The Wonders of Wetlands

Wetlands: They have always been around, but it seems that we are hearing more and more about them these days. Throughout the history of the world, wetlands have been dredged, drained, filled in, built upon, and used as a dumping ground for trash and debris.

Wetlands are basically wet lands. They are often transition zones between dry land and waterways, but some are more isolated. The most common types of wetlands are swamps, bogs, and marshes, though there are many other kinds and a variety of names for them: mire, fen, moor, muskeg, prairie pothole, bottomland, riparian wetland, wet meadow, slough, playa lake, or Delmarva bay. What these areas have in common is what defines them as wetlands: Water, hydric soils, and water loving plants. The particular types and arrangement of these three characteristics is what makes one kinds of wetland distinct from another type.

Wetlands may be any size and shape, coastal or inland, tidal or non-tidal, and may contain fresh, salty, or brackish (slightly salty) water. They may be always wet, regularly or infrequently flooded, or even seasonal (usually wet in the spring). There may not even be water standing on top of the surface for the area to be called a wetland, an area that only needs to be wet for 7-30 consecutive days or more, and have soil that is saturated within 6-18 inches of the surface, during the growing season (usually spring through fall). That means that wetlands are dry for most of the year, and when you visit a wetland, you may not actually see water--because the water may have dried up for a while or may only be saturating the soil.

Wetland Types:

Bog--a peat accumulating wetland that has no significant inflows or outflows and supports acid-loving mosses, particularly Sphagnum; water comes mainly from direct precipitation. Some shrubs (heath family) and evergreens also grow in bogs.

Bottomland--lowlands along streams and rivers, usually in the flood plain (land surrounding shore lines that becomes flooded when water overflows); periodically flooded; often forested, sometimes called riparian wetlands or bottom wood hardwoods forests.

Delmarva or Carolina Bay--isolated, irregularly shaped or elliptical basin fed by rain or groundwater; contains dark colored acidic water, may have trees or shrubs; may dry up in late summer, found in coastal regions from Delaware to North Carolina; origin uncertain. Some think a whale wallow, others think a meteor shower.

Fen--a peat-accumulating wetland that receives some drainage from surrounding mineral soil and usually supports marsh like plants.

Marsh--fresh, brackish or saltwater wetland; mostly Asoft≅ herbaceous plants that grow up out of the water; frequently or continually flooded; found on edges of rivers, creeks, ponds, lakes, in isolated depressions, along coastal canals and roadsides, or along the ocean, bays or estuaries.

Mire--European word for any peat-accumulating wetland.

Moor--European word synonymous with peat land. A high moor is a raised bog, low moor is a basin or depression.

Muskeg--large expanse of peat lands or bogs, particularly in Canada and Alaska.

Peat land--generic term for any wetland that accumulates partially decayed plant matter (peat).

Playa Lake--used in southwest U. S. for marsh like ponds similar to potholes, but with a different geological origin.

Pothole--shallow marsh like ponds in Midwest U. S. & Canadian Prairie region.

Slough--swamp or shallow lake in northern and Midwestern U.S., slowly flowing shallow swamp or marsh in southeast.

Swamp--wetland with mostly trees or shrubs. often associated with rivers or slow streams, or isolated depressions (e.g., Great Dismal Swamp in Va.-NC).

Wet meadow--grassland with waterlogged soil near the surface but without standing water for most of the year.

Water:

Wetlands receive water from two main sources: ground water and surface water. Surface water is rain water, runoff (rain that runs off the land), or water from water bodies, such as streams, rivers, ponds, or the ocean. Surface water finds its way to wetlands by gravity--it runs downhill until it finds a low spot in which to rest. In some cases, the surface water is overflow from a water body--wetlands along the shores of a river that are wetted by flood water are called flood plains wetlands. The water in wetlands can also come from under the ground--seeping groundwater or even underground springs. A wetland may form on a hillside or slope from groundwater that seeps out to the surface there. Other wetlands may occur n low-lying areas where the groundwater table is very high, which keeps the soil saturated from below. Many wetlands are fed by both surface and groundwater sources.

Soils:

Because of the prolonged presence of water, the soil in these areas (called hydric soil) develops special conditions. When the soil is saturated, most or all of the pore spaces are filled with water, which means that there is little or no room for oxygen. This means that the soil is anaerobic (lacks oxygen). Because it is saturated and anaerobic, a variety of chemical reactions occur in hydric soil. These reactions affect the nature of the soil over time, changing some of its physical properties (e.g. color). The initial composition of the soil (minerals and/or organic materials), degree of wetness, and frequency and duration of flooding determine what the soil will look and feel like. Because of the lack of oxygen, many organisms living in the soil must carry out anaerobic respiration. Certain bacteria, for example, perform their metabolic processes with the help of sulfur compounds--releasing sulfides that give the soil (e. g., in a marsh) a characteristic rotten egg smell.

