

# Greater Monterey County IRWM Assessment of Water Quality Monitoring Programs and Data Gaps

## Background

In 2006, staff from the Monterey Bay National Marine Sanctuary (Sanctuary), the Central Coast Regional Water Quality Control Board (RWQCB) and the California Coastal Commission (with staff support from the Resources Legacy Fund Foundation) initiated an effort called the *Central Coast Water Quality Data Synthesis, Analysis and Management (SAM)* project. This effort brought local, state and federal agencies; researchers, and volunteer monitoring groups together to assess gaps and develop strategies to strengthen regional monitoring efforts. This resulted in the formation of a much stronger partnership between all agencies and agreements to share data and other information related to water quality monitoring efforts in order to learn more about water quality conditions and threats in the Sanctuary and its adjacent watersheds. As a result, characterizations of most of the major monitoring efforts on the Central Coast were cataloged and are currently available on the Sanctuary Integrated Monitoring Network (SIMoN) website<sup>1</sup>.

In 2008, the SAM Central Coast Data Assessment report was finalized. The numerous monitoring programs that collect water quality and other environmental data on the Central Coast have substantial differences that include sampling designs, measurement types, analytical methods, objectives, funding stability levels, and technical capacities that have historically made coordination among programs and integration of data sets difficult. Important general differences between data sources include:

- Spatial extent
- Temporal extent and frequency
- Purpose
- Measurement types (analytes, media, species, habitat quality metrics)
- Experimental designs (targeted vs. probabilistic)
- Data formats
- Data documentation

Based on the 2008 Assessment, the following recommendations were made to address key information gaps:

- (1) The absence of a region-wide universal water quality data format for the Central Coast is an important barrier to regional water quality data analysis; information exchange, and coordination between monitoring organizations. A system should be created for automatic, seamless data integration that is based on the Surface Water Ambient Monitoring Program (SWAMP) formats and facilitates upward data flow toward a central location the California Environmental Data Exchange Network (CEDEN).

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<sup>1</sup> [http://sanctuarysimon.org/regional\\_sections/maps/wqviewer/index.php](http://sanctuarysimon.org/regional_sections/maps/wqviewer/index.php)

- (2) The lack of coordination between monitoring organizations results in wasted resources and important data gaps that reduce our ability to understand the status and trends of water quality conditions. Two things that would help to identify opportunities to optimize resources are: (1) a regularly updated clearinghouse of information on all the existing programs and (2) annual water quality conferences in the region to disseminate information and highlight the value of monitoring coordination efforts.
- (3) Adequate detection of changes over time in water quality conditions requires that we maintain commitments to sustain long term monitoring stations such as the CCAMP Coastal Confluences stations, (2) encourage flow measurement as a regular part of water quality monitoring, and (3) allocate sufficient resources to data analysis.
- (4) Encourage cooperation of watershed stakeholders to collect and share information about changes in land management practices in a standardized way that will be useful for comparison with water quality data.
- (5) Develop a monitoring design with the express purpose of evaluating relationships between changes in land-use management activities and water quality conditions at multiple watershed scales.
- (6) Institutionalize a regional data node for ongoing data collection, analysis and multi-tiered reporting to facilitate the NPS pollution management objectives of regional stakeholders.

### **Objectives/Methods**

The goal of this current effort funded by the Department of Water Resources through the GMC-IRWMP was to inventory all water quality monitoring activities in the Greater Monterey County Integrated Regional Water Management Plan area. The inventory determined if monitoring was still occurring, and the sampling locations and analyte list were updated. This effort paid particular attention to organizations conducting water quality monitoring in the Greater Monterey County region. The existing eleven organizations were contacted first to determine if monitoring was still occurring and if there were any changes to the programs. After the initial contact was made, additional organizations were investigated in the Greater Monterey County area to ensure all water quality data was represented. A spreadsheet that contained metadata for site locations, analytes and frequency was provided to the initial participants in order to facilitate a mechanism to update the existing information (ATT 1). The online Water Quality Viewer<sup>2</sup> was updated with the information and the results were compared to the 2008 SAM assessment.

