

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF SEPTEMBER 22-23, 2016

Prepared on August 26, 2016

ITEM NUMBER: 16

SUBJECT: Update on the Central Coast Ambient Monitoring Program and the Healthy Watersheds Report Card

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THIS ACTION: Board Discussion/Information

Summary

The State and Regional Water Board mission is *“to preserve, enhance, and restore the quality of California’s water resources, and ensure their proper allocation and efficient use, for the benefit of present and future generations.”* In addition, the Central Coast Water Board adopted a vision of *“[Healthy Watersheds](#)”* and defined measurable goals to achieve that vision. Central Coast Water Board staff is dedicated to achieving the statewide mission, and the Central Coast vision and goals. We also understand that we must measure our success in terms of human and environmental outcomes, and hold ourselves accountable for tangible results through real water quality outcomes. To this end, the Central Coast Water Board developed the Central Coast Ambient Monitoring Program (CCAMP). CCAMP is a surface water monitoring program, and is one of the most comprehensive monitoring programs of its kind. CCAMP has collected tens of thousands of data measurements related to surface water quality throughout the Region since 1998, creating one of the largest water quality data sets in the State. These data directly measure the physical environment over time and determine our success in achieving our mission, vision, and goals. CCAMP data are routinely used by Water Board staff and other organizations, and serve to inform the Central Coast Water Board’s priorities, direction, and decisions, and helps us quantify change in the environment related to our efforts. While CCAMP focuses on surface water and aquatic habitat, and is the subject of this report, we are also developing a parallel effort for groundwater.

One of our priority objectives is to make CCAMP data available and useful to all users. We therefore continue to develop and improve web-based interpretive tools for Central Coast Water Board staff and the public. CCAMP has two primary web-based tools: the CCAMP “Data Navigator” (at www.ccamp.org) has long provided easy and informative access to maps, graphs, and charts of Central Coast surface water quality-related data. A newer web tool (not yet public) is the Healthy Watersheds Report Card (Report Card). The purpose of the Report Card is to broadly assess the health of watersheds and to indicate whether we are achieving or progressing towards our mission, our vision, and our three measurable goals (healthy aquatic habitat, proper land management and clean groundwater).

At the Board meeting, Karen Worcester, senior technical staff for the CCAMP program, will summarize the activities and some of the findings of the program, will describe the Report Card project and its current status, and will introduce Water Board members to CCAMP web-based

tools for their information and use. This staff report provides background and context for that presentation.

Discussion

The Central Coast Ambient Monitoring Program (CCAMP) is the Central Coast Water Board's surface water monitoring program. Since 1998, CCAMP has collected data on the status of Central Coast surface water quality, with a particular focus on characterizing the status and trends in freshwater rivers and streams. Staff collects basic measures of water quality on a monthly basis, and collects other measures, including organic chemistry and metals in sediment and water, toxicity assessment in sediment and water, bio-assessment for invertebrates and algae, and habitat assessment, on a less frequent basis at a sub-set of sites.

CCAMP conducts ongoing monitoring of all major river and stream mouths at their outflow to the ocean, which provides information on pollutant loading to the marine environment including all Marine Protected Areas on the Central Coast. These sites have been sampled on a monthly basis since 2001, with a focus on trend detection.

In addition, CCAMP divides the Region into five watershed areas, and conducts focused monitoring in one of these watershed areas each year, in sequence. It therefore takes five years to monitor all five watershed areas. Thirty sites are monitored monthly for a year in a watershed area. Three complete rotations have been conducted through our five watershed areas (over a fifteen year period), which provides enough data to identify statistically determined changes at many monitoring sites. Beginning in 2017, CCAMP will be starting its fourth rotation.

CCAMP uses data from other sources as well, such as third-party Agriculture organizations (i.e., Central Coast Water Quality Preservation, Inc. [Preservation Inc.]), and the State Water Board's Surface Water Ambient Monitoring Program (SWAMP), which allows a robust characterization of status and trends in surface water quality for the Region. CCAMP data are used for many purposes, such as determining the Water Board's Clean Water Act 303(d) List of Impaired Waters. CCAMP data are also used for TMDL development and tracking, to support enforcement actions, permit decisions, surface water-related program prioritization, and basin planning, and to prioritize areas for grant fund focus. Over the years, CCAMP findings have brought important problem areas to the attention of staff and the Board, and have helped prioritize program focus, particularly for the Irrigated Lands program.

CCAMP also continues to develop and improve web-based interpretive tools for Central Coast Water Board staff and the public. CCAMP has two primary web products. The CCAMP "Data Navigator" (at www.ccamp.org) has long provided easy and informative access to maps, graphs, and charts of our data. Recent updates include downloadable data, access to more sources and types of data, new statistical analyses, chemical loading and other improvements. A fact sheet about the CCAMP Data Navigator is available on the State Board's Surface Water Ambient Monitoring Program website:

http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/factsheets/ccamp_data_navigator.pdf

A newer web tool is the Healthy Watersheds Report Card (Report Card). The purpose of the Report Card project is to broadly assess the health of watersheds and to indicate whether we are achieving or progressing towards the three vision goals of healthy aquatic habitat, proper land management and clean groundwater. CCAMP is currently capable of assessing "healthy aquatic habitat" in a robust manner, and we are currently building our capacity to assess the other two goals (proper land management and clean groundwater). The remainder of this staff report focuses primarily on assessing aquatic habitat, as this portion of the Report Card is the closest to completion.

