

Maps for Understanding the Geology of the Greater Yellowstone Region

The geological literature is filled with interesting insights. But geological articles quickly become technical in nature. This is because the main audience for articles consists of other professionals working in one or another sub-specialty in the field. In comparison, attempts to summarize these insights for the interested amateur are relatively rare.

On the other hand, the maps that one finds in the literature can be quite helpful for getting a big picture grasp of what's going on. Below are three maps that you may find useful.

1. Simplified Map of the Geology of the Teton-Jackson Hole Region

No matter what direction you come from, driving across the region means crossing a jumble of mountains and basins. This map, from Love, et al., 1978, outlines the main geologic features of the Greater Yellowstone Region.

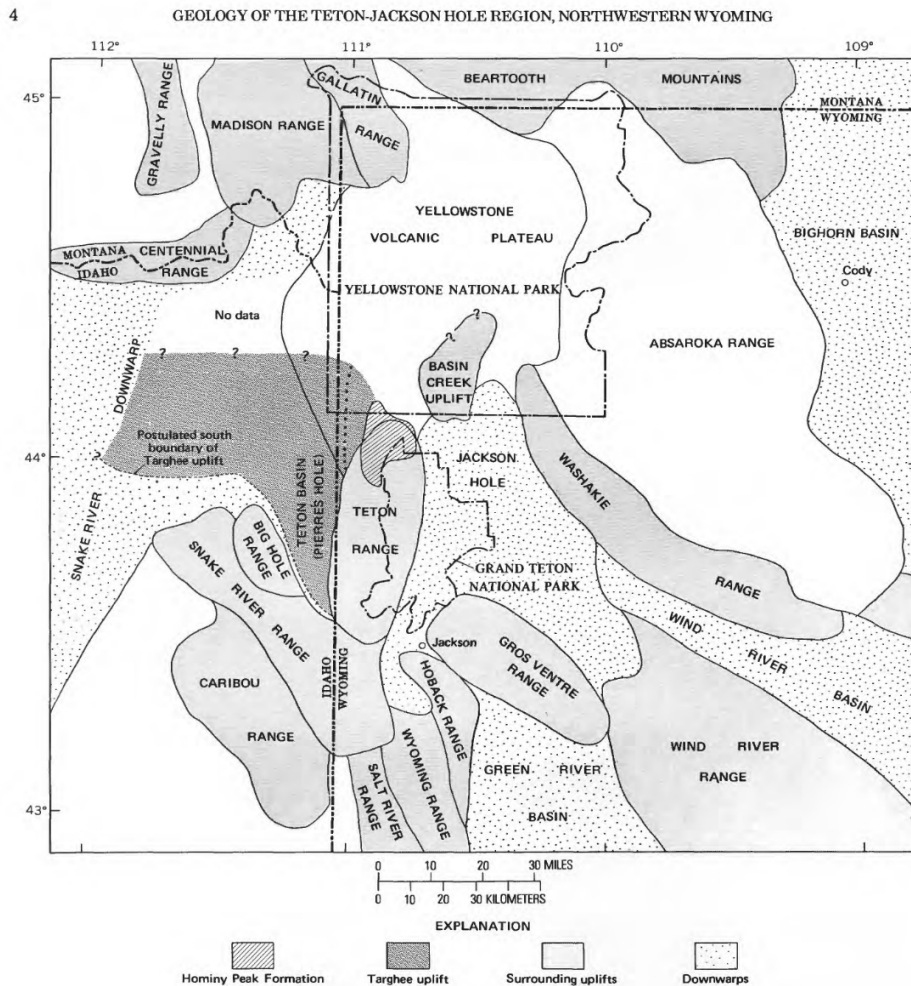


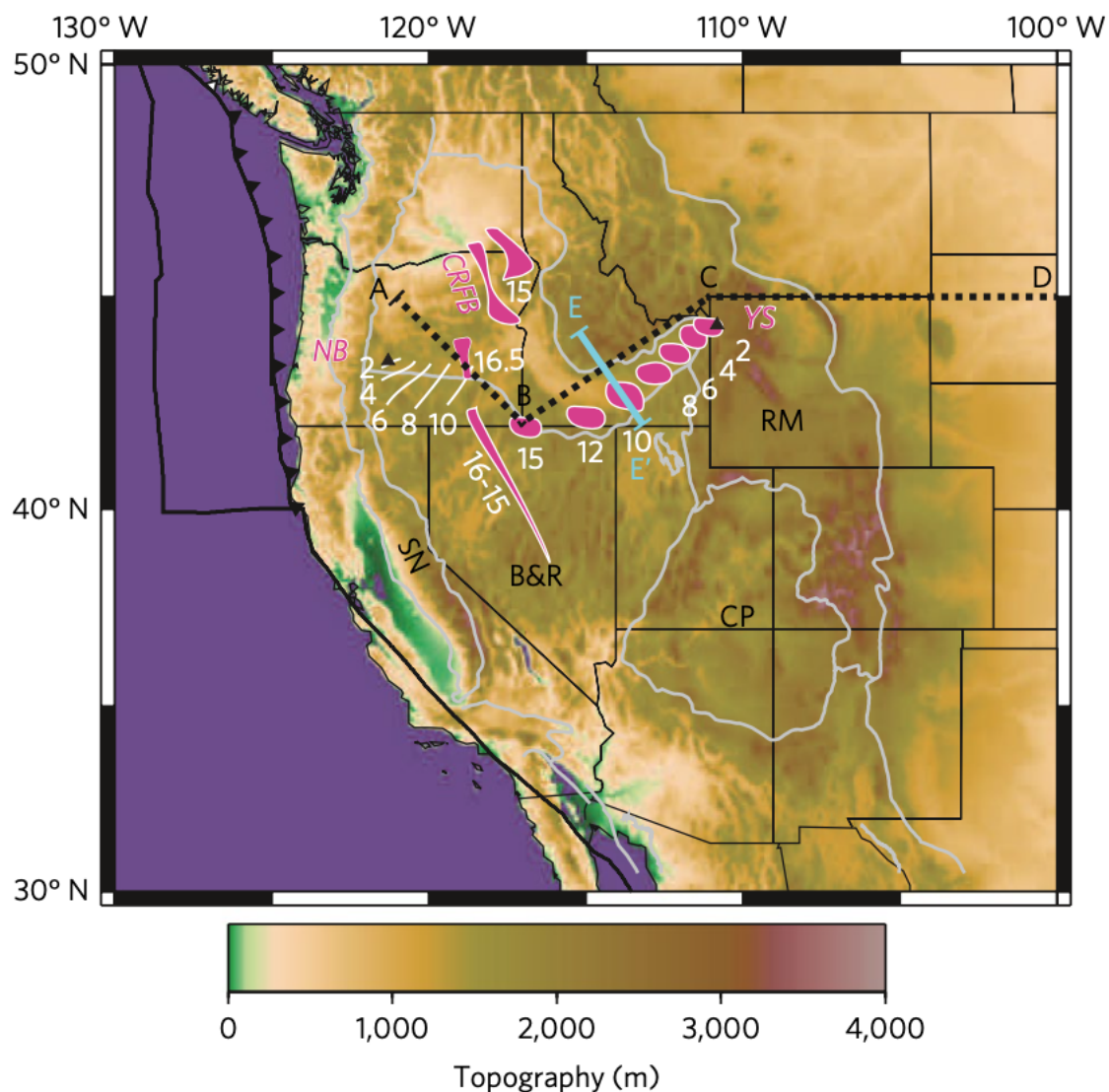
FIGURE 1. — Map showing relation of the area containing scattered outcrops of Hominy Peak Formation to Targhee uplift, surrounding uplifts, downwarps, the Yellowstone volcanic plateau, and the Ab-

saroka Range. Line of large dots indicates approximate position of steep east flank of Targhee uplift during deposition of Hominy Peak Formation.

(J. D. Love, Estella D. Leopold, and D. W. Love, 1978. *Eocene Rocks, Fossils, and Geologic History, Teton Range, Northwestern Wyoming*. Geological Survey Professional Paper 932 -B)

2. Tracking the Yellowstone Hotspot

Hotspots are a poorly understood but a generally accepted explanation for prominent volcanic chains found across the surface of the earth. Examples of hotspots include the Hawaiian Islands, Iceland, and Yellowstone. Hotspots are believed to be the result of hot plumes rising from the Earth's mantle, or of unusually weak areas of the Earth's crust, that remain stationary as the Earth's plates move over them. The map below tracks the northwest movement of the Yellowstone hotspot over the last 16 million years.

