



IDDO HAPPENINGS SINCE LAST SAB MEETING AND FUTURE PLANS

SAB MEETING 2014

7TH INTERNATIONAL WORKSHOP ON ICE DRILLING TECHNOLOGY

- Sponsored by IDPO-IDDO, IPICS, and IGS
- September 9-13, 2013
- 101 Attendees from 13 countries
- 56 Papers – 8 by IDDO staff and 2 by UW PSL
- 36 Posters – 2 by IDDO Staff, 1 by PSL, and 2 by IDPO
- TAB Meeting Held In Conjunction with Workshop



ORGANIZATIONAL

- Resignation of Nicolai Mortensen – Setback
- Using EE and Technician from Local Engineering Firm
- Hiring of Mechanical Engineering Research Intern – Grant Boeckmann, former student assistant
- Drillers Hired as Employees of UW
 - Working through details of how it will work
 - 2 Drillers with continuing appointments

OPERATIONAL

- **Survived Government Shutdown and Resulting 2013-14 Field Season Changes**
 - Most field projects completed
 - WAIS divide season cancelled but siple dome logging done instead
- **FFY 2013 Ended Up as 13 Month Year**
 - Start of new Dartmouth IDPO and IDDO sub-award delayed until November 1 (FFY begins October 1)
 - IDDO continued operations including 2013-14 field projects and equipment development projects

CHANGES

- Don Lebar Plans to Retire June 30
- Positions to Be Filled by Highly Qualified Individuals
 - Mark Mulligan – Principal Investigator
 - Kristina Dahnert – Program Director
 - Alex Shturmakov – continuing as Director of Engineering and Research
 - Two new SSEC employees being hired – together will help backfill and improve IDDO capabilities



RECENT, CURRENT AND UPCOMING IDDO FIELD PROJECTS

SAB MEETING 2014

ARCTIC/ALASKA

2013

HAND AUGERS

ARCTIC

MCCALL GLACIER

- P.I. Matt Nolan
- McCall Glacier, Alaska
- PICO 3" and 4" drilling to explore processes of internal accumulation of ice within firn
- Collected approximately 40 meters of shallow firn cores down to 10 meters depth

GREENLAND CORE ARRAYS

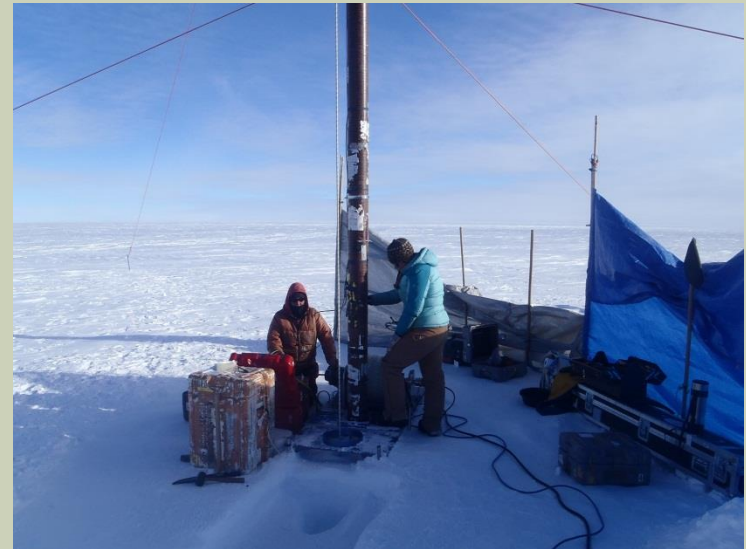
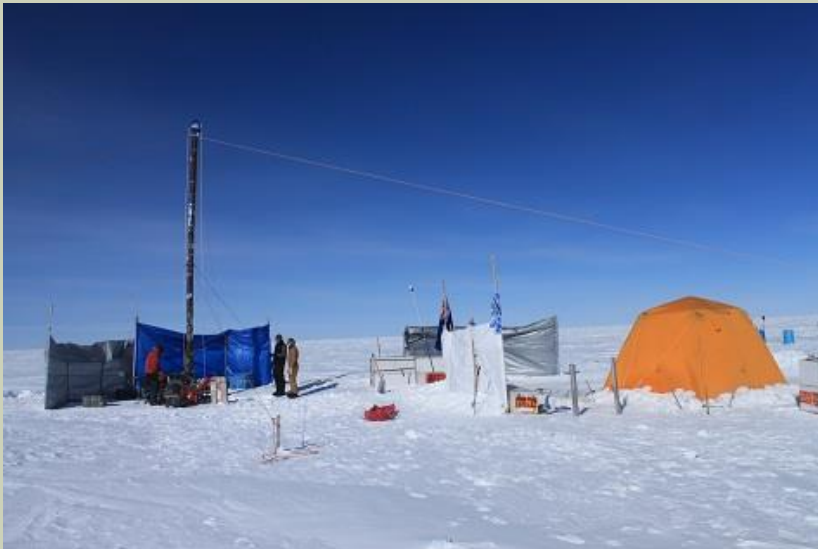
- P.I. David Noone
- Summit Camp, Greenland
- Firn core collected for isotopic analysis using a new IDDO 3-Inch hand auger and Sidewinder system
- Drilled two 20-meter firn cores