### **Results**

The following summary of water quality monitoring efforts is organized in alphabetical order by agency and/or their associated monitoring program(s):

- (1) **Central Coast Ambient Monitoring Program (CCAMP):** [www.ccamp.org/](http://www.ccamp.org/) CCAMP is the regional water quality monitoring and assessment program of the Central Coast Regional Water Quality Control Board.

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<sup>2</sup> [http://sanctuarysimon.org/regional\\_sections/maps/wqviewer/](http://sanctuarysimon.org/regional_sections/maps/wqviewer/)

- Monitoring Objectives:
  - Conduct monthly sampling of watersheds in Region 3 on a five-year rotation, reporting on each hydrologic unit.
  - Detect trends at coastal confluence sites (located at 33 river and stream mouths at locations above salt water mixing).
  - Conduct additional short-term assessments targeted at specific questions, including Clean Water Act Section 303(d) impaired water body listed sites.
  - Provide data to inform managers and provide assessments on water body safety for human-uses: eating, drinking, and swimming; non-contact use, and aquatic and agricultural uses.
- Status of Sampling Program/Locations:
  - CCAMP monitors four large rivers and the lower ends of tributaries in a monthly water sampling program including the Salinas River, Pajaro River, San Lorenzo River, and Carmel River.
  - The Coastal Confluences program samples at 36 sites and has added additional analytes since 2008 including copper, zinc, urea, and silica. Sampling includes: monthly water column sampling, annual bioassessments of benthic invertebrates, a chemical suite of tissue and sediment samples, toxicity in water and sediment, and flow rates.
  - All Coastal Confluence sites are on-going, long-term data sets since 2001, with a few exceptions of sites that concluded in 2004.
  - CCAMP is also working with the Central Coast Wetlands Group on riparian health assessments.
- Water Quality Results:
  - Reports are made available online and data is uploaded to the Surface Water Ambient Monitoring Program (SWAMP)<sup>3</sup> for quality assurance and eventually to California Environmental Data Exchange Network (CEDEN).

**(2) Central Coast Long-term Environmental Assessment Network (CCLEAN):**

[www.cclean.org/](http://www.cclean.org/) CCLEAN is a discharger-based water quality monitoring program that focuses on nearshore marine water quality in the Monterey Bay Area with the goal of protecting marine and wildlife habitat, rare, threatened and endangered species, as well as informing municipal agencies of safe recreational water exposure.

- Monitoring Objectives:
  - Test municipal effluent discharge at the Salinas, Pajaro, San Lorenzo, and Carmel Rivers for: persistent organic pollutants (POPs), nutrients, and suspended sediments in rivers accounting for dry/wet season flow rates to determine if the above analytes are more prevalent in surface waters than effluent from the Monterey Bay area wastewater treatment facilities.
  - Monthly monitoring at 16 coastal sites, streams, and rivers for nutrients, bacteria, and suspended sediment.

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<sup>3</sup> [www.waterboards.ca.gov/water\\_issues/programs/swamp/](http://www.waterboards.ca.gov/water_issues/programs/swamp/)

- Status of Sampling Program/Locations:
  - Mussels are collected and measured for persistent organic pollutants and bacteria at five locations in the dry season and in the wet season (Scott Creek, Laguna Creek, “The Hook”, Fanshell Overlook, and Carmel River Beach).
  - Sediment and benthic organisms for POPs at eight sites once a year within the depositional band along the 80-meter contour in Monterey Bay
  - Nearshore water at two locations in Monterey Bay for concentrations of POPs, nutrients and bacteria in the dry season and in the wet season.
  - Tissues of sea otters that have died and been necropsied by the California Department of Fish and Game Marine Wildlife Veterinary Care and Research Center to measure POP concentrations and determine whether POPs have affected the cause of death.
  - Two sediment sites have been dropped from sampling (SED REF 1, SED DEP 4) since 2008.
- Water Quality Results:
  - Annual reports detail trends and findings of CCLEAN programs and are available on the CCLEAN website. The data is uploaded to CEDEN.

(3) **Central Coast Water Quality Preservation, Inc. (CCWQP):** [www.ccwqp.org](http://www.ccwqp.org)  
 CCWQP is the non-profit partner of the Cooperative Monitoring Program (CMP) that represents farmers and landowners in order to comply with irrigated agriculture requirements (Conditional Waiver of Waste Discharge) with the Central Coast Regional Water Board.

