



7. DATA MANAGEMENT

7.1 CURRENT MONITORING EFFORTS

Various types of monitoring are currently being conducted throughout the Newport Bay and Newport Coast Watersheds to comply with the TMDLs, NPDES permits, and general waste discharge permits, as well as Department of Public Health requirements for drinking water and recycled water. In the Newport Bay Watershed, there are many monitoring stations for measuring sediment, surface water quality, TMDL parameters, and other bioassessment characteristics.

Aside from water quality data, there are also data available for both habitat conditions and water supply. The Nature Reserve of Orange County collects information relevant to the health of the habitat areas it maintains, and information related to the implementation of the NCCP. Other biological information is collected by government agencies related to the SAMP and the Natural Treatment System program, as well as by nongovernmental organizations such as the local Audubon chapter and the Newport Bay Naturalists and Friends. In terms of water supply, MWDOC maintains information about water importation and use, and OCWD maintains information about groundwater production and the status of the groundwater basin.

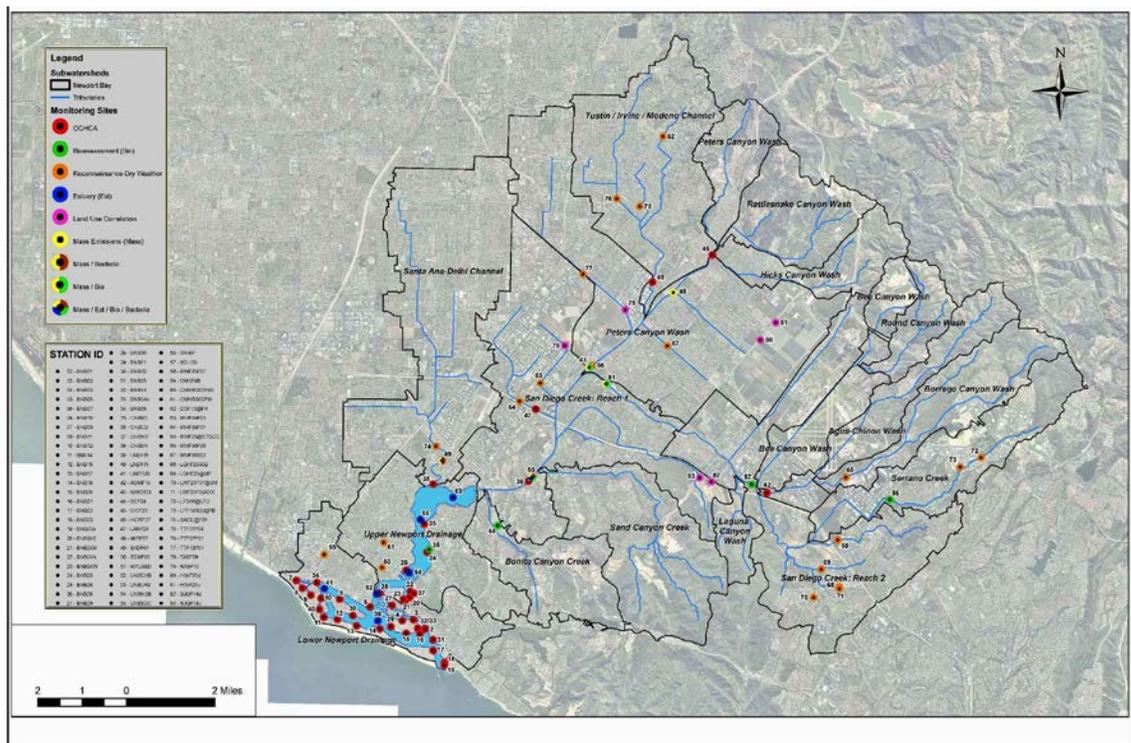
The sediment TMDL includes a monitoring element for Newport Bay and incorporates bathymetric surveys, vegetation surveys, and sediment removal. Surface water at the monitoring stations in Upper Newport Bay and Lower Newport Bay has been sampled since 1976. The Upstream monitoring element consists of monitoring the sediment-holding capacities of the three in-channel basins and seven foothill basins. In addition, fluvial sediment samples and stream flow data are collected from eight monitoring stations in the following locations:

