

ICWG 2008 Meeting Review

Denver Federal Center Building 810 – Hayden Room

March 27-28, 2008

Attendance: 35 people. Representatives from: NSF, USGS, NICL, ICWG, ICDS,
NSIDC, RPSC and 16 Institutions.

Ice Core Working Group – 2008 – Member Listing

<u>Representative</u>	<u>"Disciplinary"</u>	<u>Alternate</u>	<u>Years Served</u>
Eric Saltzman Chair -	Atm Chemistry	TBD	3
Ross Edwards	Ice Chemistry	TBD	3
Lonnie Lane	Technical	TBD	3
Howard Conway	Modeling/Geophysics	Todd Dupont	3
Todd Sowers	Gases	TBD	3
Eric Steig	At Large	TBD	3
Karl Kreutz	Stable Isotopes	TBD	3
Ian Baker	Physical Properties	Rachel Obbard	1
Brent Christner	Biological	TBD	1
Tom Neumann	Surface Glaciology	TBD	1
Ken Taylor	WAIS Divide - At Large	TBD	2
Ryan Bay	Borehole Logging	TBD	1
Mark Skidmore	Biogeochemistry	Christine Foreman	1

NSF Update – Julie Palais

Arctic Update:

Jane Dionne retired from Arctic Natural Sciences Program Manager in January.

Arctic ice core activities are being handled by Bill Wiseman, who was the co-Manager with Jane for Arctic Natural Sciences Program.

New announcement just released for new Arctic Natural Sciences Program Manager.

Others who might be involved with Arctic ice core activities: Martin Jeffries, Arctic Observing Network Program Director and Neil Swanberg Arctic System Science Program Director.

Patrick Haggerty working with Renee Crain. Both are Research Support and Logistics Managers for the Arctic

Antarctic Update:

Bernie Letau retired from Manager of Ocean & Atmospheric Sciences Program. Peter Milne is the new Ocean & Atmospheric Sciences Program Manager

Antarctic Logistics.

Brian Stone Deputy to the Director (Erick Chiang)

Alexander Isern; Antarctic Logistics Manager. Replacing Brian Stones' previous position.

Cyber Infrastructure playing a big role in NSF funding. Keep an eye out for program solicitations or check on the web.< <http://www.nsf.gov/dir/index.jsp?org=OCI>>

Budgets: They are tight. Large cuts in both Arctic and Antarctic programs. Doing what they can to keep things going. Did not get money from Congress along with fuel and other prices going up.

New Drill Solicitation (released after meeting)

(http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503228&org=OPP&from=home) Julie Palais and Alexander Isern are the NSF contacts. NSF is committed to keep WAIS Divide drilling continuing with new contract.

NSF puts out “nuggets” on research being done. Keep your Program Manager informed on your research, findings, press releases so they can get the work out.

NICL Update – Todd Hinkley

Personnel changes: Randy Schumann is the Acting Technical Director for NICL.

Current Inter-agency Agreement between USGS and NSF is for 2 years (until 11/09). NSF covers 75% and USGS covers 25%. NICL annual budget \$925,000.

Current holdings at NICL are 14,555 tubes. NICL had 1126 client activity hours (including NICL time assisting clients). 34 sample allocations and a WAIS Divide core processing line. Client hours are typically busier in the Spring months and slower in the Fall.

Outreach visitors to NICL: 1733 people. Similar to last year. NICL still curtailing visits due to staffing load for tours. 10 film crews visited NICL for video recording.

Inbound ice shipments were 30,000 lbs, outbound ice shipments were 18,600 lbs.

Inventory status: ~62% of the NICL holdings have been completed.

NICL is planning 3 core processing lines (CPL) from May-October. In May the cores collected on the US_Norway Antarctic traverse will be processed. WAIS Divide will have 2 CPLs. In June, the chemical, isotopic and physical properties sampling will be processed. In July, biological scanning of the core and gas sampling will be performed.

Physical plant:

The NICL freezer system is approaching 15 years old.

Aggressive maintenance regime continues with a favorable alarm record recently. -There was a problem with the back-up generator kicking in but that has been solved.

