

## Exploring global tectonics from your armchair.

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Wherever we live, our lives are shaped by the motion of the Earth's tectonic plates. Mountain belts, sedimentary basins, oceans, volcanoes and earthquakes are formed by plate tectonics and they control climate, agriculture, mineral resources and natural disasters. Google Earth, released in 2005, provides free and accessible satellite imagery of a quality previously only available to those with access to expensive datasets and complex processing software. As a tool for gaining rapid, global-reaching and often detailed views of the earth's surface it is unsurpassed – leading to its widespread use by non-scientists, the media, industry as well as academia.

To the Earth scientist, Google Earth provides a ready method of visualising surface processes, rock characteristics and tectonic deformation in three dimensions comparable to the traditional method of using stereopairs of air photos. In its early days much of the imagery was based on relatively poor resolution Landsat data, but blocks of high resolution data including those acquired by the QuickBird and SPOT satellites are progressively being added, so that it is now possible to undertake 'virtual fieldwork' almost anywhere on Earth and obtain genuinely original results without leaving home.

In this talk I show how Google Earth can be used to investigate large-scale tectonic features such as mountain belts formed during plate collision, continental rifts and belts of lateral plate motion. I also show how small-scale features reveal information about the history of individual earthquakes that accompany each minute increment of tectonic deformation. In many cases imagery is of such high resolution it is even possible to assess changes in the human environment as a result of tectonic processes. Adding custom layers of data such as earthquake locations, crustal ages, population density and historical surface imagery to Google Earth allows us to undertake stand-alone analysis of remote areas, to assess tectonic processes in four dimensions and understand the impact of plate tectonics on the Earth's inhabitants.

