

**Southern California Bight
2018 Regional Marine Monitoring Program
(Bight '18)**

**Sediment Quality Assessment
Workplan**



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CONTENTS

I. INTRODUCTION	2
Previous Regional Monitoring Studies	3
2018 Survey	4
II. STUDY DESIGN	8
A. Study Objectives	8
B. Sampling Design	9
B1. Sediment Quality Impacts	9
B2. Bioaccumulation.....	10
C. Indicators	11
C1. Contaminant Exposure Indicators	12
C2. Biological Response Indicators	14
C3. Habitat Condition Indicators	14
C4. Bioaccumulation Indicators.....	15
III. LEVERAGED STUDIES	16
IV. REFERENCES	28
APPENDIX A	30
APPENDIX B	37
APPENDIX C	51
APPENDIX D.....	67
Screening for Contaminants of Emerging Concern in Southern California Bight	68
Sediment Transport.....	70
Characterizing Meiofaunal Assemblages in the Southern California Bight	72
CA Halibut Juvenile Index of Abundance, and Age at Length Relationships.....	75

I. INTRODUCTION

The Southern California Bight (SCB) is an important and unique ecological resource. This open embayment along the coast stretches from Point Conception to Punta Colonet (south of Ensenada), Baja California. The SCB is a transitional area that is influenced by currents from cold, temperate ocean waters from the north and warm, tropical waters from the south. In addition, the SCB has a complex topography, with offshore islands, submarine canyons, ridges and basins, bays and estuaries, which provide a variety of habitats. The mixing of currents and the diverse habitats in the SCB allow for the coexistence of a broad spectrum of species, including more than 500 species of fish and several thousand species of invertebrates. The SCB is also a major migration route, with marine bird and mammal populations ranking among the most diverse in north temperate waters.

The coastal zone of the SCB is a substantial economic resource. Los Angeles/Long Beach Harbor is the largest commercial port in the United States, and San Diego Harbor is home to one of the largest US Naval facilities in the country. More than 100 million people visit Southern California beaches and coastal areas annually, bringing an estimated \$9 billion into the economy. Recreational activities include diving, swimming, surfing, and boating, with tourism and recreational activities in Southern California valued at nearly \$5 billion (Kildow and Colgan 2005).

The SCB is also one of the most densely populated coastal regions in the country, which creates stress upon its marine environment. Over 21 million people inhabit coastal Southern California (US Census Bureau 2010). Population growth generally results in conversion of open land into non-permeable surfaces. More than 75% of Southern California's bays and estuaries have already been dredged and filled for conversion into harbors and marinas (Horn and Allen 1985). This "hardening of the coast" increases the rate of runoff and can impact water quality through addition of sediment, toxic chemicals, pathogens and nutrients to the ocean. Besides the impacts of land conversion, the SCB is already home to fifteen municipal wastewater treatment facilities, eight power generating stations, 10 industrial treatment facilities, 4 desalinization plants, and 18 oil platforms that discharge to the open coast.

Each year, local, state, and federal agencies spend more than \$31M to monitor the environmental quality of natural resources in the SCB (Schiff et al. 2001). At least 75% of this monitoring is associated with National Pollutant Discharge Elimination System (NPDES) permits and is intended to assess compliance of waste discharge with the state and federal regulations, which set water quality standards for effluent and receiving waters. Some of this information has played a significant role in management decisions in the SCB.

While these monitoring programs have provided important information, they were designed to evaluate impacts near individual discharges. Today, resource managers are encouraged to develop management strategies for the entire SCB. To accomplish this task, managers need regionally-based information to assess the cumulative impacts of contaminant inputs and to evaluate relative risk among different types of stressors. It is difficult to use local datasets to evaluate regional issues because the monitoring was designed to be site-specific and is limited to specific geographic areas. This place-based monitoring provides substantial data for

some areas, but there is little or no data for the areas in between. Beyond the spatial limitations, data from these programs are not easily merged to examine relative risk. The parameters measured often differ among programs, and even when the same parameters are measured, the methodologies used to collect the data often differ and interlaboratory quality assurance (QA) exercises to assess data comparability are rare. As a result, the Southern California Bight Regional Marine Monitoring (Bight) Program was born from the frustration of environmental managers' inability to answer regional questions about the SCB coastal environment (NRC 1990).

Previous Regional Monitoring Studies

There have been five previous regional monitoring efforts to address environmental concerns at larger spatial scales (Table 1). The first regional monitoring survey in 1994, called the Southern California Bight Pilot Project (SCBPP), was a compilation of 12 agencies that cooperatively sampled 261 sites along the continental shelf between Point Conception and the United States/Mexico border. The second regional monitoring survey, called the Southern California Bight 1998 Regional Monitoring Program (Bight '98), was comprised of 64 agencies that cooperatively sampled 416 sites between Point Conception and Punta Banda, Mexico and included new habitats such as ports, bays, and marinas. The third regional monitoring survey, called the Southern California Bight 2003 Regional Monitoring Program (Bight '03), was comprised of 65 agencies that cooperatively sampled 391 sites between Point Conception and the United States/Mexico border, and expanded the number of habitats from Bight '98 to include estuaries and deep ocean basins. The fourth regional monitoring survey, called the Southern California Bight 2008 Regional Marine Monitoring Program (Bight '08), was comprised of 61 organizations that sampled 383 sites between Point Conception and the United States/Mexico border, and included new contaminants of emerging concern. The fifth survey, the Southern California Bight 2013 Regional Marine Monitoring Program (Bight '13), was comprised of 34 organizations that sampled 397 sites between Point Conception and the United States/Mexico border, including the new habitats of submarine canyons and marine protected areas.

Benefits derived from the previous Bight Programs included the development of new useful technical tools that could only be developed with regional data sets and participation by multiple organizations. For example, the program produced iron-normalization curves for the SCB, allowing distinction between natural and anthropogenic contributions of metals in sediments (Schiff and Weisberg 1999). A Benthic Response Index was developed that integrates complex benthic infaunal data into an easily interpreted form that describes the degree of perturbation at a site (Smith et al. 2001). These types of tools have culminated in management tools such as the State of California's Sediment Quality Objectives (SQOs; Beegan and Bay 2012). The Bight Regional Program have also improved the comparability among the monitoring organizations in the SCB. The quality assurance and quality control (QA/QC) significantly improved following laboratory intercalibration exercises for chemistry, group training for field crews, and taxonomic resolution for biologists. The Regional Monitoring Program has also produced a series of manuals containing standardized field, laboratory and data management activities that increased continuity of data and data reporting among participants, even after the regional monitoring surveys were completed. Many of these manuals are now mandated in NPDES monitoring and reporting programs region-wide.

2018 Survey

The proposed Southern California Bight 2018 Regional Monitoring Program (Bight '18) is a continuation of the successful cooperative regional-scale monitoring in Southern California. Bight '18 builds upon the previous successes and expands on the 2013 program by including new participants, answering additional questions, and measuring more parameters. Forty-six organizations, including international and volunteer organizations, have agreed to participate (Table I-2). The inclusion of multiple participants, many of them new to regional monitoring, provides several benefits. Cooperative interactions among many organizations with different perspectives and interests, including a combination of regulators and dischargers, ensure that an appropriate set of regional-scale questions will be addressed by the study.

The Bight '18 Program is organized into five technical components: 1) Sediment Quality (formerly Contaminant Impact Assessment/ Coastal Ecology); 2) Microbiology; 3) Ocean Acidification; 4) Harmful Algal Blooms; and 5) Trash. The Sediment Quality component focuses on sediment contaminants and associated impacts on benthic infauna and demersal fish. This Workplan provides a summary of the sediment quality project design. The Workplan is supported by four companion documents including the Field Methods and Logistics Manual, Benthic Laboratory Manual, Toxicology Laboratory Manual, Information Management Plan, and Quality Assurance Plan (QAP). Separate Workplans are also available for the other elements of Bight '18.

FIGURE I-1. Map of the Southern California Bight sampling domain.

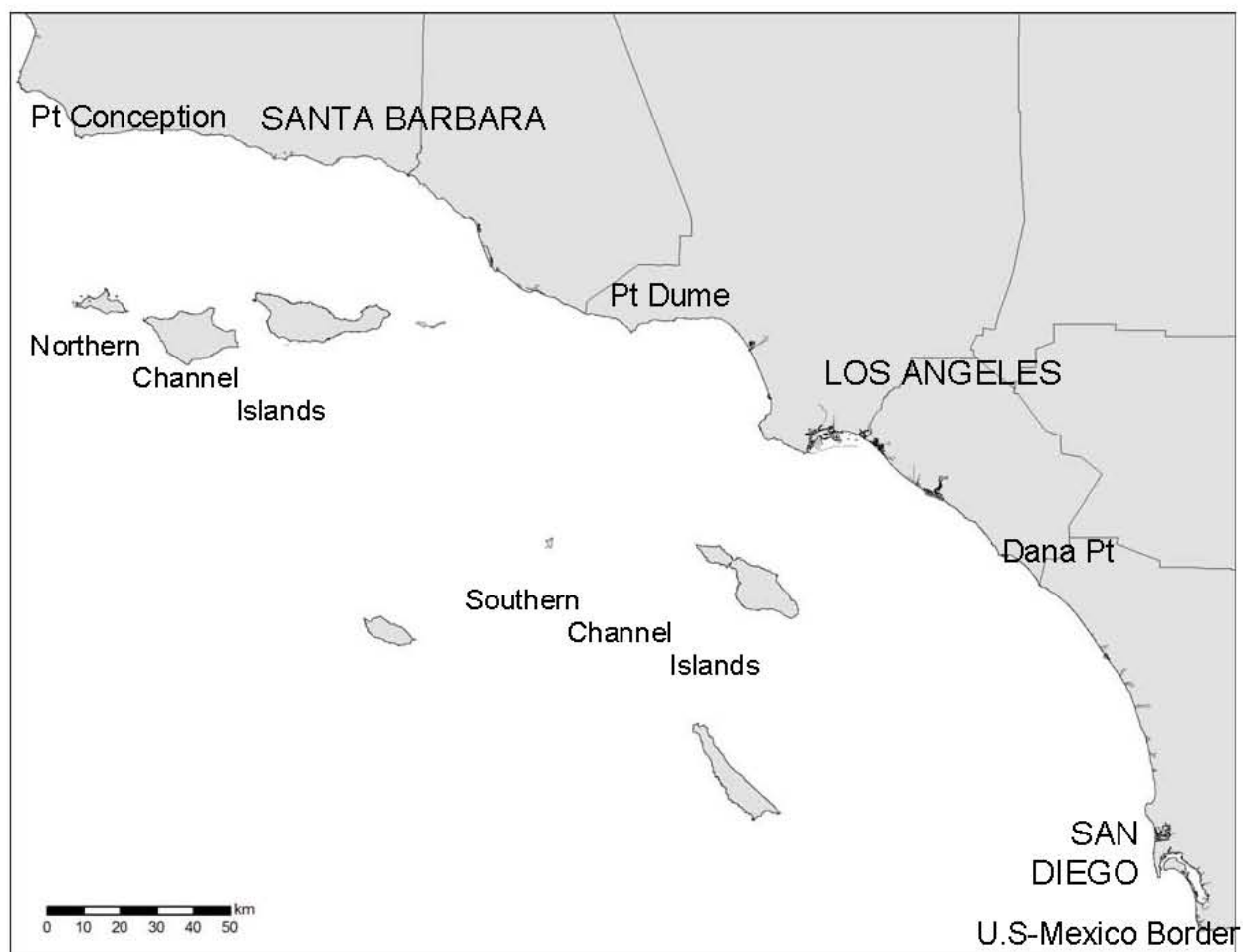


Table I-1. Summary of Bight Regional Marine Monitoring Programs.

Strata	1994 (Pilot Project)	1998 (Bight '98)	2003 (Bight '03)	2008 (Bight '08)	2013 (Bight '13)	2018 (Bight '18)
Inner Shelf	X	X	X	X	X	X
Middle Shelf	X	X	X	X	X	X
Outer Shelf	X	X	X	X	X	X
Upper Slope			X	X	X	X
Lower Slope and Basin			X	X	X	X
Submarine Canyons					X	
Channel Islands		X	X	X	X	X
Marine Protected Areas					X	
River Mouths	X	X				
Mexico		X				X
Marine Estuaries			X	X	X	X
Brackish Estuaries						X
Marinas		X	X	X	X	X
Ports		X	X	X	X	X
Bays		X	X	X	X	X
POTWs		X	X			

TABLE I-2. Participants in the Bight '18 Regional Monitoring Program, Sediment Quality.

AES Corporation
Amec Foster Wheeler / Wood
Anchor QEA
Aquatic Bioassay and Consulting Laboratories (ABC)
Bureau of Ocean Energy Management (BOEM)
CalScience Environmental Laboratories, Inc.
Channel Islands National Marine Sanctuary (CINMS)
Chevron USA Products Company
City of Los Angeles, Department of Water and Power (LADWP)
City of Los Angeles Environmental Monitoring Division (CLA-EMD)
City of Oceanside
City of Oxnard
City of San Diego
Dominguez Channel Watershed Management Group (City of Los Angeles, Los Angeles County Flood Control District, Los Angeles County, City of Lomita, City of Carson, City of El Segundo, City of Hawthorne, City of Inglewood, City of Lawndale)
EcoAnalysts
Encina Wastewater Authority
Greater Los Angeles and Long Beach Harbor Waters Regional Monitoring Coalition (RMC)
Los Angeles Regional Water Quality Control Board (LARWQCB)
Los Angeles County Department of Public Works
Los Angeles County Sanitation Districts (LACSD)
MBC Aquatic Sciences
National Oceanic and Atmospheric Administration (NOAA)
Nautilus Environmental, Inc.
Naval Facilities Engineering Command (NAVFAC) Southwest
NES Energy, Inc.
NRG Energy, Inc.
Orange County Sanitation District (OCSD)
Orange County Public Works
Pacific EcoRisk
Physis Environmental Laboratories, Inc.
Port of Long Beach
Port of Los Angeles
Riverside County Flood Control and Water Conservation District
San Diego County Dept. of Environmental Health and Municipal Co-permittees
San Diego Regional Harbor Monitoring Program (RHMP)
San Diego Regional Water Quality Control Board (SDRWQCB)
San Diego Unified Port District
San Elijo Joint Powers Authority
Santa Ana Regional Water Quality Control Board
Southern California Coastal Water Research Project (SCCWRP)
Space and Naval Warfare (SPAWAR) Systems Center Pacific
State Water Resources Control Board
U.S. Fish and Wildlife Service (USFWS)
U.S. Geological Survey (USGS)
Vantuna Research Group, Occidental College
Weck Laboratories, Inc.
Weston Solutions, Inc.

II. STUDY DESIGN

A. Study Objectives

The overall goal of the sediment quality component of Bight '18 is to assess the condition of the benthic environment and the health of the biological resources in the SCB. To accomplish this goal, Bight '18 will focus on three primary questions:

1. What is the extent and magnitude of sediment quality impacts in the Southern California Bight?
2. How does the extent and magnitude of sediment quality impacts vary over time in the Southern California Bight?
3. What is the extent and magnitude of bioaccumulation of select contaminants in seafood in the Southern California Bight?

Impacts refer to ecological changes resulting from exposure to contaminated sediment. The first question, estimating the area (i.e., number of square kilometers) in which ecological conditions differ from reference conditions, is a departure from traditional approaches to environmental monitoring that generally focus on estimating average condition. Estimating the areal extent of ecological change offers several advantages. First, it provides a more direct assessment of status. For instance, identifying that the average Shannon-Weiner (H') benthic diversity in the SCB provides less useful information for environmental managers than does identifying what percentage of the area in the SCB has impaired biological communities. A corollary to this concept is the assessment of regional reference condition. Since most monitoring programs in the SCB are site specific, assessment of regional reference condition allows managers to compare individual sites to the breadth and depth of natural variation in the SCB.

There are two sub-objectives within the areal extent and magnitude question. The first sub-objective is to determine if the areal extent and magnitude varies among geographic regions. If we answer this question, then managers can determine if specific areas are in worse condition than others, such as areas near anthropogenic inputs versus those areas distant from inputs. Therefore, Bight '18 will compare conditions among 11 geographic areas of interest (strata, Table II-1). These strata were selected to represent a range of natural and potentially affected habitats, and are inclusive of most of the habitats sampled in Bight '13, except for the submarine canyons and MPAs strata, which will not be sampled in Bight '18. However, Bight '18 has one new stratum never focused on previously; brackish estuaries (salinities less than 27ppt). Comparison of the relative condition among strata provides information about the geographic distribution of impacts and may indicate the relative risk among a variety of pollutant discharges. An assessment of conditions may be conducted by comparing the extent of area exceeding a threshold of concern or to a mean condition.

The second sub-objective within the areal extent and magnitude question is to assess the relationship between biological responses and direct contaminant exposure. Such associations provide the information necessary for risk assessment, and for developing efficient regional strategies for protecting the environment by identifying the predominant types of stress in the SCB ecosystem. Therefore, this sub-objective will be accomplished by simultaneously collecting

numerous measures of biological response, contaminant exposure and habitat condition (Table II-2) to better identify when exposure has reached a level of concern. Measuring multiple indicators also permits the identification of the most likely type of exposure leading to biological response. Furthermore, multiple indicators can be integrated into an overall index of impact using the SQO framework.

The second primary question is to assess trends in estimates of areal extent and magnitude of sediment quality impacts. If habitats of concern improve over time, then this demonstrates the effectiveness of cumulative management actions. If habitats of concern worsen, then this demonstrates the need for management action. However, if some habitats improve and others worsen, then the average condition might not change. By estimating the areal extent of alteration, we will be better able to describe these changes. We have designed Bight '18 to build upon previous surveys to assess trends in areal extent and magnitude. This will be accomplished by revisiting a subset of randomly sampled sites from 1998 and 2003, which were revisited in 2008 and 2013.

