

What can thematic studies of exhumed systems contribute to the GeoPRISMS initiatives?

- Integrating data from multiple sites allows coverage of a broad range of conditions not observable at a single site
- Links experimental and seismic observation to physical reality
 - Adds components of space and time
 - Do the measurements scale up? grain scale to outcrop scale, outcrop scale to seismically resolvable features, days to millions of years
- Enables coupled study of mechanical and chemical processes
- Organizes individual efforts into major interdisciplinary objectives
 - the whole is greater than the sum of the individuals
- Allows sample and data collection to be tuned to serve the needs of other groups with agendas of their own (geochemists helping seismologists, petrologists helping modelers, etc...)

Scientific Questions

- What are the rates and fluxes associated with fluid and melt production as recorded by interaction with rocks?
- What are the mass transfer processes important for global evolution models as well as concentration of ore metals (societal relevance)?
- How are tremor and slip recorded in the rock record?
- What are the geophysical properties of natural rocks (velocity structure, anisotropy, fabrics) at a variety of scales?
- How is magma formed and stored in the crust, and how does the crust evolve in response?

Types of exhumed systems

- Subducted crust (blueschists, eclogites)
- Ophiolites / Mantle wedge
- Upper, middle, and lower arc crust
- Faults

Example localities

- Slab blueschist / eclogite
 - Catalina / Franciscan
 - Tianshan
 - Franciscan
 - Guatemala
 - Alps
 - Greece
- Ophiolite / Mantle wedge
 - Josephine
- Arc crust
 - Fiordland
 - Talkeetna
 - Ivrea
 - Valle Fertil (Middle)
- Faults
 - Coast Range Thrust?
 - Kodiak
 - Namibia
 - Catalina

Baseline dataset for sample repository

- composition (mode, major, trace, isotopic for minerals and whole rocks)
- PT conditions
- structural and mineral orientation
- location (GPS coordinates)
- geologic context
- geometry of pore space, fractures, etc.
- age

Archiving, curating, and data management

- Lamont system (example)
- museums / repositories
 - Smithsonian
 - Yale
 - GSO
 - WHOI

Other opportunities

- On site workshops and field trips
- International Collaborations
 - incorporate samples from existing collections worldwide
- Develop guidelines for sample collection and management to foster interdisciplinary research