- Peters Canyon Wash at Barranca Parkway
- San Diego Creek at Culver Drive
- San Diego Creek at Campus Drive
- Santa Ana–Delhi at Irvine Avenue
- Sand Canyon Channel at University Drive
- Bonita Canyon Creek at MacArthur Boulevard
- Marshburn Channel at Trabuco Road
- Agua Chinon Channel at Irvine Boulevard

The routine monitoring for nutrients includes most of the traditional monitoring that has occurred in the watershed (i.e. 24-hour composite samples are collected weekly, biweekly, or monthly from drainages throughout the watershed). Sampling is conducted in the following locations:

- Santa Ana–Delhi Channel at Irvine Boulevard
- San Diego Creek at Campus Drive
- Bonita Canyon Creek at MacArthur Boulevard
- Costa Mesa Channel at Westcliff Drive
- El Modena–Irvine Channel at Michelle Drive
- Lane Channel at Jamboree Road
- Agua Chinon Wash at Irvine Center Drive
- Peters Canyon Wash at Barranca Parkway
- San Diego Creek at Culver Drive

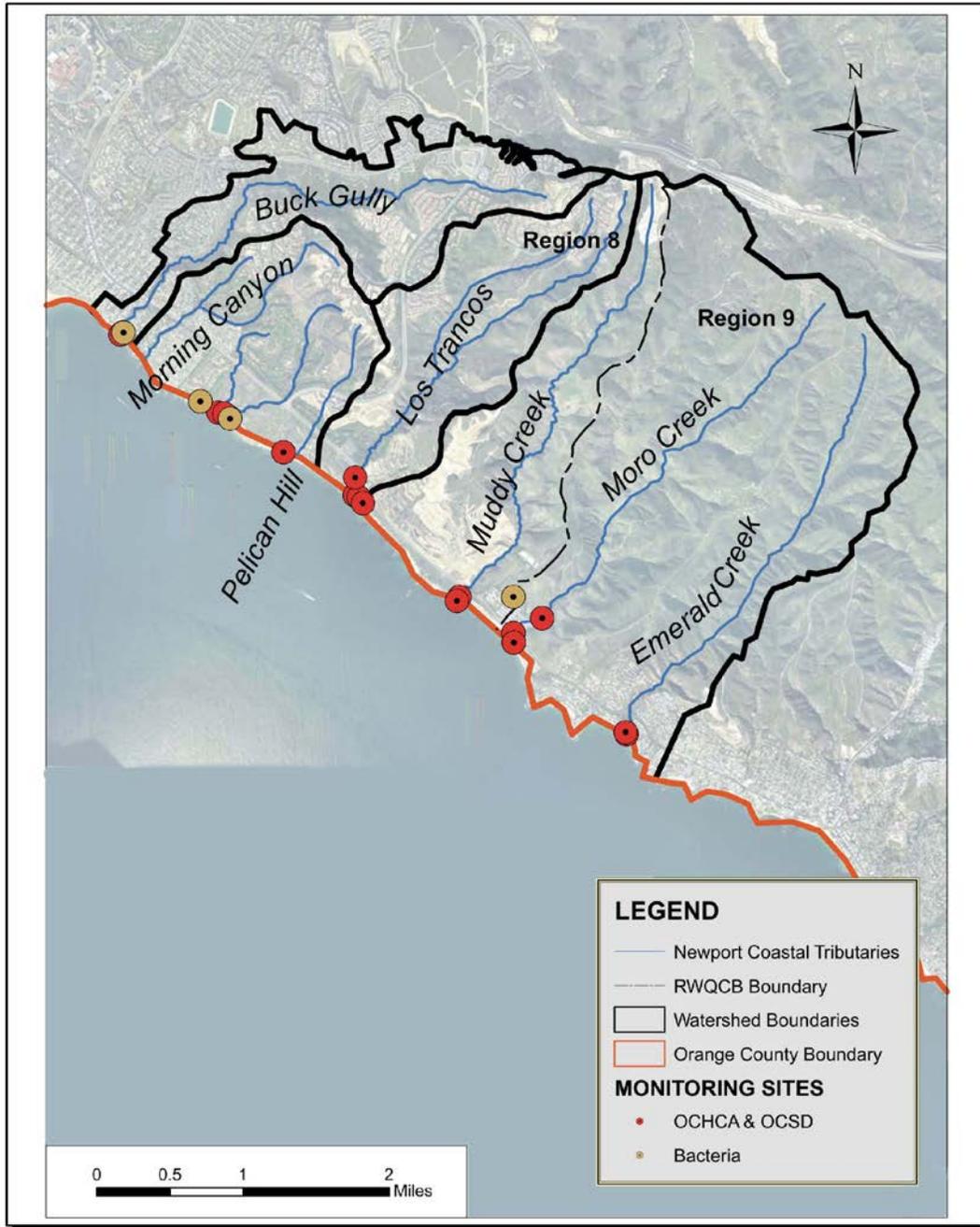
Figure 7.1 shows the type of monitoring and the locations of monitoring in the Newport Bay Watershed.



