

Coastline of Submergence

Description of Model 1: Coastline of Submergence

This model represents a sinking coastline. As the land slowly sank, the sea filled the valleys to form bays. Former ridges now protrude into the sea as promontories. Seaward from the northernmost promontory is an island that was a hill on the old ridge which has been isolated by drowning of the lower land between the hill and the higher part of the ridge.

This model represents a coastline that is constantly changing, and the forces of erosion and deposition are working to produce these changes. Let us first examine the force of erosion; the sea is the most dramatic agent of erosion, it constantly tears away at the promontories, to produce cliffed headlands. Remnants of the original land remain as steep-sided, almost chimney-like remnants, called stacks. On the seaward side of the islands, the force of the waves has produced steep cliffs, similar to those on the promontories. As the waves come in from the sea, they are usually parallel to the trend of the coast. Waves hit the high land around the promontory first, bend around it, concentrating energy on the end of the promontory and as a result most of the erosion occurs here.

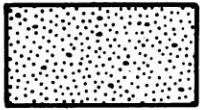
The refraction of the waves causes them to bend around the promontory and the eroded material is moved along the sides of the promontory towards the head of the embayment.

The depositional features which have resulted from these processes are as follows:

Mid-bay Bar (8) — Deposited here as the refracted waves carried material towards the head of the embayment where they lost most of their force. **Cusate Foreland** (13) — Waves and current action have carried the materials seaward and deposited them in this triangular form. **Looped Bar** (5) — The action of the waves which were refracted around the island, produced longshore drift along each side of the island. Longshore drift carried sand along each side and toward the back of the island and the two streams of sand met and produced a horseshoe shaped or “looped” bar. **Simple Recurved Spit** (7) and **Compound Recurved Spit** (6) — Waves erode the end of the promontory and longshore currents carry the sand northward into deeper water to form spits. Spits are usually recurved because of wave action. **Tombolo** (16) — The material eroded from the cliffed headlands of the island has been swept from the island toward the land. This material has formed a deposit joining the island to the land to form a “tied island”.

Another agent of erosion is the many streams that occur in the valleys of the promontories. These streams have steep gradients and are fed by the rainfall that is characteristic of this coastal region. The streams tend to deepen their beds as the water rushes to the sea. Submarine canyons may also be found along the continental shelf. These may be ancient drowned river valleys or may have been formed by underwater currents in ways still being studied by marine geologists.

LEGEND



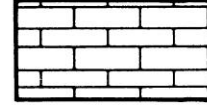
SANDSTONE



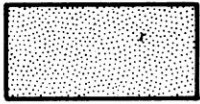
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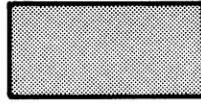
SHALE



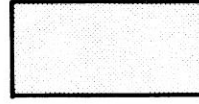
LIMESTONE



SEDIMENTS



LAVA



ASH

Coastline of Submergence Find each feature on the model and write the number of the feature in the table below. Answer the questions below.

Feature Number	Feature Name
	Bay
	Promontory
	Island
	Beach
	Looped Bar
	Simple Recurved Spit
	Compound Recurved Spit
	Midbay Bar
	Creek
	Stack
	Wave-Cut Cliff
	Cuspate Foreland
	Tombolo
	Sediments

1. How is this sinking coastline formed?
2. This coastline is not static. What agents would be acting to cause changes in its topography?
3. What is the chief such agent?
4. What feature of the agent in Question 3 does the work?
5. List the depositions formed by the previous processes.
6. What is another agent of erosion besides the one in Question 3?