

# Imaging and Analyzing Southern California's Active Faults with High-Resolution Lidar Topography

## DRAFT WORKSHOP OUTLINE

### Day One – October 24

- 8:30 Welcome and introductions (EPS 1316)  
Goals of course and agenda review (Team)  
Acknowledgements (Team)
- 9:00 1. Review of LiDAR technology and data acquisition (Crosby):  
- GPS + IMU + scanning laser rangefinder  
- Pulse rate, pulse density, spot size, number of returns
2. Overall LiDAR processing workflow - what happens at each step, who typically does it? (Crosby)  
- Typical deliverables  
- Data volumes, considerations for managing these datasets, projection issues, metadata, file formats and terminology.
3. What is the acquisition and processing parameter space that geoscience users should be aware of? What are possible sources of error/artifacts? (Crosby, Oskin)  
- GPS control and dataset accuracy vs. quality – corduroy, scan line artifacts, etc.  
- The role of vegetation in determining "quality" of the data (Crosby, Oskin)
4. Creating DEMs From Points (Crosby & Arrowsmith):  
- Methods – local vs. global (Bin, TIN, IDW, spline, etc).  
- What are advantages/disadvantages of each method? (artifacts, interpretability, computation time).
- 10:15-10:45 *Break (Coffee outside EPS 1119, followed by walk to Hunt 253 for day)*
- 10:45 – 12:00 EXERCISE 1: Basic visualization of LiDAR DEMs using ArcMap (Arrowsmith, Crosby, Oskin)  
- DEM with color gradients  
- DEM with hillshade  
- Slope & slopeshade  
- Generating Contours from DEMs
- 12 – 1:15 pm *Lunch (Lunch at Segundo Dining Hall – See Map)  
Mention “Geology” when at Registers so lunch is charged to workshop*

1:15 pm EXERCISE 2: Extracting information from DEMs in ArcMap (Arrowsmith, Oskin):

- Point and profile queries
- Watershed analysis
- Visualization of channel networks

2:45 – 3:00 Break (*Hunt Courtyard*)

3:00 EXERCISE 3: Fault-zone mapping (Oskin)

- Fault-zone geomorphology
- Change-detection with time-series LiDAR
- Mapping fault-zone features

5:30 Stop

6:00 *Optional no-host group dinner in downtown Davis. Details TBD.*

**Day Two – October 25th**  
**(Location EPS 1316)**

8:30 Recap from yesterday, questions, intro to day two.

8:45 Online data LiDAR data sources (Crosby):

- General sources
- OpenTopography intro.

EXERCISE 4: Accessing LiDAR via OpenTopography (Crosby).

9:45-10:00 Break (*outside of EPS 1119*)

ROTATING EXERCISES 5, 6, 7 – three groups, 1.75 hrs per exercise:

EXERCISE 5: LidarViewer (Oskin/UC Davis Group) (**Mac Lab – EPS 2231**)

EXERCISE 6: KeckCAVES (Oskin/UC Davis Group) (**KeckCaves**)

EXERCISE 7: LaDiCaoz —Matlab-based tool for computing small offsets along faults and discussion of results (Arrowsmith) (**EPS 1119**)

10:00-12:00 EXERCISE BLOCK 1

11:45 -1:00 Lunch (*Dining passes at Tecero*)

1:00 – 2:45 EXERCISE BLOCK 2

2:45-3:00     *Break (coffee break in 1119)*

3:00-4:45     EXERCISE BLOCK 3

4:45-5:00     Wrap-up session / lingering question and answer session. (1119)

5:00     END – *Thanks!*