City of Santa Barbara
Sustainability and Resilience Department

Memorandum

DATE: July 17, 2024

TO: Creeks Restoration/Water Quality Improvement Program
Citizen Advisory Committee

FROM: Jill Murray, Water Quality Research Analyst

SUBJECT: Annual Water Quality Research and Monitoring Plan

COMMITTEE DIRECTION – FOR ACTION

That the Committee concur with the staff recommendation to implement the proposed Research and Monitoring Plan for Fiscal Year 2025 (FY 25).

DISCUSSION

Background

Creeks Division staff have monitored water quality in local water bodies since the Division was formed in 2001. Each year, the Creeks staff review and revise as necessary the annual Research and Monitoring Plan. In July 2023, the Committee concurred with the staff recommendation to implement the Water Quality Research and Monitoring Plan (Research Plan) for Fiscal Year 2024 (FY 24). In December 2023, the Committee received an update on FY 23 results and in May 2024 the Committee received a presentation on the Beach Swimming Risk study. At this time, the Committee will review the proposed Research Plan for Fiscal Year 2025 (FY 25).

Fiscal Year 2025 Research and Monitoring Plan

The following are the goals and focus areas for FY 25.

The purpose of the monitoring program is to obtain information that can be used to:

1. Develop strategies for water quality improvement, including evaluation and prioritization of projects and programs.
2. Understand changes over time in surface water quality.
3. Communicate effectively with the public about water quality.

4. Understand the role of climate change and sea level rise in altering creek conditions.

The goals of the monitoring program are to:

1. Assess the impacts of chemical and microbial pollutants:
    a. Identify suspected pollutants of concern, including traditional pollutants such metals, organics, nutrients, fecal indicator bacteria, trash, and sediment, and emerging contaminants such as personal care products, newer pesticides, microplastics, per- and polyfluoroalkyl substance, and pathogens; and evaluate laboratories for testing opportunities. Include field properties such dissolved oxygen, pH, temperature, conductivity, and chlorophyll a.
    b. Quantify the levels (concentration, flux, and/or load) of microbial contamination and chemical pollution in watersheds.
    c. Evaluate impacts of pollution on beneficial uses of creeks and beaches, including recreation and habitat for aquatic organisms.
        i. Compare pollutant levels to known toxicity thresholds.
        ii. Use toxicity testing and bioassessment to assess impacts.
    d. Identify sources of pollutants to creeks and storm drains, including interactions with groundwater and infrastructure.
2. Evaluate the effectiveness of the Creeks Division projects on improving water quality, which includes collecting baseline data for future projects.
3. Implement hydrologic models of creeks in order to predict alterations in flow due to climate change.
4. Evaluate the role of infiltration and groundwater movement on creek water quality and quantity, including the intersection with sea level rise.
5. Where feasible, evaluate the effectiveness of City programs such as street sweeping and outreach in reducing pollutants.
6. Evaluate long-term trends in water quality and quantity.
7. Meet monitoring requirements for grants.
8. Meet General Permit monitoring requirements.
9. Investigate 303(d)-listed waterbody impairments.
10. Employ contemporary tools to conduct advanced research and monitoring with rigorous quality standards and data management methods.

In FY 25, the Research Plan will focus on five main efforts. The Research Plan follows very closely the FY 24 Plan, as all efforts are ongoing, with a focus on long term and required monitoring, 303(d) targeted sampling, and microbial source tracking. In addition, work on the Clean Streets, Clean Seas microplastic project will be continued and methods utilizing environmental DNA will continue to be incorporated into bioassessment and restoration studies.

FY 25 Monitoring Efforts

During FY 2025, the Creeks Division will continue sampling required by the City's NPDES General Permit, including outfall testing, 303(d) sampling (biweekly indicator bacteria sampling at several locations), and Special Studies sampling, which requires calculations of load reduction based on rainfall rates. Dry-weather monitoring at long-term monitoring sites will also be conducted. Project assessment monitoring will include sampling at the Bird Refuge, Arroyo Burro Open Space, Barger Canyon, and the City's bioretention planters. Emerging contaminants and toxicity will be assessed during storm events. As in prior years, contracts will be awarded to Ecology Consultants, Inc. for bioassessment monitoring and Dr. Holden (UCSB) for annual microbial source tracking. Environmental DNA to identify invertebrate and vertebrate species will be used in bioassessment and restoration monitoring. Based on community input, a storm monitoring focus will include high levels of foam observed in Arroyo Burro; recent observations suggest that saponins produced by native plants may contribute to the observed foam.

