

# Turning the Tide

A NEWSLETTER of the MORRO BAY NATIONAL ESTUARY PROGRAM

SPRING 2008

## Estuary Program Teams Up with SLO County to Monitor Watershed Storm Data

This rainy season has certainly proven to be an interesting one. High winds and intense storms have kept most people inside and left many of us wondering what might be happening outdoors. How much rain has fallen in the last hour? How much has the creek level risen? The answers to these questions can now be easily found.

The SLO County Flood Control and Water Conservation District monitors water resources data using stream and rain gauges, well measurements, reservoir data, and more to support water resources planning efforts. Last year, Estuary Program staff member Annie Gillespie began a partnership to better utilize the County's Chorro

Creek gauge station. The Estuary Program added a rain gauge and backup stream gauge to the existing Chorro Creek station to assist with understanding the volume of freshwater flow to the estuary. The best part? The County's station is linked via radio telemetry to provide real time, on-demand data via their website.

Using these live links, you can view real-time data for Chorro and Los Osos Creek water height levels and rainfall totals for several sites in the watershed (as well as other sites in SLO County). Go to [www.mbnep.org](http://www.mbnep.org), click on *Explore the Estuary*, and *Live Estuary and Watershed Data*.



The collaboration and shared equipment is saving money while helping both parties reach their missions. We would like to thank the County for partnering with us.

## New Interpretive Signs Greet Visitors in Morro Bay

**A Bird's Body Tells a Story of Survival**

How would you and your family survive if you were birds living in and around the bay? Take a closer look and the birds will reveal their secrets of survival.

**Body Shape:** A long neck like neck enables an Egret to strike unsuspecting prey.

**Beaks & Bills:** A hungry Egret uses its heavily speared-like beak to catch fish and frogs.

**Legs & Feet:** Long legs are essential for wading in the marsh and shallow bay waters.

**Legs & Feet:** Which bird is a Snowy Egret with long legs to wade in the wet marsh? An Osprey with strong, sharp talons to snatch a fish?

**Beaks & Bills:** Which bird is a Gadwall with a spatula-like bill to skim the water's surface for bits of food? A Curlew with a long, thin bill to probe in the sand for hidden treats?

**Body Shape:** Which is the Common Loon whose aerodynamic body dives fast and efficiently after fish? A Mallard built to tip for submerged plants?

**WATERFRONT TIP**  
If you need help to see a bird's body, consider buying a pair of binoculars to see the details. Avoid disturbing wildlife.

**Learn More!**  
The Morro Bay Nature Center in Morro & Escondido welcomes you.

The Estuary Program has produced three new interpretive signs to enlighten visitors about local natural resources. The sign topics are bird identification (see image at left), bird migration and what attracts birds to Morro Bay, and the Morro Bay Watershed. The signs are located on the Embarcadero at Anchor Park, Mariner Park near Tidelands, and on the Harbor street-end pier. You can view all the signs at [www.mbnep.org](http://www.mbnep.org).

These new signs complement an eelgrass sign and a general estuary sign developed a few years back. The City of Morro Bay is planning a series of five additional interpretive signs along the Harbor Walk.

# What's Flowing into Your Neighborhood Storm Drains?

Storm drains are a familiar sight in many neighborhoods and we think of them as a way to whisk away rainwater during storms to prevent flooding. But these same systems can transport contamination from our yards, streets and driveways directly into our waterways including creeks and Morro Bay. When you see water in a storm drain during the dry season, the source is usually human activities that may also be generating pollution. Examples include over-irrigation that can carry fertilizers and herbicides, car wash runoff containing harmful detergents (surfactants) and oil, or even illegal dumping into a storm drain.

The Morro Bay Volunteer Monitoring Program (VMP) has begun an *Urban Watch* program to help track and

measure this source of pollution. Last summer was the first effort and the monitoring took place from June of 2007 until the first big storms hit in mid-October. Volunteers patrolled eight drains in Morro Bay and six drains in Los Osos on a weekly basis.

At each drain, the volunteer noted any signs of flow, and if enough water was present, they collected a sample and conducted some simple analyses. Measurements were taken for turbidity, conductivity, pH, temperature, chlorine, nutrients and bacteria. The volunteers also noted the color, odor, clarity and other observations about the flow.

The goals of *Urban Watch* are to determine which neighborhoods

produce dry season flows on a regular basis and to find out what the water quality is like in those flows.



The following table describes the location of each drain being monitored, the number of observations made at each one, the percent of the time that the drain had either flow or signs of recent flow, and any results of interest.

The VMP will restart this monitoring in June and the season will continue until the first big storm in the fall. If you'd like to join the effort, please contact VMP staff at 772-3834.

