# EXECUTIVE OFFICER'S REPORT

**North Coast Regional Water Quality Control Board**
**June 29, 2017**

## Cyanobacteria and Harmful Algal Bloom Monitoring & Response Program Update – Part 2

*Katharine Carter and Rich Fadness*

The May 2017 Executive Officer's report provided an overview on cyanobacteria harmful algal blooms and an update on 2016 conditions in the North Coast Region, with emphasis on results from freshwater samples and public health alert postings. This article reviews the process for reporting and responding to freshwater blooms in the North Coast Region and compares monitoring results from three different sampling methods utilized to characterize benthic blooms originating in river systems.

Bloom Reporting and Response:

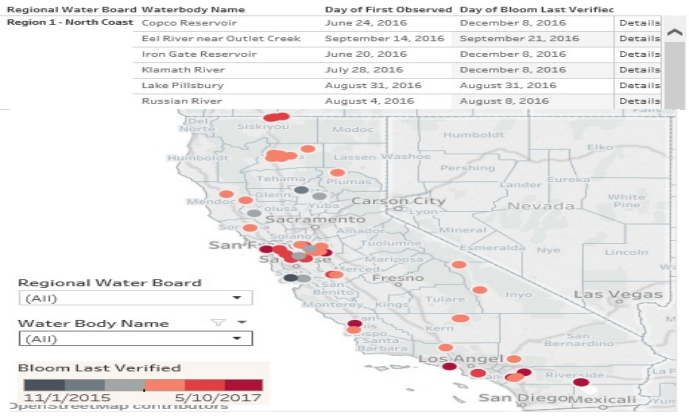
Suspected freshwater harmful algal blooms (HABs) and related human or animal illness can be reported to the State Water Resources Control Board (State Water Board) via the "Report a Bloom" webpage. Reports can be made via web based form, e-mail, phone, or the bloomWatch app.

| Report A Bloom | |
|---|---|
| Web Based Form | Report a bloom webpage: http://www.mywaterquality.ca.gov/habsdo/index.html#how |
| bloomWatch app | https://cyanos.org/bloomwatch/ (Free download – Android, iOS) |
| E-mail | CyanoHAB.Reports@waterboards.ca.gov |
| Phone | 1-844-729-6466 (toll free) |
| | 1-916-341-5357 |

Reports received by the State Water Board are disseminated to the Regional Water Board with jurisdiction over the water body in question, the State Water Board's Division of Drinking Water, the Office of Environmental Health Hazard Assessment, and the California Department of Public Health's duty officer who notifies the appropriate County or City Public Health Officer.

Regional Water Board staff will follow-up with the reporting entity to determine if field investigation is warranted. If it is, Regional Water Board staff will work with the appropriate local entities to confirm if a HAB is present and will initiate sampling as needed. Staff will coordinate response with the land and water managers, local public and environmental health officials, and the Division of Drinking Water.

Data, information, and updates on the HAB investigation will be provided on the interactive map found on the "My Water Quality: Are harmful algal blooms affecting our waters?" webpage (http://www.mywaterquality.ca.gov/habs/index.html). The details tab for each HAB report will provide information on the extent of the bloom, what toxins are present (if any), if public health alert signs were posted or if a do not drink advisory was issued, and who to contact for additional information.




**Interactive Map of Reported Freshwater Harmful Algal Blooms in California**

Regional Water Board staff will continue to track each HAB until data and information reflect that any

potential threat to the public, wildlife, or domestic animals has passed.

Sampling Benthic Blooms – Method Matters:
Cyanobacteria harmful algal blooms (cyanoHABs) occurring in the Klamath River and reservoirs are caused by free-floating, planktonic cyanobacteria cells. CyanoHABs occurring in the Eel, South Fork Eel, and Russian Rivers on the other hand, are benthic blooms originating on the substrate of these rivers. Researchers have been studying cyanoHABs caused by planktonic cells for many years as they are common throughout the United States and throughout the world. Conversely, relatively little research has been conducted on benthic blooms. Since 2015, Regional Water Board staff work has focused on monitoring for the protection of public health while collecting additional data to further our understanding of the habitat, growth, and toxin production of benthic cyanobacteria found in our rivers so we can better understand the exposure routes and the risk factors causing these blooms.

