

# **Water Related Monitoring in Santa Barbara County**

## **SWMP PROGRAM EVALUATION**

The intent of the Storm Water Management Program Evaluation and Monitoring Section is to evaluate the measurable goals, minimum control measures, and overall program for effectiveness. The measurable goals described in the Minimum Control Measure (MCM) section of the Storm Water Management Plan (SWMP) will be used to help establish a baseline against which future progress at reducing pollutants to the Maximum Extent Practicable (MEP) can be measured. Numerical measurements will be utilized where possible. Monitoring results will be reported in the Annual Report.

## **WATER QUALITY MONITORING**

Santa Barbara County is currently involved in several of the many monitoring studies currently underway throughout its non-federal areas. The activities, which the County are currently working on or helping to finance, are listed in Section 1 below. Other important monitoring activities being conducted by other organizations are listed in Section 2.

### **1. Monitoring involving Santa Barbara County**

The County has performed several water quality assessments, and continues to implement Benthic Macroinvertebrate assessments in selected creeks as part of Project Clean Water. Based on availability of funds and identified need, the County may continue with BMI monitoring activities. Other monitoring efforts are funded by sources such as the water purveyors, sanitary districts and other interests, which have restrictions on funding availability and uses, thus cannot be and are not committed to as part of the SWMP. If and when the County becomes involved with new monitoring programs, it will be summarized in Annual Reports.

Because of the extensive monitoring that is already underway on the subject watersheds, the County is not proposing to implement any new water quality monitoring at this time. To better focus our limited resources and avoid duplicating effort of other organizations, the County plans to examine the objectives and results of existing monitoring programs during the term of the SWMP, with an emphasis on monitoring programs that focus on the land uses and pollutants of concern identified in the SWMP. If the results of that evaluation indicate that there is a need for additional monitoring that would help to evaluate the effectiveness of the SWMP activities, a program could then be devised to accomplish this. Such a proposal would be made in the second Annual Report.

The County will communicate with other Phase 2 communities, including the cities of Santa Barbara, Santa Maria and Goleta about monitoring activities that are currently underway or in the planning stages. The County will look for opportunities to partner in water quality monitoring data collection as part of other's monitoring/research efforts using grant or other outside funding sources.

## **HISTORIC WATER QUALITY MONITORING**

### South Coast Watershed Characterization Study

The South Coast Watershed Characterization (SCWC) Study was initiated in 1998 by the Santa Barbara County Public Health Department to characterize the water quality of several South Coast streams: Arroyo Burro, Mission, Carpinteria, and Rincon creeks. The SCWC Study involved the collection of water samples from a minimum of ten locations along each creek during four sampling

events. The set of first sampling occurred in August and October 1998, and represented a dry weather sampling. The second sampling occurred after the first rainfall in November 1998 to capture the first flush. The last two samplings occurred in the middle and end of the winter runoff period, in January and March 1999, respectively. The report and data are available on the Project Clean Water website ([www.countyofsb.org/project\\_cleanwater/Documents/scwc.final.pdf](http://www.countyofsb.org/project_cleanwater/Documents/scwc.final.pdf)).

#### Lower Rincon Creek Watershed Study

The Lower Rincon Creek Watershed Study was designed to identify the sources of coliform bacteria in discharges from dry weather flows. During the spring of 1999, water sample collection was performed over 10 sampling events at each of the 3 sample locations, with 5 water samples collected per sampling event at each location. The report and data are available on the Project Clean Water website ([www.countyofsb.org/project\\_cleanwater/Documents/DNAReport3Rev5.pdf](http://www.countyofsb.org/project_cleanwater/Documents/DNAReport3Rev5.pdf)).

