

To: US Ice Core Community  
Fr: Mark Twickler – NICL-SMO  
Re: 2004 ICWG meeting review  
Date: March 23, 2004

Greetings,

Below are the review notes from the 2004 Ice Core Working Group meeting held at the Desert Research Institute in Reno, NV, February 26. These notes are a combination of chair, Jeff Severinghaus and Mark Twickler.

NSF Updates:

Antarctic Sciences: Julie Palais and Brian Stone

Personnel changes at NSF since last meeting:

Scott Borg has replaced Dennis Peacock (retired) as Antarctic Science Section Head

The past season was very successful for the Glaciology/Logistics programs. The Light Ground Traverse from South Pole to Taylor Dome was successful; Clean up at Siple Dome from the drilling program completed, Taylor Dome clean scheduled for next year. Need to seriously consider any future deep drill camps design to limit clean up logistics. McMurdo-Pole traverse not as successful as hoped. Although the road through the transition seems good, slow progress across the ice shelf is thought to be due to breaking trail.

Funding and logistics (Herc) outlook is improving with the completion of the South Pole station. 30 flight missions are currently scheduled for the Inland WAIS core in FY06. Julie and Brian have been the joint coders for the Ice Core Drilling Services (ICDS) contract the past 9 months. They are developing an array of ice core drills for use by the community ranging from hand, shallow and deep ice core drills.

Antarctic field support is supported on a three-tier system: Base; Project specific; Anticipation for future programs. Funds are being requested for deep field infrastructure improvements. A new twin-otter contract (3 year with four 1-year extensions) has been awarded to Ken Borek Air. This is a longer contract than in the past and is expected to help in long term logistic planning. Additional funds are being requested to continue the new ICDS deep ice core drill construction (more on the new drill in the ICDS review).

The Arctic Natural Sciences (ANS) – Jane Dionne (not present at meeting)

ANS Section has a new Program Manager, Dr. William Wiseman, a coastal oceanographer. Bill has been a rotator in the Ocean Sciences Division and professor of coastal studies at Louisiana State University.

The proposal pressure in ANS continues to grow while the budget remains flat. PIs may be seeing excellent proposals declined and much of that is due to the unique nature of ANS. It is the only program in NSF which is a "mini-NSF" for the Arctic. We receive proposals ranging from biology (terrestrial, marine and microbial), geology and geophysics (terrestrial and marine), oceanography, glaciology, atmospheric sciences, sea ice, upper atmospheric physics, and contaminants. We are required to maintain a balanced program by funding a fairly equal spread of each of the disciplines. Perhaps it is time to change the way ANS is structured, but that direction will have to come from NSF management or external pressure.

Proposals are being received for the renewal of the arctic logistics contract. VECO is our current contractor and I think that most of the PIs have been very pleased with their support. VECO's current contract expires in Dec. 2004.

NICL Update (Todd Hinkley, Geoff Hargreaves, John Rhoades)

NICL is currently in year 3 of a 5-year inter-agency agreement.

The ICWG decided the best way to increase the storage of ice cores at NICL was to install new, higher density racks. NICL has almost completed this task. This has alleviated the capacity issue at NICL for the next few years. NICL does have the ability to archive the proposed ~3000 meter core from West Antarctica, satellite cores from that project and have room for additional cores. With the new configuration of storage racks, storage of individual PI samples (from processing at NICL) may become an issue. The ICWG is aware of this and will start addressing the issue.

NICL has an excellent outreach program and has received the "Benchmark Award" from the USGS for their outreach activities.

International Partnerships in Ice Core Sciences (IPICS) Workshop – Algonkian Regional Park, March 13-16.

Representatives from 11 countries of the ice core community recently meet to discuss international partnerships in ice core sciences. A report from the workshop will be published in the next 6 months. To keep updated on IPICS check out the IPICS webpage: <http://nicl-smo.unh.edu/IPICS/IPICS.html>

International Polar Year (IPY) (Mary Albert)

The 4<sup>th</sup> IPY will occur in 2007-08.

This could be an opportunity to increase long-term funding for ice drilling science by a quantum step. Needs work but could possibly establish an ongoing, permanent ice drilling program along the lines of ODP, instead of episodic campaigns, with a cadre of professional drillers who could make a career out of it. Could be called "Ice Drilling Program" (IDP) to underscore comparison with ODP. Julie Palais suggested an acronym: "COnsortium for INternational Cooperation in Ice Drilling Endeavors" (COINCIDE)

The general themes are "compelling science", "bipolar", and "international". Two sub-themes for focus are 1) Change in polar regions, 2) Exploring new frontiers

There is the possibility to bring new money into OPP

FASTDRILL (rapid access drill) would be a good focus – new, enabling technology that would increase scientific understanding of deep ice and access to bed by order-of-magnitude. FASTDRILL is better for borehole thermometry than larger-diameter ice core boreholes and could vastly increase polar climate understanding, especially spatial variability. Subglacial geology/hydrology is a largely unknown frontier.