Source: Orange County 2003

Central Orange County Integrated Regional Watershed Management Plan
Newport Bay Watershed Monitoring Locations **FIGURE 7.1**

Figure 7.2 shows the type of monitoring and the monitoring locations in the Newport Coast Watershed. OCSD and OCHCA conduct most of the monitoring in this watershed. OCHCA monitors near-shore water quality weekly.



Source: Orange County 2003

Central Orange County Integrated Regional
Watershed Management Plan

Newport Coastal Watershed Monitoring Stations

FIGURE
7.2

7.2 DATA MANAGEMENT

Data will be acquired and shared by means of coordination among local agencies and stakeholder groups, which will further assist project proponents in monitoring and data management. Once the information is developed and available for dissemination, the public and general stakeholders will be able to access specific data on the OC Watersheds website (<http://www.ocwatersheds.com>). With the current and future technology of websites and data browsers, the public, stakeholders, and regulators can query reports to assist in decision-making and the development of management objectives. Water quality monitoring data can also be queried and displayed, providing valuable information for ensuring the success of the watershed monitoring plan. Information will be provided in nontechnical terms so that the general public will be able to understand and support the activities within the region. Other monitoring websites will be identified and used as appropriate during the implementation of the IRWMP.

As projects within the IRWMP are implemented, monitoring will be conducted and the resulting information will be managed. For projects with data collection components, quality control and quality assurance practices will be established to ensure data consistency. Quality control ensures that adequate sampling and technical activities are used. Quality assurance is the process of quantifying the effectiveness of the quality control procedures.

7.3 Data Gaps

Many studies have been completed for the Newport Bay and Newport Coast Watersheds, and a number of studies are planned or currently underway. These studies are being conducted to address identified data gaps. Although there are reliable data related to the contaminant loads emanating from San Diego Creek, the Santa Ana–Delhi Channel and the Costa Mesa Channel, loading data are not available for 200 storm drains and other channels draining to Newport Bay. Data gaps identified in the watershed action plans include the following:

- Nutrients, specifically the macronutrients nitrogen and phosphorus and algae-related issues:
 - Clarify the link between algal growth and the degree of beneficial use impairment. Determine thresholds related to increased potential for adverse effects and describe key links between nitrogen, environmental conditions, algal growth, dissolved oxygen, and beneficial uses

- Develop a conceptual model to describe important nitrogen cycle processes that determine the availability of nitrogen in the watershed and guide data collection and analysis
- Examine spatial and temporal concentrations of nitrogen in groundwater and urban runoff and sites of excessive algal growth (in fresh water and marine water)
- Potential effectiveness of BMPs
- Bacteria:
 - Identify and quantify the contribution of urban and natural sources
 - Refine the applicability of current biological indicators for measuring human health risk
 - Rapid bacteriological indicators
 - Microbial source tracking identification methods
- Bulk sediment:
 - Changing landscape within the watershed
- Sediment contamination, including contaminants that are bound to the sediment and transported through the system with the sediment:
 - Functional linkage between sediment flows and pollutant concentrations
 - Pattern of sediment contamination by season and in response to storms
- Selenium, the identified data gaps for which are currently being addressed by the NSMP(Orange County, 2009a):
 - Groundwater/surface water model
 - Conceptual model to describe important processes of selenium
 - Concentrations and loading estimates
 - Food web and wildlife impacts in the watershed
 - Evaluate effective BMP technology and assessment
- Toxics, including metals (other than selenium), pesticides, and organochlorinated compounds:
 - Organochlorine and PCB concentrations
 - Food web relationships that affect pollutant pathways
 - Risks to human health, fish, and other wildlife
 - Technology to identify sources of certain pesticides