The third question is to assess bioaccumulation of select chemicals in higher-order predators, specifically species that are popular for human consumption. Bioaccumulation in seafood measured during the Bight '08 survey identified chlorinated hydrocarbons and metals in edible tissues and helped to identify locations of greatest concern in the SCB. This study question builds on the Bight '08 study to investigate those species with tissue concentrations exceeding California Office of Environmental Health Hazard Assessment (OEHHA) Fish Advisory Tissue Levels.

B. Sampling Design

The Sediment Quality sampling design for Bight '18 will be divided into two components. These include areal extent, magnitude, and trends in 1) sediment quality impacts and 2) bioaccumulation in sport fish.

B1. Sediment Quality Impacts

The areal extent, magnitude, and trends component of Bight '18 will involve sampling a target of 330 sites for sediments in the SCB between July 1 and September 30, 2018. The summer period was chosen for the study because it represents a period of consistent weather during which the indicators measured are expected to remain stable.

Maps of the sampling sites are provided in Appendix A. Sites were selected using a stratified random approach, with the strata corresponding to the habitats of interest in Table II-1. Stratification ensures that an appropriate number of samples are allocated to characterize each habitat of interest with sufficient statistical power. Thirty sites were allocated to each stratum because this yields a 90% confidence interval of about $\pm 10\%$ around estimates of areal extent (assuming a binomial probability distribution and $p = 0.2$; Figure II-1). This level of desired precision was selected because differences in response of less than 10% among strata are unlikely to yield different management decisions.

Sites were selected randomly within each stratum, rather than by investigator pre-selection, to avoid bias and to allow for extrapolation of the response for the entire stratum. Although sites were selected randomly, a systematic component was added to the selection process to minimize clustering of sample sites. The systematic element was accomplished by using an extension of the sampling design used in the SCBPP and in EPA's Environmental Monitoring and Assessment Program (EMAP) (Stevens 1997). A hexagonal grid is randomly placed over a map of the sampling area, a subsample of hexagons is chosen from this population, and samples are obtained at randomly selected sites within grid cells. The hexagonal grid structure ensures systematic separation of the sampling, while the random selection of sites within grid cells ensures an unbiased estimate of ecological condition.

One of the design attributes of Bight '18 is to maximize the coincidence of indicators, allowing us to relate biological response to chemical exposure and physical habitat condition. The number of sites sampled for each indicator type within each stratum is presented in Table II-3. To maximize overlap of indicators, sites that receive fewer indicator measurements were randomly chosen (with a systematic element) as a subset of the sites at which all indicators are measured.

Approximately half of the sites in each of the eight strata are revisits of previously sampled sites to assess trends. These strata include the 5-30m, 30-120m, 120-200m, and 200-500m depth zones on the coastal shelf, as well as marinas, ports, bays and estuaries. One quarter of the sites will be from Bight '98, one quarter will be from Bight '03, all of which were revisited during the Bight '13 and will be sampled again during Bight '18. The remaining half will be new sites for Bight '18. Because field teams can sample any site within a radius of 100 meters, new sites selected for the Bight '18 survey must fall outside of a radius of 200 meters from a revisit station to be considered an independent site. All sites were randomly selected and spatially unbiased so estimates of spatial extent are still valid. The number of revisit sites was based on an analysis of the spatial and temporal variance of the 105 revisited sites sampled over the previous three Bight surveys. Variance was evaluated for infauna as well as representative chemical parameters (total DDT, total PCBs, total PAHs, copper, zinc, total organic carbon, total nitrogen, and percent fines). Spatial variance was calculated as the average variance among sites within a stratum during a single survey. Temporal variance was calculated as the average variance of a single site across multiple sampling events. A variance ratio was calculated as the ratio of the spatial variance by the temporal variance (if these two measures of variance were equal, the ratio would be 1). The results indicated that spatial variance and temporal variance were similar, with space being slightly more variable than time, particularly in the offshore strata (Figures II-3 and II-4), thus revisiting half of the sites slightly favors trend detection. Given this analysis, the planning committee decided to maintain the previous ratio of revisits to new sites to maintain consistency between surveys.

B2. Bioaccumulation

This component has both a spatial extent and magnitude component in its design. Preliminary trends may also be investigated using the previous fish bioaccumulation study from

Bight '08. For Bight '18 we will use the Bight '08 sampling design, which followed five basic guiding principles:

1. Make region-wide assessments
2. Target fish species that people eat
3. Sample locations where species are caught
4. Measure tissues that are consumed
5. Analyze constituents that represent potential risk to human consumers

Sampling locations for this study will be comprised of fishing zones, which are a subset of the 68 state-wide zones defined by OEHHHA. The use of the zone concept is consistent with the direction that OEHHHA will take in the future development of fish consumption guidelines for coastal areas because previous Southern California advisories issued on a pier-by-pier basis were unsatisfactory. Fishing zones recognize that fish are mobile, which can result in variable contaminant exposure as well as a range of locations to be caught.

A targeted sampling design will be used to examine bioaccumulation in seafood. Twenty-seven (27) fishing zones have been delimited from Point Conception to the US/Mexico International Border for this study (Figure II-2). The offshore extent of fishing zones was confined to 200 m depth (approximate shelf break), but most frequently extended only as far as 60 m depth since this is the limit of most recreational fishers. The longshore extent of fishing zones was selected using the following criteria:

1. Fishing pressure. Zones are smaller and more numerous in areas with more fishing pressure. Popular fishing locations were identified from Jones (2004) and discussions with stakeholders.
2. Homogeneity of contamination. Fishing zones were delineated based on known gradients of contamination to ensure as consistent exposure as possible to fish species. Contamination gradients were defined using previous regional monitoring data (Schiff 2000).
3. Stakeholder interest. Some intensification was provided where stakeholders had specific interest and resources.
4. Complete coverage. The entire SCB coastline must be sampled.

Fishing will be conducted by the California Department of Fish and Wildlife under the auspices of the SWRCB's Surface Water Ambient Monitoring Program (SWAMP). Fishing will occur between June 1 and September 30, 2018 by a variety of gear including seines, trawls, hook and line, trap, and spear (BOG 2009).

C. Indicators

Bight '18 will measure multiple indicators (Table II-2) at each site to relate contaminant exposure, biological response, and habitat condition. Collecting measures of contaminant exposure with measurements of biological response at common sites allows investigators to identify and statistically model associations between altered ecological conditions and

environmental stresses. Habitat indicators help discriminate between changes caused by anthropogenic and natural factors. These multiple metrics can be combined into an index of overall sediment quality impacts using the SQO framework.

The probability-based sampling design provides a framework for integrating data into a comprehensive regional assessment, but the validity of such an assessment depends on ensuring that all the data that contribute to it are comparable. Therefore, under the Bight '18 program, all indicators will be measured using consistent sampling methods throughout the SCB. Below, we present a short description of the methods used to measure the Bight '18 indicators; more detailed descriptions of the methods can be found in the accompanying Field Methods and Quality Assurance Manuals for the project.

C1. Contaminant Exposure Indicators

Contaminant exposure will have three components: sediment chemistry, marine debris, and harmful algal bloom toxins. The latter two will be coordinated with other Bight '18 Elements (Trash and Harmful Algal Blooms, respectively).

1. Sediment Chemistry: Chemical analysis of sediment samples provides an assessment of contaminant exposure for bottom dwelling animals. Sediment samples will be collected from the top 2 cm (coastal sites) or top 5 cm (embayments) of a Van Veen grab sample, or a 6-inch sediment core (brackish estuaries). The chemical analyte list includes both inorganics and organics (Table II-4) and was developed to include comparisons to local programs and to state and national monitoring datasets such as California's SWAMP or NOAA's Status and Trends program. The constituent list and associated reporting limits were specifically developed for comparison to sediment quality guidelines such as the State of California's SQOs (SWRCB 2008). All chemistry measurements will follow performance-based quality assurance guidelines described in the Bight '18 Quality Assurance Plan.

1a. Organics

Organic compounds in sediments will be extracted with solvents and cleaned to remove interfering substances. PAHs will be analyzed by GC/MS. Organochlorine pesticides and polychlorinated biphenyls will be analyzed by GC/ECD, GC/MS, or GC/MS/MS. The accuracy of PCB measurements will be enhanced by measuring 41 individual congeners in all samples with elevated concentrations. The PCB congener list was selected to include compounds that are abundant in the environment and compounds with a high potential for toxicity. Thirteen polybrominated diphenyl ethers (PBDEs) congeners will be analyzed by GC/ECD, GC/MS, or GC/MS/MS. The PBDE congener list was selected to include compounds that were present in the original technical mixtures, are abundant in the environment and compounds, and have a high potential for bioaccumulation. PAHs, chlorinated hydrocarbons, and PCBs will be measured in all strata. Pesticides (Pyrethroids and Fipronyl) will be measured in embayment strata only. PBDEs will be measured at all embayment strata and in a subset of offshore strata (those sites coinciding with the toxicology samples).

1b. Inorganics

Metals in sediments will be analyzed by ICP, ICPMS, or atomic absorption spectrophotometry after strong acid digestion. Methyl mercury will be analyzed by cold vapor technique. In addition to trace metals, the reference elements iron and aluminum will also be measured in each sample. Normalization of the trace metal data to reference element concentrations will enable anthropogenic contamination to be distinguished from natural variations in background concentrations. Metals will be analyzed in all Bight strata.

2. Marine Debris: The amount of plastic, metal, and other debris on the ocean bottom is a measure of human impact. Debris captured in trawls will be classified by type (e.g., plant material, plastic, and cans, etc.) and scored according to relative abundance. For more detail on the marine debris assessment, please refer to the Bight '18 Trash workplan.

3. Harmful Algal Bloom Toxin: Blooms of the marine diatom genus *Pseudo-nitzschia* that produce the neurotoxin domoic acid (DA) have been documented with regularity along the coast of Southern California (Smith et al., 2018) and cause major socioeconomic impacts, including prolonged closures of key fish, bivalve and crab fisheries, health advisories, and marine wildlife illness and mortalities. However, the fate and persistence of DA has been historically understudied. Fluxes of DA from the pelagic euphotic zone to deep waters and into sediment have been documented in Southern California (Sekula-Wood et al., 2009, 2011; Schnetzer et al., 2007) but there have been no regional studies to date focused on the long-term impacts and fate of DA to benthic communities. An event response survey conducted after a DA bloom in 2017 indicated DA in both sediment and benthic infauna samples collected from Los Angeles and Orange Counties. This Bight Program will investigate the regional extent of DA in sediments, which can be the source of contamination to the benthic communities. Sediment samples from the inner, mid, and outer shelf will be analyzed for domoic acid concentrations and presence of DA degradation products by LC-MS. For more detail on the sediment DA assessment, please refer to the Bight '18 Harmful Algal Bloom workplan.

C2. Biological Response Indicators

While indicators of contaminant exposure provide an important measure of the influence of anthropogenic materials on the marine and estuarine environments, it is the effect of this exposure upon biological processes that determines the significance of the contaminants. The effect of contaminant exposure will be examined through a variety of indicators:

1. Benthic Infauna: Benthic infauna (animals that live in the sediment) are an important part of the ocean food web. Because infauna generally reside in one location for most of their lives and can be chronically exposed to sediment contaminants, they are an excellent indicator of environmental quality. Samples for infaunal analysis will be taken with a 0.1-m² modified Van Veen grab or 4-inch sediment core (brackish estuaries). Samples will be washed through a 1.0-mm mesh screen and preserved for identification to the lowest practical taxonomic unit.

2. Demersal fish and megabenthic invertebrate assemblages: Demersal fish and megabenthic invertebrates are more mobile than the benthic infauna, but are still closely associated with bottom sediments and chronically exposed to any contaminants therein. Demersal fish and megabenthic invertebrates will be collected with a semi-balloon otter trawl with 7.6 m headrope length and a 1.3 cm cod-end mesh. Trawls will be towed for 10 min at 0.8-1.0 m/s along depth isobaths (5 min in harbors). All fish and most invertebrates (>1.0 centimeters in any dimension) will be identified to species, counted, and weighed.

3. Gross fish pathology: The presence and extent of external diseases (e.g., fin rot and tumors) and anomalies (e.g. skeletal deformities or abnormal coloration) will be recorded from fish collected in the trawls for assemblage analysis. The presence of external parasites will also be noted. Specimens with unusual or unidentified conditions will be returned to the laboratory for detailed examination.

4. Sediment toxicity: Toxicity tests provide a direct measure of the effect of contamination on benthic organisms. These tests complement sediment chemistry measurements by providing a measure of the combined toxic effect of the complex mixture of contaminants present in surficial sediments or in the porewater between sediment grains (interstitial water). The toxicity of sediments will be assessed in two ways: 1) survival of the amphipod, *Eohaustorius estuarius*, after exposure to sediments for 10 days; and 2) the embryonic development of the bivalve, *Mytilus galloprovincialis*, using the sediment:seawater interface test. Both tests support the application of California's SQOs. Both tests are performed in the embayment strata. The *Eohaustorius* test alone will be performed in a subset of the shelf strata (10 sites each inner, mid, and outer shelf).

C3. Habitat Condition Indicators

The distribution of biota is also affected by natural habitat factors, such as grain size and the amount of organic matter present. Habitat indicators will be measured to help distinguish the relative effects of natural and anthropogenic factors on biotic distribution.

1. Sediment grain size: Grain size will be measured with a laser diffraction technique, a method that provides sufficient resolution between particle size classes with less variability than other conventional techniques.

2. Sediment total organic carbon (TOC), total nitrogen (TN): TOC and TN will be measured with an Elemental Analyzer.

C4. Bioaccumulation Indicators

1. Species Selection

Selecting fish species to monitor is complicated due to the relatively high diversity of species, variation in habitat type and quality, variation in contamination, and the varying ecological attributes of potential indicator species. The following criteria were used to select target species:

1. Popular for consumption. These data were collated from the Recreational Fisheries Information Network (RecFIN), a product of the Pacific States Marine Fisheries Commission PSMFC), which integrates state and federal marine recreational fishery sampling efforts (www.recfin.org/forms/est2004.html).
2. Widely distributed. Range of preferred species will extend the length of the SCB.
3. Representative of different exposure pathways. Both benthic and pelagic feeders should be included.
4. Continuity with previous monitoring efforts. This will increase the comparability with existing monitoring programs.

A total of three species will be selected for chemical analysis per fishing zone. Three species have been selected as primary target species and additional species will be selected from a list of secondary species (Table II-6). Primary target species will be fished until sufficient numbers of specimens are caught. Secondary species will be kept as by-catch. The final selection of secondary species will be made at the end of the field effort. This will allow selection of the most widely distributed specie(s). The primary target species are White croaker (*Genyonemus lineatus*), Kelp Bass (*Paralabrax clathratus*), and Pacific Chub Mackerel (*Scomber japonicus*). White Croaker is predominantly an epibenthic feeder, often associated with soft-bottom sediments. Kelp Bass is predominantly a water column feeder, often associated with rocky substrate so their range is somewhat limited. Pacific Chub Mackerel are a water column feeder with a dynamically large range. One or more of these species are also the most frequently measured in NPDES monitoring programs bight-wide including the MSRP monitoring conducted in the Los Angeles margin. The secondary species are California Halibut (*Paralichthys californicus*), Shiner Surfperch (*Cymatogaster aggregata*), Yellowfin Croaker (*Umbrina roncadore*), Barred Sand Bass (*Paralabrax nebulifer*), Spotted Sand Bass (*Paralabrax maculatofasciatus*), Olive Rockfish (*Sebastes serranoides*), California Scorpionfish (*Scorpaena guttata*). The California Halibut and Shiner Perch were selected because they are included in the SWRCB's SQO program. The Croaker, Bass, and Rockfish were selected because they serve as ecological replacements for primary species (i.e., same ecological niche or guild). The Scorpionfish and Mackerel were selected because they are frequently caught in other monitoring programs.

2. Tissue Composite Samples

Fish tissue will be saved for analysis in compliance with SQO guidance either as filet muscle tissue with the skin off or whole fish without head, tail or internal organs. Muscle filets are recommended by the USEPA (2000) for predator species and whole fish without head or organs for prey species (Amendments to the Water Quality Control Plan for Enclosed Bays and Estuaries of California). Upon collection, each fish collected will be tagged with a unique identification number and measured for total length (longest length from tip of tail fin to tip of nose/mouth), fork length (longest length from tail fork to tip of nose/mouth), and weight. During dissection, each fish will be sexed and the weight of tissue recorded. Dissection and compositing of tissue samples will be performed following USEPA guidance (USEPA 2016). A total of three composite samples per species will be targeted per fishing zone. A targeted total of five specimens will be collected per composite sample. Specimens of legal size or larger are preferred but not required. If more than five specimens are collected, then the middle 75% of the length distribution will be used for the composite. Specimens from this interquartile range will be selected at random for inclusion in each composite.

3. Contaminants

The State of California OEHHA has provided guidelines for the evaluation of contaminant data (Table II-5). Each composite sample will be analyzed for PCB congeners, DDT isomers and metabolites, mercury, and percent lipids (Table II-5), using analytical methods as described above in sediment chemistry. Reporting levels shall be consistent with OEHHA thresholds for comparative purposes. Quality assurance activities shall focus on accuracy, precision, sensitivity, and comparability. There will be an estimated 243 samples total for this element of Bight '18 (27 zones x 3 species x 3 replicates per species). The effort will be shared equally among organic and inorganic analytes.

III. LEVERAGED STUDIES

The Bight Program represents an excellent opportunity to leverage studies and pilot research not routinely conducted for ongoing monitoring programs. Researchers are always looking to test new technology, evaluate new indicators, apply new methods, or explore unanswered questions in new locations. The Bight Program comprises an enormous platform of core measurements with indicators typically measured on a routine basis. The merging of the Bight Program with researchers provides a positive interaction for both parties. Researchers view the Bight Program as a cost-efficient vehicle to move their research forward. Bight participants get the added value of their research for nominal extra cost. Incorporating new measurements and methods into the Bight Program benefits regulated participants in the Bight Program because it is not part of a permit requirement and can help determine if a perceived issue is a widespread environmental problem. Incorporating their studies into the Bight Program benefits researchers because it allows their work direct access to the important environmental decision makers in the SCB.

