

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Jill A. Marshall)
MEETING DATE: April 8, 2009

ITEM: 10

SUBJECT: The Dynamic Nature of Bar Built Estuaries – Pescadero Lagoon as a Case Example

DISCUSSION: Dr. Curt Storlazzi, a researcher with the United States Geological Survey's Pacific Science Center, who specializes in shallow-water hydrodynamics and sediment transport along rocky coastlines will be giving this presentation. Dr. Storlazzi has been studying coastal systems in California and Hawaii for the last 13 years. He is a member of the Pescadero, Scott, and Waddell Creek Lagoon Restoration Working Groups. Dr. Storlazzi is also the coastal and marine geology representative on the Monterey Bay National Marine Sanctuary's Research Activities Panel, and has taken part in developing the past two 5-year science plans for the Monterey Bay National Marine Sanctuary.

In his presentation to the Board, Dr. Storlazzi will talk about the dynamic processes that have shaped and continue to shape Pescadero Marsh across space and time. Historically, many past studies of this marsh system have hypothesized that historical modifications to the marsh have altered the timing and style of bar formation, potentially causing a loss of habitat. Dr. Storlazzi's work serves as a reminder that we need to also consider local and not so local forces such as large-scale geologic and oceanographic processes that shape the very dynamic Pescadero Marsh ecosystem.

Pescadero Marsh, located at the very southwestern tip of our region, on the stunning San Mateo County coast, provides critical habitat for a wide variety of wetland and estuarine species, including endangered coho and steelhead, red legged frog, tidewater goby, and the San Francisco Garter snake. This 340-acre ecosystem changes both seasonally and over longer time scales (e.g., due to fluctuating winter El Nino or La Nina storm patterns). In the winter months, freshwater runoff from Pescadero and Butano creeks interacts with wave- and tidally-driven salt water in the marsh causing an estuarine system. In the spring of most years, a sand bar forms across the mouth of the creek, converting the marsh into a closed lagoon. When this happens, the bar-built estuary remains shut off from the ebb and flow of the daily tides, and continued freshwater runoff from the watershed above

slowly converts the marsh into a freshwater system. In fall or winter, when tides and waves and/or Pescadero Creek's discharge are large enough to breach the barrier, the lagoon again reverts back to a brackish estuarine system.

In eight of the last twelve years, the breaching of the bar and the opening of the lagoon has coincided with a die-off of fish and invertebrates, including steelhead trout. This is a phenomenon of great concern to local fishermen, who are active in efforts to restore the marsh and make the system healthy again.

Dr. Storlazzi will provide a general overview of bar-built estuaries, and discuss available information about the timing of bar formation at Pescadero over the last few decades, the potential impact of human activities on this process, and how climate change and rising sea levels could influence bar formation in the future.

**RECOMMEN-
DATION:**

Information item only; no action necessary