Coastal deposition

In this section, you’ll learn how coastal processes create depositional landforms.

Beach sediment
The material eroded from cliffs by hydraulic action and abrasion is called sediment. Sediment comes in many sizes, from tiny clay particles to larger sand and silt, right up to pebbles, cobbles and boulders. Sand is material that is 0.063-2 mm in size. Over time, two things happen:
- Attrition makes sediment smaller and rounder
- Sediment is transported from where it was eroded to new locations.

Get the drift?
The main way that sediment is transported is by longshore drift, shown in Figure 1. This happens when waves break at an angle to the coast, rather than parallel to it.
Because prevailing winds are mostly from one direction, longshore drift is usually in one direction too. Longshore drift transports sediment along coastlines, as Figure 1 shows, sometimes for hundreds of kilometres before it is eventually deposited.

Depositional landforms
When rocks are eroded, sediment is first deposited very close to where it eroded. In a sheltered area such as a cove or bay, a beach forms because the sediment is trapped in the bay. Sediment transported by longshore drift creates new landforms where it is deposited, as Figure 2 shows.
Many beaches are simply rivers of sand and shingle (pebbles) slowly moving along the coast as sediment is transported by longshore drift.
- Strong onshore winds can blow sand inland, forming sand dunes parallel to the shoreline.
- Small bays on the coast can sometimes be blocked by a bar of sand which grows across the mouth of a bay due to longshore drift. A good example is shown in Figure 3, from south Devon. Behind the bar, a shallow lagoon forms. These are often important habitats for birds.
- Longshore drift carries sand along the shore until it reaches a river estuary where it gets pushed out into the river channel. The river flow halts the drift, so sand is deposited, forming a long sandy neck, called a spit (see Figure 4). The spit stops growing when deposition of sand, by longshore drift, is balanced by erosion from the river.
- The river moves out to sea at low tide, whilst at high tide, the sea flows inland. Each tide erodes the spit and causes it to curve back on itself. Many spits have a hooked or recurved end. The water behind a spit is protected from storms and tides so remains calm, allowing salt marshes to form, as shown in Figure 4.
Depositional landforms are made of loose sediment, so they are not very stable. Sand dunes can be stabilised by plants growing on the sand. Plants that grow on beach sand need to be tough:
- They have long roots to hold them in place in the strong winds, e.g. marram grass.
- They have tough, waxy leaves to stop them getting sandblasted.
- They can survive being sprayed by salt water.

Practice question
1. Explain the formation of a spit. You may use diagrams in your answer. (6 marks)

Your questions
1. a) Rank sand, boulders and pebbles in order of size.
   b) Explain how and why sediment size would change between X and Y in Figure 1.
2. Draw a labelled copy of Figure 1 to show how longshore drift occurs. Add the following labels in the correct places: large sediment at this end of the beach, fine sediment at this end of the beach.
3. Explain the differences between a beach, a bar, a spit, a tombolo, a salt marsh, and a sand dune.
4. Explain why spits do not grow across the mouths of rivers (unlike bars), but have a curved end.