SUMMEDup EarthCube Tutorial

An introduction to a tool for investigating the SUMup dataset of snow and firn density measurements

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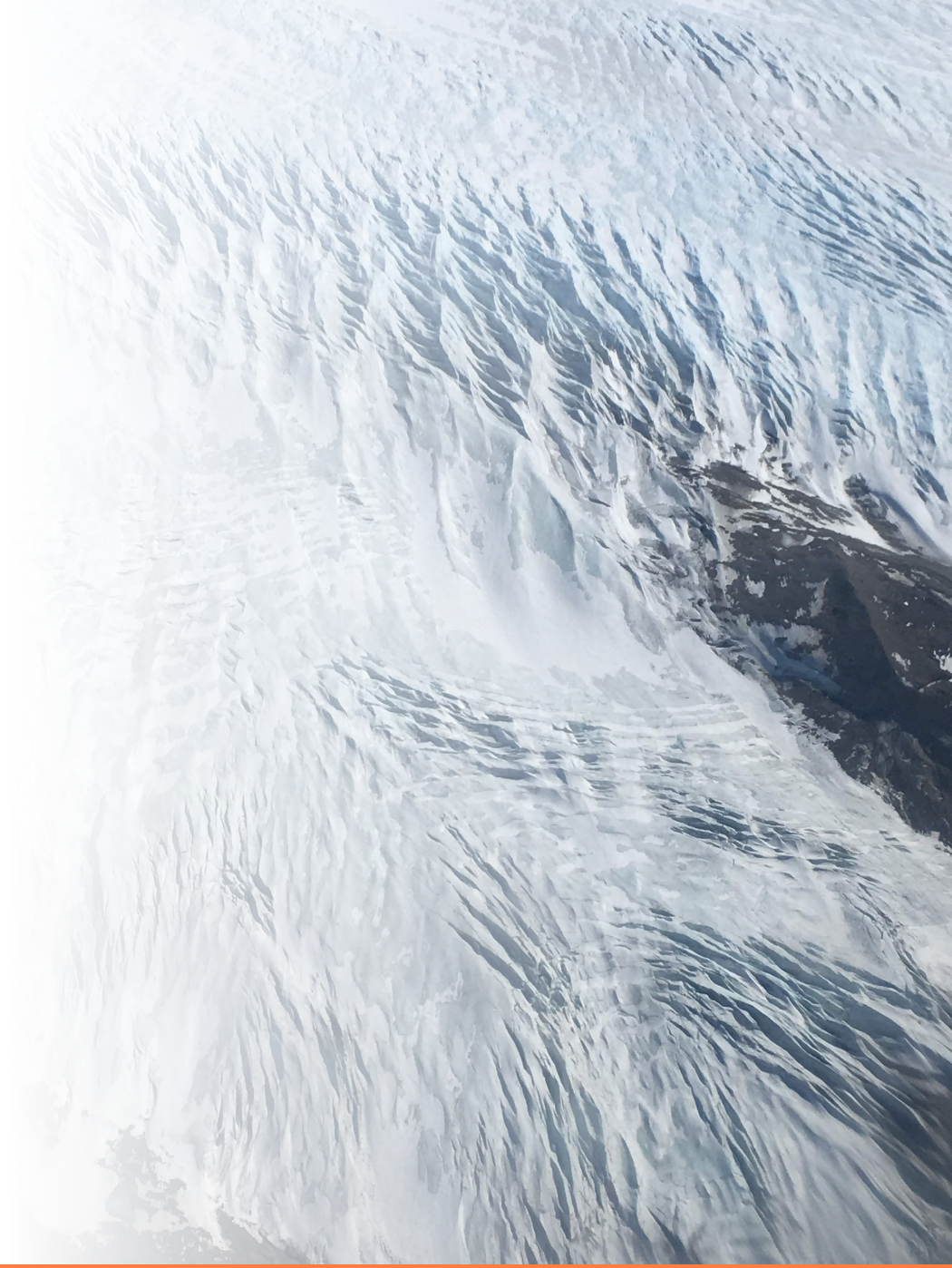
EarthCube
Transforming Geosciences Research

