

**Greater Monterey County Integrated Regional Water Management Program
Regional Water Management Group Meeting
June 26, 2017**

Location: Monterey County Water Resources Agency, Salinas, CA

RWMG Attendees:

Horacio Amezcuita – San Jerardo Cooperative, Inc.
Colin Bailey – Environmental Justice Coalition for Water
Joseph Chavez – Environmental Justice Coalition for Water
Ross Clark – Central Coast Wetlands Group
Monica Gurmilan – Environmental Justice Coalition for Water
Brenda Granillo – California Water Service Company
Sarah Hardgrave – Big Sur Land Trust
Tom Harty – Monterey County Resource Management Agency
Bridget Hoover – Monterey Bay National Marine Sanctuary
Alison Imamura – Monterey Regional Water Pollution Control Agency
Elizabeth Krafft – Monterey County Water Resources Agency
Heather Lukacs – Environmental Justice Coalition for Water
Leah MacCarter – Monterey County Resource Management Agency
Mike McCullough – Monterey Regional Water Pollution Control Agency
Christina McGinnis – Monterey County Agricultural Commissioner’s Office
Heidi Niggemeyer – City of Salinas
John Olson – California State University Monterey Bay
Sarah Stevens – Monterey Regional Water Pollution Control Agency
Rae Taylor-Burns – Central Coast Wetlands Group

Non-RWMG Attendees:

Yoram Cohen – Chemical and Biomolecular Engineering Department, UCLA
Mike Godwin – Central Coast Regional Water Quality Control Board
Madelyn Glickfeld – Institute of Environment and Sustainability, Water Resources Group, UCLA
Daisy Gonzalez – Community Member
Lawrence Hinkle – Mission Ranches Company
Alex Huang – State Water Resources Control Board
John Hunt – UC Davis
Maria Kennedy – UCLA
Howard Kolb – Central Coast Regional Water Quality Control Board
Doug Dowden – City of Marina
Katie McNeill – Central Coast Regional Water Quality Control Board
John Mukhar – MNS Engineers, Inc.
Karen Nilsen – Nilsen & Associates
Kristina Olmos – Central Coast Regional Water Quality Control Board
Colby Pereira – Costa Farms, Inc.
Susan Robinson – Greater Monterey County IRWM Program Director

Meeting Minutes

1. Brief Introductions.

2. UCLA Salinas Valley Distributed Water Treatment Project: Dr. Yoram Cohen, Professor of Chemical and Biomolecular Engineering at UCLA, and Madelyn Glickfeld with the UCLA Institute of Environment and Sustainability Water Resources Group presented a wellhead treatment pilot project that they have been conducting in the Salinas Valley to address contaminated drinking water in small

disadvantaged communities, with a specific focus on the removal of nitrate. The project is being undertaken with a grant from the State Water Resources Control Board.

Among the various nitrate removal technologies, the research team selected reverse osmosis (RO), integrated with RO feed pretreatment, as the treatment approach for nitrate removal, in part because it was considered effective for nitrate removal, easiest to implement in remote communities, and would allow for remote monitoring and self-adaptation. Dr. Cohen explained that the membrane removal treatment system removes particular matter, and then the RO membrane removes 94-97% of nitrate, with disinfection and re-mineralization of the product water. He showed an example of a system that UCLA has been operating remotely in the Panoche Drainage District, California. The system is autonomous and self-adapting.

The goals of the project in the Salinas Valley include:

- To find a reliable and affordable option for supplying safe drinking water for small disadvantaged communities where consolidation or digging a new well is infeasible or impractical.
- To demonstrate that geographically separate but virtually networked (autonomous but remotely monitored/operated) treatment systems can be operated in several communities with economies of scale at affordable operating costs.
- To work with the Regional Water Quality Control Board to demonstrate septic tank suitability for residuals discharge from the water treatment systems.

The pilot project is taking place in three small communities:

- Blue Rock Apartments (population 16)
- Pryor Farms (population 36)
- Santa Teresa (population 34)

The team visited each of the communities, conducted onsite testing, and explained and demonstrated the technology. At Blue Rock, the drinking water contained 120 mg/L nitrate measured as NO_3 (where the maximum contaminant level is 45 mg/L nitrate measured as NO_3). The RO treatment produced water with 34 mg/L NO_3 (71%-88% nitrate rejection). At Pryor Farms, the drinking water contained 92 mg/L NO_3 , and the RO treatment resulted in water with 26 mg/L NO_3 (72%-73% nitrate rejection). At Santa Teresa, the drinking water contained 46 mg/L NO_3 , and the RO treatment resulted in water with 6.8 mg/L NO_3 (85% nitrate rejection). Dr. Cohen noted that the RO technology used during these trials did not utilize the highest available nitrate rejection membrane which is now being used by the team and will be deployed in the field systems that will be utilized in the systems to be installed in the three communities.

