depth: 506.00 m.

3. CFA analysis: 24.75 m. Depth: 189.75 m.

4. Finishing BAS radar program.

5. Calibrated Picarro water isotope instrument.

6. Seismic station checked and calibrated.

7. Boosting drill trench cooling tunnel with additional blower.

Ad.1: Drillers Report June 30:
'Today we drilled 25.82 m of ice core finishing at 762 m depth. Maintenance was required on the drill when the plastic electrical connections plate cracked in the anti-torque section, leaving a piece of plastic down hole but which was later successfully fished out. A new plate was made from similar plastic material by Philippe (with eager helpers) and this

was fitted and drilling continued.'

Ad. 2: Processing close-to-brittle-zone-ice requires a lot of patience. Mai Winstrup keeps the Swiss saw running at lowest possible speed whereby the number of breaks in the cores is minimized.

Ad. 5: The Picarro water isotope instrument is installed in an insulated box on top of the CFA hut that provides a continuous melt water stream from the CFA melt head. We are excited about this first successful calibration because this type of instrument potentially may be able to provide continuous on-line ice-core water-isotope profiles in the future. We do, however, keep our expectations low for this first test season of the new instrument.

Weather: Change from clear sky to thin overcast in the evening, temperatures from -9 to -14 deg C, almost no wind.

FL, Anders Svensson

Figure caption:

NEEM bird of the day: *Pagophilia Eburnean* (Ismåge).

Thursday, 2nd July 2009.

British Antarctic Survey Radar measurements

British Antarctic Survey (BAS) is running an associated project at NEEM, i.e. a project not directly related to the ice core drilling. Fabien Gillet and Timothy Burton have spent the last week driving skidoo to various points in the surroundings with their radar, GPS, radio, and a tent for the case of sudden change of weather. They use a phase sensitive radar for precise measurements of the displacement of internal layers of the ice sheet. Two lines perpendicular to the ice divide (10 km upstream and down stream of the camp) were surveyed last year, each line consisting of 33 points of measurements. Two bamboos were left at each point for precise repositioning of the instrument. This year's measurements show good resemblance with those of last year and vertical velocity profiles of the ice down to 1000 m depth are obtained by comparing the two sets of measurements. Furthermore, GPS measurements have been made on one line for comparison with the radar measurements. The results are important for a detailed understanding of the flow of ice.

What we have done today:

1. Drilling with the NEEM long drill: 33.56 m. Drillers depth: 829.56 m.

2. Ice core processing: 21.45 m. Depth: 527.45 m.

3. CFA analysis: 18.70 m. Depth: 208.45 m.

4. Preparing rain gutters for protecting brittle ice in the core buffer.

5. Filling in ramp to drill trench.

6. Feeding camp bird 'David' with sardines in tomato sauce.

Ad.1: Drillers Report July 1
'Thirty four metres of ice core was recovered today, finishing at a depth of 796m. The new plastic plate cracked during the first run of the day and a large loose piece was luckily trapped in the anti-torque springs when the drill returned to the surface so a fishing trip was not required. The plate was re-clamped and drilling continued. This plastic becomes brittle with the present combination of cold temperature, drill fluid and pressure in the hole. Another part of different design and different plastic material has been made ready for backup.'

Weather: Several snow showers during the day and winds up to 14 knots. Clearing up and becoming quiet in the evening, temperatures from -8 to -20 deg C, almost no wind.

FL, Anders Svensson

Figure caption 1:

The mobile BAS radar setup in action

Figure caption 2:

David in the air

Friday, 3rd July 2009.

NEEM production curves

Each day, we note the drilling depth, the ice core processing depth, and the depth of the CFA analysis (see figure). The drilling is now in the brittle-zone that covers roughly the interval 600-1200 m depth. The ice in this interval is not suited for processing this year because of high pressure air bubbles and we, therefore, store the brittle ice in a core buffer until next year, when it has relaxed. The plan is that drilling goes on as fast as possible throughout the brittle zone, whereas the ice core processing and the CFA analysis stop at the onset of the brittle zone and only continues when drilling reaches ice below the brittle zone. From the curves in the figure one can speculate about how far the project will reach this year. There are still 4-5 weeks left of the season where drilling can continue, so if everything continues to run smoothly, drilling could actually reach rather far already this year. We knock on wood and hope that drilling can reach bedrock at 2565 m depth in 2010.

What we have done today:

1. Drilling with the NEEM long drill: 30.99 m. Drillers depth: 860.55 m.

2. Restarted logging at 561.55 m depth. Final depth: 568.15 m.

3. Ice core processing: 23.10 m. Depth: 550.55 m.

4. CFA analysis: 22.55 m. Depth: 231.00 m.

5. Preparing rain gutters for protecting brittle ice in the core buffer.

6. Starting to collect shallow drill parts.

7. Building ice bar for tomorrow night.

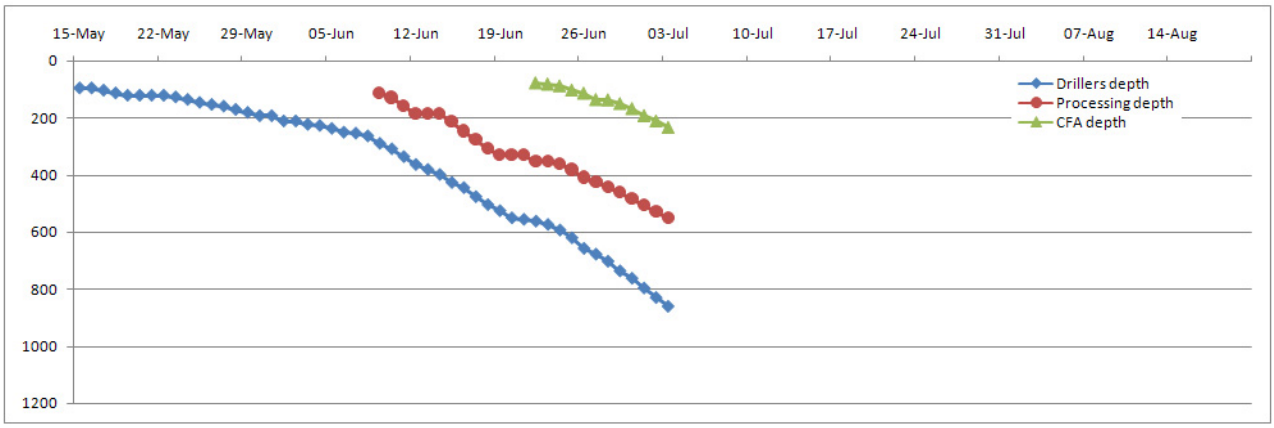
Ad.1: Drillers Report July 2:
'In the drilling trench too we celebrated passing 800 m, recovered 33.5 metres of core and finished the day at 829.56 m.'

Ad. 2: The cores we are now logging have been stored for more than ten days in the core buffer to relax. We bring the cores back to the logging table in the drill trench and log and cut them into 1.65 m long sections. The logging and the sawing does not introduce new cracks in the cores. Tomorrow we will test if we can also process the newly logged cores without making new cracks. If so, we may continue the ice core processing for a few more days and thus increase the onset-depth of the brittle zone. This would make a little room in the ice core buffer for processing below brittle zone. The ice core buffer is now about -18 deg C and both the science trench and the logging table are about -15 deg C. The temperature difference does not seem to affect the cores.

Weather: Just like yesterday we had some wind and slight snowdrift during the day, but clear blue sky and beautiful weather during the night. Temperatures from -12 to -20 deg C. It appears that the storm is waiting for next week.

FL, Anders Svensson

Figure caption:



The daily progress in drilling, ice core processing, and CFA analysis. The x-axis shows the NEEM field season 2009 and the y-axis shows the depths in meters.

Saturday, 4th July 2009.

Saturday nights at NEEM

Saturday nights at ice drilling camps in Greenland have a long tradition reaching back to the Dye-3, GRIP, and NGRIP drillings. Although the NEEM camp has only existed for a couple of years, we already have a reputation for being one of the hottest places to spend Saturday night on the entire Greenland ice sheet. This Saturday is no exception. A highly artistic ice bar was laid out in front of main dome where we had warm Glühwein before enjoying an exceptional meal prepared by our Mediterranean participants. Later we may enjoy some music.

What we have done today:

1. Drilling with the NEEM long drill: 19.45 m. Drillers depth: 880.00 m.

2. Logging brittle zone ice. Final depth: 583.00 m.

3. Ice core processing: 14.85 m. Depth: 565.40 m.

4. CFA analysis: 17.05 m. Depth: 248.05 m.

5. Intensive preparations for NEEM Saturday night.

Ad.1: Drillers Report July 3:
'Thirty metres of ice core was recovered today in the drill trench and we finished at 860.08 m depth. Maintenance was carried out on the drill fluid transfer and mixing pump which decided to stop.'

Ad. 5.
- Timothy and Nerys finished highly artistic ice bar 'The Lost Penguin'.
- German experts prepared tasty Glühwein. Taste was perfected by a Friday night test run.
- A French-Italian-Ecuadorian-British crew prepared a 3-course haute cuisine dinner.
- Jeppe repaired broken compressor and hooked it up to the draft beer machine for faster tapping.

Weather: Rather windy morning with 18 knots from S. Later wind decreased to a level more suitable for an ice bar around 9 knots. Temperatures from -9 to -16 deg C.

FL, Anders Svensson

Figure caption 1:

Group photo in front of ice bar ‘The Lost Penguin’.

Figure caption 2:

Some of today’s cooks.

Figure caption 3:

‘The Lost Penguin’

Sunday, 5th July 2009.

Ice core stratigraphy

In the NEEM ice we have been through so far the visual ice core stratigraphy is in general not very exciting. Mostly, the ice is clear with many air bubbles. From time to time certain interesting features do however occur such as a volcanic ash layer, a dust layer, or melt layers. The annual layering in the ice is of course there but it is normally not visible to the naked eye. Only when we measure the ice in the Dielectric Profile (DEP), the Electrical Conductivity Measurement (ECM), the Continuous Flow Analysis (CFA), or analyze the isotopic composition of the ice we can identify the annual layering.

What we have done today:

1. Drilling with the NEEM long drill: 24.48 m. Drillers depth: 904.48 m.

2. Logging brittle zone ice. Final depth: 598.95 m.

3. Ice core processing: 16.50 m. Depth: 581.90 m.

4. CFA analysis: 4.40 m. Depth: 252.45 m.

5. Extending and sampling Korean pit for chemistry and isotopes.

6. Checked seismic station.

7. Barbecuing outside at -4 deg C

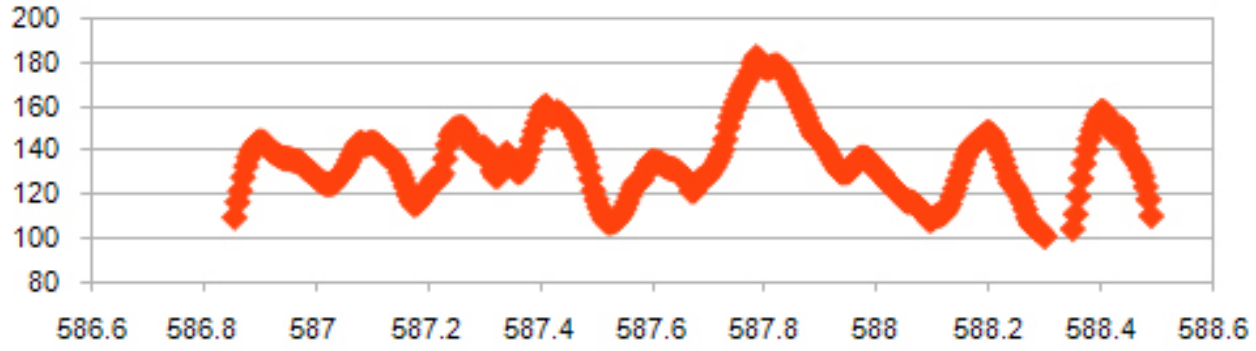
Ad.1: Drillers Report July 4:
'A shorter work day recovered 19.45 metres of core and finished at 880 m this Saturday.'

Ad 2+3: We are continuing to log and process the ice in the transition into the brittle-zone for a few more days. When the logging and/or the processing starts to make serious 'damage' to the core we will stop processing. So far, the Swiss saw rarely introduce any breaks, whereas ECM and the other saw cuts more and more frequently breaks the core. The logging will go on throughout the brittle-zone, but if the separation into 1.65 m sections repeatedly introduces breaks in the core we will also stop sawing the logged core and just leave the cores in the lengths they were drilled.

Weather: Temperatures from -4 to -14 deg C. During the afternoon we had a cloud cover that raised the temperature significantly to -4 deg C. Excellent for a barbecue but possibly on the warm side for a C-130 take-off. In the evening it cleared up again and the temperature dropped to -12 deg C. Wind from S 2-12 knots.

FL, Anders Svensson

Figure caption 1:



Nine annual layers in 1.65 m NEEM ice as seen in the Dielectric Profile (DEP). The x-axis shows the depth in meters and the y-axis has arbitrary units. DEP is a non-destructive method and the wiggles in the figure reflect the seasonal variation in impurity content of the ice. The relatively high peak at 587.8 m depth may be caused by elevated sulfate concentrations of volcanic origin. This will be determined when the same ice will be analyzed in the CFA laboratory. The ice at this depth is from about 1000 BC. The annual layer thickness has decreased from about 20 cm of ice in the top of the core to about 17 cm at this depth due to the thinning of layers with depth.

Figure caption 2:

Melt layers in the NEEM ice we have seen so far are rare because the temperature usually does not exceed 0 deg C. However, occasionally we notice a clear bubble-free layer in the core that is an indication of melt. This image shows a unique 20 cm long core section from about 1000 BC that contains no less than seven melt layers. The section represents more than one year's precipitation, but the melting has only occurred in the summer. Most likely the melt water penetrated the snow at the surface whereby several melt layers were formed at different depths.

Figure caption 3:

Enjoying a barbecue in the NEEM biergarten Sunday afternoon.

Figure caption 4:

A game of 'Rundbold', the danish equivalent of baseball, in the nice Sunday evening.

Figure caption 5:

Apres Ski.

Monday, 6th July 2009.