- Monitoring Objectives:
  - Coordinate a cooperative monitoring program that meets the requirements of the Central Coast Regional Water Quality Control Board’s Conditional Waiver of Waste Discharge requirements for Discharges from Irrigated Lands and is a cost effect and scientifically based regional monitoring program.
- Status of Sampling Program/Locations:
  - For the first seven years of the CMP, the sampling parameters have remained the same, although some frequencies in sampling have changed. The majority of sites are sampled monthly for physical, chemical and nutrient related parameters, quarterly for water toxicity, and annually for sediment toxicity.
  - Sites previously monitored by Marc Los Huertos’ group at California State University Monterey Bay via funding through the Central Coast Regional Water Board were transferred to CCWQP in 2008 and included additional sampling parameters.
  - Sites new to the Conditional Waiver program in 2012 will be monitored on a reduced schedule, and sites already monitored monthly by other programs will only be sampled under the CMP during the first year of the updated program (2013) for parameters not currently being monitored by other programs.
  - CCAMP will sample for all parameters for the CMP in 2013.

- Beginning in 2013, all sites under the Conditional Waiver will be monitored for water toxicity parameters, and sediment and biological community toxicity.
- Water Quality Results:
  - CCWQP provides CMP data to CCAMP for upload to CEDEN.

**(4) Central Coast Watershed Studies at Cal State Monterey Bay (CCoWs):**

<http://ccows.csUMB.edu/home/index.htm> The mission of CCoWS is to conduct watershed and ecosystem research and education that supports sustainable ecosystem management both in California's Central Coast region, and in the world in general.

- Monitoring Objectives:
  - Operate and study a constructed wetland on the Tembladero Slough at Molera Road.
- Status of Sampling Programs/Locations:
  - Focus of research is on the efficacy of water quality improvement at the constructed wetland at Molera Road in Castroville.
  - The only sampling CCoWS currently conducts is short-term project-based, with analytes varying by project. Nitrate is the main analyte, although this program has sampled for pesticides and pathogens in the recent past.
  - This program has been significantly reduced in the past several years due to funding constraints.
- Water Quality Results:
  - Reports are available on their website.

**(5) Central Coast Wetlands Group (CCWG):** <http://ccwg.mlml.calstate.edu/> CCWG is a wetlands science research group that work closely with regional and state partners to improve wetland science communication between researchers, resource managers and policy makers through on the ground research, the development and dissemination of tools and materials, and through organizing and hosting meetings and symposia that bring groups of people together to increase dialogue.

- Monitoring Objectives:
  - Conduct water quality monitoring that is project specific to determine the efficacy of restoration projects but no long-term monitoring.
- Status of Sampling Programs/Locations:
  - They are the Central Coast organization that conducts California Rapid Assessment Monitoring (CRAM)<sup>4</sup>, an indicator of overall environmental health.
- Water Quality Results:
  - Not available to the public

**(6) Center for Integrated Marine Technology CIMT/CeNCOOS:** <http://cimt.ucsc.edu/>

The Center for Integrated Marine Technologies (CIMT) has been a non-operational program since 8-1-2007. The website is still available and contains many useful links

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<sup>4</sup> <http://www.cramwetlands.org/>

including the historical CIMT database and informational fact sheets. Some of CIMT's research programs and products will continue through the Central and Northern California Ocean Observing System (CeNCOOS) <http://www.cencoos.org> as well as through the ongoing research of its principal investigators.

- Monitoring Objectives:
  - None currently
- Status of Sampling Program/Locations:
  - The M0 site was decommissioned in 2008 and other CIMT sampling responsibilities transferred to Central California Ocean Observing System (CeNCOOS).
  - Santa Cruz Ocean Observing Program (SCOOP) is a long term time-series at the Santa Cruz Municipal Wharf (Kudela lab running it since 2002). They sample weekly for nutrients, chlorophyll, FIB, HABs and is anticipated to continue indefinitely.
  - SCOOP also has a time -series at the Pinto Lake boat dock in Watsonville, where they sample for nutrients, chlorophyll, and freshwater toxins for the past 3 years, with plans to continue for at least another year but it may eventually stop since it's funding-dependent.

