Predicting Channel Geometry in Faulted Hydrocarbon Reservoirs

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This field-based project (located on the Volcanic Tableland, a Late Pleistocene ash-flow in eastern California) focuses on interaction between normal fault displacements and paleo-channel morphology.

We utilize differential GPS to study the effects of fault interaction and linkage on bedrock channel morphology. Because the channels are now inactive, we estimate downstream changes in channel width and depth using HEC-RAS, a one-dimensional open channel flow model developed by the U.S. Army Corps of Engineers.

- **Trends in channel slope and width to depth ratio suggest that displacement rate acceleration drives incision, and this process begins well before the fault geometry would suggest imminent linkage.**
- **Channel slope and width to depth ratio may adjust independently to changes in fault displacement rate.**
- **Our data to date can be interpreted in one of two ways:**
  - **either channels respond to increased displacement rates by first decreasing their width to depth ratio, and channel slope only changes once a threshold width to depth ratio is achieved,**
  - **or changes in width to depth ratio remain in the channel even after channel convexities have been eroded out of the profile.**