

Landforms of coastal erosion, to include cliffs, wave-cut platforms, headlands, bays, caves arches, stacks and stumps.

You should be able to describe and explain the formation of each landform listed. You must be able to **use annotated diagrams** and **sketches** in your descriptions and explanations. You need to know **located examples**, primarily, but not exclusively, **from two contrasting stretches of coastline** (North Devon and Dorset Coast)

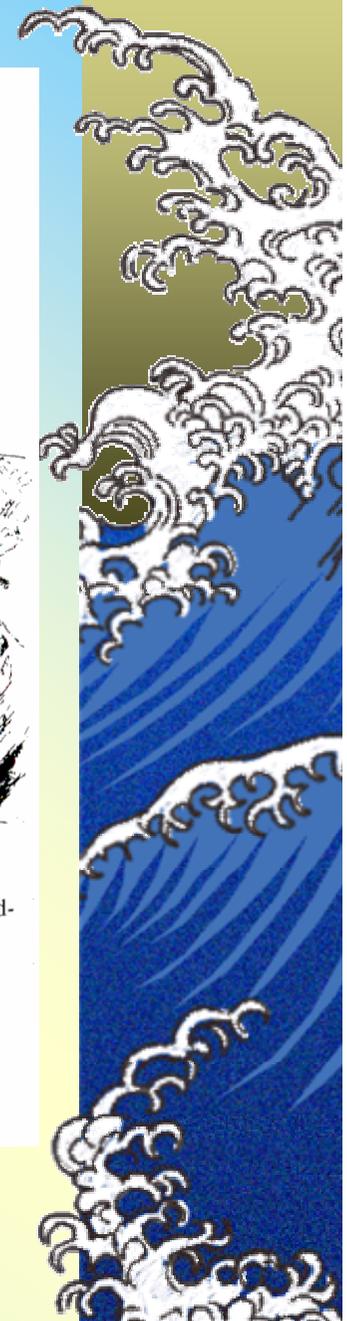
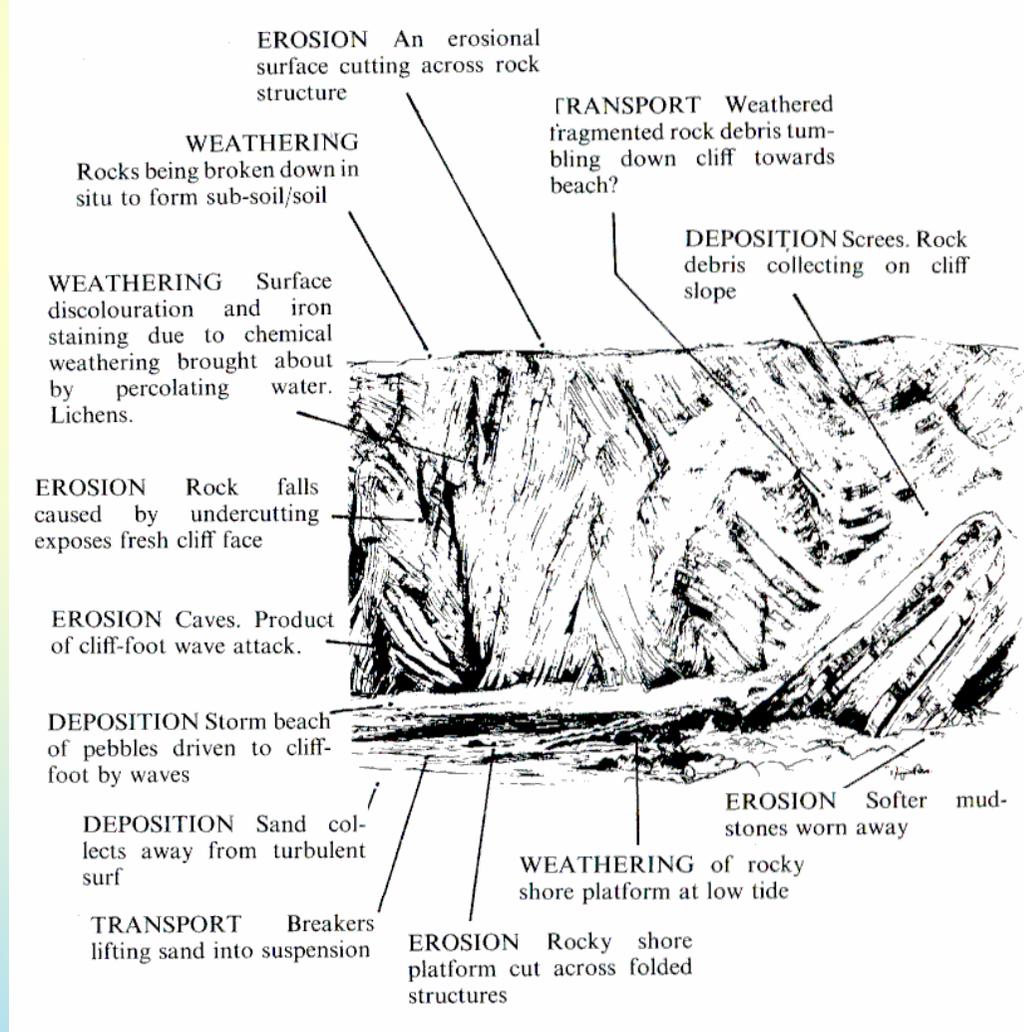