First results of on-line water isotope measurements

The isotopic composition of the ice is one of the most important climate proxies provided by ice cores. Conventionally, the water isotopic composition is obtained from discrete samples that are cut from the ice core in the field, send to laboratories and measured on a mass spectrometer. For the NEEM core we do for example cut about 1 cm2 of the ice core into 2.5 or 5.0 cm long samples, in total more than 50000 samples all along the ice core, each packed in individual plastic bags. Back in the labs it takes several years to carry out the measurements and obtain the valuable high resolution climate profile. A new generation of mass spectrometers based on laser absorption in a multi-pass cavity enables fast water isotope measurements on very small water quantities. For the first time in Greenland, we have one of those instruments in the science trench at NEEM. The instrument is connected to the CFA laboratory that provides a continuous melt water stream from a melt head. In principle, this setup allows to obtain online high resolution profiles of water isotopes directly here at the site. Since the setup is now tested for the first time there are many difficulties and the new measurements cannot replace conventional measurements, but they have the potential to do so in the future. We are therefore very proud of being able to show the first results from the new instrument here.

What we have done today:

1. Drilling with the NEEM long drill: 37.28 m. Drillers depth: 941.76 m.

2. Logging brittle zone ice. Final depth: 623.70 m.

3. Ice core processing: 19.80 m. Depth: 601.70 m.

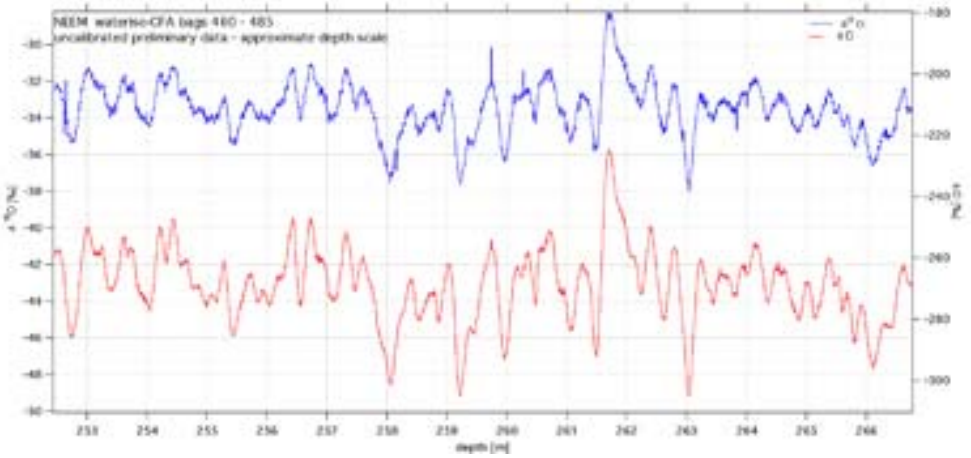
4. CFA analysis: 23.10 m. Depth: 275.55 m.

Ad.1: Drillers Report July 5:
'We finished the weekend with another good day recovering 24.5m of core finishing at 904.48 m depth. The first run of the day was used to clean the hole and recovered a short core but part dropped off on the way up and was recovered in the subsequent run although a bit worse for the extra trip down and back.'

Weather: In the morning wind picked up and we got up to 30 knots from SW at noon. During the afternoon wind dropped again and in the evening we have below 10 knots. Temperatures around -11 deg C all day; down to -17 deg. C at night with clear blue sky. Pressure has been rising during the day. There has been quite some snow drift. It has not been possible to groom the skyway today, but Timothy will go out with the beam tomorrow.

FL, Anders Svensson

Figure caption 1:



(Click on figure for higher resolution.) First results from the new online water isotope instrument. The measurement covers 15 meters of ice from about 800 AD. The blue curve shows delta-18O and the red is delta-D. The results are preliminary and uncalibrated, but they show that the measurement is feasible. Further data analysis and comparison to conventional water isotope measurements will reveal the quality of the new results.

Tuesday, 7th July 2009.

Skiway maintenance

Maintaining a skiway on snow in polar regions is an art. 'Grooming' is the term for driving up and down the skiway in a heavy vehicle with a beam or a tiller hooked on whereby the snow surface gets flattened and compacted. The same technique as is used in the Alps to prepare skiing areas. With a typical speed of 10 km/h and the skiway being 4 kilometres long and 65 m wide it takes several days to prepare the skiway and the loading area (apron) in the beginning of the field season. Once the skiway is hardened it normally only takes 1-2 days of maintenance before a skier is expected. One of the tricks is to groom during the day when the snow is warm and let it settle during the colder night, which makes a hardened surface. After each flight mission the skiway is evaluated by the pilots. The better the skiway the heavier pay load will be approved for the next flight and the worse weather is tolerated for landing and take-off. If the skiway is in a poor state the skier may not be able to take off with high pay load and it may need to off-load some retro cargo, such as ice core boxes, in order to loose weight. With a flight-hour cost of several thousands of dollars it is essential for a project like NEEM to maintain the skiway as well as possible.

What we have done today:

1. Drilling with the NEEM long drill: 34.24 m. Drillers depth: 976 m.

2. Logging brittle zone ice. Final depth: 650.10 m.

3. No ice core processing today. Brittle zone has been reached.

4. CFA analysis: 26.40 m. Depth: 301.95 m.

5. Grooming skyway with beam

6. Expanding tunnel between trenches

Ad.1: Drillers Report July 6:
'It's another new week in the drill trench and drilling continues to go well with 37.28 m of core recovered for the day finishing at 941.76 m.'

Weather: Mostly overcast and temperatures between -4 and -7 deg C. Wind 10-20 knots from S. At midnight -4 deg C, surface definition fair, horizon good, visibility 5 miles.

FL, Anders Svensson

Figure caption.

Chain saws are essential in ice core research. Left: Celia is expanding the tunnel between the drill and the science trenches to make room for tall participants expected to arrive to camp later this week. Right: Some drillers have build up an intimate relationship to the spinner used to separate drill liquid from ice chips.

Wednesday, 8th July 2009.

Drilling reaches 1000 m depth

Celebration! Today at around dinnertime the NEEM deep drilling reached a depth of 1000.07 m (driller's depth). Over the last couple of weeks the two drill teams consisting of JiWoong (S. Korea), Olivier (France), Mads (Denmark), Frank (Germany), Alex (New Zealand), Fernando (Ecuador/Germany) and Phillipe (France/Italy) have kept the drill busy 16h a day and performed a high speed drilling of more than 200 m/week. Reaching this depth is very good news for our project as it means that most likely 1) we will get below the brittle-zone this year, 2) there will be processing of the stable ice below the brittle-zone, and 3) with a little luck we will pass the transition into the last glacial period that is expected at around 1400 m depth. This is all assuming that the drilling continues without major problems, which can never be taken for granted.

What we have done today:

1. Drilling with the NEEM long drill: 24.07 m. Drillers depth: 1000.07 m.

2. Logging brittle zone ice. Final depth: 670.45 m.

3. No ice core processing today. Brittle zone has been reached.

4. CFA analysis: 17.60 m. Depth: 319.55 m.

5. Grooming skyway with beam

6. Starting assembling shallow drill

7. Extended platform in front of core buffer to reach higher.

8. Celebrated 1000 m drill depth and Tim Burtons 50 years birthday.

Ad.1: Drillers Report July 7:
'A good drilling day in the trench with 34.24 m of core recovered finishing at a depth of 976 metres. Olivier and Fernando's favourite machine the chips spinner had a close call, but Jeppe stepped in at the eleventh hour, refitted some missing parts and now it is as "good as new"; well at least until next time!'

Weather: Mostly overcast and temperatures between -1 and -4 deg C. Wind 0-6 knots from alternating directions. Fog banks morning and evening; minor snow showers during the day.

FL, Anders Svensson

Figure caption.

1000 m celebration in the drill trench.

Thursday, 9th July 2009.

Ice fog all night long

This morning we had planned a flight mission with departure from SFJ at 4 in the morning. We plan flights at night in order to have low temperatures; the high day temperatures make it difficult for the plane to take off as the snow becomes sticky. When the skier departed from SFJ weather conditions at NEEM were marginal with ground fog and almost no wind. We were hoping that the ground fog would disappear in the morning as it is often the case, but in this case the fog just became more and more dense and when the skier arrived to NEEM at around 6.30 the pilots couldn't see camp and it was impossible to land. The skier circulated above us for about and hour, we could hear it and once we saw it for a second just above main dome, but the visibility didn't improve and unfortunately the skier had to return to SFJ. Tomorrow night we will give it a second try if weather allows.

What we have done today:

1. Drilling with the NEEM long drill: 20.35 m. Drillers depth: 1020.42 m.

2. Logging brittle zone ice. Final depth: 692.45 m.

3. No ice core processing. Brittle zone has been reached.

4. No CFA analysis today.

5. Attempting to receive Skier 73 in the morning

6. Packing and unpacking ice core box pallet and luggage pallet.

Ad.1: Drillers Report July 8:
'Drilling finished a little earlier today as we recovered 24 m of core and reached 1000.07 m depth and took a little time for celebration. New drillers will be arriving on the plane scheduled for early tomorrow and some of us will leave over the next days so drilling shifts will be reorganised during this transition period.'
Drillers Report July 9:
'Short shifts of drill crews today produced 20.4 m of core finishing at 1020.42 m. The plane today could not land because of ice fog so the drill crew exchange will wait another day.'

Ad 6: Because of the night flight some people didn't go to bed whereas others were woken up at 4:30 in order to prepare retro pallets for the skier. We are sending out ice core boxes and the ice core pallet has to be prepared right

before the plane arrives in order not to heat up the ice too much. The ice core boxes were taken up from the science trench by the elevator and driven out to the apron where a pallet was build. A second pallet with personal luggage was also build. As the plane was not able to land we unfortunately had to disassemble the pallets again and bring the ice cores back in the cold.

Weather: In the late morning the ground fog from last night disappeared and in the afternoon we got clear blue sky, low winds from S and temperatures up to -4 deg C. At 20 local we have ground fog in camp again but also wind at 9 knots from S.

FL, Anders Svensson

Figure caption.

During the night the visibility in camp was rather low due to the ground fog. From the main dome we could barely see the tents at the far end of camp that are about 500 m away. The Sun was however visible most of the time.

Friday, 10th July 2009.

The NEEM control tower

At the top of main dome is installed a cabin from where one has one of the best views of the Greenland ice sheet. In the cabin is installed the camp communication equipment, radio, satellite telephone, weather station and internet connection. The cabin works as an office for the field leader who can survey any movement in camp at any given moment through five windows plus a top hatch. This is in particular useful during a flight operation as one can follow the movement of the airplane on the skiway and the loading area. It is thus possible to guide the pilots about navigation and loading of the plane. From the cabin we make weather reports and keep in contact with the Field Operation Manager (FOM) in Kangerlussuaq that is our life line to civilisation. The tower is also a popular touristic spot for field participants to take pictures of the countryside. As of today, the tower is handed over to Dorthe Dahl-Jensen who will be NEEM field leader for the remaining part of the season.

What we have done today:

1. Drilling with the NEEM long drill: 20.35 m. Drillers depth: 1020.42 m (numbers from yesterday).

2. Logging brittle zone ice. Final depth: 715.55 m.

3. No ice core processing. Brittle zone has been reached.

4. CFA analysis: 7.70 m. Depth: 327.25 m.

5. Receiving Skier 72 in the morning.

6. Packing ice core box pallet and luggage pallet to depart with skier.

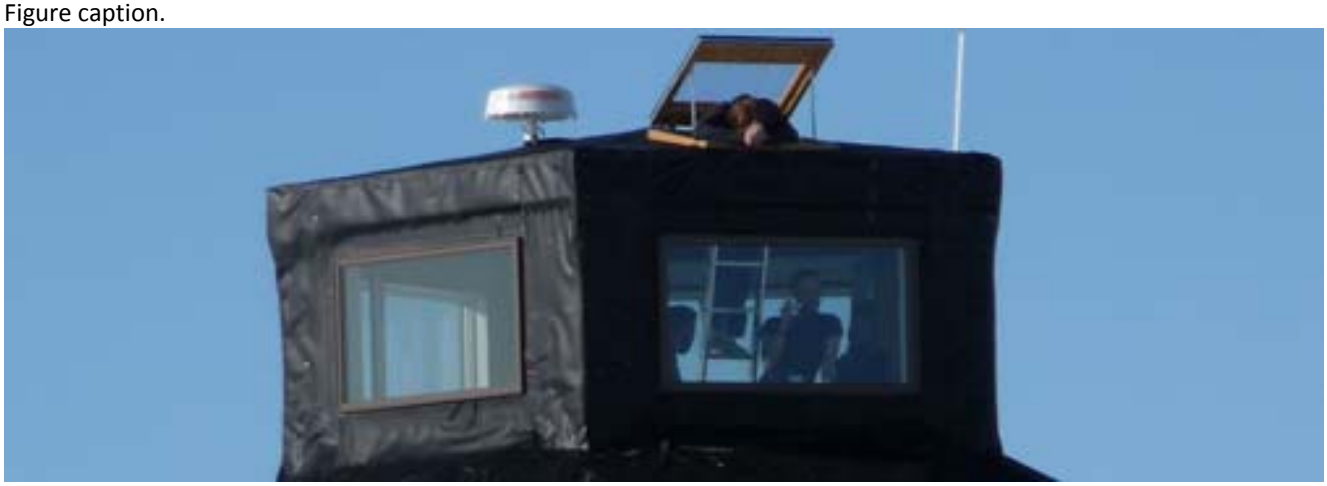
7. Unpacked pallets received by skier and packed two drum pallets for tomorrows skier.

Ad.1: There is currently a crew exchange in the drill trench and drilling progresses a little slower.

Weather: From early morning to late evening we have had a nice sunny day. It was perfect for receiving the skier in the morning. Just after midnight, we did however get a ground fog like in the previous nights.

FL, Anders Svensson

Figure caption.



Participants following today's flight operation from the NEEM control tower

Saturday, 11th July 2009.

Storage of brittle ice cores

The core buffer is filling up with 4m troughs with the brittle ice cores from the depth 600 m to the present depth 1055 m (loggers depths). The capacity of the core buffer has been calculated to be able to store all the brittle ice core over winter so they can be processed next year when they are less brittle to handle in the science trench. We find the cores are well preserved although they do contains some breaks.

