

ICE CORE WORKING GROUP (ICWG) MEETING

MAY 11, 2023

IDP OPERATIONS UPDATE

KRISTINA SLAWNY – IDP DIRECTOR OF OPERATIONS

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IDP-WI TEAM UPDATES

- Mechanical Engineers
 - Grant Boeckmann departed IDP in March 2022 to join the Centre for Ice and Climate (CIC) group in Copenhagen, Denmark.
 - Chris Rush joined IDP in late April 2022 and departed in April 2023.
 - Barb Birrittella joined IDP in late April 2022, coming to us from the UW Physical Sciences Lab.
- Field Support Manager
 - IDP welcomed Jess Ackerman in August 2022.



Grant Boeckmann



Chris Rush



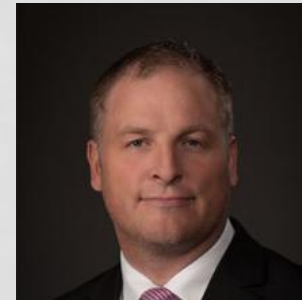
Barb Birrittella



Jess Ackerman

IDP TECHNICAL ASSISTANCE BOARD (TAB)

- Biennial TAB Meetings have resumed in Madison, WI.
- Meeting held March 22-23, 2023.
- After serving many years on the ICDS/IDDO/IDP Technical Advisory Board and Senior Advisory Board, Marshall Pardey rotated off the TAB in 2022.
- IDP welcomed two new TAB members in 2023
 - Chris Delahunty – Engineer/Owner of Matrix Drilling Products in Lewisburg, Tennessee and has a long history of working with IDP during the RAID and ASIG Drill development and testing days.
 - Tim Lyons – Project Manager with the Australian Antarctic Program and has been collaborating with IDP in recent years as both AAD and IDP fabricate deep drilling systems (IDP Foro 3000).
- For more information on the TAB, visit:
<https://icedrill.org/about/technical-assistance-board>



Chris Delahunty



Tim Lyons



FIELD SUPPORT

After two postponed Arctic seasons (2020, 2021) and two postponed Antarctic seasons (2020-2021, 2021-2022), IDP is back in the field!

ARCTIC/NORTH AMERICA/PERU 2022

PI	NSF Award No.	Location	IDP Equipment
Harper	2113391	W. Greenland	3-Inch Hand Auger & Sidewinder
Licht	2039854	Kangerlussuaq, Greenland	SIPRE Hand Auger & Power Head
Mayewski	1600018	Quelccaya Ice Cap, Peru	Thermal Drill
McConnell	1925417	Tunu Glacier, Greenland	Foro 400 Drill
McWethy	1832486	Wyoming Ice Patches	Chipmunk Drill
Neff	2002441	Mount Waddington, Canada	3-Inch Hand Auger
Zoet	2013987	Madison, WI	Chipmunk Drill

ANTARCTIC 2022-2023

PI	NSF Award No.	Location	IDP Equipment
Anandakrishnan	1738934	Thwaites Glacier	Rapid Air Movement (RAM) Drill, Small Hot Water Drill (SHWD)
Higgins	1744993	Allan Hills	Blue Ice Drill, Foro 400 Drill, Hand Augers
Venturelli	1738989	Hudson Mountains	Winkie Drill, Eclipse Drill

