

Taylor Dome: A Natural Laboratory to Study Firn

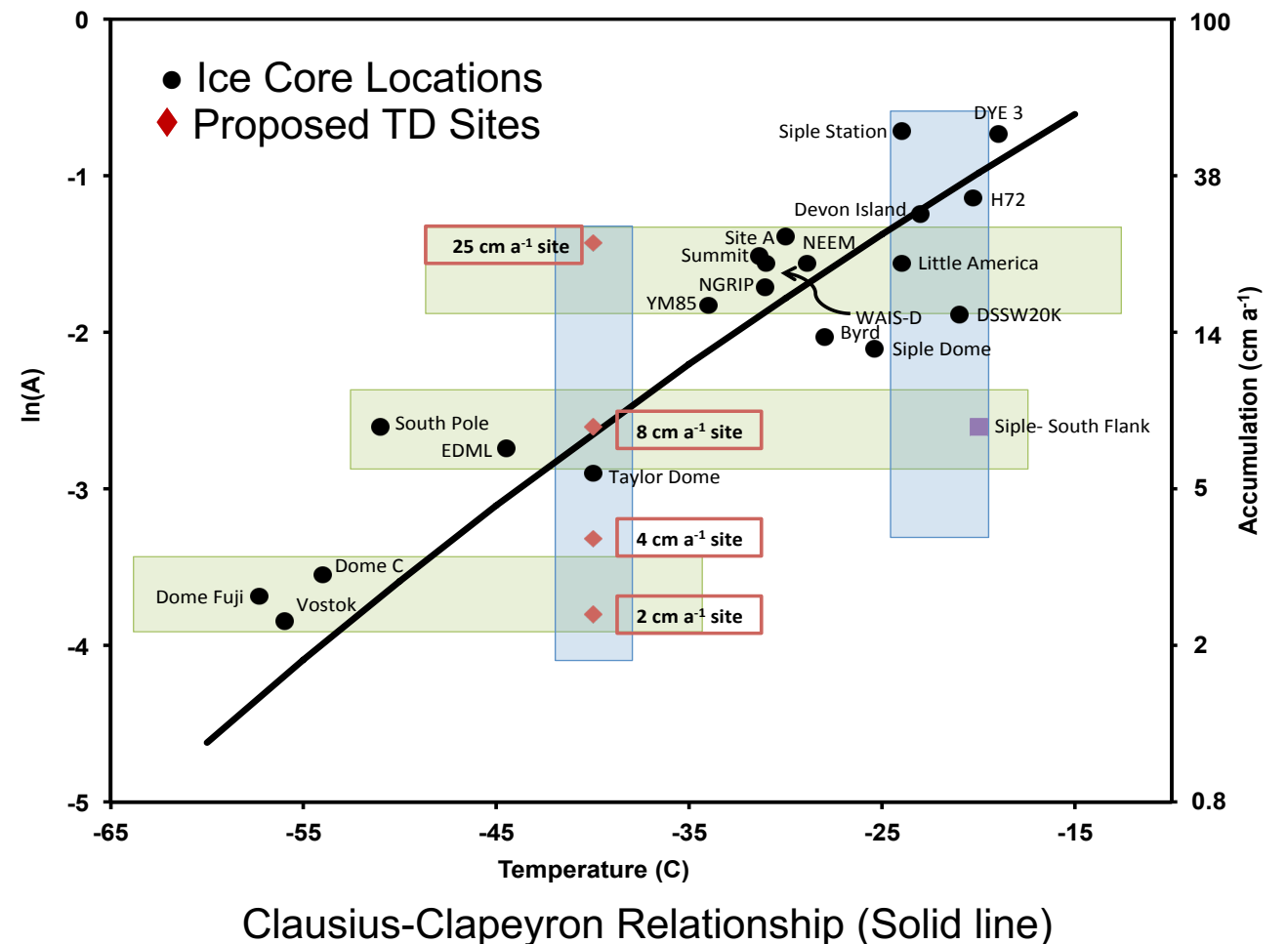
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Why study firn evolution?

