

morro bay
volunteer monitoring

Morro Bay Volunteer Monitoring Program

Algae Documenting Update

Winter 2004

Background

The Morro Bay Volunteer Monitoring Program (VMP) photodocuments algal growth at sites in the back bay and in the creeks.

The bay algae documenting effort occurs year-round. Volunteers venture to ten set vantage points around the bay to photograph algal growth, record the types of algae and estimate the percent coverage.

The creek algae documenting effort occurs from late spring through fall. Volunteers go to set points in the creek and take pictures, estimate the canopy cover, and record observations of algal growth.

Why do we do this type of monitoring?

The Central Coast Regional Water Quality Control Board (CCRWQCB) Basin Plan has a mission to protect the beneficial uses of our state's waters. Excess algal growth can negatively impact uses such as recreation and aquatic habitat.

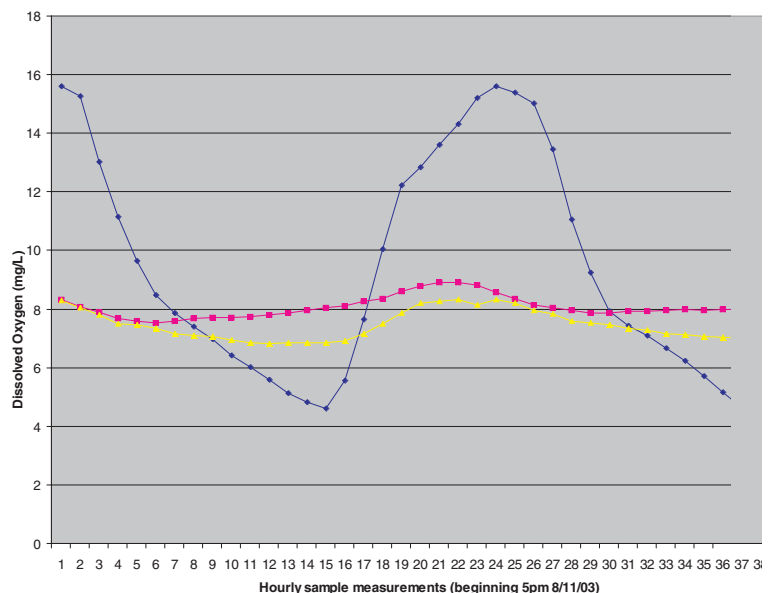
If excess algae are present in an aquatic system, they can drastically impact the oxygen levels in the water, which can be stressful for aquatic life. Algae produce oxygen through photosynthesis during the day, and then

take up oxygen at night. Through these processes, algae can cause extreme swings in the oxygen level during a diurnal cycle which can be stressful for aquatic life. The Basin Plan standard lists 7 mg/L as the protective level.

Based on data collected by the Dawn Patrol and algae documenting, the CCRWQCB may be proposing to add Morro Bay to the state's 303(d) list as being impaired for dissolved oxygen, which means that the low DO levels are impairing the beneficial uses (i.e., aquatic and fish habitat). If the bay is added to the 303(d) list, then a Total Maximum Daily Load (TMDL) will be developed for the bay to identify the sources of pollutants, determine how much pollution can enter the bay without impacting the beneficial uses, and assign proportional responsibility for controlling the pollutants. Both bay and creek algae documenting data collection will continue to assist the CCRWQCB in making these decisions.

Diurnal Dissolved Oxygen Levels on Chorro Creek

The graph depicts the dissolved oxygen levels at three sites on Chorro Creek over a 35 hour period: at Camp SLO (blue), at Canet Rd. (pink) and at Twin Bridges (yellow). The wide swings in DO levels at Twin Bridges is stressful for aquatic life. Regulations set 7 mg/L as the level to protect aquatic life.



Bay Algae Documenting

Bay algae documenting is conducted monthly at ten sites: Big Sandy, Crows Landing, Cuesta Inlet, Cuesta Channel, Cuesta Point, S. Bay Boulevard, Pasadena Point, Baywood Pier, Audubon Lookout and Sweet Springs. Volunteers take pictures at the lowest tide possible, note whether algae are enteromorpha or ulva, and estimate the percent coverage of each type.

When we began this monitoring effort in early 2003, we expected to detect a seasonal trend of increased algal growth during summertime and reduced growth in the winter. However, our preliminary conclusion has been that algae are

present year-round and that bloom activity did not follow the expected seasonal trend. We tended to see heavy enteromorpha growth in the spring, which led to large mats being built up by the wind in the back bay. Upon decomposing, these mats likely contributed to hypoxic conditions in that part of the bay. Blooms continued throughout the summer and even through December, presumably driven by the warm weather often experienced in late fall. Enteromorpha was continually present at Baywood Pier where a culvert discharges urban runoff. Since both species of algae are free-floating, they may be pushed to one part of the bay on the tide, making it difficult to track where they originated in the bay.

