RIS-Vis:

A Novel Visualization Platform for Seismic, Geodetic, and Weather Data Relevant to Antarctic Cryosphere Science

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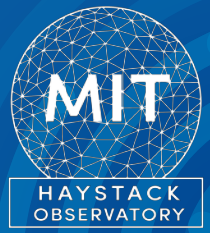
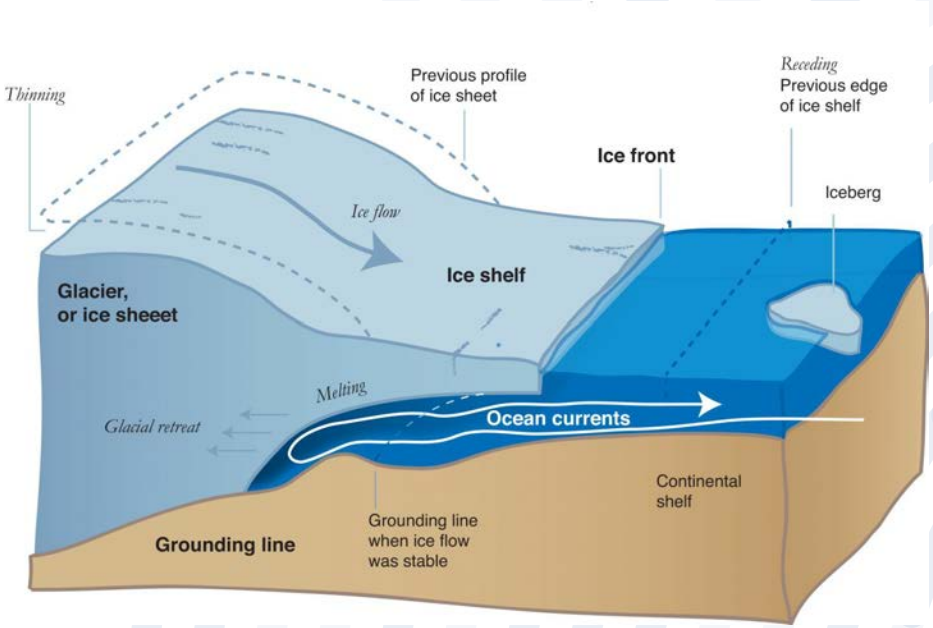


Outline

1. Scientific Background
2. Research Objectives
3. Project Development + Demo
4. Future Steps

Introduction

- Ice shelves **buttress** surrounding **grounded ice**
- **Ice shelf collapse** causes **sea level rise**

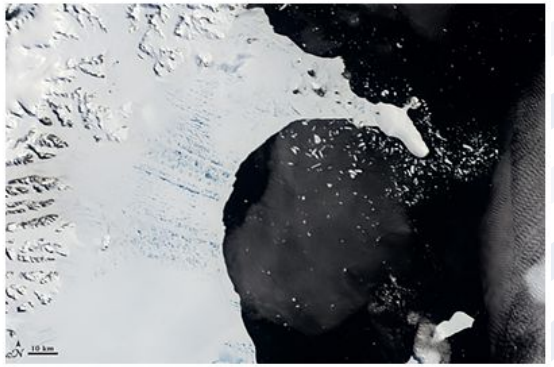


[European Geosciences Union]

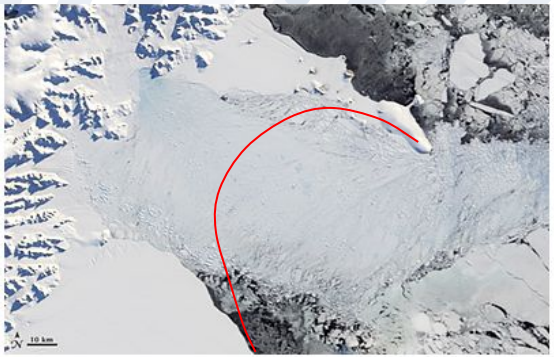
Introduction (Continued)

- What causes **ice shelf collapse**?
  - **Climate Change**
  - **Infragravity ocean waves**
- **Ice shelf health** can be monitored using data (**seismic, geodetic, weather, etc.**)