What we have done today:

1. Drilling with the NEEM long drill: 13.97 m. Drillers depth: 1051.70 m (10th July 1037.73 m).

2. Training of Loggers; No Logging today

3. Removal of snow walls around core buffer to allow 4m troughs to be used in the full buffer.

4. No ice core processing. Brittle zone has been reached.

5. CFA analysis: 3.85 m. Depth: 331.10 m.

6. Monitoring weather all night for receiving skier. The skier arrived at 11 am local and returned to Kangerlussuaq unsuccessful after many attempts to land in camp. Weather conditions with low clouds and ground fog was the reason for the unsuccessful mission.

7. Preparing 3 pallets with empty drums for retro load

8. Close down of generator for maintenance.

9. Had a super Saturday night with curry prepared by Tim and Lizzie. We enjoyed the unexpected pleasure of celebrating with the old times that were not able to leave camp with the unsuccessful mission.

Ad.1: Driller's Report July 10 and 11, 2009: "We said goodbye to several drillers and hello to one returning one. The partial crew change has resulted in slower productivity as we prepare for the rest of the new drillers to arrive and settle into new shifts. Drilling continues to be stable, but over the last 100 meters or so inclination has increased sharply from about 1.5 to 2.2 degrees. To try to get a handle on the inclination as a first step the cutters were changed. The old cutters had performed beautifully for more than 700 meters but have begun to show some wear. Few adjustments over seven runs have been necessary to find a drilling mode that may help stabilize the inclination with a negative cutter load while at the same time not resulting in current limitation of the drill motor. A cutting pitch of about 2 mm appears to be optimal right now. By the last run on Saturday night it seemed we might be on the right track. With the arrival of Coasol into camp we can begin to balance the borehole drill liquid column to offset the 23 drum Estisol excess in the hole. Meanwhile assembly of the shallow drill is well underway. Driller's depth is 1051.70 meters."

Weather and flight operations: Just before midnight ground fog rolled in and made flight operations impossible. At 08:00 the fog lifted enough to call the mission but before the skier arrived low clouds and new banks of ground fog had arrived. Skier 96 attempted to land but after 2 hours the mission was aborted. Temperatures between -16 deg C and -6 deg C

FL, Anders Svensson and Dorthe Dahl-Jensen

Figure caption.

Brittle ice cores in the core buffer. The cores will be left in the core buffer over winter so they are less brittle when proceesed in the science trench.

The shallow ice core drill is being assembled in the garage by Trevor and Sverrir. The shallow drill will be used to drill ice cores for several programs and the shallow borehole will be used for firn-gas measurements extending the big firn-gas program done last year at NEEM.

Sunday, 12th July 2009.

A day with exchange of many people in camp.
Today was a lucky day and we received the skier at 10:00. 15 new people arrived, 8 left us. It is sad to say goodbye and wonderful to say hello. All teams in camp have changed and the day has been spent instructing newcomers in the tasks. There has been a fantastic positive and eager atmosphere in the whole camp.

What we have done today:

1.Drilling with the NEEM long drill: 18.19 m. Drillers depth: 1069.89 m

2. Logging 10.35 m of core. Logging depth 725.9 m

3. CFA analysis: 1.65 m. Depth: 332.75 m.

4. Receiving Skier 73. The mission was very successful, the ground time was only 50 minutes even though we received 3 pallets, loaded 3 pallets and received fuel from the skier. Thanks to the crew for a very professional and efficient mission.

5. Preparing shallow drill

6. Preparing the firn-gas and ice structure activities

7.Overhaul of generator to be used by the shallow ice core projects

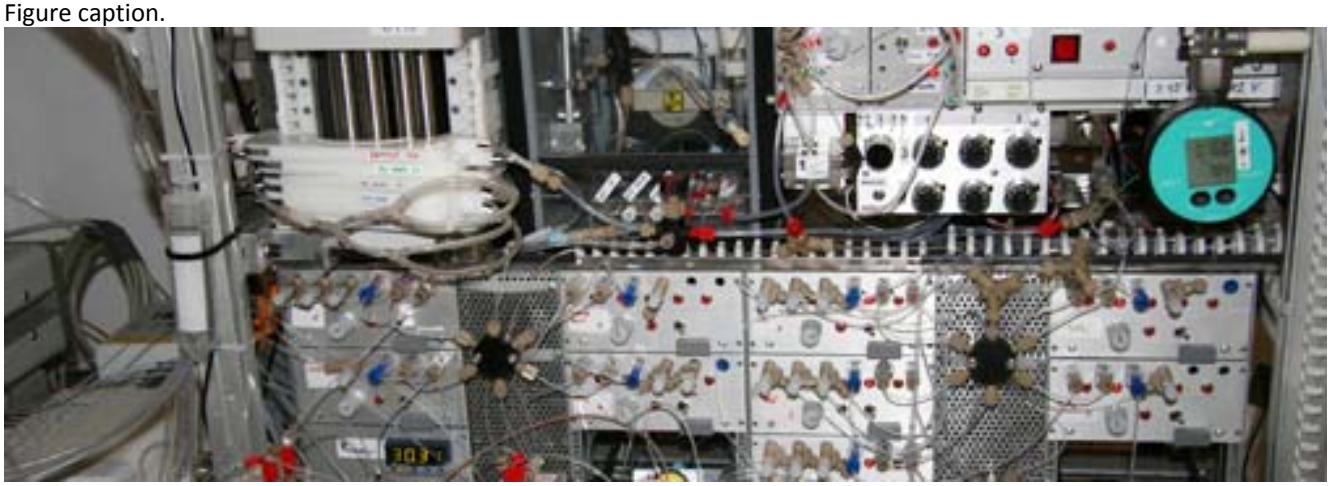
8. Improvement of entrance to drill trench

Ad.1: Driller's Report July 12, 2009: "With the arrival of the remaining drillers two full shifts have again been established. Over the last day and a half the inclination has stabilized between 2 and 2.1 degrees. Adjustments with shims under the shoes with new cutters gives stable runs of 3.45 meters per core beginning with a pitch of about 2.8 mm and ending with a pitch of about 1.7 mm. To begin balancing the fluid density in the borehole pure Coasol is being added to the recycled drill fluid as space in the mixing barrels permits. Once these barrels are emptied a 2:1 Coasol:Estisol mixture will be used until a balance in the hole is reached. Driller's depth (at 19:30 local) is 1066.45 meters."

Weather: sunny most of the day with low clouds passing overhead a few times. Surface emperautres from -10 to -1 deg C.

FL, Dorthe Dahl-Jensen

Figure caption.



The warn cfa lab in the cold science trench is a surely complicated and integrated system and the inside of the box reminds me of modern art.

FL, Dorthe Dahl-Jensen

Monday, 13th July 2009.

Camp is getting into routine again. All have been busy today and logging, cfa and drilling is nearly back to the 'normal'

high production with the new teams. The drilling depth is over 1110m (logged depth) and the ice is still very brittle due to the high pressure in the air bubbles. We are all the time improving the way to handle the core to be as gentle as possible to the new cores. The just drilled cores are placed in the core buffer for 10 days before they are logged. It is possible to divide the cores in 1.65 m sections during the logging without futher damage to the cores.

What we have done today:

1.Drilling with the NEEM long drill: 29.45 m. Drillers depth: 1099.34 m
2. Logging 20.47 m of core. Logging depth 725.9 m

3. CFA analysis: 17.60 m. Depth: 332.75 m.

4. Building garage

5. Preparing shallow drill

6. Preparing the firn-gas and ice structure activities

7.Build table and side supports in top office

8. Cleaned cargo from the surface

Ad.1: Driller's Report July 13, 2009: "Stable drilling throughout the day produced 29.45 meters over nine runs. Throughout each run the cutting pitch continues to gradually decrease from about 2.7 mm to about 1.3 mm. Maintenance was required on the pump to replace the knobs which hold the pump fast against the inner "sleeve". One cleaning run in the morning collected 6 kg of the excess chips left in the hole during the previous day. The inclination has now begun to steadily decrease and is down to 1.83 degrees.
Ad. 5. After assembling the drill it there turned out to be a failure in the electronic system. Aksel found the short and repaired the control box within few hours.

Weather: A warm and sunny day with temperatures between -8 and -4 deg C. Wind has been between 9 and 14 kn from S to SE. We have had slight haze from time to time.

FL, Dorthe Dahl-Jensen

Figure captions.

Happy driller. JiWoong from Korea is now fully trained as a NEEM driller. His good humor (and fantastic hat) is very

much appreciated in the camp.

The frame of the third garage went up this afternoon in few hours. Sverrir, Tim and our doctor Lizzie must have been garage constructors in their earlier life!

The ice core loggers are discussing how to improve the handling of the freshly drilled ice cores after a core got rather broken during the extraction from the drill. A perfect alignment of the drill and the core trough and cold temperatures are believed to be the most important factors.

Tuesday, 14th July 2009.

The NEEM camp is a busy camp with drilling from 08 to 24 and cfa and logging 24 hours a day. At most meals 8 of the 36 in camp are on shifts and eat at other times. The cfa is a very time consuming line. A square strip of ice with the side length 3.5 cm is melted and the melt water used to measure 14 chemical components, 3 parameters related to

the dust particles, the methane concentration and the stable water isotopes. The night shift works from 20:00 to 08:00 and are well stocked with coffee, cakes and chocolate. The camp celebrated the French Bastille day with red wine and good cheeses after dinner and at the time I am writing this daily report the French music is still playing down stairs.

What we have done today:

1.Drilling with the NEEM long drill: 33.29 m. Drillers depth: 1132.63 m
2. Logging 32.83 m of core. Logging depth 779.20 m

3. CFA analysis: 23.10 m. Depth: 373.45 m.
4. Building shelves in the main dome for boots and parca coat

5.Shallow drilling at the air-firn village. Present depth 8 m. Ice core logged and packed and gas pumping equipment prepared.

6. Moving fuel tanks on the surface so a full tank is brought close to the generator hut.

7. Flattening the main camp area with the Pisten Bully

Ad.1: Driller's Report July 13, 2009: "All was left exactly the same as yesterday and the performance and production was similar. Stable drilling throughout the day produced about 33meters over ten runs. The inclination is steady at 1.95 degrees. The shallow drill is fully assembled and operational and produced the first 8 meters of ice for the firn gas program. "

Ad. 2. The logging is lagging far behind the drilling due to the time the cores need to relax before being logged. Now when we are nearing the end of the brittle zone the logging will happen in 24 hour shifts to be able to catch up with the drillers.

Weather: A slightly windy day (up to 15 kn) with mostly sun shine. After dinner it became overcast and the temperature increased from -8 deg C to -3 deg C. The coldest nigh temperature was -14 deg C.

FL, Dorthe Dahl-Jensen

Figure captions.

The night shift in the cfa hut. The night shift is from 20:00 to 08:00 and coffee, cake and chokolade is found in big amounts.

The celebration of the French Bastille Day with red wine and good humor. At present we have 7 French in camp.

Wednesday, 15th July 2009.

With two cooks in camp, Brandon and Louise, we are truly spoilt. Fantastic meals and several varieties of cakes during the day makes life really comfortable in camp. We are 36 in camp, the maximum population this year so there is good use for two cooks. It is a pleasure to enter the main dome and smell all the wonderful creations. A BIG thanks to the two miracle makers!

What we have done today:

1.Drilling with the NEEM long drill: 26.29 m. Drillers depth: 1158.92 m
2. Logging 67.85 m of core. Logging depth 847.05 m

3. CFA analysis: 20.90 m. Depth: 373.45 m.
4. Finished the shelves in the main dome for boots and parca coat

5. Shallow drilling at the air-firn village. Present depth 8 m. Air pumping equipment was tested but due to warm temperatures no attempts were made to make pit studies while waiting for more ice core.

6. Finished the building of the third garage intended for storage

7. Changed the water xx in the kitchen sink

Ad.1: Driller's Report July 15, 2009: "The configuration of the past days began to be unstable today. The drill head was re-tuned giving a stable run as the day closed with a constant pitch of 2.1 mm. A slight modification to the hallow shaft was also made for this final run. We moved the central booster to sit just above the central junction of the hallow shaft, rather than its previous position just below the central junction. With the original booster position no chips would collect in the 70 cm just above the central junction. Otherwise the rest of the chip chamber was usually full in this mode, including occasional packing in the pump itself. In contrast, during this last run with the new booster position the entire upper part of the hallow shaft was packed with chips while the lower part and the pump were relatively clean in comparison. The redistribution of chips in the chip chamber seems possible, and with both booster positions full chip recovery is achieved unless the pump is packed. We will continue with this on the night shift to learn if it really makes a difference. Inclination has returned to 2.2 degrees during the day. "

Ad. 2. Logging og 67m of core the first 24 hour shift is very good. The core quality is mixed with occasional mall sections of totally smashed ice. The logging depth is 847m where the ice is expected to be very brittle.

Weather: A very warm day with night temperatures between Tuesday and Wednesday no colder than -3 deg C and day temperatures up to 0 deg. The snow was wet. The night between Wednesday and Thursday the temperatures dropped to -7 deg C Wind 8-14 kn from S

FL, Dorthe Dahl-Jensen

Figure captions.

Two happy cooks in the NEEM kitchen.

Thursday, 16th July 2009.

NEEM – the plywood eating camp. It is amazing how many sheets of plywood that is used every week. With each flight period 20-30 sheets of plywood are shipped to the camp – and often there exists plans for the use of the sheets. But – before the plans have been realized – the plywood has been used for other purposes – under tents, for shelves, for boxes….. Sverrir has a dream of building a Sauna at NEEM and we are still hoping that one day the plywood sheets will be there for him….

What we have done today:

1.Drilling with the NEEM long drill: 15.00 m. Drillers depth: 1173.92m
2. Logging 85.44 m of core. Logging depth 932.49 m

3. CFA analysis: 15.40 m. Depth: 409.75 m.
4. Made a little extra core buffer for the science trench

5. Shallow drilling at the air-firn village. Present depth 20 m.

6 . Prepared for a second NEEM 2009 shallowcore

Ad.1: Driller's Report July 16, 2009: "In the drill trench we have experienced alternating good and bad runs today. High drilling current plagues the bad runs right from the start of drilling (short cores) despite a low cutting pitch of less than 2 mm. A consistent pattern has yet to emerge today, so our efforts will be focused on the drill head, cutting pitch and reexamining the position of the central booster, one step at a time. One possibility is that the hollow shaft

was inadvertently reassembled yesterday in a way that did not account for the 3 mm modification to the junction piece which makes the shaft slightly longer and positions the pump properly in the inner sleeve. “

Ad. 5. Firn air program NEEM 2009: A sealed borehole will be drilled to a depth of 80m, enabling measurements of ultra-trace compounds at various depths. We will measure the concentrations of a large range of gases that are active in global climate, stratospheric ozone depletion, atmospheric chemistry and pollution. For example, the concentrations of carbon dioxide, methane and carbon monoxide, and their isotopes, which are tracers of the sources of these important gases. Some gases such as mercury vapour and the CFC’s are at concentrations of only parts per trillion. The firn air record also bridges the ice core gas record to the present day and reveals how much the longer atmospheric record is smoothed during enclosure into bubbles in the ice. The firn air program at NEEM in 2009 is being undertaken by atmospheric and climate scientists from CSIRO (Australia) and the CIC (Denmark), LGGE (France), University of Colorado (USA), and University of East Anglia (UK) and IMAU (Netherlands). The cores drilled to access the firn are being analysed by scientists from Dartmouth College (USA). And of course drilling and general support is being provided by people from the main NEEM camp. Every day, the firn people head off on skidoos or skis to the firn “village” 2 kilometres from the main camp, returning tired, hungry and a little sunburnt for meals and a rest.

