November 2022

SZ4D Contributions from field Geoscience

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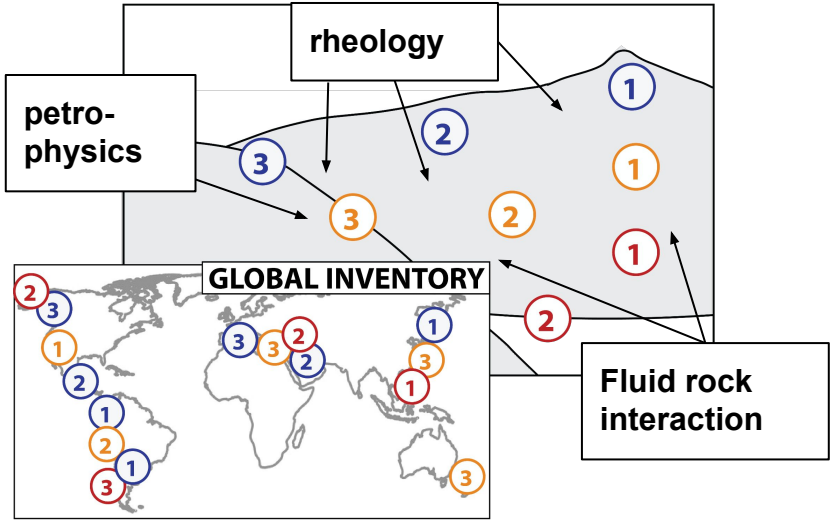
@SZ4D1

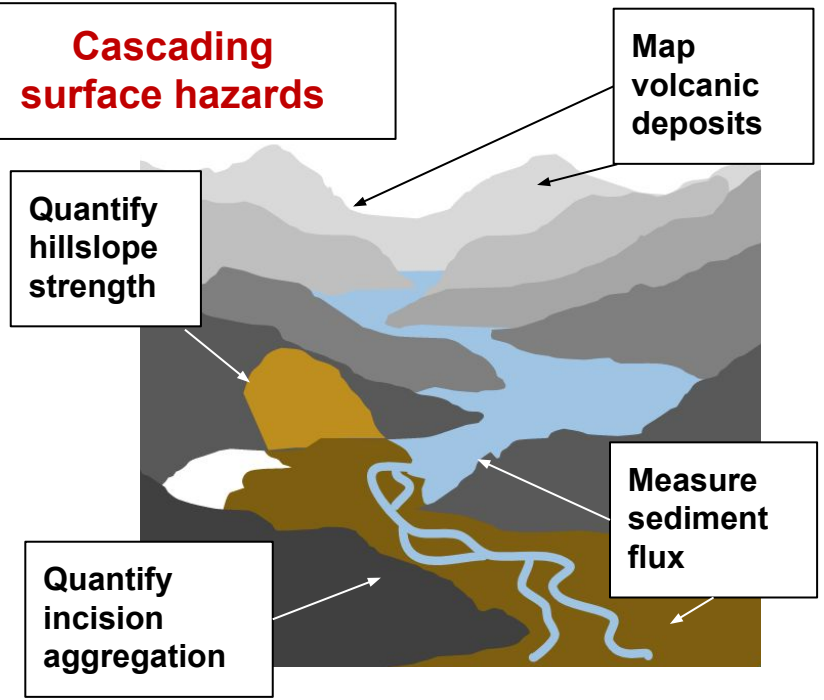
Key Role of the Field Geosciences

Two examples

Exhumed arc, subduction interface, host rocks

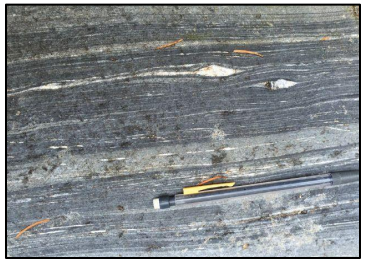
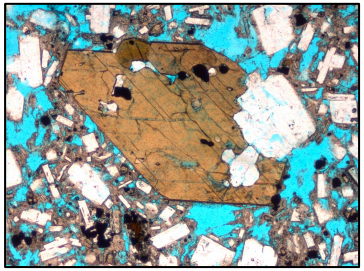


