



# IDP Leadership Update

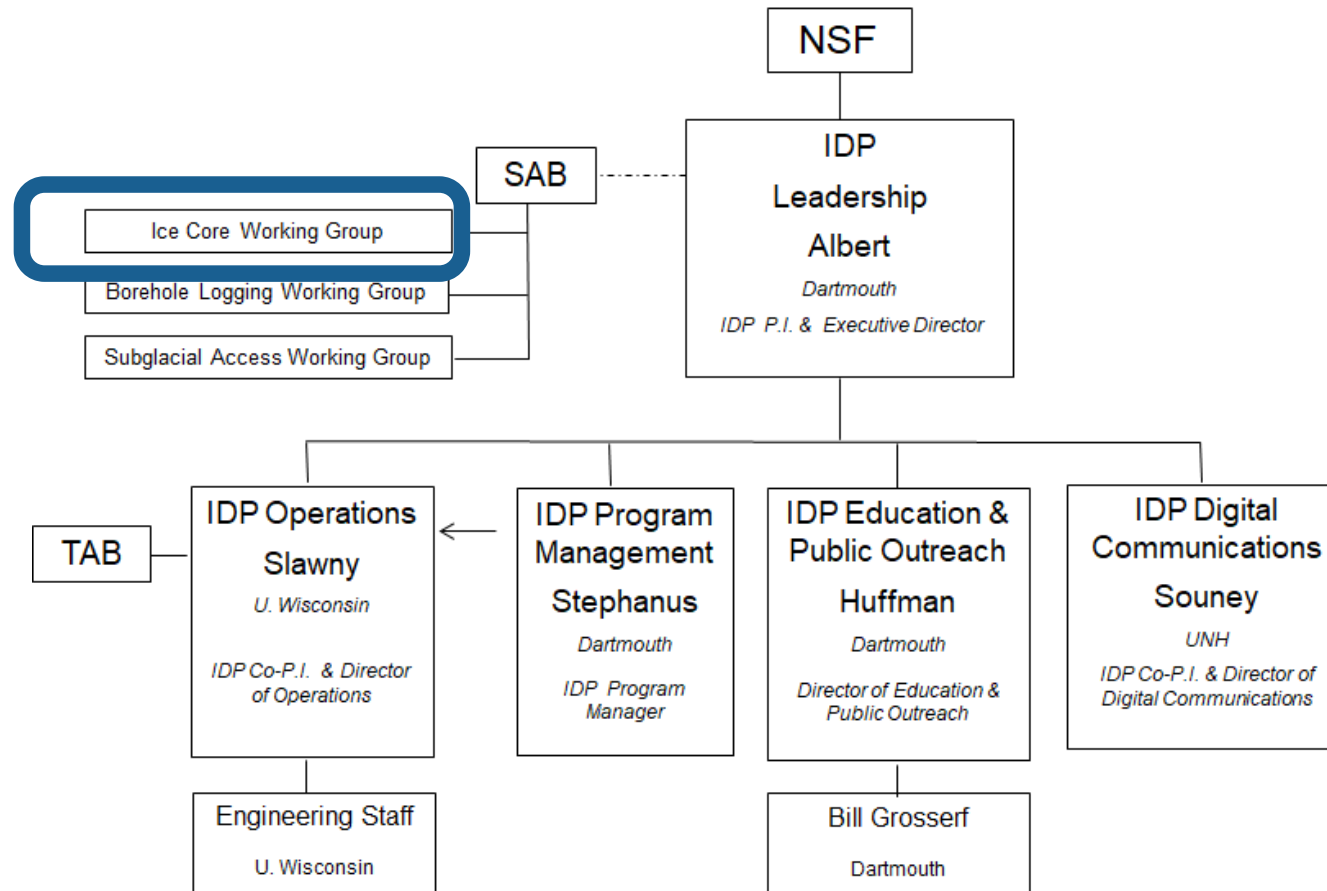
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Mary R. Albert, PhD  
IDP P.I. & Executive Director

