California Water Boards

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FACT SHEET

DEVELOPMENT OF TOTAL MAXIMUM DAILY LOADS FOR NUTRIENTS AND ALGAL TOXINS: PINTO LAKE WATERSHED

What is a Total Maximum Daily Load (TMDL)?

Simply put, TMDLs are strategies or plans to restore clean water. Section 303(d) of the federal Clean Water Act requires every state to evaluate its waterbodies and maintain a list of waters that are considered "impaired" either because the water exceeds water quality standards or does not achieve its designated use. For each water on the Central Coast's "303(d) Impaired Waters List," the California Central Coast Water Board must develop and implement a plan to reduce pollutants so that the waterbody is no longer impaired and can be de-listed

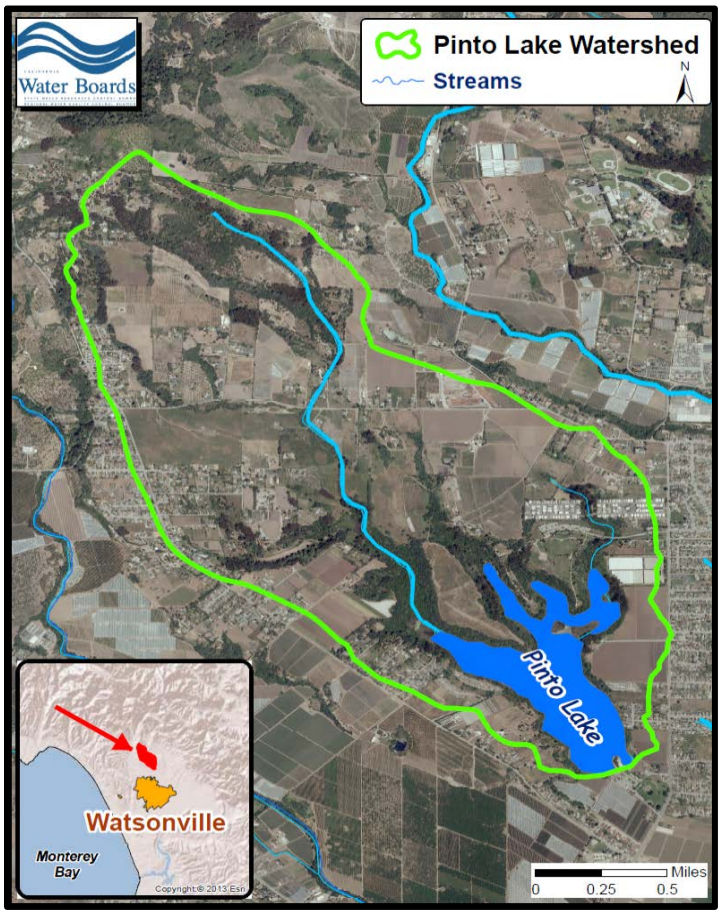
"Total Maximum Daily Load" (TMDL) is a term used to describe the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. A TMDL project identifies the probable sources of pollution, establishes the maximum amount of pollution a waterbody can receive and still meet water quality standards, and establishes a plan to rectify the water quality impairments. . Water Board staff are in the initial phases of developing a TMDL for Pinto Lake intended to address identified algal toxin water quality impairments.

Location and Watershed Description

The Pinto Lake Watershed drains a 1,480 acre (2.3 square miles) catchment of southern Santa Cruz County, just north of the city of Watsonville. Pinto Lake is a natural, perennial lake that has existed for at least 8,000 years as a result of a tectonically-driven local topographic depression. The lake is an important recreational and aesthetic resource for the public, and historically has provided high quality habitat for aquatic species and wildlife. Land cover in the watershed is comprised largely of residential areas, and cultivated cropland; upland reaches of the watershed contain substantial amounts of mixed woodland and grasslands. Soils of the watershed are predominantly loams, with subsidiary amounts of sandy loams, and clays. Surface drainage in the watershed range from moderately-well drained to somewhat-poorly drained.

