

Shaping of nz

[Environment](#), [Earth](#)



The causes of tectonic plate movement and how different processes have shaped New Zealand's landforms occur nearly every single day. In fact one of these processes is happening right now, somewhere on the Earth. The 3 major processes are folding, faulting and volcanism. While these take place, another "force" is also acting, changing the shape of our continents, and Earth itself, the tectonic plate movement. Earth's outer shell, long thought to be a continuous, unbroken, crust is actually a fluid mixture of many irregular rigid segments, or plates. Comprised mainly of cool, solid rock, these enormous blocks of Earth's crust vary in size and shape, and have definite borders that cut through continents and oceans alike. There are nine large plates and a number of smaller plates. Of the nine major plates, six are named for the continents embedded in them: the North American, South American, Eurasian, African, Indo-Australian, and Antarctic. The other three are oceanic plates: the Pacific, Nazca, and Cocos. There are 3 primary types of Tectonic Plate boundaries: Divergent boundaries; Convergent boundaries; and Transform boundaries. As the giant plates move, diverging (pulling apart) or converging (coming together) along their borders, tremendous energies are unleashed resulting in tremors that transform Earth's surface. While all the plates appear to be moving at different relative speeds and independently of each other, the whole jigsaw puzzle of plates is interconnected. No single plate can move without affecting others, and the activity of one can influence another thousands of miles away. For example, as the Atlantic Ocean grows wider with the spreading of the African Plate away from the South American Plate, the Pacific sea floor is being consumed in deep Subduction trenches over thousands of miles away. In plate

tectonics, a convergent boundary is an actively deforming region where two (or more) tectonic plates collide. As a result of pressure, friction, and plate material melting in the mantle, earthquakes and volcanoes are common near convergent boundaries. When two plates move towards one another, they form either a Subduction zone or a continental collision. An example of this is the collision of the Eurasian and Indian plates, forming the Himalayas.

A divergent boundary is when two tectonic plates that are moving away from each other cause a linear feature. Divergent boundaries form rift valleys as well as volcanic islands which occur when the plates move apart to produce gaps which molten lava rises to fill. An example is the Mid-Atlantic Ridge.

Transform boundaries are when 2 continental crusts collide and as neither can sink, they are forced up into Fold Mountains. Example here is the New Zealand's Alpine fault. Powered by forces originating in the Earth's inner core, these tectonic plates move ponderously about at varying speeds and in different directions atop a layer of a much hotter and softer rock called the Asthenosphere. Because of the high temperatures and immense pressures found here, the uppermost part of the Asthenosphere is deformed and flows almost plastically just beneath the Earth's surface. One idea that might explain the ability of the Asthenosphere to flow is the idea of convection currents. When mantle rocks near the inner core are heated, they become less dense than the cooler, upper mantle rocks. These warmer rocks rise while the cooler rocks sink; creating slow, vertical currents within the mantle. This movement of warmer and cooler mantle rocks, in turn, creates pockets of circulation within the mantle called convection cells. The circulation of these convection cells could very well be the driving force behind the

movement of tectonic plates over the Asthenosphere. There are many more reasons for the tectonic plate movement, but this is the major one that has the most convincing evidence. So what has folding and faulting got to do with the process of landform? Well, Folding is a process in which the Earth's crust is compressed together by internal forces acting in the earth's crust which causes it to fold forming up folds called synclines and down folds called anticlines. Folding bends many layers of rocks without breaking them. A fault is a fracture or a crack in the earth's crust along where movement occurs. When there is pressure or stress on one of the portions of the crack, that portion drops lower leaving the other portion above it. Mountains sometimes form when many layers of the Earth's crust are moved vertically upward at fault lines by pressures caused by plates colliding. Fault lines are great cracks in the crust. The mountains that are formed in this way are called Block Mountains (horst). When there is a depression between two block mountains, the feature becomes a Rift valley. Another process that forms various landforms is Volcanism. Volcanism includes all the processes associated with the ejection of magma and related material from deep below into the earth's crust or onto the earth's Surface. Deep down, the rocks of the earth are subjected to great heat and pressure and as a result some of them become molten. But when there is crustal disturbance resulting in cracks or faults, pressure is released, and molten rocks find their way to the surface to form extrusive features. If it fails to reach the surface, it forms intrusive features within the crust. When a volcano erupts constantly, it is called an active volcano. Those which have not erupted for two thousand years are believed to be an extinct volcano. But some

volcanoes are believed to be sleeping or dead and are classified as dormant Volcanoes. Volcanoes are domed shaped structures built by the emission of lava and it contains gases which erupt from a limited vent in the earth's surface, although there are many types of other volcanoes including shield volcanoes. Depending on their lava flow and how likely they are to erupt shows the difference of many volcanoes.