



# IDP Leadership Update

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

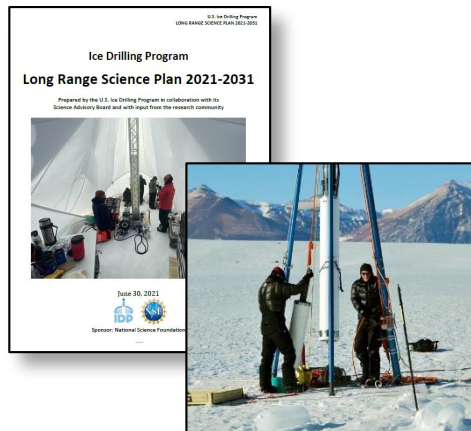
IDP-SAB meeting  
March 3, 2022

# IDP Vision & Mission



## Vision

To enable discoveries about changes in climate and the environment, using evidence from glaciers and ice sheets, to inform environmental policy.

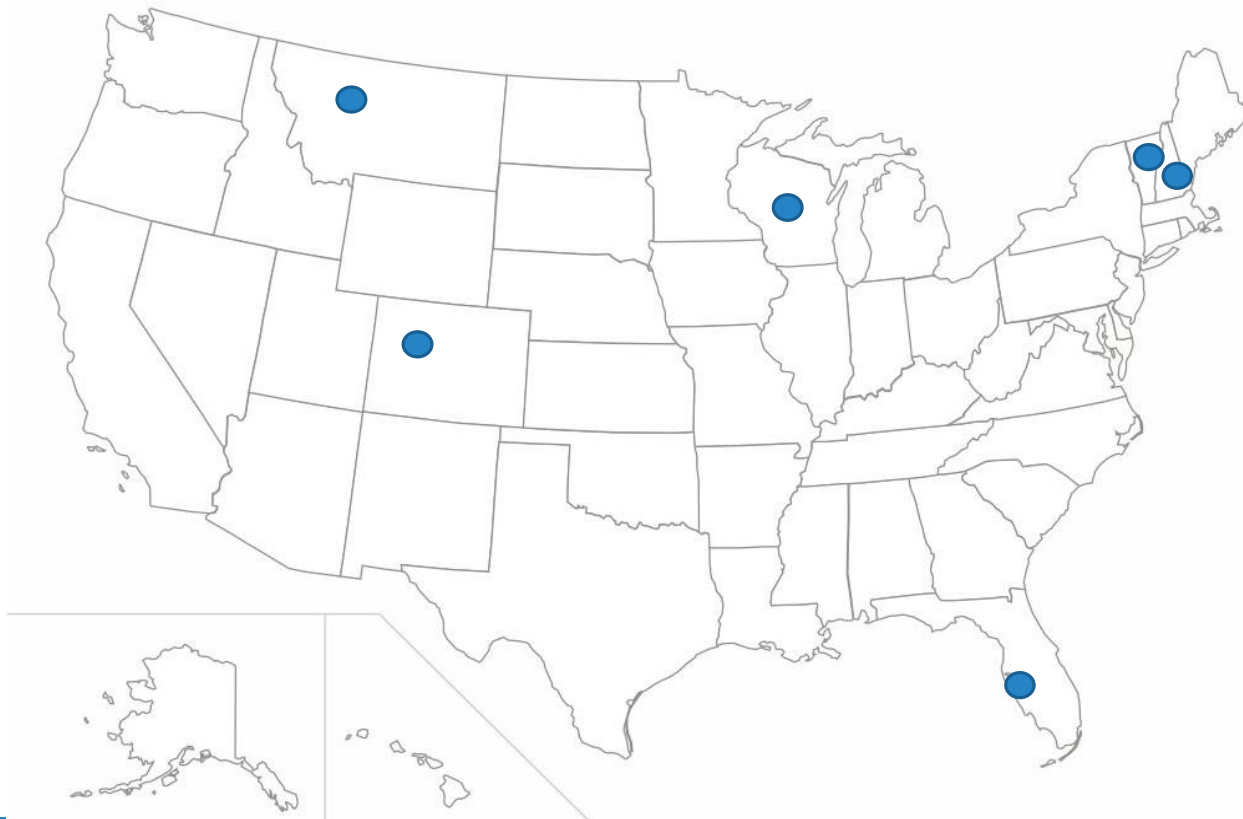


## Mission

To conduct **integrated planning** for the ice drilling science and technology communities and to **provide drilling technology and operational support** that will enable the community to advance the frontiers of climate and environmental science.