The traditional method of toxin sampling during a cyanoHAB involves taking a water grab sample, where a sample bottle is filled with water from a water body at a particular location and point in time. This type of sampling captures "free" toxin in the water column (extracellular) and free-floating cyanobacteria cells in which toxins are bound within the cells (intracellular). Given that benthic blooms are much less likely to be free-floating cells in the water column, and thus less likely to be captured in a traditional water grab sample, Regional Water Board staff also collect benthic cyanobacteria mat grab samples. This consist of physically removing some cyanobacteria mat material from the substrate and placing it in a sample bottle. The third method used to sample toxins is the deployment of passive, time-integrated samplers called Solid Phase Adsorption Toxin Testing (SPATT) bags; which are mesh bags that contain a synthetic resin that toxins adsorb to as the water flows through the bag.

**Solid Phase Adsorption Toxin Tracking (SPATT) bag in the Eel River. Photo Courtesy of Keith Bouma-Gregson**

Results from these multi-parameter monitoring effects have shown the importance of collecting cyanobacteria mat grab samples when monitoring in water bodies with benthic blooms. As reflected in the table below, simply measuring cyanotoxins present in the water column may result in underestimating the potential health threat. Cyanobacteria mat grab sample results provide insight into the toxins which are bound within cells but not yet released into the water column. Not only is this a source of cyanotoxins that will eventually be released to the water column, but these toxin-rich cyanobacteria mats are especially dangerous to dogs, which will preferentially eat cyanobacteria and thus could be exposed to high levels of toxins.

| Sample Method | Anatoxin (Neurotoxin) |
|---|---|
| SPATT | Non Detect |
| Water Grab | Non Detect |
| Cyano Grab | >15,750 ug/L |

**Sample results from the Russian River between Healdsburg and River Front Park – 9/11/2016**

During the 2017 monitoring season, the Regional Water Board will continue to implement these three monitoring methods in an effort to better understand toxin dynamics, exposure routes, and risks of these benthic blooms in our river systems.

For additional information please contact Katharine Carter at 707-576-2290 or Katharine.Carter@waterboards.ca.gov

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## Timber Regulation and Forest Restoration Fund Program *Fred Blatt*

The Timber Regulation and Forest Restoration Fund (TRFRF) Program, which began implementation in January 2013, is a component of Assembly Bill 1492 (AB1492). The TRFRF is funded by a one-percent assessment on lumber and engineered wood products sold at the retail level. The major elements of the TRFRF Program (http://resources.ca.gov/forestry/) are to seek transparency and efficiency improvements to the State's timber harvest regulation programs, provide for development of ecological performance measures, establish a forest restoration grant program, and require program reporting to the Legislature. The latest Annual Report to the Legislature (March 13, 2017) can be found at the following link: http://resources.ca.gov/forestry/ab_1492/.

Regional Water Board timber program staff are involved in assisting with the implementation of the TRFRF Program. We actively participate in monthly TRFRF Leadership Team meetings with the California Natural Resources Agency, Assistant Secretary for Forest Resource Management, and representatives from CAL FIRE, California Department of Fish and Wildlife, California Geologic Survey, the Board of Forestry, and the State Water Board. These monthly meetings help manage the overall efforts of the TRFRF Program and several associated Working Groups. The Leadership Team also assists with implementation of a watershed Pilot Project, development of the CalTREES on-line timber harvest plans, training needs, agency coordination through development of regional and local roundtables, and receives updates on forestry related issues from throughout the state such as the (http://www.fire.ca.gov/treetaskforce/) and the Board of Forestry (BOF) Effectiveness Monitoring Committee (http://www.bof.fire.ca.gov/board_committees/effectiveness_monitoring_committee_/).

Staff also participate in Working Groups and projects that help to implement the TRFRF program, including:

The **Ecological Performance Measures Working Group** is charged with developing ecological performance measures for management outcomes on the State's forest and timberlands.

The **Data and Monitoring Working Group** works to identify and address data and data needs related to the implementation of the two accountability areas established by AB1492:
1) Environmental Data Assembly and Sharing, and
2) Ecological Performance Measures.

**The Forest Planning Watershed Pilot Project** is a pilot project at the planning watershed scale addressing data collection and characterization, identification of information and methods used for cumulative environmental impacts assessment, and the identification of restoration opportunities in a forested landscape. The project is highly collaborative, multi-disciplinary, and provides opportunity for public participation.

Regional Water Board staff also participates in the BOF Effectiveness Monitoring Committee as an official committee member. This committee's charter is to understand if specific requirements of the California Forest Practice Rules and other laws and regulations related to forest resources are effective in achieving resource objectives. This is a key component of adaptive management.

Finally, Regional Water Board staff manage several grants awarded to the North Coast grantees under the TRFRF Grant Program.

