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One-Day snapshot finds HOTSPOTS

by Lisa Emanuelson

The first Saturday in May is Snapshot Day in central California. On this single day, hundreds of volunteers head out to creeks, rivers, and streams that drain into the Monterey Bay National Marine Sanctuary (MBNMS). Volunteers are assigned three to six sites where they field-test running water for temperature, pH, transparency, dissolved oxygen, and electrical conductivity, and collect samples to be lab-tested for nitrate, phosphate, total coliform, and E. coli. These are not your ordinary volunteers—many have participated since the very first Snapshot Day, in 2000. For them, the trek to streamside sites is an annual ritual where they can see, smell, and hear the changes from one year to the next.

A number of programs are available to central California citizens interested in monitoring water quality, but Snapshot Day is special. Volunteers collect data from an almost 300-mile stretch of coast-line, including areas 100 miles upstream of the ocean. The information is used in conjunction with other data to determine whether water quality is improving in watersheds flowing into the MBNMS, and to determine whether creeks and rivers should be included on California's list of impaired water bodies (303(d) list). All this from volunteer-collected data!

A program of this scope and range would not be possible without partners dedicated to recruiting and training volunteers and making certain that data is reliably collected using the same protocols at all sites. The primary partners in this venture are the Coastal Watershed Council and the Monterey Bay Sanctuary Citizen Watershed Monitoring Net-work.


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Volunteers of any age are encouraged to participate in Snapshot Day. Here a volunteer uses a transparency tube to check water clarity in Big Sur.

Data Quality

The first step in ensuring good-quality data is training. Volunteers are usually trained a week or two before the event in a three-hour class. Volunteers get a chance to try out the materials and equipment (CHEMets test kits for dissolved oxygen, Oakton meters for conductivity, and either transparency tubes or turbidimeters for turbidity) and make certain they understand everything and know how to spot any equipment malfunctions. During the training course and after, volunteers are encouraged to ask questions. For many, their last connection to any scientific data gathering may have been years earlier in high school. Being open and available for questions is a way for program staff to make sure the volunteers feel supported in learning new skills. “Anybody can participate, because the training provided prepares you for the sampling tasks,” says water quality volunteer Art Evjen.

Snapshot Day teams can be as few as two or as great as 10, and usually combine new volunteers with veterans. Each team has its own set of equipment along with a thorough instruction sheet. Replicate measurements are taken at one site monitored by each team, to help assure the quality of the team’s data.

Using the Results

“The results really do matter—they are shared and published and used to improve the quality of the watershed,” says Fran Horvath, longtime MBNMS water quality volunteer.

With 10 years of Snapshot Day data, trends are apparent. Snapshot Day measurements are compared to Central Coast Ambient Monitoring Program Water Quality Objectives and the EPA Ambient Water Quality Criteria to determine which sites have exceeded the water quality objectives. A site with exceedances in three or more of the measured parameters is identified as an Area of Concern (see map); sites that continue to be Areas of Concern year after year are considered “hotspots.” Snapshot Day has identified many hotspots that consistently show high levels of nitrates, phosphates, and bacteria. The majority of these areas have a mix of urban and agricultural uses, which contributes to difficulty in source tracking.

One appeal of Snapshot Day is that the commitment is minimal—up to three hours for training and another four to six hours for the actual event. Horvath says, “With just one short day, you get a lot out of it—the fun of meeting new people, the satisfaction of volunteering, knowing that it’s doing some good, and probably seeing parts of the local area you never went to before.” A one-day program like this gives volunteers an entrée into the world of water monitoring where they can see if they would like to learn and do more. In 2009, Snapshot Day volunteers monitored 185 sites. Red dots indicate Areas of Concern for 2009, and yellow triangles show areas that have consistently exceeded water quality objectives over the years

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