FALL 2025

ICE BITS

Newsletter of the U.S National Science Foundation Ice Drilling Program (IDP)

IDP Kicks Off Support for the 2025/2026 Antarctic Field Season

On October 31, IDP/SSEC Engineers Jay Johnson, Andrew Haala, Dusty Brunner, and Driller Elizabeth Morton headed south to support the NSF COLDEX project (PIs Sarah Shackleton and John Higgins; I-187-M) at Allan Hills, Antarctica. After a one-day delay in Christchurch (CHC), New Zealand, they arrived at McMurdo Station (MCM), Antarctica, on November 6 and then to Allan Hills on November 18. The team plans to use the large-diameter Blue Ice Drill and a smaller diameter fluid-enabled drill to drill cores at different locations. After a lengthy stay in Christchurch due to weather delays, IDP Engineer Elliot Moravec and Driller Forest Harmon arrived at McMurdo Station on November 29 and are awaiting a flight to Taylor Dome where they will operate the Eclipse Drill and the IDDO Hand Auger and Sidewinder to collect firn cores in support of PI Kaitlin Keegan's (I-162-M) firn evolution project. IDP Engineer Tanner Kuhl and Jim Koehler are scheduled to deploy to Seymour Island via the R/V Sikuliaq where they will aid in drill site reconnaissance and operate the SIPRE Hand Auger and a PI-provided Shaw Drill in support of PI Thomas Tobin's (G-296-N) project. At Flask Glacier, PI Jonathan Kingslake's (I-347-E) team will operate an IDDO Hand Auger to drill several shallow firn cores to investigate the influence of meltwater on Antarctic ice sheet dynamics. And at South Pole Station, PI Albrecht Karl's IceCube upgrade project (A-334-M/S) will operate the Deep Logging Winch to log one of their newly drilled deep holes with an oriented dust logger.

Map of Antarctica showing 2025-2026 Antarctic field season locations. The numbers shown on the maps correspond to the following projects:

1. I-187-M (PIs Sarah Shackleton and John Higgins)
2. I-162-M (PI Kaitlin Keegan)
3. G-296-N (PI Thomas Tobin)
4. I-347-E (PI Jonathan Kingslake)
5. A-334-M/S (PI Albrecht Karl)

(Top) A run of ice from the smaller-diameter Shallow Wet Drill (left) and large-diameter Blue Ice Drill (right) drilled during the 2025/2026 field season at Allan Hills, Antarctica. Credit: IDP. (Bottom) Core boxes being pulled out of the core storage trench (left) and loaded onto a Twin Otter (right) at Allan Hills, Antarctica, during the 2025/2026 field season. Credit: Matthew Kippenhan/ASC.

Future Clean Deep Hot Water Access Drilling

Each year the annual update of the IDP Long Range Science Plan is finalized in June to include recent input from the IDP Science Advisory Board (SAB), the IDP Working Groups, and the research community at large; the SAB prioritizes items within the section on Recommended Technology Investments. In October 2025, the SAB revised the language in the June 2025 Long Range Science Plan on a priority item involving hot water drilling; it was revised so that it now reads:

- *Describe/adapt the design and develop a cost estimate for the future build of a clean modular hot water drill (e.g. replicate the BAS modular drill for holes up to 3,000 m depth) that minimizes logistical footprint including fuel supply.*

IDP engineers are currently working on this task. A paper on the BAS drill was published in 2020 by Makinson and others and can be downloaded from https://doi.org/10.1017/aog.2020.88. The updated IDP Long Range Science Plan can be downloaded from https://icedrill.org/long-range-science-plan. U.S. scientists who are interested in using a clean hot water drill to 3,000 m depth are invited to provide input to IDP on the draft IDP Science Requirements for a Deep Clean Hot Water Access Drill. Please send an email indicating your interest to Icedrill@Dartmouth.edu and we will follow up with you.

2025 Fall AGU Town Hall: Scientific Drilling in the Polar Regions

The NSF Ice Drilling Program (IDP) will hold the AGU Town Hall on Scientific Drilling in the Polar Regions on Wednesday, 17 December 2025, from 18:00-19:00 Central Standard Time (CST) in room 283-285 of the New Orleans Convention Center, New Orleans, Louisiana. **This is an in-person only event.** We hope to see you there!