IDDO continues to use P.I. feedback to improve Hand Auger design and function.

4-INCH DRILL

GREENLAND AEROSOLS & GREENHOUSE GASES CORE - TUNU

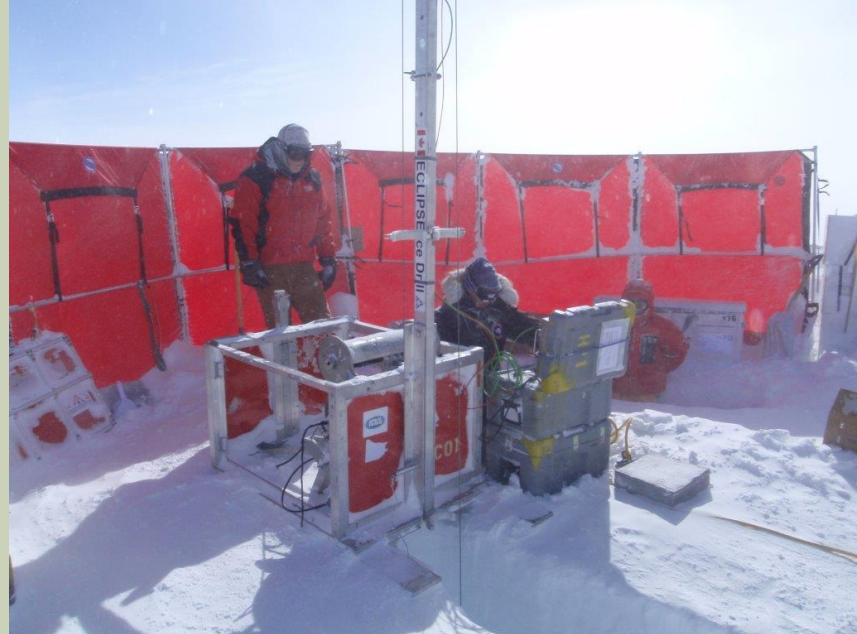
- P.I. Joe McConnell
- Co-P.I. Ed Brook
- IDDO Driller Beth Bergeron
- One 213 meter dry borehole drilled in 14 days
- One 142 meter dry borehole drilled in 5 days



BADGER-ECLIPSE DRILL

GREENLAND COSMOGENIC C-14 CORES

- P.I. Vasilii Petrenko
- Co-P.I.'s Ed Brook and Jeff Severinghaus
- IDDO Drillers Lou Albershardt and Mike Jayred
- Two boreholes dry drilled to 120 meters and 90 meters for firn air pumping studies