There are four leveraged studies planned for Bight '18 (Table II-7, Appendix D). The studies range across all 10 indicators being measured in Bight '18 incorporating contaminant exposure, biological response, and habitat condition. Leveraged studies supplement existing indicators already being measured as part of the Bight Program. For example, the bioassay work is a pilot project to explore new contaminants and may serve as a tool to link contaminants to toxicity. Individually, these indicators all provide useful information, but collectively they provide invaluable insight.

FIGURE II-1. 90% Confidence Intervals about an estimate of percent of area changed as a function of sample size (binomial probability distribution and $p = 0.2$)

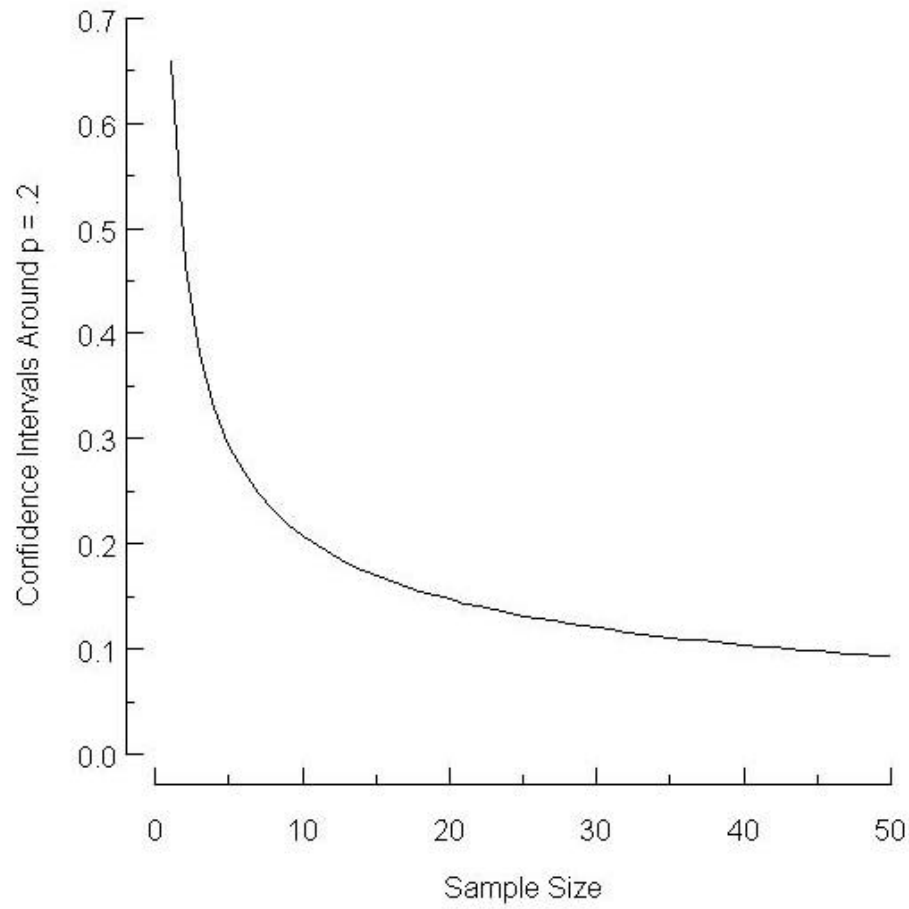


Figure II-2. Map of fishing zones for Bioaccumulation component in Bight '18. Fishing zones are a subset of the 68 SWAMP BOG zones along the entire CA coast.

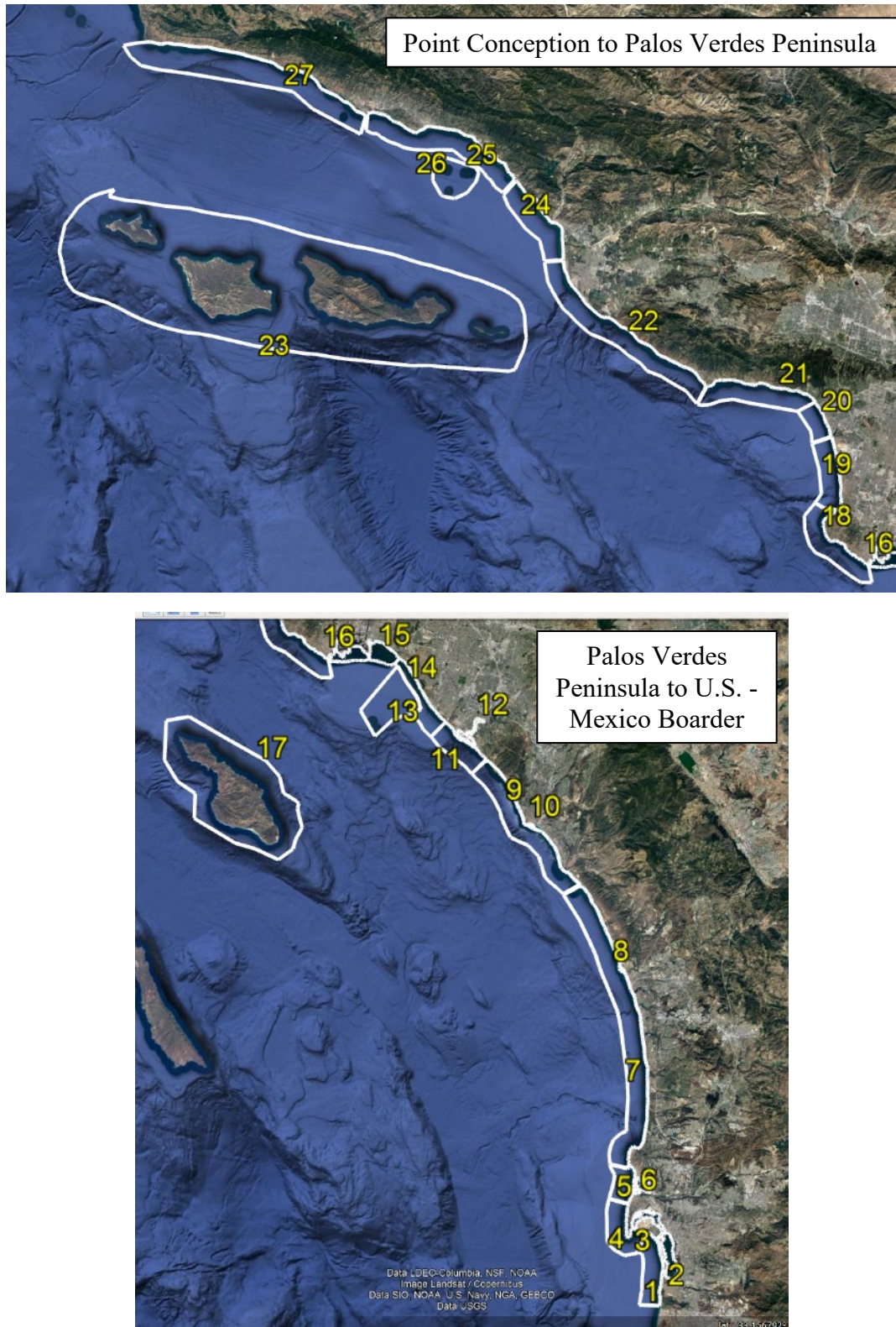


Figure II-3. Spatial:Temporal Variance ratio across all indicators and strata in the SCB. Values less than 0 indicate time has greater variance, values larger than 0 indicate that space has the greater variance.

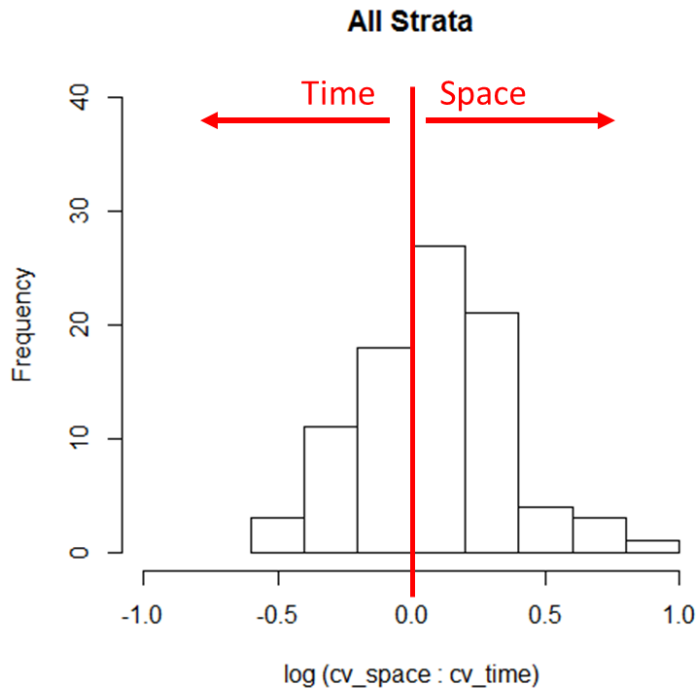


Figure II-4. Spatial:Temporal Variance ratio across all indicators for 3 strata categories (shelf = inner-, mid-, and outer-shelf), slope (upper and lower slope), and embayments (estuaries, marinas, bays, ports) in the SCB.

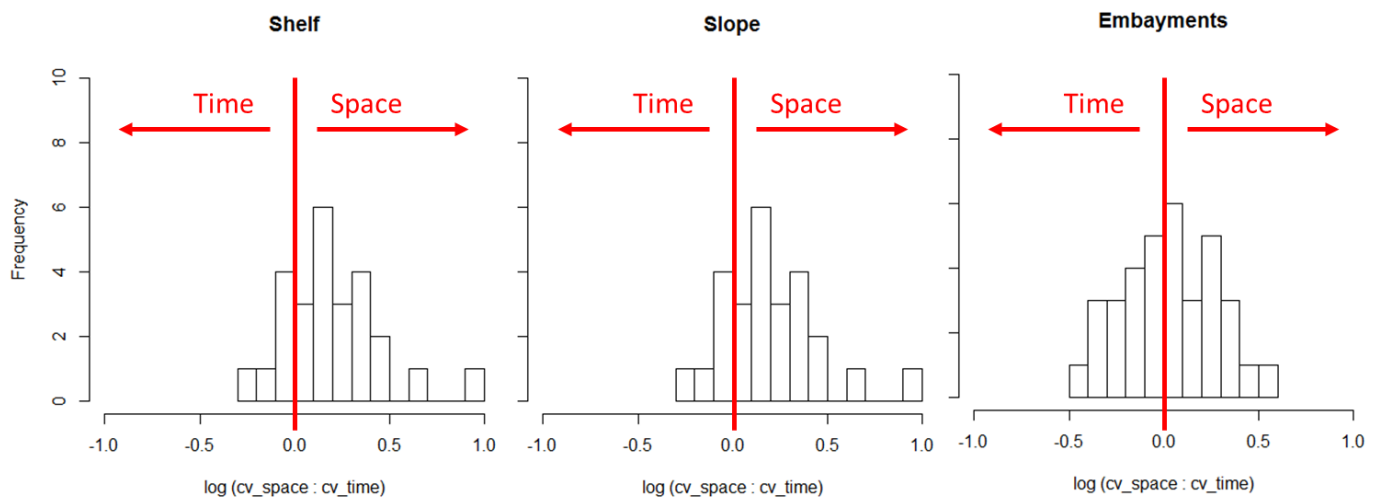


TABLE II-1. Strata of interest in the areal extent, magnitude, and trends objectives of the Bight '18 Sediment Quality study.

Offshore Areas

- a. Inner shelf (5-30 m)
- b. Mid-shelf (30-120 m)
- c. Outer shelf (120-200 m)
- d. Upper slope (200-500 m)
- e. Lower slope (500-1000 m)
- f. Channel Islands (30-120 m in Sanctuary)

Embayment Areas

- a. Marine Estuaries (salinity \geq 27 ppt)
- b. Brackish Estuaries (salinity $<$ 27 ppt)
- c. Ports
- d. Bays
- e. Marinas

TABLE II-2. Indicators to be measured in Bight '18.

Contaminant exposure

Sediment chemistry

Debris

Biological response

Benthic infauna

Fish assemblage

Fish pathology

Macroinvertebrate assemblage

Sediment toxicity

Habitat

Grain size

Sediment organic carbon

TABLE II-3. Sample sizes in the strata for Bight '18.

	Sediment Chemistry	Infauna	Trawl	Sed Tox
Offshore Strata				
5 to 30 m	30	30	30	Combined 30 ^a
30 to 120 m	30	30	30	
120 to 200 m	30	30	30	
200 to 500 m	30	30	30	-
500 to 1000 m	30	30	-	-
Channel Islands	15	15	-	-
Embayment Strata				
Marinas	30	30		30 ^b
Ports	30	30		30 ^b
Bays/Harbors	30	30	30	30 ^b
Saline Estuaries/Lagoon	30	30		30 ^b
Brackish Estuaries/Lagoon	30	30		30 ^b
Target Sample Size				
	315	315	150	180

The three shelf strata are combined for sediment toxicity testing

^a1 species for toxicity (10-day amphipod test)

^b2 species for toxicity (10-day amphipod and 48-hour bivalve tests)

TABLE II-4. Constituents that will be measured in sediment during Bight '18.

Trace Metals	PCB Congeners	Polycyclic Aromatic		
		Hydrocarbons		PolyBrominated Diphenyl Ethers
Aluminum	PCB 8	PCB 157	1,6,7-Trimethylnaphthalene	BDE 17
Antimony	PCB 18	PCB 158	1-Methylnaphthalene	BDE 28
Arsenic	PCB 28	PCB 167	1-Methylphenanthrene	BDE 47
Barium	PCB 37	PCB 168	2,6-Dimethylnaphthalene	BDE 49
Beryllium	PCB 44	PCB 169	2-Methylnaphthalene	BDE 66
Cadmium	PCB 49	PCB 170	Acenaphthene	BDE 85
Chromium	PCB 52	PCB 177	Acenaphthylene	BDE 99
Copper	PCB 66	PCB 180	Anthracene	BDE 100
Iron	PCB 70	PCB 183	Benz[a]anthracene	BDE 138
Lead	PCB 74	PCB 187	Benzo[a]pyrene	BDE 153
Mercury	PCB 77	PCB 189	Benzo[b]fluoranthene	BDE 154
Nickel	PCB 81	PCB 194	Benzo[e]pyrene	BDE 183
Selenium	PCB 87	PCB 195	Benzo[g,h,i]perylene	BDE 190
Silver	PCB 99	PCB 201	Benzo[k]fluoranthene	
Zinc	PCB 101	PCB 206	Biphenyl	
	PCB 105		Chrysene	Pyrethroids
	PCB 110		Dibenz[a,h]anthracene	Bifenthrin
	PCB 114		Fluoranthene	Cyfluthrin (total)
	PCB 118		Fluorene	Cypermethrin (total)
	PCB 119	Chlorinated	Indeno[1,2,3-c,d]pyrene	lambda-Cyhalothrin (total)
	PCB 123	Hydrocarbons	Naphthalene	cis-Permethrin
	PCB 126	4,4'-DDT	Perylene	Trans-Permethrin
	PCB 128	2,4'-DDT	Phenanthrene	Deltamethrin
	PCB 138	4,4'-DDD	Pyrene	Esfenvalerate
	PCB 149	2,4'-DDD		
	PCB 151	4,4'-DDE		
	PCB 153	2,4'-DDE		
	PCB 156	4,4'-DDMU		
Other		alpha-		
Constituents		Chlordane		
Total Organic		gamma-		
Carbon		Chlordane		Fipronils
Total Nitrogen		cis-nonachlor		Fipronil
Grain Size		trans-nonachlor		Fipronil Desulfinyl
		oxychlordane		Fipronil Sulfide
				Fipronil Sulfone

Table II-5. State of California Office of Environmental Health and Hazard Assessment Fish Contaminant Goal (FCG) and Advisory Tissue Level (ATL).

Contaminant (ng/wet g)	Number 8 oz Meals Per Week		
	<Three	<Two	<One
DDTs*	520	1000	2100
methylMercury (women 18-45, child 1-17)	70	150	440
methylMercury (women >45, men)	220	440	1310
PCBs*	21	42	120

*Congeners as listed in Table II-4

Table II-6. Primary and secondary target species for bioaccumulation study component.

Common Name	Scientific Name
Primary Target Spp.	
White Croaker	<i>Genyonemus lineatus</i>
Kelp Bass	<i>Paralabrax clathratus</i>
Pacific Chub Mackerel	<i>Scomber japonicus</i>
Secondary Target Spp.	
Shiner Surfperch	<i>Cymatogaster aggregata</i>
California Halibut	<i>Paralichthys californicus</i>
Yellowfin Croaker	<i>Umbrina roncadore</i>
Barred Sand Bass	<i>Paralabrax nebulifer</i>
Spotted Sand Bass	<i>Paralabrax maculatofasciatus</i>
Olive Rockfish	<i>Sebastes serranoides</i>
California Scorpionfish	<i>Scorpaena guttata</i>

Table II-7. Integration of special studies with existing indicators. X=where there is overlap or correlation among measurements.