The concern over a backup cooling tower is still present. If the cooling tower were to fail it would take days to weeks to replace. Maintenance is performed but this is the weak link in the archive preservation system. Cost for back-up cooling tower is in the ~\$100,000 range.

The computerized control system for the refrigeration system is getting outdated due to advancements in technology. An updated system is estimated in the \$15,000-25,000 range.

NICL Concerns:

PIs who want to ship ice to NICL need to make arrangements at the proposal stage to assure adequate storage space at the facility, which includes amount of ice and timetables for being at NICL.

Investigators returning samples to NICL after analysis need to contact NICL well in advance of sending samples.

Investigators who receive Insulated Shipping Containers (ISC) from NICL need to return to NICL ASAP so the ISCs can be sent to Antarctica for the WAIS Divide core retro.

Investigators need to remove processed samples from NICL in a timely manner.

Shipping of samples via Federal Express has caused some major delays in the past several year. Fed Ex not being much help in this matter. No shipments were compromised but still a concern.

As always, storage space is a concern in the NICL facility. Current capacity will allow for the WAIS Divide core and up to another possible 1000 meters or so before capacity is reached.

NICL-SMO Update - Mark Twickler

ICWG:

Seven new members were added to the Ice Core Working Group. Brent Christner (Louisiana State) replaced Scott Rogers as the Biology rep. Ian Baker (Dartmouth) is the Physical Properties rep with Rachel Obbard (currently at BAS) the alternate. Ryan Bay (UC-Berkley) was selected as the Borehole Logging rep. Mark Skidmore (Montana State) as the Biogeochemistry rep with Christine Foreman (Montana State) as the alternate. Todd Dupont (UC-Irvine) is the Modeling/Geophysics alternate.

Sample Request:

NICL-SMO received and processed 28 sample requests in 2007. GISP2 (11 requests) remains the most requested core from the archive followed by Vostok and Siple Dome (4 each). 4 de-accessed requests were processed. Nine pre-proposal requests for ice from the NICL archive were sent out.

January-March, 2008, six sample requests were processed. One request for GISP2 rock core was processed and one pre-proposal requests for samples from the NICL archive.

Outreach:

NICL-SMO outreach activities included a science café talk at the Exploratorium in San Francisco, talks to schools and civic groups. Video was donated to 4 film productions and still imagery was donated to 7 groups consisting of magazines, museums and newspapers.

Two issues of *In-Depth* were published in 2007 and the Spring issue of 2008 is in production. NICL-SMO requests submissions of articles to *In-Depth* from the community.

NICL-SMO is working on an ice core poster for the community. A draft was shown at the meeting. Comments were collected from the Group and the next draft will be circulated to the ICWG for additional comments.

ICDS update – Don Lebar

2007 Projects:

Greenland Summit Cores Jihong Cole- Dai, PI

4-Inch Drill with collet head

Beth Bergeron and Terry Gacke – Drillers

4 Holes Cored in 22 ½ days

80-meter

161-meter; later deepened to 220 meter

80-meter

220-meter

Used multiple shoe/cutter combinations

Good to excellent core quality

Summit Greenland Firn Air and Cores M. Albert and J. Severinghaus, PIs

Badger-Eclipse Drill

J. Kyne, L. Albershardt, M. Waszkiewicz – Drillers.

1 - 120-meter core and firn air sampling.

Other cores using Prairie Dog Drill.

Testing of modifications to drill.

Norwegian – American Traverse Mary Albert, PI

Badger-Eclipse Drill and Hand Augers

Lou Albershardt – Driller

US ITASE Paul Mayewski, PI

Badger-Eclipse Drill and 2-Inch Drill

Mike Waszkiewicz – Driller

Four - 3-inch cores

1 - 150-meter

3 - 50-meter

100 meters total 2-inch core

Mount Erebus Seismic Phil Kyle, PI

4-Inch PICO Hand Auger with Sidewinder

Jay Kyne – Driller

10 Holes drilled

6 – 12 meter with core collected

1 – 9 meter

2 – 7 meter

1 – 6 meter

Thwaites Glacier Seismic Sridhar Anandakrishnan

Operated by science crew

Thwaites Glacier

15 holes

15 meters deep

15 minutes per hole

WAIS Divide

36 holes

30 meters deep

25 minutes per hole

Drill Modifications:

Eclipse Drill Modifications

Simplified Control Boxes

Sled mounted drill assembly

Collet cutter heads

New core barrels

Other Drill Modifications

Updating of 4-Inch Drills

Barrels
Instrumentation/Controls
Hand auger – cutter holders/cutter inserts
Koci Drill
Downhole vacuum cleaner
Re-sized ice coring drill
New drill stand
Sleds for portable hot water drills

Upcoming Field Projects

Summer 2008 Drilling
McCall Glacier Cores – Matt Nolan
2008-2009 Antarctic Season Drilling
WAIS Divide Shallow – Ian Joughin
South Pole Firn Air – Murat Aydin
Beacon Valley (Test)– Michael Bender
Nor-Am Traverse – Mary Albert
WAIS Divide Deep – Ken Taylor

Other:

Fast Access Drilling and Ice Sheet Bed Sampling Workshop
–April 29-May 1, 2008
Design of DISC Drill ice sheet bed sampling equipment (2009-2011)
Design of DISC Drill replicate coring system (2009-2012)

National Snow and Ice Data Center Update – Ted Scambos

Antarctic Glaciological Data Center (AGDC) – Funded since 1998. Expecting to put a extension proposal this June.

Main Goals:

- archive the data sets funded by the NSF Glaciology Program and closely-related geoscience data (Palais, Wagner, Borg)
- provide ‘compiled data sets’ that are useful for the community in conducting Antarctic glaciological research

NSIDC moving from ftp data download to map servers and a new tool “A-CAP” (Antarctic-Cryosphere Access Portal). A-CAP will consist of web-based tools for comparing, analyzing, interpreting data sets.

Project Updates:

WAIS Divide – Ken Taylor, Geoff Hargreaves, Jay Johnson
<http://waisdivide.unh.edu/>

SCO:

Field Staff for 2007/2008
SCO office staff
Ken Taylor, Trevor Popp, Joe Souney
SCO field staff

Gabrielle Dreyfus (Bender, Princeton)
Sylvia Englund (INSTAAR, White)
David Ferris (SDSU, Cole-Dia)
John Michler (PSU, Sowers)
Anais Orsi (Scripts, Severinghaus)
Ursula Rick (INSTARR, Pfeffer)
Inger Seierstad (Denmark, Dahl-Jensen)
Zach Smith (Tuffs)

Science in the Field:

Physical properties (Nicole Reed, Metro State)
DEP-annual layers (Rebecca Anderson, DRI)
Shallow temperature logging

Media events for 2007/2008

Nova
Climate change, WAIS Divide and ANDRILL
Polar-Palooza
NSF funded, video blogs
Possibly National Geographic
WAIS stability
SCO
Collecting HD video with RPSC support and DRI equipment
Blogs from the field

2008 Activities

Core Processing at NICL
460 m core in June
Science Meeting
La Jolla, October 2, 3
Antarctic Field Season 2008/2009
Open camp, work on arch (4 weeks)
Drilling prep & training drill (1 weeks)
Deep drilling, 600 - 800 m of new core (6 weeks)
Hope to end season at ~1,400 m depth
Science and Implementation Plans
Replicate coring- Severinghaus
Basal Sampling- Priscu, Skidmore, Tulaczyk

Beyond 2008 Activities

January 2011: Touch the bed (permit permitting)
2011/2012: Logging and basal sampling
2012/2013: Replicate coring

ICDS:

Installed Drill
180 drill runs were completed over 14 days
During 24 hour operations we drilled an average of 40m per day

The average core length was 2.7m
2.6m min – 3.0m max
467m drilled
Final borehole depth was 580.6m
Drilling fluid usage
16,029L total
58 barrels of Isopar K
24 barrels of 141b
Fluid lose rate was 26%

NICL:

Installed core handling equipment
Trained Science Techs
Logged, packed and shipped to 580 m

Greenland North Eemian (NEEM) – Jim White

Collaborative project involving Denmark, US, Netherlands, Germany, UK, Canada, Sweden, Belgium and France

Objectives/Questions

Obtain a full record of the last interglacial period (Eemian)
- Stability
- Gas records
- Sea ice extents, etc.