Cliffs Examples of cliffs have already been looked at in detail.

This diagram is to remind you of some of the complex processes, including weathering, mass movements, wave trimming and sediment removal, that operate on the 80m cliffs at Warren Bay at Hartland Quay. Notice the strong influence of the geological structures.

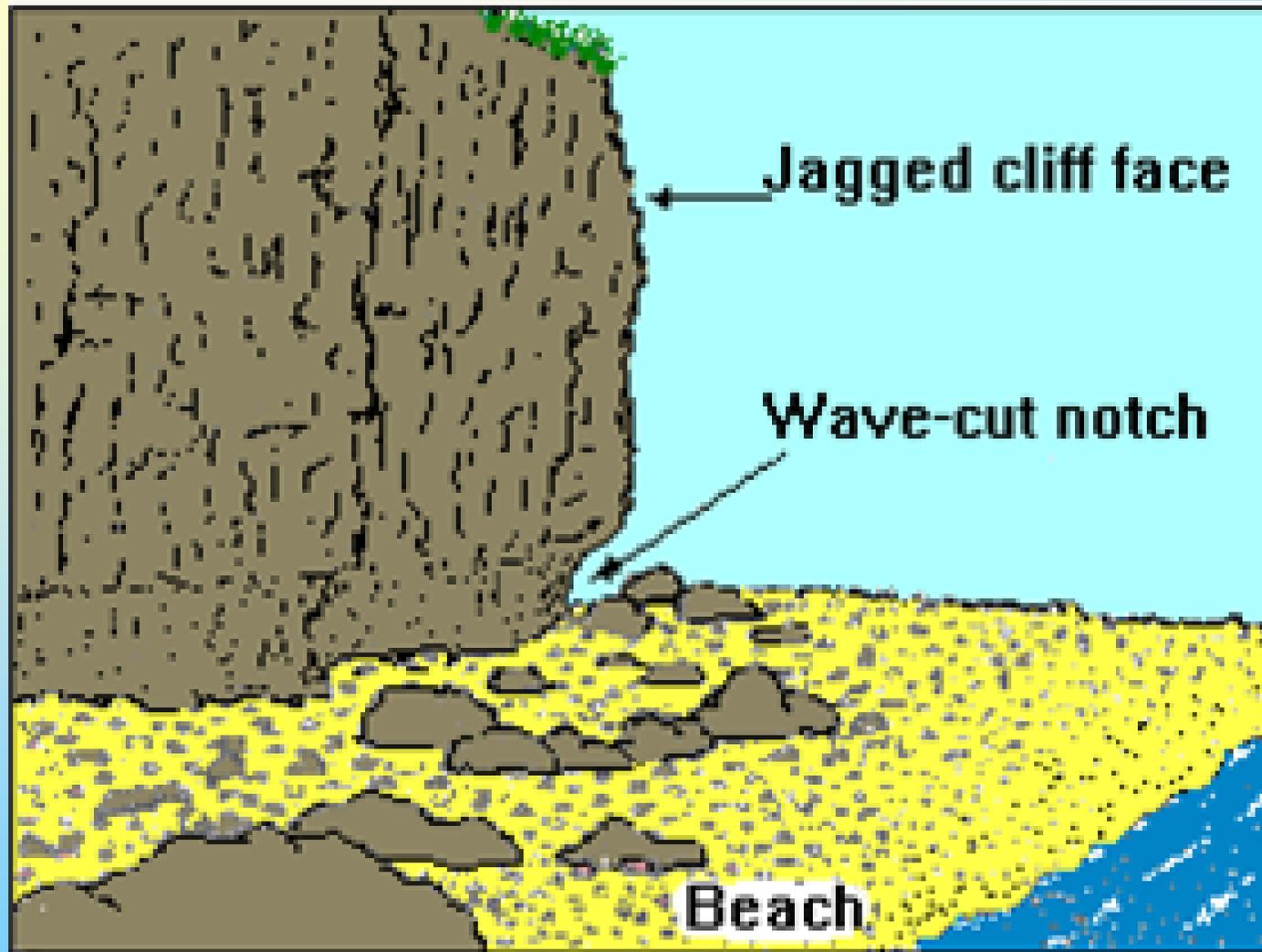
Cliff forming processes at Warren Bay at Hartland Quay