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## Russian River Watershed Association Environmental Column – June 2017

### *Santa Rosa Unveils Its New Sustainable Education Garden*

*This article was authored by the City of Santa Rosa's Water Use Efficiency Team, on behalf of RRWA, and is printed with permission.*

The Sustainable Education Garden, located at Santa Rosa's City Hall, will celebrate its grand opening

June 20th from 10:00 -11:30 am. Join us for the ribbon cutting ceremony, refreshments, and a tour to highlight the innovative features built into this beautiful garden. Attendance is free, but please RSVP to watersmart@srcity.org.

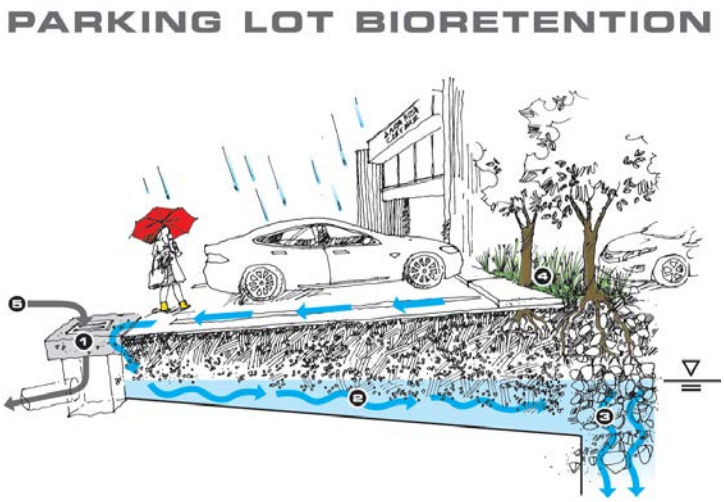
**Funding from the State**
The City of Santa Rosa received $806,174 in grant funds from the State Water Resources Control Board to create an educational garden that demonstrates on-site stormwater capture and treatment, and low water-use landscaping. To create the final design, City staff, design professionals, and community members participated in open design sessions and a 30-day public comment period, with the project's landscape architect. City engineering staff completed the civil design work.

**Improving Water Efficiency**
This project converted 34,000 square feet of lawn and ivy into drought tolerant, low water-use landscaping. Upgrades include replacing the old inefficient overhead spray irrigation system with a high-efficiency drip system, and installation of a new weather-based irrigation controller that will apply water only when the plants need it, preventing waste and supporting plant health. This smart controller also uses flow-sensing technology to detect leaks or breaks and will alert staff to issues. The landscape and irrigation improvements from this project reduced site water requirements by 54 percent.

**Harnessing Stormwater**
Stormwater runoff from the City Hall area flows directly into Santa Rosa Creek, which subsequently flows into the Laguna de Santa Rosa. Untreated stormwater runoff typically carries pollutants from parking lots and hardscapes to local waterways. Sediment, nutrients, bacteria, higher water temperatures and decreased dissolved oxygen from urban stormwater runoff can negatively impact water quality and aquatic habitat. Capturing, cleaning and infiltrating stormwater runoff before it has a chance to leave a site improves water quality, and protects wildlife habitat in our local waterways.

The City Hall Sustainable Education Garden includes carefully designed swales and bioretention features that will slow and capture stormwater runoff to naturally clean and improve water quality onsite.

The diagram below shows how the new Low Impact Development (LID) features can remove pollutants before the stormwater infiltrates and recharges ground water: porous concrete rings installed around existing storm drain inlets capture stormwater runoff, 1) and direct it into lined permeable rock trenches, 2) and structural soil, 3) where the plants in the bioretention planters, 4) can then collect, absorb, and begin to treat stormwater.




Additional features include 4,100 square feet of permeable concrete paving throughout the garden and a 2,100- gallon cistern that will collect and reuse rainwater from the City Hall roof. This rainwater harvesting system provides a stormwater LID function by storing rainwater for slow release into the swale, effectively mimicking the pre-development conditions.

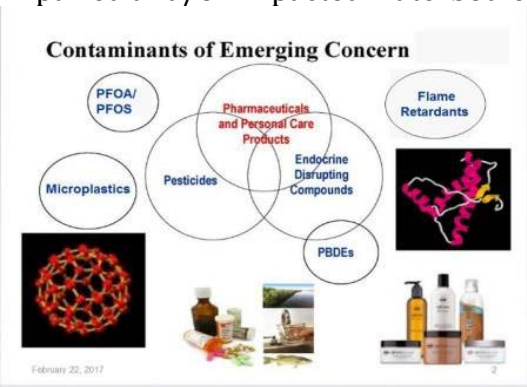
**Enhancing Community Spaces**
The design of the Sustainable Education Garden invites the public to enjoy the City Hall campus in new ways. Visit the open-air classroom that

features seating for formal workshops or informal gatherings, or take a self-guided tour using the educational signs around the garden, which explain the benefits of Low Impact Development and Russian River-Friendly landscaping practices. To learn more about the project, please visit www.srcity.org/1177/Sustainable-Education-Garden.