The end product after RO treatment consists of about 90% drinking water and 10% residual; the residual concentrate would be directed to the septic system. In order to keep the costs (and residual stream) low, there would be a provision that water used for irrigation would not be RO-treated water (i.e., would be well water prior to RO treatment). Also, the team would encourage communities to use the residual water for beneficial uses, such as blending it with irrigation water, or for car washing.

Dr. Cohen discussed septic systems, and explained that most domestic waste influent to septic systems is nitrogen in the form of ammonia, and it is not converted to nitrate in the septic tank but rather when the effluent reaches the leach field, where oxidation can occur under aerobic conditions (the septic tank environment is anaerobic). The residual stream (containing the removed nitrate) from the drinking water treatment system will be diverted to the septic tank, and in the anaerobic environment, oxygen starved bacteria will denitrify nitrates, leaving nitrogen gas, a non-pollutant. The degree of denitrification indicated in the scientific literature varies, but UCLA will be monitoring to determine the extent of denitrification in the pilot community septic system. Dr. Cohen said that UCLA's goal is to reduce the concentration of nitrates left over from water treatment that are returned to groundwater.

Madelyn reviewed next steps, which include:

- Proceed to obtain drinking water permit amendments from the Regional Board.
- Commence with design, construction, installation, and operation of the water treatment systems. They will run these systems remotely from UCLA for three years. The team will create a website, where community members can read their water quality any time of day.
- Implement an extensive monitoring program.
- Aim to expand the program to include additional small communities (consolidating will help bring the costs down).

In three years the project team will have a sense of how much this treatment option will cost.

Heidi Niggemeyer asked about the maximum inflow for the treatment units. Dr. Cohen responded that there is no maximum because each unit is custom designed. Costs per unit could be anywhere from \$15K to \$150K, depending on size and additional features. Madelyn compared that with, for example, \$1 million/mile cost of pipeline to connect with a large water system. Katie McNeill added that it cost \$100K to provide 200 individuals with bottled water for two years. Madelyn noted that the State can subsidize capital costs but not O&M costs; therefore the UCLA Pilot is designed to determine the affordability of O&M costs to disadvantaged communities. Presumably these costs will be lower if there are 10 or 15 communities in a network rather than just three (as in the pilot project).

Heather Lukacs commented that O&M costs have been one of the hardest things to determine during the Salinas Valley Disadvantaged Community Plan process, so the results of this pilot project will be very helpful. Also, wellhead treatment had been considered generally too expensive an option for small disadvantaged communities, but this pilot project may put that option back on the table.

3. Climate Change Vulnerability Evaluation for the IRWM Plan Update: Ross Clark presented the Central Coast Wetlands Group's (CCWG) work to date on updating the Climate Change chapter of the IRWM Plan to meet current State IRWM Program Guidelines. He noted that the current chapter is very good, but needs some updating of data, models, and tools, as well as to link water-related climate change vulnerabilities to work that is currently being done in the region. Ross had sent the Regional Water Management Group (RWMG) members a survey questionnaire, and asked the group to review those questions and send their responses back to either Susan or Ross.

CCWG intern, Rae Taylor-Burns, discussed some updated climate change information that has occurred since the chapter was written and approved in 2012, including: record heat and record low for summer Arctic sea ice in 2016, atmospheric CO₂ hitting 400 ppm in 2013 for the first time, and emission reduction goals being set at the Paris Climate Accord. Other updates include: the UN's International Panel on Climate Change (IPCC) put out a fifth assessment report in 2014 with updated information (the IRWMP chapter used the fourth assessment); California has passed new significant legislation to limit emissions; the Cal-Adapt website has new tools and models (the new website is available at <http://beta.cal-adapt.org/>); and new actions and projects are being undertaken in Monterey County. The CCWG team used Cal-Adapt data to create updated predictive visuals for temperature and precipitation predictions based on averaging four climate models selected by California State agencies. Rae demonstrated the results for Salinas, Big Sur, and the Greater Monterey County region.

Rae noted new examples of “vulnerability” since 2012, including Soberanes Fire and Big Sur road closures due to intensive rain, along with estimated economic costs. She also provided some examples of “adaptive capacity” in Monterey County, including: the Interlake Tunnel, and San Clemente Dam removal (though Sarah Hardgrave noted that the dam removal had to do with earthquake risk rather than climate change). Sarah suggested including the Salinas Valley Water Project as another example. Ross also mentioned the many opportunities for increased water storage during the rainy season (which will be the focus of the Storm Water Resource Plan).

