noaa ocean service education

Back

Return to Estuarine Habitats

Salt Marshes

salt marshes | mangrove forests

Scroll down to read detailed information about salt marshes

<< Lower Tide | Play - Stop | Higher Tide >>

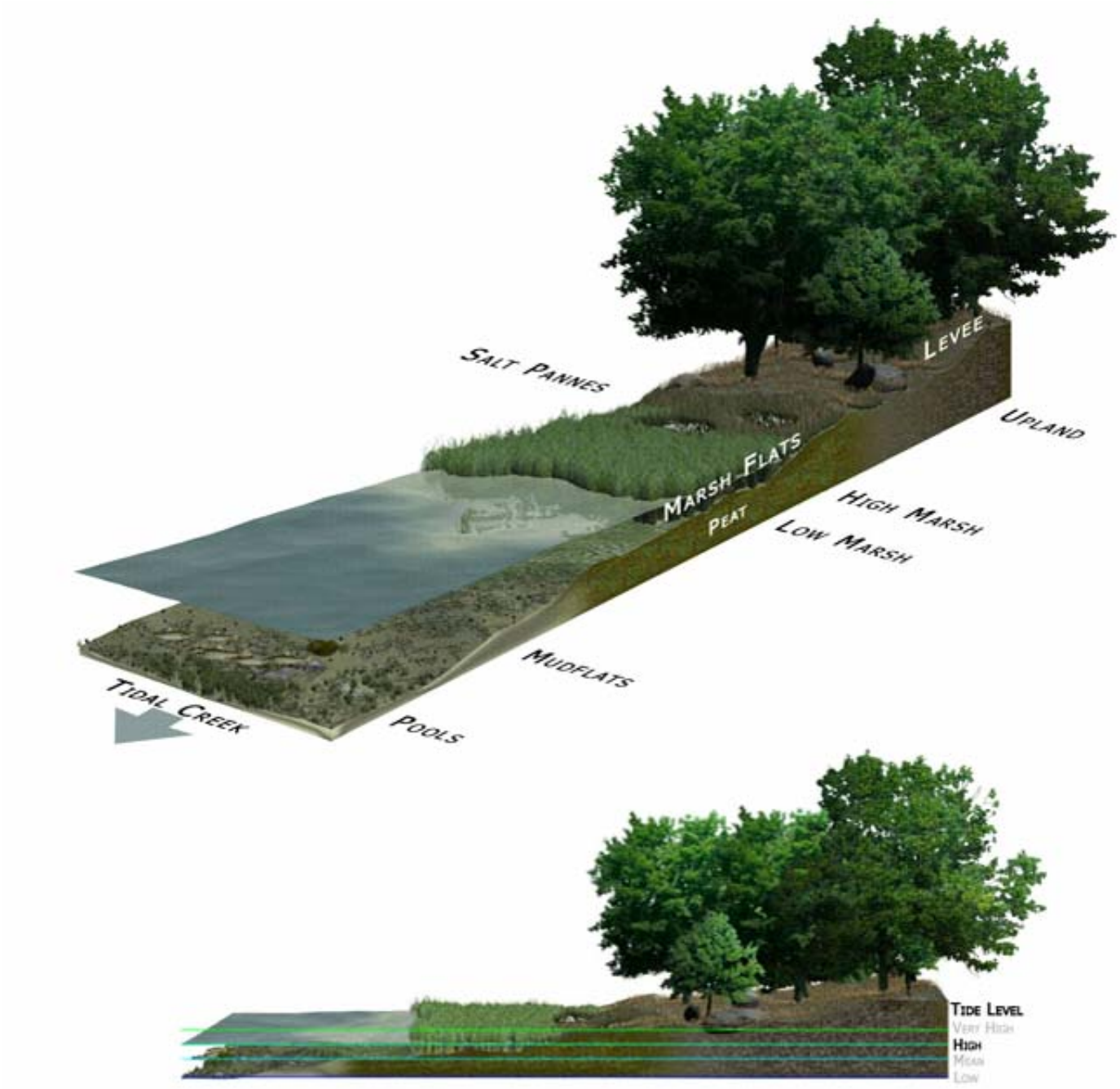

Image: 3 of 4 - High Tide

Salt marshes are a mosaic of snaking channels called tidal creeks that fill with seawater during high tides and drain during low tides. Fish species including flounder and mullet live most of their lives in marsh creeks.

(top)

Levees are areas of higher ground that border the marsh creeks. Between the levees and tidal creeks are marsh flats, which contain pools and salt pannes. Salt pannes are shallow depressions that contain very high concentrations of salt. Pannes retain seawater for very short periods of time. When the seawater evaporates, the salts remain and accumulate over many tidal cycles. Glasswort, a plant tolerant to very high salt concentrations, is one of the only organisms able to survive in salt pannes. Pools are generally deeper than pannes, and retain water all year long (Molles, 2002). Salt-marsh snails and green crabs are some of the creatures found in pools scattered across the marsh.

Low-lying areas of the marsh are often covered with large, flat expanses of mud called mud flats (Bertness, 1999; Smith and Smith, 2000). Composed of fine silts and clays, mud flats harbor burrowing creatures including clams, mussels, oysters, fiddler crabs, sand shrimp, and bloodworms.

Salt marshes are salty because they are flooded by seawater every day. They are marshy because their ground is composed of peat. Peat is made of decomposing plant matter that is often several feet thick. Peat is waterlogged, root-filled, and very spongy. Because salt marshes are waterlogged and contain lots of decomposing plant material, oxygen levels in the peat are extremely low—a condition called hypoxia. Hypoxia promotes the growth of bacteria which produce the rotten-egg smell that is attributed to marshes and mud flats.

Salt marshes are covered with salt-tolerant plants, or halophytes, like salt hay, black rush, and smooth cordgrass. However, these plants do not grow together in the same area. Marshes are divided into distinct zones, the high marsh and the low marsh. The difference in elevation between these two areas is usually only a few centimeters, but for the plants that inhabit each of these zones, a few centimeters makes a world of difference. The low marsh floods daily at high tide. The high marsh usually floods about twice a month during very high tides associated with new and full moons. The more often an area is flooded, the more saline it is. Plants living in salt marshes have different tolerances to salt. Those with higher tolerances are found in the low marsh, and those with lower tolerances to salt are found in the high marsh zones. Plants from one marsh zone are never found in the other.

(top)

Smooth cordgrass *(Spartina alterniflora)* dominates the low marsh all the way down to the

estuary's edge. It is tall, sturdy, broad-leaved, and one of the main components of peat. As one moves toward the high marsh, salt hay *(Spartina patens),* a very fine-leaved grass about 1-2 feet tall, and spike grass *(Distichlis spicata)* dominate the area. The highest parts of the marsh are characterized by black rush *(Juncus gerardii),* which grows in dense swaths.

Surrounding the high marsh are the upland habitats. Uplands are rarely, if ever, flooded with saltwater.

(top)