

Burning Questions in Plate Boundary Dynamics and Rheology

Transients - understand transients – ‘one size doesn’t fit all’

Cascadia subduction – northern end poorly imaged at present – suggest new observations along Cordillera between Vancouver to Alaska

Deformation at southern end of the San Andreas Fault – seen in InSAR, plus strainmeters ; could be better imaged

Tremor migration along faults

B&R and east – Recognize the need for longer time series in low strain-rate zones

3D imaging of heterogeneity raises new questions

- **LAB I** – coupling of asthenospheric flow and lithosphere
- **LAB II** – mechanical vs flow boundary – testing against range of data sets
- **Lower crustal flow** – Snake River plain + Walker Lane

Vertical motions studies - geodesy (short term), shoreline changes (millennial scale), postglacial rebound - as tests of crustal dynamics and geodynamical models

Earthquake cycle and strain rates

- models to tie post-seismic to inter-seismic cycle – e.g., Denali over the next 2 decades (origins of the surface velocity field)
- Relationship of earthquakes and magmatism – many questions
- paleoseismological obs that span fault zone and longest time period – fill in the time scale over 100Kyears

Stable NAM – definition of reference frame – progress made but a few questions remain– Canadian data, etc

Modulus variations along fault zones – distributed vs localized strain along faults – shape of strain distribution – need linkage to geology, high-res seismic reflection

Dynamic topography in Colorado plateau , Nevada etc. and linkage to mantle drips – mass conservation; modeling studies – multiple time scales; coupling of lith and asthenosphere – decoupled? – links to earlier questions of LAB1, LABII

Rheology of mantle – transients, constraints on mantle viscosity? Can't restrict to ES
Is upper crust elastic, and over what time scales? Sum of geodesy and geology –