Rock type, lithology and cliff profiles

Cliff profiles are influenced by geological structure

Coastal morphology is related not only to the underlying geology, or rock type, but also to its *lithology* – its geological structure. Lithology means any of the following characteristics:

- Strata layers of rock
- Bedding planes horizontal, natural breaks in the strata, caused by gaps in time during periods of rock formation
- Joints vertical fractures caused either by contraction as sediments dry out, or by earth movements during uplift
- Folds formed by pressure during tectonic activity, which makes rocks buckle and crumple (e.g. the Lulworth Crumple)
- Faults formed when the stress or pressure to which a rock is subjected, exceeds its internal strength (causing it to fracture). The faults then slip or move along fault planes
- Dip refers to the angle at which rock strata lie (horizontally, vertically, dipping towards the sea, or dipping inland).

The relief – or height and slope of land – is also affected by geology and geological structure. There is a direct relationship between rock type, lithology and cliff profiles. The five diagrams that make up Figure **7** help to illustrate this.



c) Steep dip towards the sea Rock slabs slide down the cliff along bedding planes

a) Horizontal strata produce

steep cliffs

---- Bedding

planes

d) Rocks dip inland

producing a stable,

steep cliff profile

e) Rocks dip inland but with well-developed joints at right angles to bedding planes

Joints act as slide planes

SFigure 7 Cliff profiles and geological structure

The **dip** of the rocks is also a major factor. The steepest cliffs tend to form in rocks that have horizontal strata or which dip gently inland, whereas rocks that dip towards the coast tend to produce much more gently sloping features (Figure 3.16).

Horizontal

lavers of rock

Rocks dip steeply

seawards

Rocks dip

Rocks dip gently

seawards

Figure 3.16 The influence of rock strata on coastlines

inland