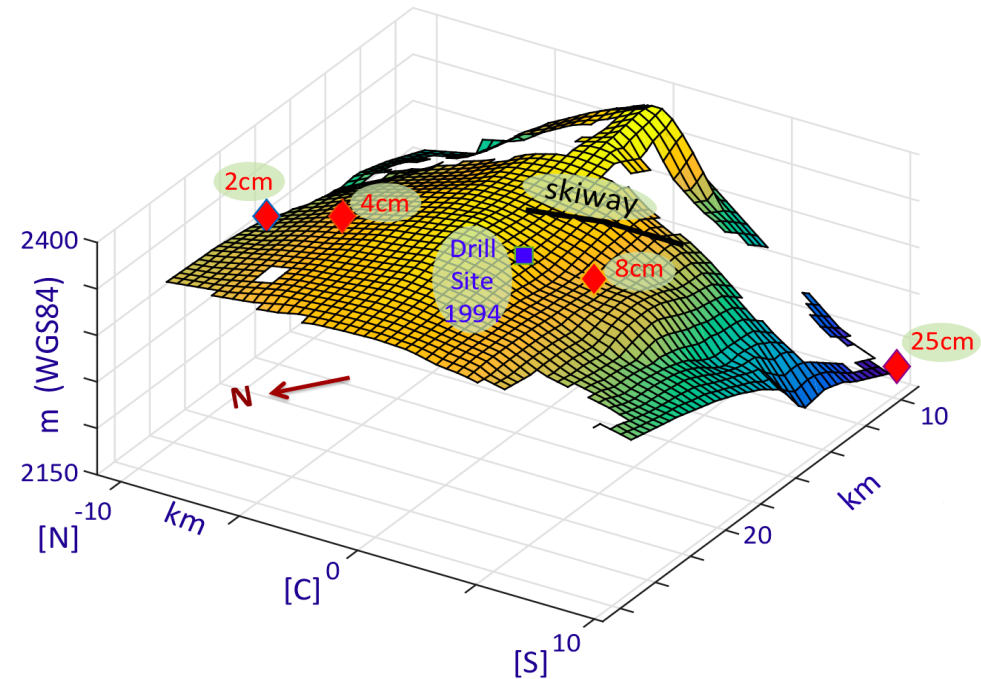
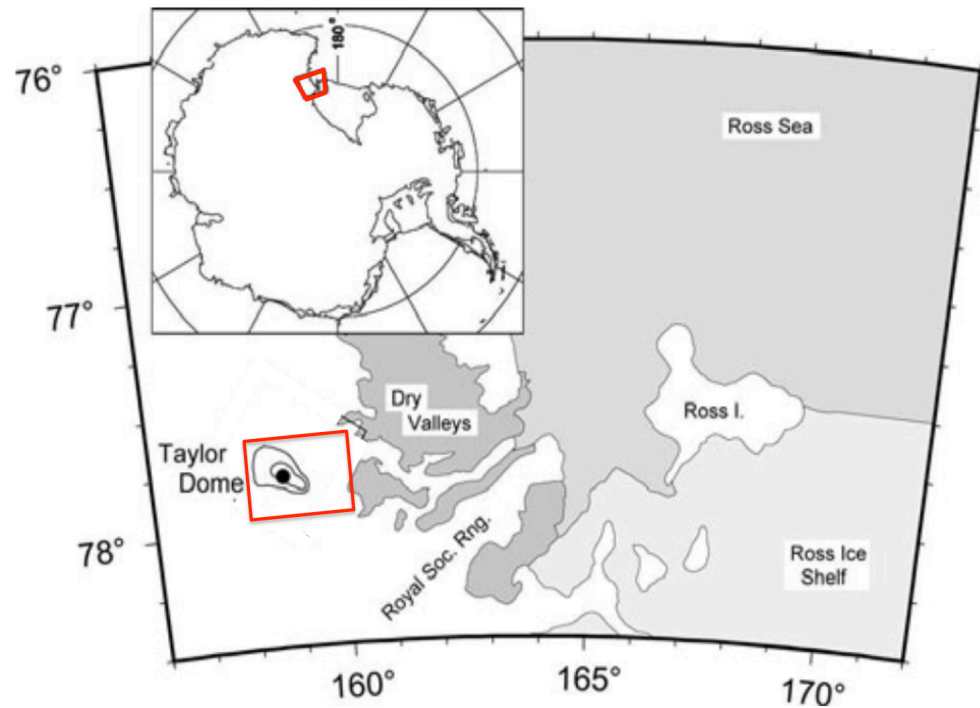
- Understanding of firn column important for satellite altimetry, pore close-off processes
- Current models empirically-based, perform poorly outside calibration range

Our Proposed Research

- Investigate accumulation impact on firn compaction
- Take first steps toward physics-based firn compaction model

