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## Central Coast Regional Water Quality Control Board

# Project Update: Development of Total Maximum Daily Loads (TMDLs) for the Elkhorn Slough Watershed

August 2022

### Background

This update presents a brief overview of a Total Maximum Daily Load (TMDL) project that will address biostimulatory impairments (nutrients, dissolved oxygen, pH imbalances) within the Elkhorn Slough watershed (TMDL project area). Central Coast Water Board (CCWB) staff began work on this project in 2015. Elkhorn Slough is a complex and dynamic estuarine system, and it has taken some time to develop suitable strategies for addressing the issues related to biostimulation. CCWB staff worked with Southern California Coastal Water Research Project (SCCWRP) and Tetra Tech, who significantly contributed to the development of this TMDL, along with Elkhorn Slough National Research Reserve, and stakeholders within the watershed. Please visit our [project website](#) for a link to SCCWRP's technical report (2022) and for other information about this project.

### Total Maximum Daily Loads

TMDLs are strategies to restore the beneficial uses (e.g., fishable/swimmable) of waterbodies that are "impaired" because they do not meet water quality standards<sup>1</sup>. The federal Clean Water Act section 303(d) requires every state to evaluate its waterbodies and maintain a list of waters that are "impaired" either because the water exceeds water quality standards or does not achieve its designated beneficial use(s). For each waterbody on the Central Coast's "303(d) Impaired Waters List," the CCWB must develop and implement a plan to reduce pollutants so that the waterbody is no longer impaired and can be removed from the impaired waters list.

A TMDL is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. A TMDL study identifies the probable sources of pollution, establishes the maximum amount of pollution a waterbody can receive and still meet water quality standards, allocates that amount to all probable contributing sources, and establishes a schedule to attain the water quality standards.

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<sup>1</sup> [Water quality standards](#) (WQS) are provisions of state, territorial, authorized tribal or federal law approved by EPA that describe the desired condition of a water body and the means by which that condition will be protected or achieved. Water bodies can be used for purposes such as recreation (e.g., swimming and boating), scenic enjoyment, and fishing, and are the home to many aquatic organisms. To protect human health and aquatic life in these waters, states, territories and authorized tribes establish WQS. WQS form a legal basis for controlling pollutants entering the waters of the United States.

### The TMDL Process

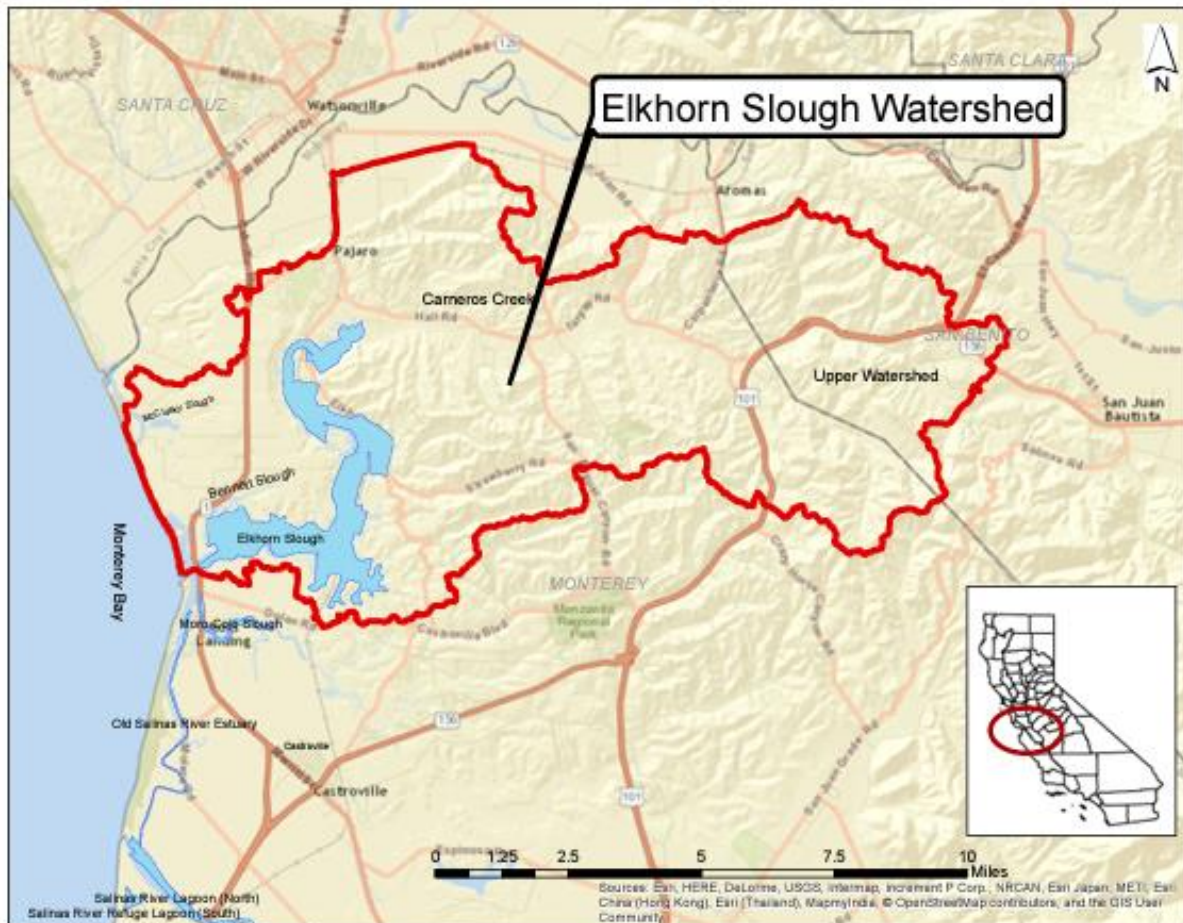
TMDLs developed by CCWB staff must go through an approval process before going into effect and staff will notify interested parties of opportunities for public participation through public meetings and workshops. Staff will also solicit public comments and encourage other forms of public participation through correspondence, email, and other informal contacts.

