

River Dynamics: Changing Riparian, Estuarine, and Marine Habitats

DID YOU KNOW?
From where you are standing, the Navarro River Estuary extends upstream for approximately 5.5 river miles and is included in the California Coastal Zone. You can canoe or kayak the estuary throughout the year.

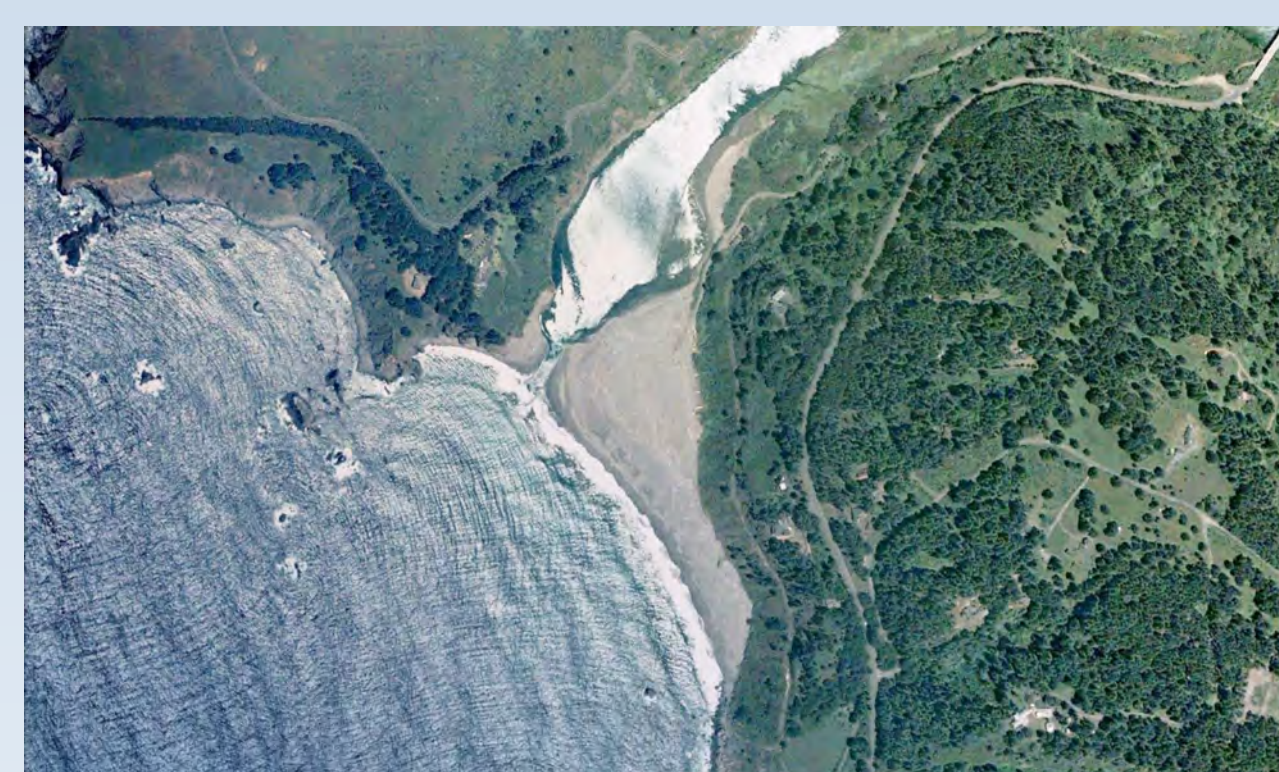
The 5.5 mile-long Navarro River Estuary is a shifting equilibrium between salt and fresh water, changing nutrient levels, and sandbars and islands that support colonizing plants that come and go with the seasons. The key is how the estuary is sometimes open and sometimes closed to the Pacific Ocean. This may happen daily with the tides or may happen seasonally based on the volume of river flows.

Do you ever come to Navarro Beach and notice sometimes that you can't get to the Pacific Ocean because the river is in the way? That there are mudflats and islands that were not there in the spring? That willows, bulrush, and cattails come and go?

The estuary's habitats are perpetually in flux, influenced by the forces of the Pacific Ocean on one side and the freshwater flows of the Navarro River on the other. Hanging in the middle between these two is Navarro Beach. Typically water only moves from the ocean to the estuary during high tides. Every few years the river floods (see chart) and brings with it a watershed of nutrients, debris, and driftwood that grace the estuary's edges and beach, and huge quantities of silt, sand, and gravel.