Chalk Cliffs at Ballard Point, north of Swanage



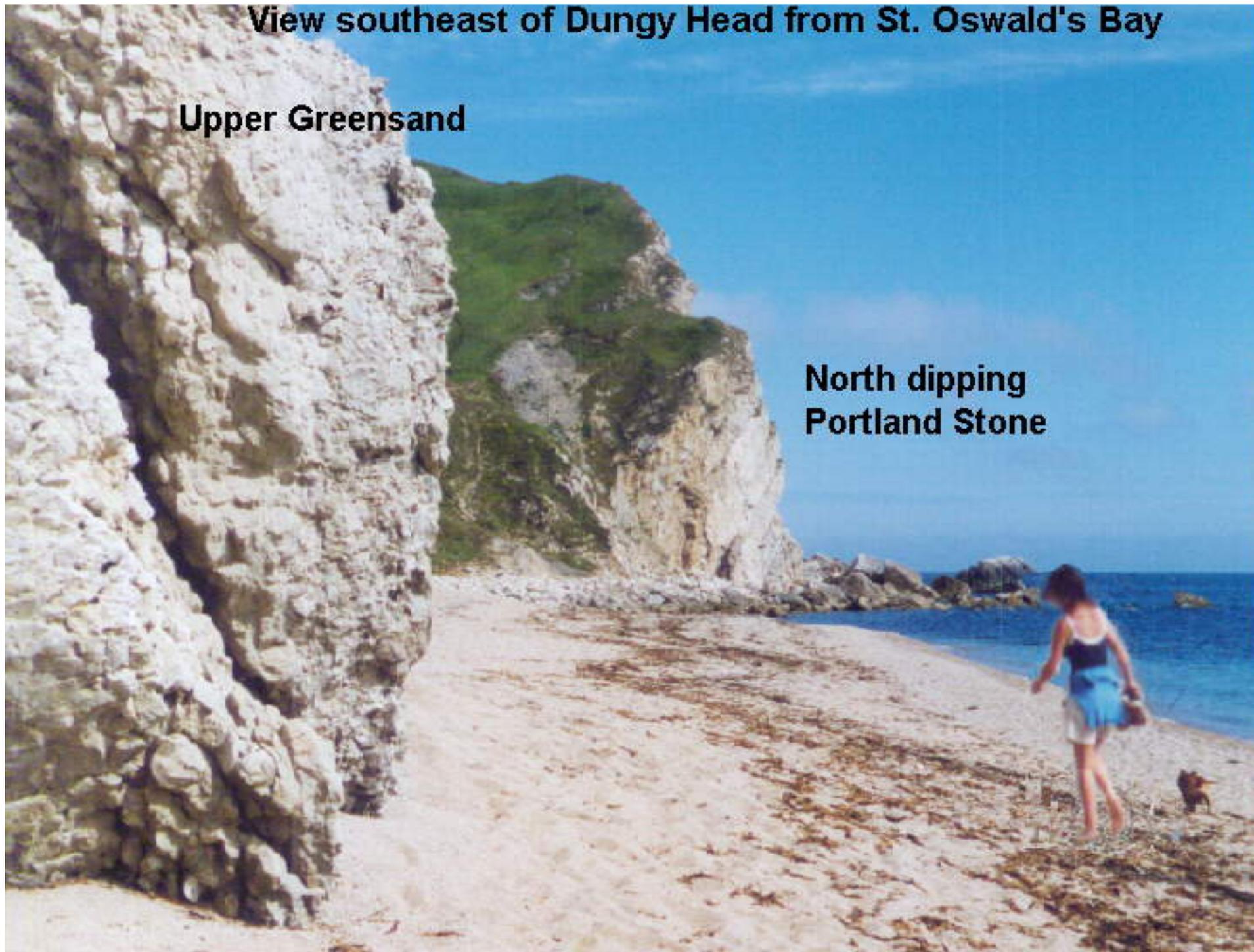
Wave-cut notches



View southeast of Dungy Head from St. Oswald's Bay

Upper Greensand

**North dipping
Portland Stone**