Larsen Ice Shelf Collapse



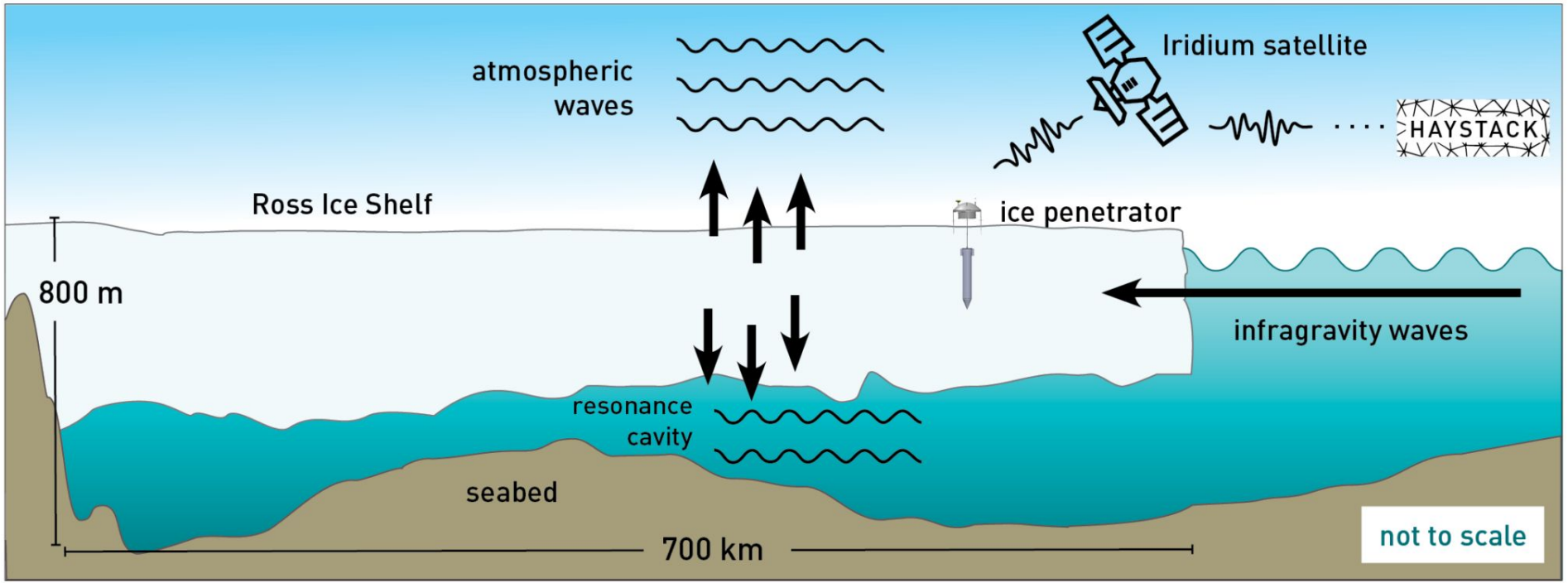
January 31



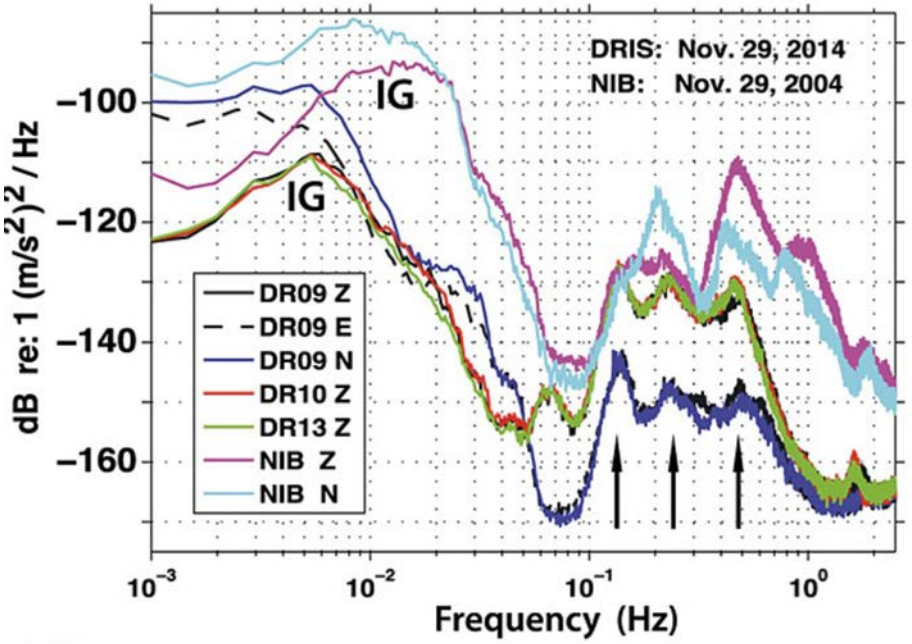
April 13

[NSIDC]