**(7) Coastal Watershed Council (CWC):** <http://coastal-watershed.org/> The Coastal Watershed Council (CWC) is a 501(c)(3) nonprofit organization that was formed in 1995 in response to the declining health of watersheds in the Monterey Bay region. CWC is well-recognized for their technical expertise in designing and implementing water quality monitoring programs and they follow SWRCB and EPA protocols. CWC advocates for the preservation and protection of coastal watersheds through the establishment of community-based watershed stewardship programs.

- Monitoring Objectives:
  - CWC partners with the MBNMS on volunteer programs such as First Flush, Urban Watch and Snapshot Day.
  - CWC is part of a collaboration with [CSUMB](#), [Elkhorn Slough National Estuarine Research Reserve](#) and Agriculture and Land-Based Training Association ([ALBA](#)) to evaluate the effectiveness of organic farming practices and wetland restoration in improving habitat and sediment and water quality in the slough.
- Status of Sampling Programs/Locations:
  - Since 2007, approximately 70 Clean Stream sites have been converted from monthly to annual sampling under the Snapshot Day program.
- Water Quality Results:
  - Water quality results are available on their website and are uploaded to CEDEN.

**(8) Elkhorn Slough National Estuarine Research Reserve (ESNERR):** <http://www.elkhornslough.org> Two different ESNERR monitoring programs track water quality in the Elkhorn Slough area: The volunteer program, running since 1988, provides superb spatial coverage; 24 stations are sampled monthly and the NERR system-wide

program, operating since 1995, offers excellent temporal coverage. In this program, water quality data is collected every 30 minutes at four stations along the main Slough channel.

- Monitoring Objectives:
  - ESNERR's Research program includes studies on slough life, water quality, tide flow and offers specific recommendations to conserve and restore estuarine habitats and implements them.
- Status of Sampling Programs/Locations:
  - Volunteer Program: monthly sampling at 24 stations
  - NERR system-wide program: 4 sampling stations collecting data every 30 min in the main Slough channel.
  - Long-term monitoring continues except for sampling at Salinas River Lagoon and Bennett Slough, West.
- Water Quality Results:
  - Water quality data results are uploaded to CEDEN.
  - Reports are available by contacting ESNERR staff.

**(9) Marine Pollution Studies Laboratory, Granite Canyon:**

<http://www.envtox.ucdavis.edu/granitecanyon/granitecanyon.htm> The UC Davis Marine Pollution Studies Laboratory at Granite Canyon conducts applied toxicology research in watersheds, estuaries, and coastal waters. Assessing water quality and the impacts of pollutants is increasingly important to our understanding and management of healthy ecosystems.

- Monitoring Objectives:
  - Their research addresses questions about sources of agricultural and urban pollution, effects of pollutants in aquatic ecosystems, and identification of toxic constituents.
  - They also conduct research to analyze the effectiveness of management practices designed to reduce polluted runoff.
- Status of Sampling Programs/Locations: These programs are not represented on the WQ viewer because they are not long-term monitoring programs. We list them here because it is valuable to know the data exists for these different programs
  - There are five Stream Pollution Trends Monitoring Program (SPoT) sites in this area.
  - State Water Resources Control Board project to assess salinity toxicity thresholds for marine species to assess potential impacts of desal plant brine discharges (ends Dec. 2012)
  - Department of Pesticide Regulation project to evaluate effectiveness of best management practices to eliminate toxicity and pesticides in row crop agriculture runoff (on going)
  - Fish and Wildlife Service project to determine effects of pyrethroid pesticides on tidewater gobies (project ends 2014)
  - DWR/ GMC Round 1 IRWMP project to measure effectiveness of LID practices to reduce pesticides and toxicity in stormwater runoff (project ends 2015)
- Water Quality Results:

- Reports are available on their website and water quality data is uploaded to CEDEN.

**(10) Monterey Bay Sanctuary Citizen Watershed Monitoring Network**

**(Network):** <http://montereybay.noaa.gov/> The Network is a consortium of citizen monitoring groups that monitor the health of the watersheds flowing into the Monterey Bay National Marine Sanctuary. It was established in 1997 and has since provided support, training, and a central forum and database for citizen monitoring programs.

