

Southern California Bight 2018  
Regional Monitoring Program



**Bight '18**  
Sediment Quality  
Executive Synthesis

## About this report

This report is the executive summary of an integrative study documenting how sediment contamination has impacted marine ecosystems across 1,539 square miles of Southern California's coastal waters. The Sediment Quality Executive Synthesis reflects the findings of five reports produced by the Southern California Bight 2018 Regional Monitoring Program (Bight '18) that chronicle the multiple scientific approaches taken to assess ecosystem impacts: Sediment Toxicity (Volume I), Sediment Chemistry (Volume II), Benthic Infauna (Volume III), Demersal Fishes and Megabenthic Invertebrates (Volume IV) and Contaminant Bioaccumulation in Sport Fish (Volume V). This document, the Executive Synthesis, is Volume VI. In addition, summarized results from two other reports, Harmful Algal Blooms (Volume VIII), which document the persistence of harmful algal toxins in marine sediments and infauna throughout the continental shelf, and Trash and Marine Debris (Volume IX), which characterizes the spread of trash and marine debris across aquatic environments, are included as they are linked to sediment quality.

The detailed technical reports are available online at [www.sccwrp.org/publications](http://www.sccwrp.org/publications). In previous iterations of the Bight monitoring program, the Sediment Quality element was known as Contaminant Impact Assessment and Coastal Ecology. In addition to Sediment Quality, which focuses on sediment contamination, Bight '18 examined two other aspects of Southern California's coastal ocean: a study characterizing chemical and biological impacts of ocean acidification on Bight coastal waters (Volume VII) and a comparison of microbial methods to evaluate beach water quality (Volume X), both of which will be published in 2022.

## Bight '18 Regional Monitoring erratum

Errors were found in the calculation of Sediment Quality Objective (SQO) scores post publication. These errors do not change the overall conclusions in this Synthesis Report. Minimal to modest errors were found and corrected in the original data set or in the automated SQO calculation subroutines. After a rigorous quality assurance investigation and subsequent re-calculation of SQO scores for every site in Bight '18, the figures and associated text on pages 7, 8, 9, 10, and 12 have been updated. In addition, Appendix A was added listing each site's SQO line of evidence categorical score, the final combined line of evidence SQO score, and if the combined SQO changed after updated re-calculation. The Appendix shows 23 of the 377 total sites sampled changed combined SQO score: one site changed from passing to failing, 11 sites changed from failing to passing, and 11 sites changed from either passing (N=4) or failing (N=7) to incomplete information for SQO scoring.



# Introduction to Bight Monitoring

How has contamination in Southern California's coastal waters impacted the health of its marine ecosystems? Have these impacts intensified or lessened over time? Southern California's coastal managers need answers to these questions to more effectively protect the marine ecosystems of a region that is home to more than 22 million people.

**The Southern California Bight is the bend in the coastline stretching from Point Conception in Santa Barbara County to Punta Colonet in Mexico.**

