San Diego Coastkeeper Water Quality Monitoring Program

SAN DIEGO COASTKEEPER
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www.sdcoastkeeper.org
IMPACT

WHAT:
San Diego Coastkeeper and its crew of trained volunteers collect surface water quality information in nine of 11 watersheds in the county. Although local cities and the county collect wet and dry season information from storm drains and our beaches, Coastkeeper's monitoring represent the largest monitoring effort of the county's watersheds.

HISTORY:
Initially started in 2000, Coastkeeper's water quality monitoring program continues to evolve and expand. We have increased the types and complexity of data we collect, the number of sites we monitor and the frequency that we monitor them. In 2008, Coastkeeper successfully won a large grant from the State of California that will allow us to continue refining our monitoring program.

WHY:
Coastkeeper runs its monitoring program to help improve regulatory and local agencies' ability to assess water resources data and decision-making regarding the use and protection of local water bodies. The program creates community involvement by training volunteers to collect and analyze water samples and empowers them with water quality data from their local waters.

Coastkeeper monitors unique sites that are not monitored by local cities or the County of San Diego, thereby capturing a larger baseline of surface water quality data. Coastkeeper monitors between 28 and 33 sites per month. By monitoring sites that would otherwise not be, and by monitoring more frequently than other programs, Coastkeeper increases the spatial and temporal representation of data in the county's watersheds. The data generated by Coastkeeper assists local water quality agencies and regulators (municipal storm water and the San Diego Regional Water Quality Control Board) to identify and reduce sources of pollution.

WHERE:
Coastkeeper's volunteers collect samples at locations that meet Coastkeeper's sample selection criteria in nine watersheds each month. We currently do not collect data in the two most northern watersheds, San Juan and Santa Margharita. Ordered from north to south, the watersheds tested include:

* San Luis Rey
* San Dieguito
* San Diego
* Sweetwater
* Tijuana
* Carlsbad
* Los Peñasquitos
* Pueblo
* Otay

WHO:
Coastkeeper trains more than 100 yearly program volunteer participants. Since its inception in 2000, we've trained more than 1,000 volunteers including students, professionals, researchers, and San Diego citizens. We partner with thirteen local organizations (non-profits, universities, and local government agencies – see our website for a full list of our project partners) to reach a broad volunteer base and to increase our research capacity.

WHEN: Once a month. Check www.sdcoastkeeper.org for listing of next monitoring days.

HOW:
Coastkeeper's trained volunteers collect water samples at locations using standardized operating procedures and sampling equipment. Some analysis, like temperature, oxygen, and pH, occurs immediately in the field. Water samples are also brought back to our certified lab to be analyzed for more complex factors like water chemistry, microbiology and toxicity.

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DATA:
Volunteers gather information at each site including water chemistry, microbiology, toxicity, ambient measurements and observational information. Water sample collection and analyses performed by Coastkeeper volunteers follow a rigorous quality assurance project plan to ensure the data Coastkeeper generates is acceptable at the state level and aides in the scientific foundation for water resources management. The Coastkeeper quality assurance project plan has been submitted to the Regional Water Quality Control Board for approval. We test:

- Water Chemistry

  Nitrates (NO_3): We test for dissolved levels of nitrates, which is one form of nitrogen found in the environment. Although nitrates are an essential plant nutrient, they can cause significant water quality problems when levels are too high. Excessive levels of nitrates in waterways can cause problems like hypoxia (very low levels of oxygen in the water) and at very high levels can be toxic to animals. Some typical sources of excessive nitrates include fertilizer runoff from residential, agricultural or recreational areas like golf courses.

  Phosphates (PO_4) - We test also for dissolved levels of phosphates, which is one form of its parent element, phosphorus, and is an essential plant nutrient. However, phosphorus is often in short supply in freshwater ecosystems, so small additions can lead to big changes in our local waterways. Too much phosphorus can cause excessive plant and algae growth and can lead to low levels of oxygen. Sources of phosphates are often present in detergents and other cleaners, runoff from fertilized lawns and agricultural fields, discharges from wastewater treatment plants and failing septic systems.

- Microbiology

  Bacteria - We test sample for bacteria levels that indicate the presence of waste from humans, wild animals, or domestic animals. We measure total coliform, *Escherichia coli* and levels of Enterococci.

- **Ambient Measurements**
  - pH: We measure whether water is acidic or basic.
  - Dissolved oxygen: Organisms need enough oxygen to survive and thrive. We determine how much oxygen is dissolved in the water.
  - Conductivity: Conductivity is the electrical charge between non-organic solids in water.
  - Temperature: Plants and animals have a normal range of water temperatures above which it becomes too stressful for them.

- Toxicity

  We currently work with Assure Controls to assess the potential toxicity of our watersheds. We rapidly assess all sites each month for toxic events, using a marine plankton (dinoflagellates) as a biological indicator. Dinoflagellates emit light (bioluminescence), but the amount of light decreases when exposed to biologically harmful levels of chemicals. We measure the light output of the organism after they have been exposed to water collected from creeks and lagoons.

WATER QUALITY DATA WEBSITE:

San Diego Coastkeeper Water Quality Monitoring Program

Coastkeeper developed an interactive site to house the water quality information collected by its volunteers and members of the community and make that information readily available to the public and decision-makers. It can be accessed at www.sdwatersheds.org.

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