

SITREP 8, December 27, 2009

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Written at WAIS Divide

Merry Christmas from the ice! We have passed sea level, and we are now drilling between 8 and 10ka BP. These are interesting times! We are definitely keeping our eyes out for surprising layers in the core. Camp is doing well; the white elephant Christmas gift exchange had some good surprises. We're now getting ready for New Year's (and the cold deck flight that should bring mail on the way in).

I. DRILLING

- A. The drillers are producing beautiful core. It is very clear clathrate ice. We have had issues with scratches along the core (~0.3mm thick, not affecting core quality), which was resolved after changing the cutters. A more pressing issue is the inclination of the drill: It passed 5 degrees mid week (from ~3 degrees at the start of the season), and drillers paused and evaluated the strategy to get it under control. All the relevant experts were called, new pieces were machined, and we are now trying things out. From the start, the weight on bit was kept as low as possible, so that gravity would have a chance to correct the inclination, but it did not appear to be sufficient. New stabilizers were put on the top of the screen sections (above the center of mass), so as to avoid the drill flexing the wrong way in the hole under gravity (for 5 degree angle, and 15 m of drill sonde, we are talking about an arc of 2mm), and to provide a pivot for the drill to start working towards vertical. Additionally, the hole is reamed in between runs for the last 15 m (3 times at first, now 1 time) so that the cutters have some room to play.

The pitch has been reduced. It makes things slower, but it should allow the drill to recover better. Cable payout is about 1.33 mm/s. We have been noticing today that there are some marks on the core, which suggest that the drill is slightly adjusting its location. These marks are ridges less than 1mm thick on the outside of the core. They do not affect core quality. As of run #1245 the inclination is 4.7 degrees. It is too early to say whether we are truly recovering, but it seems that we are on the right path.

If you have some time, you could send a thank you message to Nicolai Mortensen. He has not been sleeping much, and has been doing a wonderful job in trying to find a solution to this problem. nicolai.mortensen.guest@wais.usap.gov

Core dog marks are getting more pronounced. Drillers are also working on it, going from 4 to 3 core dogs. We get bottom breaks pretty regularly (when the ice breaks at the bottom of the drill rather than at the core dogs).

II. NUMBERS

- A. We started the week on a very fast pace, doing 10 to 15 runs a day, around 3.2m each. Monday and Tuesday, we drilled more than 40m of core each day. The record for the longest core was broken on Tuesday, at 3.446m. Things are a bit slower now, owing to the azimuth problem. Overall, we have drilled 59 runs and 187.7m of ice this week, and the last run #1243 has a bottom depth of 1803.86, which corresponds to 10.1ka BP (Neumann time scale).

III. CORE LOGGING

- A. We saw a volcanic ash layer at 1586.37m (temporary depth) last week. This week, we have seen a series of "cloudy layers", which could be ash, or maybe could be wet deposition of dust? There is a series between 1703.832 and 1703.858, and another series between 1741.246 and 1741.274 meters depth. They correspond, respectively, to 9.24ka BP and 9.56ka BP. It is interesting to see several layers belonging to what appears to be several storms. As we were ready to pack the ice (24hr after logging), Peter Neff noticed that he could see more bands: the ice sublimates and gets clearer after sitting in the drying booths for a few days, which lets more cloudy bands appear. We decided to let the ice sit and sublimate for 48hr instead of 24, so that we can detect more layers with the naked eye. By the way, if any of you, readers, have a good idea of what these layers are, and where we should find more, please get in touch with us. We like to learn, and we would be able to have even sharper eyes to look for them! (Our eyes are quite sharp already though. This ice is so beautifully clear!). We are waiting for the potential of another tephra layers around 1822m, maybe tomorrow! We sent a pallet of ice on a cold deck on Monday, Dec 21st. There will be another pallet of ice going on a cold deck flight Monday, Dec 28th. This is pallet #9/11. Bess Koffman's samples will also go on the cold deck.

IV. ARCH TEMPERATURE

- A. The temperature is monitored around the arch using temperature loggers (hobo/stowaway). It peaks during the heart of the day 10am-1pm, and cools off at night. The amplitude is about 3 degrees Celsius. It is definitely colder on our day off, when we are not in the arch. The temperature in front of the AC units is -24 degrees Celsius, and it is -21.77 degrees Celsius at the logging table. It has come up to -19.1 degrees Celsius during a couple hours in the middle of the day. Three of the four AC units are on, and working hard, right now. The fourth unit could work, but needs an oil change. We are waiting for the technician to come.

V. WEATHER

- A. We have had an interesting weather this week: there was a warm front coming through on Tuesday, and the outside temperature went up to -10 degrees C. Friday, we had a cold front come through, with winds around 25 knots, blowing snow, and lots of drifting. In between, we had a chance to see a few gorgeous halos. In general, the surface definition has been low. We hope to be fully shoveled out before the next storm hits us next Wednesday.

VI. FLIGHTS

- A. We had 2 successful LC-130 missions (3 were scheduled). One pallet of ice was retrograded on a cold deck, as well as I-188 (CReSIS) science cargo. We had to choose between "Freshies" (fresh vegetables and fruit) and mail on Wednesday. You guess what won: Christmas Freshies. As a result, everyone is awaiting the pallets and pallets of Santa Claus mail on the next flight. The Basler MKB and Twin Otters CKB and SJB are passing by to do survey lines and install ski-ways for CReSIS. Multiple storms have prevented 2 teams of groomers to go out. The planes are based out of Byrd and will keep passing by to refuel.

VII. CAMP ACTIVITIES

- A. The camp has been very busy doing weather observations night and day before 11 flights were canceled this weeks, due to weather here, at McMudro, at Siple Dome and at Byrd.

The last couple days have seen a lot of grooming of the drifts around camp. Winter burms are progressing slowly, due to poor contrast.

VIII. HEALTH

- A. The last PAX came with a new strand of crud, and the camp is slowly getting affected. The night shift is the most affected. Everyone is watching their sleep, hydration, and basic hygiene.

IX. CHRISTMAS

- A. We celebrated Christmas on Friday night (25th). John White had prepared beef fillet, duck breast, vegetables and salad. It was obvious that the most desired item was the salad! Hors-d'oeuvres started at 4pm, and dinner was at 6pm. Desserts were inspired by French tradition: the Christmas log (chocolate based), and a tower of puffs called "piece montee". True to the original! Camille Frost had been working all week to prepare such a dessert! The traditional white elephant gift exchange was again a success. The most desirable item was a book, dedicated by Shackleton himself, saying "Antarctica is a harsh continent. I wish I had stayed home".

We had one day off this week, and will have another day off for New Year's next week (Friday 4pm-Saturday 4pm). The crew is in great spirits and trying to keep healthy and warm. After a week of production drilling, every one is finding their new equilibrium. We are waiting for new surprises in the ice. Another ash layer? Another cloudy band? These are interesting times!

Merry Christmas from WAIS Divide!