## 2007 *Urban Watch* Dry Season Results

City	Site Description	How often was there flow?	Results of Interest
Los Osos	Drain outlet on Bayview Heights Dr.	92% (11 out of 12)	Constant water presence led to algal growth.
	Drain inlet on Ash Street, south	50% (6 out of 12)	Never enough flow present to collect a sample.
	Drain inlet on Ash Street, north	25% (3 out of 12)	
	Drain inlet on corner of Fairview & LO Valley Rd.	0 out of 12	
	Drain inlet on Pine Street	0 out of 12	
	Culvert at Baywood Pier	100% (12 out of 12)	Culvert typically inundated with tidal flow.
Morro Bay	Culvert below ramp to boat dock at Tidelands	30% (6 out of 20)	Had the highest average orthophosphate levels of all sites.
	Culvert draining boat wash station at Tidelands	58% (11 out of 19)	Elevated nutrient and turbidity levels detected.
	Culvert at north end of Tidelands Park	53% (10 out of 19)	Source of ponded water may have been tidal inundation.
	Smaller culvert at north end of Tidelands Park	0 out of 19	
	Culvert at end of Pacific St.	53% (10 out of 19)	Site often flowing, but difficult to collect a sample.
	Drain in parking lot at end of Pacific St.	0 out of 19	
	Culvert south of public access dock at end of Harbor St.	90% (17 out of 19)	Water was often cloudy with a milky white color and a strong odor. Highest bacteria and turbidity levels of all of the sites.
	Culvert at boat ramp near the end of Beach St.	0 out of 19	

## Over \$40,000 in Grants Awarded by the MBNEP this Spring

The **City of Morro Bay** has been awarded **\$2,500** toward a much larger \$44,000 project to map storm drain inlets throughout the City and create a GIS-based storm drain atlas. The funds will assist with purchase of a GPS unit. The mapping project, which will ultimately assist with reducing pollution in urban runoff flowing to the bay, is scheduled for completion next January.

The **Los Osos/Morro Bay chapter of SWAP** (Small Wilderness Area Preservation), who manage Elfin Forest in Los Osos, has been awarded **\$12,675** for erosion Control, weed abatement, and revegetation work to be completed over the next two years. These efforts are part of the "Recovery Action Plan for the El Moro Elfin

Forest Los Osos, CA" prepared in 2003 for SLO County Parks by the Morro Group, Inc. and submitted to the US Fish and Wildlife Service in that same year.

**Morro Bay State Park**, under the CA Dept. of Parks and Recreation, won an award of **\$21,000** to survey for, map, and research occurrence histories for all sensitive species and habitats within the larger Morro Bay Area. The final report will act as an up-to-date authoritative reference on local sensitive resources. The project will improve our understanding of their status, serving as a comprehensive collection of current information for planners, consultants, and will provide for well informed planning and acquisitions.

A **\$2,500** request from **Pacific Wildlife Care (PWC)** has also been granted. PWC is an all volunteer, local non-profit organization that is licensed for wildlife rehabilitation. The funds will be used to purchase presentation equipment (data projector and laptop computer) to enhance the more than 100 annual informational presentations made to community organizations.

**Central Coast Natural History Association** has been granted **\$2,500** toward their State Park docent video microscopy station utilized at the Museum of Natural History for school outreach related to the estuary. Also funded, as part of the station, is a projector to be mounted in the auditorium and used for *Mind Walks* and other educational programs.

## Help Monitor the Health of the Morro Bay Watershed

The Morro Bay Volunteer Monitoring Program is seeking volunteers for many of its monitoring efforts. Program volunteers get to spend time in parts of the watershed that are seldom seen while contributing to an on-going data set that helps improve understanding of this dynamic system.

**Water quality** monitors conduct monthly monitoring at creek sites throughout the watershed. Each monitoring visit takes approximately two hours during which various test kits and meters are used to gather data about water quality conditions on local creeks. A minimum commitment of six months is required.

**Bacteria** monitors collect creek water samples on a monthly basis and bring them to a lab to conduct analysis for common bacterial indicators. Samples are incubated and volunteers return to the lab the next day to interpret the results. The monitoring requires

approximately two hours per month and a minimum commitment of six months.

**Macroinvertebrate** monitoring is expected to take place in late April and early May. Volunteers venture into local creek sites to collect macroinvertebrate samples and take measurements to assess the quality of the habitat. Each trip requires approximately four hours and all training and equipment are provided (see insert for more information).

The **Urban Watch** monitoring season is just around the corner. Each volunteer will need to make two trips each month to patrol the storm drain sites in their designated community. Each trips takes approximately two hours. We are asking for a commitment for the entire Urban Watch season, which lasts from mid-June until the first big storm in the fall, which typically takes place in October.



For more information, go to [www.mbnep.org](http://www.mbnep.org) and click on the volunteer link or call 772-3834.

