Item 4c

CALIFORNIA OCEAN PROTECTION COUNCIL

Staff Recommendation
April 24, 2018

Screening for Contaminants of Emerging Concern in Sediment and Fish Tissues from the Southern California Bight

Holly Wyer, Program Manager

RECOMMENDED ACTION: Authorization to disburse up to $425,500 to the Southern California Coastal Water Research Project to conduct a bioscreening and non-targeted analysis for contaminants of emerging concern in sediment and fish tissue samples from the Southern California Bight.

LOCATION: Southern California Bight (from Point Conception south to the United States-Mexico border)

STRATEGIC PLAN OBJECTIVE: The proposed project addresses Ocean Protection Council Strategic Plan Objective 9.1: Support an integrated approach to water management that minimizes harm to the health of downstream ocean and coastal ecosystems.

EXHIBITS

Exhibit A: Support Letters

FINDINGS AND RESOLUTION:

Staff recommends that the Ocean Protection Council (OPC) adopt the following findings:
"Based on the accompanying staff report and attached exhibit(s), the Ocean Protection Council hereby finds that:

1) The proposed project is consistent with the purposes of Division 26.5 of the Public Resources Code, the Ocean Protection Act.
2) The proposed project is consistent with the Ocean Protection Council's grant program funding guidelines (Interim Standards and Protocols, August 2013).
3) The proposed project is not a 'legal project' that triggers the California Environmental Quality Act pursuant to Public Resources Code section 21068 and Title 14 of the California Code of Regulations, section 15378."

Staff further recommends that the OPC adopt the following resolution pursuant to Sections 35500 *et seq.* of the Public Resources Code:

"The California Ocean Protection Council hereby approves the disbursement of up to $425,500 to the Southern California Coastal Water Research Project (SCCWRP) to conduct a bioscreening and non-targeted analysis for contaminants of emerging concern in sediment and fish tissue samples from the Southern California Bight.

This authorization is subject to the condition that prior to disbursement of funds, SCCWRP shall submit for the review and approval of the Executive Director of the OPC detailed work plans, schedules, staff requirements, budgets, and the names of any contractors intended to be used to complete the projects, as well as discrete deliverables that can be produced in intervals to ensure the projects are on target for successful completion. All projects will be developed under a shared understanding of process, management and delivery."

PROJECT SUMMARY:

Contaminants of emerging concern (CECs) are new and emerging contaminants that are unregulated in a water quality context. CECs may include pharmaceuticals, personal care products, and pesticides, among other substances. Assessing impacts of CECs on aquatic ecosystem health is challenging due to their occurrence and potential for harmful effects at exceedingly low concentrations, and the ever-changing landscape of CECs found in receiving waters. Moreover, current chemical-specific monitoring does little to address unmonitored or unknown substances or the cumulative impacts of multiple CECs.

This project is a special study that would be added to the work already being conducted through the Southern California Bight Regional Monitoring Program (Bight '18). Bight '18 is a cooperative effort among dozens of water quality agencies to assess the how human activities have affected the health of the Southern California Bight. Bight '18 participants will collect sediment and sportfish tissue samples and analyze them for more than 200 known pollutants, sediment toxicity, and benthic community health. This project will build on the sample collection and analysis provided through Bight '18 by analyzing samples using a combination of bioanalytical screening tools (bioscreening) and non-targeted CEC analysis, as described in more detail below. Bioscreening involves using engineered cells to detect CECs in samples; the cells release a florescent protein when they bind to a CEC. Bioscreening detects CECs based on how they interact with cells; however, this method does not identify which CEC is causing the reaction.

To gain a better understanding of bioscreening results, the project will also run a subset of samples through a non-targeted analysis for CECs. Non-targeted analysis reveals all the chemicals present in the sample, including those chemicals that cannot currently be identified through targeted screening. This project, coupled with the analyses provided through Bight '18, will enhance current monitoring by putting the CEC assessment done by this project into context. Coupling bioscreening with non-targeted analysis will improve our ability to identify and prioritize CECs that are most likely to impact aquatic ecosystem health.

OPC funding would pay for the screening and analysis of up to 68 sediment and 54 fish tissue samples

for CECs. The analysis would begin with running the samples through bioscreening. The samples would be analyzed for 3 different cell bioscreening endpoints[1]:

- Estrogen receptor – detects CECs that mimic estrogens and may cause feminization or impaired reproduction
- Aryl hydrocarbon receptor – detects CECs that interfere with cell reproduction, and may cause tissue damage or cancer
- Anti-androgen receptor – detects CECs that block testosterone and may cause impaired reproduction

A subset of approximately 20 samples will be selected for non-targeted chemical analysis. Comparative analysis of CECs detected across habitats will be performed to determine if distinct sources may be found. The information provided by the bioscreening and non-targeted analysis will also complement and assist in the interpretation of data collected on contaminant exposure, accumulation, and effects as part of Bight '18.