Climate of northern Greenland
New gas and gas isotope analyses

Funded US Activities by OPP

Logistics funded via grant to J. White
LC130 support, camp fuel, Kanger support
US field personnel
Claude Laird, Prasad Gogineni (U. Kansas, CReSIS), radar profiling

Schedule:

Summer 2007: traverse from NGRIP to NEEM, transfer heavy equipment and supplies, cache fuel, 3 shallow cores (along route), surface and airborne radar
Summer 2008: set up camp, dig drill and science trenches, begin main hole, shallow cores
Summers 2009-10 (and 11?): drill to bedrock

Norwegian-US Scientific Traverse of East Antarctica - Tom Neumann

<http://traverse.npolar.no/>

Collaborative project involving CRREL, Dartmouth, U Vermont, U Colorado, DRI and the Norwegian Polar Institute.

Objectives/Questions

What is the accumulation rate in this part of East Antarctica, and has it changed in recent decades?
What regional climate patterns are evident in this area of East Antarctica over the last 1000 years?
What is the evidence in East Antarctica of anthropogenic activity abroad?
What is the thermal response of this area to global warming?

Roosevelt Island – Twit Conway

Proposal being re-submitted this June. Collaborative project currently involving U. Washington, Oregon State, USGS along with New Zealand, Denmark and United Kingdom.

Objectives/Questions

- a “dipstick” that will help constrain deglaciation
- contribute to the IPICS 40-ka array
- an ENSO climate record through the Holocene

Logistics:

- Challenging
- Danes offering the use of the *Hans Tausen* drill
- New Zealand offering to archive core and logistic assistance

Denali – Karl Kreutz

Collaborative project between U Maine and U New Hampshire

Objectives/Questions

- How anomalous is recent Arctic warming in the context of the past 2000 years?
- What are the spatial patterns of climate variability over the past 2000 years, and how are they related larger scale events (LIA and MWP)?
- How did Arctic climate respond to forcings (volcanic and other aerosols, solar, GHG) over the past 2000 years?
- What role do tropical-extratropical teleconnections play in North Pacific climate variability?

Fieldwork: May 2008:

- Fixed wing transport to Kahiltna Base Camp
- Travel over glacier to Kahiltna Pass, 14,000’ Medical Camp, Peters Dome
- Installation of AWS stations at Kahiltna Pass and 14,000’ Medical Camp
- GPR surveys at each site
- Shallow cores and snowpits at each site; transport of cores to Kahiltna Base Camp by helicopter, transport to Anchorage via fixed wing

IPICS – Ed Brook

<http://www.pages.unibe.ch/science/initiatives/ipics/>

International Partnerships in Ice Core Sciences rationale:

- To meet the expectations of the research community, increasingly complex future ice coring projects will require international collaboration.
- By working collaboratively we can investigate more complex, universal issues than can one nation working alone.

IPICS now has representation from 20 nations.

Website is being hosted by PAGES and small funds for meeting support.

IPICS is a working group within IUCS (International Union of Cryospheric Sciences). Provides meeting venue and may provide financial support.

Endorsement by SCAR. Bid to become an “expert group” in July at St. Petersburg Meeting.

Recent science progress

- Camp being build at NEEM, drilling to begin this year.

Survey work for oldest ice.
Drilling at James Ross Island (BAS), WAIS Divide, NEEM.
French-Chinese preliminary drilling at Dome A

GISP2 Borehole Casing Damage – Mark Twickler

Over the past decade or so, logging on the GISP2 borehole has been taking place. It has been found that obstructions appear to be inside the casing. Bob Hawley has a borehole logging video camera we put down the GISP2 casing in the summer of 2007. His footage shows that there appears to be significant damage, especially where the casing is joined together. At this point most logging tools would not be able to safely deploy into the GISP2 borehole without significant risk to loss of instrument and/or blockage of borehole.