There are other data gaps that are not pollutant specific. They are related to a broader understanding of pollutants, such as how they travel, how they affect the habitat, and development of regional stormwater infrastructure targeted for specific

pollutants. Through implementation of the IRWMP, it is anticipated that important data gaps will be addressed and the information shared locally and by statewide dissemination of information and data exchange programs.

7.4 SUPPORT FOR STATEWIDE DATA NEEDS

For quality assurance, the IRWMP Stakeholders Group will implement techniques compatible with state programs, such as the California Environmental Resources Evaluation System (CERES), the California Environmental Data Exchange Network (CEDEN), the Surface Water Ambient Monitoring Program (SWAMP), and the Groundwater Ambient Monitoring and Assessment (GAMA) Program.

The results of the environmental analyses performed by the region's agencies and the project monitoring and performance plan for individual projects can be made available for a variety of uses. The projects proposed in this Plan will incorporate the following existing and proposed monitoring methods:

- **Water quality monitoring.** For projects designed to improve the physical quality of water, water sampling is expected to be performed in a manner compatible with state-prescribed methods. A quality assurance project plan may also be required for such projects.
- **Ambient water quality monitoring.** Monitoring data will follow the SWAMP data reporting requirements.
- **Load reduction monitoring.** Projects that include the removal of pollutants from water bodies will generate an annual estimate of load reductions achieved as a part of the project.
- **Stream and wetland monitoring.** Projects that include protection or restoration of streams, shorelines, or wetlands will include an annual accounting of the acreage of wetlands restored, feet of stream bank and shoreline protected, and feet of stream channel stabilized, as appropriate.
- **Photo-monitoring.** Projects that include restoration or construction activities will include photographic documentation done in accordance with the guidelines produced by the State Water Board.

The following sections provide an overview of the state information and data exchange programs: CERES, CEDEN, SWAMP, and GAMA:

7.4.1 California Environmental Resources Evaluation System

CERES is an information system developed by the California Resources Agency to facilitate access to a variety of electronic data describing California's rich and diverse environments. The goal of CERES is to improve environmental analysis and

planning by integrating natural and cultural resource information from multiple contributors and by making it available and useful to a wide variety of users. CERES collects and integrates data and information and distributes it via the Internet, tapping into important information sources and contributing to advances in the science of data management and metadata cataloging by encouraging cooperation among governmental, educational, and private groups.

CERES focuses on three related components: technology, data, and community. *Technology* includes the development of new software and network structures to accommodate the search and retrieval, organization, and accessibility demands associated with huge volumes of data in a wide range of forms. *Data* encompasses the conversion of information into digital form, as well as the evaluation of existing digital data sets and the development of metadata catalogs, required searching, data quality, and appropriate use assessment. *Community* includes CERES' efforts to promote the use of the network for planning and policy and to foster the growth of new users and contributors in a far-reaching web of affiliations.

CERES also coordinates focused applications to support well-defined natural resource management activities and to supply the public with critical and timely information. CERES has developed web links that include the following:

- Environmental education
- Environmental law
- Land Use Planning Information Network
- Watershed Information Technical System
- California Wetlands Information System
- California Environmental Information Catalog
- California Environmental Keyword Thesaurus

Data standards are central to the exchange of information between CERES partners. Some data are exchanged by manually transferring them into a shared system. Other data are exchanged using machine-to-machine transfers. CERES has identified multiple websites and standards to be useful for coordinated data sharing, including the California Environmental Information Catalog (CEIC). CEIC is CERES' own online directory for reporting and discovery of information resources for California. Potential partnerships for information exchange using this system include cities,

counties, utilities, state and federal agencies, private businesses, and academic institutions that have spatial data resources and other types of data resources.