## New monitoring tools at center of State Water Board's CEC monitoring Plans.

*Below is an excerpt from a recent newsletter by the Society of Environmental Toxicology and Chemistry (SETAC), Southern California Chapter. The author is Dr. Keith Maruya of Southern California Coastal Water Research Project (SCCWRP), who has been conducting the Russian River CECs monitoring since 2015 under a contract with the State Water Board. We expect a final report in the next few months.*

State Water Board (SWB) staff presented an update on monitoring and regulatory strategies for constituents of emerging concern (CECs) to Board members on February 22, 2017 at CalEPA headquarters in Sacramento. Front and center in the proposed approach for ambient monitoring of CECs are bioanalytical and non-targeted tools that are being adapted to bolster current monitoring workflows, which often fall short of addressing CECs. Pilot investigations in northern and southern California are showing that cell bioassays are effective in screening for endocrine disrupting chemicals (EDCs). Staff emphasized, however, that more evaluation of these assays is needed, particularly in regions with the largest number of impaired and/or impacted waterbodies.




CECs like prescription drugs, fragrances, garden pesticides and flame retardants for textiles and electronics are diverse and ubiquitous.

### Monitoring of CECs presents unique challenges

CECs are substances that may pose a risk to ecological or human health, but for which limited data exist. Picked out from thousands of chemicals found in commercial and consumer products, CECs include natural and synthetic hormones, antibiotics, laundry detergents, and plastic components that are flushed down the drain on a daily basis. CECs are removed to varying degrees by wastewater treatment plants, but there is no active treatment for urban runoff. When it rains, CECs wash off into coastal waters, often with little time and space for attenuation.

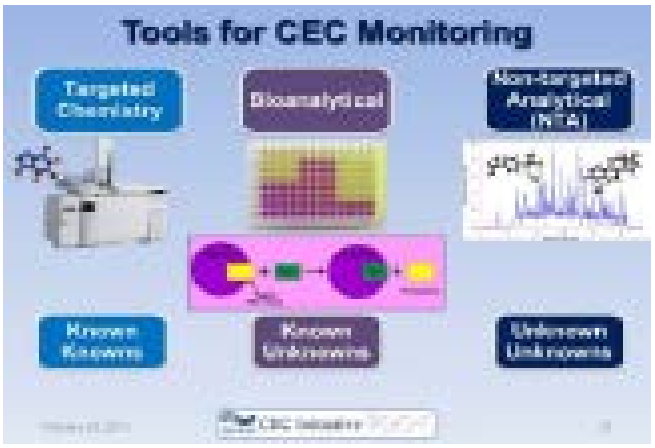
Current water quality monitoring relies on measuring individual chemicals and short-term lethal toxicity. The number of chemicals that get targeted (about 1,000) is limited by both technology and cost, and the long-term effects associated with many CECs are missed. In receiving waters, contaminants from multiple sources blend together to create mixtures whose impacts on water quality is not fully characterized using current monitoring tools. These same issues are germane to recycled and drinking water, where breakdown products of CECs may be generated by treatment processes and practices (e.g. chlorination).

CECs enter waterways via discharge of treated wastewater and surface runoff to form a "chemical soup." Many CECs dissipate rapidly, but others persist in sediments or wildlife.

### Experts recommend new monitoring tools

In 2009, the SWB commissioned a panel of experts to develop recommendations for CEC monitoring. In 2012, the panel recommended development of bioanalytical and non-targeted instrumental tools to address the impacts of CECs. In 2015, the panel's findings were synthesized into guidance for developing and test driving these tools statewide. A

monitoring strategy incorporating these tools was presented to the Board at the Feb. 22 meeting. "In addition to optimizing existing analytical methods and toxicity testing, we support the development of bioanalytical tools and non-targeted analysis (NTA) as an innovative and cost-effective means to monitor for CECs we know about, but also to capture the possible impacts from unknowns," said Claire Waggoner, Senior Environmental Scientist for the SWB's Division of Water Quality. "We see the utility of this framework now and into the future, as the mix of chemicals being produced changes over time."



Bioanalytical tools and non-targeted analysis were proposed by Water Board staff to better screen for and identify problematic CECs.

