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.)
Seismo-Geodetic Ice Penetrator (SGIP)
Power Spectral Density

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
  - IRIS
- Geodetic Data
  - Nevada Geodetic Laboratory
- Weather Data
  - WISCONSIN
- System Monitoring Data
  - SIDEx
Design Decisions

- Container Manager
- Front-end Dashboard
- Cache
- Back-end Data Downloads
- AP Scheduler
- Back-end Database
Summary of RIS-Vis

- **Dashboard** to track **Ice Shelf health**
- **Monitors:**
  - **Vibrations** of RIS
  - **Movement** of RIS
  - **Climate** of RIS
  - **SGIP** Instrument Health
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<th>Challenges</th>
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<td>1. a. Cache for home page</td>
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Roadmap

1. Visualize SGiP Data
2. Develop more monitoring capabilities (ex. machine learning)
3. Help scientists predict and mitigate ice shelf collapse

2024
5 - 10 years later...
Thank you!

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