However, in some years, as the river's flow rate subsides through the spring, the force of the river's water is not enough to combat the ocean's tides and move the sand and gravel it transports all the way to the sea. The result? A sand dam! Sometimes the dam is a complete barrier that can last for months.

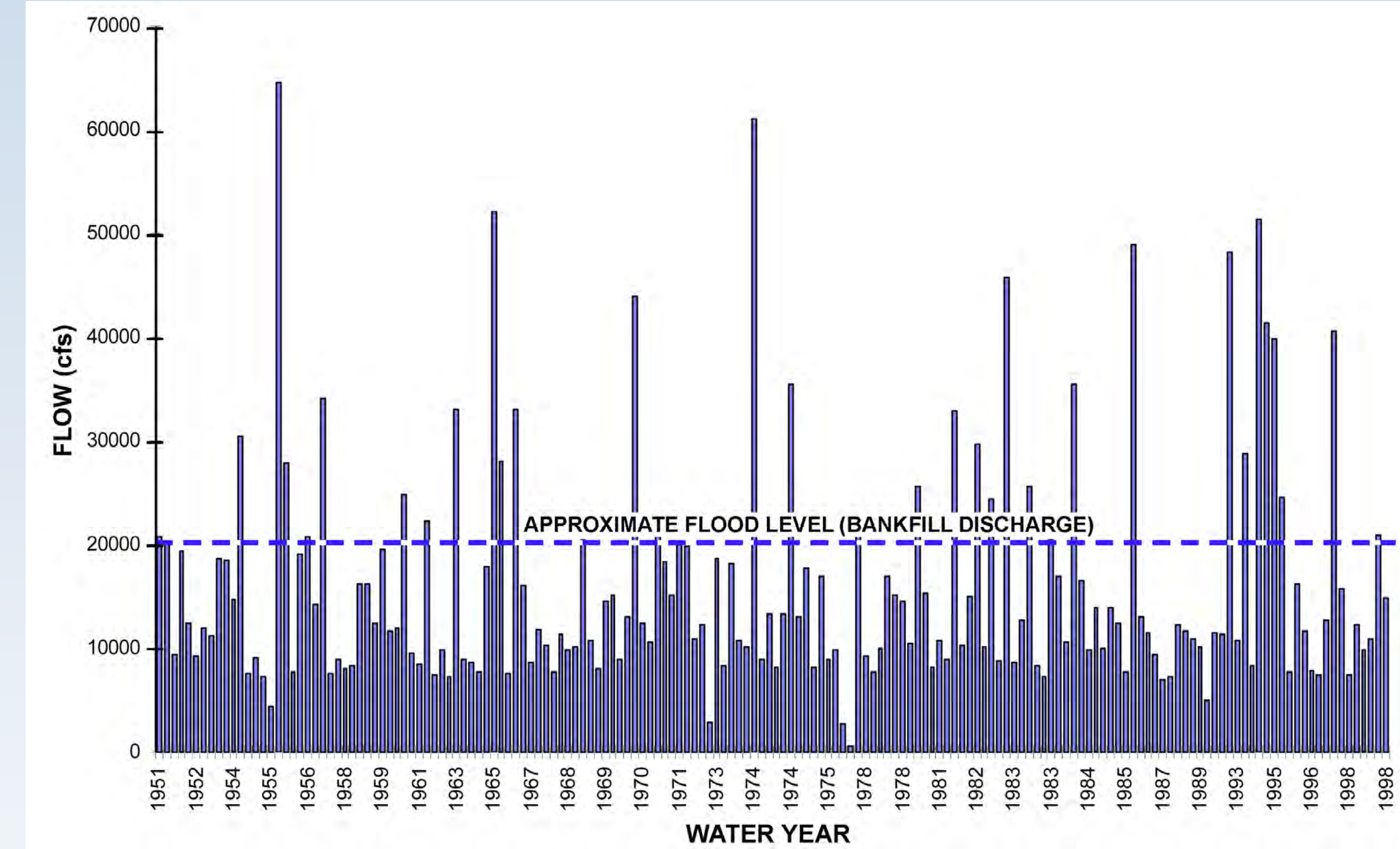
In the summer months behind the sand dam the estuary's waters build up. It is not until the next fall with annual rains and higher flows that the pressure of the backed-up river's waters combine with its flows to "breach" the barrier and once again connect with the ocean. Virtually every year there is a different pattern formed in the way the river and ocean connect. The river meanders widely around and through the beach. The graphic below illustrates the variability of river flows from season to season and year to year and how it affects the estuary.



