## A virtual representation of Hawaii’s topography

This is a virtual head-on view of the Big Island of Hawaii that should give you an idea of the vertical grandeur of the mountains on the island. The volcanic summits of Mauna Loa and Mauna Kea both exceed 13,000 feet, which means that the elevation must change from sea level to these lofty altitudes over a relatively short distance. The black contours on our virtual island here are contours of constant elevation, so they connect points with equal elevations.

Now we’ll flip to a top-down view and observe how tightly packed contours of constant elevation make a bull's-eye around the summit of each mountain. The contours are tightly packed, which means that elevation changes rapidly over short distances, indicating a steep grade as you might expect near the summit of a mountain nearly 14,000 feet high. If we change back to the head-on view, you can confirm that areas with tightly packed contours are those where the slope of the terrain is steep.

Now, what about other parts of the island away from the peaks of the mountains? Let’s focus over here where the terrain is flatter. Switching back to a top-down view shows a looser packing of contours, which means that elevation changes are much smaller over a fixed distance compared to the mountain sides. So, the packing of these contours of constant elevation tells us a lot about how steep the grade is. Areas where elevation changes very rapidly over a short distance have a tight packing of contours, while areas with smaller elevation changes have a looser packing of contours. Hopefully, our virtual look at Hawaii’s topography has shown you how we can analyze three-dimensional topography on a two-dimensional map.