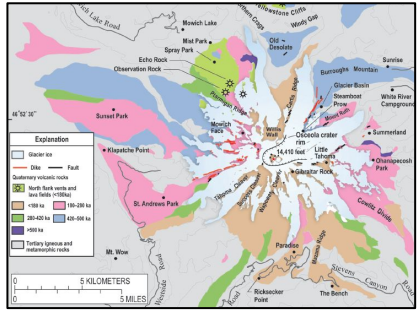
Cascading surface hazards



Key Role of the Field Geosciences

- **Geoscience data are critical** to answer SZ4D Questions for all working groups; record mechanical, physical, chemical processes
- **Need lots of data:** Large quantities of envisioned geoscience data require the collection, analysis, and synthesis of data, collected by numerous scientists from diverse subdisciplines
- **Need to integrate:** Requires the coordination of **people** and integration of **data** across geoscience, geophysical, modelling, and laboratory groups, from experimental design through completion.
- **Built into SZ4D Structure:** Field Geoscience Deployments on parity with instrument arrays, modelling, and lab networks in SZ4D vision (Catalyst proposal)

A Community Field Geoscience Experiment: GeoArray

What should a large scale, collaborative, SZ4D Geoscience Field Array (GeoArray) look like?

SZ4D RCN

- All Hands meetings
- Working Group meeting
- Ad Hoc sub committee meetings

We've also been gathering community feedback:

- April 30 2021: Geology and Experiments Virtual Town Hall
- Fall 2021 - Summer 2022: small group meetings
- Oct 2022 GSA: Field Deployment in person workshop

Priority Needs of the Field Geosciences
Identified in discussions to date

- **Human infrastructure** to support:
  - Travel logistics, field safety, equipment shipping
  - Coordination of PI research form inception to completion
  - Onboarding mechanisms to support inclusive research practices

STRABOSPOT

- **Physical Infrastructure** to support:
  - Field lodging, field vehicles, field research equipment, meeting space (Field Station)
  - Sample shipping, storage, archival, dissemination (Sample Repository)
  - Data management (standard data collection, archival dissemination)

The field geosciences could greatly benefit from coordinated, centralized Human & Physical Infrastructure resources to collect the scale of integrated geological data required to answer SZ4D questions

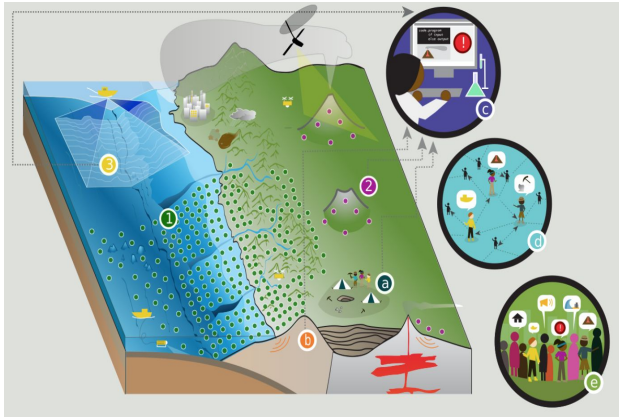
Need effective strategies to foster large scale collaborative, integrative research

Some ideas that have been put forward:

- Community Field Sites (ex: Critical Zone Observatories)
- Community Data Collection Expeditions (ex: IODP on Land, Coordinated EDMAPs)
- Community Sample Repositories, sample parties 🥳 🎉
- SZ4D PI matching, proposal writing workshops, lab visit and exchange programs, sabbatical programs
- Coordinated data synthesis efforts through workshops (e.g. CIDER)
- Chapman or Penrose conferences, field schools & field trips, student training programs
- REU cohorts, PhD cohorts, PostDoc cohorts

The GeoArray vision: Moving Forward

- What are the best strategies to implement large scale collaborative geological research in SZ4D?
- How can geologic activities be best integrated with modelling, laboratory, instrumental, and geophysical activities?
- What are the best practices to build an inclusive program with ample access to onboard new scientists, especially those who have not previously worked in SZ4D special interest regions?
- What is the ideal balance between community-level research vs PI-level research?



"Creating support for terrestrial-based field science as a facility is potentially one of the most transformative aspects of SZ4D"