- Monitoring Objectives:
  - With the help of volunteers, the Urban Watch program conducts monthly monitoring during the dry weather season to determine if there are common urban pollutants in the runoff from outfalls into the MBNMS.
  - Conduct quarterly monitoring for the Monterey Regional Stormwater Program (MRSWMP) to measure common urban pollutants in runoff during both dry and wet weather (includes First Flush).
  - Assess the water quality of the majority of coastal streams flowing into the MBNMS on the first Saturday of May each year.
- Status of Sampling Programs/Locations:
  - Most Urban Watch sites remain the same in Pacific Grove with the addition of upstream sites in 2012.
  - Twenty-three MRSWMP sites continue to be monitored during the dry weather, but that number was reduced for wet weather in 2012 because of the additional monitoring for Areas of Special Biological Significance.
  - Snapshot Day sites remain the same.
- Water Quality Results:
  - Water quality data results were uploaded to CCAMP for transfer to the CEDEN database.

**(11) Monterey County Environmental Health Division:**

[http://www.mtyhd.org/index.php?option=com\\_content&view=article&id=853&Itemid=522](http://www.mtyhd.org/index.php?option=com_content&view=article&id=853&Itemid=522) In accordance with State statutes, the Monterey County Health Department monitors ocean water at public beaches and water contact sports areas. Water samples are collected from sites that are: 1) visited by over 50,000 people annually; and 2) adjacent to storm drains (including rivers, creeks and streams). These samples are analyzed for bacteriological "indicator" organisms.

- Monitoring Objectives:
  - Monterey County Environmental Health Division provides water quality information to concerned swimmers to alert them to areas that may be contaminated by fecal indicator bacteria.
- Status of Sampling Programs/Locations:
  - Weekly from April through October and monthly November through March at beaches with more than 50,000 visitors a year.
- Water Quality Results:
  - Monitoring results are available on their website and in the near future will be uploaded to CEDEN.



(12) **City of Paso Robles:**

<http://www.prcity.com/government/departments/publicworks/water/> The City of Paso Robles wastewater plant (Plant) discharges 3 million gallons of wastewater to the Salinas River each day. The Plant operates under [NPDES Permit No. CA0047953](#). They conduct both surface water (SW) and ground water (GW) monitoring as required in their NPDES Permit.

- Monitoring Objectives:
  - To protect public health and the environment in the most cost-effective manner possible.
- Status of Sampling Program/Locations:
  - There are two different sampling locations on the Salinas River, SW-001 (upstream of outfalls) and SW-002 (downstream of outfalls). The location of the surface water monitoring changes depending on which outfall they are using. Monitoring is only done upstream when there is flow in the Salinas River.
- Water Quality Results:
  - Annual reports are available on their website.

(13) **Pajaro Valley Water Management Agency (PVWMA):**

<http://www.pvwma.dst.ca.us/hydrology/basin-monitoring.php> The Pajaro Valley Water Management Agency conducts monthly surface water quality monitoring at sites throughout the watershed.

- Monitoring Objectives:
  - Data collected helps the agency's hydrologists in their work to maintain water quality throughout the basin.
- Status of Sampling Locations:
  - A network of 30+ surface water sites is monitored once per month for more than 20 analytes since 2002.
  - Additional monitoring includes groundwater sites (a combination of PVWMA sites and private wells) and three sites in Harkin's Slough as part of an NPDES permit to monitor agricultural activity. Suspended solids are sampled weekly, while ammonia, nitrate, nitrite, Kjeldahl nitrogen and total fecal coliforms are sampled monthly.
- Water Quality Results:
  - Annual reports are available on their website.

(14) **City of Salinas:**

[http://www.ci.salinas.ca.us/services/maintenance/urban\\_watershed.cfm](http://www.ci.salinas.ca.us/services/maintenance/urban_watershed.cfm)

The City of Salinas' Urban Watershed Management Program is an integrated effort involving municipal departments, Federal, State, and other local agencies, as well as the public. Program staff seek to protect water resources by reducing or eliminating contaminants from entering our local creeks, the Salinas River, and eventually the Monterey Bay National Marine Sanctuary.