Leveraged Study	Sediment Chemistry	Infauna	Demersal Fish	Sediment Toxicity	Sediment Grain Size	Bioaccumulation
Cell Assays	X			X		X
Sediment Transport					X	
CA Halibut Stock Assessment			X			
Meiofaunal Assemblages		X				

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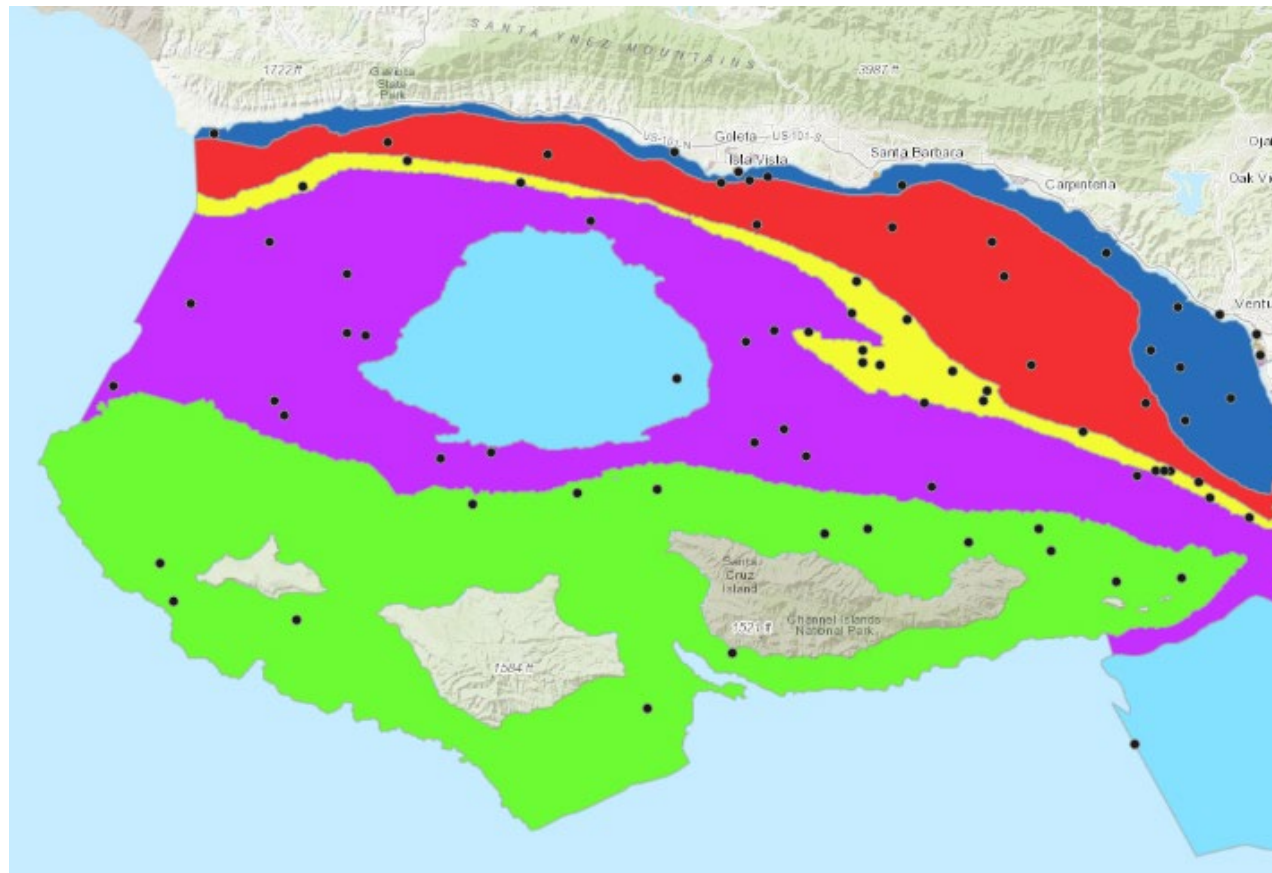
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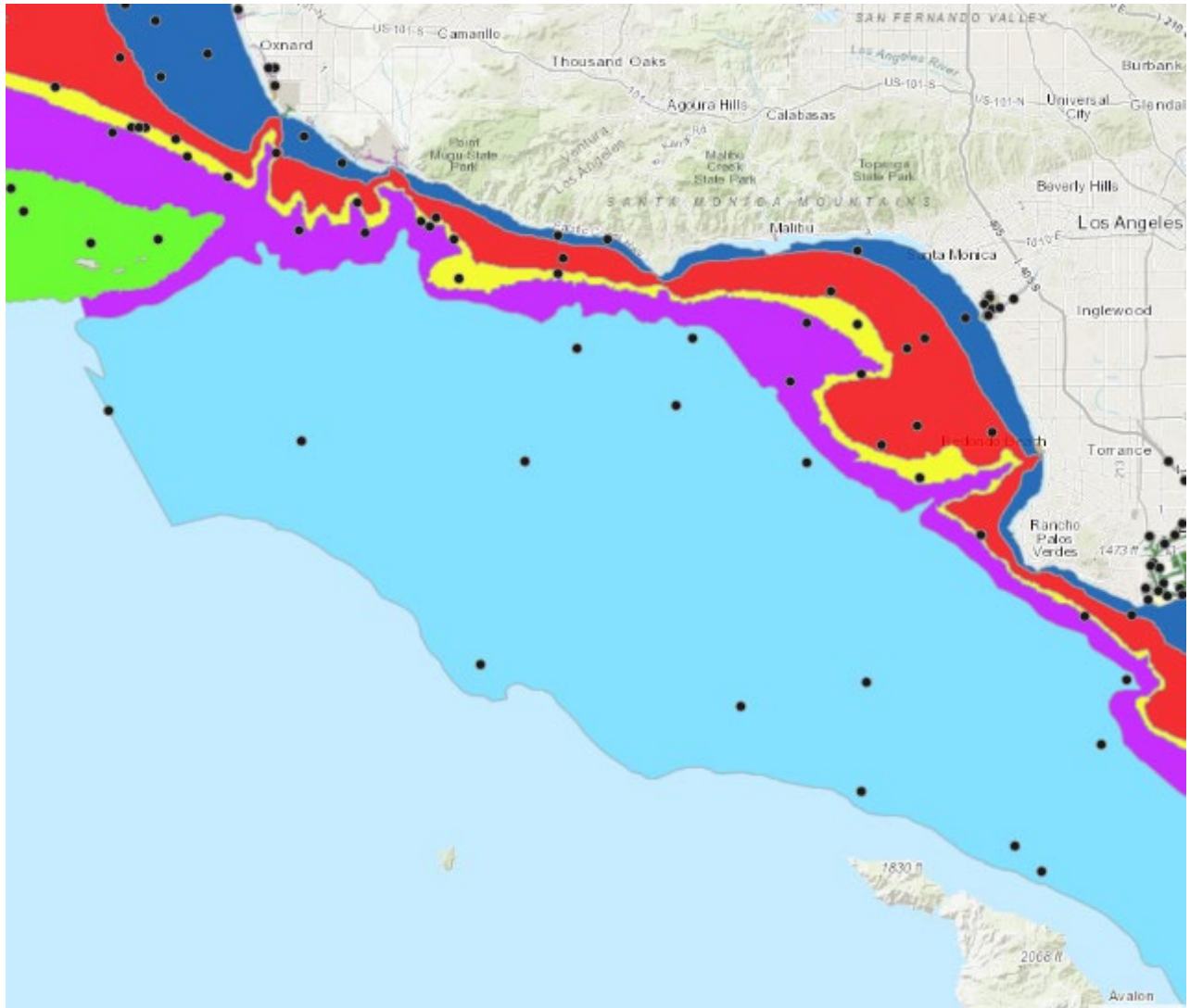
APPENDIX A