# IDP Organization

IDP is a virtual organization with core expertise located across the U.S.



DARTMOUTH



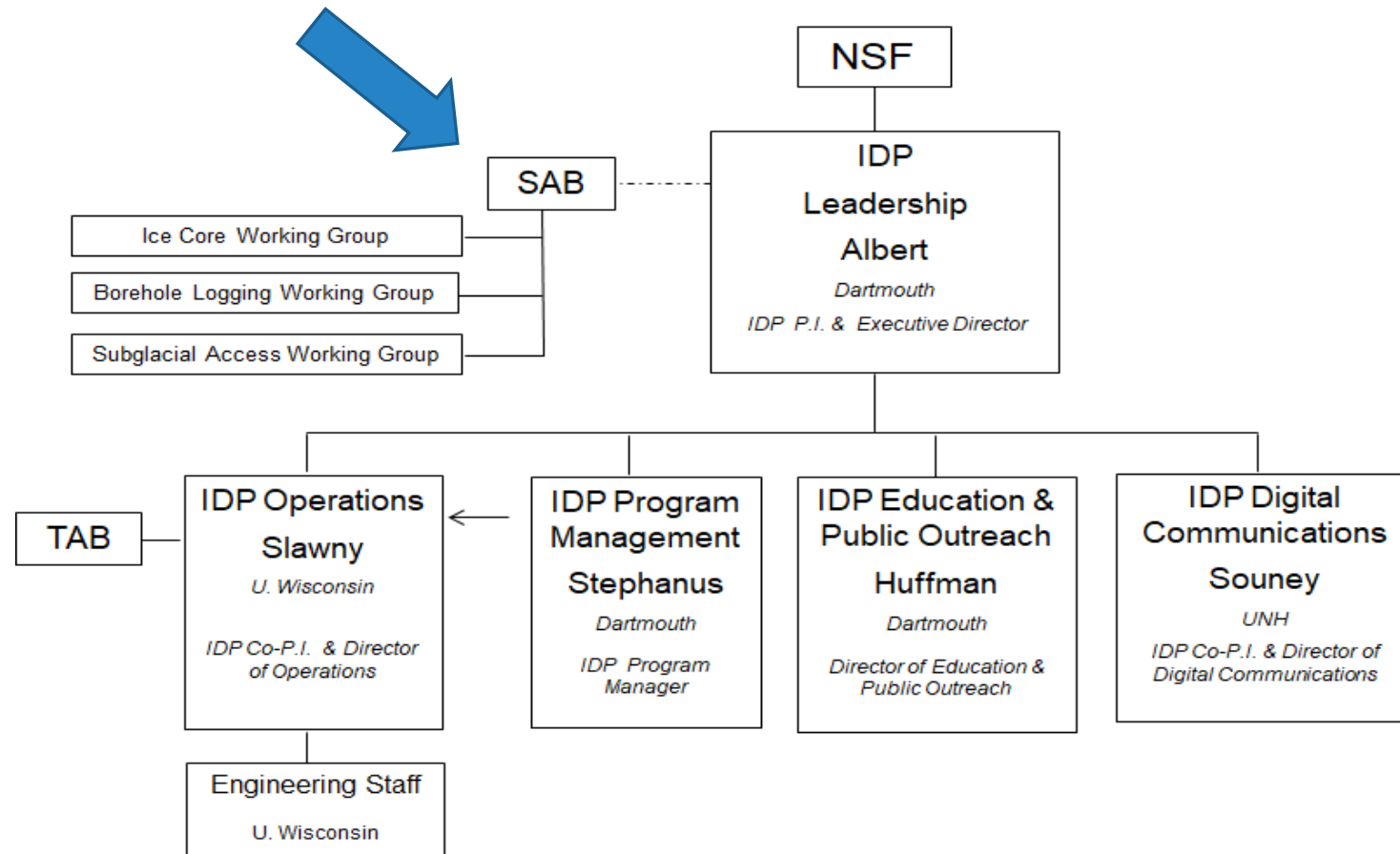
University of  
New Hampshire



WISCONSIN  
UNIVERSITY OF WISCONSIN-MADISON



# IDP Organization



# Scientific Discovery: Outcomes Enabled by IDP

58 peer-reviewed journal papers from 2019-2021 crediting IDP support





# Engineering Innovation: Outcomes Achieved by IDP

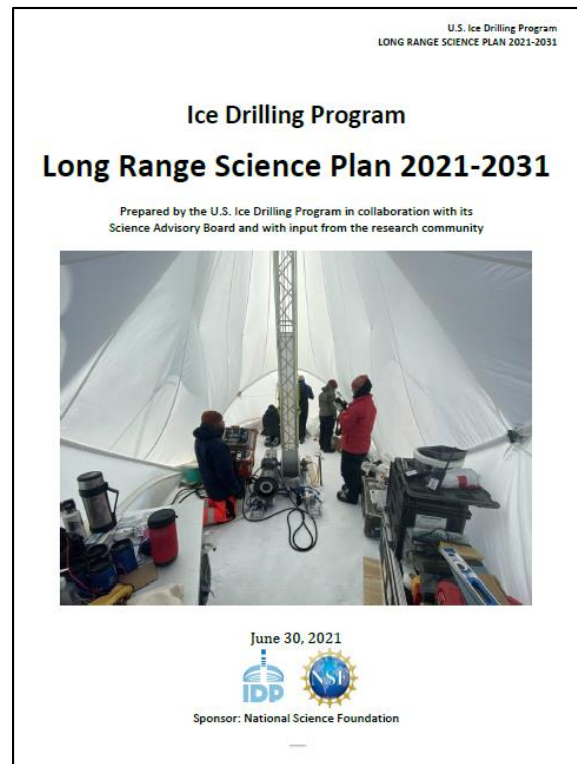
- Grant Boeckmann, Chris J Gibson, Tanner W Kuhl, Elliot Moravec, Jay A Johnson, Zachary Meulemans, Kristina R Slawny (2021) **Adaptation of the Winkie Drill for Subglacial Bedrock Sampling**. *Ann. Glaciol* 62(84).
- Tanner W Kuhl, Chris J Gibson, Jay A Johnson, Grant Boeckmann, Elliot Moravec, Kristina R Slawny (2021) **Agile Sub-Ice Geological Drill Development** *Ann. Glaciol* 62(84).