Microbial Source Tracking

Results from dry and wet weather microbial sampling conducted by UCSB and chemical sampling conducted by the Creeks Division signal potential contamination in Laguna Channel, which discharges into Mission Lagoon and East Beach at Mission Creek. The Beach Risk Swimming study assessed potential swimming risk in the ocean during dry weather and found extremely low risk of illness from swimming. In FY 25 Creeks Division staff will review pending wet weather results from FY 24 and conduct quantitative risk assessment calculations to assess the level of concern during wet weather. Pending FY 24 results, FY 25 sampling will include additional testing in Laguna Channel Watershed and at integrator sites (the most downstream sites above tidal influence) of Arroyo Burro, Mission Creek, and Sycamore Creek to continue assessing for potential new water quality problems. In addition, the Creeks Division is sampling ocean and creek samples during dry and wet weather to contribute to the Southern California Coastal Waters Research Project's Bight '23 regional monitoring project for health risk from swimming. The samples are filtered in house and filters are delivered to Los Angeles County Sanitation District's laboratory for processing. In a new development, the Creeks Division will test new technology allowing for samples to be processed in house for human waste markers. The "laboratory in a box" will be rented for three months and pending results, the rental price may be applied to purchase the equipment. A study will also be planned to understand the role of shallow groundwater in moving contaminants to the storm drain system.

303(d) Targeted Sampling

Based on the Clean Water Act, the Regional Water Quality Control Board (Regional Board) assesses impairments to water bodies (creeks, estuaries, and beaches) every three years for a range of pollutants. The impairments are specific to beneficial uses such as recreation, habitat, and water supply. In the most recent effort (2022), several

impairments of Santa Barbara creeks were added to the list of impaired water bodies, some of which were based on very limited sampling (ten data points). Creeks staff will resume consulting with Regional Board staff to finalize a sampling plan to determine which of the new impairments are supported by additional testing. Results will be provided to the Regional Board to support triennial review of impairments.

Clean Streets, Clean Seas Grant

In FY 23, the Creeks Division applied for and has been awarded a grant from NOAA's National Sea Grant program under the Marine Debris Competition. The grant involves collaboration among the City, the University of California, Santa Barbara (Dr. Patricia Holden), the San Francisco Estuary Institute, the Southern California Coastal Water Research Program, the Moore Institute for Plastic Pollution Research and the consulting groups Wood and Cascade Pacific. The focus of the project is quantifying how street sweeping, catch basin cleaning, and full capture trash devices may intercept and remove microplastic prior to discharge to creeks, estuaries, and the ocean. During FY 25, dry weather and wet weather samples will be collected and plans for an optimization study will be finalized.

Southern California Stormwater Monitoring Coalition

The City of Santa Barbara has been invited to join the Southern California Stormwater Monitoring Coalition (SMC). The SMC is a regional partnership of stormwater management agencies working to develop solutions to regional challenges in stormwater management. Since its founding in 2001, the SMC has pooled resources and expertise to collaboratively conceptualize, develop and fund stormwater research and monitoring initiatives across coastal southern California. Creeks Division staff will attend quarterly meetings and decide which research projects should receive Measure B funding, totaling approximately $25,000-$40,000 per year to start in FY 26. The benefit to the Creeks Division is to join larger and more rigorous projects than could be conducted locally, with statistically relevant results that will inform stormwater best management practice and permitting.

Budget

Sufficient funds exist in the FY 25 Creeks Division Budget for the proposed research and monitoring.

Timeline

Staff will begin implementing the FY 25 Research and Monitoring Plan and perform scheduled monitoring beginning in July 2024. The FY 24 Annual Report will also be completed and presented to the Committee in December 2024.

cc: Melissa Hettrick, Interim Creeks Division Manager
Alelia Parenteau, Sustainability and Resilience Director