June, 2003



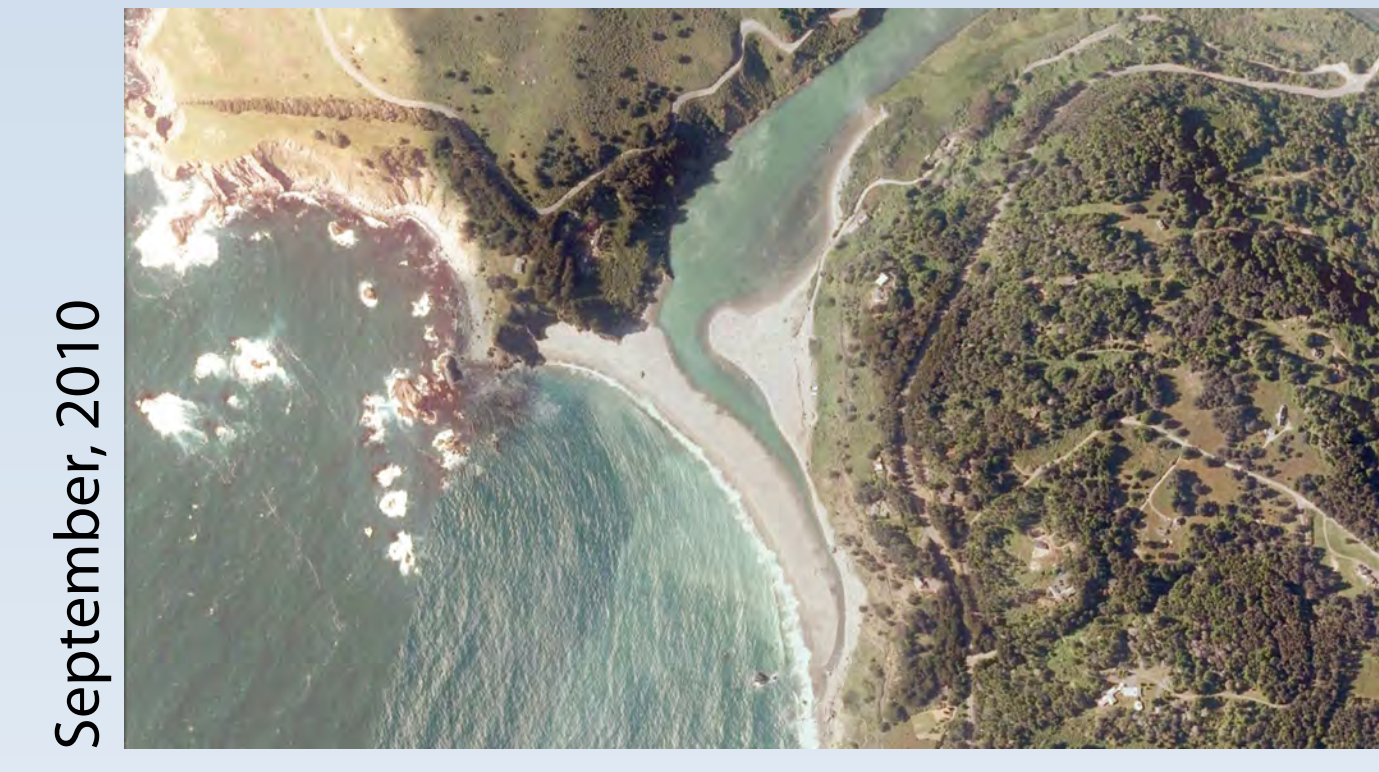
July, 2004



August, 2006



August, 2009



September, 2010



May, 2012

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CHALLENGE

Go visit Navarro Beach and walk to the ocean's edge. Is the river connected to the ocean? Can you see any evidence of where the river previously cut through the beach?

All photo Images from GoogleEarth.