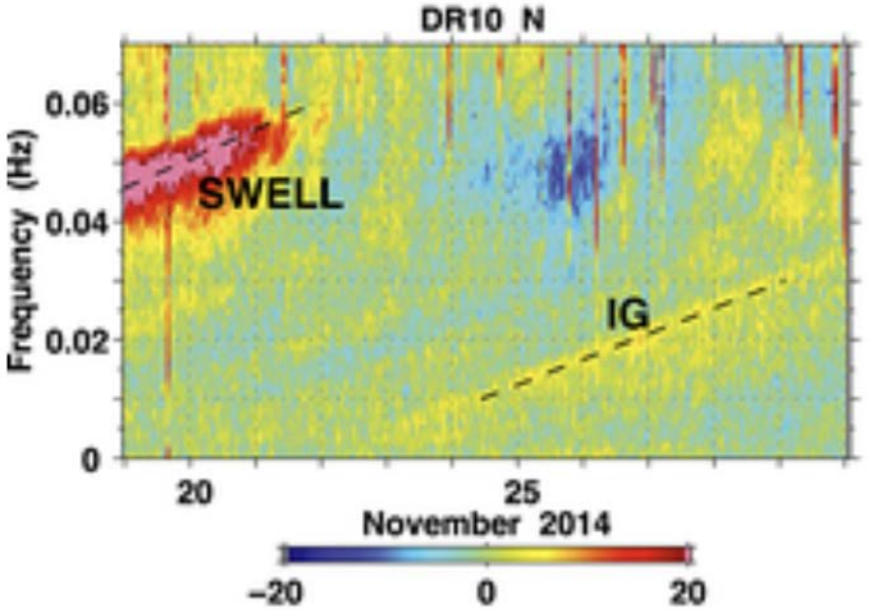
Seismo-Geodetic Ice Penetrator (SGIP)



Power Spectral Density



Spectrogram



Bromirski et al., 2015

Research Objectives

- Develop an **automated processing dashboard** to visualize **simulated SGIP Data**:
    - **Seismic Data:** Ice Shelf Vibrations
    - **Geodetic Data:** Ice Shelf Movement
    - **Weather Data:** Ice Shelf Climate
    - **System Monitoring Data:** SGIP Health