- Chris J Gibson, Grant Boeckmann, Zachary Meulemans, Tanner W Kuhl, Jim Koehler, Jay A Johnson, Kristina R Slawny (2021) **RAM-2 Drill System Development: an upgrade of the RAM Drill**. *Ann. Glaciol* 62(84).
- Jay A Johnson, Tanner W Kuhl, Grant Boeckmann, Chris J Gibson, Joshua Jetson, Zachary Meulemans, Kristina R Slawny, Joseph M Souney (2021) **Drilling Operations for the South Pole Ice Core project**. *Ann. Glaciol* 62(84)
- Joseph M Souney, Mark S Twickler, Murat Aydin, Eric J Steig, TJ Fudge, Leah V Street, Melinda R Nicewonger, Emma C Kahle, Jay A Johnson, Tanner W Kuhl, **KiCore Handling, Transportation and Processing for the South Pole Ice Core project**emberly A Casey, John Fegyveresi, Richard M Nunn, Geoffrey M Hargreaves (2021). *Ann. Glaciol* 62(84)
- Albert, M.R., K.R. Slawny, G. Boeckmann, C.J. Gibson, J. A. Johnson, K. Makinson, J. Rix (2020) **Recent Innovations in Drilling in Ice**. *Chapter 6 of Advances in Terrestrial Drilling: Ground, Ice and Underwater*, Bar-Cohen and Zacny, eds.