Cliff failure in Rhossili Bay,
Gower, South Wales. What
processes are operating here?



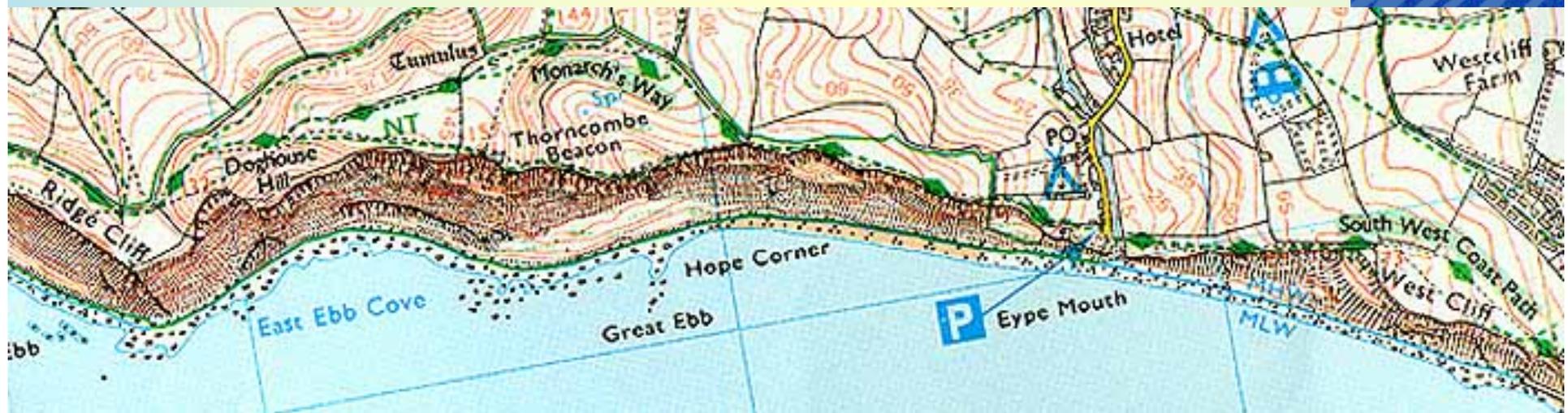
Fresh rock falls in Lulworth Cove



Landslide at Seatown
in Cornwall.



