

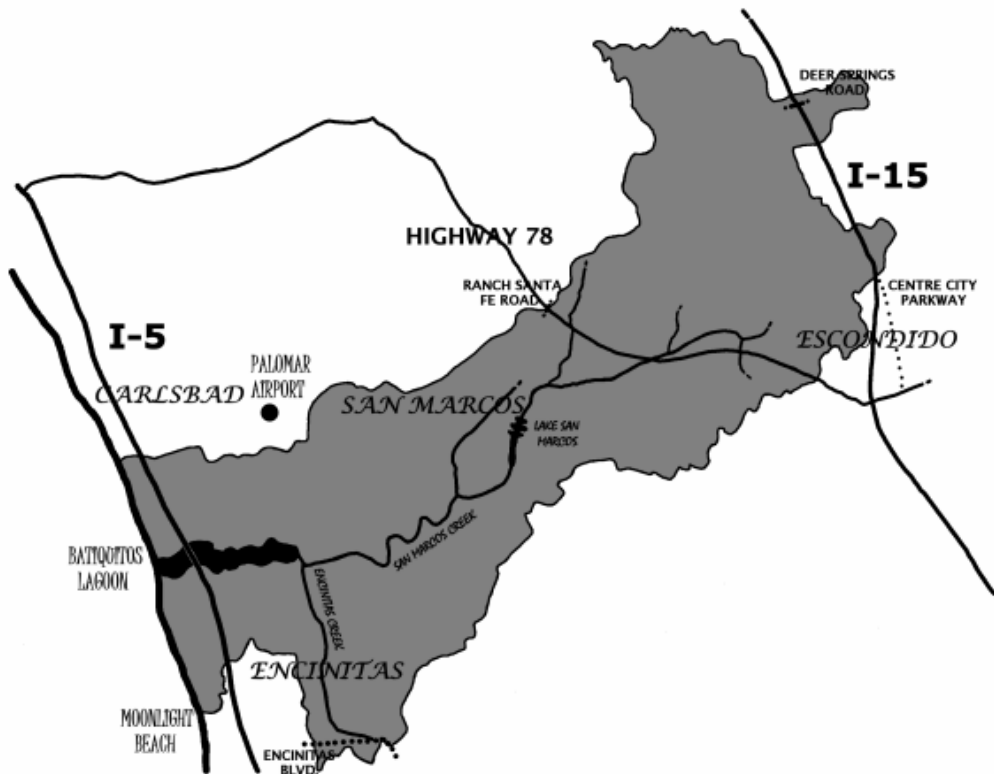


LAGOON DYNAMICS

WATERSHED

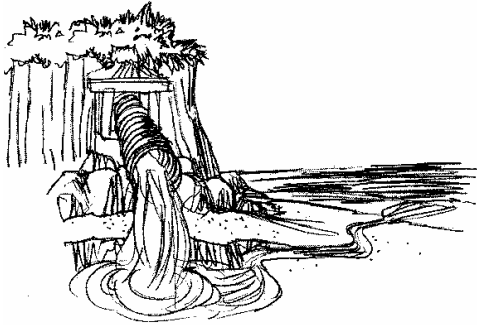
BATIQUITOS LAGOON FOUNDATION

The main source of fresh water for Batiquitos Lagoon is rainfall coming in via natural creeks and streams. This fresh water is collected from the area around the lagoon called the “watershed.” All water, except what is trapped or evaporated, coming as rain or in any other form anywhere in the **watershed** area of Batiquitos Lagoon drains downhill into the lagoon and into the ocean. The watershed of Batiquitos Lagoon extends east and inland past Interstate 15 north of Escondido (encompassing about 35,000 acres or 55 square miles in all) and is higher than sea level (up to 1,540 ft above), while both the lagoon and the ocean are at sea level. Rainwater throughout most of the watershed drains into gullies and small streams which join together as bigger streams which flow into San Marcos Creek which then empties into Batiquitos Lagoon. In addition, a second much smaller stream (Encinitas Creek) empties into the lagoon after collecting water from another part of the lagoon’s watershed. Some water also flows directly into the lagoon.



When settlers began living around the lagoon, they started adding roads, farms, buildings, and landscaping to the watershed. Because of these, other fresh water sources have developed, such as street runoff via storm drains and farm or lawn irrigation. As a result, both the quantity and quality of the water in the watershed have changed.

The quantity of water leaving the watershed and flowing into the lagoon is greatly affected by impervious surfaces (or “hardscape”) such as paving and asphalt (roads, driveways, and parking lots) and roofs on buildings. In general, the more impervious surfaces there are in a watershed, the faster the runoff into the waterways, and fast runoff means less storage of water either in lakes and ponds or by absorption into the soil and less adequate filtering of the water by the soil and vegetation. Also, fast runoff means that existing streambeds will be unable to handle the enlarged flow, increasing the chances of flooding and landslides, increasing the amount of erosion throughout the watershed, and increasing the amount of sediment carried to the lagoon. Approximately 18% of the Batiqitos Lagoon watershed is covered by impervious surfaces.



The quality of the water has changed because it often now carries pollutants: debris; sediments; excess nutrients such as fertilizers and other sources of phosphorus, nitrogen, or phosphate; acids, salts, and heavy metals; organic chemicals such as pesticides, herbicides, oil, and detergents; and pathogens like coliform bacteria. Some parts of the natural watershed serve as filters for the water, removing pollutants. (Urban watershed planning makes use of such filters.) Vegetated riparian wetlands (i.e., where trees and bushes surround streambeds) in areas where fertilizers are used have proven to remove high percentages of nutrients from runoff water. Without this upstream filtering, the increased nutrient levels in downstream wetlands could result in algal blooms and over-abundant aquatic plant growth. When these overgrown algae and plants die, oxygen in the water is used during the decomposition process. This can result in lowered oxygen levels which may lead to fish die offs.

Most of the soil within our watershed is considered to be “highly erodible”—this means that the original structure of the soil is easily broken down by water, wind, or mechanical means so that there are smaller particles which can be more easily carried away by running water to be deposited at lower elevations. This process causes sediment accumulation, or **sedimentation**, in the lagoon following activities such as plowing and grading (agricultural uses and development, respectively) which remove the native vegetation, disrupting soil which has been held together by plant roots and also break soil down mechanically. Sedimentation is a problem throughout the watershed, affecting the flow into the lagoon as well as tidal flows between the lagoon and the ocean.