CEIC is based on the metadata standard of the Federal Geographic Data Committee (FGDC). Contributors may enter data into the catalog via a convenient web interface or via a batch process by exporting the data to an XML file made available to CEIC over the Internet.

7.4.2 California Environmental Data Exchange Network

CEDEN is another CERES-identified website for coordinated data sharing. CEDEN is a growing statewide cooperative data exchange program of various groups involved in the water and environmental resources of California. Most of CEDEN's data exchange services are custom developed using a robust tool set, which has been used to connect scores of programs into the network. Multiple projects are underway to extend CEDEN data exchange to additional standards, and those services should be available in coming years. SWAMP describes the standards used for these services, as well as the Environmental Data Standards Council, which uses standards to establish data exchanges with the California Environmental Protection Agency node of the U.S. EPA National Environmental Information Exchange Network.

7.4.3 Surface Water Ambient Monitoring Program

SWAMP was proposed to integrate existing water quality monitoring activities of the state and regional water boards and to coordinate with other monitoring programs. SWAMP is a statewide ambient monitoring effort designed to assess the conditions of surface waters throughout California. Responsibility for implementation of monitoring activities resides with the nine regional water boards that each have jurisdiction over a specific geographical area of the state. *Ambient monitoring* refers to any activity in which information about the status of the physical, chemical, and biological characteristics of the environment is collected to answer specific questions about the status and trends in those characteristics. For the purposes of SWAMP, ambient monitoring refers to these activities as they relate to the characteristics of water quality.

SWAMP also hopes to capture monitoring information collected under other state and regional board programs, such as the state's TMDL, nonpoint source, and watershed project support programs. SWAMP does not conduct effluent or discharge monitoring that is covered under NPDES permits and waste discharge requirements. In addition, local project implementation and reported water quality results will provide additional monitoring information for SWAMP.

Monitoring and assessment of ambient water quality and beneficial uses is necessary to accomplish the following:

- Identify and characterize water quality and beneficial use problems and threats
- Identify trends in water quality and beneficial uses
- Determine whether water quality standards are met
- Evaluate the uniqueness or pervasiveness of problems
- Evaluate the severity of problems
- Make decisions about which problems and which locations should be prioritized for action
- Make decisions about what actions should be taken

In accordance with Clean Water Act, Section 305(b), the state and regional water boards periodically compile an inventory of the state's major waters and the water quality condition of those waters, using monitoring data and other pertinent information. This inventory, which is referred to as the Water Quality Assessment, is the foundation upon which the TMDL program was built, although it continues to be inadequately funded.

To satisfy the need for more extensive and more thorough monitoring and assessment of the waters of the Santa Ana region, monitoring and assessment, for both status and trends, needs to be planned, ongoing, and continuous. The Santa Ana Regional Water Board intends to use SWAMP resources to ensure that monitoring is conducted in each hydrologic unit every 5 years. Although all of the hydrologic units will be monitored, the current funding will allow only cursory monitoring and assessment. The Santa Ana Regional Water Board plans to locate monitoring sites on main stem rivers and streams, just above tidal influence; main stem rivers and streams just above the confluence with major tributaries, and major tributaries just above the confluence with the main stem rivers and streams.

Ambient monitoring is not and does not need to be conducted by water board staff only. Academic and other research groups, dischargers, and other stakeholders all have a role in monitoring and assessment. Therefore, the Central Orange County IRWMP project proponents will assist in meeting the goals of the Water Quality Assessment Program and SWAMP by providing water quality data to the state programs. This additional level of monitoring information will be provided to the state in a useful and coordinated manner to allow sharing of information and avoid duplicative monitoring. The state's monitoring coordination program led by the California Water Quality Monitoring Council will assist in identifying regulatory and

nonregulatory monitoring efforts in the region and to coordinate the SWAMP monitoring efforts with these programs.

7.4.4 Groundwater Ambient Monitoring and Assessment Program

The primary purpose of the GAMA Program is to comprehensively assess statewide groundwater quality and gain an understanding of the contamination risk to specific groundwater resources. The two primary goals of this program are:

- Improve comprehensive groundwater monitoring
- Increase the availability of groundwater quality information to the public.

