



WAIS Divide Ice Core Project

Climate, Ice Sheet History, Cryobiology

Science Coordination Office (SCO)

The WAIS Divide Ice Core Project is progressing very well and preparations for the 2007/2008 field season are almost complete thanks to the efforts of Matthew Kippenhan (RPSC - logistics), Joan Fitzpatrick and Geoff Hargreaves (NICL - core handling equipment), and Alex Shturmakov and Jay Johnson (ICDS - drilling).

The SCO has selected the 10 science technicians who will log the core and assist with the drilling. The technicians consist of students and staff from Tufts University, Princeton University, Pennsylvania State University, South Dakota State University, University of Colorado-Boulder, University of California-San Diego, and University of Copenhagen.

In June we processed the top 110 meters of the main core (drilled during the 2006/2007 field season) at the National Ice Core Laboratory (NICL) in Denver, Colorado. The core processing line also provided an opportunity for some of the SCO-hired science technicians to experience working in the cold, practice handling ice cores, and to work together before deployment to WAIS Divide.



A scientist logs ice cores at the June WAIS Divide ice core processing line at the National Ice Core Laboratory. Photo: E. Cravens (NICL)

Our first annual science meeting will be held at Lake Tahoe on October 4 and 5, 2007. In addition, on Wednesday, October 3 there will be a gas PI meeting and also a borehole logging planning meeting for PIs who are interested in submitting borehole logging proposals. Online registration has already started so if you plan to attend the science meeting but haven't registered yet please do so ASAP. No

late or on-site registrations will be accepted. Full details about the science meeting, including a draft agenda, lodging details, and the online registration form, can be found at: www.waisdivide.unh.edu/meetings/index.html

If all goes according to schedule we'll be drilling with the DISC drill by late-December. After a little warm-up time operating the DISC drill and handling the core, we'll switch into a 6 days/week, 24 hours/day drilling operation. It is lining up to be a great start to the deep ice coring we have waited so long for.

-- WAIS Divide SCO

Raytheon Polar Services Company (RPSC)

It's going to be a very busy field season at WAIS Divide this year. WAIS Divide is scheduled for a Basler put-in around 24 October. This will be the first winter-over with all of the field camp stored outside on cargo lines (rather than stored inside the arch facility as the 2006 winter) and it is expected to be a slow dig out. It typically takes about a week to get the main camp equipment and modules dug out, warmed up, and running. After this initial put-in phase is completed, there will be up to three more weeks of camp construction before everything is in place and operable. A large construction crew is flown in by LC-130 Hercules aircraft to handle the main camp setup. Once camp can support larger populations, arch construction activities followed by the installation of the DISC Drill and the NICL core handling equipment will occur. Drilling and core processing operations are scheduled to start late-December. The current plan is to close camp the first week of February, but that requires the drilling operations to cease and camp population to begin redeployments in late January. Camp population is expected to peak at ~60 people by mid-December.

Dave Zastrow will be returning as Camp Manager this season. Dave was the camp manager during the 2005/2006 field season and we're really excited that he is returning this year. Mike Tayloe (from Katabatic Consultants Inc) and Charles Kirkland have been hired as the medical staff. Charles was the camp medic last season as well. Eric Brown

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Ice Coring and Drilling Services (ICDS)

The DISC Team has been very busy implementing all of the planned modifications to the drill system. We focused our efforts in three areas: the winch, the sondes, and the screen cleaning system.

Extensive mechanical, electrical, and software changes, along with the “in-house” whole system testing of the winch are completed. During the last week of July our “new” winch went through the final steps of all subsystems testing, has been accepted for production drilling at WAIS Divide, and packed for shipment.



Photo: ICDS

Sonde electronics received a major face-lift to increase their robustness and fidelity. All three sondes are fully bench tested at room and -30°C temperatures. No deficiencies were found. Two sondes will be delivered to WAIS Divide, and the third one is packed and will stay in Madison as a spare. By the end of August we plan to finish assembly and room and cold temperature testing of the “engineering model”, which is, essentially, the fourth instrument section of the sonde that is exactly the same as the other three. This section will be used for future hardware and software development, and especially for bedrock drilling and replicate coring modifications.

The new screen cleaning system that includes a wide array of new capabilities - the second screen barrel holder, the system to warm and dry screens, mechanical vibrator to assist chip removal - is finally assembled, tested, and packed.