Plants:

Without realizing it, you have probably already recognized that there are special plants growing in wetlands. Have you ever seen a cattail growing anywhere but in wet areas? Can you tell the difference between a marsh (with reedy, grass like plants) and a dry meadow (mostly Aweeds≅ and dotted with wild flowers)? In many instances, it is the plants that make us recognize wetlands, because they are a particular type that we expect to see in wet areas. Not all wetlands have plants growing in them (a mud flat, for example).

The plants that grow in wetlands are special adapted to life in wet conditions. After all, wetland environments are very stressful--many are alternately wetted and drained, some are periodically flooded with salt water, the soil is saturated and lacks oxygen, and many wetland areas receive soil and chemicals that wash off the land. Soft bodied plants that grow in the water must be lightweight, so they can float upright, yet sturdy enough to keep their shape. Many aquatic plants have special channels for holding water to give their leaves and stems support. Plants that grow with Afeet≅ wet but stick up above the surface of the water (called emergent plants) must be able to support themselves above the water. Plants growing in salty conditions have developed specialized tissues or organs that control the amount of salt taken in or that excreted the salt.

Although plants take carbon dioxide out of the air and release oxygen (which is why they help keep our air Aclean≅), they also need to take oxygen in through their roots. In wetland soil, however, there is little oxygen available. So, wetland plants have adapted special air spaces (called aerenchyma) for transporting oxygen from their leaves down through their stems to their roots! Trees that grow in wetlands have adapted other physical features that help them survive in wet conditions--pneumatophores or knees (a secondary root system that pokes above the surface of the water) for gas exchange: buttresses or swollen bases (trees look like they're wearing bell bottoms) help aerate the trees; shallow adventitious roots (growing from stem tissue) grow in the aerobic soil near the surface; or prop roots, such as on a mangrove tree, that have pores above the water level, where oxygen can be taken from the air.

A Valuable Resource

Wetlands are very important to us in many ways. In general, they help us keep our environment in balance (therefore, more healthy). Wetlands provide habitat (food, water, shelter and hiding places, and space) to numerous species of fish, birds, and other wildlife, including one third of America's threatened and endangered species. Many creatures that live most of their lives in other types of areas were born and raised in wetlands. Wetlands are one of the most productive habitats on earth, providing a strong base of plants and animals for the world's food web (including rice for humans, which is grown in wetlands called paddies). This also means economic strength, as the harvest of fur-bearers (muskrat, raccoon, nutria, mink, beaver and otter), alligators and raccoons (for pelts and meat), waterfowl, fish, and shellfish, peat and other vegetation (energy sources*), and even timber* each bring millions of dollars to the U. S. economy annually. Recreational attractions such as fishing, hunting, boating, and bird watching means that people spend a lot of money in local economies on sporting goods (guns, fishing equipment, etc.); clothes; gasoline (boat and auto); photographic equipment, film and processing; travel, food and lodging.

The ecological functioning of wetlands provides many other benefits. Wetlands act in preventing floods--they catch, store and slowly release runoff, particularly important during storms (this reduces the danger of the adjacent waterway overflowing from increased input); if the waterway does overflow, bordering wetlands will catch and hold the flood waters, protecting the upland area. Wetlands protect against storm damage--in coastal areas, wetlands absorb the brunt of ocean storms as they hit shore; where wetlands have been replaced by development, the homes and beach houses receive the initial shock of the storm instead and are often destroyed.

Wetlands are also vital to our water supply. In fact, many people consider this the most important function or benefit of wetlands. Wetlands sometimes recharge or replenish the aquifer (the underground layer of water used to supply wells) by slowly releasing stored water to the groundwater supply. During periods of drier weather or drought, wetlands help keep our groundwater flowing! Wetlands and wetland plants are efficient sinks and traps for sediment and other pollutants that are washed off the land. Caught in wetlands, these pollutants are kept rom degrading the quality of surface and groundwater, including our drinking water. Excess nutrients will stress an aquatic system, but wetland plants filter nutrients from passing water and use them in their own metabolism.

Important Commercial and Recreational Wetland-Associated Fish and Shellfish

Fresh water--bass, catfish, sun fish, perch, pickerel, trout
Anadromous (travels from salt water to fresh water)--salmon, shad, alewife, striped bass (rockfish)
Salt water fish--menhaden, mullet, sea trout, croaker, flounder, fluke, bluefish, drum, spot
Salt water shellfish--shrimp, blue crab, oyster, hard clam, soft clam, mussel

Wetland facts

*Wetlands can be found in every state in the United States.
*Wetlands can be found on every continent except for Antarctica
*Forested areas along wetland areas are call riparian areas
*The mining of peat for gardening and other uses means the destruction of the wetland in which the peat was formed.
*Plants adapted to wet conditions are called hydrophytes
*Wetlands may be pristine natural areas or may have been built by humans
*Wetlands can age- many exist in various stages of human disturbance or natural succession