BADGER-ECLIPSE DRILL

DENALI ICE CORE

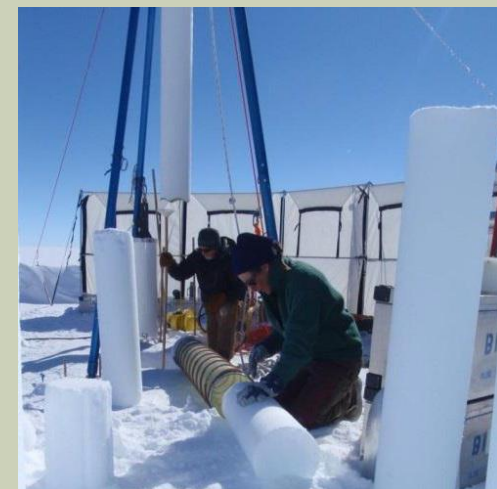
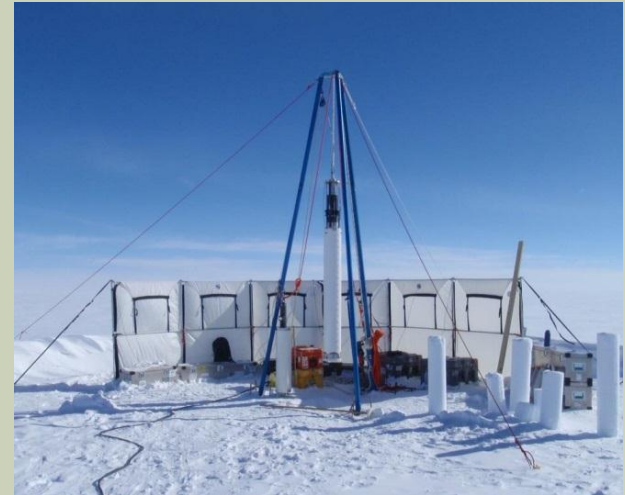
- P.I. Erich Osterberg
- Co-P.I.'s Karl Kreutz and Cameron Wake
- IDDO Driller Mike Waszkiewicz
- Two boreholes dry drilled to 208 meters on Mt. Hunter between May-June
- All drilling and camp operations completed using IDDO's newly designed solar and wind power system



BLUE ICE DRILL

GREENLAND COSMOGENIC C-14 CORES

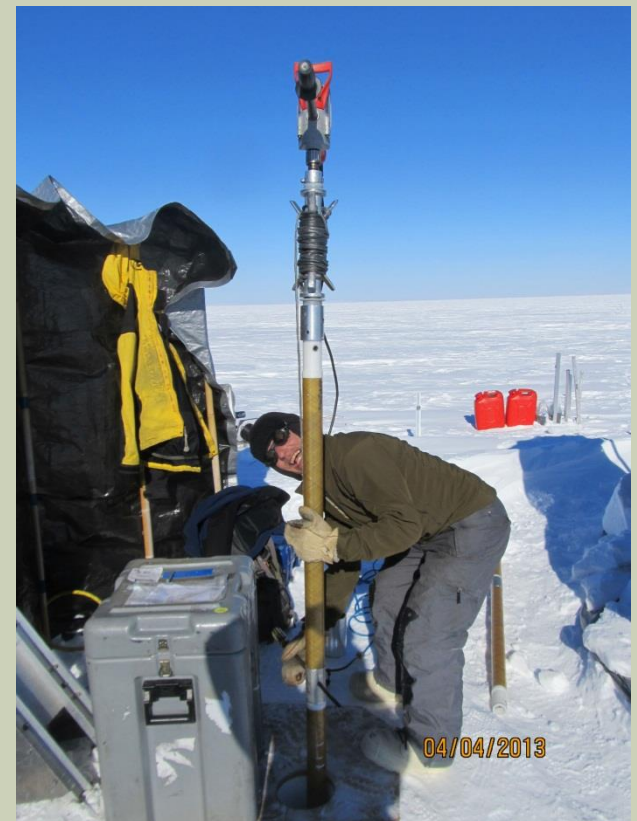
- P.I. Vasilii Petrenko
- Co-P.I.'s Ed Brook and Jeff Severinghaus
- IDDO Driller/Engineer Tanner Kuhl and Driller Mike Jayred
- Objective was to test the Blue Ice Drill's ability to collect large diameter (9.5 inch) firn cores.
 - Tested split-ring collet performance for core recovery
 - Tested new anti-torque addition to motor section for deep coring
 - Tested upgrades to slide-hammer assembly for core breaks



THERMAL DRILL

GREENLAND FIRN AQUIFER CORE

- P.I. Rick Forster
- IDDO Driller/Engineer Jay Kyne
- Follow up project to 4-Inch Drilling in 2011 where the drill hit a water layer
- Successfully drilled two holes to 60 meters and 25 meters for the installation of thermistor strings