Abstract: Ice sheets, glaciers, and the underlying bedrock, sediment and permafrost hold crucial evidence about past conditions, ice sheet dynamics, and cratonic geology. National and international collaboration for drilling in the remote Polar Regions requires strategic coordination between science, technology, and logistics. This meeting will provide the research community with brief updates from the NSF Ice Drilling Program (IDP), ICECReW, NSF Center for Oldest Ice Exploration (COLDEX), and Hercules Dome. Opportunities for community involvement will be showcased, and input from the audience will be solicited.

Event: AGU Town Hall - TH35D - Scientific Drilling in the Polar Regions
Date: Wednesday, 17 December 2025
Time: 18:00-19:00 Central Standard Time (CST)
Location: 283-285 of the New Orleans Convention Center, New Orleans, Louisiana
Primary Contact: Mary R Albert, Dartmouth College
AGU meeting website: https://agu.confex.com/agu/agu25/meetingapp.cgi/Session/249098

9th International Symposium on Ice Drilling Technology

The 9th International Symposium on Ice Drilling Technology was held in Potsdam, Germany, on September 14-19, 2025. As a follow-up to the eight previous ice drilling technology symposia held between 1974 and 2019, the 9th International Symposium on Ice Drilling Technology took a comprehensive look at the latest innovations in ice drilling technology, including but not limited to mechanical and thermal drilling, borehole logging, subglacial sampling, core logging and handling, and field logistics. IDP Engineers Jay Johnson and Tanner Kuhl attended the symposium in-person, and others at IDP-WI participated via Zoom. Seven IDP presentations were given and five posters were presented, covering topics including 700 Drill development, advancements in drill electronics, high-altitude thermal drilling, development

of shallow wet drilling capability, and research into and use of different materials for fabricating replaceable cutter inserts.

As a follow-up to the symposium, the International Glaciological Society (IGS) will prepare a special collection of the Annals of Glaciology with the theme 'Ice Drilling Technology' in 2026. The Collection will be part of Annals Volume 67. The papers will be published continuously online as part of Annals Volume 67 and will simultaneously be brought together in the special issue's online thematic 'Collection'. Symposium participants and non-participants alike are encouraged to submit manuscripts for this thematic Collection. For more information, read the Ice Drilling Technology – Call for Papers solicitation by the IGS.

Publications from the eight previous ice drilling technology symposia are available within the Library section of the IDP website.

Covers from the journals associated with the eight previous ice drilling technology symposia. All papers published in these journals are available for viewing within the IDP website's 'Library' portal.

NSF COLDEX Polar Science REU Summer 2026

The U.S. National Science Foundation Center for Oldest Ice Exploration (NSF COLDEX) is excited to announce that applications are OPEN for the Summer 2026 NSF COLDEX Research Experience for Undergraduates (REU) Program!

During the NSF COLDEX REU experience, students work with ice core scientists and researchers to answer questions that will help find the oldest ice in Antarctica and make important contributions to our understanding of Earth's climate history. For detailed information about NSF COLDEX and its REU program, visit the NSF COLDEX REU website at https://coldex.org/reu.

For questions about the NSF COLDEX REU program, contact the NSF COLDEX Coordinator for Education, Outreach, and Engagement, Mindy Nicewonger at mindy.nicewonger@oregonstate.edu.

Requesting Field Support

If you are preparing a National Science Foundation (NSF) proposal that includes any kind of support from IDP, you must include a Letter of Support from IDP in the proposal. Researchers are asked to provide IDP with a detailed support request **six weeks** prior to the date the Letter of Support is required. **Early submissions are strongly encouraged.**

Scientists who seek to include IDP education and outreach activities associated with U.S. ice coring or drilling science projects should contact Louise Huffman at Louise.T.Huffman@Dartmouth.edu during their proposal preparation stage.

For additional information on requesting IDP support, visit our website at https://icedrill.org/requesting-field-support or contact us at IceDrill@Dartmouth.edu.

Acknowledgment of IDP in Publications

If you receive any support from IDP, we kindly request you acknowledge IDP in any resultant publications or articles with the following statement: "*We thank the NSF Ice Drilling Program for support activities through NSF Continuing Grant 2318480.*" If you have any questions, please contact us at IceDrill@Dartmouth.edu.

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