



Chapter 1

Landscapes and their landforms



Landscapes

A landscape is an area of land incorporating different geographic characteristics (or the interaction between different spheres) and activities, such as:

- flora and fauna (biosphere)
- climatic conditions (influenced by the atmosphere)
- physical features, including different landforms, topography, soils (lithosphere)
- role of natural agents that shape the landscape, e.g. water (hydrosphere)
- human land uses, e.g. agriculture, urbanisation.



Types of landscapes

- Certain characteristics and interactions will be common to different landscapes – for example, a coastal landscape may have species of plants that are tolerant to salt spray, possibly a windy climate and landforms like sand dunes or cliffs, depending on the rock/soil type.
- Types of landscapes include:
 - coasts
 - arid landscapes (deserts)
 - riverine landscapes
 - forests
 - mountain landscapes
 - Karst landscapes (limestone region with underground water as main cause of distinctive landforms).



Examples of landscapes



Half Dome of Yosemite
National Park



Sand dunes near Liwa oasis



Landforms

A landform is a naturally formed feature on the Earth's surface with distinctive characteristics, e.g. a floodplain is low-lying ground adjacent to a river.

- Landforms are shaped by the characteristics and interactions occurring in the landscape, e.g. valleys are carved out by rivers and differ in size and shape, depending on density of the soil/rocks and velocity of the river.
- Some landforms only occur in certain landscapes, e.g. salt flats in arid environments.
- Other landforms may occur in different landscapes, e.g. dunes occur in coastal and arid environments.



Earth's composition

- The Earth is made up of five main layers:
 - crust (and lithosphere)
 - upper mantle (and asthenosphere)
 - lower mantle
 - outer core
 - inner core.
- This composition helps to drive plate tectonics, which in turn influences the formation of landforms and landscapes.



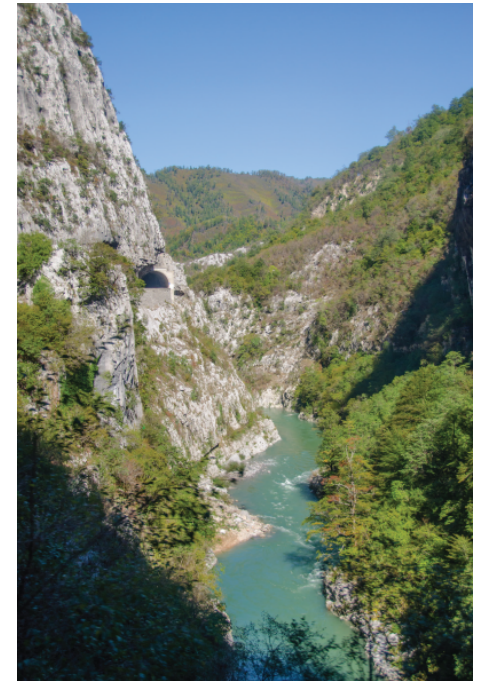
Plate tectonics

- The Earth's crust is broken into tectonic plates that move (via convection currents in the mantle), creating mountain and volcanic landscapes.
- Different types of plate boundaries include:
 - divergent boundaries (the point where plates are pulled apart, allowing molten rock to emerge at the Earth's surface)
 - collision boundaries (the point where two plates of similar strength or speed collide)
 - convergent (subduction) boundaries (the point where two plates are moving towards each other and collide, with one plate being pushed beneath the other)
 - transform boundaries (where plates slide, grate or jerk past each other).



Folding and faulting

- Where tectonic plates collide or converge, rocks may fold (or buckle), influencing the shape of the landscape and landforms such as mountains and valleys.
- Large fractures and stresses may also occur due to tectonic movement, creating faults.
- Further tectonic activity may cause uplifting near fault lines, which can result in the formation of landforms like valleys, e.g. Canyon of the Moraca River.





Types of folds

The main types of folds are:

- anticline (the upwards bulging of rocks caused by compression)
- syncline (the downwards squeezing of rocks caused by compression)
- monocline (a fold that occur by themselves rather than as a series of anticlines or synclines)
- recumbent fold (a layer of rock that has folded over or overturned so that the youngest rock is on the surface).



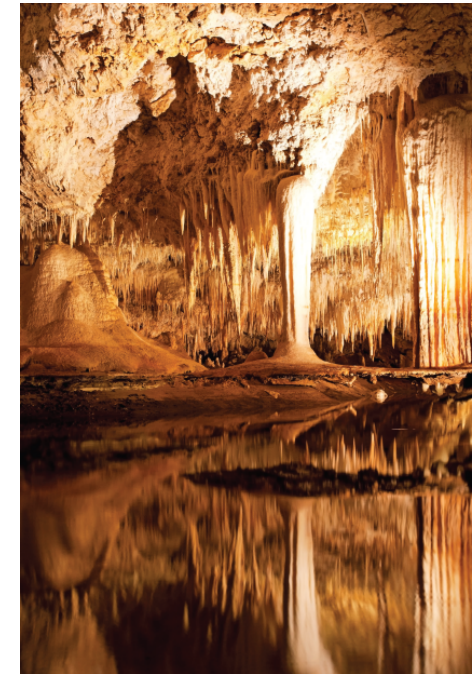
Volcanic landscapes

- Volcanoes tend to occur along convergent and divergent plate boundaries, as well as on hot spots (e.g. Hawaii).
- The type and nature of volcanic landscapes will differ depending on the location and type of volcanic rock created, e.g. shield volcanoes, producing relatively fluid lava flows and less explosive eruptions, normally occur at divergent boundaries or hot spots.
- Distinctive volcanic landforms will occur on certain types of volcanic landscapes, e.g. calderas on composite/strata volcanoes.
- Volcanic activity is often associated with other events (e.g. earthquakes, tsunamis and topographic changes).



Rock types and landforms

- Different landforms are often associated with certain rock types – for example:
 - basalt plateaus (basalt is igneous rock created by relatively fluid lava flows, building up layers from eruptions and eventually a raised plateau)
 - limestone caves (limestone is sedimentary rock that easily dissolves in water).
- Some landforms can occur on a variety of different rocks – for example:
 - Inselbergs (an isolated steep-sided hill, often made of bare rock).





Rock types

- There are three main rock types on the Earth:
 - igneous (formed by the solidification of magma – around volcanic landscapes) – e.g. granite, basalt
 - sedimentary (sediments that are eroded and then deposited in layers, e.g. by oceans) – e.g. sandstone, limestone, shale
 - metamorphic (rocks that begin as igneous or sedimentary and are changed by extreme pressure and temperature) – e.g. granite turning into gneiss, shale into slate, limestone into marble.
- The nature of these rocks differs, depending on factors such as the length of time it takes to form the rock, temperatures and pressures, location/depth in the Earth's crust and minerals present in the rocks.