# Long Range Planning with the Community

Long Range Science Plan: inclusive planning to articulate the future vision



**Past Climate**

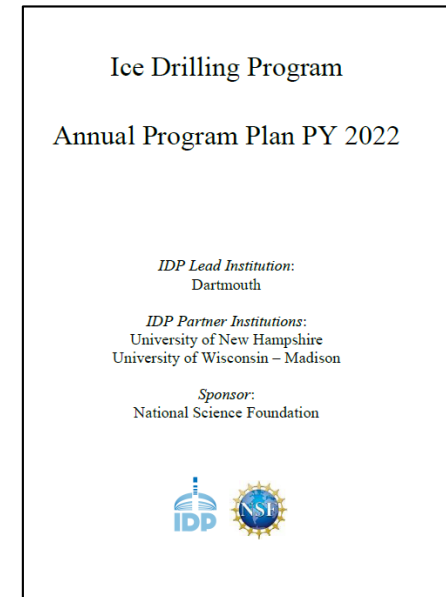
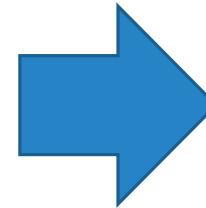
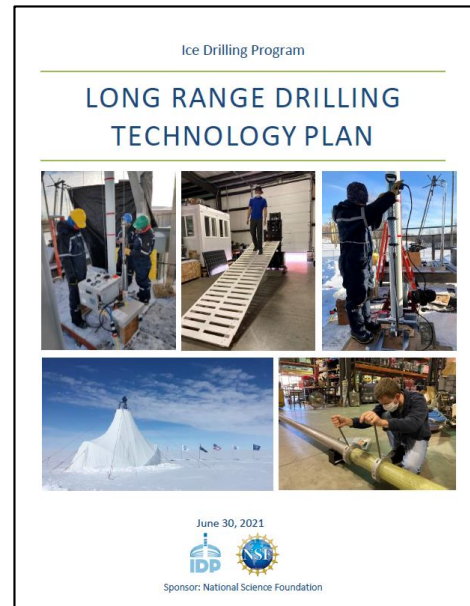
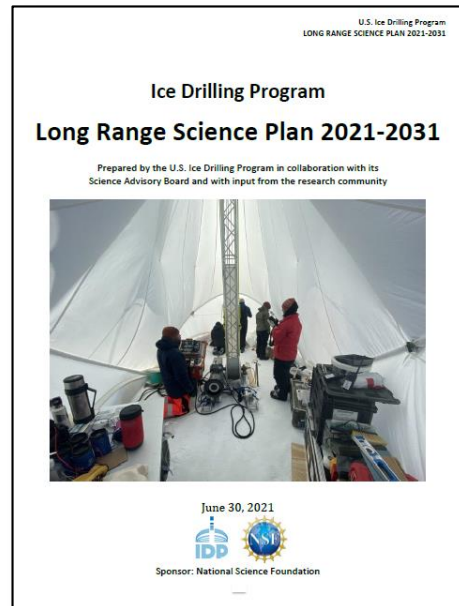
**Ice Dynamics and Glacial History**

**Subglacial Geology, Sediments & Ecosystems**

**Ice as a Scientific Observatory**

# Integrated Science & Technology Planning

IDP conducts integrated science and technology planning, from long range vision with the community to planning next year's program plan with NSF.



Science planning drives drilling technology planning, 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: For 3000 Drill

### Foro 3000 Drill

| Completion Date | Milestones   | Owner         |
|-----------------|--|---------------|
| June 2016       | IDP Long Range Science Plan 2016-2026 recommends ice coring drill to 3,000 m   | Albert        |
| Oct 2016        | NSF approved IDP-WI to evaluate refurbish DISC Drill or adapt Foro 1650  | Albert        |
| April 2017      | IDP Long Range Science Plan 2017-2027 recommends adapting Foro 1650  | Albert        |
| April 2017      | Complete IDP Science Requirements for Foro 3000.   | Albert        |
| May 2017        | Complete IDP-WI Conceptual Design for Foro 3000.   | Slawny        |
| June 2017       | Complete IDP Review of the Conceptual Design.  | Albert/Slawny |
| Aug 2017        | NSF approval to create IDP-WI Detailed Design  | Albert/Slawny |
| Sept 2018       | Complete Detailed Design for Foro 3000.  | Slawny        |
| Sept 2018       | Complete IDP Review of the Detailed Design.  | Albert/Slawny |
| PY 2019         | Scope expanded to building stand-alone Foro 3000 Drill. Initiate fabrication   | Slawny        |
| PY 2020         | Complete fabrication of core barrels and chips chambers, anti-torque, motor section, .... initiate sub-system verification, casing welding system. | Slawny        |
| PY 2021         | Complete fluid handling system, core processing system, sonde mechanical, design drill tent and control room, initiate system integration testing. | Slawny        |
| PY 2022         | Complete procurements, Final Review and Acceptance; Foro 3000 ready for issue.   | Albert/Slawny |
|                 |  |               |



