

Metadata Report

Project Name

Quaternary Surface Ruptures along Panamint Valley Fault, Eastern California, April-May 2018

Summary

The digital surface models, generated from sUAS-derived aerial images, show fault scarps that displaced Quaternary alluvial deposits at six sites along the Panamint Valley Fault, eastern California. The six sites are (1) south of Middle Park Canyon, (2) South Park Canyon, (3) Big Horn Canyon, (4) Manly Peak Canyon, (5) between Manly Peak Canyon and Goler Canyon, and (6) Goler Canyon. We coupled our model with ground control points using RTK positioning survey. The fault scarps and offset channels range from less than a meter to a few meters of offset. These data were collected as part of a master's thesis, which aims to reconstruct the displacement and rupture length of the most recent earthquake and to understand the kinematics of the Panamint Valley Fault.

Personnel

- PI Israporn Sethanant
- Field staff Wesley von Dassow

Site Information

- Site description

Middle Park Canyon and South Park Canyon exhibit fault scarps with dominant normal-slip component. The other four sites show offset channel markers along the right-lateral strike-slip segment of the Panamint Valley Fault and some normal-slip fault scarps along the oblique-slip segment. The stratigraphic relationship between the alluvial fans or their inset patterns are also present at some locations. Manly Peak Canyon site requires a few kilometres of hiking from the main road to the Quaternary surface ruptures near the mouth of the canyon. The other sites are relatively close to the main road.

- Site objective

We target surface ruptures that offset Late Quaternary deposits to measure the displacements of the most recent earthquake. In addition, the study areas are located at both the oblique-slip and strike-slip segments of the Panamint Valley Fault, to understand the complexity of the rupture, whether both segments ruptured during the most recent earthquake.

- Site location

Figure 1. Shaded relief map of the Panamint Valley Range and the site locations (white boxes). The black lines represent the Panamint Valley Fault along the range front and in the valley. The faults are composed of the NE-trending oblique-slip segment and the NW-trending strike-slip segment.

- Site conditions

70-90°F; There were various weather conditions—sunny and clear sky, some clouds during some hours, moderate wind during some hours, and precipitation.

- Date/time spent at each site

(Note that the time spent includes the RTK survey of the GCPs.)

Middle Park Canyon (South)

Condition: Sunny, clear sky

Date: April 27, 2018

Time: 12:00-14:00

Goler Canyon

Condition: Sunny, but some overcast in the north

Date: April 30, 2018

Time: 9:30-13:00

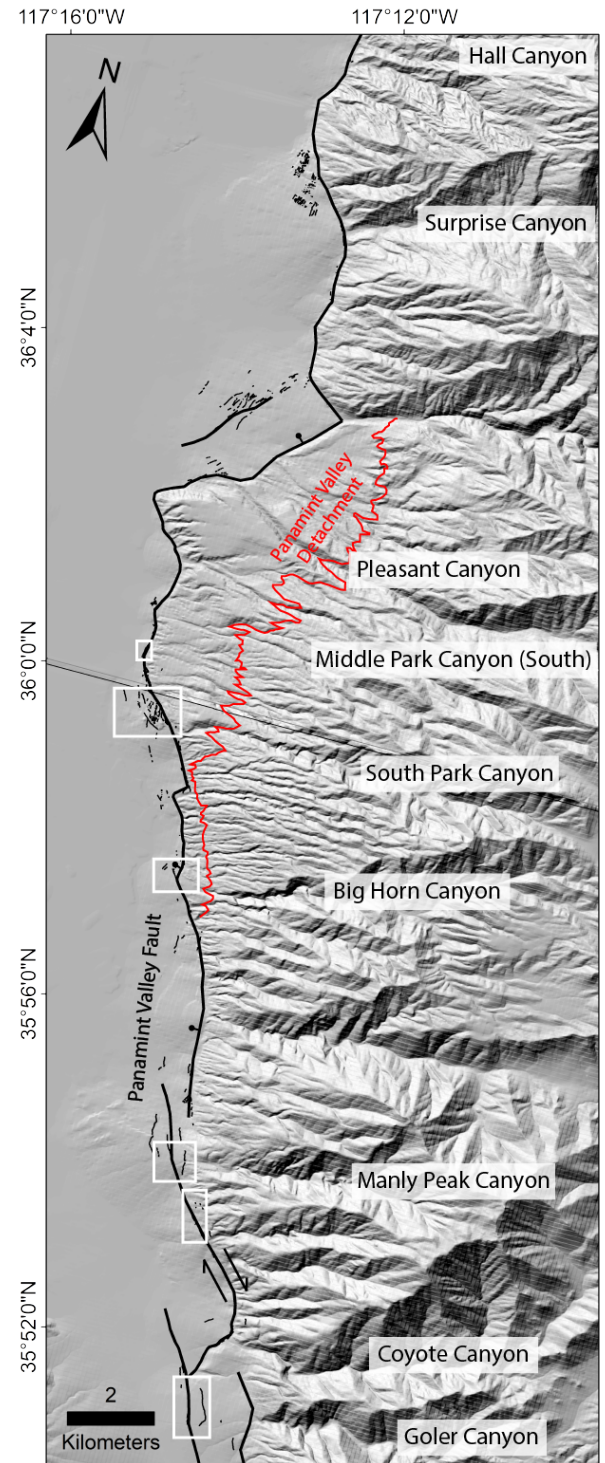
Between Manly Peak Canyon and Goler Canyon

Condition: Overcast and started to rain, so we

resumed the survey on another sunny day

Date: May 1, 2018 (rained); resumed on May 3, 2018

Time: 12:30-13:40



South Park Canyon

Condition: Sunny, but 30-50% cloud during some parts of the acquisition

Date: May 2, 2018

Time: 8:00-12:00

Manly Peak Canyon

Condition: Sunny, a few clouds, no wind

Date: May 3, 2018

Time: 10:20-12:00

Big Horn Canyon

Condition: Sunny, clear sky, no wind

Date: May 4, 2018

Time: 10:00-13:00

Survey Results

- Equipment used DJI Mavic Pro I
- GPS solutions RTK Survey using Trimble 5800
- Collection methods

We used the Ground Station Pro application for flight planning and taking the images along the fault, at ~35-65 m flight altitude. The images had 60-80% front- and side-overlap. At Big Horn Canyon, the drone battery and iPad overheated and stopped working. Data at this site were then collected by manually flying the drone via DJI Go 4 and using a video recording. The video frames were extracted in MATLAB and used as inputs in Agisoft Photoscan.

Products

- Date of dataset collection April 27, 30; May 1-4, 2018
- Coordinate system of datasets WGS 84 / UTM zone 11N (EPSG::32611)

	Spatial Resolution		Horizontal Accuracy (m)	Vertical Accuracy (m)
	Point Cloud (points/m ²)	Raster (cm/pix)		
Middle Park Canyon (South)	1201	3	0.78	0.09
South Park Canyon	624	4	1.0	0.15
Big Horn Canyon	393	5	0.26	0.04
Manly Peak Canyon	447	5	1.4	0.19
Between Manly Peak Canyon and Goler Canyon	589	4	0.88	0.09
Goler Canyon	735	4	0.16	0.01

Note that these values were reported from Agisoft Metashape.

- Data formats Point cloud (.laz), Raster (.tif)
- Data processing methods Point cloud and digital surface models were processed using Agisoft Photoscan with high alignment parameter settings.