ANTARCTICA

2013-2014

SMALL HOT WATER DRILL

BEARDMORE GLACIER SHOT HOLES

- P.I.'s Twit Conway and Paul Winberry
- Collection of active source seismic data using hot-water drilled shot-holes
 - 112 25-meter holes drilled
- Drill operated by science team



INTERMEDIATE DEPTH LOGGING WINCH

SIPLE DOME BOREHOLE LOGGING

- P.I.'s Ryan Bay and Joey Talghader
- First deployment of IDDO's new Intermediate Depth Logging Winch
- Successfully obtained two round-trip dust to 1000 m depth and logged to >200 m depth using a second fiber optic method
- Severe weather delays and aircraft unavailability kept crew onsite for 15 days instead of the 6 days planned



DISC DRILL

DISC DRILL PACKING & ASSEMBLY

- 2013-2014 WAIS Divide field season canceled due to government shutdown in fall 2013.
 - WAIS Divide Camp did not open
 - Logging and DISC Drill packing operations were delayed by one year



BLUE ICE DRILL

TAYLOR GLACIER BLUE ICE CORES

- Two projects jointly supported with the Blue Ice Drill
 - AEROSOL FLUXES TO TAYLOR DOME AND TAYLOR GLACIER
 - P.I.'s Sarah Aciego and Paolo Gabrielli
 - Top five meters of ice discarded and samples collected from 6-7 meters depth
 - 66 holes drilled with 120 core samples collected and shipped to the University of Michigan for analysis
 - 14C FROM TAYLOR GLACIER BLUE ICE CORES
 - P.I.'s Vasilii Petrenko, Ed Brook and Jeff Severinghaus
 - Approximately 900 meters drilled with the BID
 - Approximately 180 boreholes sampled to 4 meters or deeper with PICO Hand Auger and Sidewinder

PLANS FOR UPCOMING SEASONS

ARCTIC 2014

HAND AUGERS

U.S. & CANADA

NW GREENLAND HOLOCENE CLIMATE CHANGE

- P.I. Erich Osterberg
- Plan to drill a 30-meter ice core outside of Thule Air Base in Greenland during late May and early June 2014
- New IDDO Hand Auger and Sidewinder

MIDWEST U.S. ICE CORES

- P.I. Mike McKay
- Lakes and rivers in the Midwest U.S. & Canada
 - Coring completed in March 2014
 - First use of new IDDO hand auger in lake or river ice
 - Some issues experience with fractured cores and the cracking of the aluminum cutter head
- Two additional field seasons planned in 2015 & 2016
 - May provide a SIPRE Hand Auger for use in 'dirty' lake and river ice

HAND AUGERS

GREENLAND

GREENLAND CORE ARRAYS

- P.I. David Noone
- Summit Camp, Greenland
- Firn cores will again be collected for isotopic analysis using a new IDDO 3-inch hand auger and Sidewinder system

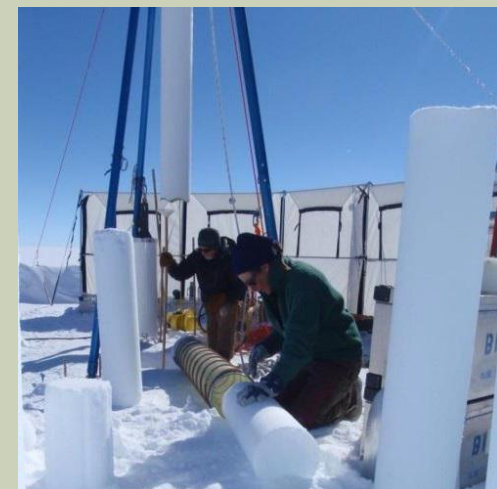
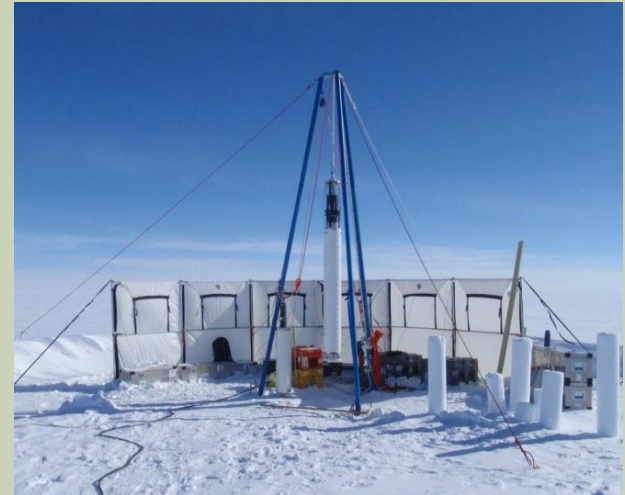
DISKO BAY ICE CORE