Status of Surface Water Quality and Aquatic Habitat in the Central Coast Region

Many of the upland areas of the Central Coast Region, particularly those in public lands ownership, are in relatively good condition. The most prevalent water quality problems in these areas are associated with sedimentation and pathogen indicators. Some of the more pristine areas have also shown recent impacts associated with drought and fire. For example, the relatively pristine Big Sur coastline has several watersheds impacted by sediment and, consequently, for biological indicators, and these impacts are likely the result of fires over the last few years.

Areas in intensive land use, such as irrigated agriculture and urban areas, are typically heavily impacted. The CCAMP Data Navigator presents clear patterns of impairment in these areas for multiple analytes. These areas include the lower Salinas and Santa Maria watersheds, and to a lesser extent the Pajaro River, and have elevated nutrients, pesticides, toxicity and salts, and degradation of biological indicators and habitat. Several smaller watersheds are also severely impacted, including some with important consequences for sensitive habitats, such as lower Los Osos Creek (entering the Morro Bay National Estuary), Elkhorn Slough (a National Estuarine Research Reserve and Marine Protected Area), Atascadero Creek (entering Goleta Slough) and Franklin Creek (entering Carpinteria Marsh). Many systems are partially impacted by one or several parameters but overall are considered in "fair" condition.

CCAMP has detected trends and changes in water quality at a number of locations in the Region for multiple parameters. There are several examples of dramatic improvements. For example, in some agricultural areas, water toxicity to the "water flea" *Ceriodaphnia* has been significantly reduced in association with reductions of organophosphate pesticide applications. No improvements are yet apparent associated with sediment toxicity and chemistry, and toxicity has been found to other invertebrate test organisms in water. This likely indicates a shift from organophosphate pesticides, to which *Ceriodaphnia* is highly sensitive, to other pesticides that cause toxicity to other test organisms. Nitrate concentrations show improving trends in some locations in the southern part of the Region, including some areas of intensive agriculture, but similar trends are not seen in agricultural areas of the lower Salinas valley. However, at a number of sites showing increasing nitrate concentrations, including in the lower Salinas area, loading (total mass of nitrate) shows significant decreases, potentially because drought and/or reductions in irrigation runoff are reducing the volume of water in the system.

There are several locations with dramatic improvements in water quality associated with waste water treatment plant upgrades, particularly for nitrate. These include Chorro Creek below the California Men's Colony wastewater treatment plant discharge, Santa Ynez River below the City of Lompoc's wastewater treatment plant discharge, and San Simeon Creek below the Cambria percolation ponds.

In many locations, overall water quality scores are high, while biology and habitat scores are relatively low; this is important because poor habitat quality is a significant stressor on benthic communities in streams, and in some cases is the most important stressor. Poor habitat quality can be caused by improper land management, which causes erosion, sedimentation, and removal of critical aquatic habitat.

Healthy Watersheds Report Card

Karen Worcester and Dave Paradies, CCAMP software designer, developed the Healthy Watersheds Report Card project to provide a framework for assessing progress towards the Region's three Measurable Goals of 1) healthy aquatic habitat, 2) proper land management and 3) clean groundwater. The first phase, assessing aquatic habitat, is nearing completion. This includes developing a scoring approach to assess and display aquatic habitat health throughout

the Region using multiple measures of health, including chemistry, biology and physical habitat data. The aquatic habitat assessment builds on a modeled statewide assessment of health developed for the California Water Quality Monitoring Council (Monitoring Council). The Report Card uses the State's modeled assessment as a base layer and corrects it using local data-driven assessments to improve spatial resolution and information content for Central Coast watersheds. Assessment of land management and groundwater goals will similarly make use of both modeled and measured data, as available. The Report Card assessment displays results in color-coded maps and report cards for Central Coast watersheds (e.g., green for healthy, red for unhealthy) (Figure 1).