A lot of small and big changes were made to the control room and control system, the tower and tower base, the drill fluid collection system, borehole covers, gantry cranes, the centrifuge, the fluid handling system, the power distribution system, and the safety system. The numerous

odds and ends have been taken care of - we designed and built special “fishing tools” (we hope that we will never use them), we made special software changes to make our life in Antarctica easier, MECC modifications, and many others.

We identified and ordered the majority of spare parts that would be needed for production drilling. All of them are received and packed.

As I write this update, we are loading four trucks with all DISC equipment to be delivered to Port Hueneme. The cargo is scheduled to arrive to Port Hueneme no later than August 20.



Photo: ICDS

A tremendous amount of work was done to develop and file DISC Drill System documents. Currently we have 738 finished documents which includes not just drawings, but also the procedural documents, such as a DISC Project Management Plan, Quality Plan, Safety Plan, and the FMEA’s for each component of the Drill System. More than 50 documents are in the sign-off stage. This is an ongoing effort, so the number of documents will be growing.

The drilling staff for the 2007-2008 season is identified, and drilling contracts and the physical qualification process are on the way.

We feel that we have an adequate amount of time to be fully ready for the coming production season in Antarctica.

-- Alex Shturmakov, DISC Drill Project Manager, ICDS, UW-Madison

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has been hired as the arch construction foreman. Eric has been part of the WAIS Divide project for a couple of seasons now, including the Greenland Field Test and the 2006/2007 field season at WAIS Divide. We will be able to expedite cargo through McMurdo Station pretty quickly this year due to a dedicated WAIS Divide cargo person in McMurdo.

-- Matthew Kippenhan, WAIS Divide Project Manager, RPSC

National Ice Core Laboratory (NICL)

During this reporting period NICL staff conducted component tests, fabricated additional cpl components, purchased vendor-supplied components for the processing arch, consulted with RPSC regarding air handling in the processing arch and finalized the design requirements for the equipment needed to move core into and out of the basement. The NICL Support Information Package was also completed, reviewed, and submitted during this reporting period as was the FY08 budget request.

Recognizing the potential for supercooling of the ice as it moves through the FED, NICL staff conducted a series of temperature monitoring tests on a core at a starting temperature of -34°C using a 60/40 mixture of Isopar K and HCFC 141b. Three test runs were completed. A maximum cooling of 6°C was observed on the final repeat. Five test runs were completed at a starting temperature of -24°C utilizing a suite of Isopar K / HCFC 141b mixtures. The maximum delta T°C from these tests was less than 1°C.

Simple legibility tests were also conducted during this period to identify the best means of marking wet cores. 6H graphite artists pencil was identified as the best performing marker tested.

CPL components fabricated/assembled during this reporting period include:

- ❖ 4-m tray return rack
- ❖ drying booths
- ❖ computer logging station stands

- ❖ refitted Hardigg cases for computers
- ❖ warm boxes for printers
- ❖ circular saw mount
- ❖ mounting system for Balluffs
- ❖ hoist

CPL components designed but not yet fabricated:

- ❖ hoist cage for basement access (submitted to AES Engineering)
- ❖ downdraft hood (to be fabricated in the field)
- ❖ drying booth ductwork (to be shipped from RPSC and assembled in the field)

Vendor supplied components purchased or submitted to RPSC for purchase during this period included:

- ❖ 2-ton rolling gantry
- ❖ 2-ton hoist
- ❖ 2-ton hoist trolley
- ❖ 2-ton manual chain hoist (backup to powered hoist)
- ❖ platform
- ❖ lift carts
- ❖ Balluff measuring units
- ❖ circular saw blades
- ❖ HDPE shelf liners
- ❖ wire hardware cloth for tray gates
- ❖ additional MK rail system components

In addition 150 out of 350 ISC boxes have been packed with core tubes for shipment to Port Hueneme.

During this reporting period NICL was requested to reconfigure the processing arch floor plan to accommodate taking the DEP analysis bed offline. After consultation with the WAIS Divide SCO a new floor plan was generated that will permit core to be stored offline after it emerges from the drying booths until it can be run through the DEP.

-- Joan Fitzpatrick, NICL



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Kendrick Taylor, Chief Scientist, Desert Research Institute
 Mark Twickler, University of New Hampshire

Joe Souney, University of New Hampshire
 Trevor Popp, Desert Research Institute