November 2004: The photo shows typical algal growth in Cuesta Inlet for most of the year. In photos taken at the same time last year, no algae were present in Cuesta Inlet. However, algal growth was high elsewhere in the bay during the same time period.



November 2004: The culvert near Baywood Pier carries urban runoff directly into the bay. A permanent plume of algae is typically present just below the culvert.



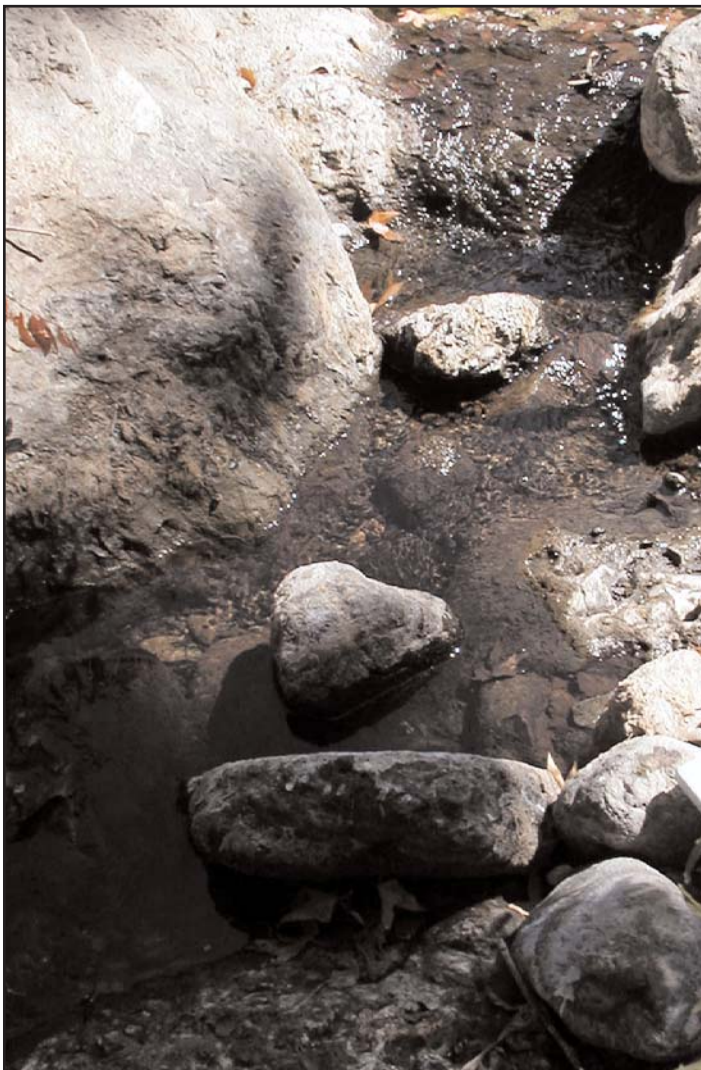
May 2004: This overview shot from near the Audubon Lookout in Los Osos shows the extent of algal growth that we commonly observe.

Creek Algae Documenting

In the summer of 2003, the RWQCB requested algae documentation photos from some of our regular water quality monitoring sites, and they repeated the request for this past summer. Volunteers snapped photos at creek sites, made estimates of canopy cover, and recorded observations about the quantity and types of algae present. Sites monitored were Chorro Creek at Camp SLO, Canet Rd. and Twin Bridges, Pennington Creek, Dairy Creek and Los Osos Creek.

The 2004 monitoring spanned from May through November. Algae were observed consistently at all of the sites through October and had mostly disappeared by November. The 2004 monitoring also included observations at both shady and sunny spots at each site to track the impact of canopy cover and shading on algal growth. A pretty clear trend emerged of increased algal growth in sunny areas as compared to shaded areas at each site.

This effort will start up again in the spring to provide the RWQCB with additional information.



The photos are of Chorro Creek at Camp San Luis Obispo in August 2004. The photo on the left was taken in a shaded spot and the photo on the right was taken in a sunny spot. The difference in algal growth is marked. This site is above the CMC wastewater treatment plant, which discharges its treated effluent into the creek. Although this type of nutrient source is typically considered a culprit when it comes to excess algal growth, Chorro Creek shows a great deal of algae above the plant outfall. The data collected thus far points to a lack of canopy cover and the resulting increased sunlight exposure as a more likely cause of algal growth in this particular system.