Water Transitions

Brackish water is a fairly salty mixture of freshwater and sea water. It is unique in numerous ways and is a life giving ecosystem. To understand what brackish water is, a background should be known about its sources.

First of all, there is freshwater. Out of all the water on the planet, only three percent of it is fresh, and only one fiftieth of one percent is readily available. Freshwater is not pure in that it contains minerals and other particles. There are numerous plants and animals that depend on freshwater for their lives. Humans are one of them. Seventy percent of the human body is made up of freshwater (744 Headlam).

Next, there is saltwater, or seawater. Seawater consists of fifty-five percent chlorine, and thirty-one percent sodium (Groliers). It makes up approximately ninety-seven and two tenths percent of the total volume of the world's water, and covers more than seventy percent of the earth's surface (Groliers). Sea water doesn't just contain hydrogen, oxygen, sodium, and chlorine; it also contains every naturally occurring element. Although seawater has a fairly constant ratio of major elements, salinity and seawater can fluctuate. Normally, the salinity is thirty-four to thirty-seven parts per thousand (ppt.), but on a particularly rainy morning, the salinity may decrease to something as low as thirty-two ppt. (Stuller 29).

The mixing of freshwater and sea water forms a third type of water, known as brackish water. Brackish water can be found in a variety of mixing zones such as river deltas, freshwater title marshes, estuaries, fjords, and in the middle of the ocean (Stuller 30). To begin with, freshwater traveling towards the sea carries suspended particles. As the particles make contact with saltwater, an electrochemical reaction called flocculation takes place. The clay with a positive charge, and the sodium chloride with a negative charge, combine and form a heavier particle that descends to the bottom of the mixing zone and creates a layer of mud (Stuller 28). This is one of the reasons that a mixing zone is a thriving ecosystem. A salt wedge estuary is one of these transitional zones. The water closest to the surface has a lower salinity content than the water nearest to the estuary's floor because the water is not thoroughly mixed and saltwater has a higher density than freshwater (Stuller 31). Another zone is a fully mixed zone which is apparent in fjords. Also, there are zones in the middle of the ocean called either submarine springs, or seeps. These are where freshwater from under the ground seeps through the ocean floor. There is also a parallel situation, in which salt water can seep into a freshwater ecosystem, but this can be fatal to many animals (Stuller 31). Transitional zones are homes for all kinds of marine life, such as manatees in Charlotte Harbor.

The most prevalent mixing zones are estuaries. Estuaries are drowned costal river valleys where salt and freshwater are present to form brackish water (Groliers). The circulation in estuaries is stratified with river water flowing above sea water with some vertical mixing taking place (Groliers). As indicated earlier, sediments accumulate at the upper reaches of estuaries because of flocculation. This in turn spikes diatom growth, diatoms are eaten by possum shrimp, and possum shrimp are eaten by striped bass. Some other common fish, present in brackish water ecosystems are mullet and silversides (Groliers). Thus, the food cycle continues.

Brackish water has some very interesting qualities. It represents unity of two very diverse ecosystems. The mixing of seawater and freshwater is extremely beneficent at the right time in the right place, but in the past it may have been harmful. Scientists speculate that an ice age may have been triggered by freshwater occupying a location where saltwater was supposed to have been. There is a deep ocean current of very salty water beneath the gulf stream travelling from the tropics to the North Atlantic. As it reaches the North, it disturbs surface water, the salty water rises and discharges heat, and then it cycles back to the tropics. What could have triggered an ice age, a surge of freshwater (Stuller 33).