- Monitoring Objectives:
  - The state has required the City to monitor water quality over time and use this information to take corrective action

- Status of Sampling Program/Locations:
  - In May, 2012, the City received its third five-year NPDES Stormwater Permit. The monitoring design was revised to incorporate a catchment (watershed) approach with associated primary land use in each category.
  - Annually, during two rain events, the Urban Catchment monitoring program is designed to assess attainment of stormwater discharge action levels identified in the Section P of the permit in each of 4 catchments.
  - Stormwater discharge trend monitoring will occur at the Salinas River pump station for long-term loading trends during 3 storms a year.
  - Monthly receiving water monitoring will occur in the Reclamation Ditch downstream of urban influences.
  - Monthly background receiving water monitoring will include sites upstream of urban influences in Gabilan and Natividad creeks and the Reclamation Ditch.
- Water Quality Results:
  - Results will be available through CEDEN.

(15) **Santa Cruz County Department of Environmental Health:**

<http://scceh.com/EnvironmentalHealthServices/Programs/EnvironmentalWaterQualityProgram/CurrentWaterQualityInformation.aspx> Santa Cruz County Water Quality sites (beaches, rivers, swimming) are not in the GMCIRWM area, but are a valuable long-term regional data set for the region.

- Monitoring Objectives:
  - The County of Santa Cruz Environmental Health Service provides water quality information to concerned swimmers to alert them to areas that may be contaminated by fecal indicator bacteria.
- Status of Sampling Programs/Locations:
  - Weekly from April through October and monthly November through March at beaches with more than 50,000 visitors a year.
- Water Quality Results:
  - Available on the county website at <http://waterqualitygis.co.santa-cruz.ca.us/> and uploaded to CEDEN.

(16) **United States Geological Survey:** <http://ca.water.usgs.gov/data/nwis/>

The U.S. Geological Survey's (USGS) National Water Information System (NWIS) is a comprehensive and distributed application that supports the acquisition, processing, and long-term storage of water data.

- Monitoring Objectives:
  - Collect, analyze, and interpret water-quality data.
  - Engage in field and laboratory research and methods development.
  - Work with local, State, and Federal agencies and the citizenry to identify and understand environmental issues and concerns.
- Status of Sampling Programs/Locations:
  - They currently have one active site on the Salinas River at Chualar where they collect grab samples for water quality testing.

- They have many other sites for real time stream flow data throughout the Central Coast.
- Water Quality Results:
  - All monitoring locations and data are available on their website.

## Discussion

There have not been significant changes to monitoring programs, sites and analytes over the past five years. After interviewing staff from each organization, spreadsheets which populate the WQ Viewer, were updated for each monitoring program and a summary of changes was totaled (Table 1). Of the eleven initial monitoring programs, one is no longer collecting watershed data and a second was combined with CCWQP. We added four additional programs to the list because they reside within the GMC-IRWMP region. There are 109 fewer sites than in 2008 mostly because the CCoWs are no longer doing watershed monitoring.

Table 1. Summary of Monitoring Site Changes in Water Quality Viewer

Sites	Original	Updated	Diff	Notes
<b>CCAMP</b>				
Coastal Confluences	39	42	3	added analytes copper and zinc for all sites
Watersheds	203	180	-23	added analytes copper, zinc, silica, and urea for all sites
<b>CCLEAN</b>	<b>20</b>	<b>20</b>	0	No edits
<b>CCOWS</b>	<b>106</b>	<b>106</b>	-105	The sites were not removed from the WQ viewer b/c of historical data
<b>CCWQP</b>	<b>38</b>	<b>38</b>	0	No edits
<b>CIMT</b>	<b>1</b>	<b>1</b>	0	No edits
<b>CWC</b>				
First flush	34	23	-11	
Clean streams	108	86	-22	
Snapshot day	84	101	17	
<b>ESNERR</b>	<b>25</b>	<b>23</b>	-2	
<b>MarcLH</b>	<b>83</b>	<b>83</b>	0	No edits to WQ Viewer except these sites are now part of CCWQP
<b>MBNMS</b>				
First Flush	11	9	-2	
Clean streams	15	17	2	
Snapshot day	100	85	-15	
<b>MCEH</b>	<b>0</b>	<b>8</b>	8	New program added to viewer
<b>PVWMA</b>	<b>0</b>	<b>30</b>	30	New program added to viewer
<b>City of Paso Robles</b>	<b>0</b>	<b>2</b>	2	New program added to viewer
<b>SCCEH</b>	<b>85</b>	<b>85</b>	0	No edits
<b>City of Salinas</b>	<b>0</b>	<b>9</b>	9	New program added to viewer, however site locations are not confirmed.
<b>USGS</b>	<b>31</b>	<b>31</b>	0	No edits
<b>TOTALS</b>	<b>983</b>	<b>979</b>	<b>-109</b>	

