

morro bay
volunteer monitoring

Macroinvertebrate Monitoring Update

Spring 2008

What can we learn from macroinvertebrates?

Macroinvertebrates are animals such as insects, mollusks and arthropods that have no backbone and are visible to the naked eye. They spend all or part of their life cycle in freshwater. They are themselves a food source for larger animals such as fish, which in turn, are a source of energy for birds, raccoons, watersnakes, and even fishermen.

The survival of macroinvertebrates is directly tied to the quality of the water in which they live, making them ideal indicators of creek water quality. It may be difficult to identify stream pollution by taking periodic measurements of creek water, which can only provide information for the time of sampling. Most stream-bottom macroinvertebrates cannot move to avoid pollution and spend long periods of time maturing in aquatic habitats. Some cannot survive in even slightly polluted water while others will thrive

in heavily polluted water. In a healthy stream, the stream-bottom community will include a wide variety of macroinvertebrates, including those that are pollution sensitive. In an unhealthy stream, there may be only a few types of pollution tolerant macroinvertebrates.

The Morro Bay Volunteer Monitoring Program (VMP) collects macroinvertebrate samples each spring from several local creeks. The types and diversity of macroinvertebrates found provide information about the long-term quality of the water in the creek.



How do we monitor macroinvertebrates?

Program volunteers collect samples during the early spring, before aquatic insects have reached the adult lifestage and flown away from the creek bed.

A net is set in the water just downstream from a shallow riffle and the rocks and gravel are stirred and scrubbed to detach larvae from rocks. The invertebrates float down into the net, and the sample is filtered through a sieve where large debris is removed. Samples are stored with preservative until they are brought to the lab for identification. Due to the complexity of macroinvertebrate identification, a professionally certified lab conducts analysis of the samples.



What do we find in the Morro Bay watershed?



Small minnow mayflies are abundant in most local creeks. While most mayflies indicate good water quality, this family may also indicate pollution from excess nitrates and phosphates.



Case-maker caddisflies build their cases using glue to mold fine sediment into a case and silk to attach the cases to larger cobbles in the stream. They produce only one generation per year and are very sensitive to pollution.



There are over 1,000 species of non-biting midges in North America, and they are known to account for as much as 50% of the invertebrate community in streams. Some species may be highly tolerant of toxic conditions, while others are considered sensitive to pollution.



The riffle beetle may spend up to three years in the larval stage before they emerge as mature beetles. Mature beetles fly for a short period of time before re-entering the water where their wings degrade.

What does macroinvertebrate data tell us about the health of creeks in the Morro Bay watershed?

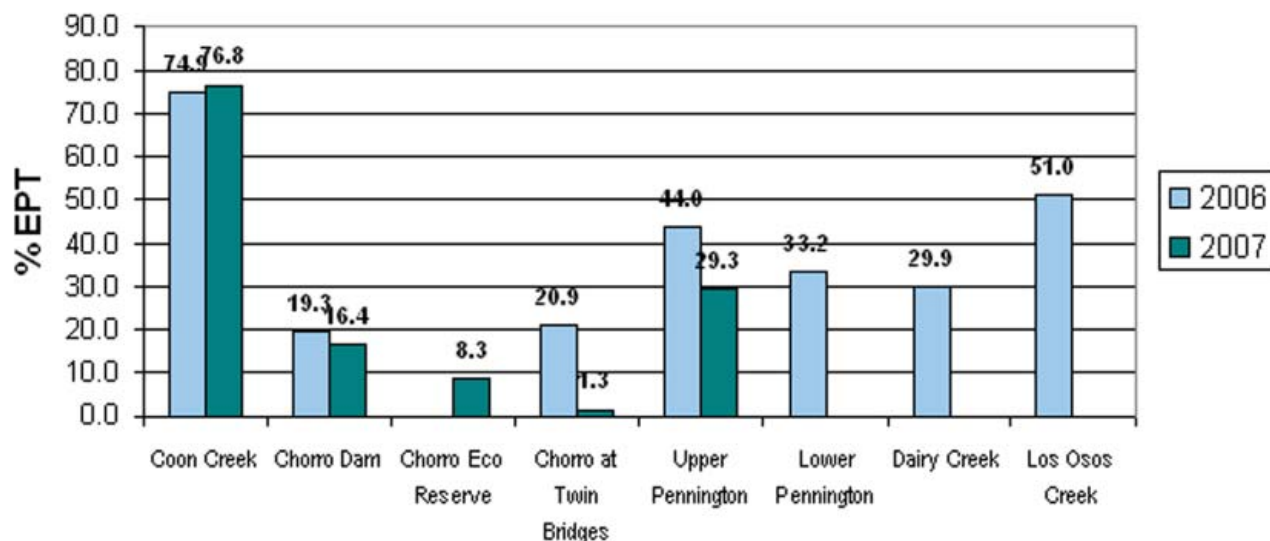
A measure commonly used to compare sites is the % EPT index. EPT is an acronym representing three pollution sensitive families of insects: Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies). The % EPT index divides the number of pollution sensitive insects (EPT Taxa) by the number of pollution tolerant species (blackflies, midges, etc.). For this calculation, a site with good water quality would have a higher % EPT value than a site with poor water quality.

In the above graph, the light blue bars represent data from 2006 and the turquoise bars show results from 2007.

These results identify the control site at Coon Creek as having the highest EPT Index %, and thereby the greatest number of pollution sensitive macroinvertebrates. Coon Creek is minimally impacted by humans and, as expected, has one of the most diverse and pollution-sensitive macroinvertebrate populations in the area.

Los Osos Creek in Clark Valley and Upper Pennington Creek also returned high values when compared to impacted sites on Chorro Creek. While EPT taxa were present at each of the sites, the pollution tolerant species dominated at sites on Dairy Creek and Chorro Creek.

Sampling Results from 2006 and 2007



Join us: Volunteers needed for the 2008 macro monitoring effort!!

Monitoring is dependent on long-term dry weather conditions but is expected this year to take place during late April to mid-May. Monitoring at each site requires approximately four hours. Training is conducted in the field, and all the necessary equipment is supplied.

If you are interested in more details on the data or in participating in the upcoming monitoring season, please contact the Volunteer Monitoring Program at 805-772-3834, extension 14 or via email at annieg@mbnep.org



The Morro Bay Volunteer Monitoring Program is one of the primary organizations monitoring the health of Morro Bay and its watershed. The program is part of the Morro Bay National Estuary Program.