### SLOSEA Monitoring Equipment Update

In the last issue we reported on new SLOSEA monitoring stations in the bay and mistakenly left out that the stations were installed by a team that included Cal Poly and Tenera. Thanks go out to John Penvenne for sending in this correction.

## Steelhead Trout Sightings Around SLO County

The Estuary Program Conservation Plan (CCMP) lists loss of healthy steelhead trout populations and pristine spawning habitat as a high priority problem. A healthy creek, that can support steelhead trout, will also contribute to the health of the estuary that receives its flow.

Steelhead trout belong to the family Salmonidae which includes all salmon, trout, and chars. Steelhead are the anadromous form of rainbow trout. The term anadromous refers to fish species born in the stream that migrate to the ocean for their adult phase. Steelhead are born in fresh water streams, where they spend their first 1-3 years of life. They then emigrate to the ocean where most of their growth occurs. After spending up

to four growing seasons in the ocean, steelhead return to their native fresh water stream to spawn.

In California, most steelhead spawn from December through April in small streams and tributaries where cool, well oxygenated water is available year round. Southern steelhead are survivors, adapted to our seasonally dry streams. Tens of thousands of these prized fish used to return to southern California streams every year. Now they're stopped by dams and other migration barriers, as well as low flow conditions. Even for the lucky few that succeed in their migration, poor water quality or a silted creek bottom (due to excessive erosion on adjacent lands) can prevent steelhead eggs from surviving.

These impacts have decimated southern steelhead runs and resulted in our regional population being listed as threatened under the Endangered Species Act.

However, thanks to the ongoing creek restoration work of many organizations and the winter's heavy rainstorms (and subsequent high creek flows), this should be an excellent year for steelhead trout spawning.

Adult steelhead trout have been sighted in a number of local creeks including the following:

- Chorro Creek above Chorro Flats,
- San Luis Creek in SLO,
- Santa Rosa Creek,
- Arroyo de la Cruz Creek, and
- San Carpoforo Creek.



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The Morro Bay National Estuary Program is a local non-profit working to protect, preserve and restore the Morro Bay estuary and its watershed. The MBNEP is funded by the U.S. Environmental Protection Agency.

"Turning the Tide" is a free quarterly newsletter. To subscribe, call the MBNEP office or visit our website.

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# 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?

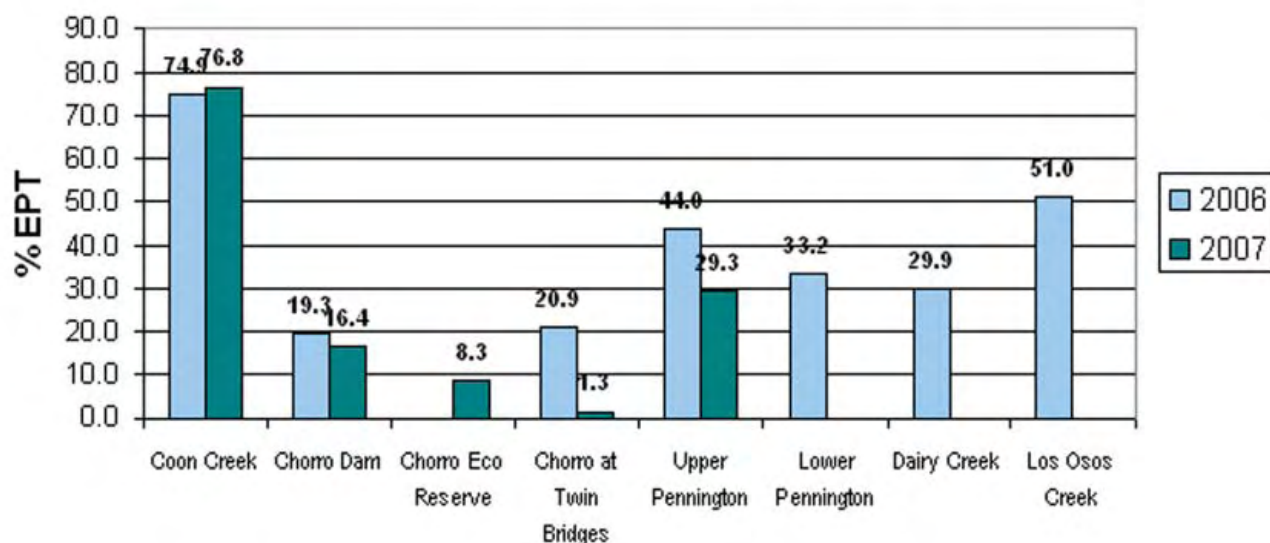
A measure commonly used to compare sites is the % EPT index. EPT is an acronym representing three pollution sensitive families of insects: Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies). The % EPT index divides the number of pollution sensitive insects (EPT Taxa) by the 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](mailto:annieg@mbnep.org)



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*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.*