Weather: A warm day with night temperatures between Wednesday and Thursdaydown to -10 deg C -3 deg C and day temperatures up to -2 deg. Wind 8-14 kn from S to SSE

FL, Dorthe Dahl-Jensen

Figure captions.

Sverrir gurading his pile of plywood sheets.

Anne drilling shallow cores with the three inch drill at the firn village 2 k m from NEEM

Friday, 17th July 2009.

At the firn village we have Zoe and Kaitlin who are interested at the ice cores from the shallow drilling – not the borehole as the gas pumping gang is. The shallow core are carefully documented and logged and packed in bags and boxes for transport back to the US. Every day the cores are transported back to camp and stored in the colder science trench.

What we have done today:

1.Drilling with the NEEM long drill: 7.67 m. Drillers depth: 1181.59m
2. Logging 95.78 m of core. Logging depth 1028.27 m
3. CFA analysis: 19.80 m. Depth: 429.55 m.
4. Maintained saws and placed bags for the processing under the brittle zone in the science trench

5. Made ventilation from cfa lab directly to the surface to further cool the science trench and to lower the temperature in the cfa lab from 30-40 deg C to 23 deg C.

5. Shallow drilling at the air-firn village. Present depth 30 m. Air-sampling has been made at the depth 30m.

6 . Shallow drilling at a second site 40m from the firn-gas sampling borehole. Present depth 6.6 m

7. Temperature logging of the 2008 shallow hole started

8. Pit sampling by Zoe and Kaitlin.

Ad.1: Driller's Report July 17, 2009: "The last night shift and morning shift were spent doing thorough maintenance on the drill. In between was an unexpected midnight shift to recover a lost core barrel down hole. Drilling performance had become unsatisfactorily unstable so we did an "overhaul". We replaced all seals on the pump and valves and serviced the pump. We replaced the black PE guides near the drill head. We separated the outer tubes and found that ice had collected around the inner sleeve that needed to be melted out. We repositioned the central booster just below the hallow shaft junction. The drill head was inspected and the cutters were changed back to the old set, sharpened, and the pitch retuned. We learned that the cutter sets do not have exactly the same the dimensions. The new set we had put on at 1030 meters gave a very slightly smaller diameter, one that allows the drill to pass with the previously used cutter set, but that increased friction enough to rotate the inner core barrel backwards and disengage the super banger when descending the last 150 meters of the borehole. Happily, the resulting fishing expedition for the lost core barrel was successful on the first attempt. Subsequently the drill was reassembled and the lower part of the borehole was reamed with the "old" very slightly wider cutters. Two runs before dinner were excellent and stable throughout. Inclination is now 2.38. "

Weather: A very nice and sunny day with blue sky and night temperatures between Thursday and Friday down to -10 deg and day temperatures up to -5 deg. Wind 3-12 kn from S.

FL, Dorthe Dahl-Jensen

Figure captions.

Zoe and Kaitlin working with the shallow cores at the firn village

Saturday, 18th July 2009.

Saturday night. Saturday evening in camps was special as usual. We had a more than excellent French meal cooked by the French team. THANKS! The evening turned into a French evening and after dinning we all walked over to the new empty garage and had a table tennis competition with France against the rest of the World. Even the French had to conclude that the champignon was JiWoong from Korea. After dinner Mauro gave a lesson in Salsa

What we have done today:

1.Drilling with the NEEM long drill: 22.69 m. Drillers depth: 1204.28m
2. Logging 79.34 m of core. Logging depth 1107.61 m
3. CFA analysis: 12.65 m. Depth: 442.2 m.
4. Prepared Saturday night

5. Finished building the new core buffer including beams to place the buffer on.

6. Shallow drilling at the air-firn village. Present depth 40 m. Air-sampling has been made at the depth 40m.

7. Repaired cable from shallow winch motor to power supply

8. Pit sampling by Zoe and Kaitlin.

9. Made platform for sofa and placed sofa on the platform in the top office

10. Restarted snowmelter and pump after a total drainage Saturday evening at 23:00

Weather: A very nice and sunny day with blue sky and night temperatures between Friday and Saturday down to -15 deg C and day temperatures up to -3 deg. Wind 5-12 kn from S.

FL, Dorthe Dahl-Jensen

Figure captions.

Lizzie painting a French mustache on Tim with a (non)permanent speedmarker

Lars playing table tennis in the new garage

Walking back to the main dome after the table tennis matches in the new garage

Sunday, 19th July 2009.

Here is a true Sunday story: To avoid too bad smells in the main dome we have two outdoor toilets. They are constructed as a little tent over a comfortable wooden seat padded with insulating material over a deep hole in the snow. When the tent is in use a bamboo pole with a red flag is placed in front of the entrance and when the tent is not in use the flag is removed. This year there as been a competition in hand digging the deepest hole for the 'shitters' and here we are: the record of this year goes to Tim and Lizzie for their 4m deep hole. Congratulations!

What we have done today:

1.Drilling with the NEEM long drill: 13.46 m. Drillers depth: 1217.74
2. Logging 23.68 m of core. Logging depth 1131.29 m
3. CFA analysis: 0 m. Depth: 442.2 m.
4. Removed smashed gear section from one of the skidoos. The camp only has three skidoos now.

5. Made food order and overview over drill liquids

6. Shallow drilling at the air-firn village. Present depth 50 m. Air-sampling has been made at the depth 50m.

7. Shallow drilled at the second site NEEM2009S1. Depth 15m

8. Pit sampling by Zoe and Kaitlin and temperature measurements in NEEM2008S2 by Anais.

9. Made a new 4 m deep outdoor toilet

Ad 1: Driller's Report July 19, 2009: "Drilling has been very smooth since Friday after the full maintenance and fishing expedition described two days ago. Cutting pitch is 2.4 mm at the start of the runs and reduces slowly to less than 2 mm by 3.4 meters. With this reduction in pitch the drilling current will also decrease slightly throughout a run and only increase near the end when the chip chamber becomes fuller. With each run we get full chip recovery. On only one occasion the pump was packed with chips for a reason not understood. Inclination is 2.4 degrees and has been stable for the last two days. "
Ad 2: At 20:30 today the first unbroken core for a long time was drilled and we cross our fingers that this indicates that we are below the brittle zone. The loggers depth is 1230m (drillers depth 1217m) and model calculations predicted that the brittle zone would end at 1220m. We hope – and tomorrow will show if all cores are unbrittle now!

Weather: A very nice and sunny day with blue sky and night temperatures between Saturday and Sunday down to -12 deg C and day temperatures up to -3 deg. Wind 5-12 kn from S.

FL, Dorthe Dahl-Jensen

Figure captions.

A 4 m hole has been digged for a new outdoor toilet.

Lizzie in front of the outdoor toilet tent

Monday, 20th July 2009.

A great effort has been made by the loggers to catch up with the drillers when the end of the brittle zone was reached. We have had three teams working around the clock and the record today was the logging of 119.20m. The big effort was the Birthday gift from the loggers to Anais – so she did not have to have the night shift on her birthday. Happy Birthday, Anais!

What we have done today:

1.Drilling with the NEEM long drill: 24.77 m. Drillers depth: 1244.37
2. Logging 119.20 m of core. Logging depth 1250.49 m
3. CFA analysis: 12.92 m. Depth: 455.12 m.
4. Counted ice core boxes in camp

5. Shallow drilling at the air-firn village. Present depth 64 m. Air-sampling has been made at the depth 64m.

6. Shallow drilled at the second site NEEM2009S1. Depth 33 m

Ad 1: Driller's Report July 20, 2009: "Stable drilling continues but on a couple runs chip transport was inefficient after 2.3 meters and drilling become more labored with high current and required "cleaning" stops. On these runs 3.4 meters were possible to drill but the pump was found to be packed at the surface with full chip recovery. The chips centrifuge is broken. The replacement has been installed while we check out the old one. Hopefully Bruno Stocker takes this news sitting down. The final run at the end of the drill day looked to be significantly less brittle and provided the first bottom break in some time. Inclination is 2.2 degrees"

Weather: A very nice and sunny day with blue sky and night temperatures between Sunday and Monday down to -12 deg C and day temperatures up to -3 deg. Wind 4-10 kn from SSE.

FL, Dorthe Dahl-Jensen

Figure captions.

Nearly all drillers and loggers discussing if this is a non-brittle core or not.

Anne pulling out the inner core barrel of the shallow drill at the firn-gas village.

Tuesday, 21th July 2009.

Finally – we are through the brittle zone and the ice drilled and logged today will be processed later this week when it has relaxed in the core buffer for some days. The brittle zone started at the depth 600 m and terminated at the depth 1280m. The ice from this zone is stored in the big core buffer and will first be processed next year when it has relaxed for a year in the core buffer. A small core buffer in front of the big buffer will be used for the coming cores – the cores we will process.

What we have done today:

1.Drilling with the NEEM long drill: 22.77 m. Drillers depth: 1269.14 m
2. Logging 32.01 m of core. Logging depth 1282.54 m
3. CFA analysis: 0 m. Depth: 455.12 m.
4. Calculated amount of ice to be shipped from camp 2009

5. Shallow drilling at the air-firn village. Present depth 68 m. Air-sampling has been made at the depth 68m.

6. Shallow drilled at the second site NEEM2009S1. Depth 45 m

7. Moved all the vehicles in camp to groom the area in the camp

8. Build 2 pallets with empty drums

Ad 1: Driller's Report July 21, 2009: "Good runs all day and night until a bad run ended with a missing small screw from one of the inner core barrel spirals. The run showed classic symptoms of a screw down hole, and on the surface we noted some slight damage to one cutter. With fishing expeditions with the drill no further damage was done to the cutters despite never finding the missing screw on the core or in the slush. The core produced on the fishing run had a high pitch of 3.1 mm which turned our attention back to the drill head. We concluded the hole was clean, we sharpened all three cutters, retuned the pitch, and resumed normal drilling. Inclination is 2.3 degrees. "

Ad 2: The ice seems to be less brittle and today we declared that the first core under the brittle zone to be bag 2331 with the top of this bag at the loggers depth 1281.50 m. Note the loggers depth are depths below the snow surface May 2008 while the drillers operate with a different depth defined by the beginning of the borehole 13 m below the surface. The ice between bag 1095 and 2330 is stored in the core buffer to be processed in 2010.

Weather: A very nice and sunny day with blue sky and night temperatures between Monday and Tuesday down to -10 deg C and day temperatures up to -1 deg. Wind 3-6 kn from SSE to SE.

FL, Dorthe Dahl-Jensen

Figure captions.

Today has been a very warm and sunny day with very light wind. The snow was wet like European Christmas snow and Axel build a penguin to watch camp.

Sverrir moved all the vehicles in camp so he could groom the area around the garage. It is quite a parade.

The old and new core buffers. The big old buffer is completely full with the brittle ice and in the new buffer in the front the first core to be processed in the science trench below the brittle zone is waiting…

Wednesday, 22th July 2009.

The brave drillers.
Drilling a deep ice core is actually a very 'wet' affair. The drill liquid is a mixture of coconut oil extract (Estisol 240) and Coasol and is non-hazardous, not unhealthy and has a low environmental impact. When the drill with an ice core surfaces the inner core barrel is parted from the drill in order to take the ice core out. It is a quite wet affair for the drillers and they often become rather soaked. The liquid that surfaces with the drill is collected and reused.

What we have done today:

1.Drilling with the NEEM long drill: 27.48 m. Drillers depth: 1296.62 m

2. Logging 26.92 m of core. Logging depth 1309.46 m

3. CFA analysis: 27.33 m. Depth: 482.35 m.

4. Repaired centrifuge for recycling drill liquid

5. Shallow drilling at the air-firn village. Present depth 74 m. Air-sampling has been made at the depth 74m.

6. Shallow drilled at the second site NEEM2009S1. Depth 68 m

7. Build last core buffer in science trench

Ad 1: Driller's Report July 22, 2009: "Good drilling all day with one unexplained short run. Second centrifuge needs work. Apparently upon purchase the inside was all rusted out making the recycled liquid unusable in the bore hole. We even found some old underwear from when it worked at a møntvask in a previous life. Sverrir and Axel repair the old centrifuge though."

Weather: A very nice and sunny day with blue sky and night temperatures between Tuesday and Wednesday down to -15 deg C and day temperatures up to -3 deg. Wind 3-10 kn from SE.

FL, Dorthe Dahl-Jensen

Figure captions: A small cartoon of Oliver releasing the inner core barrel from the deep ice core drill.

Thursday, 23th July 2009.