#### Project Clean Water Storm Sampling

Following the South Coast Watershed Characterization Study (see above) and, in order to gain a better understanding of the types and extent of pollutants contributed by storm water and low flow runoff, as well as to address future regulatory requirements (see Section 2.0, Regulatory Setting), Project Clean Water staff designed an expanded program of dry and wet weather sampling for the 1999-2000 season. The sampling program significantly broadened the previous year's study by adding many more creek sites (57 sites within 22 watersheds) and water quality parameter measurements (up to 128), such as volatile organic compounds (VOCs) and various pesticides. In addition, the 1999-2000 storm water sampling program focused heavily on collecting samples during the "first flush" of each storm event (i.e., during increasing flow due to initial runoff). The purpose of this sampling effort was to conduct a broad screening of water quality in local creeks in order to ascertain which contaminants are present at significant levels, and which watersheds exhibit consistently higher levels of contaminants. Five storms were sampled between November 1999 and April 2000. The report and data are available on the Project Clean Water website ([www.countyofsb.org/project\\_cleanwater/documents.htm](http://www.countyofsb.org/project_cleanwater/documents.htm)).

This same water quality sampling program was continued during the 2000-2001 season with some minor modifications. Over 30 creeks were sampled during up to four storm events in each creek to 1) identify the types of contaminants that appear to be present in significant concentrations, 2) ascertain relative levels of contamination in each watershed and 3) identify problematic watersheds. With this information staff refined storm sampling and better focus implementation of source and treatment control Best Management Practices. Samples were tested for a wide range of potential contaminants including bacteria, pesticides, volatile organic compounds (VOCs), nutrients, metals, and others (oil and grease, total suspended solids, etc.). Sample sites were set up in 44 locations within 22 watersheds. Six storms were sampled between October 2000 and May 2001. Sampling was conducted during the initial period of runoff ("first flush") as creek levels approached their maximum flow. The report and data are available on the Project Clean Water website ([www.countyofsb.org/project\\_cleanwater/documents.htm](http://www.countyofsb.org/project_cleanwater/documents.htm)).

During the 2001-2002, four entirely new sites were added at storm drain outfalls selected as pilot project sites for treatment control Best Management Practice. Two sites (Rhoads East and Rhoads West) were located along San Vicente Drive near Walnut Avenue in unincorporated Goleta, one at the end of South Turnpike at Atascadero Creek and one on 6th Street at Carpinteria Creek. The data from these sites reflect urban runoff undiluted by creek flows. Also during this year, the San Jose Creek watershed was (and continues to be) the subject of a watershed plan currently being developed by the County and other agencies and stakeholders. In order to more accurately characterize the sources of pollutants, Project Clean Water staff sampled this watershed at five sites for a full suite of constituents. Furthermore, an intensive bacteria-only sampling was performed on November 29, 2001. The report and data are available on the Project Clean Water website ([www.countyofsb.org/project\\_cleanwater/documents.htm](http://www.countyofsb.org/project_cleanwater/documents.htm)).

Due to funding issues in the 2002-2003 rain year, the program was scaled back and attention turned to selected watersheds. On the South Coast, time-series, longitudinal sampling was conducted on San Jose creek. That this creek provided flow to a 303(d)-listed waterbody (the Goleta Slough), had established sampling locations, and was the subject of an in-progress watershed plan were all critical in the selection of this watershed. Special studies were also performed at the South Turnpike BMP site and at the discharge point of the Glen Annie Golf Course. In the North County, sampling sites were selected to ascertain the inputs to the Santa Ynez River from the communities of Santa Ynez, Vandenberg Village and Mission Hills. Also in the North County, sampling was continued at sites on Orcutt Solomon creek. The report and data are available on the Project Clean Water website ([www.countyofsb.org/project\\_cleanwater/documents.htm](http://www.countyofsb.org/project_cleanwater/documents.htm)).

## **ONGOING MONITORING**

Beginning in 2000, the County of Santa Barbara began an annual bioassessment program. This program involves collection and analyses of physiochemical and biological (including benthic macroinvertebrates) data from local streams using standardized methods adapted from the U.S. Environmental Protection Agency's (USEPA's) *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers*.