IDP-ICWG meeting  
May 11, 2023



# ICWG in the IDP Organization





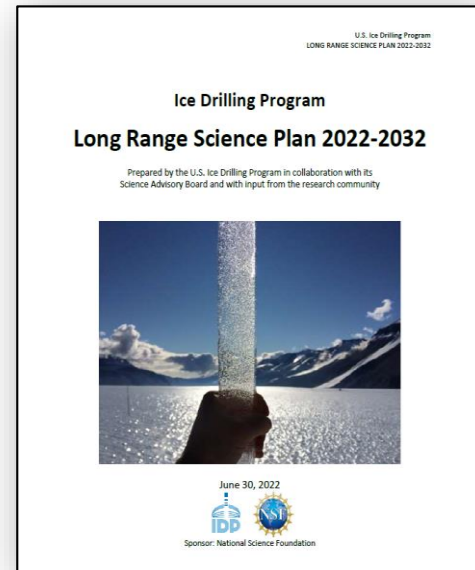
# IDP Long Range Planning with the Community

- \* IDP convenes live & virtual planning meetings with our IDP Working Groups:
  - IDP Ice Core Working Group
  - IDP Englacial and Subglacial Access Working Group (formerly SAWG & BLWG)
- \* IDP listens to advice from the IDP Science Advisory Board, who prioritize IDP drilling technology investments
- \* IDP convenes AGU Town Halls to inform the community & hear suggestions
- \* IDP participates in community conferences
- \* IDP posts our draft plans on [Icedrill.org](http://Icedrill.org) & invite community input
- \* All of this culminates in our annual update of the **IDP Long Range Science Plan**



# IDP Long Range Planning with the Community

Long Range Science Plan: inclusive planning to articulate the vision for the next 10 years



**Past Climate**

**Ice Dynamics and Glacial History**

**Subglacial Geology, Sediments & Ecosystems**

**Ice as a Scientific Observatory**

**Science planning drives IDP drill technology development & use**



# What's the process for new drill development?

- Scientific need for technology articulated in the **IDP Long Range Science Plan**
- IDP works with scientists to create the IDP Science Requirements
- IDP seeks NSF approval to create the Conceptual Design  
< NSF Decision Point; if approved, the Conceptual Design is created >
- IDP holds Conceptual Design review with science reps & invited engineers
- IDP seeks NSF approval to create the Detailed Engineering Design  
< NSF Decision Point; if approved, Engineering Design is created >
- IDP holds Engineering Design review with science reps & invited engineers
- IDP seeks NSF approval for Construction of the drill  
< NSF Decision Point; if approved, new drill is created >
- IDP holds drill test review with invited engineers & science reps
- When possible, new tech is field tested before deployment for science



# What's the process for new drill development? Example: 700 Drill

## 700 Drill

Core diam:  
70mm

Depth: 700 m

Completion Date	Milestones	Owner
June 2016 & 2017	IDP Long Range Science Plans recommend a portable ice coring drill for depths up to 700 m	Albert
March 2018	Complete IDP Science Requirements for Foro 700 Drill	Albert
August 2019	Complete IDP Conceptual Design for Foro 700 Drill	Slawny
August 2019	Complete IDP Review of the Foro 700 Drill Conceptual Design	Albert/Slawny
May 2020, updated Jan 2021	Revise IDP Science Requirements from Foro 700 Drill to 700 Drill	Albert
Sept 2020	Update IDP Conceptual Design from Foro 700 Drill to 700 Drill	Slawny
Jan 2021	Complete IDP Review of the 700 Drill Conceptual Design	Albert/Slawny
March 2021	NSF approval of creation of the Detailed Design for the 700 Drill (work included in the IDP PY 2021 Program Plan)	Albert/Slawny
Oct 2021	Complete Detailed Design for 700 Drill	Slawny
Nov 2021	Complete IDP Review of the Detailed Design	Albert/Slawny
February 2024*	Complete 700 Drill Fabrication, Integration, and Drill Documentation	Slawny
March 2024*	Complete Final Review and Acceptance 700 Drill ready for issue	Albert/Slawny



