Subduction Zone Observatory
Perspectives from the Student & Postdoc Symposium

Erin Wirth, University of Washington
TEI Student + Postdoc Symposium

- Students (30) + Postdocs (18)

Why Was This Important?
- Perhaps less biased towards preconceived notions of what an SZO should be.
- (And perhaps less practical.)

Courtesy of Kimmy McCormack
Discussion on an SZO led by Joan Gomberg (USGS)

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What is the slip behavior and rheology of the near-trench portion of subduction fault and what controls it?
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Questions for Today!

• What are major scientific questions?
• What observations, tools, and structures are needed to solve the big science problems?
• What are the major geographic targets?
• How to organize a SZO (centralized or distributed, community or individual experiments)?
• Who are partners, nationally and internationally?
What are the major scientific questions?
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- Subduction Initiation
- Controls on Slab Morphology – Effects on Dynamics
- Erosion and Morphology near the Trench
- Water Budget
- Spectrum of Slip Behavior
- Feedback Cycles
- Why do we have deep earthquakes?
- Constraints on the Spatial Distribution of Slip
- Stability of the Wedge at Trench
- Fluid migration in the slab and wedge
- Can Slabs Tear?
- What physical characteristic modulate the transition zone?
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What observations, tools, and structures are needed?
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- Strong Offshore Component
  - OBS
  - Marine EM
  - Ocean bottom GPS
  - Fluid flow sensors
  - Tidal gauges
  - Drill cores
What observations, tools, and structures are needed?

• Onshore
  – Boreholes everywhere! (3BB, strainmeters, GPS)
  – Remote observations (InSAR)
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- **Deployment Style**
  - Some long term (10-20 year) deployments
  - Package & move instruments? (like Earthscope)
  - RAMP Component
What are the major geographic targets?

• “Weird” vs. “Normal” Subduction Zones
• Every Subduction Zone!
• Hazard Oriented – Go where there are people
• Well-studied
• Compare multiple (2+) systems
• Do a few things at many subduction systems, or many things at just one?
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Do a few things at many subduction systems, or many things at just one?
Centralized or distributed, community or individual projects?
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- Community sharing for some aspects (i.e., OBS). Smaller projects or more novel techniques can be carried out by individuals.
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- Japan.

Biologists? Climate Scientists?
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- Japan.
- GeoPRISMS, Earthscope, UNAVCO, Cascadia Initiative, Neptune & OOI Cabled Observatories, IODP, JAMSTEC & ERI...
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• Biologists? Climate Scientists?
Thank You!

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- What are major scientific questions?
- What observations, tools, structures are needed to solve the big science problems?
- What are major geographic regions?
- How to organize a IAO (centralized or distributed, community or individual experiments?)
- Why are partners, not international?