RAID update

Field trials — success in 2019-20

Drilling summary — see paper in *Annals of Glaciology* ('21)

Current upgrades — FRS mods nearly complete in Tennessee

Science Planning Workshop — September 25-27, Herndon VA

RAID is ready for ice-sheet exploration!

Annals of Glaciology

IGS 2021

Article

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Deep ice drilling, bedrock coring and dust logging with the Rapid Access Ice Drill (RAID) at Minna Bluff, Antarctica

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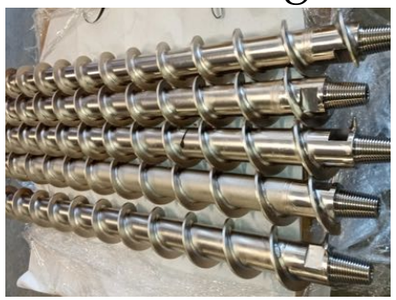
RAID at Minna Bluff

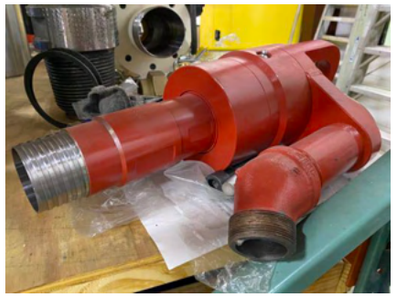
RAID upgrades

Tooling

new firn augers



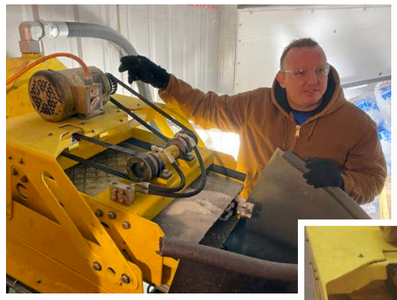
new swivel



new diverter

Fluid Recirculation System

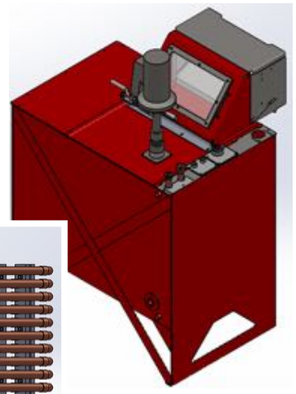
shaker testing

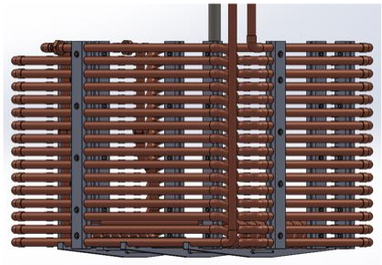


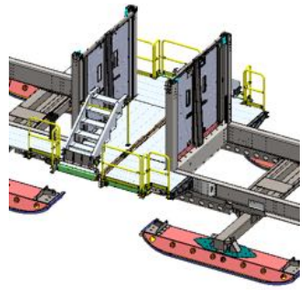
shaker overhaul

redesigned PLC automation

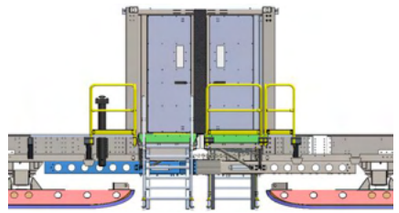
melting tank overhaul







CAD engineering for module mating



RAID as an inter-disciplinary tool

- old ice dating
- paleoatmospheric records
- paleoclimate reconstructions
- glaciology
- ice-sheet dynamics
- borehole logging
- glacial bed mechanics
- subglacial exposure histories
- thermal and landscape histories
- subglacial geology
- subglacial sedimentology
- heat flow
- glacial geophysics
- potential-field geophysics
- seismology
- glacial-rebound geodetics

RAID is one-of-a-kind –

- mobile
- deep
- fast
- multi-disciplinary
- potentially transformative

2nd RAID Science Planning Workshop, 2024

Sarah Shackleton, Woods Hole Oceanographic Institution

John Goodge, Planetary Science Institute

Allie Balter-Kennedy, Lamont-Doherty Earth Observatory

Shuai Yan, University of Washington

Jeff Severinghaus, Scripps Institution of Oceanography

2024 Workshop goals

- Re-vitalize & grow scientific **user community** for RAID.
- Grow participation & inclusion of new generation of **Early-Career Researchers** in cutting-edge Antarctic science.
- Promote interdisciplinary **research synergies**, including development & implementation of new cryosphere technologies.
- Re-engage the **geophysical community** (aeromagnetics, seismology, geodetics, heat flow) for reconnaissance, site selection & data analysis.
- Help integrate **RAID and COLDEX** activities.
- Stimulate new cross-disciplinary **research & proposal collaborations**, particularly inclusive of and among young researchers.
- Develop new concepts to support **traverse-oriented platforms** in Antarctica.
- Write a **Long-Range Science Plan** with shared community research goals & recommend priorities for future drilling.