University of Colorado Boulder



Outline of Tutorial

1. Introduction
2. Overview of SUMup dataset
3. Overview of SUMMEDup tool
4. Demonstration of SUMMEDup
   - Binder
   - Google Colab
   - Jupyter Notebook

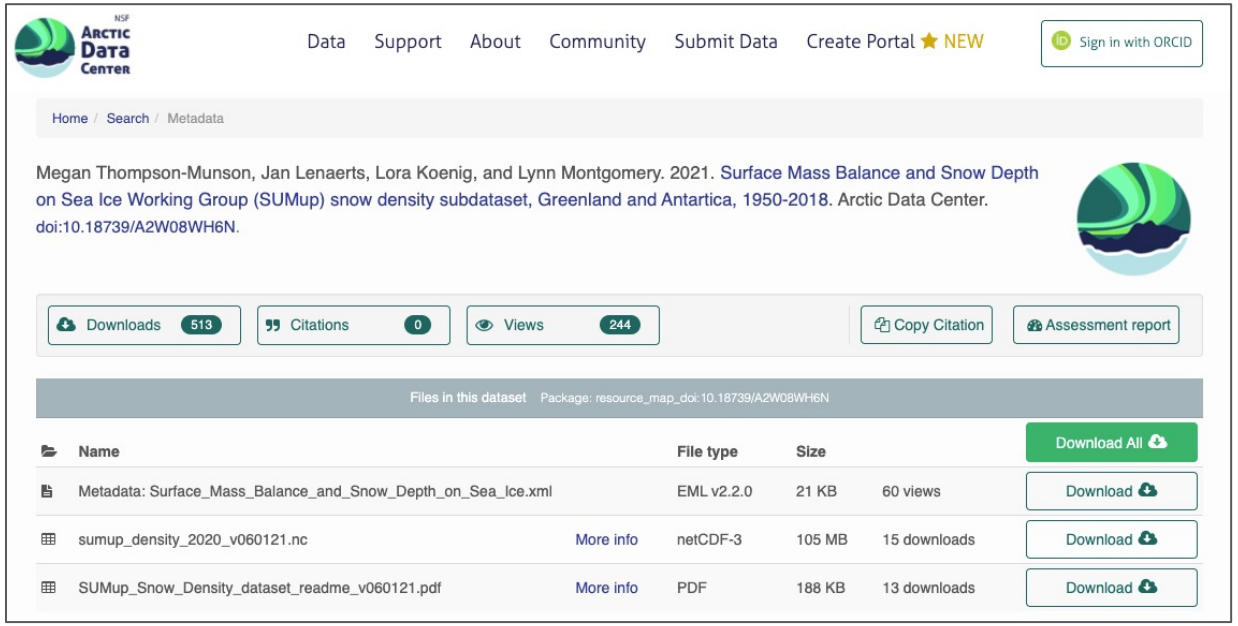
About Me

- BS in Geology and Environmental Science (2017)
  - University of Massachusetts Amherst
- MS in Geology (2020)
  - University of Wyoming
- PhD student in Atmospheric and Oceanic Sciences
  - University of Colorado Boulder

- Research: interactions between atmospheric properties and ice sheet surface processes
- Current manager of SUMup dataset
- 2 field seasons in Greenland extracting firn cores

SUMup Dataset

- Surface Mass Balance and Snow Depth on Sea Ice Working Group
  - Snow and firn density on ice sheets
  - Accumulation rates on ice sheets
  - 10-m borehole temperatures
  - Snow depth on sea ice