After researching and communicating with current organizations conducting water quality monitoring on the Central Coast, it appears that much of the same findings from

the SAM report regarding programmatic data gaps remain the same (ATT 2). We recognize that while water quality monitoring is critical to understanding natural patterns and anthropogenic influences in the environment, very few resources are committed to it. A scientifically rigorous monitoring design is important for both understanding if specific management practices are effective and how, on a regional scale, the status and trends of water quality in the watersheds and marine environment are changing.

That said several very important efforts are making good progress toward the gaps identified in the SAM report. The first gap addressed the need for a region-wide universal water quality data format and database that provides easy access in digital format. This has been accomplished by the CCAMP program in partnership with the State Water Resources Control Board to ensure the ability for all monitoring programs to upload water quality data to a statewide database. The California Environmental Data Exchange Network (CEDEN) database<sup>5</sup> is now capable of uploading water quality data and also providing it for download by interested data users. CCAMP data is the highest priority for CEDEN upload. CCAMP is currently collecting multiple datasets and being the test case for loading multiple datasets and databases into CEDEN. Once glitches have been tested, the entire CCAMP database, including the CCWQP data, will go live on CEDEN web page. This is a huge success as it facilitates compilation of data of known quality collected by multiple programs that is accessible to the public and can be analyzed on a larger spatial scale to better understand water quality conditions. The GMC-IRWMP data management chapter ensures that all projects, implemented in the region that require surface water quality monitoring, upload the results to the CEDEN database.

Another identified data gap is to encourage cooperation of watershed stakeholders to collect and share information about changes in land management practices in a standardized way that will be useful for comparison with water quality data. This is being developed in partnership with Central Coast Resource Conservation Districts through IRWMP funding. The Conservation Action Tracker<sup>6</sup> is an online database web portal that will allow all project proponents to enter information about management practices designed to improve water quality. This will provide a comprehensive resource to better understand the amount of effort going in to sub-watersheds to improve water quality. The goal is to then identify if water quality is improving downstream as a result of the practices. If it isn't, either the practices are not being effective or we're not able to see an improvement at that geographic scale and adaptive management is necessary. The Conservation Action Tracker will be online Spring 2013.

Another gap is the inability to detect changes over time in water quality conditions. This requires that we maintain commitments to sustain long term monitoring stations such as the CCAMP Coastal Confluences stations, (2) encourage flow measurement as a regular part of water quality monitoring, and (3) allocate sufficient resources to data analysis. For the past year, we have been working on developing a regional monitoring design that will include all discharges into the Sanctuary. The initial discussions include all of the

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<sup>5</sup> <http://www.ceden.org/>

<sup>6</sup> In development <http://ccactiontracker.org/>

municipalities located on the coast as well as the wastewater treatment plants and dischargers to Areas of Special Biological Significance (ASBS)<sup>7</sup>. This seems to be a viable option at this time because of new regulations for ASBS, the Ocean Plan and Phase II Municipal Stormwater monitoring requirements. Ultimately, the goal is for this data along with the other long term monitoring programs identified above, be downloaded from CEDEN and analysis performed based on the NPS questions identified by the SAM project which are similar to the regional monitoring questions.

This also addresses the final two gaps identified above by the SAM assessment to develop a monitoring design with the express purpose of evaluating relationships between changes in land-use management activities and water quality conditions at multiple watershed scales; and institutionalize a regional data node for ongoing data collection, analysis and multi-tiered reporting to facilitate the NPS pollution management objectives of regional stakeholders. It is our hope that through IRWMP efforts and the resources of all dischargers, that a comprehensive regional monitoring program will leverage funds and provide valuable information as to the success of resource management and the quality of the water on the Central Coast.