The science trench becomes very lively again.
Today was the day where we started processing the ice below the brittle zone. It was a great success. The ice showed no signs of breaking or exploding and we used the day training the team in the science trench. We are ready now – and just need a lot of core. Expectations are high and the whole science team is hoping to be in camp when we pass the transition from interglacial to interglacial (modelled to be at 1390m). Exchange of people will be next Thursday…

What we have done today:

1.Drilling with the NEEM long drill: 16.91 m. Drillers depth: 1313.53 m

2. Logging 17.36 m of core. Logging depth 1326.82 m

3. CFA analysis: 18.15 m. Depth: 500.5 m.

4. Processing 8.35 m. Processing depth: 1289.75 (bag 2345)

5. Tuning of saws, alignment of tables and placement of longer guiders in the science trench

5. Shallow drilling at the air-firn village. Present depth 75 m. Air-sampling has been made at the depth 75m.

6. Shallow drilled at the second site NEEM2009S1. Depth 88.75m.

7. Build last core buffer in science trench

Ad 1: Driller's Report July 23, 2009: "Three perfect runs were followed by five very poor runs. Poor runs ended after 60 to 130 cms and were plagued with high current from the start, each ending by a total blockage of drill rotation. Chips transport may be a cause for at least two of these short runs where we found the pump packed and the space between the pump and lowest booster packed, with nothing above the lowest booster. We considered changing the pump, but first we installed new cutters and reduced the pitch and finally a normal run was achieved before dinner without altering the pump or hollow shaft. We will continue to tune the drill during the night shift. Inclination is steady between 2.2 and 2.4 degrees."
Ad 3. A great celebration just at the time for crew shift at 19:00 when 500m was passed. CONGRATULAIONS to the cfa team for very dedicated work!
Ad 4. The first bag to be processed was 2331 (start depth: 1281.5m) .
Ad 6: The Laki eruption has been found at the depth 70.98 – 71.08 m by ECM measurements (pls note that the bag system was started wrong with a 1.45 m offset (the first core length!) so depth is: 0.55*BAGNR-1.45). Vas will

continue drilling in the S1 hole to a depth of 150m. The core from 0 to 90 m is Steering Committee core; the core below 88.75m will be divided as described in the firn-gas program that will be circulated to the SC.

Weather: In the morning sunny but changing from noon fog. Night temperatures between Wednesday and Thursday down to -10 deg C and day temperatures up to -3 deg. Variable wind 5-12 kn from SE to SSE. Pressure steadily dropping from 1030 to 1015 mb.

FL, Dorthe Dahl-Jensen

Figure caption:
A 1.65m slab of ice in the line scan instrument in the science trench. The ice is in one piece with no breaks at all!

The football game on the first floor is very popular and the games become load and fun. The ball does not always stay in the box and on the photo the ball has just been shot out to the left.

Friday, 24th July 2009.

Is it always good weather at NEEM?
We have had good weather with blue sky and low winds since the last crew exchange 9 July. WE are really getting spoilt and we hope the weather will continue next week when we have the next flight period. The good weather encourages all to go for a walk, to ski or to visit the sofa at the end of the skiway in the evening. Looking at the skiway from the windows of the office is like looking at the Rivera promenade.

What we have done today:

1.Drilling with the NEEM long drill: 15.54 m. Drillers depth: 1329.07 m

2. Logging 18.18 m of core. Logging depth 1345.30 m

3. CFA analysis: 20.90 m. Depth: 521.40 m.

4. Processing 23.1 m. Processing depth: 1312.85 m (bag 2387)

5. Shallow drilling at the air-firn village. Present depth 76 m. Air-sampling has been made at the depth 76m.

6. Shallow drilling at the second site NEEM2009S1. Depth 96 m.

7. Localizing the Laki eruption in the ice core from the firn-air site (NEEM2009S2) by ECM measurements. Depth 70.5 m

Ad 1: Driller's Report July 24, 2009: "Since leaving the brittle ice stable drilling has been elusive. We are able to get 3.5 meters ice cores but in a mode that rides at the current limit regardless of which cutting pitch we attempt. Low RPM's at the current limit seems to reduce the effectiveness of the pump for chip transport. Now and then drilling drops into a good mode for a portion of a run but this mode is hard to maintain. Drilling seems best now with a slight negative cutter load which is different than we have experienced previously this season. New cutters have made no difference in the efficiency of drilling over the last two days. Despite all of this quality ice is being produced, but at a slower rate at the moment while we seek a good mode. In the meantime we are making a new pump ready as we seem to have exhausted our tuning of the drill head."
Weather: In the morning sunny but changing from noon fog. Night temperatures between Wednesday and Thursday down to -10 deg C and day temperatures up to -3 deg. Variable wind 5-12 kn from SE to SSE. Pressure steadily dropping from 1030 to 1015 mb.

FL, Dorthe Dahl-Jensen

Sunday, 26th July 2009.

A driller in action in the drillers cabin in the drill trench
Phillipe has just finalized the drilling of a 3.2m long ice core. How do we know? The drill is on the way up the borehole but the computer in the drill communicates with the consol on the surface so all information is on the screens in front of the driller.

What we have done today:

1.Drilling with the NEEM long drill: 12.47 m. Drillers depth: 1354.37 m

2. Logging 11.37 m of core. Logging depth 1367.62 m

3. CFA analysis: 2.20 m. Depth: 540.65 m.

4. Processing 19.8 m. Processing depth: 1349.65 m (bag 2453)

5. The gas pumping has reached an end and the shallow drilling has continued to a final depth of 91m

6. Shallow drilling at the second site NEEM2009S1. Depth 105 m

7. Repairing the floor in the mechanic's garage. The warm weather has melted the floor and new snow has been put on the floor.

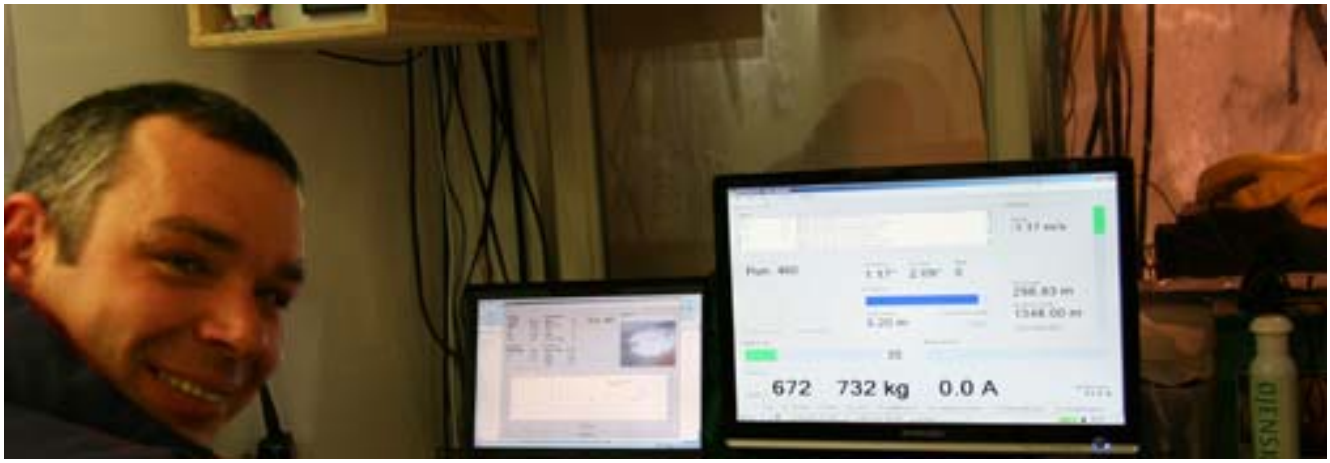
8. The camp area has been smoothed using the Pisten Bully

9. A bet for the depth of the glacial-interglacial transition has opened. Entrances before Monday at noon (Greenland time) will be accepted. The definition of the transition point is the depth where ECM changes from cold glacial values to the warm interglacial values (the end of Younger Dryas).

Ad 1: Drillers report 25 and 26 July: "Drilling has become more stable after completely drying out the hallow shaft between Saturday and Sunday. Still runs begin with a high current that limits drill rpms, but after a meter or so the current drops an ampere or two and very fine drilling commences. Conditions gradually degraded with each run with high current lasting longer into the run before dropping into a nice mode. But with each run full length cores with complete chip recovery is possible. With the 4th and final run of the short Sunday some of the instabilities of the past days reemerged. The operator must be quite active during these runs. Core breaks are range between 900 and 1350 kg of force including cable and drill weight (395 kg). Inclination is 2.41 degrees."
Ad 5: Sampling and measurement of firn air is now essentially complete. Air from 18 levels from surface to 76 metres depth was sampled and analysed over a period of 13 days from borehole NEEM 2009 S2. Samples includes 13 high pressure tanks for UEA/IMAU/MPI, 19 0.5 L glass flasks and 7 large stainless steel tanks for CSIRO, and measurements at the site of elemental mercury vapour (LGGE) and CO2 concentrations (using UB CO2 analyser) at 16 levels. Mercury measurements in the free atmosphere and in the snow have also been made. The CO2 measurements suggest the deepest samples have older effective air ages than expected based on results from the 2008 NEEM firn air program and model-predicted results. If these results are confirmed with sample analyses in the lab of additional species then the samples would represent some of the oldest firn air sampled from firn in Greenland and even Antarctica. The mercury results also show promise for a long uncontaminated record. Cores to 90 m at S2 have been logged and packed for structural properties at Dartmouth (USA) and accompanied by snow pit and hand auger core measurements. NEEM 2009 S2 has been completed at 90 m and samples packed for analyses.

Weather: Sunny all day with temperatures from -15 deg C to -5 deg C, Wind 5-13 kn from SE.
FL, Dorthe Dahl-Jensen

Figure caption:



Phillipe happy after drilling a 3.2 m long ice core.

Monday, 27th July 2009.

Moving empty drums from the drillers roof.
A deep borehole through the ice needs to be filled with drill liquid to avoid the borehole to close due to ice flow. At NEEM we use a mixture of ESTISOL 240 (coconut oil extract) and COASOL. This liquid is non-hazardous and has a low environmental impact. The empty drums are packed on pallets and returned to Kangerlussuaq.

What we have done today:

1.Drilling with the NEEM long drill: 24.00 m. Drillers depth: 1378.37 m

2. Logging 20.37 m of core. Logging depth 1387.99 m

3. CFA analysis: 9.35 m. Depth: 550.00 m. (bag 1000!)

4. Processing 6.6 m. Processing depth: 1355.75 m (bag 2465)

5. Shallow drilling at the second site NEEM2009S1. Depth 130 m

6. Finishing the research in the firn-village

7. Collecting cargo on pallets.

Ad 1: Drillers report 27 July: "We have had a good day drilling. A clean borehole and hallow shaft are suspected for the improvement. However, today we had one short run due to ice under one shoe, a very rare case. Density of the liquid at the bottom of the borehole is fine (measured 0.925 at -24 C). With increasing depth longer trip times are starting to be noticeable. For the bottom quarter of the borehole descending speed is approximately 0.70 m/sec to allow safe passage through the viscous drilling liquid. Inclination is 2.6, a step higher from yesterday. All controllable elements on the drill for a plumb hole are in good shape."
Weather: Sunny in the morning with overcast building up during the afternoon to full overcast in the evening. Wind picking up from noon to 18 kn at 18:00. Wind direction W. Temperatures -12 to -7 deg C.

FL, Dorthe Dahl-Jensen

Figure caption:

Jørn moving empty drums from the roof of the drill trench

Louise and Brandon preparing sushi for the whole camp. THANKS!

Tuesday, 28th July 2009.

The beauty of ice crystals
A less than 0.5mm thin slice of ice placed between polarized light reveal the single ice crystals in the ice core. The picture represents a section of an ice core placed horizontally.The beautiful colours tell us that the crystals have very different c-axis orientation. Observe the band of smaller crystals to the left of the picture which probably is a band of ice with a high concentration of impurities from a spring storm 10.000 years ago which reduces the crystal growth rate.

What we have done today:

1.Drilling with the NEEM long drill: 23.29 m. Drillers depth: 1401.66 m

2. Logging 23.48 m of core. Logging depth 1411.47 m

3. CFA analysis: 17.05 m. Depth: 567.05 m.

4. Processing 21.45 m. Processing depth: 1377.20 m (bag 2504)

5. Shallow drilling at the second site NEEM2009S1. Depth 136 m

6. Packing in the firn-village

7. Collecting cargo on pallets.

Ad 1: Drillers report 28 July: "A good day drilling ending with three runs with a new drill head. Cutting pitch of 2.1 mm gives motor current of 8.5-9 amps for the first 2.2 meters of each run followed by 11 to 11.5 amps for the remaining 1.3 meters of the 3.5 meter ice cores. The chips remain mainly in the lower half of the chip chamber. Inclination held steady today at 2.65 degrees. We have the first signs of a very small amount of chips on top of the cores. Bottom density of liquid is 922 at -24 C. "
Ad 2: The logging is eagerly followed to find the glacial interglacial transition. We have seen no visible sign of the transition yet – the truth will come when the ice is processed in the science trench.
Ad 4: The processing of bag 2500 was celebrated in the science trench.
Ad 5: The core quality is too poor to continue drilling in the NEEM2009 S1 borehole at the depth 136m. The ice core is drilled with the 3 inch shallow ice core drill without the use of drill liquid.
Weather: Overcast with light snow. From time to time the overcast was broken with big spots of blue sky. Wind 10kn decreasing to 3 kn from W to SW. Temperature -10 to -7 deg C.

FL, Dorthe Dahl-Jensen

Figure caption:

Beautiful ice crystals from 10.000 year old NEEM ice.

Daphne recording the ice crystals on the laptop in the physical property laboratory in the science trench.


Celebration of the processing of bag 2500 in the science trench

Wednesday, 29th July 2009.

The transition ice has been drilled.
Today we celebrated that we have drilled past the glacial to interglacial tranisiton 11.703 years before 2000AD. The transition has been seen by the appearance of cloudy bands in the cold glacial ice and also by running a hand held version of ECM over the cores as they where logged. We celebrated that we have passed the depth of the NGRIP1 ice core at 1372 m, the depth of the Camp Century ice core at 1389m and off course the transition. The depth – in bag 2580. Details will be revealed later when the ice cores have been processed in the science trench.

What we have done today:

1.Drilling with the NEEM long drill: 20.36 m. Drillers depth: 1422.02m

2. Logging 26.50 m of core. Logging depth 1437.97 m

3. CFA analysis: 13.20 m. Depth: 580.25 m.

4. Processing 19.8 m. Processing depth: 1397.00 m (bag 2540)

5. Packing in the firn-village

7. Collecting cargo on pallets.

Ad 1: Drillers report 29 July: “Good drilling today. Seven stable runs but some time lost due to the depth counter malfunction. We remounted the rear set screw on the flexible shaft which had started slipping. This had also occurred once during May of this season. We will cancel the night shift to allow the three departing drillers to enjoy the special dinner and begin to rearrange the shifts in the morning.”
Weather: Overcast with light snow. Wind 9-15 kn from S. Temperature -11 to -7 deg C.

FL, Dorthe Dahl-Jensen

Figure caption:

The NEEM'ers celebrating the transition with a glass of champagne.

Brandon in the snow – the story told in the sun glasses.