SUMMEDup

- Python tool that downloads, processes, and displays density data from SUMup
- Available on GitHub with instructions for use in Binder, Google Colab, or as a regular Jupyter Notebook

github.com/MeganTM/SUMMEDup

Instructions for using SUMMEDup

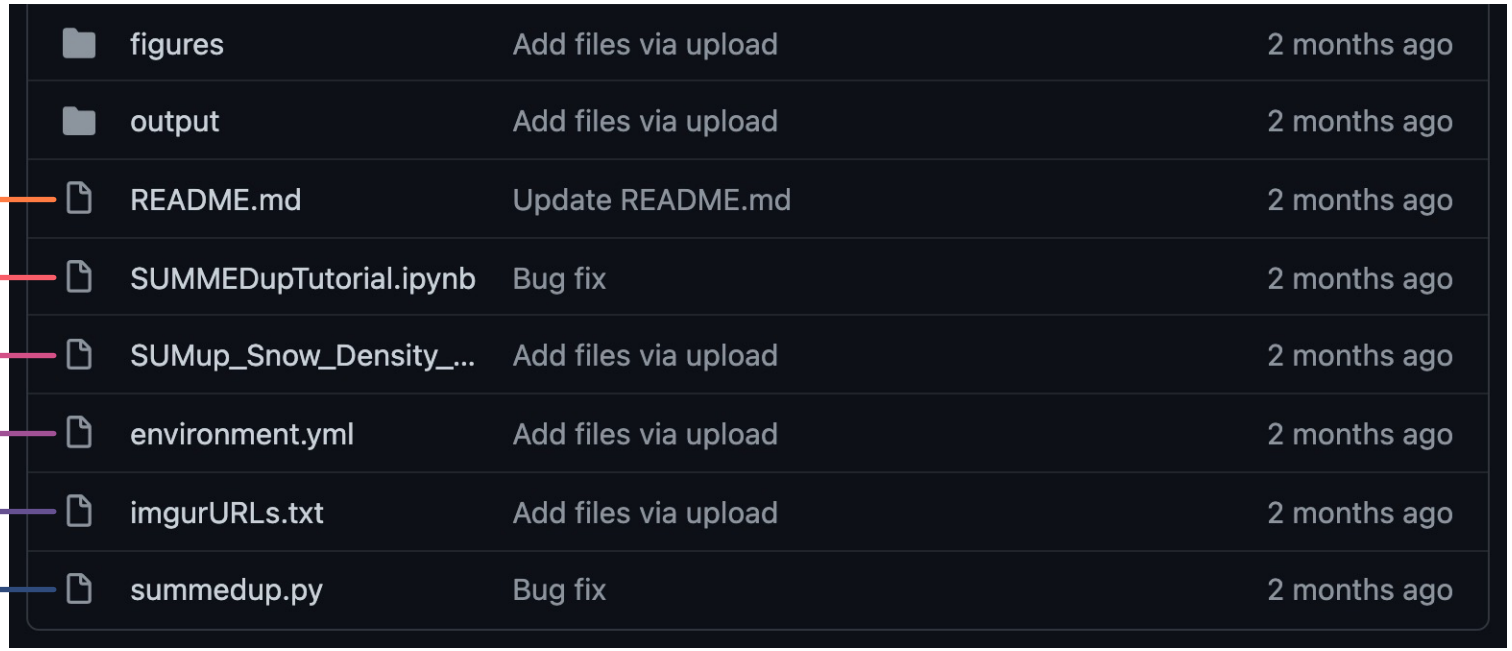
Jupyter notebook that shows how to use SUMMED up

Information about the SUMup density subdataset

Python dependencies (for use on Binder)

List of URLs pointing to plotted density profiles housed on imgur

Python package with the bulk of the code



SUMMEDup

- Excellent for researchers who use (or plan to use) SUMup snow and firn density measurements
- Simple enough to use as a teaching tool in undergraduate or graduate courses

- SUMMEDup is ever-evolving—expect new versions with new SUMup releases!
- I encourage you to reach out with:
  - Questions
  - Ideas for new features
  - If you'd like to contribute data to the SUMup dataset
  - If you find any bugs in the code!

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