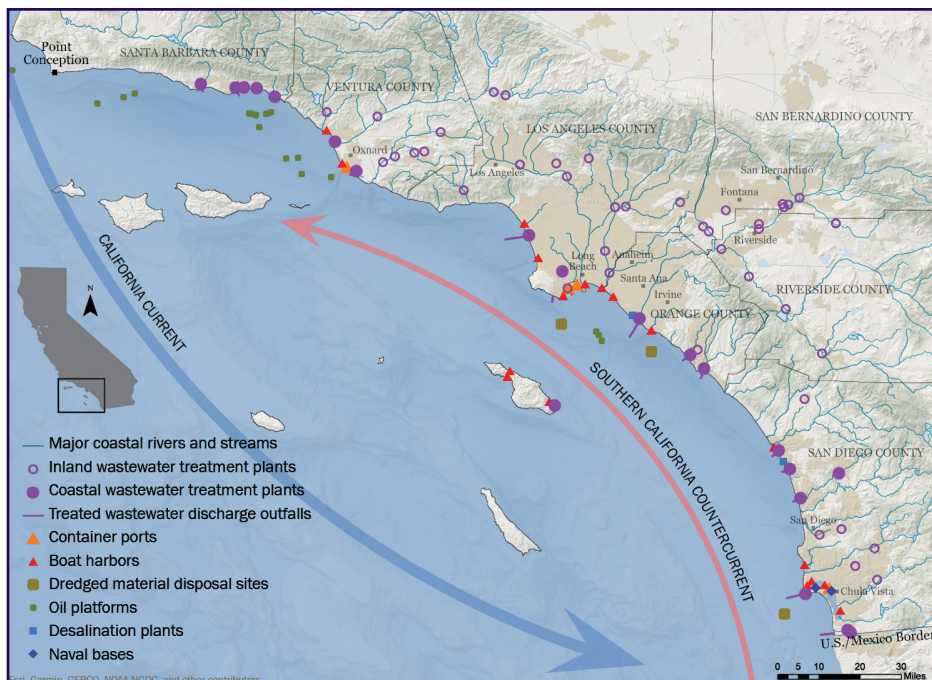
- ◆ Cold waters from the north mix with warm waters from the south in the Bight.
- ◆ This mixing of currents, together with seasonal upwelling and varied habitat types, makes for a highly productive ecosystem that is rich in diversity, including more than 500 species of fish and thousands of invertebrates.
- ◆ This productivity sustains a diverse array of resident and migratory marine birds and mammals.



**Sea lions in Channel Islands National Marine Sanctuary.**  
(Photo credit: Robert Schwemmer, NOAA)

**The Bight's coastal waters are vulnerable to human impacts.**

- ◆ Approximately 5,600 square miles of watersheds across coastal Southern California drain to the Bight, nearly half of which have been intensively developed. Most runoff that enters storm drains is not treated prior to its discharge into coastal waters.
- ◆ There are 19 coastal wastewater treatment plants that discharge over 1 billion gallons per day of treated municipal and industrial effluent into the Bight.
- ◆ The Bight is home to the nation's largest commercial port complex, the second largest U.S. naval facility, and more than 30,000 boat slips and moorings.



## **The Southern California Bight 2018 Regional Monitoring Program continues a 25-year monitoring collaboration designed to examine how human activities have affected the health of Southern California's coastal waters.**

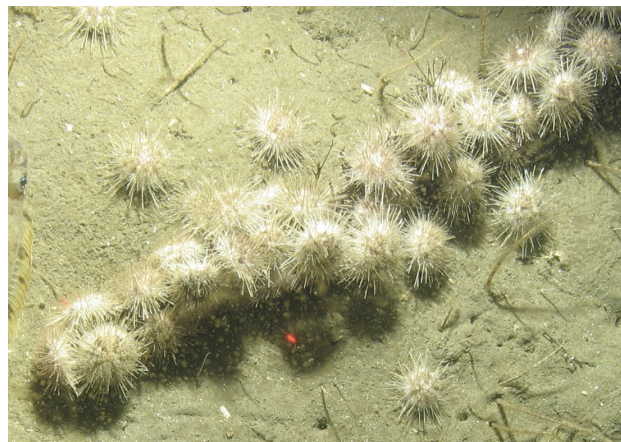
- ◆ The Program mobilizes participating agencies to collect data from across a much greater expanse than just their local discharge zones, enabling coastal managers to paint a broader picture of regional condition.
- ◆ The Program is question-driven, prioritizing issues of highest concern among participating agencies.
- ◆ Both regulated and regulatory agencies, as well as non-governmental and academic organizations, come together to engage in highly productive dialogue as they collaboratively design the monitoring program and interpret its findings.
- ◆ The Program has a five-year cycle. Bight '18 is the sixth cycle and was initiated in 2018.