Sample Site Maps

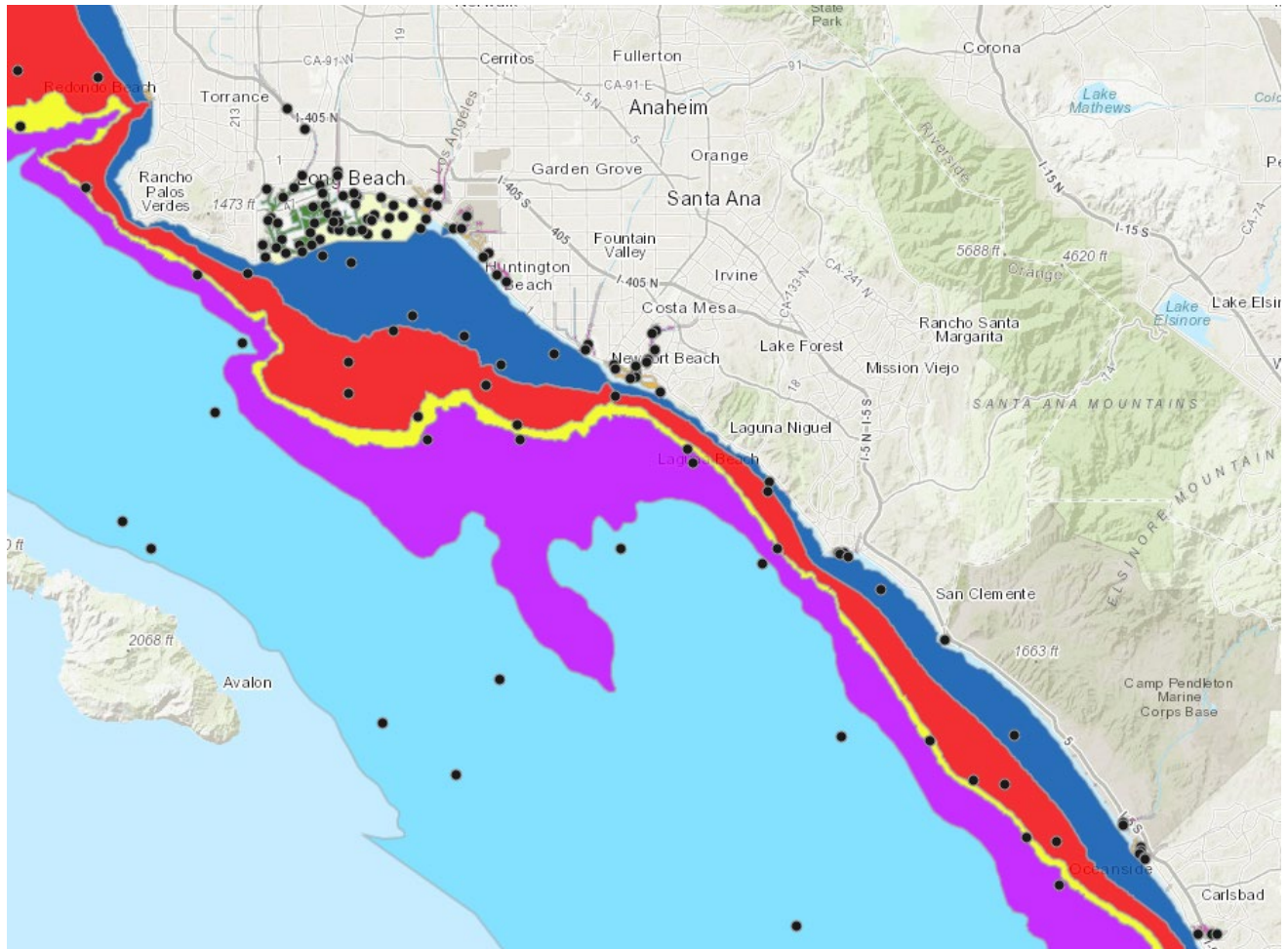
Santa Barbara Channel



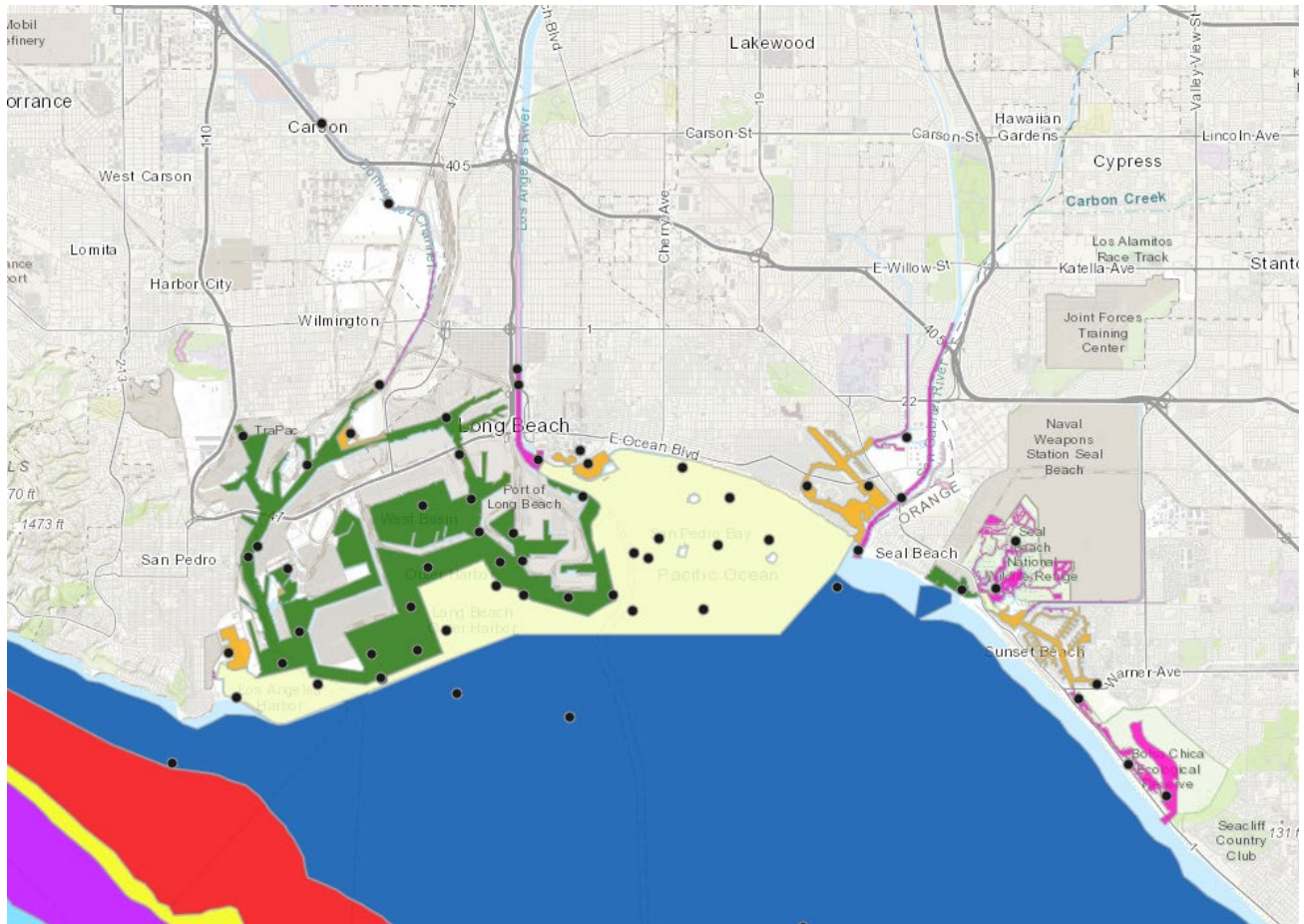
Hueneme to Santa Monica Bay



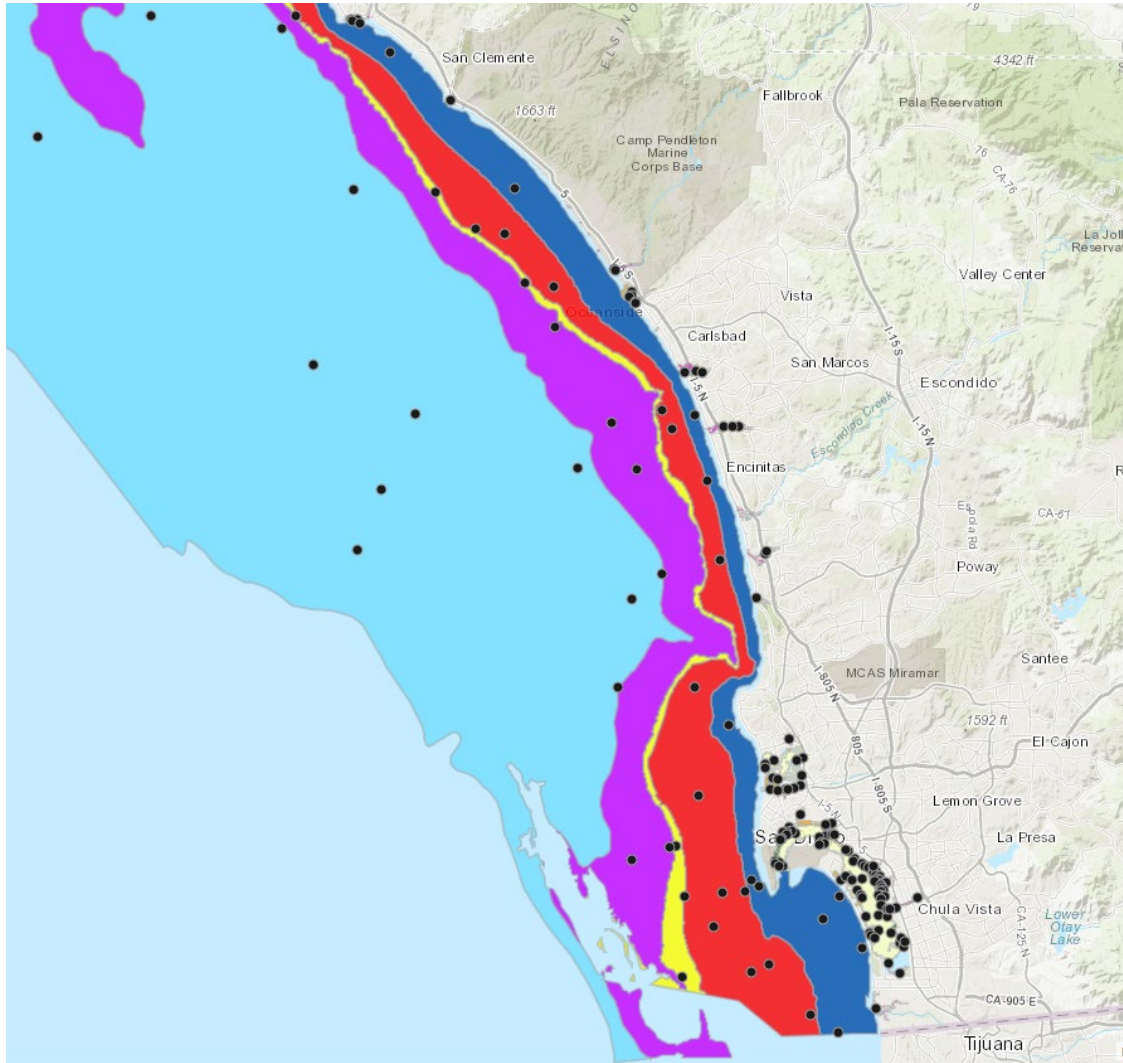
San Pedro Shelf and Channel



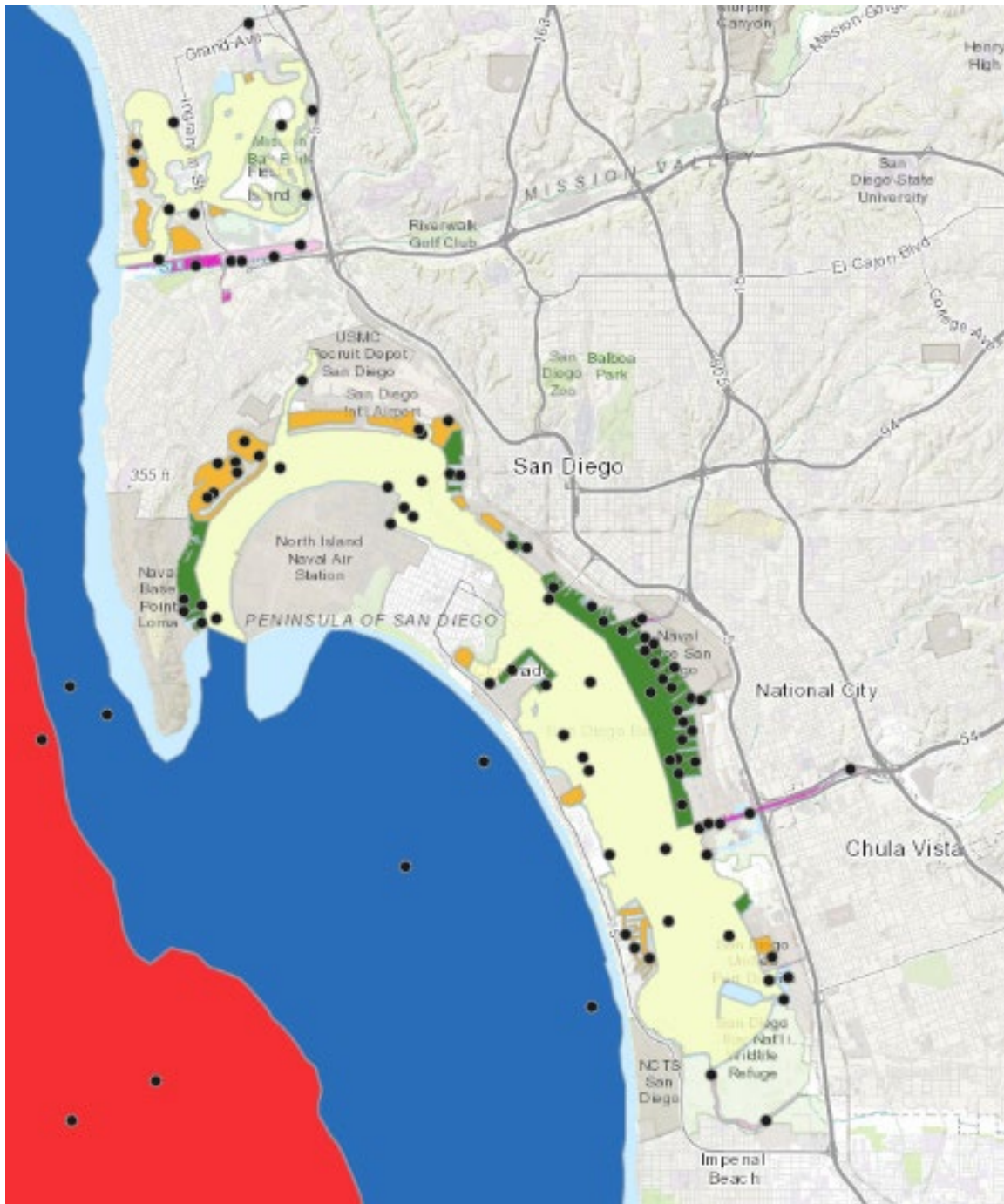
San Pedro Bay



San Diego County



San Diego Bay



APPENDIX B

Sample Site Information

Table B1. Station locations and assignments

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10000	33.7594	-118.162667	5	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10001	33.75298309	-118.1502215	9	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10002	33.744217	-118.168733	10	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10003	33.74379309	-118.1398563	8	Bays	Los Angeles/Long Beach	Yes	RMC	Yes	CLA-EMD
B18-10004	33.742717	-118.1532	10	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10005	33.74081332	-118.1751432	14	Bays	Los Angeles/Long Beach	Yes	RMC	Yes	CLA-EMD
B18-10006	33.7398	-118.171317	12	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10007	33.73370098	-118.2113542	20	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10008	33.73168	-118.20415	20	Bays	Los Angeles/Long Beach	No	N/A	Yes	CLA-EMD
B18-10009	33.728683	-118.157	14	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10010	33.7282943	-118.1757358	16	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10011	33.72421	-118.22437	18	Bays	Los Angeles/Long Beach	Yes	POLA/LB	Yes	CLA-EMD
B18-10012	33.71345	-118.24131	24	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	Yes	CLA-EMD
B18-10013	33.71242	-118.2579	25	Bays	Los Angeles/Long Beach	Yes	CLA-EMD	No	N/A
B18-10014	33.70964533	-118.2791439	5	Bays	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10015	32.78719078	-117.2082639	0	Bays	Mission Bay	Yes	RHMP	No	N/A
B18-10016	32.78486474	-117.2405215	1	Bays	Mission Bay	Yes	RHMP	Yes	RHMP
B18-10017	32.784475	-117.215358	4	Bays	Mission Bay	Yes	RHMP	Yes	RHMP
B18-10018	32.77081374	-117.2097002	1	Bays	Mission Bay	Yes	RHMP	No	N/A
B18-10019	32.767905	-117.241481	7	Bays	Mission Bay	Yes	RHMP	Yes	RHMP
B18-10020	32.7580708	-117.2441015	2	Bays	Mission Bay	Yes	RHMP	No	N/A
B18-10021	32.73462213	-117.2105636	3	Bays	San Diego Bay	Yes	Unassigned	Yes	Unassigned
B18-10022	32.724148	-117.182983	5	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10023	32.71745595	-117.2159262	0	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10024	32.714963	-117.182907	12	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10025	32.7137	-117.1909	2	Bays	San Diego Bay- NBC	Yes	Navy	No	N/A
B18-10026	32.7096	-117.187	2	Bays	San Diego Bay- NBC	Yes	Navy	No	N/A
B18-10027	32.7079	-117.1850	2	Bays	San Diego Bay- NBC	Yes	Navy	No	N/A
B18-10028	32.70658	-117.19	2	Bays	San Diego Bay- NBC	Yes	Navy	No	N/A
B18-10029	32.701758	-117.15861	1	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10030	32.68796429	-117.2305094	1	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10031	32.686984	-117.132959	1	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10032	32.675472	-117.143841	5	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10033	32.6752	-117.1670	3	Bays	San Diego Bay- NAB	Yes	Navy	No	N/A
B18-10034	32.665184	-117.149804	4	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10035	32.66074324	-117.1454935	3	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10036	32.658339	-117.144218	5	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10037	32.646936	-117.118238	10	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10038	32.6428033	-117.1262292	3	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10039	32.641654	-117.139188	2	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10040	32.64164436	-117.1164632	1	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10041	32.628574	-117.125565	2	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10042	32.6258071	-117.1115371	1	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10043	32.6172124	-117.1022578	1	Bays	San Diego Bay	Yes	RHMP	Yes	RHMP
B18-10044	32.61327	-117.098925	1	Bays	San Diego Bay	Yes	RHMP	No	N/A
B18-10045	34.25841416	-119.2669992	0	Marinas	Ventura Harbor	Yes	ABC	No	N/A
B18-10046	34.1712	-119.22348	3	Marinas	Channel Islands Harbor	Yes	ABC	No	N/A
B18-10047	33.983083	-118.45075	2	Marinas	Marina del Rey	Yes	LA Public Works	No	N/A
B18-10048	33.98015207	-118.4509405	0	Marinas	Marina del Rey	Yes	LA Public Works	No	N/A
B18-10049	33.97524009	-118.4561531	0	Marinas	Marina del Rey	Yes	LA Public Works	No	N/A
B18-10050	33.970367	-118.447683	5	Marinas	Marina del Rey	Yes	LA Public Works	No	N/A
B18-10051	33.9647	-118.453517	5	Marinas	Marina del Rey	Yes	LA Public Works	No	N/A
B18-10052	33.77738666	-118.2417289	0	Marinas	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10053	33.767	-118.24938	4	Marinas	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10054	33.76044833	-118.1873161	0	Marinas	Long Beach	Yes	MBC	No	N/A
B18-10055	33.755483	-118.129894	20	Marinas	Alamitos Bay	Yes	MBC	No	N/A
B18-10056	33.7554306	-118.1137115	0	Marinas	Alamitos Bay	Yes	MBC	No	N/A
B18-10057	33.71932122	-118.281224	0	Marinas	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10058	33.71227661	-118.0538902	0	Marinas	Huntington Harbor	Yes	OC Public Works	No	N/A
B18-10059	33.61925	-117.926921	6	Marinas	Newport Bay	Yes	OCSD	No	N/A
B18-10060	33.61554889	-117.9255097	0	Marinas	Newport Bay	Yes	OCSD	No	N/A
B18-10061	33.61247612	-117.905245	0	Marinas	Newport Bay	Yes	OCSD	No	N/A
B18-10062	33.609098	-117.904639	6	Marinas	Newport Bay	Yes	OCSD	No	N/A

Bight '18 Sediment Quality Workplan - Page 40

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10063	33.60709413	-117.911185	2	Marinas	Newport Bay	Yes	OCSD	No	N/A
B18-10064	33.59644797	-117.8802341	0	Marinas	Newport Bay	Yes	OCSD	No	N/A
B18-10065	33.46069968	-117.700811	1	Marinas	Dana Point Harbor	Yes	RHMP	No	N/A
B18-10066	33.46044769	-117.6946126	1	Marinas	Dana Point Harbor	Yes	RHMP	No	N/A
B18-10067	33.45946684	-117.6994206	1	Marinas	Dana Point Harbor	Yes	RHMP	No	N/A
B18-10068	33.45744334	-117.6912491	2	Marinas	Dana Point Harbor	Yes	RHMP	Yes	RHMP
B18-10069	33.21306086	-117.3952555	0	Marinas	Oceanside Harbor	Yes	RHMP	No	N/A
B18-10070	33.20946123	-117.3953086	1	Marinas	Oceanside Harbor	Yes	RHMP	No	N/A
B18-10071	33.2079881	-117.397525	1	Marinas	Oceanside Harbor	Yes	RHMP	Yes	RHMP
B18-10072	33.20419841	-117.3911786	0	Marinas	Oceanside Harbor	Yes	RHMP	No	N/A
B18-10073	32.780705	-117.249278	3	Marinas	Mission Bay	Yes	RHMP	No	N/A
B18-10074	32.77721291	-117.2497482	1	Marinas	Mission Bay	Yes	RHMP	No	N/A
B18-10075	32.767196	-117.235646	4	Marinas	Mission Bay	Yes	RHMP	No	N/A
B18-10076	32.72676884	-117.1767116	1	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10077	32.725018	-117.183684	6	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10078	32.722639	-117.223929	1	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10079	32.71984627	-117.2206964	1	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10080	32.718569	-117.226112	6	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10081	32.718402	-117.2304	4	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10082	32.71660252	-117.2259477	1	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10083	32.71238816	-117.23125	0	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10084	32.711543	-117.232552	7	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10085	32.62596927	-117.1356676	0	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10086	32.623601	-117.13346	3	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10087	32.62173551	-117.1014007	1	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10088	32.62152463	-117.1300244	0	Marinas	San Diego Bay	Yes	RHMP	No	N/A
B18-10104	33.73287437	-118.0892839	0	Marinas	Huntington Harbor	Yes	OC Public Works	No	N/A
B18-10089	33.7703171	-118.2244559	11	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10090	33.7662	-118.27747	15	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10091	33.7624346	-118.2207722	0	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10092	33.75995206	-118.2606779	0	Ports	Los Angeles/Long Beach	Yes	POLA/LB	No	N/A
B18-10093	33.75321832	-118.1884842	9	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A

Bight '18 Sediment Quality Workplan - Page 41

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10094	33.75269	-118.21776	18	Ports	Los Angeles/Long Beach	Yes	CLA-EMD	No	N/A
B18-10095	33.75109	-118.23063	17	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10096	33.74553	-118.2157	20	Ports	Los Angeles/Long Beach	Yes	POLA/LB	No	N/A
B18-10097	33.74517931	-118.2067595	0	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10098	33.74229211	-118.2739391	0	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10099	33.74011722	-118.2761255	0	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10100	33.7391719	-118.2044247	18	Ports	Los Angeles/Long Beach	Yes	CLA-EMD	No	N/A
B18-10101	33.73891	-118.21039	27	Ports	Los Angeles/Long Beach	Yes	CLA-EMD	No	N/A
B18-10102	33.73779584	-118.2289921	13	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10103	33.73743265	-118.265866	1	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10105	33.73173013	-118.1809134	15	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10106	33.7311	-118.1924	15	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10107	33.72924	-118.23361	11	Ports	Los Angeles/Long Beach	Yes	CLA-EMD	No	N/A
B18-10108	33.72387	-118.2627	27	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10109	33.71971041	-118.2318764	13	Ports	Los Angeles/Long Beach	Yes	CLA-EMD	No	N/A
B18-10110	33.71897199	-118.2438183	13	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10111	33.71707878	-118.2673881	13	Ports	Los Angeles/Long Beach	Yes	RMC	No	N/A
B18-10112	32.71619	-117.176237	13	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10113	32.716092	-117.173953	12	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10114	32.7024	-117.16178	9	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10115	32.69413825	-117.1523197	6	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10116	32.691721	-117.153217	13	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10117	32.691687	-117.238244	15	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10118	32.6907	-117.2340	3	Ports	San Diego Bay- NBPL	Yes	Navy	No	N/A
B18-10119	32.69025491	-117.1433799	0	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10120	32.6895	-117.2380	3	Ports	San Diego Bay- NBPL	Yes	Navy	No	N/A
B18-10121	32.68739097	-117.1406312	5	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10122	32.6872	-117.2340	3	Ports	San Diego Bay- NBPL	Yes	Navy	No	N/A
B18-10123	32.68578263	-117.1362525	5	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10124	32.68426001	-117.1310331	0	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10125	32.6832	-117.1291	3	Ports	San Diego Bay- NBSD	Yes	Navy	No	N/A
B18-10126	32.68167548	-117.1310279	3	Ports	San Diego Bay	Yes	RHMP	No	N/A

Bight '18 Sediment Quality Workplan - Page 42

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10127	32.6792931	-117.1285701	3	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10128	32.6784	-117.1243	3	Ports	San Diego Bay- NBSD	Yes	Navy	No	N/A
B18-10129	32.6780	-117.1621	3	Ports	San Diego Bay- NAB	Yes	Navy	No	N/A
B18-10130	32.67606917	-117.1269117	3	Ports	San Diego Bay- NBSD	Yes	Navy	No	N/A
B18-10131	32.67484386	-117.1540384	3	Ports	San Diego Bay- NAB	Yes	Navy	No	N/A
B18-10132	32.67427386	-117.1248611	2	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10133	32.67359712	-117.1296354	3	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10134	32.67245708	-117.1204634	3	Ports	San Diego Bay- NBSD	Yes	Navy	No	N/A
B18-10135	32.6721	-117.1180	3	Ports	San Diego Bay- NBSD	Yes	Navy	No	N/A
B18-10136	32.67014627	-117.123543	3	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10137	32.66783189	-117.1220505	2	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10138	32.6660	-117.1200	3	Ports	San Diego Bay- NBSD	Yes	Navy	No	N/A
B18-10139	32.66427152	-117.1225257	4	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10140	32.660613	-117.12339	10	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10141	32.66033036	-117.1253183	5	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10142	32.66006467	-117.1193153	3	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10143	32.65755441	-117.1232918	3	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10144	32.65155	-117.122464	12	Ports	San Diego Bay	Yes	RHMP	No	N/A
B18-10145	33.97108	-118.43923	7	Estuaries	Ballona Creek	Yes	MBC	No	N/A
B18-10146	33.96422692	-118.4521081	1	Estuaries	Ballona Creek	Yes	MBC	No	N/A
B18-10147	33.78083	-118.20569	9	Estuaries	Los Angeles River	Yes	MBC	No	N/A
B18-10148	33.7774381	-118.2055034	0	Estuaries	Los Angeles River	Yes	MBC	No	N/A
B18-10149	33.766034	-118.103714	8	Estuaries	Los Alamitos Estuary	Yes	MBC	No	N/A
B18-10150	33.76109325	-118.2003214	3	Estuaries	Los Angeles River Estuary	Yes	RMC	No	N/A
B18-10151	33.75302	-118.10528	4	Estuaries	San Gabriel River	Yes	ABC	No	N/A
B18-10152	33.72809	-118.0721	0	Estuaries	Huntington Harbor	Yes	OC Public Works	No	N/A
B18-10153	33.74148	-118.11662	2	Estuaries	San Gabriel River Estuary	Yes	ABC	No	N/A
B18-10155	33.70343	-118.0528	0	Estuaries	Bolsa Chica Wetlands	Yes	OC Public Works	No	N/A
B18-10156	33.69572	-118.0462	0	Estuaries	Bolsa Chica Wetlands	Yes	OC Public Works	No	N/A
B18-10158	33.64705	-117.88421	19	Estuaries	Upper Newport Bay	Yes	OC Public Works	No	N/A
B18-10159	33.64579	-117.8889	18	Estuaries	Upper Newport Bay	Yes	OC Public Works	No	N/A
B18-10160	33.636618	-117.953748	3	Estuaries	Santa Ana River	Yes	OC Public Works	No	N/A