Seatown Coast: Cliffs and OS map Extract

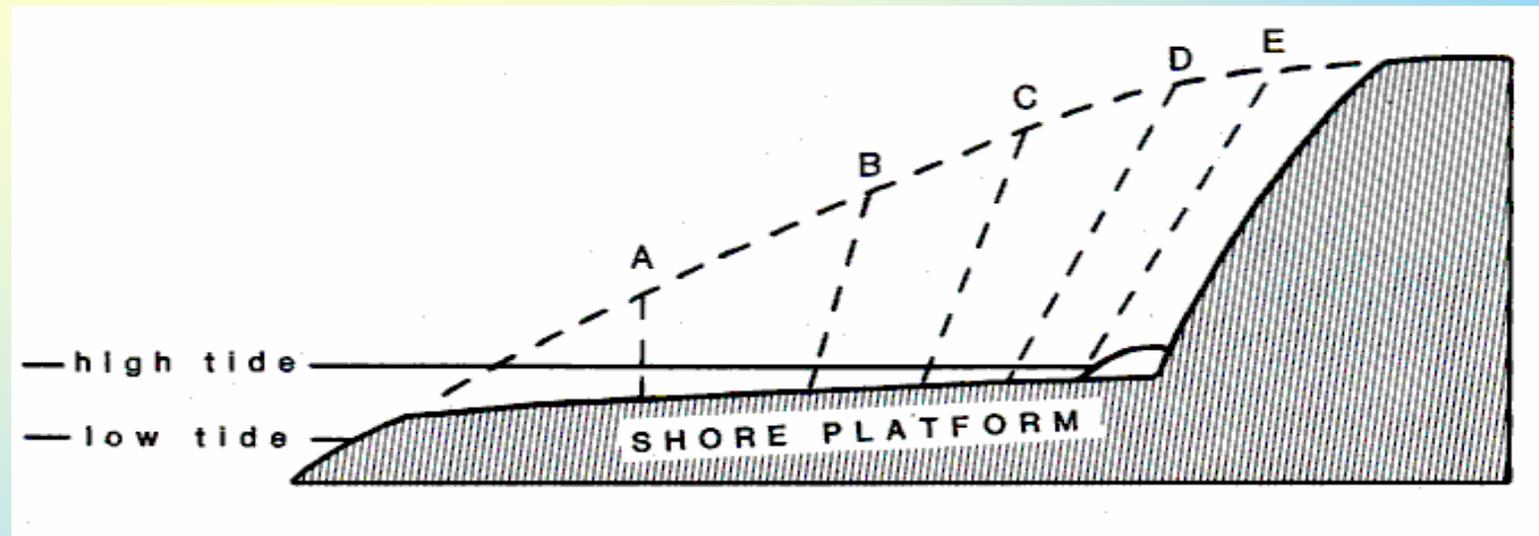


Wave-cut platforms (or shore platforms).

Marine erosion (abrasion, attrition, hydraulic action and solution) attacks the base of the cliff at high tide. This undermines it and causes the cliff to collapse. As long as the fallen rock is removed by wave action, the process can be repeated many times. Erosion does not extend down much below the water surface, as this is where the wave energy is concentrated. The retreating cliff reveals a wave-cut platform.



The stages in the formation of a wave-cut platform



In reality, the surface of the platform will not be flat. Erosion of its surface is differential so in North Devon the platforms are deeply ribbed by the differential erosion between the sandstone and shales. Where faults cross the platforms, wide gullies have been eroded up to a metre deep.





