CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

PROJECT APPLICATION FORM

Name of Project: Creating Tools to Assess Adverse Effects of Organic Matter Pollution on Estuarine Sediments

Project Applicant: Southern California Coastal Water Research Project

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Problem Statement:

San Diego estuaries are an important regional resource, providing critical habitat for endangered and migratory species of birds and fish, among other beneficial uses. The majority of the estuaries in this region are “bar-built”—so named because they experience seasonal restriction and/or closure at the ocean inlet due to low freshwater flow and an energetic wave environment that builds a sand bar at the inlet. These bar built estuaries are at heightened risk for impairment from biostimulatory conditions and eutrophication (i.e. accumulation of organic matter), in part due to increased deposition of organic matter from the watershed (e.g. nonpoint source inputs, sewage spills, scouring of nuisance algal growth in stream, etc.) during restricted inlet conditions. Currently, five of San Diego Lagoons are on the 303(d) list of impaired waters for eutrophication-related impairments, including low dissolved oxygen, macroalgae and poor benthic habitat quality. While the State of California has existing sediment quality assessment (SQA) tools, comprised of interpretive indices of benthic macroinvertebrates, sediment chemistry, and toxicity, this tool is optimized for toxic contaminants, not organic matter accumulation. What’s more, the existing SQA tools don’t work well in many estuaries because of lower salinity regimes (< 17 ppt). A refined tool and regulatory endpoints are needed to assess to impacts of sediment organic matter impacts in San Diego bar built estuaries in order to assess compliance with MS4 and NDPES permits and as numeric targets for nutrient TMDLs. The purpose of this study is to expand on the existing SQA toolkit in order to create causal assessment tools that identify impacts from sediment organic matter loading

Work Plan containing tasks and deliverables compartmentalized into partial funding opportunities, if applicable.

This project will consist of four primary tasks including:

1) **Develop a Conceptual Model and Compile Existing Data and Information.** We will develop a conceptual model of potential pathways of impairment associated with accumulated sediment organic matter on beneficial uses. A functional trait database will be compiled to identify characteristics of benthic macroinvertebrates with sensitivity to specific pathways in which organic matter impacts aquatic life. Existing data will be compiled from publically available data on benthic macroinvertebrate taxonomy, sediment organic carbon, nitrogen, and grain size from Bight Regional Monitoring Program surveys, NPDES and MS4 monitoring programs, EPA EMAP and National Coastal Assessments, and other available data sources. The *products from this task* are: 1) a technical memo with the conceptual model of impacts of organic matter accumulation, 2) a database of functional traits of benthic invertebrate response to sediment organic matter accumulation, 3) a database of available data that has undergone quality assurance for the purpose of metadata analyses.

2) Metadata analysis, tool development, with emphasis on synthesis of information supporting regulatory endpoints. The compiled data from task 1 will be analyzed to: 1) identify sites that represent reference condition, 2) create a eutrophication index based on benthic macroinvertebrate taxonomic composition that represents a gradient in increasing stressor from organic matter accumulation, 3) a synthesis and key graphics of this biological condition gradient, identifying thresholds in organic matter content associated with reference condition, no adverse effect, resistance and exhaustion thresholds. The product from this task is oral presentations to the San Diego Regional Board staff and its stakeholders, with an emphasis on outreach to disadvantaged communities.

3) Reporting. The *product from this task* will be project reporting including quarterly and annual reports, as necessary, and the project final report. All electronic databases will also be given to the San Diego RWQCB.

Timeline (from funding approval) with milestones and end dates.

1) Conceptual model development, functional trait database, and compilation and quality assurance of available sediment quality data. Four months.
2) Metadata analysis, tool development, and synthesis of thresholds of organic matter thresholds of impact on benthic macroinvertebrates. Eight months from data compilation (Task 1).
3) Reporting - Final Report 3 months from metadata analysis.

Total estimated project time: 14 months pending funding availability and rainfall.

Budget broken down into tasks.

1) Conceptual model, functional trait database, and compilation of existing data. $35,000
2) Metadata analysis and synthesis of thresholds: $65,000
3) Reporting. $25,000

Total Project Cost: $125,000
Each task can be funded independently.

Discuss all permitting requirements, including CEQA, and their status. If exempt, cite applicable statute.

Since this project will analyzing existing data, there will not be a requirement for any construction permits, and it would be exempt from CEQA/NEPA requirements (Article 18, Section 15306. Information Collection).

Watershed(s) affected.

This project will affect all San Diego Region watersheds and provide opportunities to reduce the primary risks to estuarine aquatic life and degraded water quality. The project proposes improvements support the control of legacy organic matter, non-point and point source loading (including spills). Tasks will focus on conditions of eutrophication within estuaries that will that address disadvantaged communities and/or 303(d) listed waterbodies, where optimization is important to protect public health, but will also support efficient use of public funds.

Describe if this project can be a basis for additional funding from other sources.

This project has several opportunities for co-funding and in-kind service contributions. These opportunities include leveraged state-funded projects (i.e., State Water Board) or regulated party contributions (i.e., Stormwater Monitoring Coalition). These collaborations can be used to offset project costs and enhance stakeholder outreach.

Monitoring, success criteria, and other tools to track long-term success.

Success criteria of this project will be defined utilization of the assessmen tool in ambient assessments and as numeric targets in TMDLs. Long-term success will be quantified by improvement of eutrophication conditions in San Diego Lagoons. Long-term monitoring will be accomplished through a combination of existing TMDL monitoring requirements and via the recurring [Bight] Regional Monitoring of sediment habitat quality via the Contaminant Impact Analysis. Additional Performance Goals include standard Water Board requirements including timely completion of tasks,

production of high quality data following Surface Water Ambient Monitoring (SWAMP) protocols, and data submittal to the California Environmental Data Exchange Network (CEDEN).

Description of how the project is resilient to climate change.

This project helps the San Diego Region by developing a tool that will identify conditions that increase the susceptibility of bar-built estuaries to climate change. A warming climate, coincident with labile sediment organic matter, will cause increase bacterial activity and proliferation in water column hypoxia, macroalgal blooms, and poor benthic habitat quality. A quantitative tool and thresholds will help to target restoration or remediation actions that can remove legacy organic matter and target BMPs to remove sources of organic matter loading to estuaries.

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Applicant's ability/authority to receive and distribute funds.

The Southern California Coastal Water Research Project is a Joint Powers Authority, which serves as a governmental agency and enables direct authority to receive SEP funds. SCCWRP has received SEP funds from the San Diego Regional Board in the past, and has always completed the projects on time and on budget.

Is the project to conduct work that is required by any entity/agency? (e.g. cleanup or mitigation)

This project is not required by another entity/agency. Development of this tool can improve the efficacy of TMDLs and Water Quality Improvement Plan-identified implementation actions.