Thursday, 29th July 2009.

The media and DV visit – and exchange of crew.
A very busy day in camp for all. The morning began very early with weather observations, packing of ice pallets grooming of skiway and packing of personal equipment. Skier 96 arrived at 10:00 with 37 guests and new NEEM'ers. We had 4 filming media teams and the drill and science trench where on show. The guests stayed in camp for 5 ½ hours while the skier picked fuel up in Thule for the camp. There was also time for coverage of the outside logistics and the busy main dome. We had 19 NEEM'ers leaving camp and 17 new NEEM'ers arriving. Goodbye to all out departing friends – we will miss you!

What we have done today:

1.Drilling with the NEEM long drill: 16.02 m. Drillers depth: 1438.04m

2. Logging 13.29 m of core. Logging depth 1451.26 m

3. CFA analysis: 0.00 m. Depth: 580.25 m.

4. Processing 0.00 m. Processing depth: 1397.00 m (bag 2540)

5. Grooming skiway after 2 inch snowfall the last days

6. Receiving skier 96. A BIG thanks for more than excellent operations.

7. Media and DV visit.

Weather: Overcast with light snow with patches of blue sky in between. Wind 9-15 kn from S. Temperature -11 to -7 deg C.

FL, Dorthe Dahl-Jensen

Figure caption:

Media interviewing Dorthe in the drill trench

Goodbye to all our departing NEEM'ers

Release of a weather balloon to measure the rather low ceiling of the clouds before arrival of the skier.

Friday, 31th July 2009.

Back to routine
The Media and DV visit and the exchange of crew has a big impact on a camp isolated 3 weeks in between the flight periods. So although all in camp enjoyed the fresh air from the outer world there was a BIG sigh of relief when the skier took of Thursday afternoon. Friday was the day of training new teams in the drill trench, the science trench and the cfa lab. The day was also used to unpack all the goods that had arrived with the skier and enjoy fresh vegetables and fruit at the meals.

What we have done today:

1.Drilling with the NEEM long drill: 11.22 m. Drillers depth: 1449.26 m

2. Logging 12.32 m of core. Logging depth 1463.58 m

3. CFA analysis: 8.80 m. Depth: 589.05 m.

4. Processing 16.5 m. Processing depth: 1413.5 m (bag 2570)

5. Repairing the broken skidoo

6. Making boxes for the office

Ad 1: Drillers report July 31st: "Yesterday on flight and media day we managed five good runs while making movies and saying good bye to three drillers. Thank you to Olivier, Ji Woong, and Philippe, and we hope to have you all back next year. We welcome two new drillers, Christo and Wang, and welcome the return of Steff to join Anne, Adrian, Romain, and Trevor to form the team to take us to the end of this season. Although drilling has been going well of late, with Steff's arrival we will take the opportunity to do some more focused tuning of the drill before we enter the testing phase. So far we have reconfigured the hallow shaft in order to close the gap in the superbanger, closed the hallow shaft at the base of the superbanger with the spring-ball valve, and removed the lower valve. We have had two short

runs with high current in this configuration so far and will continue testing on the night shift. At the same time we have an eye toward decreasing the inclination of the hole which now stands at 2.8 degrees."
Ad 2,4: The crew in the science trench now consists of Lars M, Jesper, Jun, Li, James, Vasilis, Julia, Thomas, Christoffer, Emilie and Sepp with good help from Todd, Lizzie and Dorthe. Lars G, Kaitlin, Katy, Aslak, Atsushi, Anais and Daphne have left us. It takes a few days to get the routine in the trench with this change but I am impressed by the eager and skill shown in the science trench.

Weather: Overcast with light snow with patches of blue sky in between. Wind 10-17 kn from S. Temperature -11 to -7 deg C.

FL, Dorthe Dahl-Jensen

Figure caption:

Trevor has just pushed out an ice core from the drill. This core, like most of the cores drilled these days, are unbroken 3.5 m long cores. Beautiful!

The tough life of a polar researcher – Louise and Brandon just spoils us with fresh vegetables and fruit.

August

Saturday, August 01st 2009.

Saturday evening! Today is the Swiss national day so we had a Swiss evening. Thanks to Suzanne, Uhrs, Adrian (Swiss guy) and Robert for an excellent meal. The table was decorated with Swiss flags and a green apple with an arrow for

Wilhelm Tell. No further details – except – we celebrated Kumiko's birthday (02 August) at midnight with layered cakes, a birthday song and dancing.

What we have done today:

1.Drilling with the NEEM long drill: 11.78 m. Drillers depth: 1461.04 m

2. Logging 11.04 m of core. Logging depth 1474.62 m

3. CFA analysis: 3.30 m. Depth: 582.35 m.

4. Processing 19.8 m. Processing depth: 1433.3 m (bag 2606)

5. Showers for all

6. Installed kitchen mill in kitchen sink

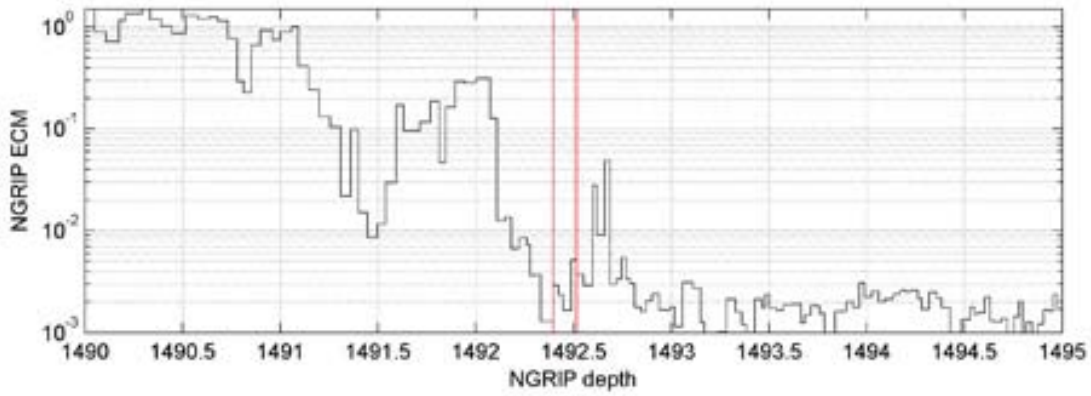
Ad 4: The glacial to interglacial transition. ECM from NEEM is compared to the ECM from the NGRIP core. Based on the match and the NGRIP annual dated transition 11.704 to 11.701 B2P the transition in the NEEM core is predicted to be at the depth 1418.80m. Line scan of the 3.3 m section shows clear cloudy bands in the colder glacial Younger Dryas ice to the right. For the gas sampling the special transition sampling started with bag 2580 (T1). The gas transition sampling will continue to T170 and the return to the original sampling program.

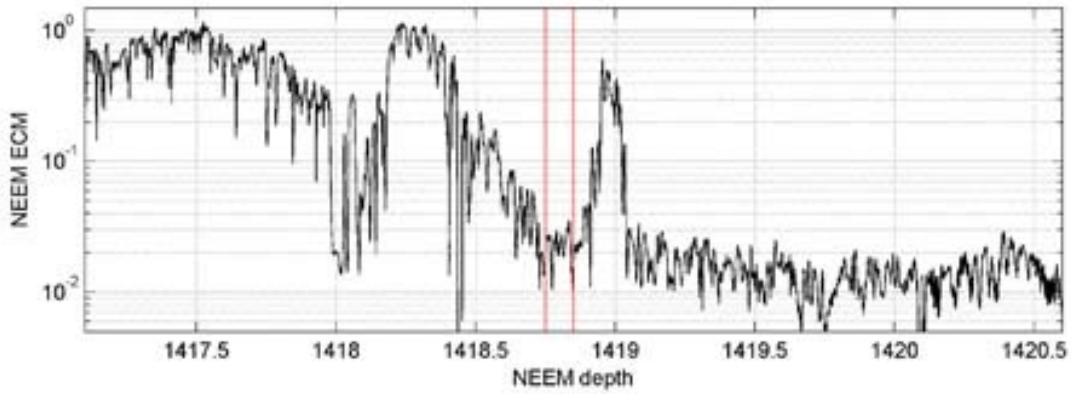
Weather: A sunny and windy day. Blue sky, temperature between -13 to -7 deg C. Wind 12-16 kn from SSE.

FL, Dorthe Dahl-Jensen

Figure caption:

The Wilhelm Tell experiment





Line scan 1416.80 -1420.10m (bag 2577-2482)

The glacial to interglacial transition seen in the ECM data from the NEEM ice core is compared and matched to the ECM transition in the NGRIP ice core. The bottom picture showns the line scan results over the transition.

Sunday, August 02nd 2009.

A quiet day – with no accidents. The science trench reached into Bølling-Allerød ice today, the drillers drilled run 500, the methan Picarro instrument is doing well and the cfa is getting into routine with the new manning. The weather has been good with high winds.

What we have done today:

1.Drilling with the NEEM long drill: 9.44 m. Drillers depth: 1470.48m

2. Logging 9.32 m of core. Logging depth 1483.94 m

3. CFA analysis: 0.55 m. Depth: 592.9 m.

4. Processing 16.5 m. Processing depth: 1449.80 m (bag 2636)

5. Improved office with storage boxes along the sides.

6. Tested HF radio and various antenna's

Ad 1: Drillers report August 02nd : "We continue to train new drillers and to try various hallow shaft/booster configurations to learn about the drill's performance. The closed hallow shaft configuration with no lower valve did not result in stable drilling. We abandoned this test after three short runs with high current. Afterwards we completely cleaned the hallow shaft and repaired the filter and returned the drill to the open hallow shaft configuration and reinstalled the lower valve. Full-long runs were possible again. As before, though, at least one point in each run high current demand is required, probably due to the distribution of the chips in the chip chamber. To learn why this might be happening we have repositioned the middle booster above the central junction. The result of this small change was to redistribute the chips to the upper half of the chip chamber leaving the lower third and the pump clean after a full 3.5 meter run., but still high current is needed at some point during the run that limits the motor RPMs. Another small change was to replace the lower booster (just in front of the pump) with a centering ring. Previously, on a couple of occasions chips were packed between this booster and the pump. There has been no noticeable effect yet of replacing the booster with the ring. On at least one occasion there was also packing between the pump and the ring, but in this case the pump itself was clean. Just before Saturday night we experienced a winch control failure upon hoisting the drill after the day's final run. The winch simply stopped itself at 800 meters depth and the inverter turned itself off and would not restart. The backup winch control was connected without issue (Thank you Jakob and Simon). It seemed that the heating unit of the winch control had stopped working. When we tried to restart it the fan and heater did not turn on. However, Sunday morning I reconnected the original winch control and it restarted without issue. Axel and I will look into what happened more closely, but at the moment all systems are go for both winch controls. Inclination is 2.6 degrees."

Weather: A sunny and windy day. Blue sky, temperature between -16 to -7 deg C. Wind 14-18 kn from SE.

FL, Dorthe Dahl-Jensen

Figure caption:

A quiet camp picture

One of the attempts to improve the antenna was to try with an antenna of aluminum poles. The long aluminum, poles is placed above the surface on bamboo poles.

Monday, August 03rd 2009.

A first picture of the methan Picarro output: the monitoring of the CO2 content in the science trench. The trench is a busy place and during the night the CO2 concentration drops and increases again in the morning when work starts again. The whole camp is summing happily and we had 2 big events to celebrate today: the cfa lab finished the measurement of the ice to the depth of 601.70 m where the brittle ice starts and the drillers passed 1500 m!

What we have done today:

1.Drilling with the NEEM long drill: 21.65 m. Drillers depth: 1492.13 m

2. Logging 23.10 m of core. Logging depth 1505.81 m

3. CFA analysis: 8.80 m. Depth: 601.70 m.

4. Processing 23.10 m. Processing depth: 1472.9 m (bag 2678)

5. Continued to improve office with storage boxes along the sides.

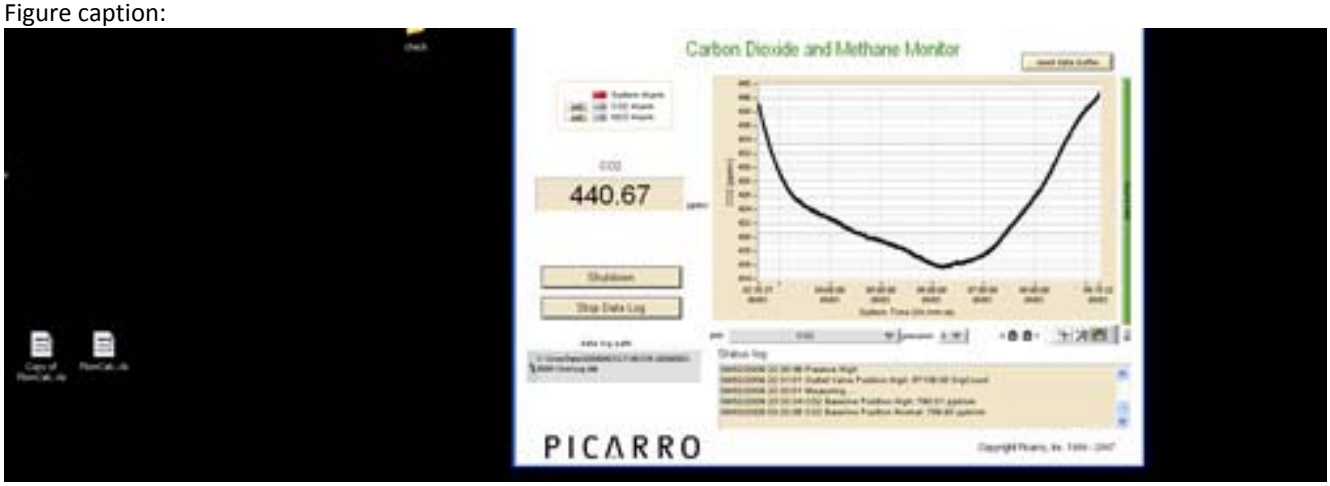
6. Built floor for sauna in the third garage

7. Flattened the camp area for snow drifts.

Weather: A sunny day with light haze at times. Blue sky, temperature between -17 to -7 deg C. Wind 10-14 kn from SE.

FL, Dorthe Dahl-Jensen

Figure caption:



A screen picture from the PICARO CO2 and methan instrument. The CO2 concentration increases during the day when 10 scientisit work in the science trench.

Alli building shelves in the top office.