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<sup>7</sup> [http://www.waterboards.ca.gov/water\\_issues/programs/ocean/asbs.shtml](http://www.waterboards.ca.gov/water_issues/programs/ocean/asbs.shtml)



## **ATT 2: WATER QUALITY DATA GAPS by Program:**

### **CCAMP Data Gaps:**

- Quarterly sample for full suite of pesticides, metals, and herbicides. While lots of sampling is occurring, it is for a limited suite of analytes.
- CCLEAN data for Carmel River
- To conduct whole watershed analysis rather than current linear assessments. Currently working with Ross Clark on riparian health assessment to develop watershed map of a healthy riparian system, piloted in Morro Bay.
- Very little info exists on emerging contaminants and sources such as: phthalates, PBDE flame retardants (sea otters); more locations require this testing.
- Regional monitoring program already conducting storm and waste water sampling. Better testing for **loading** in rivers for pesticides. Looking for decreasing trend in loading and persistence of pesticides.
- Need to understand the bottom-end of healthy areas in damaged watersheds. Currently, sampling sites for bioassessments and integrity higher up in the river/watershed. This would be done by identifying healthy areas and dividing up the healthy upper water shed and randomly conducting a bioassessment, while conducting targeted sampling in the lower (less healthy) watershed sampling sites.
- Coastal Confluences program tests water going into estuaries, but routine monitoring of small estuaries is needed. Some sampling is being conducted at Elkhorn for pesticides and toxicity, but not routine chemical sampling in estuaries (including Elkhorn; others needed too).
- Currently sampling fish tissue in lakes for listing. Need to monitor lakes for stratification of oxygen levels, plankton blooms, and to measure the water quality coming out of lakes.
- More ocean monitoring is needed to augment the mussel sites at edge of Monterey Bay, SWAMP bio accumulation in fish, and the CalCOFI transects that are not surveyed on a regular basis. Need to focus on the sources on land and ocean.

### **CCLEAN Data Gaps:**

- Carmel River: stopped sampling for Persistent Organic Pollutants (POPs) in 2007.
- Salinas River: sampling of persistent organic compounds needed
- San Lorenzo: sampling of persistent organic compounds needed
  - City of Santa Cruz is using a different method to sample (dissolved phase analytes) not measuring whole water analytes, which makes the comparison of results difficult.
- Pajaro River: persistent organic compounds are currently being sampled by the City of Watsonville. CCLEAN would like to take on this responsibility with the other POC needs as funding allows.
- Working to fill a fully regional monitoring program that would measure loads from urban storm water run-off
  - Carmel north to Santa Cruz and areas of special biological significance in Marin County in particular.

- Dropped two sediment sites with historical data that could be picked up: SED REF 1, SED DEP 4.

**Coastal Watershed Council Data Gaps:**

- Several regular Clean Streams sampling sites (at least 70) have since converted to annual sampling via Snapshot Day.
- More upper Soquel creek monitoring locations needed
- More frequent monitoring needed, especially for sites that have dropped down to annual monitoring.
- North of Santa Cruz, Scott Creek and logging impacted areas should be sampled.
- Add more bioassessment levels to sampling sites to include physical and biotic parameters.

**CIMT Data Gaps:**

- Reinstigate sampling at the M0 ocean site.
- For the past three years, a weekly time-series experiment has been conducted at the Pinto Lake boat dock, where CIMT samples for nutrients, chlorophyll, and freshwater toxins. This time-series will continue for at least another year, but the project is funding dependent.

**Central Coast Water Quality Preservation, Inc. Data Gaps:**

- Will reassess gaps as the new Conditional Waiver monitoring requirements are tracked after 2014.

**ESNERR data gaps:**

- Two sites are no longer sampled: Salinas River lagoon and Bennet Slough West.

**MBNMS Data Gaps:**

- There is never enough time or resources to analyze data in a comprehensive way that will inform managers.
- Agree with all the data gaps identified by CCAMP.

**City of Paso Robles data gaps:**

- Searching for a location north of the Wastewater Treatment Plant for a third groundwater well. The City of Paso Robles is trying to find a location south of the confluence of the Huerhuero Creek. Currently testing a private agricultural well to determine if the location is appropriate. This well will be analyzed for TDS, Chloride, Sodium, and Sulfate.