Bight '18 Sediment Quality Workplan - Page 43

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10161	33.63159164	-117.8865874	0	Estuaries	Newport Bay	Yes	OC Public Works	No	N/A
B18-10162	33.63667	-117.9633	2	Estuaries	Talbert Marsh	Yes	OC Public Works	No	N/A
B18-10163	33.62374695	-117.8922848	0	Estuaries	Newport Bay	Yes	OC Public Works	No	N/A
B18-10164	33.62096631	-117.8947269	1	Estuaries	Newport Bay	Yes	OC Public Works	No	N/A
B18-10165	33.61821915	-117.9046339	1	Estuaries	Newport Bay	Yes	OC Public Works	No	N/A
B18-10166	33.23333813	-117.4140932	2	Estuaries	Santa Margarita estuary	Yes	Riverside County Flood Control	No	N/A
B18-10167	33.23197	-117.41291	1	Estuaries	Santa Margarita Estuary	Yes	Riverside County Flood Control	No	N/A
B18-10168	33.140126	-117.324378	3	Estuaries	Agua Hedionda Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10169	33.139452	-117.31874	1	Estuaries	Agua Hedionda Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10170	33.139112	-117.337572	6	Estuaries	Agua Hedionda Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10171	33.08985657	-117.2786859	0	Estuaries	Batiquitos Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10172	33.08963637	-117.2947619	0	Estuaries	Batiquitos Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10173	33.089536	-117.284912	0	Estuaries	Batiquitos Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10174	32.97301227	-117.2496542	3	Estuaries	San Dieguito Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10175	32.932778	-117.25881	0	Estuaries	Los Penasquitos Lagoon	Yes	San Diego Stormwater	No	N/A
B18-10177	32.756983	-117.235297	1	Estuaries	San Diego River	Yes	San Diego Stormwater	No	N/A
B18-10178	32.68785665	-117.1317259	0	Estuaries	San Diego Bay	Yes	RHMP	No	N/A
B18-10179	32.64973002	-117.1067462	0	Estuaries	San Diego Bay	Yes	RHMP	No	N/A
B18-10180	32.64779355	-117.1161832	1	Estuaries	San Diego Bay	Yes	RHMP	No	N/A
B18-10181	32.6477399	-117.113523	1	Estuaries	San Diego Bay	Yes	RHMP	No	N/A
B18-10182	32.55662	-117.128214	1	Estuaries	Tijuana River Estuary	Yes	San Diego Stormwater	No	N/A
B18-10176	32.757755	-117.22732	1	Brackish Estuaries	San Diego River	Yes	San Diego Stormwater	No	N/A
B18-10183	34.40800568	-119.844335	7	Brackish Estuaries	UCSB Lagoon	Yes	MBC	No	N/A
B18-10184	34.27684618	-119.3081933	2	Brackish Estuaries	Ventura River	Yes	ABC	No	N/A
B18-10185	34.238994	-119.2628082	1	Brackish Estuaries	Surfers Knoll Pond	No	MBC-Reject	No	N/A
B18-10774	33.79791672	-118.2048952	0	Brackish Estuaries	Los Angeles River	Yes	MBC	No	N/A
B18-10186	34.18694997	-119.223427	5	Brackish Estuaries	Edison Canal	Yes	MBC	No	N/A
B18-10187	34.18620034	-119.2299489	1	Brackish Estuaries	Edison Canal	Yes	MBC	No	N/A
B18-10188	33.97918128	-118.4248676	0	Brackish Estuaries	Ballona Creek	Yes	MBC	No	N/A
B18-10189	33.842076	-118.264579	5	Brackish Estuaries	Dominguez Channel	Yes	Dominguez Channel Watershed	No	N/A

Bight '18 Sediment Quality Workplan - Page 44

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10190	33.791886	-118.230535	7	Brackish Estuaries	Dominguez Channel	Yes	Dominguez Channel Watershed	No	N/A
B18-10191	33.76313462	-118.1892578	4	Brackish Estuaries	Rainbow Lagoon	Yes	MBC	No	N/A
B18-10192	33.3870841	-117.5934011	0	Brackish Estuaries	San Mateo	Yes	MBC	No	N/A
B18-10193	33.20309722	-117.3912421	2	Brackish Estuaries	San Luis Rey River	Yes	SD Co/ San Luis Rey	No	N/A
B18-10194	32.97616023	-117.2477884	3	Brackish Estuaries	San Dieguito	Yes	San Diego County Stormwater	No	N/A
B18-10195	32.80422604	-117.2231091	3	Brackish Estuaries	Rose	Yes	San Diego County Stormwater	No	N/A
B18-10196	32.76112759	-117.2108584	0	Brackish Estuaries	San Diego River	Yes	San Diego Stormwater	No	N/A
B18-10197	32.75866963	-117.2172825	1	Brackish Estuaries	San Diego River	Yes	San Diego Stormwater	No	N/A
B18-10198	32.75801014	-117.2247979	0	Brackish Estuaries	San Diego River	Yes	San Diego Stormwater	No	N/A
B18-10199	32.65844403	-117.0834648	0	Brackish Estuaries	Sweetwater River	Yes	San Diego County Stormwater	No	N/A
B18-10200	32.61763302	-117.0976771	1	Brackish Estuaries	San Diego Bay	Yes	RHMP	No	N/A
B18-10201	32.59869843	-117.1154819	0	Brackish Estuaries	Otay	Yes	San Diego Stormwater	No	N/A
B18-10202	32.589642	-117.102982	0	Brackish Estuaries	Otay	Yes	San Diego Stormwater	No	N/A
B18-10203	34.44317889	-120.4298373	18	Inner Shelf	West Santa Barbara Channel	Yes	MBC	No	N/A
B18-10838	34.41259179	-119.8958176	19	Inner Shelf	Eastern Santa Barbara Channel	No	N/A	Yes	MBC
B18-10204	34.42640872	-119.917066	4	Inner Shelf	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10205	34.40395	-119.81211	18	Inner Shelf	East Santa Barbara Channel	No	N/A	Yes	ABC
B18-10206	34.398397	-119.864848	29	Inner Shelf	Campus Point	Yes	ABC	No	N/A
B18-10848	34.10921345	-119.2095335	29	Inner Shelf	Hueneme to Dume	No	N/A	Yes	ABC
B18-10207	34.396139	-119.661999	24	Inner Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10208	34.3340827	-119.4346221	19	Inner Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10209	34.28368	-119.35453	18	Inner Shelf	East Santa Barbara Channel	Yes	ABC	No	N/A
B18-10210	34.24335366	-119.3852447	26	Inner Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10211	34.22842249	-119.3525247	23	Inner Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10212	34.19944692	-119.2960875	17	Inner Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10213	34.17863	-119.34714	26	Inner Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10214	34.12488	-119.19248	15	Inner Shelf	Hueneme to Dume	Yes	ABC	Yes	ABC
B18-10215	34.10102	-119.15105	15	Inner Shelf	Hueneme to Dume	Yes	ABC	Yes	ABC
B18-10216	34.03669	-118.9171	15	Inner Shelf	Hueneme to Dume	Yes	ABC	No	N/A
B18-10217	34.0333739	-118.8638262	4	Inner Shelf	Hueneme to Dume	Yes	ABC	No	N/A
B18-10842	34.32715802	-119.4137858	13	Inner Shelf	Bight	No	N/A	Yes	ABC
B18-10218	34.0233	-118.593483	23	Inner Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD

Bight '18 Sediment Quality Workplan - Page 45

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10219	33.962433	-118.476117	16	Inner Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10220	33.733383	-118.122033	5	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10221	33.71388	-118.24162	18	Inner Shelf	Hueneme to Dume	No	N/A	Yes	ABC
B18-10222	33.71036868	-118.2216644	18	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10223	33.70516351	-118.1919918	22	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10224	33.6952	-118.296	27	Inner Shelf	Palos Verdes Shelf	Yes	LACSD	Yes	LACSD
B18-10225	33.6596	-118.131	27	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10226	33.6434	-118.078743	26	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10227	33.627799	-117.987516	13	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10228	33.61891999	-118.0418036	28	Inner Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10229	33.520951	-117.770247	16	Inner Shelf	Orange Shelf	Yes	OCSD	No	N/A
B18-10867	33.65988706	-118.054842	16	Inner Shelf	Bight	No	N/A	Yes	OCSD
B18-10230	33.43047212	-117.6582498	13	Inner Shelf	Orange Shelf	Yes	OCSD	Yes	OCSD
B18-10231	33.30718509	-117.5233882	17	Inner Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10232	33.09985	-117.3263453	12	Inner Shelf	North San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10233	33.0399657	-117.3128137	24	Inner Shelf	North San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10880	32.65309661	-117.214964	10	Inner Shelf	Bight	No	N/A	Yes	City of San Diego
B18-10234	32.81629057	-117.2889376	14	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10235	32.67462964	-117.2646724	13	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10236	32.66917453	-117.2559687	11	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10237	32.65983159	-117.1684268	10	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10238	32.63931549	-117.1865887	19	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10239	32.61201273	-117.1434812	11	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10240	32.53430972	-117.1693426	22	Inner Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10241	34.43591826	-120.2367627	75	Mid Shelf	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10242	34.42375244	-120.0577384	71	Mid Shelf	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10243	34.400981	-119.832791	29	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10244	34.35909285	-119.8250195	81	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10245	34.35756132	-119.673767	55	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10246	34.34406	-119.56253	44	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10247	34.31192099	-119.5477014	69	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10248	34.2297993	-119.5181744	88	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC

Bight '18 Sediment Quality Workplan - Page 46

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10249	34.19527121	-119.3909015	35	Mid Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10250	34.05265231	-119.0491019	82	Mid Shelf	Hueneme to Dume	Yes	CLA-EMD	Yes	CLA-EMD
B18-10251	34.0157796	-118.9120183	58	Mid Shelf	Hueneme to Dume	Yes	ABC	Yes	ABC
B18-10252	33.9864445	-118.6218623	73	Mid Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10253	33.943783	-118.519783	48	Mid Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10254	33.93486	-118.53976	37	Mid Shelf	Santa Monica Bay	No	N/A	Yes	CLA-EMD
B18-10255	33.86610609	-118.5280901	72	Mid Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10256	33.860133	-118.447783	60	Mid Shelf	Santa Monica Bay	No	CLA-EMD-reject	No	CLA-EMD-reject
B18-10906	33.92690864	-118.554542	115	Mid Shelf	Bight	Yes	CLA-EMD	Yes	CLA-EMD
B18-10257	33.84815	-118.56745	80	Mid Shelf	Santa Monica Bay	Yes	CLA-EMD	No	N/A
B18-10258	33.6481	-118.149	31	Mid Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10259	33.621	-118.195	43	Mid Shelf	San Pedro Shelf	Yes	OCSD	No	N/A
B18-10260	33.601949	-118.056462	38	Mid Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10261	33.60185	-118.05647	55	Mid Shelf	San Pedro Shelf	No	N/A	Yes	OCSD
B18-10262	33.59497191	-118.1944958	51	Mid Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10263	33.59226054	-117.9254279	28	Mid Shelf	San Pedro Shelf	Yes	OCSD	Yes	OCSD
B18-10264	33.512166	-117.771484	41	Mid Shelf	Orange Shelf	Yes	OCSD	No	N/A
B18-10914	33.61116072	-118.2224555	50	Mid Shelf	Bight	No	N/A	Yes	OCSD
B18-10265	33.269751	-117.564827	78	Mid Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10266	33.265584	-117.533447	62	Mid Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10267	33.21759371	-117.4805131	57	Mid Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10268	33.10526	-117.36216	85	Mid Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10269	33.08764	-117.35097	73	Mid Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10270	32.96766131	-117.2995866	48	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10271	32.85111126	-117.325908	67	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10272	32.75182312	-117.3226555	74	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10273	32.66439671	-117.2712796	43	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10274	32.66369091	-117.2959914	74	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10275	32.6323618	-117.3057403	103	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10276	32.59752772	-117.2447978	45	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10277	32.58969	-117.26429	58	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10278	32.55148	-117.1995	35	Mid Shelf	South San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10279	34.41819003	-120.2139579	163	Outer Shelf	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10280	34.39785188	-120.0874257	183	Outer Shelf	West Santa Barbara Channel	Yes	Unassigned	Yes	Unassigned
B18-10281	34.39477	-120.33174	184	Outer Shelf	West Santa Barbara Channel	Yes	MBC	No	N/A
B18-10282	34.30786	-119.71283	139	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10283	34.27783	-119.71844	202	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10284	34.27241821	-119.6573421	129	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10285	34.26088	-119.76726	195	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10286	34.24395824	-119.7057712	173	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10287	34.23287	-119.70663	159	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10288	34.2303	-119.68726	138	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10289	34.22412	-119.60608	146	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10290	34.20677	-119.56748	135	Outer Shelf	East Santa Barbara Channel	No	N/A	Yes	LACSD
B18-10291	34.19693036	-119.5713302	147	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10292	34.19563166	-119.6373317	226	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10293	34.16897	-119.46088	127	Outer Shelf	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10294	34.1329	-119.37902	119	Outer Shelf	East Santa Barbara Channel	No	N/A	Yes	LACSD
B18-10295	34.13274521	-119.3633611	178	Outer Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10296	34.132675	-119.369899	173	Outer Shelf	East Santa Barbara Channel	No	N/A	Yes	LACSD
B18-10297	34.12281	-119.33129	129	Outer Shelf	East Santa Barbara Channel	No	N/A	Yes	LACSD
B18-10298	34.11009	-119.22178	137	Outer Shelf	Hueneme to Dume	Yes	ABC	No	N/A
B18-10299	34.10717	-119.31902	195	Outer Shelf	East Santa Barbara Channel	No	N/A	Yes	ABC
B18-10300	34.08884049	-119.2747574	210	Outer Shelf	East Santa Barbara Channel	Yes	ABC	Yes	ABC
B18-10301	34.06644	-119.13415	186	Outer Shelf	Hueneme to Dume	Yes	ABC	No	N/A
B18-10302	34.04914	-119.06544	119	Outer Shelf	Hueneme to Dume	No	N/A	Yes	ABC
B18-10303	34.04413	-119.05558	205	Outer Shelf	Hueneme to Dume	Yes	CLA-EMD	Yes	CLA-EMD
B18-10304	34.03355024	-119.0300097	129	Outer Shelf	Hueneme to Dume	Yes	CLA-EMD	Yes	CLA-EMD
B18-10305	34.002434	-118.917967	118	Outer Shelf	Hueneme to Dume	No	N/A	Yes	LACSD
B18-10306	33.99729247	-119.0237869	85	Outer Shelf	Hueneme to Dume	Yes	CLA-EMD	Yes	CLA-EMD
B18-10307	33.95711	-118.59303	156	Outer Shelf	Santa Monica Bay	No	N/A	Yes	LACSD
B18-10308	33.91233898	-118.5885681	201	Outer Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10309	33.8191507	-118.5255526	169	Outer Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10310	33.76745	-118.45903	118	Outer Shelf	Santa Monica Bay	No	N/A	Yes	LACSD

Bight '18 Sediment Quality Workplan - Page 48

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10311	33.7671	-118.46	127	Outer Shelf	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10312	33.57529025	-118.1254068	119	Outer Shelf	San Pedro Channel	Yes	OCSD	Yes	OCSD
B18-10313	33.56828222	-118.0242786	95	Outer Shelf	San Pedro Channel	Yes	OCSD	Yes	OCSD
B18-10314	33.547898	-117.85292	190	Outer Shelf	Orange Shelf	No	N/A	Yes	OCSD
B18-10315	33.464034	-117.761898	155	Outer Shelf	Orange Shelf	Yes	OCSD	No	N/A
B18-10316	33.30330725	-117.609189	130	Outer Shelf	San Diego Slope	Yes	City of San Diego	Yes	City of San Diego
B18-10317	33.221016	-117.511475	181	Outer Shelf	North San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10318	32.70574626	-117.347139	185	Outer Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10319	32.65914361	-117.3370725	155	Outer Shelf	South San Diego Shelf	Yes	City of San Diego	No	N/A
B18-10320	32.58574	-117.3407	183	Outer Shelf	South San Diego Shelf	Yes	City of San Diego	Yes	City of San Diego
B18-10321	34.36292	-120.0104	453	Upper Slope	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10322	34.34418	-120.36868	288	Upper Slope	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10323	34.31423	-120.28184	387	Upper Slope	West Santa Barbara Channel	Yes	MBC	No	N/A
B18-10324	34.28685	-120.45566	430	Upper Slope	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10325	34.26183967	-119.8054344	280	Upper Slope	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10326	34.260016	-120.281134	463	Upper Slope	West Santa Barbara Channel	No	N/A	Yes	MBC
B18-10327	34.25797601	-120.2614808	478	Upper Slope	West Santa Barbara Channel	Yes	Unassigned	Yes	Unassigned
B18-10328	34.25207557	-119.8373496	385	Upper Slope	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10329	34.21151049	-120.5426017	314	Upper Slope	West Santa Barbara Channel	Yes	Unassigned	Yes	Unassigned
B18-10330	34.19785735	-120.3625382	477	Upper Slope	West Santa Barbara Channel	Yes	Unassigned	Yes	Unassigned
B18-10331	34.18317	-120.35125	457	Upper Slope	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10332	34.17079922	-119.7936254	390	Upper Slope	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10333	34.15835	-119.82779	406	Upper Slope	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10334	34.14986805	-120.1213097	487	Upper Slope	West Santa Barbara Channel	Yes	Unassigned	Yes	Unassigned
B18-10335	34.1457	-119.76997	363	Upper Slope	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10336	34.144	-120.17799	430	Upper Slope	West Santa Barbara Channel	Yes	MBC	Yes	MBC
B18-10337	34.12821897	-119.3999854	225	Upper Slope	Hueneme to Dume	Yes	LACSD	Yes	LACSD
B18-10338	34.11828	-119.6289	259	Upper Slope	East Santa Barbara Channel	Yes	LACSD	Yes	LACSD
B18-10339	34.0416	-119.19757	400	Upper Slope	Hueneme to Dume	Yes	LACSD	Yes	LACSD
B18-10340	34.03853333	-119.1256413	373	Upper Slope	Hueneme to Dume	Yes	LACSD	Yes	LACSD
B18-10341	33.95820606	-118.6488313	229	Upper Slope	Santa Monica Bay	Yes	CLA-EMD	Yes	CLA-EMD
B18-10342	33.90605707	-118.6663844	443	Upper Slope	Santa Monica Bay	Yes	LACSD	Yes	LACSD