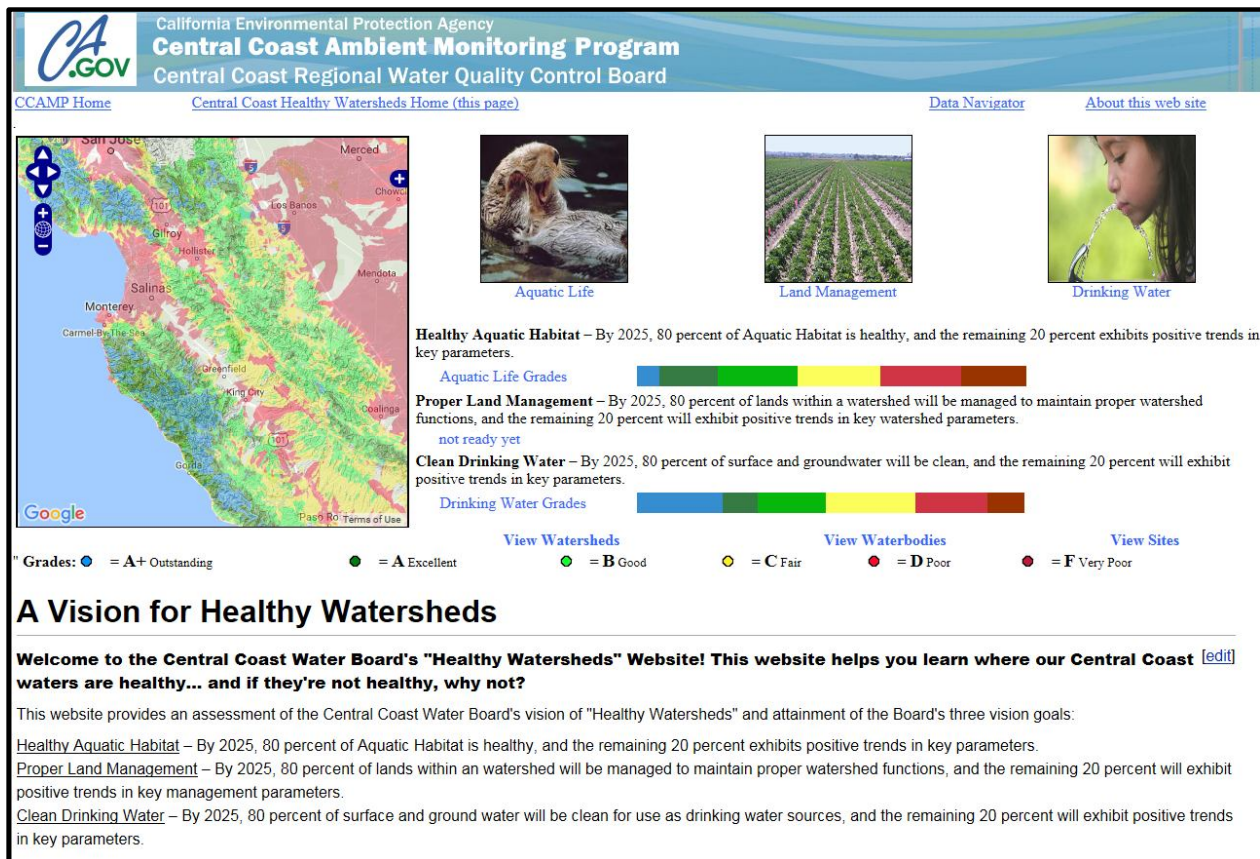


Figure 1: A screenshot of the Central Coast Healthy Watersheds Report Card

The aquatic habitat health assessment is nearing completion, and staff can next turn their attention to work on proper land management and clean groundwater assessments. Going forward, development of the remaining elements of this Report Card will require coordination with staff in disciplines and programs throughout our organization to develop assessment measures and displays of proper land management and clean groundwater. The Report Card project makes complex and often inaccessible data more available to the general public, water quality managers, and other stakeholders, in readily understandable formats that can improve decision-making about water quality, habitat, and overall watershed health. By rolling multiple types of data together into a single spatial and analytical framework, it allows for more informed decisions about the impacts of water quality on overall watershed health.

Karen Worcester has presented the Healthy Watersheds Report Card in a number of State and National venues. Most recently, Karen presented the Report Card system to members of the National Water Quality Monitoring Council and their Water Quality Data Portal development staff. Other local, state and national agencies and organizations have been highly interested in the Report Card's development. Karen is also actively participating in the State's Healthy

Watersheds Workgroup, which is supporting development of the State's Healthy Watersheds data portal for the Monitoring Council. The Monitoring Council is seeking to develop tools similar to those CCAMP has created for the Central Coast Region.

Karen Worcester will provide a demonstration of the Report Card at the Central Coast Water Board's September meeting.

Conclusion

Water Board staff are committed to achieving our mission, vision, and measurable goals. We are also committed to measuring tangible environmental outcomes and to holding ourselves accountable for these results. CCAMP is a critical program that provides us feedback on our actions, measuring our tangible results and therefore ultimately measuring our performance. Staff will continue to develop the CCAMP program and tools that allow all users to readily access, evaluate, and understand the data. Staff will also refine the healthy aquatic habitat portion of the Report Card and continue development of the remaining two components, proper land management and clean groundwater. The Healthy Watersheds Report Card, along with the Data Navigator, are unique, web-based tools that improve understanding of water quality and watershed and groundwater basin conditions in the Central Coast Region, and measure progress towards and achievement of the Central Coast Region's Healthy Watershed Vision and Measurable Goals.