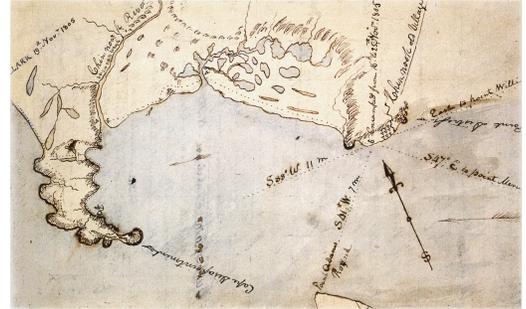




Where the River Meets the Ocean...

Read the following passage to help you answer the questions on the next page.

On November 7, 1805, the Lewis and Clark Expedition arrived near the mouth of the Columbia River. They believed they saw the Pacific Ocean, and Clark wrote excitedly in his journal, "Ocian in view! O! The joy!" What they were actually seeing was the Columbia River estuary, where the river meets the ocean.



Picture 1. Clark's Map

What is an estuary?

An estuary is where fresh water from rivers and streams meet the ocean. The fresh water is mixed with the sea water and the water becomes brackish. This water is also affected by the tides.

Tides cause changes of water level, which plays an important role in the estuaries. The land is submerged at high tide and exposed at low tide. The tides also affect the fresh water and sea water ratio. High tide=more sea water, low tide=more fresh water. Due to the fluctuation of water and the salt content in the water, the organisms of the estuary live in a delicate balance.

Why is it important?

Estuaries are one of the most productive environments on earth. They provide habitats for many kinds of plants both in and around estuaries. Fish, crabs, marine mammals, clams, shellfish, marine worms and birds also rely on estuarine habitats as places to live, feed and reproduce.

In addition, estuaries play a role as filters. They filter out sediments or pollutants from upriver, so they make water cleaner. Marsh grasses trap solid particles and prevent **algae blooms** that can deplete the oxygen in water and kill fish. Also, millions of microorganisms such as bacteria, fungi and algae help to recycle nutrients and atmospheric gasses like oxygen.



According to the journals...

"...we took the advantage of a returning tide and proceeded on to the second point on the starboard...the water of the river too salt to be used....In this situation, we are compelled to form our camp between the height of the **ebb** and **flood** tides, and raise our baggage on logs..." (Capt. Clark, Nov. 8, 1805)

"...I prosue'd this gang of Elk through bogs which the wate of a man would Shake for 1/2 an Acre, and maney places I Sunk into the mud and water up to my hips without finfing any bottom on the trale of those Elk. " (Capt. Clark, Dec. 8, 1805)

*ebb: the time between high tide and low tide. *flood: the time between low tide and high tide.