Tuesday, August 04th 2009.

A good and productive day in camp

It has been a good and productive day in camp. We prepared the camp and skiway to be used for training by LC-130 and we used the afternoon to sample pits because the weather was good. The sun is getting low in the evening and it is very popular to ski or walk in the evening.

What we have done today:

1. Drilling with the NEEM long drill: 19.04 m. Drillers depth: 1511.54 m.
2. Logging 15.41 m of core. Logging depth: 1521.22 m.
3. CFA analysis: 5 NGRIP bags and 36 pit samples from NEEM.
4. Processing 11.55 m of core. Processing depth: 1484.45 m (bag 2699).
5. Biological sampling at NEEM2009S2.

6. Starting pit study 500 m from camp.
7. Grooming skiway to be able to serve the air guard for a proposed training mission on Wednesday. The mission has however been cancelled.
8. Building a pallet with the gas sampling equipment and an empty drum pallet. All pallets have been moved onto drums.
9. Working on improving the HF radio antenna.

Ad 1: Drillers report August 4th:
"A stable mode has been found again by replacing both boosters on the hallow shaft with centering rings. The chip chamber fills evenly from the top down and 24 kg of chips per 3.5 meters is routine in this mode. The best cutting pitch is still 2.1 mm. Inclination has corkscrewed back down to 2.15 degrees."

Ad 4: The processing stopped at noon to keep 2 days behind the drilling in order to let the drill liquid evaporate from the ice cores.

Ad 5: Biological sampling at NEEM2009S2 by Todd Sowers for microbiological contamination is successfully completed. With expert help from Steff, packets of drill fluid loaded microspheres (1 micron in diameter) were delivered to the base of the S2 hole (depth 99 m). Subsequent coring yielded wet cores that are hopefully coated with beads. Future laboratory cross sectional analyses with a fluorescent microscope will tell us just how far into the centre of the cores the beads are able to move.

Ad 6: 500 m away from camp the afternoon was used to start a pit study by Li Chuanjin and a pit study and hand coring by James Zheng. Details on the sampling programs will follow tomorrow.

Weather: A sunny day with high scattered clouds. Temperature between -17°C and -6°C. Wind: 10-13 kn from SSE.

FL, Dorthe Dahl-Jensen

James sampling a hand drilled ice core for studies of metal tracers.

The shallow drill drilling in wet mode to test the ice cores for microbiological contamination.

Li Chuanjin takes pit samples under clean conditions.

Wednesday, August 05th 2009.

A beautiful sunny day. The drilling, the cfa, the science and the logistic work just works in routine. In the science trench we have passed the onset of the Bølling Allerød at a depth of 1489.5m. We are now processing cold Last Glacial Maximum ice with beautiful cloudy bands. Lizzie with her favourite saw – the saw blade is one on the troublemakers and it often jumps of.

What we have done today:

1.Drilling with the NEEM long drill: 25.49 m. Drillers depth: 1537.03 m

2. Logging 29.09 m of core. Logging depth 150.31 m

3. CFA analysis: The remaining GRIP and NGRIP samples. In the evening drilling and sampling a 5m hand core.

4. Processing 14.85 m. Processing depth: 1499.30 m (bag 2726)

5. 500m further from camp the morning was used to continue the pit study by Li Chuanjin and the pit study and hand coring by James Zheng. Position: 77 deg 25.721 min N, 51 deg 06.594 min W
6. Built floor for the sauna in the storage garage (garage 3)

8. Assembled shelves for storage in the carpenters garage

Ad 1: Drillers report August 5th: "Comfortable and efficient drilling today with some adjustments made to cutting pitch after installing new cutters. A new set of cutters was installed after a one cutter was found broken in two pieces upon surfacing. It was a similar break to the cutter that broke in May this season. Inclination has taken a really nice turn down to 1.93 degrees."
Ad 4: The science trench opened after lunch when the pit sampling program stopped. Part of the science team packed the pallet with spare US ice core boxes for storage overwinter (24 ice core boxes with 2 packages of gel elements in each). The white buckets with ice cuttings from the drilling (for Canadian studies) has been moved to the surface for storage on the cargo line overwinter.

Weather: Again sunny day with high scattered clouds. Temperature between -15 to – 5 deg C. Wind 8-14 kn from S.

FL, Dorthe Dahl-Jensen

Figure caption:

Lizzie sawing the ice cores into 55cm sections

Cloudy bands are most visiable in the line scan instrument because a 3 cm slab of ice has been cut clean.

Thursday, August 06th 2009.

End of the season getting closer.
We have approximately one week of normal drilling, processing and cfa left, before we need to pack the equipment down. The camp have started to prepare the shut down of activities in all ways; when will the drillers stop production and test some drill parts in preparation for next year, when will the science trench stop and what should the program for the cfa lab be the last days? While we are planning the work goes on and from the physical property lab Emilie has measured the decrease of crystal size over the transition (bag 2579 and bag 2580).

What we have done today:

1.Drilling with the NEEM long drill: 25.76 m. Drillers depth: 1562.79 m

2. Logging 23.28 m of core. Logging depth 1573.59 m

3. CFA analysis: Analysis of the hand drilled 5 m core and drilling of additional 2 12 m hand drilled cores.

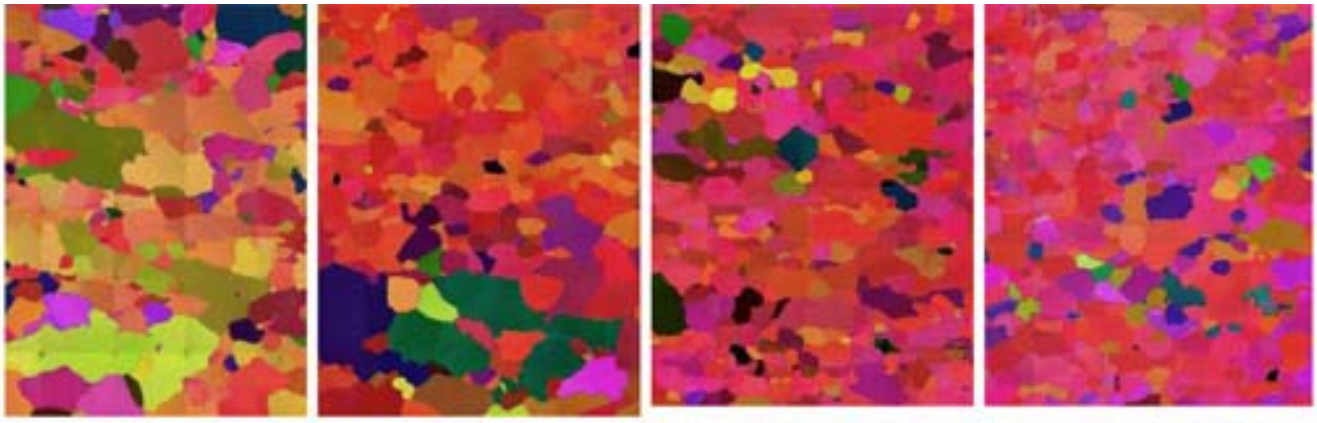
4. Processing 28.05 m. Processing depth: 1527.35 m (bag 2777)

5. Building the sauna in the storage garage (garage 3)

Ad 1: Drillers report August 6th: " A good and routine day for drilling and for the drillers. Inclination continues to improve and is now 1.68 degrees."
Weather: Again a sunny day with high scattered clouds. Temperature between -17 to – 7 deg C. Wind 8-14 kn from SSE.

FL, Dorthe Dahl-Jensen

Figure caption:



Crystal size pictures made by Emilie showing the decrease of crystal size over the tranisiton from glacial to interglacial ice at a depth of 1419m.

Louise and Brandon prepared a fantastic Mexican meal for us last night.

After dinner we played a Mexican game in the storage garage (garage 3). Anne and Christo had prepared a quinada and blinded and turned round several times the quest was to hit the quinada.

Friday, August 07th 2009.

The sauna is finished.
The last construction in camp is a sauna placed in the storage garage (garage 3). An insolated wooden cabin has been built by Alli and Aksel and a shower will be placed beside the sauna. The sauna building has eagerly been followed by the camp and everone is looking forward to the opening of the sauna – at 16:00 tomorrow - Saturday afternoon.

What we have done today:

1.Drilling with the NEEM long drill: 27.79 m. Drillers depth: 1590.58 m

2. Logging 20.58 m of core. Logging depth 1604.17 m

3. CFA analysis: Analysis of the pit samples and one of the 12m long hand drilled firn core.

4. Processing 26.40 m. Processing depth: 1553.75 m (bag 2825)

5. Building the sauna in the storage garage (garage 3)

Ad 1: Drillers report August 7th: "Good drilling again with no adjustments required to the drill. Depth counter/modem communications is acting up. One run resulted in a bottom depth of 40,013.51 meters! The mechanical depth counter was used for the run without a problem. Drill runs end themselves with a drop to low idle current, so even without a precise delta depth for the run we were comfortable with the situation. Stable comms were restored for now with a 30 minute shutdown of the modem. Inclination is steady at 1.65 degrees."
Weather: Again a sunny day with high scattered clouds. During late evening a band of clouds is seen coming in from the S. Temperature between -14 to – 7 deg C. Wind 8-15 kn from SSE.

FL, Dorthe Dahl-Jensen

Figure caption:

Construction of the sauna by Alli and Aksel.

Tim has groomed a “mountain trail” around the camp with the sofa placed on a scenic spot behind one of the cargo line hills from last year. It is popular to take a late evening walk.

Saturday, August 08th 2009.

Science is getting very exciting as we enter the glacial period where there are big and abrupt climate changes recorded in the ice cores. Today we processed ice from the Last glacial maximum 23000 years before present. Sepp prepares sections of the ice on glass plates to study the air bubbles and the clatherates in the ice. The ice looks clear – but a closer look reveals layers with small air bubbles and layers without.

What we have done today:

1.Drilling with the NEEM long drill: 19.98 m. Drillers depth: 1610.56 m

2. Logging 1628.39 m of core. Logging depth 24.22 m

3. CFA analysis: measuring pit samples and shallow cores

4. Processing 19.80 m. Processing depth: 1573.55 m (bag)

5. Finishing shelves in carpenters garage

6. Preparing sauna for use

7. GPS measurements of (WPN01,WPN02,WPN21,WPN22,WPN029,WPN119,WPN209,WPN299) successfully completed

Weather: Again a sunny day with high scattered clouds. During late evening a band of clouds is seen coming in from the S. Temperature between -13 to – 5 deg C. Wind 5-14 kn from SSE. Very early morning ice fog and very late evening ice fog.

FL, Dorthe Dahl-Jensen

Figure caption:

Sepp studying a section of ice for air bubbles and clatherates

The chefs Vasilis, Ramon, Emilie, Tim, Jesper and Christo prepared an excellent 5 course dinner for us Saturday night. A very big THANKS from all from camp.

Sunday, August 09th 2009.

Sunday morning brunch with Blue Grass entertainment.
What more can you ask for… ? At noon Louise and Brandon had prepared a brunch not found better in New York and Julie and Jesper entertained with Blue Grass music and song. Jesper played a bass made of half a fuel drum and a bamboo pole. Julie is the pro. We are preparing a array of accompanying instruments like a fennel rattle, a can washboard, a aluminium pole bell and a typewriter 'pling'. Hopefully the band will grow before next (and last) brunch next Sunday.

What we have done today:

1.Drilling with the NEEM long drill: 10.17 m. Drillers depth: 1620.73 m

2. Logging 1635.42 m of core. Logging depth 7.03 m

3. CFA analysis: measuring pit samples and shallow cores

4. Processing 19.80 m. Processing depth: 1593.35 m (2897 bag)

5. Preparing plywood floor in Sauna garage for dry food storage

6. Building shelves for main dome

8. Preparing documentation of chemicals over winter in camp

Weather: Again a sunny day with high scattered clouds. Temperature between -16 to – 8 deg C. Wind 3-6 kn from S.

FL, Dorthe Dahl-Jensen

Figure caption:

Brunch with Blue Grass entertainment

An over whelming amount of filled ice core boxes in the science trench waiting to be transported back to the many laboratories from the 14 NEEM nations.

Monday, August 10th 2009.

A super good and productive day. Actually is getting rather routine: good sunny weather, good drilling and good work in the science trench. Boring? Well actually exactly what we could wish for. Julie is cleaning the surface of an ice core before measuring the electrical conductivity (ECM). The ECM and the DEP measurements show annual cycles and the big climate transitions that we find in the glacial ice.

What we have done today:

1.Drilling with the NEEM long drill: 28.05 m. Drillers depth: 1648.89 m

2. Logging 27.81 m of core. Logging depth 1663.23 m

3. CFA analysis: measuring shallow cores and pit samples (5th day)

4. Processing 28.05 m of core. Processing depth: 1621.40 m (2948 bag)

5. Moving cold air ventilation to the logging side of the drilling trench

6. Lizzie doctored a saw cut on the hand of Li

7. Inspection of the band saws with repair of the auto stop switches.

Ad 1: Drillers report 10th August: “We are happy to report stable, routine, and boring drilling over the last several days. After a long spiral toward better inclination, the cork screw has turned again and we now stand at 2.0 degrees.”

Weather: Again a sunny day. Temperature between -20 to – 7 deg C. Wind 10 kn from SSE.

FL, Dorthe Dahl-Jensen

Figure caption:

Julie cleaning an ice core before the ECM measurements

Jun, the master of the swiss saw. Every cut is done very precise and the saw is behaving under the firm hands of Jun.

Tuesday, August 11th 2009.

The camp is preparing for the close down next week.
The pull out is next week so the preparations for packing down the camp has started. The mechanical equipment is maintained, the storage garage with the new additional shelves is being filled and documented and the food in the freezer documented. When we leave camp we have a full documentation of what is left in camp so we can plan for the coming season. While the preparations are going on the drill- and science-trench continues at full speed. We expect the drilling to terminate Thursday evening at midnight and the ice core processing on Saturday. The cfa lab with terminate the processing Wednesday evening.

