SITREP 8, January 6, 2013; Day 45 at WAIS Divide

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I. Passenger movements

A. SCO

1. Kari Peterson (I-476) arrived Wednesday on D023.

B. IDDO

1. None

II. Cargo Movements

A. No Cargo arrived from McMurdo

B. Retro; AFP of ISC boxes with 6" tubes not needed for replicate core.

III. Camp Activities

A. Current camp population; 47 total. 10 T-350, 3 I-476, 4 I-477, 9 G-079 (PoleNet), 18 ASC, 3 T-500 (KBA).

B. Saturday Safety meeting; After the camp End-of-week Review Mike Roberts (PoleNet mountaineer) gave a short workshop on prevention of lifting and repetitive-use injuries.

C. All three access-ways to the Arch remain open.

D. Elizabeth Morton (IDDO Safety Officer) and I continue to inspect the Arch and surroundings for Safety issues.

E. Camp remains in very good condition thanks to continuous grooming and attention by the camp staff.

F. The skiway remains in good condition.

G. The generator #1 was load tested over the New Year break for 24 hours and passed. Camp has been running on gen #1 this week.

H. The correct parts for the generator are still on the way.

I. The freezers are running normally and temperature has reached -25°C to -28°C. Trays are emptied every 8 hours.

J. Weather this week brought lots of fresh snow with little wind and warm temperatures until Sunday when the winds picked up and we received additional new snow.

IV. Status of Drilling

A. Broaching and further attempts at coring continue in the second deviation.

B. The first full diameter core of Replicate Core #2 was retrieved on Sunday, 30 December. Top depth of fully round core in Replicate Core #2 was 2417.5.

C. The second replicate core was brought to a halt on Thursday morning when one of the cutters sheared off the head while coring taking a second cutter off as well.

D. An attempt was made to fish the cutters using magnets but this was unsuccessful.

E. Deviation for the third replicate core was initiated Thursday evening while work continued on production of the tools needed to fish the cutters from replicate hole #2.

F. Jay Johnson produced a tool that would countersink the center of the bottom of the drill hole so that the cutters would gather in the depression. The tool was deployed Friday afternoon. The next run was with the repaired cutter head and came up with 0.9 meters of ice, the cutters and associated hardware. Regular coring continued.

G. Completed Replicate Core #2 on Sunday, 6 January at 1400. The bottom depth is 2468.99 meters for a total of 51.5 meters of core.

H. The dark ash layer found in the main core at 2462.0 meters CPL depth was identified at 2461.14 meters in the replicate core.

I. We had our highest production day of the season Saturday through Sunday, 20 meters in 24 hours.

J. All of the replicate #2 core was processed and packed.

K. From Jay Johnson: “The final logging tool pass test was completed on 1/1/13 for the second deviation. The test was run this time with a 29lb (129N) dummy tool attached to the 10m tether below the camera. The tool was lowered through the deviation zone,

2390.813m to 2415.026m, at .05 m/s. The total variation in weight on bit (WOB) was 6N. A video was taken of the deviation, but the drilling fluid was cloudy due to cuttings at the time of the test, so we were not able to get a clear image of the borehole wall. My conclusion is that the dummy logging tool passed the test." I concur with Jay's analysis.

V. Flights; flights out of McMurdo have been hampered by very poor conditions on both the road to Pegasus and at the skiway. This has affected fights on continent and flights to and from Christchurch and represents a serious challenge for the end of the season.

Wednesday; D023, Cargo, fuel and Pax

VI. Other

A. John Fegyveresi and Brad Markle continue to work on their side projects at opportune moments. Emily Longano and Ross Beaudette have been assisting. See summaries from Brad and John below.

B. Brad Markle presented a science talk on Wednesday evening which was well attended. The topic was global circulation and glacial cycles as seen from the WAIS Divide Ice Core.

C. Jihong Cole-Dai presented a science talk on Saturday evening which was also well attended. Jihong talked about the science behind the ice being recovered from the replicate cores and why it is important.

This from Brad:

My side project has been going well. I've been drilling shallow firn cores (and sampling snow pits) in transect from camp across the ice divide. So far we've sampled the first three (and highest priority) sites; at WDC, at the divide (20 km from camp), and in-between the two. Time permitting, we will sample two more sites on the far side of the divide. The aim of this project is to better understand the recent spatial variability in water isotopes in the region which help the interpretation of the deep WDC core. To this end, I've also been

conducting some modeling of recent atmospheric circulation in the region.

This from John:

On-site, I calibrated and installed (with the help of Brad, Emily and Ross) five platinum thermistor strings in order to obtain a long-term, near-surface temperature profile over a two kilometer survey line. The purpose of this sensor array deployment is to better quantify the temperature fluctuations in the upper 5 meters of firn and determine if there is a correlation to specific surface features and metamorphism that have been noted at WAIS Divide over the past few seasons. It is hypothesized that these noteworthy features are caused under specific meteorological conditions and under varying degrees of solar radiative exposure and penetration at the surface. Varying temperature gradients in the upper few meters of firn may be modulating differing degrees of vapor flux through near-surface.

The survey line was laid out in an upwind (grid-west, true-north) direction starting near the on-site Automatic Weather Station (Kominko-Slade), which also houses a solar, net-radiometer sensor that I installed last season (11/12). The thermistor strings were calibrated over a 60 minute period using a constantly-stirred ice-bath method, and were then deployed over a 10 day period starting December 15th. The sensor strings are spaced at 10 meter, 100 meter, 1000 meter, and 2000 meters intervals from the origin string at the AWS, and are taking measurements every 1 minute. Platinum thermistors were used as they allow for higher accuracy measurements, and respond to temperature changes more linearly that standard thermistors. 12V batteries are swapped out periodically to ensure that the sensor strings are constantly recording. During each site visit, photographs are taken and local meteorological conditions are noted (as well as any observed surface observations). Net accumulation is also noted. Firn density measurements were also taken at two of the five sites thus far. Lastly, it is hoped that a high-resolution GPS grid survey will be taken to document the short and long wavelength surface elevation changes over a 16 km^2 area that includes the thermistor string survey line. The attached photo is example of surface "glazed"/crust.