Why Do We Need a TMDL for the Pinto Lake Watershed?

TMDLs are required by federal law to implement state water quality standards and rectify identified surface water quality impairments. California's water quality standards designate beneficial uses for each waterbody (e.g., drinking water supply, agricultural supply, aquatic life support, recreation, etc.) and the



Pinto Lake Watershed

scientific criteria to support those uses. The Central Coast Water Board is required under both state and federal law to protect and regulate beneficial uses of waters of the state. Pinto Lake is listed on the Clean Water Act 303(d) list due to impairments by toxic algal blooms. This type of water quality impairment is a biological response to excessive loading of nutrients to the lake. While nutrients - specifically nitrogen and phosphorus – are essential for plant growth, and are ubiquitous

in the environment, they are considered pollutants when they occur at levels which have adverse impacts on water quality.

Episodic algal blooms in Pinto Lake, resulting from nutrient-driven biostimulation, constitute a potential health risk and public nuisance to humans, their pets, and to livestock and wildlife. The majority of freshwater harmful algal blooms (HABs) reported in the United States and worldwide is due to one group of algae, cyanobacteria (CyanoHABs, or blue-green algae). Univ. of California-Santa Cruz researchers report that Pinto Lake is one of the most toxic lakes ever recorded in the scientific literature on the basis of episodic high levels of algal cyanotoxins.

Possible health effects of exposure to blue-green algae blooms and their toxins can include rashes, skin and eye irritation, allergic reactions, gastrointestinal upset, and other effects. At high levels, exposure can result serious illness or death. These effects are not theoretical; worldwide animal poisonings and adverse human health effects have been reported by the World Health Organization. The California Department of Public Health and various County Health Departments have documented cases of dog die-offs throughout the state and the nation due to blue-green algae. Dogs can die when their owners allow them to swim or wade in waterbodies with algal blooms; dogs are also attracted to fermenting mats of cyanobacteria near shorelines of waterbodies. Dogs reportedly die due to ingestion associated with licking algae and associated toxins from their coats. Additionally, algal toxins originating from freshwater sources, such as coastal lakes and streams, have been implicated in the deaths of central California southern sea otters according to recent findings by researchers from the California Dept. of Fish and Wildlife. City of Watsonville staff report anecdotal cases of people contracting rashes or flu-like symptoms associated with contact with algal blooms in Pinto Lake. Currently, there reportedly have been no confirmations of human deaths in the United States. from exposure to algal toxins, however many people have become ill from exposure, and acute human poisoning is a distinct risk.

What are the Sources of Nutrients?

Elevated nutrients in a waterbody can contribute to biostimulation, such as algal blooms. There are many possible nutrient sources within any given watershed; in general the following can potentially be significant sources of nutrient loads:

- Urban Runoff
- Wastewater Treatment Plants
- Fertilizer/Manure Applications
- Livestock
- Septic Systems
- Natural Background and Atmospheric Deposition
- Groundwater inflow into streams and lakes

Based on recent research, inferred sources of controllable nutrient sources to Pinto Lake include agricultural operations, residential septic systems, and increased erosion and discharge of phosphorus-rich sediment to the lake as a result of the removal of historic native vegetation.

The TMDL Process

A TMDL is developed by Central Coast Water Board staff. A TMDL developed by staff must be approved by the Central Coast Water Board, and the U.S. Environmental Protection Agency. Public participation is an element of TMDL development. Water Board staff notify interested parties of opportunities for public participation through public meetings/workshops, we solicit public comments, and we encourage other forms of public participation through correspondence, email, and other informal contacts.

For More Information

The Central Coast Water Board encourages interest and involvement in TMDL projects from stakeholders, interested parties, and the general public. Please refer to the Water Board's TMDL webpage at:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/303d_and_tmdl_projects.shtml

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Pinto Lake algal bloom (Photo credit: City of Watsonville)

Pinto Lake water sample (Photo credit: City of Watsonville)