Group D: Remote-Sensing Data

(Geologic and Geodetic Perspectives)

A mix of participants who collect geologic and different types of remote-sensing data (e.g., optical imagery, lidar, InSAR, GNSS, seismic, geophysical data, etc.) after an earthquake and some who don't have experience with post-EQ data collection.

We mainly discussed the barriers to collecting and processing satellite, airborne, and field data; how these data could inform earthquake response locations and help people who are in the field; and how should these remote-sensing data should be shared.

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Breakout Group D: Remote-Sensing Data

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red text are discussion moderators

Geologic and Geodetic Data: What Works Well

- Satellite data collection can help inform field survey and rupture extent
  - Survey interval of several days and significant amount of postseismic afterslip signal can decay by then.
- Helicopter reconnaissance
- Drones are being used! SfM used for Ridgecrest. Lidar drones are very promising for highly vegetated regions, but slow.
- iOS lidar is useful for site mapping, and fairly accessible

sUAV/ drone photo of M6.4 Ridgecrest earthquake rupture.
Pierce & Koehler photo.

Geologic and Geodetic Data: What Needs Improvement

- Data that should not be overlooked:
  - **Rupture endpoints**
  - To inform locations for **GNSS and creepmeter installation** for afterslip studies (log-time afterslip decay) – so there is a need to quickly establish regions of afterslip (< 1 day after the event)

- Understanding of the different satellite products, **usage, and limitations**
- Need for new 3D analysis tools for **iOS lidar**

- **Agree on which service for data sharing:** EERI EQ clearing house, twitter, SCEC, Slack (USGS can't use), and permanent data repositories

- Funding for rapid UAS/Aircraft surveying: **equipment, training, response, & processing**

Use of dGPS following the Ridgecrest Earthquake

https://opentopography.org/blog/iphone-lidar-applications-geosciences

Camera system and lidar scanner on iPhone 13 Pro.

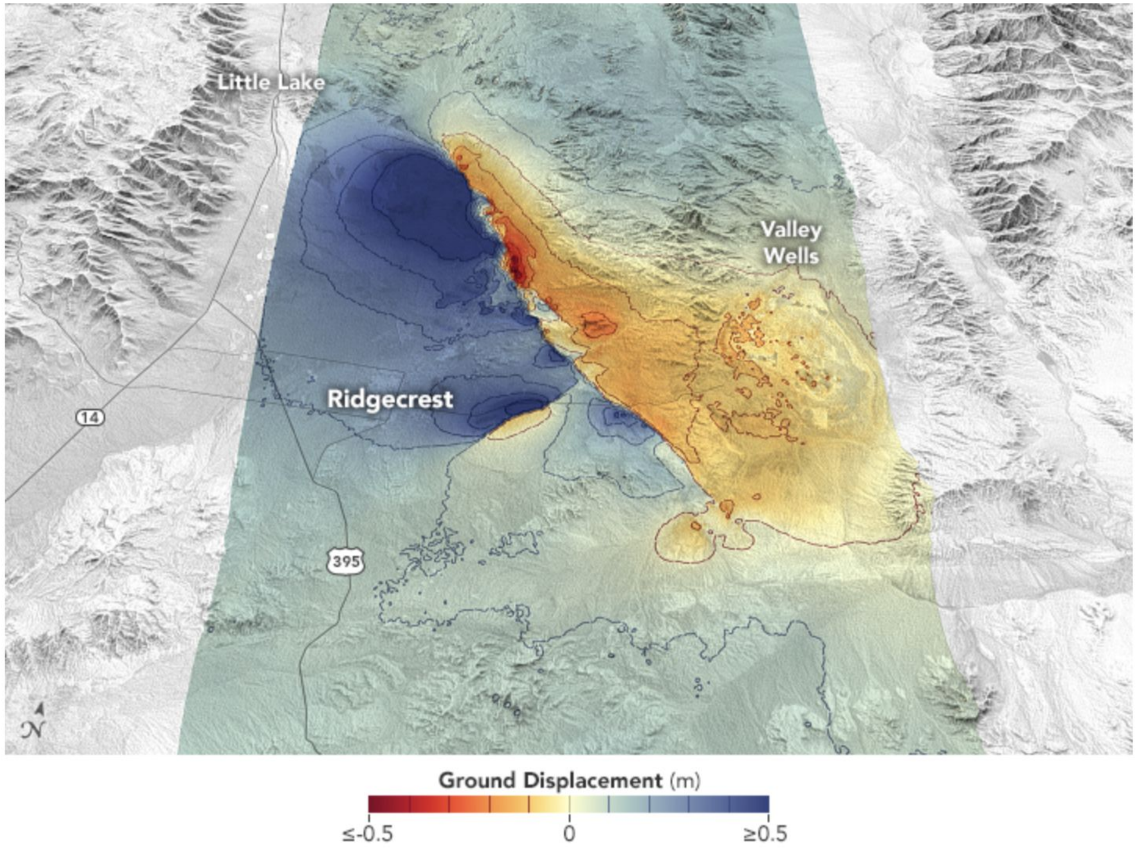
Geologic and Geodetic Data: Short-Term and Long-Term Tasks

Short-term

- General dataset cheat sheet (e.g., InSAR); Key points annotation /interpretation for sharing data with geologists
- **Immediate Helicopter Reconnaissance:** Partner with state agencies & National Guard
- Cross-discipline training between field and GNSS/creepmeter teams for fast field deployment
- Georeference sUAS imagery and field measurements: Configure existing & temporary geodetic GPS networks to for PPK dGPS processing (1 Hz data, RINEX format)
- Protocol for sharing immediate and permanent data

Long-term

- Secure funding & equipment for surveying
- More planning for vegetated & urban response environments



Unwrapped InSAR interferogram for the Ridgecrest earthquake produced by NASA