# What's the process for new drill development? Example: Scalable Hot Water Drill



12/20/2022

Britney Schmidt  
britneys@cornell.edu

Via e-mail

Re: ADELIES proposal to NSF

Dear Britney,

If the proposal submitted by Dr. Britney Schmidt entitled *Mid-Scale Research Infrastructure 1 (M1:DP): Polar Access Drill Enabling Light-logistics Implementation for Exploration and Science (Polar-ADELIES)* is selected for funding by NSF, it is my intent to collaborate and/or provide advice as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely yours,

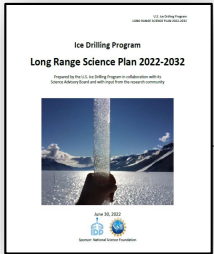
Mary R. Albert  
Professor of Engineering  
Dartmouth, Hanover NH  
IDP PI and Executive Director  
icedrill.org







# SAB prioritization of IDP Tech Investments



\* Current draft Long Range Science lists the SAB-prioritized IDP Drilling Technology Investments.

\* List of community wishes; NSF makes all decisions

\* Please look at the draft update of the LRSP. Does the ice core tech align with community needs?

<https://icedrill.org/long-range-science-plan/>

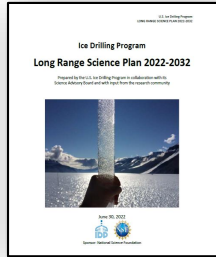
## Recommended Technology Investments

### Priority 1 (needed this year):

- Maintain and upgrade agile drilling equipment in inventory.
- Adapt the BASE drill rig for retrieving rock core from beneath 200 m of ice.
- Develop the Conceptual Design for collecting a small amount (chips to several cm) of sub-ice rock/mixed media/mud in a frozen regime using an intermediate or deep ice core drill in a fluid filled hole, for example with the Foro 3000 drill.
- Continue construction of the 700 Drill.
- Develop the updated IDP Conceptual Design and Detailed Design for a clean Scalable Hot Water Drill that minimizes its logistical footprint including fuel supply.
- Investigate a lighter weight source of power to...



IDP Tech Investments in the current draft Long Range Science Plan:  
Priority for needs planning for drilling in blue ice higher  
priority than a copy of the BID



Second Blue Ice Drill investment priority in Long Range Science Plan 2022:

\* Finish building a second Blue Ice Drill for wide-diameter drilling to 200 m.

...has been replaced by the following, in IDP Oct 2022 meeting with S. Shackleton, E. Brook, & J. Higgins:

\* Conduct engineering feasibility study to evaluate and recommend longer-term drilling approaches to retrieve ice with good core quality down to 400 m depth in blue ice areas. Possible approaches include: replicate coring for Foro 400, large-diameter thermal drill (diameter < 241 mm TBD), complete re-design of the BID, and other. For each approach, estimate the anticipated improvement in core quality, impacts on associated logistics, and the time required to complete the resulting drill. Identify the most promising approach that could be implemented not later than 2028, but earlier if possible.



Thank you to NSF for IDP add-on funding for an early career opportunity in fall 2022

**International Partnerships in Ice Core Sciences  
3rd Open Science Conference**



**Ice Core Science at the three Poles**

With supplemental funding from NSF, IDP provided travel assistance to 18 early career U.S.-based ice core scientists to the IPICS meeting in October 2022



# IDP 2023-2028

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Our renewal IDP proposal is pending at NSF  
Fingers crossed!



DARTMOUTH



University of  
New Hampshire



WISCONSIN  
UNIVERSITY OF WISCONSIN-MADISON



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Questions?