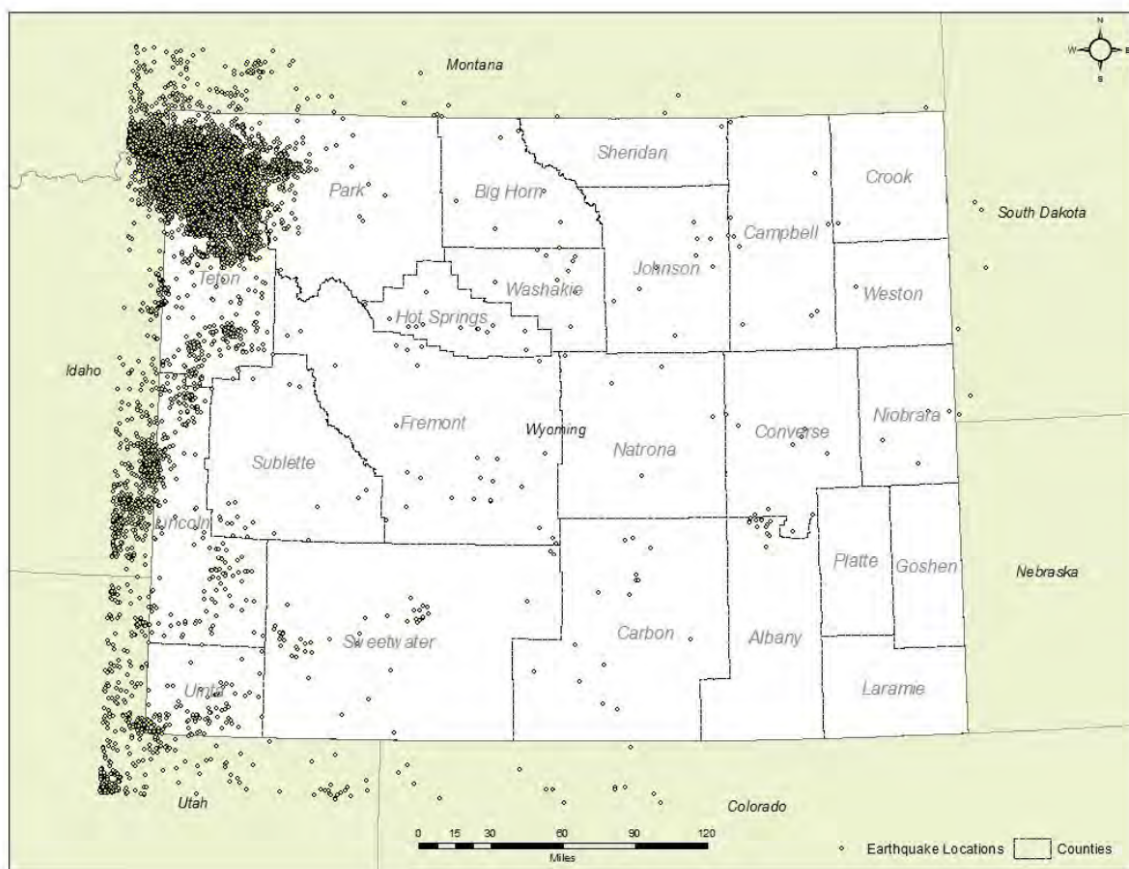


(Quan Zhou, Lijun Liu and Jiashun Hu, 2017. Western US volcanism due to intruding oceanic mantle driven by ancient Farallon slabs. *Nature Geoscience*)

3. Earthquake Frequency Across Wyoming since 1963

In the map below two facts stand out: the massive number of earthquakes in the Yellowstone region, and the lesser but notable number of quakes running north-south along the Idaho-Wyoming border, along the axis of the Idaho-Wyoming Overthrust Belt. The earthquakes are thought to be caused by the movement of tectonic plates, as well as the periodic pumping of hydrothermal fluids in the Yellowstone region.

Figure 1. Earthquakes in and near Wyoming Since 1963.



Wittke, Seth J., O'Donnell Ryan S. *Wyoming Earthquake Hazard and Risk Analysis: HAZUS-MH Loss Estimations for 16 Earthquake Scenarios*. No other publishing data.