To learn more about IPY visit the website at: <http://dels.nas.edu/us-ipy/index.html>

Inland West Antarctic ice core update – Ken Taylor

On February 25, ~65 members of the community meet to discuss the proposed Inland WAISCore. More than 30 investigators briefly described their ideas of research on the core after a discussion on the science goals of the core. Ken Taylor will be submitting a proposal for the Science Coordination Office (SCO) for the deep drilling project. New role of the SCO - Ken will propose to hire some of the drillers and some of the core handlers through the SCO, in addition to those hired through ICDS. This met with general agreement with the ICWG. Otherwise SCO role would be much like that at Siple Dome. NICL will have a greatly expanded role in ice coring relative to past projects, with NICL responsibility beginning as the core is removed from the barrel.

The current name for the "Inland WAIS" ice core is "WAIS2", although this is still being discussed.

ICDS overview and update – Don Lebar, Alex Shturmakov, Bill Mason

Don Lebar gave a general overview of ICDS. This talk discussed the organizational structure, personnel issues.

Bill Mason gave in-depth presentation of drill sonde design. Design is partially complete. Design contains many new innovations (outer barrel rotates, powerful pump motor, drill motor and pump motor are coaxial, 24 sensors on sonde so operator has unprecedented knowledge of state of drill, 4 redundant fiber optic cables insure adequate communication to surface. Cable is steel, (Kevlar too stretchy) 0.6 inch (15 mm). Cable will weigh 5000 lbs in fluid, 8000 lbs in air. No data yet on how much the cable will stretch.

The sonde will consume 5.5 kW. Most power to pump motor.

Drill fluid is still to be determined. There is a chance it might be ISOPAR-K with HFE (hydroflouroether) densifier, unless problems are found. Mike Gerasimov doing high pressure tests of fluid's compressibility, miscibility, tendency to stick to chips, over a range of temperatures.

Feedback from scientists who are testing samples of the fluid should be in by March 12.

-General feeling is that with the decision made to go with a 12.2 cm drill, the only remaining major issue is the drill fluid. Thus decision on drill fluid should be expedited. Recent discussions (at the IPICS workshop) with the scientific/drilling community may cause a change to a more standard drill fluid.

Discussions on ICDS overview and update

Ken and Jeff raised major concerns about whether schedule is realistic. Can the drill be finished in such a short time? Both are worried that the drill will not be done by the deadline of April 1, 2005 for shipment to Greenland. ICDS has history of fielding drills that are not ready (Megadunes, hand corer for Greenland, cited as examples). Ken said that we are especially sensitive to this issue because it happened at Siple Dome with PICO, and also earlier with GISP2 (Richard). How can we the ICWG help ICDS to meet this deadline, Ken and Jeff asked?

Cash flow problem identified: Brian and Julie had postponed some major capital expenditures until October 2004 due to budget constraints. Can these items be ordered earlier, using some temporary funding or a loan? Also, Alex said that improved cash flow would help in expediting purchases.

Alex and Bill Mason both stated that they could use some help, another drilling engineer in particular. Skilled person needed rather than someone who has to be trained, because time is too short now to train someone. Don gave a different message, saying that things are OK as they stand. This issue was discussed offline.

Alex also stated that there was no overall money problem, meaning that sufficient funds were available. This was somewhat confusing. Perhaps the distinction is that eventual funding is sufficient, and what we have now is just a cash flow problem.

Jeff requested Brian and Julie to meet with Alex and Don offline to resolve the cash flow problem.

ICWG as a whole recommends to ICDS that they accelerate the schedule by about one month to allow for contingency.

Another thing that would help ICDS, said Alex, would be to lighten the burden of meetings, teleconference calls, and report writing over the next three months so they can focus on building the drill. Brian emphasized that he cannot totally stop monitoring the contractor's progress since building the drill is a \$6M job.

Another problem that has been simmering for a long time, Ken and Jeff said, is that there seems to be a tendency for good news to get passed along up the chain to NSF, but not the bad news. This must change if we are to successfully deploy a drill, Ken and Jeff

claimed. Totally honest and complete communication is a requirement for a successful drill construction. Improvements in communication are critical to our effort.

#### NICL-SMO Update – Mark Twickler

The ICWG has been in existence since 1986. There were no formal bylaws for the group. A set of bylaws were reviewed by the ICWG and unanimously accepted. The bylaws are attached to this message.

We will be looking for new members for ICWG very shortly. NICL-SMO will send a call for volunteers in the coming weeks.

NICL-SMO received 38 requests for ice core samples from NICL. The GISP2 core continues to be the most requested ice core with 10 requests for samples. 13 of the requests were for de-accessed ice and 5 requests for outreach activities.

#### Open discussion- other issues

Decision needs to be made whether to do Inland core processing in the field, GISP2-style, or at NICL as in subsequent cores. ICWG believes that undergraduate, graduate students and postdocs benefit from field experience, so some activities should be done in the field. But most core processing should be done at NICL to minimize cost, and because Antarctic season conflicts with teaching schedules unlike Greenland season. Shipping partly cut-up core is problematic. Shipping core in increments, with some staying at McMurdo, is also problematic. Core should be shipped in one mass per season for best preservation. Thus CPL will be done at NICL.

There was some discussion of whether non-NSF/USGS users of NICL for core storage and processing should pay fees or somehow regularize what has been informal agreement between NSF and other agencies. Example of NASA-funded cores taking up NICL staff time during one summer was cited. No consensus reached; discussions on this issue continue.

Cores of opportunity at South Pole and Vostok in proposal by individual PI. No action taken – ICWG feels that this should be a matter between the PI and collaborating ice core scientists. When this opportunity exists NICL-SMO will send a message to the community.