Bight '18 Sediment Quality Workplan - Page 49

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10343	33.6942	-118.347	257	Upper Slope	Palos Verdes Shelf	Yes	LACSD	Yes	LACSD
B18-10344	33.556099	-118.021956	227	Upper Slope	Orange Slope	Yes	OCSD	Yes	OCSD
B18-10345	33.55555561	-118.1147775	243	Upper Slope	Orange Slope	Yes	OCSD	Yes	OCSD
B18-10346	33.536816	-117.847705	345	Upper Slope	Orange Slope	Yes	OCSD	Yes	OCSD
B18-10347	33.1806614	-117.478174	243	Upper Slope	San Diego Slope	Yes	City of San Diego	Yes	City of San Diego
B18-10348	33.09383	-117.41715	405	Upper Slope	San Diego Slope	Yes	City of San Diego	Yes	City of San Diego
B18-10349	33.05043032	-117.389548	395	Upper Slope	San Diego Slope	Yes	City of San Diego	Yes	City of San Diego
B18-10350	32.70484185	-117.353721	232	Upper Slope	San Diego Slope	Yes	City of San Diego	Yes	City of San Diego
B18-10351	32.6929	-117.39491	372	Upper Slope	San Diego Slope	Yes	City of San Diego	Yes	City of San Diego
B18-10352	34.21724563	-119.9140528	534	Lower Slope	East Santa Barbara Channel	Yes	LACSD	No	N/A
B18-10353	33.94413688	-118.7713436	583	Lower Slope	Santa Monica Basin	Yes	CLA-EMD	No	N/A
B18-10354	33.93569	-118.89715	827	Lower Slope	Hueneme to Dume	Yes	LACSD	No	N/A
B18-10355	33.88368692	-118.7900578	818	Lower Slope	Santa Monica Basin	Yes	LACSD	No	N/A
B18-10356	33.87933016	-119.4029034	705	Lower Slope	Hueneme to Dume	Yes	LACSD	No	N/A
B18-10357	33.85208	-119.19431	845	Lower Slope	Hueneme to Dume	Yes	LACSD	No	N/A
B18-10358	33.83378242	-118.9524278	900	Lower Slope	Santa Monica Basin	Yes	LACSD	No	N/A
B18-10359	33.83245	-118.64885	678	Lower Slope	Santa Monica Basin	Yes	CLA-EMD	No	N/A
B18-10360	33.65083511	-119.0017093	701	Lower Slope	Santa Monica Basin	Yes	LACSD	No	N/A
B18-10361	33.63781	-118.30256	613	Lower Slope	San Pedro Channel	Yes	OCSD	No	N/A
B18-10362	33.63467314	-118.5836013	746	Lower Slope	San Pedro Channel	Yes	LACSD	No	N/A
B18-10363	33.61355	-118.72014	750	Lower Slope	Santa Monica Basin	Yes	LACSD	No	N/A
B18-10364	33.57922	-118.32894	690	Lower Slope	San Pedro Channel	Yes	OCSD	No	N/A
B18-10365	33.53645097	-118.5894325	516	Lower Slope	San Pedro Channel	Yes	LACSD	No	N/A
B18-10366	33.48691	-118.42353	900	Lower Slope	San Pedro Channel	Yes	LACSD	No	N/A
B18-10367	33.46425	-117.919678	558	Lower Slope	Orange Slope	Yes	OCSD	No	N/A
B18-10368	33.46395	-118.39474	595	Lower Slope	San Pedro Channel	Yes	LACSD	No	N/A
B18-10369	33.45226098	-117.7768889	583	Lower Slope	Orange Slope	Yes	OCSD	No	N/A
B18-10370	33.35429475	-118.0432223	747	Lower Slope	Orange Slope	Yes	OCSD	No	N/A
B18-10371	33.317468	-118.160612	787	Lower Slope	Orange Slope	Yes	OCSD	No	N/A
B18-10372	33.30579143	-117.697866	691	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10373	33.274032	-118.086377	826	Lower Slope	Orange Slope	Yes	OCSD	No	N/A
B18-10374	33.14638708	-117.7429	809	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A

Bight '18 Sediment Quality Workplan - Page 50

B18 Station ID	Target Latitude	Target Longitude	GIS Depth	B18 Stratum	Region	Sed Grab	Agency Sed Grab	Trawl	Agency Trawl
B18-10375	33.10192	-117.6311	788	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10376	33.05229639	-117.4540585	509	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10377	33.03243	-117.66875	854	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10378	32.9772337	-117.6945535	898	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10379	32.95543291	-117.3626538	492	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10380	32.93167	-117.39472	562	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10381	32.85103	-117.41079	527	Lower Slope	San Diego Slope	Yes	City of San Diego	No	N/A
B18-10382	34.11525	-119.93538	100	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10383	34.11255	-120.02533	110	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10384	34.1018	-120.14144	101	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10385	34.0788	-119.50937	124	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10386	34.07858	-119.70081	92	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10387	34.07505	-119.74828	88	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10388	34.06663	-119.58862	88	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10389	34.05855	-119.4961	82	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10390	34.04681	-120.48995	75	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10391	34.03352	-119.35002	84	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10392	34.03022	-119.42289	82	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10393	34.01217	-120.47562	95	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10394	33.99451	-120.33739	71	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10395	33.96426	-119.85254	21	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A
B18-10396	33.91322	-119.94719	72	Channel Islands	North Channel Islands	Yes	NOAA/ SCCWRP	No	N/A

APPENDIX C

Sample Laboratory Assignments

Table C1. Sediment Laboratory Assignments

B18 Station ID	Agency Sed Grab	Agency Tox Eohast	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fipronyl	Agency Domoic Acid	Agency Infauna
B18-10000	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10001	CLA-EMD	CLA-EMD	AMEC/ WOOD	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10002	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10003	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10004	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10005	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10006	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10007	CLA-EMD	CLA-EMD	AMEC/ WOOD	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10009	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10010	CLA-EMD	CLA-EMD	AMEC/ WOOD	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10011	POLA/LB	CLA-EMD	ABC	City of San Diego	City of San Diego	City of San Diego	OCSD	OCSD	OCSD	LACSD	Weck	Weck	N/A	POLA/LB
B18-10012	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10013	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10014	RMC	RMC	RMC	RMC	N/A	RMC	RMC	RMC	RMC	N/A	N/A	N/A	N/A	RMC
B18-10015	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10016	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10017	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10018	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10019	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10020	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10021	Unassigned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10022	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10023	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10024	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10025	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10026	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy

Bight '18 Sediment Quality Workplan - Page 53

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Bight '18 Sediment Quality Workplan - Page 54

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Bight '18 Sediment Quality Workplan - Page 55

B18 Station ID	Agency Sed Grab	Agency Tox Eohast	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10083	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10084	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10085	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10086	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10087	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10088	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10089	RMC	RMC	RMC	RMC	N/A	RMC	RMC	RMC	RMC	N/A	N/A	N/A	N/A	RMC
B18-10090	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10091	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10092	POLA/LB	AMEC/ WOOD	AMEC/ WOOD	City of San Diego	City of San Diego	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	LACSD	Weck	Weck	N/A	POLA/LB
B18-10093	RMC	RMC	RMC	RMC	N/A	RMC	RMC	RMC	RMC	N/A	N/A	N/A	N/A	RMC
B18-10094	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	LACSD	OCSD	OCSD	N/A	CLA-EMD
B18-10095	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10096	POLA/LB	LACSD	ABC	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	LACSD	Weck	Weck	N/A	POLA/LB
B18-10097	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10098	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10099	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10100	CLA-EMD	CLA-EMD	Unassigned	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	LACSD	OCSD	OCSD	N/A	CLA-EMD
B18-10101	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	LACSD	OCSD	OCSD	N/A	CLA-EMD
B18-10102	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10103	RMC	RMC	RMC	RMC	N/A	RMC	RMC	RMC	RMC	N/A	N/A	N/A	N/A	RMC
B18-10104	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	OC Public Works	N/A	OC Public Works
B18-10105	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10106	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10107	CLA-EMD	CLA-EMD	ABC	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	OCSD	OCSD	OCSD	N/A	CLA-EMD
B18-10108	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10109	CLA-EMD	CLA-EMD	Unassigned	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	LACSD	OCSD	OCSD	N/A	CLA-EMD
B18-10110	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC

Bight '18 Sediment Quality Workplan - Page 56

B18 Station ID	Agency Sed Grab	Agency Tox Eohaus	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10111	RMC	RMC	RMC	RMC	City of San Diego	RMC	RMC	RMC	RMC	LACSD	Weck	Weck	N/A	RMC
B18-10112	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10113	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10114	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10115	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10116	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10117	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10118	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10119	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10120	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10121	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10122	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10123	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10124	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10125	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10126	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10127	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10128	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10129	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10130	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10131	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10132	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10133	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10134	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10135	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy
B18-10136	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10137	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10138	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Navy	Unassigned	Unassigned	Unassigned	N/A	Navy

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Bight '18 Sediment Quality Workplan - Page 58

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Bight '18 Sediment Quality Workplan - Page 59

B18 Station ID	Agency Sed Grab	Agency Tox Eohhaust	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fipronyl	Agency Domoic Acid	Agency Infauna
B18-10194	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	N/A	San Diego County Stormwater
B18-10195	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	N/A	San Diego County Stormwater
B18-10196	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	N/A	San Diego Stormwater
B18-10197	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	N/A	San Diego Stormwater
B18-10198	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	N/A	San Diego Stormwater
B18-10199	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	San Diego County Stormwater	N/A	San Diego County Stormwater
B18-10200	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	RHMP	N/A	RHMP
B18-10201	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	N/A	San Diego Stormwater
B18-10202	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	San Diego Stormwater	N/A	San Diego Stormwater
B18-10203	MBC	LACSD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	City of San Diego
B18-10204	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	City of San Diego
B18-10205	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10206	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10207	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10208	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10209	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10210	ABC	LACSD	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	SCCWRP-archive	N/A	Weck	ABC
B18-10211	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10212	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10213	ABC	N/A	N/A	City of San Diego	City of San Diego	OCSD	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10214	ABC	N/A	N/A	City of San Diego	City of San Diego	OCSD	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10215	ABC	N/A	N/A	City of San Diego	City of San Diego	OCSD	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10216	ABC	N/A	N/A	City of San Diego	City of San Diego	OCSD	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10217	ABC	LACSD	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	SCCWRP-archive	N/A	Weck	ABC
B18-10218	CLA-EMD	CLA-EMD	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	SCCWRP-archive	N/A	Weck	CLA-EMD
B18-10219	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD

Bight '18 Sediment Quality Workplan - Page 60

B18 Station ID	Agency Sed Grab	Agency Tox Eohast	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10220	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	OCSD
B18-10221	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10222	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	OCSD
B18-10223	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	OCSD
B18-10224	LACSD	LACSD	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	SCCWRP-archive	N/A	Weck	LACSD
B18-10225	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	OCSD
B18-10226	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	OCSD
B18-10227	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	OCSD
B18-10228	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	OCSD
B18-10229	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	OCSD
B18-10230	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	OCSD
B18-10231	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10232	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10233	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10234	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10235	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10236	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10237	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10238	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10239	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10240	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10241	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10242	MBC	LACSD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10243	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10244	ABC	LACSD	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	SCCWRP-archive	N/A	Weck	ABC
B18-10245	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10246	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10247	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD

Bight '18 Sediment Quality Workplan - Page 61

B18 Station ID	Agency Sed Grab	Agency Tox Eohast	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10248	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10249	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10250	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10251	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10252	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10253	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10254	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10255	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10256	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10257	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10258	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	City of San Diego
B18-10259	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	City of San Diego
B18-10260	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10261	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10262	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10263	OCSD	OCSD	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10264	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	Weck	City of San Diego
B18-10265	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10266	City of San Diego	CLA-EMD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10267	City of San Diego	CLA-EMD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10268	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10269	City of San Diego	CLA-EMD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10270	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10271	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10272	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10273	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10274	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10275	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego

Bight '18 Sediment Quality Workplan - Page 62

B18 Station ID	Agency Sed Grab	Agency Tox Eohhaust	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10276	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10277	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10278	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10279	MBC	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10280	Unassigned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10281	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10282	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10283	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10284	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10285	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10286	LACSD	LACSD	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	SCCWRP-archive	N/A	Weck	LACSD
B18-10287	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10288	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10289	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10290	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10291	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10292	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10293	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	Weck	LACSD
B18-10294	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10295	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10296	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10297	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10298	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	ABC
B18-10299	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10300	ABC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	N/A	N/A	Weck	OCSD
B18-10301	ABC	LACSD	N/A	City of San Diego	City of San Diego	City of San Diego	ABC	ABC	ABC	N/A	SCCWRP-archive	N/A	Weck	ABC
B18-10302	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10303	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD

Bight '18 Sediment Quality Workplan - Page 63

B18 Station ID	Agency Sed Grab	Agency Tox Eohast	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10304	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10305	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10306	CLA-EMD	CLA-EMD	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	SCCWRP-archive	N/A	Weck	CLA-EMD
B18-10307	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10308	CLA-EMD	CLA-EMD	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	SCCWRP-archive	N/A	Weck	CLA-EMD
B18-10309	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	Weck	CLA-EMD
B18-10310	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10311	CLA-EMD	CLA-EMD	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	SCCWRP-archive	N/A	Weck	CLA-EMD
B18-10312	OCSO	N/A	N/A	City of San Diego	OCSO	OCSO	OCSO	OCSO	OCSO	N/A	N/A	N/A	Weck	OCSO
B18-10313	OCSO	N/A	N/A	City of San Diego	OCSO	OCSO	OCSO	OCSO	OCSO	N/A	N/A	N/A	Weck	OCSO
B18-10314	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10315	OCSO	OCSO	N/A	City of San Diego	OCSO	OCSO	OCSO	OCSO	OCSO	N/A	SCCWRP-archive	N/A	Weck	OCSO
B18-10316	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10317	City of San Diego	CLA-EMD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10318	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10319	City of San Diego	City of San Diego	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	Weck	City of San Diego
B18-10320	City of San Diego	CLA-EMD	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	SCCWRP-archive	N/A	Weck	City of San Diego
B18-10321	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	OCSO	OCSO	OCSO	N/A	N/A	N/A	N/A	City of San Diego
B18-10322	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10323	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10324	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10325	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10326	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10327	Unassigned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10328	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10329	Unassigned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10330	Unassigned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10331	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego

Bight '18 Sediment Quality Workplan - Page 64

B18 Station ID	Agency Sed Grab	Agency Tox Eohaus	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fiproynl	Agency Domoic Acid	Agency Infauna
B18-10332	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10333	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10334	Unassigned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B18-10335	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10336	MBC	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	OCSD	OCSD	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10337	LACSD	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	CLA-EMD
B18-10338	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10339	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10340	LACSD	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	CLA-EMD
B18-10341	CLA-EMD	N/A	N/A	City of San Diego	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	CLA-EMD	N/A	N/A	N/A	N/A	CLA-EMD
B18-10342	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10343	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10344	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	N/A	OCSD
B18-10345	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	N/A	OCSD
B18-10346	OCSD	N/A	N/A	City of San Diego	OCSD	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	N/A	OCSD
B18-10347	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10348	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10349	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10350	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10351	City of San Diego	N/A	N/A	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	City of San Diego	N/A	N/A	N/A	N/A	City of San Diego
B18-10352	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10353	CLA-EMD	N/A	N/A	City of San Diego	City of San Diego	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	N/A	CLA-EMD
B18-10354	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10355	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10356	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10357	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10358	LACSD	N/A	N/A	City of San Diego	LACSD	LACSD	LACSD	LACSD	LACSD	N/A	N/A	N/A	N/A	LACSD
B18-10359	CLA-EMD	N/A	N/A	City of San Diego	City of San Diego	OCSD	OCSD	OCSD	OCSD	N/A	N/A	N/A	N/A	CLA-EMD

[illegible]

B18 Station ID	Agency Sed Grab	Agency Tox Eohaus	Agency Tox Mytilus	Agency Grain Size	Agency TOC/ TN	Agency Metals	Agency PAH	Agency CHC	Agency PCB	Agency Pyreth	Agency PBDE	Agency Fipronyl	Agency Domoic Acid	Agency Infauna
B18-10387	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	CLA-EMD
B18-10388	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	OCSD
B18-10389	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	OCSD
B18-10390	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	OCSD
B18-10391	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	OCSD
B18-10392	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego
B18-10393	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego
B18-10394	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego
B18-10395	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego
B18-10396	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego	City of San Diego	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	NOAA/ SCCWRP	N/A	City of San Diego

Table C2. Fish Tissue Laboratory Assignments

Laboratory	Fish Tissue DDT	Fish Tissue Total Mercury	Fish Tissue PCBs	Fish Tissue Lipid Content
	Total # Samples	Total # Samples	Total # Samples	Total # Samples
RHMP	75	75	75	75
City of San Diego	39	100	39	100
OCSD	60	60	60	60
OC Public Works	9	9	9	9
LACSD	30	30	30	30
CLA-EMD	70	70	70	70

APPENDIX D

Bight '18 Leveraged Studies

Screening for Contaminants of Emerging Concern in Southern California Bight

Lead investigators: Alvine Mehinto, Keith Maruya and Bowen Du

Background: Contaminants of emerging concern (CECs) represent a broad category of chemicals including natural and synthetic hormones, current use pesticides, personal care products, pharmaceuticals and their metabolites, and disinfection by-products, that are increasingly found in freshwater and marine aquatic ecosystems. In recent years, the California State Water Board has invested in the development of novel monitoring technologies for CECs. Using guidance from an expert panel, two technologies known as cell assay “bioscreening” and non-targeted analyses, were identified as promising monitoring tools. Cell assays provide an integrative measure of CECs acting via a common mode of action and offer a rapid and efficient way to screen for both known and unknown chemicals that can be linked to a toxic effect. Non-targeted chemical analysis has also emerged as a means for identifying previously unknown CECs in complex mixtures that show bioscreening responses, and for characterizing unique fingerprints that can be linked to a source of contamination. The Southern California Bight Regional Monitoring Program already measures numerous physical, chemical and biological parameters on any given sample. Application of bioscreening and non-targeted chemical analyses will help us determine how these techniques can enhance current monitoring practices.