2nd RAID Science Planning Workshop

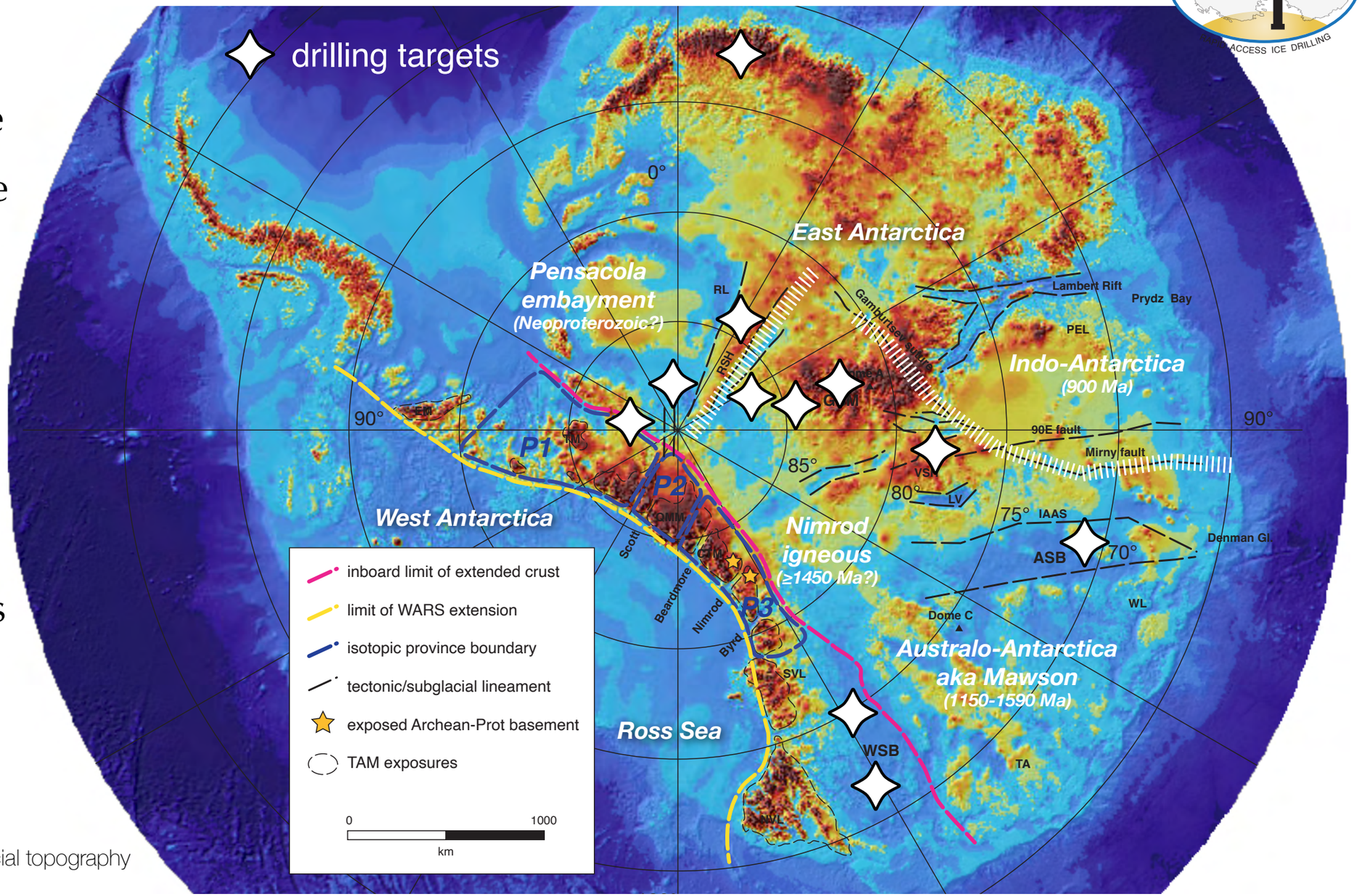
Small-group discussions, 2nd RAID Science Planning Workshop

Outcomes –

- articulated science questions
- identified potential drilling targets
- writing ‘proposition’ reports by ice-sheet domains
- discussed alternative logistics

Scientific priorities & targets

- oldest (~1.5 Ma) ice
- basal & accreted ice
- crustal provinces & boundaries
- Gamburtsev Subglacial Mtns (GSM) / Dome A
- subglacial basins
- enigmatic highlands



Bedmap2 subglacial topography

Going forward

RAID is ready for deep ice-sheet exploration!

- a potential game-changer
- think about ways to put it to work
- welcome new participation
- join the community!

https://www.rapidaccessicedrill.org/