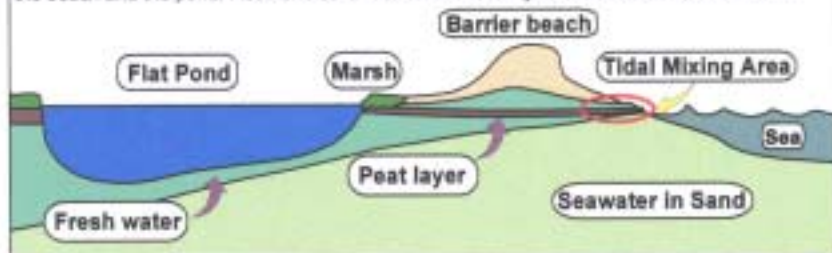


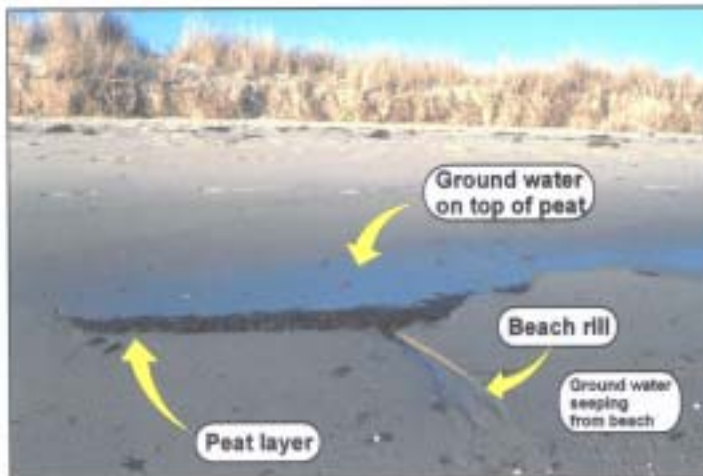
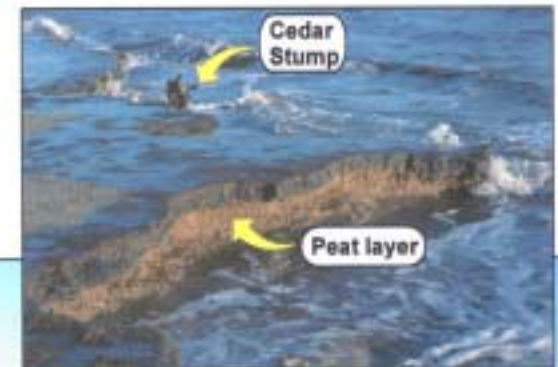
## Groundwater Seeps At South Cape Beach

In the winter, when there is less sand on the beach than in summer, at low tide one can find water seeping from the sand near Flat Pond. Slow-moving sheet flows appear on top of the old peat layer that extends under the barrier beach to the sea. The water is a mixture of fresh ground water and sea water. Mixing occurs in the "tidal Mixing area" when tides are high. Occasionally, salt water travels along the peat layer all the way to Flat Pond.

The peat is the remains of an old salt marsh that was buried by the slowly migrating barrier beach as it rolls gently landward, pushed there by waves and wind. The peat is lower at the seaward edge because it was formed many years ago when sea level was lower. Back then the marsh was much larger because the edge of the sea (and the barrier beach) were further south than they are today. Also, as stumps in the surf zone attest, there were cedar trees as well. Today, northern bayberry shrubs and phragmites are common along the shore between the beach and the pond. Flat Pond continues to shrink today as the beach rolls northward.



When air temperatures are well below freezing, sand wet with groundwater freezes, leaving a rind of ice or strange shapes in the sand.



A beach rill is a small channel formed when springs of groundwater flowing to the sea emerge along a beach at low tide. They are created by a process called spring sapping (Oldale 1992). Emerging springs of groundwater loosen the sand from underneath and carry some of it away. This causes the spring area to collapse into a very small channel. As more sand gets loosened, the channel elongates, causing it to migrate up the the slope of the beach face. The channels fill when waves wash over them on the rising tide, only to reform again and again when tides are low.

Peat is made up of incompletely decomposed organic matter. It forms where slowly decaying wetland material is covered by fine sediments, sealing it off from oxygen. As the layer thickens, it becomes fibrous and spongy. Surprisingly resistant to waves, it forms the foundation of the barrier beach at Flat Pond. It is quite visible in the winter. In summer, sand accumulates and covers the peat from view.