**Bioscreening and NTA being test-driven statewide**

Initiated by the Surface Water Ambient Monitoring Program (SWAMP) in 2016, bioanalytical screening and NTA were incorporated in pilot investigations of water quality across the state. Surface water samples from the Russian, Los Angeles and San Gabriel river watersheds, along with dozens of smaller streams in southern California, were screened for EDCs and carcinogens using cell bioassays adapted for water quality. Early results suggest that the potential for endocrine disruption is low in the Russian River and small SoCal streams; results from effluent-dominated systems are pending.

"We recognize the importance of these new CEC monitoring tools," said Shin-Roei Lee, Assistant Executive Officer for the North Coast Regional Water Quality Control Board. "Pesticide usage in our region changes over time, so there's a good reason to be vigilant. These tools will allow us to answer the most relevant questions we pose about CECs."

**Building consensus and future research**

While bioanalytical and non-targeted tools show promise, the bigger challenge for state regulators is formulating a cohesive strategy that is applicable to the water quality community statewide. "We believe innovation is essential to modernize water quality monitoring in the face of ever-changing conditions," said Greg Gearhart, Deputy Director of the SWB's Office of Information Management and Analysis (OIMA), which oversees SWAMP. "We will continue to promote the evaluation of the best new monitoring tools and to communicate and build consensus across the State on the sound application of these tools."

Meanwhile, researchers are poised to expand the applicability of these tools, and help managers interpret and apply bioanalytical screening and NTA data. Among the highest-priority efforts underway or in the later stages of planning are:

- Expanding the bioanalytical "toolbox" beyond screening for EDCs and carcinogens
- Establishing thresholds for bioscreening assays via linkage to higher order effects levels
- Cataloguing of known and unknown CECs in water and sediment using NTA
- Application of bioanalytical tools and NTA for CECs in recycled and drinking water

The Water Board is committing a healthy chunk of change to support research on water quality advancements through Proposition 1 (AB 1471), which recently authorized $7.5 billion in general obligation bonds for projects including surface and groundwater storage, ecosystem and watershed protection and restoration, and drinking water protection. This commitment will ensure that policies to preserve water quality across California are based on the best and most up to date science.

Left unchecked, CECs can affect populations of juvenile salmonids, sensitive indicators of water quality.

# Enforcement Report for June, 2017 Executive Officer's Report

***Diana Henrioulle***

| Date Issued | Discharger | Action Type | Violation Type | Status as of June 7, 2017 |
|---|---|---|---|---|
| 5/17/17 | Gholami Michael Mohammed & Nahid A. Trust | NOV | Failure to operate remediation system per CAO requirements | Ongoing |

**Comments:** On May 17, 2017, the Point Source and Groundwater Protection Division Chief issued an NOV to Gholami Michael Mohammed & Nahid A. Trust for failure to notify the Regional Water Board that the remediation system at the property located at 440 Hearn Avenue in Santa Rosa (Site) had been shut down. Under Cleanup and Abatement Order (CAO) R1-2013-0018, the Discharger is to operate the approved remediation system until groundwater water quality objectives for the Site constituents of concern are achieved and until the Regional Water Board Executive Officer determines that the system is no longer required. The CAO also requires the Discharger to notify the Regional Water Board staff of a shutdown of the groundwater extraction system lasting longer than one day. The Discharger shut the system down on May 25, 2016, but failed to notify the Regional Water Board. The NOV directs the Discharger to comply with all requirements of the CAO no later than June 12, 2017.

| Date Issued | Discharger | Action Type | Violation Type | Status as of June 7, 2017 |
|---|---|---|---|---|
| 5/23/17 | Eureka City Elk River WWTF | ACLC | MMPs | Ongoing |

**Comments:** On May 23, 2017, the Assistant Executive Officer issued Administrative Civil Liability Complaint No. R1-2017-0029 to the Eureka City Elk River Wastewater Treatment Plant for Mandatory Minimum Penalties in the amount of $27,000.

| Date Issued | Discharger | Action Type | Violation Type | Status as of June 7, 2017 |
|---|---|---|---|---|
| 6/1/17 | Jennifer Nielsen | NOV | Violation of CAO | Ongoing |

**Comments:** On June 1, 2017, the Planning, Stewardship, and Compliance Assurance Division Chief issued an NOV to Jennifer Nielsen for failure to comply with CAO R1-2015-0048. CAO required completion of all restoration work by October 15, 2015. The NOV directs the Discharger to provide a detailed schedule of what actions will be taken, when and by whom in order to obtain compliance with the CAO by June 30, 2017.

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