What we have done today:

1.Drilling with the NEEM long drill: 27.18 m. Drillers depth: 1676.07 m

2. Logging 27.61 m of core. Logging depth 1690.84 m

3. CFA analysis: 8.80m, From 1321.50 m to 1290.85 m (bags 2331 to 2347)

4. Processing 19.8 m of core. Processing depth: 1641.20 m (2984 bag)

5. Finishing and closing pit sample area 2.5 km from camp

6. Backup fuel pump functional with the correct fitting

7. New shelves mounted on the second floor in the main dome

8. Making order and documenting the storage garage

9. Making ordering and documenting the freezer

Weather: Ice fog/ low clouds from just after midnight. The fog lifted at 10:00 and we had scattered overcast during the day. The sky cleared during the evening but ice fog started just before midnight again. Temperature between -22 to – 8 deg C. Wind 10 kn from SSE.

FL, Dorthe Dahl-Jensen

Figure caption:

Sverrir in the mechanical garage with the fittings for the backup fuel station.

Alli and Axel bringing the new shelves to the main dome. The snow penguin with eggs has been guarding the camp for the last month.

Wednesday, August 12th 2009.

The ice being processed in the science trench is 30.000 years old from the deep Last Glacial Maximum when it was 25 deg C colder in Greenland than at present. The line scan images are recordings of the visible features seen through a cleaned slab of ice in indirect light. The ice is stripped with clear and cloudy bands. The cloudy bands appear white while the clear ice appears black on the line scan image. The cloudy bands coincidence with layers of high impurity concentrations mainly from the spring storms each year 30.000 years ago. The annual layer thickness is around 1.2 cm here.

What we have done today:

1.Drilling with the NEEM long drill: 29.00 m. Drillers depth: 1705.04 m

2. Logging 22.45 m of core. Logging depth 1713.29 m

3. CFA analysis: 4.40m, From Final cfa depth 1295.25 m (bag 2355)

4. Processing 28.05 m of core. Processing depth: 1669.25 m (3035 bag)

5. Lowering and leveling snow around the main dome

6. Making new box for white weatherport

7. Finalized making order and documenting the storage garage. Documentation is in 'Lagerlisten'

8. Building a pallet of empty drums

9- Placing pallets on the surface for building of new pallets

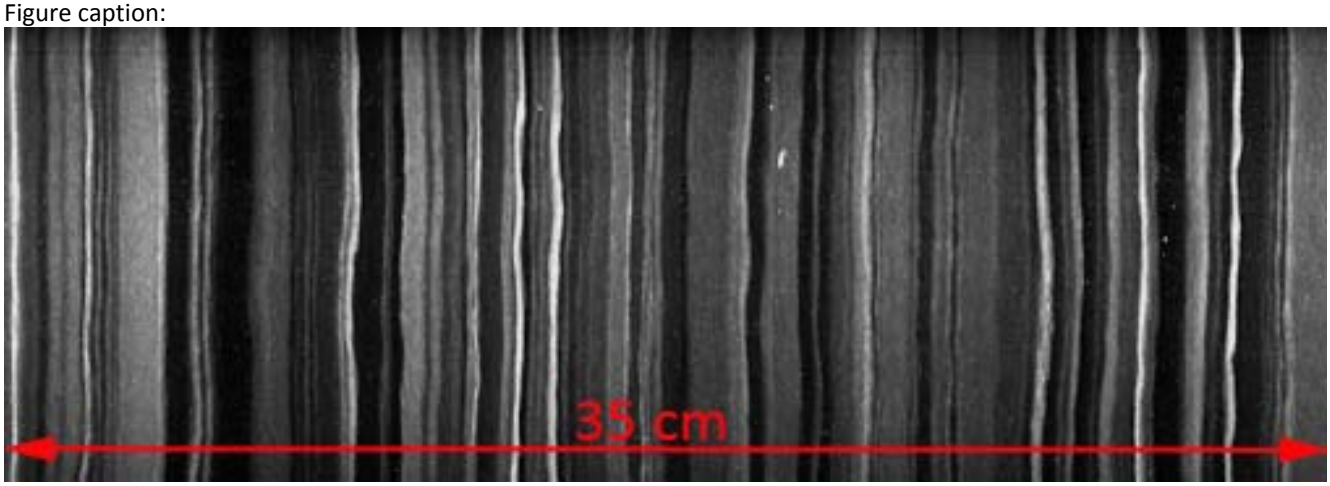
Ad 1,2: It has been noted that the drillers length (cable length) and the loggers length (summed core length) has diverged from the expected 12 to 13 m to 17.5 m. After careful investigation of the evolution of the difference and the logging and cable length measurements it is concluded that the logging is up to the standard and the difference to first order is caused by dirt collecting on the wheel that measures the cable length.

Ad 3: The cfa lab closed today after measuring the first 25 bags of ice below the brittle zone. During the last weeks there has been increasing problems with the very complicated systems and the whole team is relived that it now is time to pack and take the equipment home for cleaning and repair.

Weather: Ice fog lifted at 05:00 and we had a day with overcast. The overcast cleared around midnight where a small front probably passed the camp with the wind turning from SSE to SSW and the wind speed increasing to 15 kn for 3 hours. Temperature between -22 to – 8 deg C. Wind 5-10 kn from SSE the rest of the day.

FL, Dorthe Dahl-Jensen

Figure caption:



Vasilis and Christopher prepared the carefully cleaned slabs of ice for the linescan and run the instrument. The images in the cold glacial ice are stripped with clear and cloudy bands.

The cfa lab closed today – and promise that they will open again next year. 620m of ice was processed this year – 1930 m of ice more to process during the two next years. GOOD JOB!

Thursday, August 13th 2009.

What we have done today:

1.Drilling with the NEEM long drill: 17.88 m. Drillers depth: 1722.92 m

2. Logging 25.30 m of core. Logging depth 1738.59 m

3. CFA analysis: packing the cfa equipment in boxes for retro to Bern, BAS and Copenhagen

4. Processing 29.70 m of core. Processing depth: 1698.95 m (3089 bag)

5. Lowering and leveling snow around the main dome

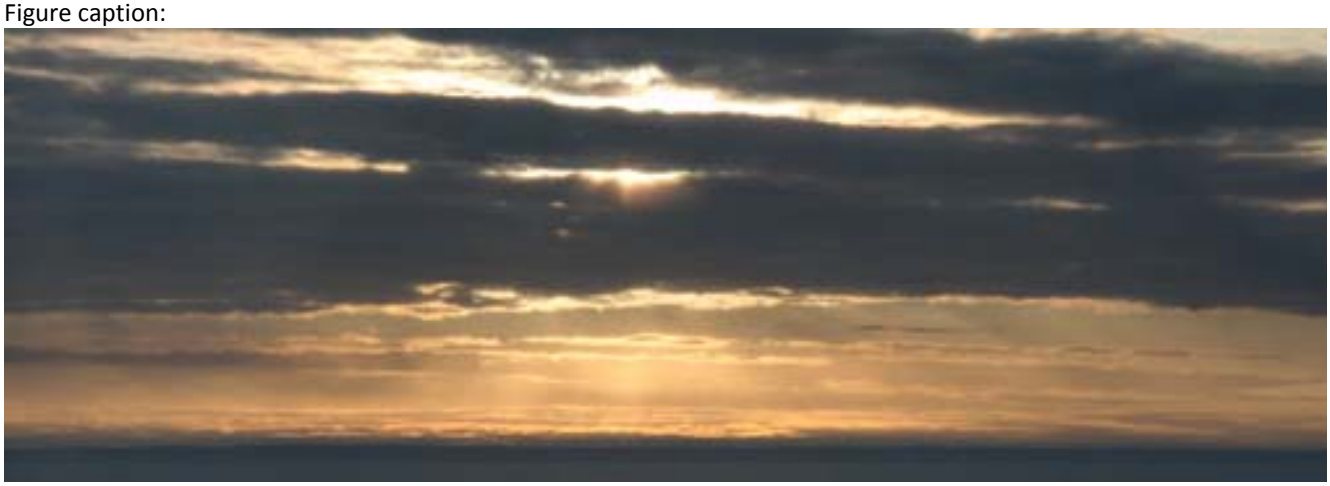
6. Building winter hills for overwintering equipment

7. Successfully deployed 1.3 liters of drill fluid containing microspheres to the bottom of the deep hole (1730mbs) and drilled a full core. The beads were contained in a plastic sleeve that was ripped open once the drill was at the bottom of the hole. A section of the core will be analyzed for the infiltration of the beads into the core over the next few years.

Ad 1: Drillers report August 13th: "Today we deployed the first "bead bomb" down the borehole in support of Todd Sower's biological experiment. A solution of 1 uM fluorescent beads in drill liquid was attached to the hallow shaft in a polyethylene bag reminiscent of the Cognac Bombs used for warm ice drilling. The beads were released at the bottom of the bore hole when starting the drill motor and the bag was sliced via a sharpened Hansen Spring mounted through two of the small holes in the upper part of the outer tube. A slow descent was used with the upper valve closed to protect the "bead bomb" while at the same time filtering the whole (which was very clean). The whole operation took about four hours. Otherwise drilling went fine throughout the day. As the night shift begins a blockage in hallow shaft will be need to be cleaned out. Normal drilling will continue through the regular late shift tonight and the first part of the morning shift, after which time we stop normal operations and make room for testing the smooth outer barrel for the rest of the day."
Weather: Changing overcast with light snow from time to time. Temperature between -13 to – 8 deg C. Wind 8-10 kn from SW.

FL, Dorthe Dahl-Jensen

Figure caption:



The sun is getting low at midnight and we get the colorful sunsets at NEEM – a sign that autumn is coming!

Active removal of snow around the main dome and the trenches: the snow blower on the roof of the science trench and the Pisten Bully between the main dome and the trench roofs.

Todd, Trevor and Steff attaching the plastic bag containing drill liquid and beads to the drill

Friday, August 14th 2009.
The final drill day at NEEM was followed with great excitement because we knew we would break the world record in ice core drilling in one season if we drilled deeper than 1751.51 m – our previous record from the NGRIP drilling in 1999. Just before lunch we got the final core up – a beautiful 3.16m long core in one piece. The final NEEM 2009 depth is 1757.84 m and we have made a new world record. Steff leads a cheer in champagne.

What we have done today:

1.Drilling with the NEEM long drill: 17.47 m. Drillers depth: 1740.39 m

2. Logging 19.25 m of core. Logging depth 1757.84 m. The final NEEM 2009 depth.

3. CFA analysis: packing the cfa equipment in boxes for retro to Bern, BAS and Copenhagen

4. Processing 34.65 m of core. Processing depth: 1733.60 m (3152 bag)

5. Testing a new outer core barrel.

6. Cleaning and documenting drill trench

5. Documenting and organizing garages

Ad 1: Drillers report August 13th: "Today we deployed the first "bead bomb" down the borehole in support of Todd Sower's biological experiment. A solution of 1 uM fluorescent beads in drill liquid was attached to the hallow shaft in a polyethylene bag reminiscent of the Cognac Bombs used for warm ice drilling. The beads were released at the bottom of the bore hole when starting the drill motor and the bag was sliced via a sharpened Hansen Spring mounted through two of the small holes in the upper part of the outer tube. A slow descent was used with the upper valve closed to protect the "bead bomb" while at the same time filtering the whole (which was very clean). The whole operation took about four hours. Otherwise drilling went fine throughout the day. As the night shift begins a blockage in hallow shaft will be need to be cleaned out. Normal drilling will continue through the regular late shift tonight and the first part of the morning shift, after which time we stop normal operations and make room for testing the smooth outer barrel for the rest of the day."

Weather: Changing overcast with light snow from time to time. Temperature between -20 to – 7 deg C. Wind 3-11 kn turning from SW to SSE during the day.

FL, Dorthe Dahl-Jensen

Figure caption:

Celebration of the final ice core for the NEEM 2009 season. Steff leads a cheer in champagne for a good season with a world record in drilling most in a season.

The NEEM camp with the yellow tent village, the red weatherport urban and the main dome. The weather is very changeable and we see very beautiful clouds on the sky.

Saturday, August 15th 2009.

At 16:00 when the generator was turned off for maintenance the candles were lit in the science trench and we celebrated the termination of the ice core processing at NEEM with a glass of warm spiced red wine. After that we had the sauna turned on for the last time this season. The dinner consisted of fish gratin, snow lamb and ice cream super cooled with the remaining kvælstof. The snow lamb was prepared by Sverrir and Alli on charcoal on the snow. The lamb had melted nearly a meter down in the snow when it was done. The ice cream cooling was a fantastic show with the white mist from the cooling creeping over the table. We had a long session with the extended Blue Grass Band led by Julie after dinner. Wow!

What we have done today:

1. Processing 29.70 m of core. Final processing 2009 depth: 1756.70 m (3194 bag)

2. Logging the borehole with the DK logger

3. Packing, cleaning and documenting drill trench

4. Documenting and making sparepart list for the mechanics garage

5. Packing food in boxes and documenting in kitchen tent

6. Packing cfa boxes.

7. Long generator maintenances at 16:00.

7. Celebrating the last Saturday night in camp.

Ad 1: The last ice was processed today and from the ECM and DEP records we have been able to find fixpoints between the NEEM ice core and the well dated NGRIP ice core. The last cores to be processed contained ice from the long Dansgaard-Oeschger event 8 (Interstadial 8) 38.500 years before year 2000 AD.

Weather: Changing overcast with light snow from time to time. Temperature between -20 to – 8 deg C. Wind 5-10 kn changing from SSE to W during the day.

FL, Dorthe Dahl-Jensen

Figure caption:

Celebration of the last core processed in the science trench with warm spiced red wine.

Li with the very last ice core processed this year

Monday, August 17th 2009.

Building pallets

During the day all the many boxes from all the participating nations appeared from the trenches and the tents and the pallets could be built. Many eager hands participated in the building. It is very nice to bild pallets in good weather.

What we have done today:

1.Finish cleaning and documenting trenches
2. Clean and document main dome
3. Take down wireless net
4. Take down the 2 weatherports close to skiway Finish ice boxes and retro boxes (Todd, Dorthe)
5. Build pallets
6. Close watersystem
7. Winterize watersystem, dishwasher, washing machines, soda machine
8. Document food in dome (Louise, Brandon, Emilie)
9. Build ice pallets
10. Take down flag line
11. Move sledges to winter hills

Weather: We had clouds and full overcast in the morning. After noon the sky was blue. During night temperatures dropped to -26.6 deg C with low winds. Max 10 deg C. Wind 3-5 kn from SE.

FL, Dorthe Dahl-Jensen

Figure caption:

After a good days work and building pallets with 80 heavy ice boxes after dinner Lizzie, Julie, Anne and Emilie are enjoying a game of cards. The low orange sun is lightning the room.

Pallet building can be a pleasure in good weather.