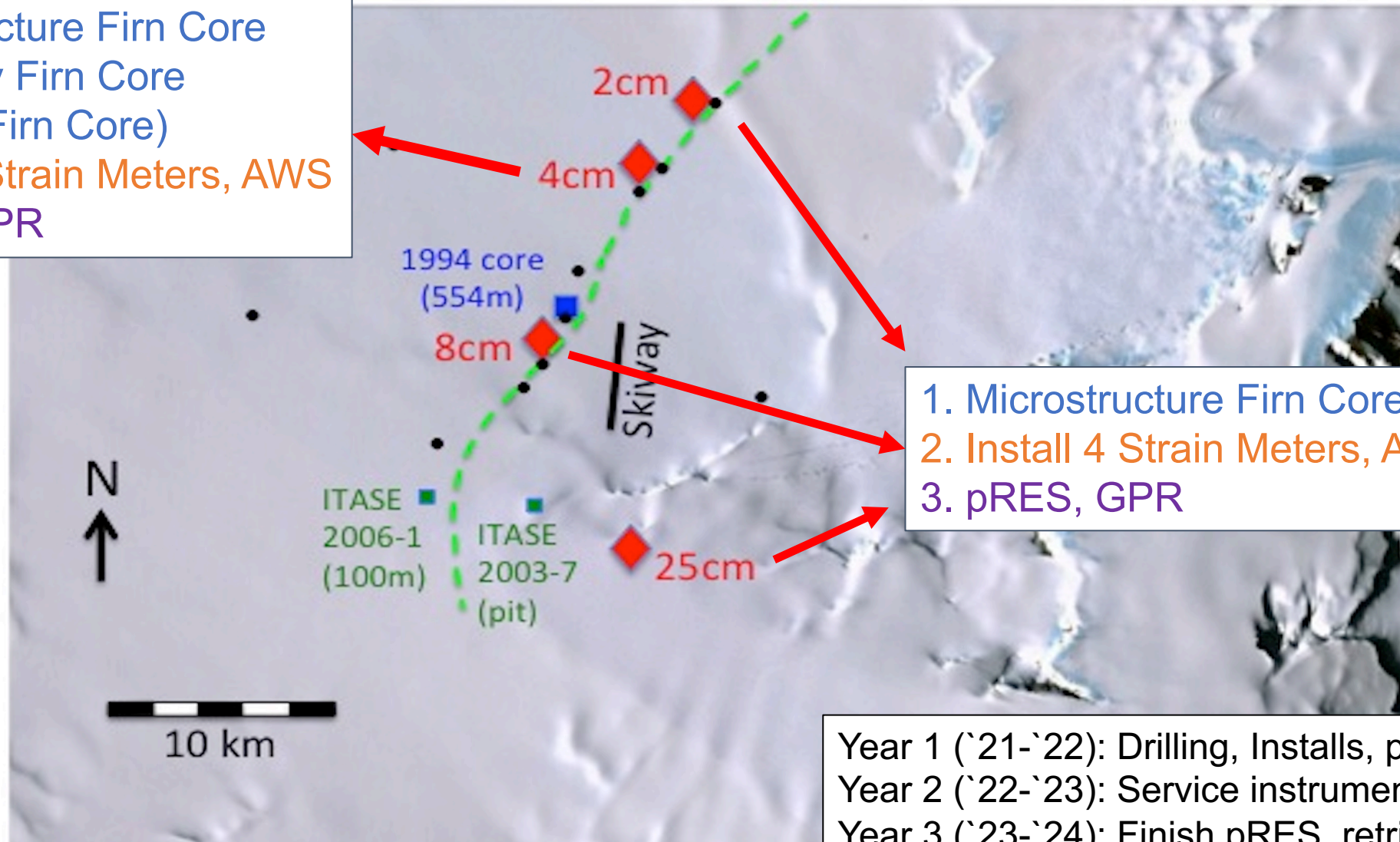


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Taylor Dome Field Work

1. Microstructure Firn Core
Chemistry Firn Core
(Community Firn Core)
2. Install 4 Strain Meters, AWS
3. pRES, GPR



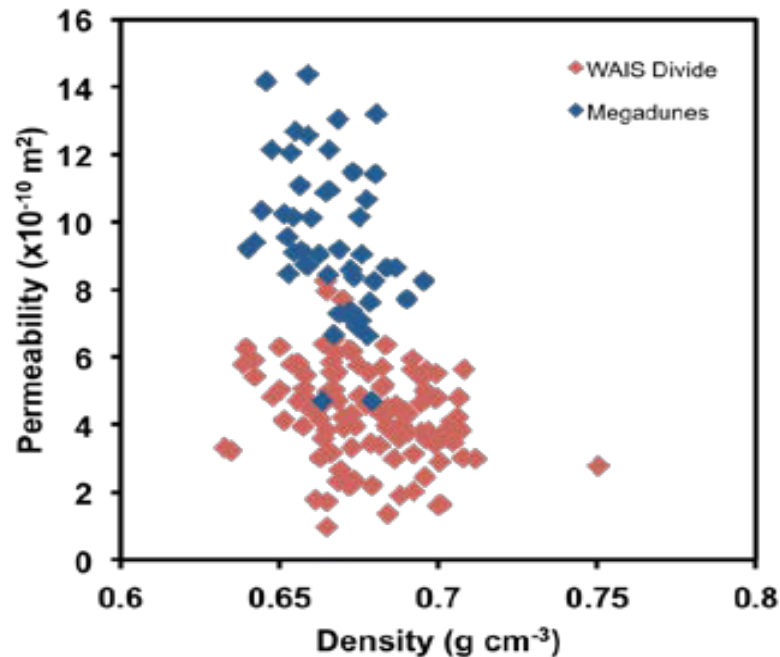
1. Microstructure Firn Core
2. Install 4 Strain Meters, AWS
3. pRES, GPR