## **The Sediment Quality assessment is the Bight Program's foundational assessment, tracking contaminant levels in coastal sediment and their potential impacts on Bight marine ecosystems.**

- ◆ Soft sediment makes up the vast majority of the seafloor of the Bight, although the seafloor is also home to areas not evaluated by the Sediment Quality assessment, including rocky reefs, kelp forests, seagrass beds, and other habitats.
- ◆ Sediment can be an "integrator" of impacts over time, capturing the history of habitat quality for the region.
- ◆ The Sediment Quality assessment involves multiple types of studies that are analyzed and synthesized using a multiple-lines-of-evidence approach, providing greater confidence in the findings. This approach is used widely around the world.



**Sheep Crab.**



**White Urchins.**



**Greenblotched Rockfish and Gorgonians.**

(Photo credits: Institute for Applied Marine Ecology/Marine Applied Research and Exploration (IfAME/MARE))

### **Bight '18 Sediment Quality assessment study 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?
3. What is the extent and magnitude of contaminant bioaccumulation in seafood?



## Bight '18 assessment areas

Bight sediment assessments focus on the continental shelf and embayments, which make up about a third of the Bight area. The seafloor is divided into habitats defined by depth and/or use, called strata. Eleven strata were included with ~30 sites sampled in each stratum.

### Assessment areas in Bight '18 included:

- ◆ Continental shelf: Four strata in offshore areas at depths of 3 to 650 feet.
- ◆ Five embayment strata: Brackish estuaries, marine estuaries, marinas, ports, and bays.
- ◆ Deeper waters: While not included in the Sediment Quality assessment, limited assessment work was completed in deeper waters (two strata more than 650 feet deep), including chemistry and assessment of sediment-dwelling organisms.



**Continental shelf: Newport Coast.**

(Photo credit: Karen McLaughlin, SCCWRP)



**Bay: San Pedro Bay.**

(Photo credit: Michael Hang, SCCWRP)



**Marina: Dana Point Harbor.**

(Photo credit: Nick Miller, SCCWRP)



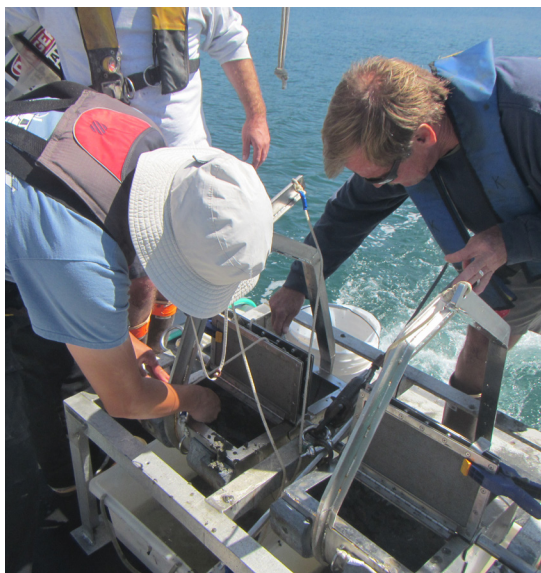
**Port: Port of Long Beach.**

(Photo credit: Michael Hang, SCCWRP)