The ICWG recommends ICDS be tasked with repairing/replacing the casing in the GISP2 borehole to allow access. It is also noted that the Taylor Dome and Siple Dome boreholes have used the same style of casing and will most likely need repair in the future.

Future USGS Involvement in the National Ice Core Laboratory: Issues and Options

Randy Schumann and Tammy Dickinson

Background:

When USGS bid for the opportunity to operate NICL in the late 1980s, Survey management anticipated that USGS scientists would engage in climate change and atmospheric research, using ice cores as a central tool. Examples include:

- atmospheric sulfur isotopes
- noble gas isotopes in ice bubbles
- physical properties studies
- atmospheric deposition of trace metals, salts, and dust

As budgets and priorities changed, these projects were (for the most part) not funded by USGS.

As part of its strategic planning, USGS is evaluating its long-term commitment to manage the NICL. They have put together a “NICL Future Working Group” document. The group is looking into a variety of issues relating to USGS/NICL relationship including:

Although USGS operates NICL, and contributes partnership funding to its operation, USGS derives little research benefit from NICL.

How does USGS directly benefit from operating NICL?

How does NICL fit into USGS Bureau and Geologic Discipline strategic science directions?

What is the likelihood that future USGS research directions will involve ice cores?

Major Benefits to Scientific Community:

Competent, well-trained, professional staff are permanent USGS employees – continuity and consistency of management and research support

Well-maintained, well-run facility on secure government campus, centrally located in U.S.

USGS does not compete with its customers for lab use and ice samples

Education/Outreach – popular facility for tours, media coverage; excellent opportunities to educate the public on climate change, role of ice in paleoclimate research, and the cryosphere

Technology development – WAIS core handling system, ice core imaging system, SafeCore development

Benefits to USGS:

- Outreach/Publicity – NICL is a highly popular media target and tour destination, helping to make the USGS name and mission highly visible
- High quality operation of NICL bolsters USGS reputation

NICL Role in USGS Science:

- Past and current role: very minimal use of ice cores in USGS cryospheric research
- USGS, CCSP, NSF science plans identify climate change as a high priority research direction
- Primary strategic direction for USGS/DOI climate change activity is establishment of “climate change effects monitoring network” to monitor climate change impacts on terrestrial, freshwater, and coastal ecosystems
- Anticipated USGS climate change research directions for next 2-5 years do not identify polar ice research as a high priority (present USGS cryosphere research focus is on Alaskan permafrost and glacier dynamics)

Options for USGS and NICL Operations:

Option 1:

- USGS Continues to operate NICL
- “No Regrets” option – cannot predict future funding outlook, commitment of new administration to climate change research
- Assumes that NICL’s intrinsic worth to USGS is independent of internal research mission (at least in the short term)
- Would need to address space issue – limited future core storage capacity
- USGS would need to hire long-term NICL director with appropriate research background (permanent, term, university IPA?)– may involve additional cost to USGS to support research role of position
- USGS cost share is continuing issue – possibly explore identifying partner to assist with or take over USGS cost share

Option 2:

- USGS Discontinues Operations of NICL
- Effect on USGS reputation and working relationship with NSF, scientific community?
- Physical location of NICL – could/should it remain at DFC?
- Would GSA lease space to non-government entity?
- Would another management entity be able to effectively manage the facility if it remains in Denver?
- Potential for core damage or loss with move to another location
- Possible adverse staffing issues – 4 USGS permanent employees
- Timeframe for transition plan

Next Steps:

- Working Group to complete “white paper” outlining issues and options
- Group will make recommendations to USGS management by early Summer 2008
- USGS management decision on future involvement of USGS with NICL by end of FY2008
- USGS decision communicated to NSF as soon as possible

Discussions:

Discussions on this issue were very enlightening. Below are some of the comments made during the discussions. It was also decided that NICL would draft a message to the US ice core community about the USGS/NICL relationship and would be distributed by NICL-SMO. The message was circulated to the community on April 7. To date, there has been 10 replies to the questions sent out by USGS/NICL.

Currently USGS supports 25% of NICL operations, NSF supports 75%.

Comments are opinions of meeting attendees and not necessarily those of NSF or USGS.

