Deformation at all timescales

**Breakout Group 4** 

# What studies + activities + products are necessary for a strong synthesis of the GeoPRISMS program?

### For students and general public:

- Book for undergraduates. Not very accessible but useful for teaching.
- Short videos (animation or lecture) of major findings (like IRIS animations and teachable moments)

For scientific community: We need a mechanism to work on synthesis projects - hard to get proposals funded to pay for people to work on this and to get all of the disciplines together to do this, but very valuable to fund and execute.

 !!! GeoPRISMS/NSF Call for Proposals dedicated to synthesize existing data (like Earthscope)



# What studies + activities + products are necessary for a strong synthesis of the GeoPRISMS program?

As individuals, we don't know how much we've learned.

### What would constitute synthesis?

- Multiple layers, multidisciplinary
- Synthesize per focus site
- Connect MARGINS sites to GeoPRISMS sites
- Compare focus sites
  - Identify differences between sites (age, magmatism, size, etc.)
  - Find similar models then tease out differences, find patterns
- Compare processes in different sites
  - Role of sediments? Role of magmatism?
  - Range of rheologies vs behavior across different sites
- Connect paleo with active



### Where do we have gaps in our understanding?

- Need higher data resolution (e.g., offshore; more rock samples in EARS)
- Fault-magma interactions, complex rheology
- Strain partitioning, discrete vs. time-averaged deformation, crust vs mantle thinning
- Fluid sources? Fluid release (pulses vs gradual)? How is it associated to bending? To slip behavior?
- Role of preexisting structure
- Gap in understanding the spectrum of disciplines → Synthesis!



### **Frustrations**

- Cannot observe full seismic cycle
- Very hard to compare, each site is different

## What kind of infrastructure does our community need to address current science questions?

- Seafloor GPS
- Seismic acquisition ship
- Synthesis projects
  - Specific Call for Proposals for synthesizing existing data (and discourage new data acquisition)
  - Interdisciplinary process-oriented workshops (like GRC, CIDER)

Is an amphibious research program required to accomplish our goals? YES. Hikurangi has demonstrated the value of amphibious capabilities.



#### **Dilemma**

- Densify vs. new areas?
- Continuity of focus sites vs. new sites?

# How do we capture the momentum of the GeoPRISMS community?



- Bibliography for everything GeoPRISMS-related/inspired, not only GeoPRISMS-funded
- Platforms to encourage interdisciplinary work
  - Webinars for promulgation of new results, with Q&A, online = more accessible, more can participate
  - Specific Call for Proposals for synthesizing existing data
  - Interdisciplinary process-oriented workshops

### Other notes:

How does SZ4D overlap or contrast with GeoPRISMS?