To most efficiently facilitate the implementation of a statewide, comprehensive monitoring and assessment program for groundwater quality, uniform and consistent protocols for study design and data collection are being applied to the entire state. The GAMA Program monitors groundwater for a broad suite of chemicals at very low detection limits, including exotic chemicals, such as wastewater chemicals and pharmaceuticals. Monitoring and assessments for priority groundwater basins are to be completed every 10 years, with trend monitoring every 3 years. The California Water Board is collaborating with the USGS and Lawrence Livermore National Laboratory to implement the GAMA Program.

Stewardship of the state's groundwater resources is the shared responsibility of all levels of the government and community. A key aspect of the GAMA Program is interagency collaboration, data sharing, and communication with local water agencies. Although the GAMA Program remains voluntary, it provides numerous benefits to federal, state, local, and community participants:

- Improves comprehensive statewide groundwater monitoring
- Increases the availability of information about groundwater quality to the public
- Provides a mechanism to unite local, regional, and statewide groundwater programs in a common effort to understand and manage groundwater resources effectively
- Facilitates interagency communication and data sharing between federal, state, and neighboring local agencies
- Improves understanding of local, regional, and statewide hydrogeology, as well as issues and concerns about groundwater quality
- Provides groundwater data to establish baseline conditions and provide early warning of potential water quality concerns

- Provides agencies with knowledge of groundwater trends and long-term forecasting in groundwater quality, which is important for the preparation of groundwater management plans
- Provides agencies with comprehensive information to respond to concerns of consumers and consumer advocate groups
- Helps interbasin agencies that have basin wide or regional groundwater management objectives
- Creates a database with access to groundwater quality data and provides tools to aid in completing groundwater assessments

The GAMA Program has two sampling components: the California Aquifer Susceptibility Assessment, which addresses drinking water wells that supply water to the public, and the Voluntary Domestic Well Assessment Project, which addresses private drinking water wells. The California Aquifer Susceptibility Assessment uses low-level VOCs and age-dating analyses to assist in the evaluation of the hydrogeologic conditions within the groundwater basin/subbasin. This California Aquifer Susceptibility Assessment addressed the relative susceptibility to contamination of public well and is the foundation for the GSAMA Basin Project. The GAMA Program also focuses on identifying and centralizing the many sources of groundwater data and information available in the state. As part of this effort, the California Water Board has joined with other groundwater agencies to form the Groundwater Resources Information Sharing Team. The various groundwater data sets will be made accessible to the public and interested agencies in a groundwater resources information database.

Various groundwater monitoring and assessment programs collect a significant amount of groundwater-related data in various coverage and formats. Data in different electronic formats may not be as valuable as a single database of information. The lack of data comparability and sufficient data sharing significantly hampers the oversight of groundwater resources. The identification of measures that would increase coordination among state and federal agencies that collect groundwater contamination information would be beneficial.

Coordination is essential for the success of a comprehensive groundwater quality monitoring program. Increased coordination will also benefit all agencies through data sharing, training costs, and project responsibilities. The emphasis should be on increasing collaboration to effectively expand existing programs to cover a wider range of sampling, analyses, and evaluation efforts. The following measures will result in increased basic interagency coordination and communication on groundwater programs:

- Share data (e.g., geographic information system [GIS] coverage)
- Share data collection responsibilities

- Develop minimum sampling and analytical protocols
- Share specialized training
- Share laboratory facilities and information on laboratory methods
- Ensure interagency coordination and communication
- Meet periodically to evaluate the achievement of these measures
- Develop a standardized data format for electronic submittal of groundwater monitoring data

Just as state agency data are being incorporated into a comprehensive database, data on local groundwater quality may also assist in basin/subbasin assessments and larger scale assessments. It is expected that the amount of local data for some basins/subbasins is significant. Partnerships and effective coordination with the local agencies will be an important part of the Comprehensive Groundwater Quality Monitoring Program. Therefore, projects implemented as part of the Central Orange County IRWMP that result in information beneficial to the GAMA Program will coordinate with the state to provide useful data.