The wave-cut platform at Well Beach and Warren Bay at Hartland Quay are about 300m across. Sea levels reached their current levels about 6000 years ago so the rate of cliff retreat averages about 5cm a year. On the coast at Westward Ho! It is no more than 4cm a year.

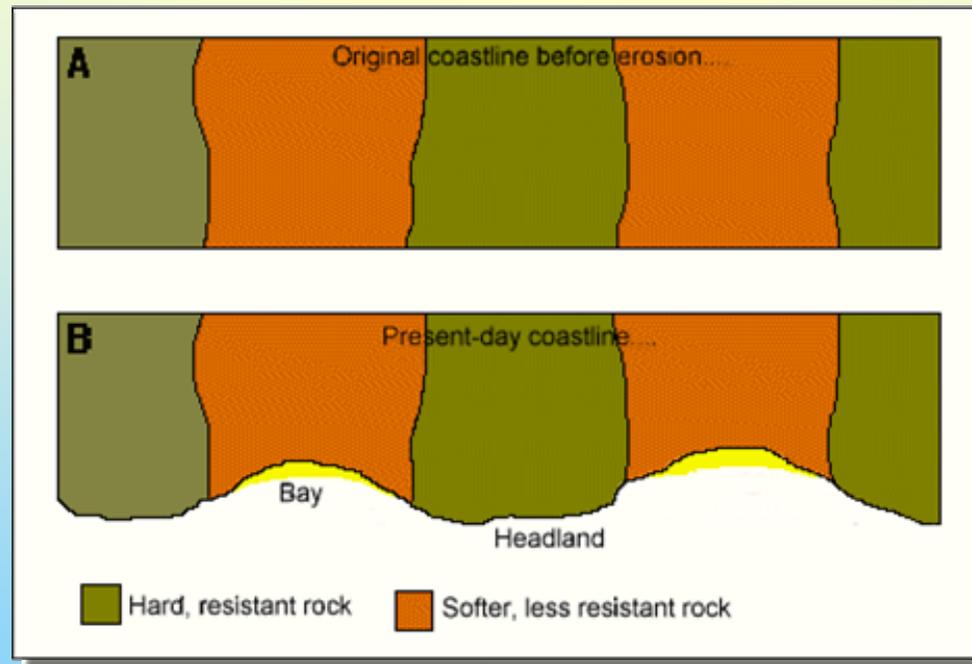


Part of a wave-cut platform in St. Oswald's Bay in Dorset



Headlands and Bays.