Are there other partners out there who would be willing to contribute to the NICL mission?

The issue is not being driven by the fact that the cores at NICL are not from the US. USGS has international programs.

Scope of the Working Group: Only to recommend what the USGS should do with NICL, not what happens beyond the decision.

NICL preserves ice core samples. Does the USGS have a mission/mandate to preserve samples? answer, not officially.

USGS is reviewing all of its laboratories, not just NICL

USGS paleoclimate programs do not focus on ice core research. Funds are not in the budget to move to this medium of study.

How often do USGS mission/scientific strategies change? every 5-10 years, most recent came out less than a year ago.

USGS tried to increase ice core research but was unable to get funds.

USGS is committed to a transition period should they decide not to operate NICL.

NICL is a shining gem at USGS along with being a world class facility.

The media exposure of NICL for the USGS is immense, well worth the funds contributed.

How do other archive facilities operate in the US? There is an ongoing NSF survey on NSF sample storage. Waiting for report.

Storage of ice cores is difficult since the samples are not stable at STP.

Support from ice core community would have a positive influence on USGS management.

Stability of 15 years at the USGS along with competent and dedicated staff with institutional knowledge is a tremendous asset.

USGS ideal place since no conflict of interest on research with USGS scientist.

NICL serves as a scientific platform for the US ice core community.

Defining NICL mission: just archival duties or technical development in core handling areas?

ICWG feels NICL staff are motivated by technical development in ice core processing.

ICWG believes that NICL technical director does not necessarily require a PhD level staff but highly motivated managerial skills.

Science community should drive the mission of NICL but not the financial aspects.

NICL currently has opportunities to increase floor space, but clock is ticking on this issue.

NICL is located in a central location and provides an affordable meeting venue.

Should the name of NICL be changed to remove the "laboratory" aspect? National Ice Core Archives?

What are the disadvantages of USGS operating NICL? Not many.

Major disadvantage: That we are having these discussions about USGS operating NICL.

USGS not supportive of NICL? Financial arrangements with NSF.

Outreach at NICL should be more of a USGS tasking since they get the most benefit from it.

USGS is supportive in running NICL. This is all about the availability of funds.

The above are comments from the open conversation about USGS and NICL operations.

Discussions were held over 2 days. Again, these comments are those attending the meeting and may not reflect USGS and NSF opinions.

Ice Core Consortium

The ICWG discussed the idea of creating an Ice Core Consortium (referred to as *COINCIDE*:

Consortium for Inter-University Cooperation on Ice Core Drilling and Experimentation). A draft white paper was presented by Eric Saltzman and Ed Brook. *COINCIDE* would be established to provide scientific leadership and oversight for critical aspects of the US ice core research program. It is thought that a more comprehensive, integrated management structure for US ice core science is needed in order to manage our growth, maximize the scientific yield of drilling projects, and to take advantage of the opportunities for collaboration with international partners. These aspects include long range scientific planning, scientific project management, ice core retrieval, archival and storage, and interaction with international partners in ice core research.

The recommendation from the White Paper states:

“It is recommended that a University Consortium for Inter-University Cooperation on Ice Core Drilling and Experimentation (*COINCIDE*) be established as a means of strengthening and centralizing the management of the highly distributed US ice coring program. The new organization would incorporate the existing ICWG and SMO, provide scientific oversight of ice coring projects, and directly manage and operate critical support facilities. *COINCIDE* would represent an incremental, but significant step in the evolution of the US ice core enterprise, and help ensure that the US ice core community continues to play a leadership role in global climate research.”

The White Paper can be downloaded at:

<http://nicl-smo.unh.edu/icwg/UCICRWhitePaper2008-03-07V2.pdf>

The ICWG was in favor of exploring the idea of *COINCIDE*. It was decided that a small committee would be developed to look into the notion of *COINCIDE*. Eric and Ed are leading the committee.

If you have interest in being involved please contact them. The Committee will be looking into:

Defining why we want to form a Consortium

Defining what is “ice core” research

Timeline:

Draft a report (July 2008)

Re-evaluate (November 2008)

Present to ICWG at 2009 meeting