YELLOWSTONE GEOLOGY

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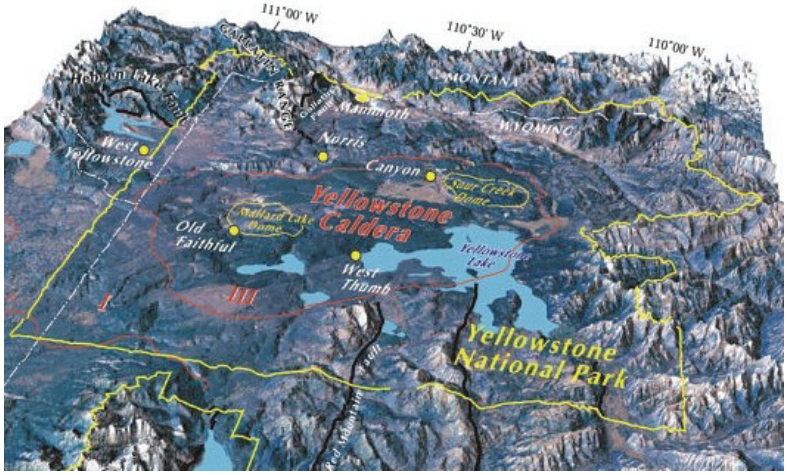

A map of Yellowstone National Park Showing the Caldera Rim (Red Circle), Image Courtesy of USGS

Every year, thousands of tourists are drawn to Yellowstone National Park to admire its beauty: the wildlife, the forests, the many wonders. The cause of the majority of Yellowstone's wonders is geologic activity over millions of years.

The scenic wonders that we are all aware of, such as the paint pots and Old Faithful Geyser, for example, are examples of geothermic activity, or an area of increased heat flow from deep inside the earth. Yellowstone's geothermic activity is referred to as a 'Hot Spot'. The earth's surface has a thin covering of rocks that are called plates. These plates float on liquid rock deep inside the earth. Due to the fact that the plates 'float', they have motion, and bump and rub against other plates. This interaction causes friction; when the built-up friction is released, an earthquake occurs. In some cases, heavy plates get pushed under other plates. This is a process called subduction, and occurs off the coast of California. As the heavy ocean plate sinks deeper into the earth, it begins to heat and melt. This melted rock floats upward, causing a collection in a specific location. That melted material is light and tries to find its way through the continental plate, using any channels that it can find. Once it finds a channel, it melts the surrounding rock and creates a larger tube to flow through; once it arrives at the surface, a volcano is formed.

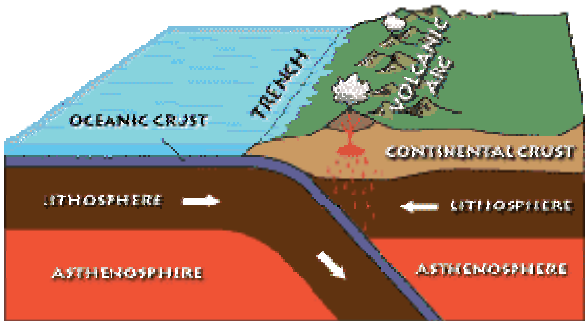

Image of plate subduction courtesy of USGS

A great example of this process is Yellowstone National Park. Yellowstone is known to have had large volcanoes and large eruptions throughout Earth's history; the most recent eruption was 70,000 years ago. Evidence of these eruptions is Yellowstone Lake – the lake sits in the caldera of the volcano, the Yellowstone Plateau, and the Snake River Plain. Currently the volcano is defined as 'active' but the United States Geological Survey (USGS) says that a large scale eruption is not imminent. However, the melted magma under the earth's crust rises and falls, which pushes the surface of the earth up and down underneath the lake. This can be seen by the ever changing coastline of Yellowstone Lake.

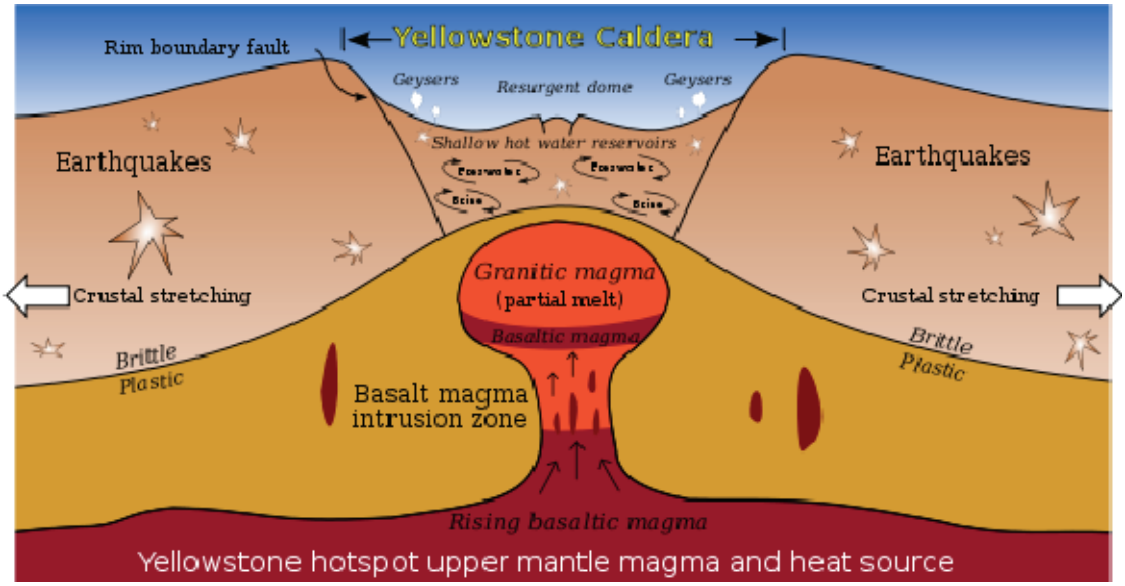

Image of the Yellowstone Caldera courtesy of USGS

The 'paint pots' are another popular attraction in Yellowstone. Under the earth's crust, there are areas of water. When the column of melted rock rises, it heats the underground water, turning it into super heated water and steam. In areas where there is only a small amount of groundwater mud pots are created. In areas of large quantities of water the result is Old Faithful Geyser. The steam builds pressure, and when the right amount of pressure is reached, the water and steam are ejected forcefully out of the geyser. This 'magic pressure number' is reached on a regular interval, resulting in the predictable schedule of eruption.

Western Wyoming is one of the most seismically active areas of the country. Many of the earthquakes that occur are small and not perceptible by humans. In Yellowstone, the earthquakes are primarily caused by the movement of magma; when the magma rises, there is pressure applied to the surface of the earth. When the magma falls, that pressure drops. Both of these motions can contribute to earthquakes.