- P.I. Sarah Das
- Disko Bay, Greenland
- Using an IDDO 3-inch hand auger, firn cores of 10 meters depth are planned
- Drilling currently in progress by the science team

BLUE ICE DRILL

GREENLAND COSMOGENIC C-14 CORES

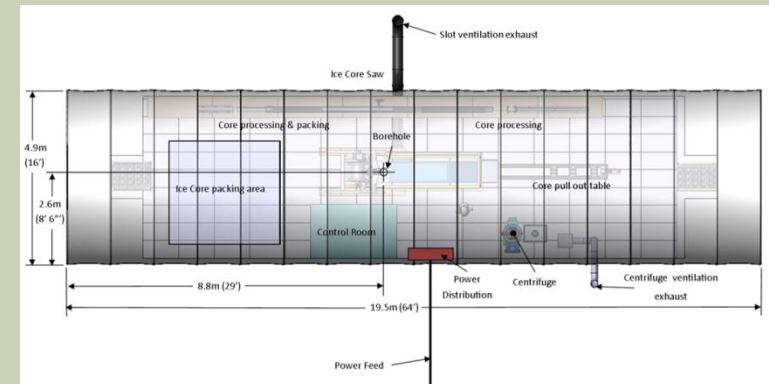
- P.I. Vasilii Petrenko
- Co-P.I.'s Ed Brook and Jeff Severinghaus
- IDDO Driller/Engineer Josh Goetz and Driller Mike Jayred
- Plan to collect firn cores down to 20 meters depth
- Very shallow samples to be cut using hand saws
- Nearly 150 holes planned with Blue Ice Drill between 3.75 meters and 20 meters
- Plan to test BID-Deep Drill components, including extensive testing of slide-hammer in preparation for 2014-2015 Taylor Glacier season in Antarctica



INTERMEDIATE DEPTH DRILL TEST

INTERMEDIATE DEPTH DRILL TEST

- Full scale drill test at Isi Camp outside of Summit Station from April 21–June 14, 2014.
- Tests to include checks for:
 - Safety
 - Drill unpacking and assembly
 - Drill calibration
 - Coring performance test
 - Ductile and brittle ice acceptance tests
 - Drilling information/cycle times
 - Power consumption
 - Disassembly and packing
- SCO and Danish colleagues to visit from May 14-18, 2014.



ANTARCTIC

2014-2015

DISC DRILL PACKING & BOREHOLE LOGGING

DISC DRILL PACKING & ASSEMBLY

- 2013-2014 WAIS Divide field season canceled due to government shutdown in fall 2013.
 - Logging and DISC Drill packing operations were delayed by one year
- Plan to send a crew of 3-4 people to fully disassembly and pack the DISC Drill in late December 2014/early January 2015
- Drill packing will coincide with borehole logging operations completed by Ryan Bay, Gary Clow and Erin Pettit
 - IDDO will send one operator to assist Gary Clow in the operation of the USGS logging winch
 - The USGS deep logging winch has now been transferred to IDDO at the University of Wisconsin and will be returned to Madison following this field season.

BLUE ICE DRILL

TAYLOR GLACIER BLUE ICE CORES

- P.I.'s Vasilii Petrenko, Ed Brook and Jeff Severinghaus
 - Collect a series of cores to depths approaching 70 meters
 - Samples to again be melted onsite



INTERMEDIATE DEPTH DRILL – SPICE CORE

SPICE CORE PROJECT

- P.I.'s Eric Saltzman, Eric Steig, Tom Neumann, Murat Aydin, Mark Twickler, Joe Souney
- Drilling operation located near South Pole Station
 - Crew to be housed in the elevated Station and commute to and from the drill site
- Two drilling seasons planned, with an optional third season for drilling completion or borehole logging



QUESTIONS?