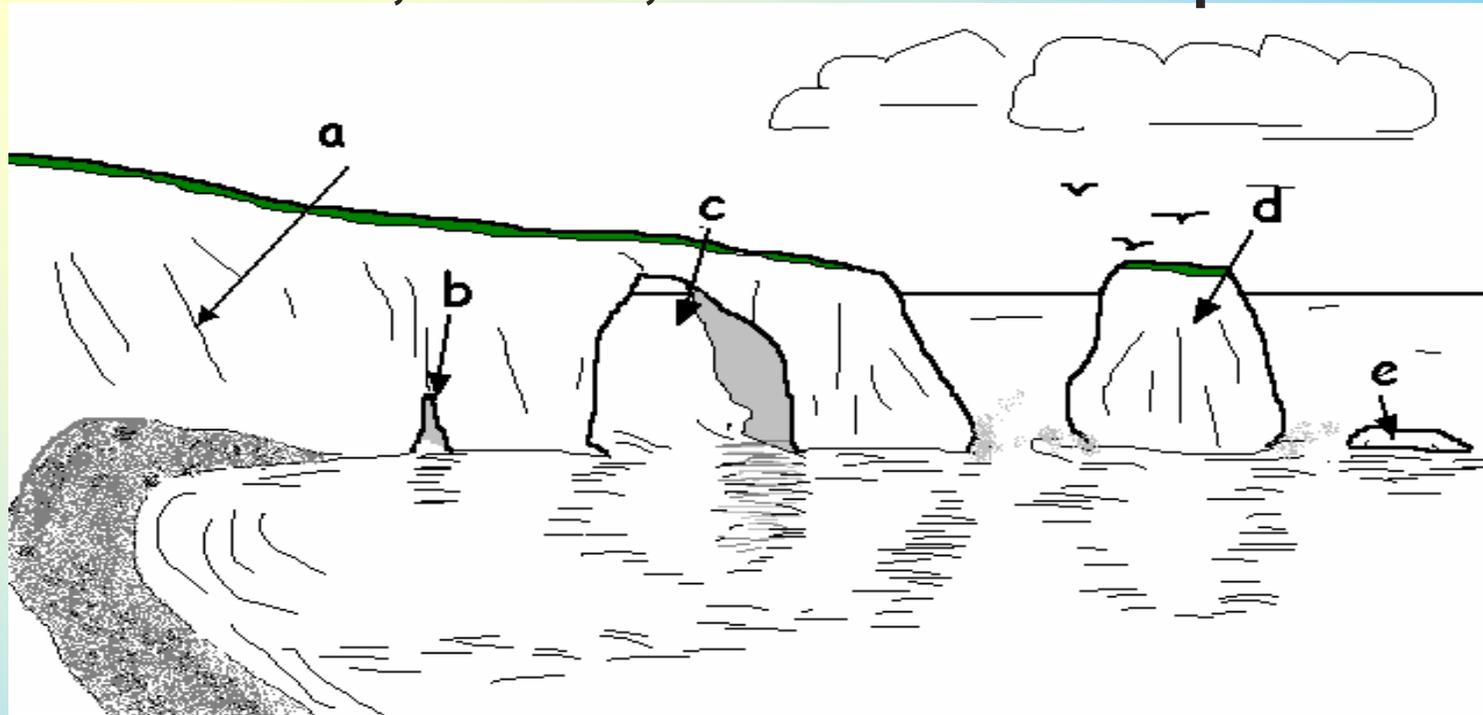
In North Devon, large bays, such as Bideford Bay result from variations in the balance between the multiple strata of Carboniferous shale and sandstone. Where there is more sandstone (Crackington Formation), headlands form. Where there is more shale (Bude Formation), bays form. Small bays, such as Warren Bay and Well Bay, form where the geological folds, created in the Varsican progeny, are closer together and are more susceptible to wave attack.



The discordant coast of Dorset best exemplify the formation of headlands and bays.



Caves, Arches, Stacks and Stumps.



Stages in coastal Development

- geological weakness (e.g. fault).
- formation of sea cave by marine erosion.
- enlargement of cave to form arch.
- collapse of arch to form stack.
- removal of stack to create a stump.

Cliff Erosion.swf

What will be the impact of wave refraction on the processes?





The formation of sea caves in North Devon following geological weaknesses.



Tunnel Slab at Hartland Quay is a type of arch controlled by a weak, thick band of shale (Hartland Quay Shale)



