Death Valley Geology

Death Valley is located within eastern California (bordering Nevada) and is nestled within two major ‘natural’ US provinces- the Sierra Nevada to the west and the large “Basin and Range Province” to the east, which extends across Nevada and into Utah. Within this region, the greatest relief (change in elevation) is recorded for the contiguous United States: the 14,776 ft difference between Mt. Whitney at 14,494 feet above sea level in the Sierra Nevada, and the infamous Badwater Basin in Death Valley at 282 feet below sea level! Death Valley is a long, narrow, north-south trending, fault-bounded trough (graben) bordered on both sides by huge mountains (see geological map below), which formed within the last few million years.

The geology within Death Valley is dominated by two large-scale tectonic processes, these are extension and volcanism. The first process, extension, has affected much of the Western United States and created the Basin and Range Province. Convection or “currents” within the Earth’s upper mantle are driving coastal California to move slowly away from the Colorado Plateau at a rate of ~1 inch/year. This extension has stretched the crust in a west-east direction, which has given rise to the north-south trending basins and ranges, such as Death Valley. Volcanism also abounds in the region; for example, the Ubehebe crater located in the northwestern region of Death Valley is the result of volcanic activity that occurred ~1,200 years ago.