

# Landscape Evolution Encyclopedia

## Article

### Landscape Evolution

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# Landscape Evolution

A landscape is the cumulative product of interaction among dynamic geological processes over time. A region's **topography** and suite of characteristic **landforms** are, thus, clues to its geologic history. For example, the landscape of rugged, linear **mountain chains**, deep canyons, dry lake beds, and mesas in the United States' **desert** southwest tells a geologic story of fluvial and Eolian **erosion** acting during a period of increasing climatic aridity while plate tectonic forces caused crustal extension and uplift. Earth processes carve a landscape; dynamic interactions between processes control its **evolution** over time.

The earth's internal heat drives plate tectonic motion and influences the related processes of crustal uplift, magmatic intrusion, volcanism, crustal deformation, and seismic activity. External heat from the **Sun** forces circulation of Earth's atmosphere and hydrosphere, which in turn drives sedimentary processes such as weathering, erosion, transportation, and deposition. These forces, interacting under the influence of **gravity**, shape Earth's surface.

Earth processes interact in complex feedback systems. A change in the rate or directional alignment of one process—for example, an increase in rainfall or the abandonment of a river channel—may start a cascade of compensatory changes throughout a region. Plate-tectonic mountain-building and erosion interact in a negative feedback system that regulates the elevation of continental mountain belts. Elevation interacts with **temperature** and rainfall, the components of **climate**, to regulate rates of erosion. Climate interacts with vegetation to create soils. A balance between **precipitation** and temperature maintains a glacier. These are just a few examples of the dynamic processes that shape a regional landscape, and of the interactions that remold an existing array of landforms over time.

## See Also

Eolian Processes; Weathering and Weathering Series