Dashboard Proxy Data Sources

Seismic Data

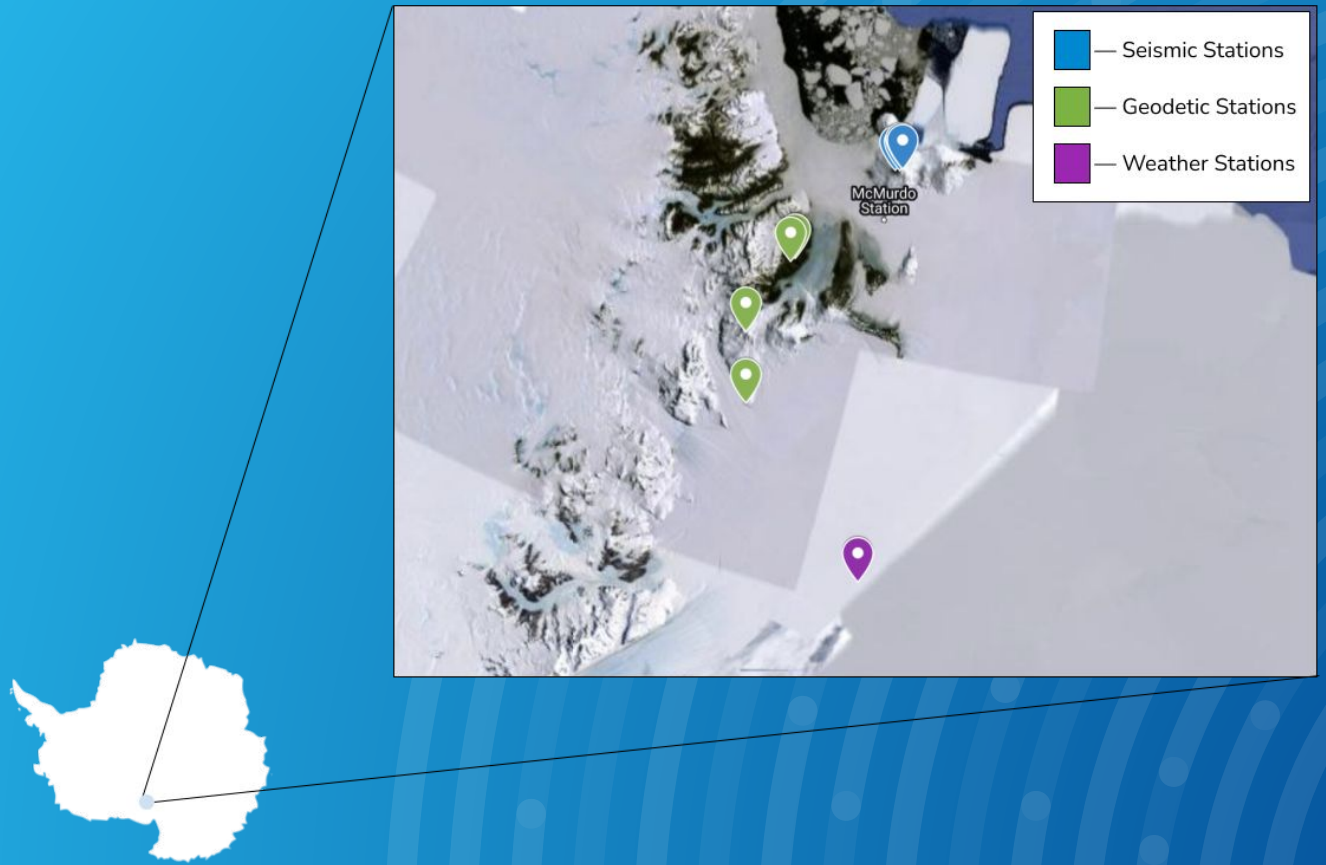
Geodetic Data

Weather Data

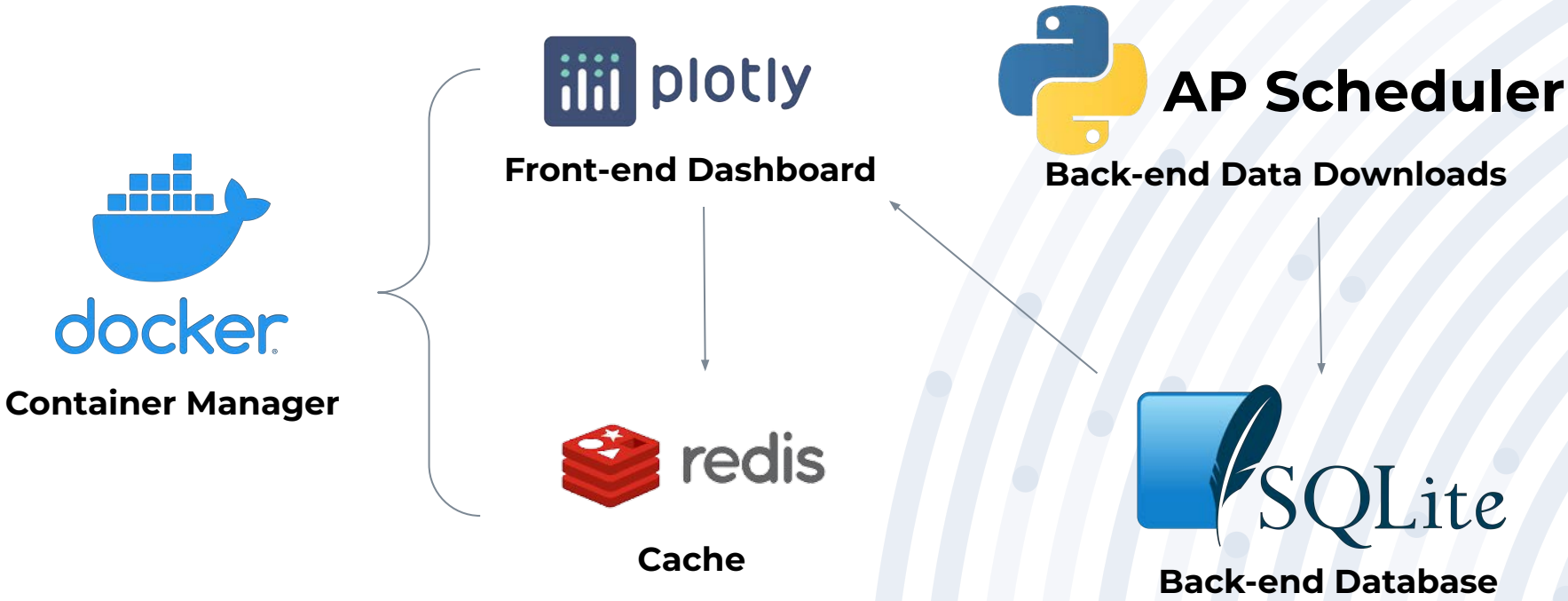
System Monitoring Data

SIDEx

Station Map


Seismic Stations
Geodetic Stations
Weather Stations
McMurdo Station

Design Decisions




Tracks of GPS Stations

Summary of RIS-Vis

- **Dashboard** to track **Ice Shelf health**
- **Monitors:**
  - **Vibrations** of RIS
  - **Movement** of RIS
  - **Climate** of RIS
  - **SGIP** Instrument Health

Challenges

1. **Processing speed**
2. **Scalability**

Solutions

1. **a.** Cache for home page
   b. Plotly Resampler
   c. Datashader
2. **a. Modular components**
   b. Backing **Database**

Roadmap

2024

5 - 10 years later...

Thank you!

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