The goal of this Bight '18 special study is to screen for CECs that occur in coastal and marine environments. Specifically, the questions this study aims to address are:

1. What is the extent and magnitude of bioscreening responses in sediments from the Southern California Bight?
2. What is the extent and magnitude of bioscreening responses in sportfish from the Southern California Bight?
3. Are there habitat-specific chemical fingerprints from CECs in sediments from the Southern California Bight?
4. Can bioscreening responses be correlated with CEC concentrations determined by targeted and non-targeted chemical analyses?[2]

Overall, this project will help managers identify new CECs that are being found in the marine environment and will enhance future monitoring practices, scientific research, and guidance to protect coastal water quality.

Project Timeline: This is a three-year project ending in Fall 2021.

PROJECT FINANCING:
Staff recommends that OPC authorize encumbrance of up to $425,500 to SCCWRP to conduct a bioscreening and non-targeted analysis for CECs in sediment and fish tissue samples from the Southern

[1] It is important to note that this project is screening for CECs. Bioscreening results mean that a CEC has been detected, not that it causes harm. Detection of a new CEC would lead to additional research to determine its toxicity and impacts.
[2] Bioscreening is a less expensive method to detect CECs than targeted or non-targeted chemical analyses. Using this study to determine whether the degree of bioscreening response can be correlated to CEC concentrations may provide a more efficient way to assess CEC concentrations in the future.

California Bight.

Ocean Protection Council	$425,500
TOTAL	**$425,500**

The anticipated source of funds will be from the Ocean Protection appropriation of the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84). Proposition 84 authorizes the use of funds for purposes consistent with Section 35650 of the Public Resources Code, establishing the California Ocean Protection Trust Fund (Pub. Res. Code § 75060(g)). Under Section 35650(b), Ocean Protection Trust Fund monies may be expended for projects authorized by OPC that are identified as appropriate Trust Fund purposes, as specified. The project is consistent with the Trust Fund purposes as discussed in the following section.

Leverage of OPC funds

Although there is no formal match for this project, the funds provided by OPC will be highly leveraged through in-kind contributions provided by Bight '18 participants. These contributions include sample collection, screening sediment and fish samples for targeted CECs, and screening sediment and fish samples for traditional pollutants.

CONSISTENCY WITH CALIFORNIA OCEAN PROTECTION ACT:

The proposed project is consistent with the Ocean Protection Act, Division 26.5 of the Public Resources Code, because it is consistent with trust-fund allowable projects, defined in Public Resources Code Section 35650(b)(2) as projects which: Improve management, conservation, and protection of coastal waters and ocean ecosystems, and provide monitoring and scientific data to improve state efforts to protect and conserve ocean resources.

CONSISTENCY WITH THE OPC'S STRATEGIC PLAN:

This project implements Focal Area D: Coastal, and Ocean Impacts from Land. Specifically, Objective 9.1, which supports an integrated approach to water management that minimizes harm to the health of downstream ocean and coastal ecosystems.

CONSISTENCY WITH PROPOSITION 84 (The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006; Public Resources Code §75060(g)

This project is consistent with Proposition 84 because it involves the development and implementation of information to conserve marine wildlife. This project would help us develop a better understanding of pollution threats to marine wildlife and would inform how to better conserve marine wildlife and recreationally important fish species.

CONSISTENCY WITH THE OPC'S GRANT PROGRAM FUNDING GUIDELINES:

The proposed project is consistent with the OPC's Grant Program Funding Guidelines for Proposition 84

funds, in the following respects:

Required Criteria

1. Directly relate to the ocean, coast, associated estuaries, or coastal-draining watersheds: This project is screening and analyzing CECs in ocean sediments and sportfish.
2. Support of the public: This project has support from a number of entities. Please see Exhibit A for support letters.
3. Greater-than-local interest: This project is being implemented regionally in the Southern California Bight, but the methods being tested are of interest across California and the results will inform management statewide.

Additional Criteria

4. Improvements to management approaches or techniques: This project tests a new screening tool to assess CECs in marine environments.
5. Resolution of more than one issue: As mentioned above, this project tests a new screening tool, but also provides an overview of CECs occurrence in the Southern California Bight, puts CECs into context with other pollutants, and provides an opportunity for scientists and managers to identify new CECs.
6. Leverage: As mentioned above, although there is no formal match for this project, the project is highly leveraged with in-kind efforts from Bight ’18 participants.
7. Timeliness or Urgency: Bight ‘18 will begin sample collection in the summer of 2018 and SCCWRP has the capacity and ability to finish the project in a timely manner.
8. Coordination: This project involves coordination between a large number of local and state and federal agencies. These partners are providing in-kind leverage for sample collection, sediment toxicity and in situ benthic community analysis, and targeted CEC screening.

COMPLIANCE WITH CEQA:

The proposed project is exempt from review under the California Environmental Quality Act (“CEQA”) pursuant to 14 Cal. Code of Regulations Section 15378 because the project involves processing sediment and fish tissue samples and does not have the potential for resulting in a physical change in the environment.