# What's the process for new drill development?

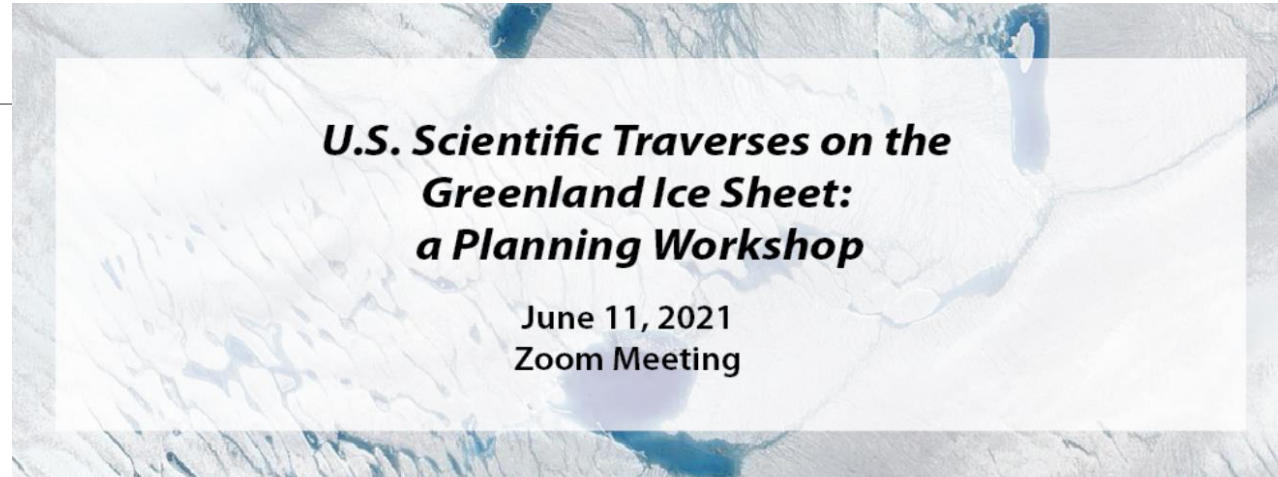
## Example: 700 Drill

### 700 Drill

| 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 2023*             | Complete 700 Drill Fabrication, Integration Testing, and Drill Documentation                                      | Slawny        |
| April 2023*                | Complete Final Review and Acceptance<br>700 Drill ready for issue   | Albert/Slawny |



# IDP community events 2021



- Bringing scientific communities together for a common vision
- Virtual workshop (32 participants) facilitated by IDP and Summit-SCO
- Outcome: Community consensus for measurements across two key regions: Northwest Greenland and Northeast Greenland.

J.M. Schaefer, M.R. Albert, Z. Courville, J. Briner, 2021. **Workshop Report: U.S. Scientific Traverses on the Greenland Ice Sheet: a Planning Workshop.** Available on [Icedrill.org](https://icedrill.org).