The study area includes approximately 35 miles of the southern Santa Barbara County coast from the Rincon Creek watershed at the Santa Barbara/Ventura County line west to Gaviota Creek. A total of 44 study reaches in 18 coastal streams have been surveyed one or more times during the spring and summer of 2000, 2001, 2002, 2003, and 2005. In 2003, an index of biotic integrity (IBI) was developed to allow comparison of local creeks and provide a more understandable method for measuring the biological integrity of streams and other water bodies.

### Environmental Health Services Beach Monitoring

The County of Santa Barbara's Public Health Department monitors 20 beaches on a weekly basis. Water samples are tested for indicator bacteria and compared to standards, as mandated by AB411. Those beaches where test results are above the acceptable standards are placed under warning status and are re-sampled two days later. Data are available on the Public Health Department's website ([www.sbcphd.org/ehs/ocean.htm](http://www.sbcphd.org/ehs/ocean.htm)) and in the local newspapers.

## **2. Monitoring Projects Undertaken by Other Organizations**

### **MONITORING OF THE SANTA YNEZ RIVER**

Surface- and ground-water monitoring in the Santa Ynez River watershed has occurred for decades. Currently Surface flow, groundwater levels and water quality are monitored by several local agencies and the USGS. Current monitoring includes:

- Stream gauging by the USGS
- Water quality measurement by the USGS
- Ground Water levels measured by local agencies including the County and water Purveyors
- Flow and water quality measurements as part of steelhead trout studies
- Stream and ground water monitoring as part of water rights orders
- Monitoring by operators of public water supply systems
- Monitoring by operators of sewage treatment plants

These monitoring efforts are briefly described below.

### Stream gauging by the USGS

The USGS operates several stream gages on the Santa Ynez River. Data collected is available from the USGS website and is used for several purposes. High flow data are used for public safety purposes including winter storm operations at Bradbury Dam. Low flow data are used for managing the river-flow to meet water right requirements and fish protection objectives. The program relies on both federal agencies and local cooperators for funding; County Flood Control District and Water Agency are both major participants.

### Water quality measurement by the USGS

Water quality measurements are made by the USGS as part of stream gauging and ground-water monitoring. Data collected is available from the USGS website and is used for several purposes including monitoring suitability of water quality for beneficial uses, monitoring success of management of the water rights releases and habitat suitability for fish habitat. In addition, ground-water quality monitoring in the Lompoc Plain area would provide early warning of potential sea-water or brackish water intrusion from the coast.

### Ground Water levels measured by local agencies including the County and water purveyors

In conjunction with the USGS monitoring program, local agencies such as County Water Agency monitor ground-water levels in several hundred wells and water quality in approximately 100 wells. These data are available directly from the agencies involved and in addition the County Water Agency summarizes this information in an annual report available on its website (<http://www.countyofsb.org/pwd/water/downloads.htm>).

### Flow and water quality measurements as part of steelhead trout studies

Since 1994 Federal, state and local agencies have monitored conditions in the Santa Ynez River to develop a plan for protecting and enhancing the local steelhead trout population. Water quality monitoring includes field measurements of temperature, specific conductance and oxygen levels. These measurements are summarized in annual reports prepared by the Cachuma Conservation Release Board on behalf of the Santa Ynez River Adaptive Management Committee (formerly the Santa Ynez River Consensus Committee).

### Stream and ground water monitoring as part of water rights orders

Streamflow and releases from the three reservoirs on the Santa Ynez River are monitored pursuant to orders of the State Water Resources Control Board to be certain that water of sufficient quantity and quality is available to all users. This monitoring is done by the USGS, the US Bureau of Reclamation and the Santa Ynez River Water conservation District. A summary and interpretation of the monitoring is provided in the "Annual Engineering and Survey Report on Water Supply Conditions of the Santa Ynez River Water Conservation District" which is available from the District.

### Monitoring by operators of public water supply systems

Water quality monitoring is required of each operator of a public water supply system. The Cities of Lompoc, Buellton and Solvang and the Santa Ynez River Water Conservation District, Improvement District Number 1 each may operate wells close to the Santa Ynez River such that their water quality is influenced by the river. The water quality monitoring results from these wells may be obtained from the respective entity owning the well.