Statement of Problem: Assessing the impact of CECs in the aquatic environment is challenging due to the ever-changing universe of chemicals found in receiving waters, their occurrence and potential for deleterious effects at exceedingly low concentrations, and a lack of standardized analytical methods. Moreover, current chemical-specific analyses conducted during established monitoring programs such as Bight do not address unexpected and/or unknown substances (e.g. drug metabolites, disinfection by-products). Coupling bioscreening tools with non-targeted analysis has the potential to enhance current monitoring by broadening the chemical universe under investigation while improving our ability to identify and prioritize CECs that are most likely to impact aquatic ecosystem health.

Objectives: The overall goal of this study is to screen for CECs occurring in coastal and marine environments. The specific questions addressed in this study are:

1. What is the extent and magnitude of cell assay responses in sediments from the Southern California Bight?
2. What is the extent and magnitude of cell assay responses in sportfish from the Southern California Bight?
3. Are there habitat-specific chemical fingerprints in sediments from the Bight?
4. Can cell assay responses be correlated with targeted and non-targeted chemistry data?

Approach

Task 1 – Sample collection and processing. Sediment (n=50-60) and fish tissue samples (n=30-45) that represent a broad range of anticipated CEC exposure will be selected from the more than 300 sediment and 100 tissue samples collected from various coastal and offshore habitats as part of Bight'18. Organic extracts of the selected sediment samples will be obtained from participating chemistry labs and further processed for bioanalytical and non-targeted analyses.

Task 2 – Bioanalytical screening. Sample extracts will be analyzed using protocols standardized by SCCWRP and collaborators for 3 different cell assay endpoints: 1) estrogen receptor (ER), 2) anti-androgen receptor (anti-AR), and 3) aryl hydrocarbon receptor (AhR) activities. Validation of results will be performance-based, including generation of multi-point calibration curves using assay-specific reference chemicals, controls to correct for bioassay artifacts, and matrix spike recovery of a known bioactive compound. Results will be expressed as a bioassay equivalent concentration (BEQ), in units of ng/g, relative to the reference chemical.

Task 3 – Non-targeted analyses. A subset of sediment sample extracts screened in Task 2 will be selected for non-targeted chemical analysis. To evaluate the utility of these tools, samples exhibiting a wide range of bioactivity will be preferred. Selected extracts will be analyzed using quadrupole-time of flight mass spectrometry (Q-TOF) coupled with liquid chromatography (LC) and/or gas chromatography (GC) to maximize the universe of CECs detectable. Comparative fingerprinting analysis of CECs detected across habitats will be performed.

Products: As one of the first, large scale evaluations of novel screening tools for CECs, this project will inform the water quality and resource management communities on the extent and severity of CEC exposure and potential for impacts in coastal and marine habitats of the Southern California Bight. The data generated will also complement and assist in the interpretation of data collected on contaminant exposure, accumulation and effects as part of the core Bight'18 effort. A detailed write-up of methods, results, and conclusions; as well as graphical and tabular summaries of the data, will be provided as an Appendix in the Bight'18 Chemistry Report. The findings will also be published in a peer-reviewed journal.

SEDIMENT TRANSPORT

Lead Investigator: Jonathon Warrick, US Geological Survey

Background

The Bight Program has been answering questions about the extent and magnitude of sediment quality for nearly 25 years. Most frequently the results of the Bight Programs suggest good sediment quality; however, when sediment quality is impacted, managers typically ask what and where is the source of the sediment contamination. Unfortunately, sediment fate and transport is not well known at regional scales within the Bight. Localized studies of contaminated sediment transport have been conducted in places such as the Palos Verdes Shelf and San Pedro Bay. Yet large-scale sediment transport across the continental borderlands remains unquantified.

Objective

This leveraged study will develop a better understanding of the transport and fate of sediment across the Bight using an existing understanding of the physical and geological setting. The study area includes the continental shelf, slope and basin regions of the Bight deeper than 10 m. This evaluation will be conducted through a synthesis of existing information to assess the relative frequency and direction of sediment transport.

Tasks

This project will compile data from four sources that characterize sediment transport processes in the Bight. The data will be used to create a simple model of sediment transport direction and magnitude.

Task 1: Sediment mobility from waves. Ocean waves are the primary means of suspending sediment on the continental shelf, and thus are directly related to sediment transport in these settings. The wave patterns within the Bight are complex owing to the offshore islands, complex shelf and shoreline patterns, and the meteorological conditions that cause waves. To better understand the spatial and temporal variability of wave-suspension of sediment, an exercise will be conducted similar to Storlazzi and Reid (2010, *Continental Shelf Research*. 30:1582-1599) that will link existing wave models from SWAN, existing sediment grain size assessments from usSEABED, and sediment suspension assessments from standard sediment transport formulations.

Task 2: Sediment mobility from biological processes. Benthic organisms actively mix and suspend sediment and can be an important process in the movement of sediment in the Bight. A subgroup of study members will review and synthesize the types of benthic communities in the Bight and the processes and rates of sediment suspension produced by these communities. These factors will be integrated into the total sediment mobility assessment.

Task 3: Sediment transport pathways from currents. Pathways of sediment are dictated primarily by the direction of ocean currents near the seafloor. These near-bed currents can be different in magnitude and direction from overlying surface water currents. Existing

numerical models of the Bight (UCLA ROMS) will be used to characterize the patterns of near-bed currents to better constrain sediment transport directions in space and time.

Task 4: Sediment transport down steep slopes. Where seafloor slope is adequately steep, suspended sediment can flow downslope from gravity-driven processes. These are important sediment transport pathways in regions such as submarine canyons. These areas will be mapped using newly acquired bathymetric maps of the Bight.

Products

The forcing elements characterized in Tasks 1 – 4 will be combined and synthesized using sediment transport ‘rules’. The rules will be defined by a project subcommittee, informed by the scientific literature, then calibrated and validated using Bight grain size measurements. Results will be synthesized in a geographical information system (GIS) and presented in a series of maps showing the relative frequency of transport and the dominant directions of transport. The project will be written as an appendix to the sediment chemistry report to help interpret sediment chemistry spatial magnitude findings. The project will also be submitted to a peer-reviewed journal for publication.

Characterizing Meiofaunal Assemblages in the Southern California Bight

Project Lead: Holly Bik (UC Riverside)

Background: Benthic meiofaunal species (organisms 45µm–1mm, including nematodes, copepods, tardigrades, other “minor” metazoan phyla, protists, fungi, and eggs/larval stages of larger species) are abundant and ubiquitous in marine sediment habitats, performing key functions such as nutrient cycling and sediment stability (Snelgrove & Butman 1994). Yet, their unexplored diversity represents one of the major challenges in biology and currently limits our capacity to understand, mitigate and remediate the consequences of environmental change. Meiofaunal assemblages have been poorly characterized in Southern California sediments (Hooge 1999), and there is a critical need for baseline data on the abundance, richness, and structure of these communities.

Statement of Problem: Comprehensive data on the composition of meiofaunal assemblages in coastal California sediments would be particularly valuable for tracking both long-term environmental change and the effects of acute localized disturbance. The abundance, biomass, and community structure of sediment infaunal communities in general exhibit tight correlations to sediment properties such as grain size, organic content, and sediment stability (e.g., Snelgrove & Butman 1994), and thus reflect hydrodynamic processes and organic inputs from the overlying water column. Chronically polluted sites may also maintain distinct communities, with long-term exposure reducing both taxonomic richness and trophic diversity (with consequences for ecosystem function; Wang et al. 2009). The Bight 2018 survey offers an unprecedented opportunity for generating a comprehensive baseline dataset of benthic meiofaunal assemblages in Southern California; associated environmental and macrofauna data will facilitate robust assessment of the environmental drivers of meiofaunal community structure and function.

Objectives: The primary objective of this study is to generate a comprehensive baseline dataset of benthic meiofaunal species assemblages in the Southern California Bight, using a combination of environmental “-omics” approaches and traditional morphological taxonomy. Specific study objectives are as follows:

1. Determine how the diversity and structure of meiofaunal assemblages in Southern California estuaries relates to sediment properties (e.g. organic matter content, grain size, chemical profiles) and salinity levels (e.g. euhaline, polyhaline, mesohaline).
2. Identify meiofaunal community changes along gradients of stress (e.g., increasing levels of trace metals, legacy pesticides, emerging contaminants), with the goal of identifying meiofaunal “indicator taxa” in sites with high pollution loads.
3. Compare meiofaunal results with standard Bight survey approaches (e.g. macrofaunal data), to assess the complementary information that can be gained about ecosystem health and function.
4. Compare the utility of morphological taxonomy versus DNA metabarcoding for generating a comprehensive survey of benthic meiofaunal assemblages in the Southern California Bight.

5. Developing Standard Operating Procedures (SOPs) for meiofauna sampling as well as paving the way for using meiofauna assemblages as an environmental assessment tool in the Southern California Region

Task 1: Sample Collection and Processing. Sediment samples will be collected at Bight survey stations using Van Veen grabs (offshore sites) or push cores by hand (shore-based sampling). Fresh sediment will be transferred into Whirl-Paks or Ziploc bags and kept cool on ice or frozen immediately on dry ice upon collection. Frozen/chilled cores will be transferred into long-term storage at -80°C and subsequently transferred to UC Riverside for further processing. Meiofaunal organisms will be extracted from sediments using standard taxonomic protocols that involve flotation and decantation over a 45µm sieve (Danovaro 2010).

Task 2: Environmental Metabarcoding: For the environmental metabarcoding approach (Figure 2), we will carry out DNA extractions on extracted meiofauna fractions followed by amplification of a ~400bp fragment of the 18S ribosomal RNA gene (F04/R22 primers amplifying the V1/V2 region; Creer et al. 2010). This primer set is effective over a broad taxonomic range (amplification of >20 metazoan phyla, as well as fungi, algae, and protists), and has been extensively tested and validated for metabarcoding studies of meiofauna. Metabarcoding PCR libraries will be cleaned, pooled, and sequenced on the Illumina MiSeq Platform (300bp Paired-End runs, enabling recovery of the entire 18S amplicon).

Task 3: Morphological Taxonomy and DNA barcoding of single meiofaunal specimens: For each sampling site, a subset of 30-100 individual meiofauna specimens will also be sorted, identified, and imaged under a high-power microscope, followed by DNA extraction and DNA barcoding of selected specimens to generate a full-length 18S rRNA barcode for the most abundant Bight meiofaunal species (~1600bps generated via Sanger sequencing, amplified using primer sets in Bik et al. 2010).

Task 4: Bioinformatics and Statistical Analysis: Morphological taxonomy data, DNA barcoding, and environmental metabarcoding datasets will be carried out in appropriate software pipelines such as QIIME, R Studio, and PRIMER-E. Alpha- and Beta-diversity analyses will be carried out to assess spatial and depth-related patterns of species richness and community structure, and identify potential environmental and biological drivers of meiofaunal assemblage structure. Phylogenetic analyses will be additionally carried out on DNA datasets to identify potential cryptic diversity amongst meiofaunal morphospecies, and assess biogeographic break points in the Southern California Bight.

Products: Products from this leveraged study will include peer-reviewed scientific publications, a reference database of key Bight meiofaunal species (morphological identifications and reference DNA barcodes generated from individual specimens), high-throughput environmental metabarcoding datasets (datasets of Operational Taxonomic Units and their geographic distribution), as well as formal SOPs detailing meiofaunal sampling protocols and data collection/analysis procedures. We anticipate a minimum of two manuscripts resulting from this leveraged study, one focused on phylogeographic patterns for Bight meiofaunal species, and a second manuscript focusing on environmental drivers of community structure (sediment grain size, salinity, pollutant levels, etc.).

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CA Halibut Juvenile Index of Abundance, and Age at Length Relationships

Project Leads: Miranda Haggerty

Background: The California Halibut (CH), *Paralichthys californicus*, has been a valuable commercial and recreational fishery for over a century. Currently the Southern California portion of the CH stock is considered depressed, estimated at 14 % of historic levels in Southern California (Maunder et al. 2011). Despite low catch levels and the depressed stock estimation, CH biomass may have the capacity to increase in a short time frame with favorable environmental conditions. Like many warm temperate fishes in the Southern California Bight (SCB), CH reproductive potential should increase during seasons with warmer than average water conditions. As the cooler Pacific Decadal Oscillation cycle ends and waters warm, there is evidence of increasing juvenile CH abundance with the ratio of released/kept CH increasing from 2015 to 2017 for private/rental boats and party/charter boats in southern CA. Developing a fishery-independent index of juvenile CH abundance will be used to inform management on the status of the resource, establishing expectations for recruitment to the fishery in Southern California and address biological data gaps for future stock assessments. The CDFW has conducted similar trawl surveys in the past which offers a unique dataset for comparison to the proposed study.

Statement of Problem: Age at length relationships across a species distribution are an important component of fishery assessments. Due to resource limitations there is currently a data gap for sublegal sized CH in southern CA. As well as age and length, identification of sex is needed to assess gender ratios and gender specific growth rates.

There are currently no fishery independent assessments of CH status in Southern California. To assess current populations and the potential for an increase in recruitment with long term oscillation in ocean temperatures, a plan is being implemented to tag and recapture CH. Collaboration with the California Bight 2018 Monitoring Program will maximize tagging/recapture events and minimize mortality of CH by providing samples that have died or already been sacrificed as part of Bight Program protocols.

Objectives: The objectives of this study are to collect samples to supplement the age at length relationship for southern CA CH and to contribute to CDFW's fishery independent assessments of CH by enumerating and tagging juvenile CH. This will aid in answering two primary questions:

1. What is the age, length and sex composition of sublegal CH from various locations in San Diego County and the SCB?
2. What is the relative juvenile abundance of CH across embayments and shallow coastal sites across the SCB, and how has this changed over time?

Task 1: CA Halibut Sample Collection. Fish will be collected from benthic trawls across the various preselected Bight'18 strata. It can be expected that CH will primarily be caught in embayment strata including marinas, ports, and bays/harbors, as well as the shallowest offshore strata, primarily inner shelf (5 to 30 m). From these strata, CH that are sacrificed for bioaccumulation sampling (primarily San Diego locations) will be provided to CDFW for otolith

extraction and sexing. Additionally any CH caught in trawls that are in poor condition and unlikely to survive if released should be retained to contribute to the ongoing age/growth study.

Otoliths, along with corresponding length (mm) and sex data will be sent to the Northern and Central California Finfish Research and Management Project (NCCFRMP) based out of Monterey, CA for processing and aging. NCCFRMP has an ongoing age/length study for CA Halibut but due to logistical difficulties sampling across the SCB, opportunities have been limited.

Task 2: Tagging CA Halibut. For CDFW's fishery independent assessments of CH, we are beginning a juvenile CH mark-recapture monitoring study in the spring of 2018 to evaluate juvenile distribution, abundance, and estimate the expected contribution from various habitats to the CH fishery. Trawling locations will vary from Oceanside to Los Angeles, covering the various embayment and shallow coastal habitats that juvenile CH (50-250 mm) rely upon. A scientific aid and/or environmental scientist will assist with trawling at the Bight'18 trawl locations that overlap with this monitoring study to ensure previously tagged CH are released as well as tag and release all untagged CH.

At other trawl locations, PIT tagging supplies and a tag reader can be provided. Biologists can scan all CH to identify tagged individuals, record their tag number, location and size, and return them back to the water. If there is time and interest, untagged CH can also be tagged before release. These data will be input into the mark-recapture model to aid in informing relative abundance and population growth.

Products: The primary products that will be provided for the Bight '18 trawl report include an age/length curve and a table describing gender specific age composition across the geographical sampling area. The secondary product is dependent upon whether tagged CH are recaptured during the trawl surveys or new CH are tagged to contribute to the ongoing monitoring study. A table summarizing any tagged or recaptured CH and model of expected fishery contributions by each habitat type can be provided. As the mark-recapture is a long term monitoring study, conclusions of how tagged individuals contributed to the larger index of relative abundance may not be apparent for several monitoring seasons.