# IDP community events 2021



## AGU Town Hall: Scientific Drilling in the Polar Regions, Dec 7 2021

### Agenda

IDP - Mary Albert

ICYS – Kathleen Wendt

IPICS – ED Brook

Herc Dome – Heidi Roop

IceDrill – Joerg Schaefer

RAID – John Goodge



# IDP community events 2021

## ***Ice Core Early Career Researchers Workshop (ICECReW)***

January 5-8, 2022

Salt Lake City, Utah, and Online

- IDP-ICWG early career workshop
- Target outcome: science synthesis papers





## IDP community events 2022

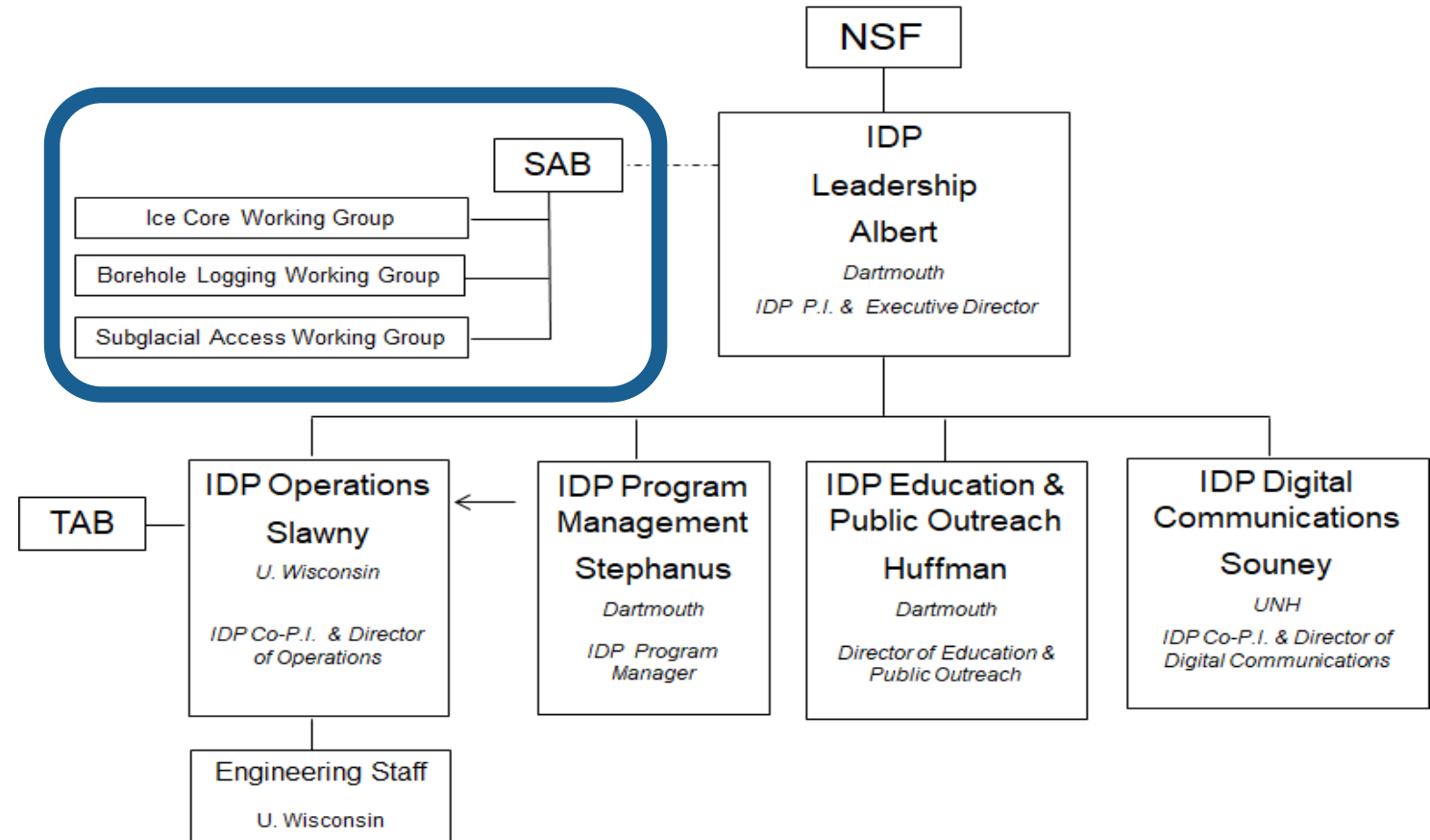


- Co-sponsored by IDP, Herc Dome, COLDEX, Juneau Icefield Research Program
- Aimed at ice core science currently, but subglacial science and borehole science may be possible. *Question for the SAB: Might this be the meeting where members of ICWG, SAWG, BLWG all converge at one place to exchange ideas?*
- <https://icedrill.org/meetings/1st-annual-us-ice-core-open-science-meeting>



# A Question for the SAB

*What is the best way to engage ongoing dialog & information exchange between ICWG, SAWG, and the BLWG?*





# Discussion

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Questions or Suggestions?