In the **Fault Zones breakout session**, the discussion focused primarily on two somewhat inter-related topics: induced seismicity and potential high-resolution fault zone field projects. Regarding induced seismicity, field deployments would benefit from access to large numbers (hundreds) of easily deployed 3-component instruments with sensors of reasonable bandwidth. Targets would include earthquakes down to magnitude 0 and possible precursory seismicity leading up to larger events. A key aspect to progress is on the political front, where regulations requiring release of operational information and intelligent regulation of operations and required monitoring are essential. Regarding potential high-resolution field projects to study particular faults, again access to very large numbers (thousands) of easily deployed 3-component instruments with sensors of reasonable bandwidth is essential. Industry can't be relied on to share/lease instrumentation when and where needed. The value of borehole instrumentation was discussed, for improved signal quality in terms of lower noise level and reduced attenuation. Numerous ideas were suggested for potential target areas, including Oklahoma, Nevada, Northwest Canada, and the northern part of the creeping section of the San Andreas. It was suggested that linkages to early warning efforts might be appropriate. The concept of intentionally inducing an earthquake was also discussed. Related to a targeted fault study, there was extensive discussion of the need for revived and expanded RAMP instrumentation for aftershock studies, and the concern about (lack of) preparedness for response to a future large earthquake.

The discussions focused on geophysical approaches to fault zone studies because of the specialties of most participants and the limited time. The meeting ended with the recognition that we needed to engage the broader fault zone studies community to come up with integrative and creative approaches to understand fault behavior from the perspectives of microscale physics to plate boundary processes. It was suggested that we would benefit by holding a multidisciplinary workshop, or series of workshops, tasked with defining what we have learned over the last two decades about the complexity of the faulting process, the key questions that we want to focus on over the next decade or two, the expertise and tools that will be required to answer these questions, the anticipated technical challenges, and the key individuals in our community that could best organize the workshops and facilitate discussions.
In other words, it is time to think big and develop a broad, forward-thinking, multidisciplinary research plan to take us to the next level of understanding of fault complexity at all scales across the full spectrum of fault slip behavior.