

# ICE BITS NEWSLETTER

FALL 2013

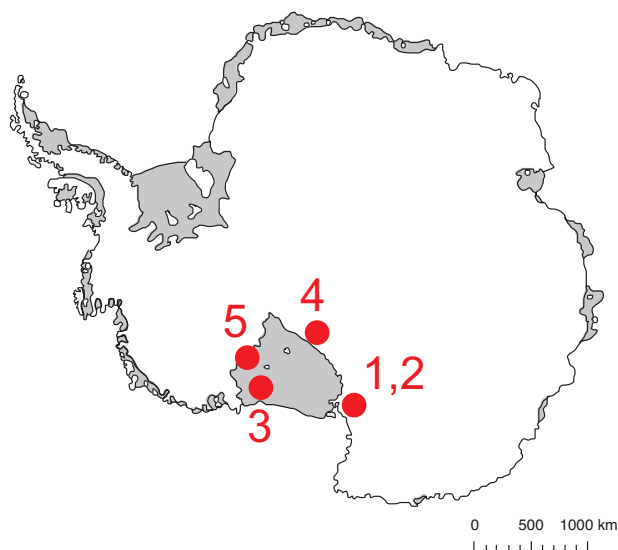
**U.S. Ice Drilling Program**  
Ice Drilling Program Office | Ice Drilling Design and Operations



*Quarterly update of Ice Drilling Program Office (IDPO) and Ice Drilling Design and Operations (IDDO) activities*

## Field Support to Antarctic Projects

During the 2013-2014 Antarctic field season IDDO is providing support to five projects: (1) the Climate Controls on Aerosol Fluxes to Taylor Dome and Taylor Glacier project (Aciego, PI) will use the Blue Ice Drill to collect shallow ice cores to investigate the changing climate of the Taylor Dome area from the Last Glacial Maximum through the Holocene; (2) the Carbon-14 in Taylor Glacier Ice project (Petrenko, PI) will use the Blue Ice Drill to collect large-diameter ice cores to understand the past methane budget and cosmogenic carbon-14 production rates; (3) the Roosevelt Island Borehole Logging project (Hawley, PI) will use a logging tower to help log the Roosevelt Island Climate Evolution borehole to investigate the internal properties of the ice; (4) the Beardmore Glacier Dynamics project (PIs Conway and Winberry) will use a small hot water drill to create the shot holes needed for their seismic characterization of the subglacial environment of Beardmore Glacier; and (5) the Optical Fabric and Fiber Logging of Glacial Ice project (PIs Bay and Talghader) will use a logging tower and the intermediate depth logging winch to profile the Siple Dome borehole with optical logging instruments that permit the study of dust, crystal structure and ice fabric.



*Map of Antarctica showing IDDO 2013-2014 field season locations. The numbers shown on the map correspond to the project numbers in the text at left.*

## Equipment Development

### **Intermediate Depth Drill**

Assembly of the various drill subsystems are in process for the Intermediate Depth Drill (IDD), and all assembly and preliminary testing of the IDD is expected to be completed on schedule for the field test in Greenland during the spring of 2014. Upon repair/upgrade from the field test, the drill will be shipped to Antarctica for use at the South Pole during the 2014-15 field season.

### **Deep Logging Winch**

The manufacturer (Markey Machinery Co.) delivered the Deep Logging Winch in early September. IDDO personnel are in the process of completing the design of the winch sled and minor modification to the winch control system. The winch is scheduled for completion in early 2014.

### **Blue Ice Drill-Deep**

IDDO is continuing with the development of the Blue Ice Drill - Deep (BIDD) system, based on the existing Blue Ice Drill (BID) system. The new system will be aimed at achieving a depth of 200 m and will eventually be used to acquire very large amounts of ice from Taylor Glacier that are needed for the study of cosmogenic carbon-14. The schedule for development is such that the first field test of the BIDD will be in Greenland in the summer of 2014.

### **STAY CONNECTED WITH US:**

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### **Shallow Basal Material Recovery Drill**

One of the goals identified in the IDPO Long Range Science Plan 2013 is the need for nimble methods for reconnaissance recovery of small rock cores near ice margins. In response to this, IDPO-IDDO is initiating work on a new Shallow Basal Material Recovery Drill designed primarily to retrieve bedrock samples beneath ice that is up to 200 to 300m thick, and will be easily transportable. The first use of this drill is planned for Antarctic field season 2015-2016 for recovery of rock pieces under several hundred meters of ice.

### **Rapid Access Hot Water Drill**

During Program Year 2014, IDPO-IDDO is initiating the design of a new Rapid Access Hot Water Drill that has a modular capability to accommodate creation of access holes of different diameters from 500 m up to 2,500 m in depth. This drill will support requests from the community for investigating basal conditions and geothermal flux, sub-ice shelf mass balance, grounding zone processes, and sub-ice microbial ecosystems and biogeochemistry.

## **Scientific Drilling in the Polar Regions Town Hall Meeting**

**Date:** 12 December 2013

**Time:** 6:15 PM – 7:15 PM

**Place:** Moscone West Room 2003



TH45B. Scientific Drilling in the Polar Regions

IDPO is once again organizing a Town Hall meeting at the Fall AGU Meeting entitled “Scientific Drilling in the Polar Regions”. Ice sheets and ocean sediments hold crucial evidence of past climate. National and international collaboration for drilling in the remote polar regions requires strategic coordination between science, technology, and logistics. The research community is invited to hear updates on recent planning including IDPO-IDDO, NICL, IPICS, RAID and ANDRILL initiatives. Opportunities for community involvement will be showcased and input solicited.

AGU Meeting website for more information:

<http://fallmeeting.agu.org/2013/events/th45b-scientific-drilling-in-the-polar-regions/>

## **Educational Outreach**

An IDPO-IDDO team will be presenting “Polar Science and Engineering: A Model for NGSS Practices” at this year’s AGU annual conference, during the Geophysical Information for Teachers (GIFT) Workshop on Monday, December 9th in the Marriott Marquis Golden Gate A ballroom. Focusing on the collaborative practices which enabled the successful season of replicate coring, IDDO’s Field Support Manager, Kristina Slawny, UW scientist TJ Fudge, and IDPO Education & Outreach Program Manager Linda Morris will deliver a multi-media infused presentation with related hands-on activities for K-12 educators who are registered for the two-day event. Further information on the full agenda and registration procedure is available at: <http://education.agu.org/education-activities-at-agu-meetings/gift/>.

## **Field Support to Science Projects**

Current - Antarctic 2013-2014

- Aerosol Fluxes to Taylor Dome and Taylor Glacier (Aciego)
- Beardmore Glacier Shot Holes, Antarctica (Conway)
- Carbon-14 from Taylor Glacier Blue Ice Cores (Petrenko)
- Roosevelt Island Borehole Logging (Hawley)
- Siple Dome Optical Borehole Logging (Bay and Talghader)

Upcoming - Arctic 2014

- Cosmogenic Carbon-14 in Polar Firn, Greenland (Petrenko)
- Disko Bay and Baffin Bay Firn and Ice Cores, Greenland (Das)
- Intermediate Depth Drill Field Test, Greenland (IDPO-IDDO)
- Isotope Hydrology at Summit, Greenland (Noone)

Upcoming - Antarctic 2014-2015

- Carbon-14 from Taylor Glacier Blue Ice Cores (Petrenko)
- South Pole 1500-meter Ice Core (Saltzman)
- WAIS Divide Fabric and Texture Logging (Pettit and Obbard)
- WAIS Divide Optical Logging (Bay)

For the latest information on our current and upcoming field projects, visit:

<http://icedrill.org/expeditions/>