Year 1 (`21-`22): Drilling, Installs, pRES & GPR
Year 2 (`22-`23): Service instruments, pRES
Year 3 (`23-`24): Finish pRES, retrieve data

Taylor Dome Lab Work

Microstructure Firn Cores

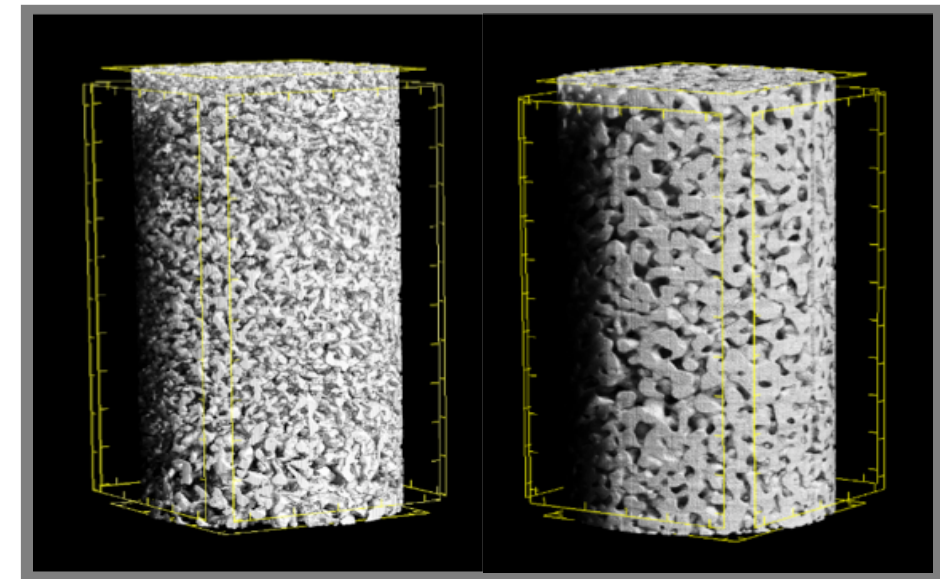
- Microstructural Analysis - MicroCT
- Permeability
- Diffusivity



Chemistry Firn Core

- CFA – Depth-Age Scale

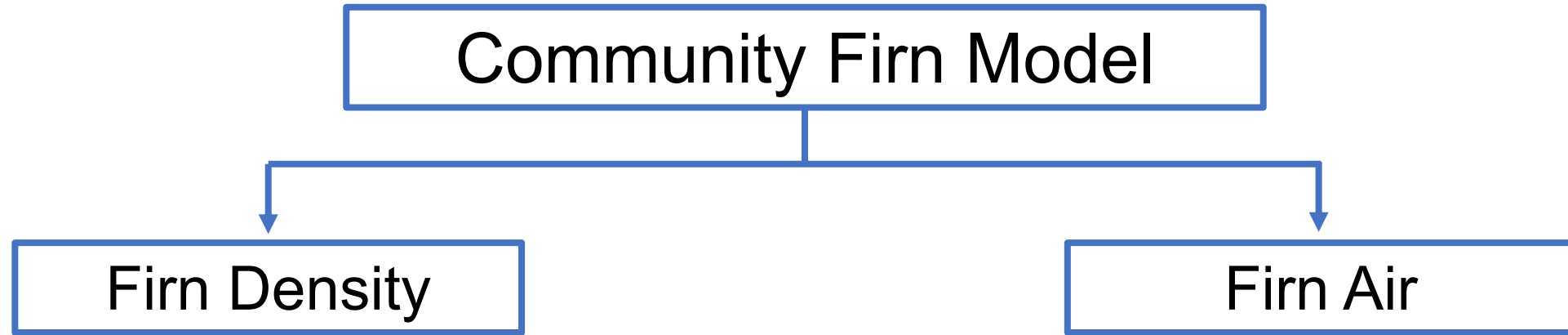
Summit Firn Cores



0.5 m depth

17 m depth

Taylor Dome Modeling Efforts



1. Firn-Microstructure Module
2. Improved Firn-Compaction Equation

3. Improved Effective-Diffusivity Parameterization