# Sediment Sampling

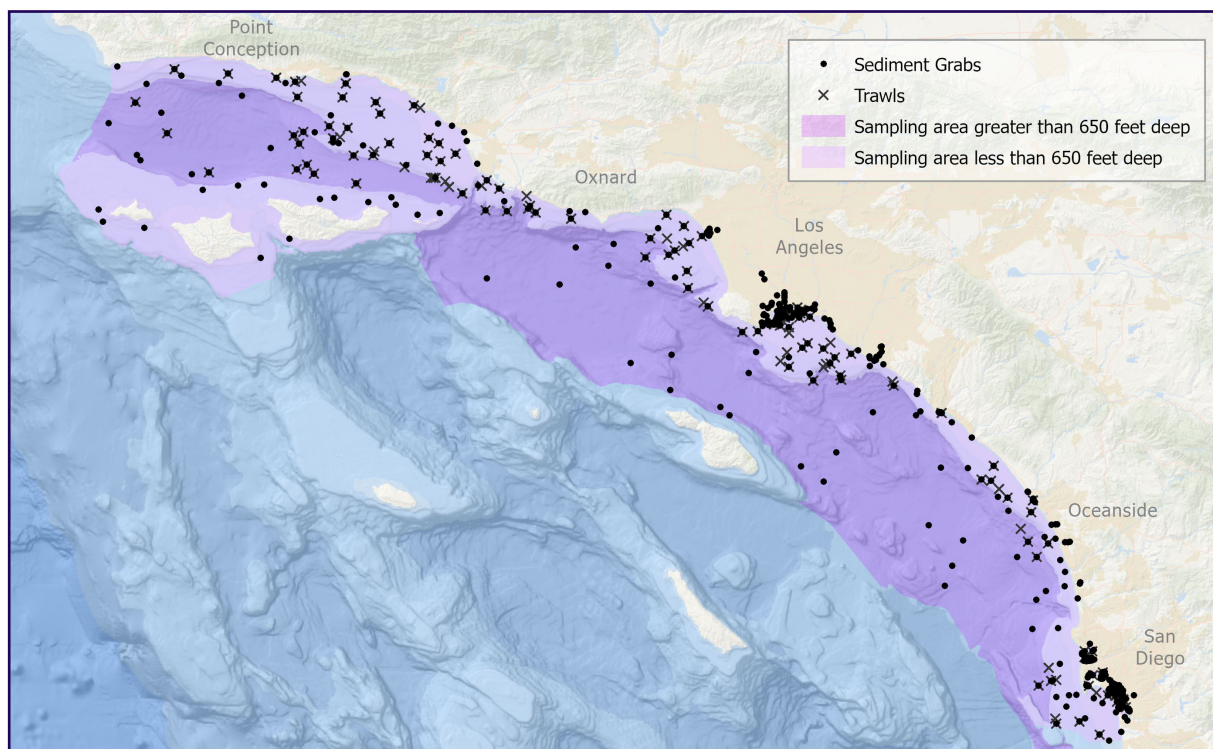
**Sample locations were selected via a stratified, random sampling design that reduces bias and ensures findings are statistically representative.**



**Sediment collection.**

(Photo credit: Ken Sakamoto, OC San)

- ◆ As part of Bight '18, 377 sites were sampled for sediment quality and 138 sites were sampled for trawl-caught fish and invertebrates across 1,539 square miles.
- ◆ Sampling started at a depth of 3 feet along the shore and extended more than 20 miles offshore, to a depth of nearly 3,000 feet.
- ◆ Researchers performed a full analysis on sediment samples collected from sites less than 650 feet deep. The full analysis involved three distinct testing methods (toxicity, chemistry, and community composition of sediment-dwelling organisms) that were combined using a quantitative scoring tool. This method provided multiple lines of evidence for sediment quality.
- ◆ The full sediment analysis was performed at 245 out of the 377 sites, including 184 embayment sites.
- ◆ More than 2,000 sites have been sampled since the Program was launched in 1994.





## Training, quality assurance, and quality control are priorities of the Bight Program.

- ◆ With more than two dozen agencies collecting and analyzing Bight samples, quality assurance and quality control among participants is a major priority. All participants engage in field training and laboratory intercalibration exercises, ensuring that data and findings are comparable and of high quality.
- ◆ The quality assurance activities enable laboratories across Southern California to maintain a high degree of quality and rigor for not only for the Bight Regional Monitoring Program, but all environmental samples they process and analyze. The close working relationship that participating agencies develop fosters a culture of collaboration.