Ross then presented a sea level rise vulnerability study that CCWG has been conducting for Moss

Landing, funded by the Ocean Protection Council. The goals of the project were:

1. Identify what critical coastal infrastructure may be compromised due to sea level rise and estimate when those risks may occur
2. Identify how fluvial processes may increase flooding risk to coastal communities in the face of rising seas
3. Define appropriate response strategies for these risks and discuss with regional partners the programmatic and policy options that can be adopted within Community Plans, Hazard Mitigation Plans, and Local Coastal Plan (LCP) updates

The CCWG team took coastal hazard maps created from 2012-2014 and overlaid them with certain communities to see potential vulnerabilities. The team focused on Moss Landing and Capitola, both of which have experienced increased flooding in recent years. They found that the existing coastal erosion models didn't take into account protective infrastructure already in place, so they inventoried existing coastal protection and water control structures and added those to the modeling (noting that most of the protective infrastructure will need to be replaced by 2030 or 2060; the model reflects that). For the analysis, the team used three different time horizons (the years 2030, 2060, and 2100) with three different sea level rise scenarios to determine coastal hazards. They then analyzed various assets, including land use (e.g., building, farm land, emergency services), water and utilities infrastructure, and parks and recreation. Ross noted that the Potrero Road and Moss Landing Road tide gates play a critical role now, and will continue to do so into the future – but not in perpetuity.

The team looked at existing asset vulnerabilities (with tide gate protection), overlaying the current hazards with FEMA 100-year-flood and 2010 Combined ESA hazard layers, and then looked at future vulnerabilities under the three different time horizons. They then examined vulnerabilities according to different coastal hazards, including: coastal storm and wave impact, fluvial impacts, rising tides, and erosion. With coastal storm and wave impact, Elkhorn Slough will be vulnerable to flooding in 2030 as well as Moss Landing Harbor. They assume the flooding will be restricted by the tide gates, but by 2060, coastal storm and wave impact will bypass the tide gates, extending into Salinas Valley and significantly impacting farm land.

Rising tides will present a challenge for wetland areas, but relatively few buildings will be vulnerable (though ag land will be impacted). There will be significant ag impact with fluvial hazards in the three different time scenarios. The onslaught of waves against the coastline will create erosion hazards with few buildings affected in the 2030 time scenario (assuming coastal armory) but with substantial impacts in the 2060 and 2100 time scenarios. Dune habitat will be especially vulnerable. The CCWG team will be studying how to increase protections. Current protection is provided by the tide gates, levees at the river, and the dunes; Ross said they need to understand all three for managing long-term flooding of the Salinas Valley.

Ross noted that individual hazards place different risks on different infrastructure at different times. Using that information they can identify prescriptive actions to address greatest vulnerabilities in the future. Ross provided an overview of key findings as well as estimated economic impacts of future climate risks. They will be working on a long-term strategy to increase resiliency of the dune system and to allow for inland migration of the dunes long term. Long-term adaptation strategies may include, for the 2030-2060 timeframe: prioritize coastal protection structures for upgrade (e.g., tide gate upgrades, hard armor protection), identify areas for managed retreat, identify areas for redevelopment; and for the 2060-2100 timeframe: implement managed retreat strategies, realign roads and utility infrastructure. Figuring out how to implement managed retreat will be important because the combined hazards will be very difficult to protect against in the long run.

John Hunt commented that 2030 is not far away; there is some urgency to this. He asked, how do we capture that urgency in the IRWM Plan and Storm Water Resource Plan? Ross said they have been working with local and State agencies, which tend to have a “balanced perspective.” He emphasized that

the most important thing to do is to continue the discussions. Regarding IRWM project development, the RWMG should discourage new infrastructure from being constructed in climate hazard areas.

The Moss Landing Sea Level Rise Vulnerability Study will be completed within the next couple of weeks. The Capitola report has been completed and will be released soon. Ross said the City of Monterey has completed a sea level rise vulnerability study as well, and The Nature Conservancy has completed a couple of reports for the lower Monterey coastline.

Heather said she would like to connect Ross and the CCWG team with the UC Davis team that presented at last month's RWMG meeting on drought resilience (focusing on small water systems). Heather also reminded everyone about the upcoming drought resilience workshops that the UC Davis will be conducting.

4. IRWM Stakeholder Perspectives. Susan briefly described the Department of Water Resources' *Stakeholder Perspectives* document and encouraged everyone to read it (it can be accessed at: http://www.water.ca.gov/irwm/docs/IRWM_Recommendations.pdf). Bridget handed out several hard copies. Susan mentioned a letter that had been submitted to DWR jointly from the Roundtable of Regions, EJCW, and the Association of California Water Agencies, which urged DWR to identify and commit to tangible next steps in response to stakeholder input. Colin Bailey (EJCW) added that they are in the process of setting up a meeting with Secretary Laird to push the agenda for supporting IRWM (noting that IRWM is absent from almost all of the versions of the 2018 water bond). That meeting will take place in late July.

5. Project Review Process for IRWM Plan Update: Susan said she had received feedback on the revised Project Review Process for the IRWM Plan that she would like to discuss with the RWMG. Since the meeting was over time, this item was postponed to the July RWMG meeting.

The next RWMG meeting will occur on July 19, 2017, 1:30PM – 3:30PM, location TBD.