Geology and Geodesy Break-out Discussions
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• Role of geology (specifically tremor):
- Should we be looking at volumes rather than surfaces as sources?
    - Problem w/ "volume:: how to explain sharp slip fronts, planar propagation
- How would such a body differ from the surrounding rocks - compare to seismic observations, e.g., fluid content, composition, structural fabric, etc.?
- What would we look for in the geologic record
    - Seismologists give PT conditions, geologists look for field evidence
    - What should geologists look for:
        - size of individual slip surface (cm)
        - domain of multiple slip surfaces (1 km)
        - evidence for pulses of fluid pressure, e.g., fractures, veins
        - how well preserved, tectonic overprinting?
- Is localized slip only possible source for tremor? Perhaps multiple mechanisms and sources yield similar kinematic response?
- Do field observations (brittle fracture, slip surfaces, foliations, pseudotachylites) provide any insights into phenomenologic laws, e.g., rate-state friction? If so, what and how?
- Is there any value comparing to volcanic tremor: frequency content, etc.?

• Role of Geodesy (general)
- Constrain location and dimensions of region of deformation
    - M 6-7 slip events (and afterslip) denote affected regions 100 km^2
    - Tremor occurs in very restricted area
- Slow slip and tremor occurs over range of depths, perhaps along entire length of fault (subduction zone). Can use to predict PT conditions, but only locally.
- Creep can occur in many different settings, no obvious geologic correlation – what should be responsible? E.g.,
    - Known serpentine rich regions do not always correspond w/ tremor/slip

• How to Improve Observations and Integration
(e.g., through EarthScope and Related Programs)

- Network of 500 strainmeters to improve resolution of observations, i.e. to better constrain the geodetic signal, source, etc.
- Clear hypotheses to test, justify well-placed experimental arrays and inversions.
- Need tools to reduce non-uniqueness of geodetic inversions, e.g., compare geodetic and seismologic inversions (integrate geology?)
- Offshore observations to extend inversions across entire fault – geodetic (e.g., borehole strain meters)
- Very LONG time-series (e.g., decadal) observations.
- "Timely comprehensive data distributions"
- Clearer picture of how fault zones vary along entire length, e.g., frictional changes, controling properties, contrasts with adjacent rocks. Compare seismology w/ geology of multiple faults (hypothesized to accommodate slip)
- Strain meter data for low-level slip behavior, e.g., inter-ETS phases, or anomalous (e.g., low-slip) zones along fault strike.
- Improved vertical GPS (allow tracking of other constellations)

• Data products:

- catalog of slip events, that could be used to test ideas. Need data, slip models, displacements, geometry, etc.
- Similarly, earthquake rupture models for geodetic comparisons
- Improved "Earth" models, e.g., not half-space, but realistically heterogeneous models – accessible to rest of community
- Blind tests of source inversions to benchmark different methods