### Monitoring by operators of sewage treatment plants

Water quality monitoring of discharge is required of each sanitary treatment plant operator that discharges to surface water. Records of such discharges are submitted to the Central cost Regional Water Quality Control Board and may be obtained from that agency.

## **CENTRAL COAST AMBIENT MONITORING PROGRAM (CCAMP)**

The Central Coast Ambient Monitoring Program (CCAMP) is the Central Coast Regional Water Quality Control Board's regionally scaled water quality monitoring and assessment program. The purpose of the program is to provide scientific information to Regional Board staff and the public, to protect, restore, and enhance the quality of the waters of central California.

The CCAMP monitoring strategy for watershed characterization calls for dividing the Central Coast Region into five watershed rotation areas and conducting synoptic, tributary based sampling each year in one of the areas. Over a five year period all of the Hydrologic Units in the Region are monitored and evaluated. In addition to the synoptic site selection approach, additional monitoring sites are established in each area to provide focused attention on watersheds and water bodies of special concern.

CCAMP uses a variety of monitoring approaches to characterize the status and trends of coastal watersheds, including:

- Rapid Bioassessment using benthic invertebrates
- Conventional water quality parameter analysis
- Chemical analysis of tissue, water, and sediment
- Toxicity evaluations
- Habitat assessments
- Sedimentation evaluations

Data are available on the organization's website (<http://www.ccamp.org/ccamp/ccamp.htm>).

## **LONG TERM ECOLOGICAL RESEARCH (LTER) PROJECT**

The Santa Barbara Coastal LTER Project is focused on investigating the relative importance of land and ocean processes in structuring giant kelp forest ecosystems. As a component of this project, several researchers are focusing on characterizing nutrient loading and developing a model to predict future nutrient export from these watersheds resulting from projected changes in land use. Bi-weekly base flow and storm water are sampled from Gaviota, Refugio, Arroyo Hondo, Arroyo Burro, Mission, Santa Monica, Franklin and Carpinteria creeks (2003-04 program). Data are available through the group's website (<http://sbc.lternet.edu/catalog/style/skins/sbclter/index.jsp>).

## **SANTA BARBARA CHANNELKEEPER**

ChannelKeeper has established stream teams in both the Ventura and Santa Barbara area. The purpose of these teams are to monitor water quality and involve citizen volunteers in the protection of their local watershed while providing educational opportunities and fostering environmental stewardship. The ChannelKeeper's Goleta Stream Team collects data at 11 sites throughout the Goleta Slough watershed on a monthly basis. Parameters measured by these teams of volunteers include dissolved oxygen, pH, conductivity, turbidity, temperature, flow, nitrate, orthophosphate, and indicator bacteria. Data and analysis are disseminated through the organization's website ([www.stream-team.org](http://www.stream-team.org)) as well as a quarterly newsletter.

## **UNITED STATES GEOLOGICAL SURVEY**

The Santa Barbara County Department of Public Works, Flood Control and Water Conservation District (FC&WCD) and Water Agency (WA) partially fund several water resources programs run by the USGS. This includes the following:

<b>USGS Program (# of stations)</b>	<b>Funding Source</b>	<b>Cost (11/1/004 – 10/31/05)</b>
Surface Water Streamgaging Stations – O&M (9)	FC&WCD	\$72,150
Surface Water Streamgaging Stations – O&M (9)	WA	\$67,985
Santa Ynez Fish Management Plan – O&M, weekly discharge measurements, water quality data (5)	WA	\$46,370
Ground Water Monitoring – water levels, water quality, seawater encroachment (~275)	WA	\$25,000
Surface Water Quality Monitoring – water quality data (11)	WA	\$32,725
<b>Total</b>		<b>\$244,230</b>

Data are available at the USGS website ([www.usgs.gov](http://www.usgs.gov)).