The Arch at Durdle Door in Dorset



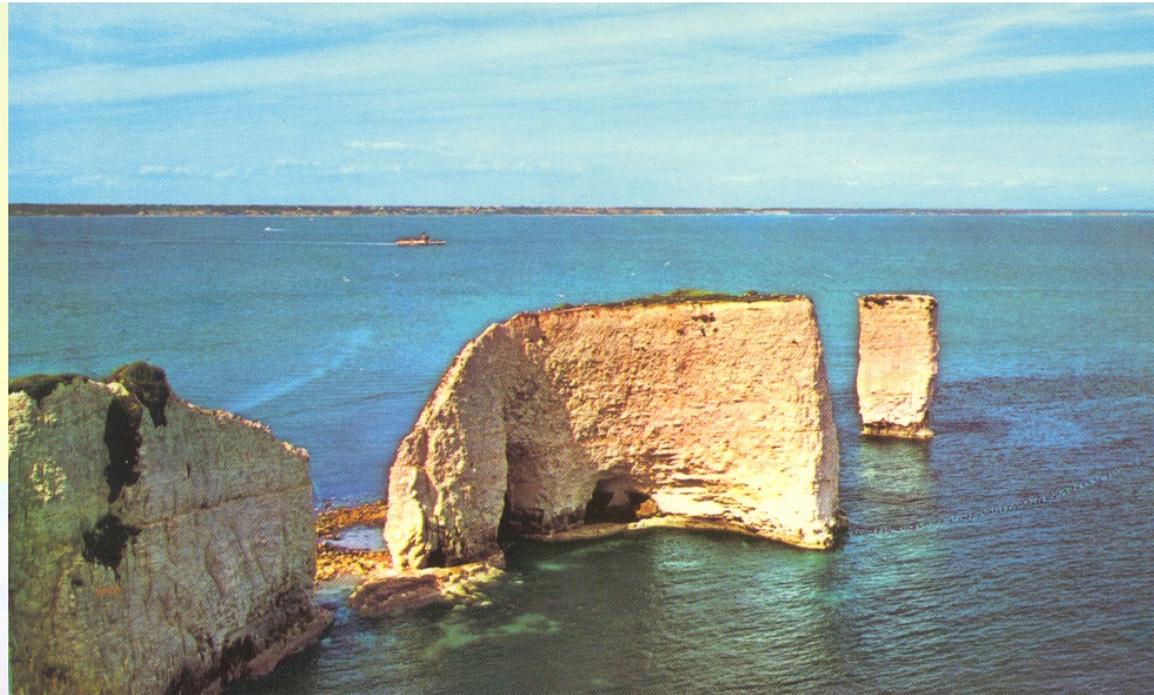
The Green Bridge of Wales in Pembrokeshire



Arch, and Stack formation at “Old Harry Rocks” in
at Studland Head in Dorset



Old Harry Rocks



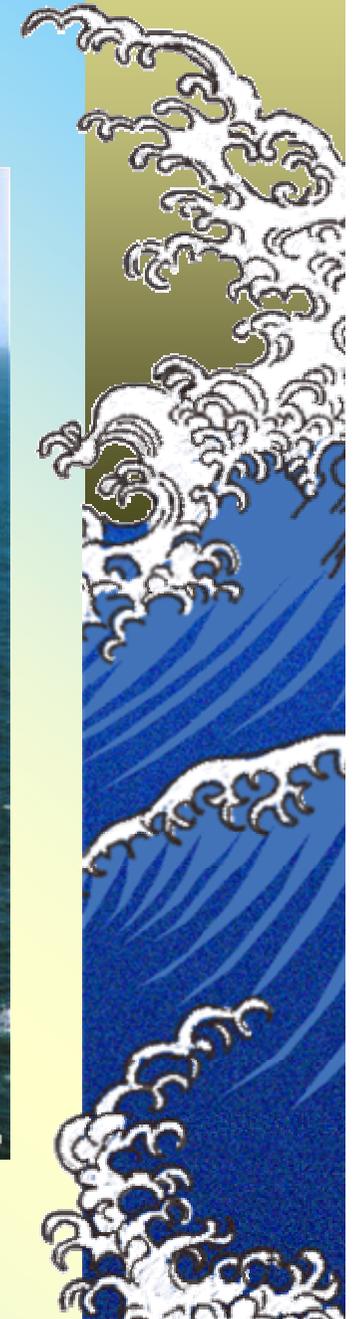
The Pinnacle stack from Ballard Point, Dorset



Mupe Rocks in Dorset



Mupe Rocks, June 2000, Copyright Ian West, 2000





Stumps at Land's End in Cornwall

Make a list of the names and locations of the coastal landforms, caused by erosion, that you have seen in North Devon.

Draw an annotated diagram of each that explain the processes that have shaped them.