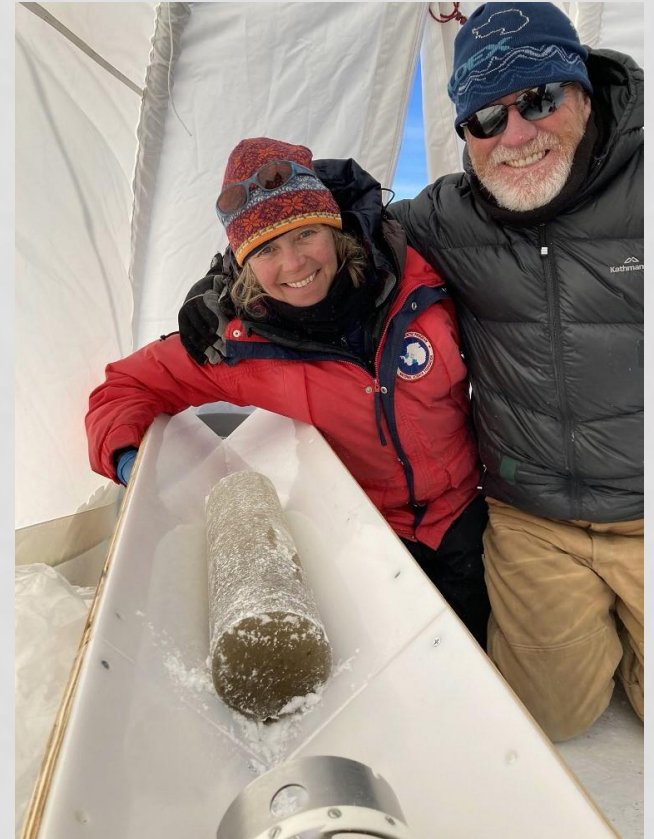
FIELD SUPPORT

ARCTIC/NORTH AMERICA 2023

PI	NSF Award No.	Location	IDP Equipment
Alexander	2230350	Summit Station, Greenland	4-Inch Hand Auger & Sidewinder
Anandakrishnan	1933802	N. Greenland	Small Hot Water Drill
Chellman	2139293	Summit Station, Greenland	Blue Ice Drill
Harper	2113391	W. Greenland	3-Inch Hand Auger & Sidewinder
Licht	2039854	Kangerlussuaq, Greenland	SIPRE Hand Auger & Power Head
Neff	2002441	Mount Waddington, Canada	Thermal Drill
Schaefer/Briner	1933927	Prudhoe Dome, Greenland	ASIG Drill, Winkie Drill

FIELD SUPPORT

- The IDP-designed aircraft cargo ramp is working well! Slight modifications are being made to the mid-point connection and surface coating and then a second ramp will be fabricated.



May 11, 2023

FIELD SUPPORT

- Successfully drilled a hole to bedrock on Quelccaya Ice Cap in Peru to a depth of 128 meters.
- Multi-year GreenDrill project kicked off in April 2023 with the deployment of four drillers.



Quelccaya
Ice Cap,
summer
2023



GreenDrill
cargo in
Pituffik and
ready to
ship from
IDP



EQUIPMENT DEVELOPMENT

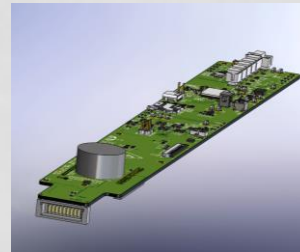
- Foro 3000
 - System is Ready For Issue for the Herc Dome project!
- BASE (Basal Access & Subglacial Exploration) Drill
 - IDP iterated with the science community on development of Science Requirements.
 - Rig ordered from Multi-Power Products in March 2023; anticipated delivery to IDP in November 2023.
 - IDP to design auxiliary subsystems such as fluid circulation system and custom pressure relief valve.
- 700 Drill
 - System development, fabrication and assembly is progressing well!



Foro 3000 electronics testing



Example of BASE Drill rig, platform and control station



700 Drill winch, crown sheave assembly and CAD model of sonde electronics

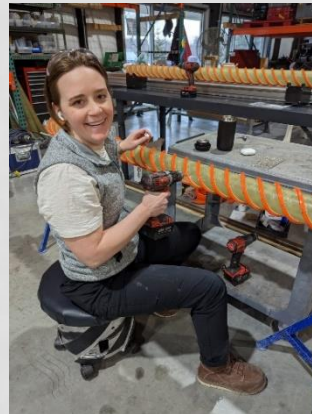
MAINTENANCE & UPGRADES

- ASIG Drill – Designed and implemented an electronic pressure relief valve (PRV) following experience from the RAID project that showed a standard mechanical PRV is insufficient for preventing hydrofracture events. Set up the rig and completed testing of the shaker table and tower assembly method. System assembled in Madison, tested, packed and shipped to Thule Air Base in June 2020 via the Pacer Goose vessel. Ice coring bit designed and fabricated.
- Eclipse Drills – Continuing to update CAD models and drawings. Eclipse Drills are in high demand in the upcoming field seasons.
- Foro 400 – Working to design/implement modifications to improve core quality. Working to source an aluminum outer barrel.
- Foro 1650 – Completed electronics modifications to mimic the design of the Foro 3000 equipment. Prepared and shipped the system on the 2022-2023 Antarctic resupply vessel for potential use with COLDEX.



MAINTENANCE & UPGRADES

- Hand Augers – Made several minor but beneficial modifications to the Chipmunk Drill including fabrication of new, simplified drive adapters and implementation of a shortened Stampfli Drill barrel to explore use of this off-the-shelf component. Worked with UW-Madison undergraduate engineering students on a Senior Design project looking at Sidewinder improvements. Established procedures for re-flighting core barrels. Tested new flight tape and epoxy in cold temperatures and fluids. **(Do not use ethanol to free a stuck Hand Auger! Use glycol. 😊)**
- Small Hot Water Drill – Assembled and tested a system before shipping it to Greenland.
- Thermal Drill – Fabricated and assembled a second aluminum core barrel. Designed and implemented an ethanol delivery system to prevent borehole freeze back. Designed and fabricated a debris vacuum for removing sand/dirt from the bottom of the hole.
- Winkie Drill – Designed and implemented a slip-style foot clamp. Implemented a new pressure relief valve. Fabricating an ice coring bit.



THANK YOU!

DISCUSSION