### Location and Watershed Description

The geographic scope of this TMDL encompasses approximately 55 square miles (35,000 acres) of the Elkhorn Slough watershed in northern Monterey and western San Benito Counties. This watershed is also known as the Bolsa Nueva hydrologic unit and is a westerly trending drainage that flows into the Pacific Ocean within the Monterey Bay National Marine Sanctuary.

Elkhorn Slough is one of the largest coastal wetlands in California and is a nationally recognized Estuarine Research Reserve. The watershed is characterized by intertidal mudflats, salt marsh, coastal dunes, oak woodlands, chaparral, and upland areas. Nearby land uses include agriculture, including strawberries and other row crops, cattle grazing, and housing.

Figure 1. Elkhorn Slough watershed



## **Why Do We Need TMDLs for Biostimulatory Substances in the Elkhorn Slough Watershed?**

California designates beneficial uses for each waterbody (e.g., drinking water supply, aquatic life support, recreation, etc.) and the scientific criteria to support those uses. The CCWB is required under both state and federal law to regulate and protect beneficial uses of waters of the state.

Data document nitrate, dissolved oxygen, pH, chlorophyll-*a*, and un-ionized ammonia impairments within waters of the Elkhorn Slough watershed.

Elevated levels of un-ionized ammonia, nitrite, and nitrate can be toxic to both humans and aquatic life and can cause biostimulatory responses. Designated beneficial uses of surface waters within the Elkhorn Slough watershed include cold and warm freshwater habitat (COLD and WARM), estuarine habitat (EST), fish spawning (SPWN), contact and non-contact recreation (REC-1 and REC-2), municipal and domestic use (MUN), and marine habitat (MAR).

Excessive nutrient levels may create adverse impacts to water quality by causing biostimulatory effects such as excessive growth of micro and macro algae, low dissolved oxygen, pH imbalances, and other deleterious effects. Water quality impairments like these can affect the entire aquatic food web, from algae and other microscopic organisms, through benthic macroinvertebrates (principally aquatic insect larvae), through fish, and to birds and mammals at the top of the food web. CCWB staff is in the initial phases of developing biostimulatory substances TMDLs for the Elkhorn Slough watershed.

## **What are the Sources of Water Quality Problems?**

As described in the document “*Science Supporting Decisions on Management of Eutrophication in Elkhorn Slough Estuary*” (SCCWRP Technical Report #1259, 2022), sources of nutrients to Elkhorn Slough include:

- Monterey Bay
- Deep groundwater
- Sediment diagenesis (loading coming from the sediment)
- Salinas River Lagoon
- Land-based sources (multiple)

## **For More Information**

The CCWB encourages your participation in this TMDL project. To receive future project announcements please subscribe to the electronic email list by checking the box for the “Elkhorn Slough Biostim TMDL” at:

[http://www.waterboards.ca.gov/resources/email\\_subscriptions/reg3\\_subscribe.shtml](http://www.waterboards.ca.gov/resources/email_subscriptions/reg3_subscribe.shtml)

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