**Bight participants engaged in an intercalibration cruise before the 2018 survey launched.**

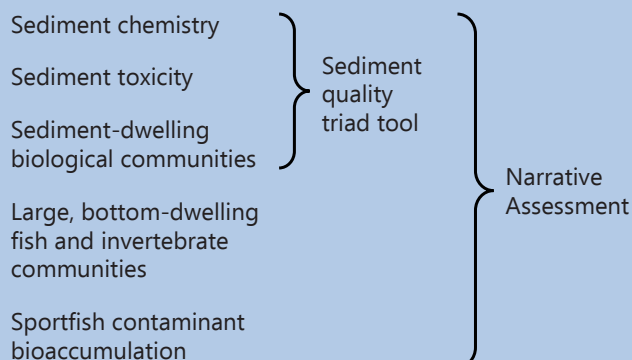


# Multiple Lines of Evidence

**The Sediment Quality assessment relies on five lines of evidence to conduct a scientifically robust evaluation of how sediment contamination has affected the Bight.**

- ♦ Bight managers use three lines of evidence – sediment chemistry, sediment toxicity, and sediment-dwelling biological communities (benthic infauna) – to assess the quality of Bight sediment. These three lines of evidence are known as the sediment quality triad.
- ♦ The two other lines of evidence – bottom-dwelling fish and invertebrate communities, and sportfish contaminant bioaccumulation – add to the overall sediment quality assessment narrative.

## Multiple lines of evidence

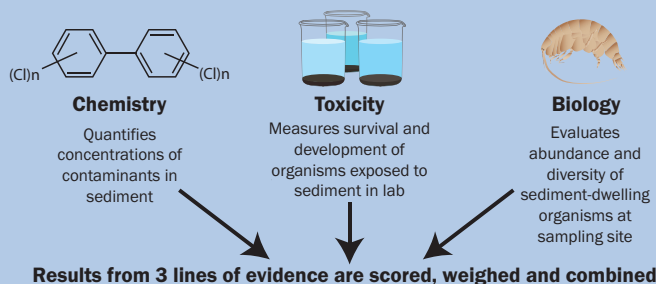


**Sediment quality is an effective indicator of how contaminants impact ecosystems.**

- ♦ While ocean currents can quickly disperse contaminants in the water column, many contaminants may bind with suspended particles and settle to the seafloor. Depending on their environmental persistence, some of these particle-bound contaminants may remain for decades, providing a record of contaminant exposure.
- ♦ Organisms living near the seafloor come into direct contact with sediment contamination via ingestion and absorption.
- ♦ When sediment-dwelling organisms are consumed by predators, the contaminants may build up – or bioaccumulate – in each successive predator that consumes its prey. In this way, contamination is transferred through marine food webs.

## Sediment quality triad scoring tool

Full sediment analysis is possible at sites less than 650 feet deep because these are the depths where a multiple-lines-of-evidence approach, called the sediment quality triad, can be used to quantitatively score sediment condition. The sediment quality triad, used to regulate sediment quality in California embayments, is the gold standard for conducting sediment evaluations. It synthesizes three main lines of evidence:



### Final sediment quality assessment classifications

Unimpacted	Likely unimpacted	Possibly impacted	Likely impacted	Clearly impacted
Confidence that there are no adverse impacts	Adverse impacts not expected, but some uncertainty due to disagreement among lines of evidence	Possibility of small or uncertain adverse impacts	Persuasive evidence of adverse impacts, even if disagreement among lines of evidence	Clear and severe adverse impacts to sediment-dwelling aquatic life

**Sediment quality classifications of concern**



# Key Findings

The Southern California Bight Regional Monitoring Program's Sediment Quality assessment offers insights into how sediment contamination has affected 1,539 square miles of the Bight seafloor across time and space, as well as the disproportionate effects of this contamination on certain marine habitats. The Sediment Quality assessment builds on two and a half decades of intensive sediment sampling, trawl surveys, and analysis across the Bight.



Palos Verdes at sunset.  
(Photo credit: Greg Lyon, CLAEMD)

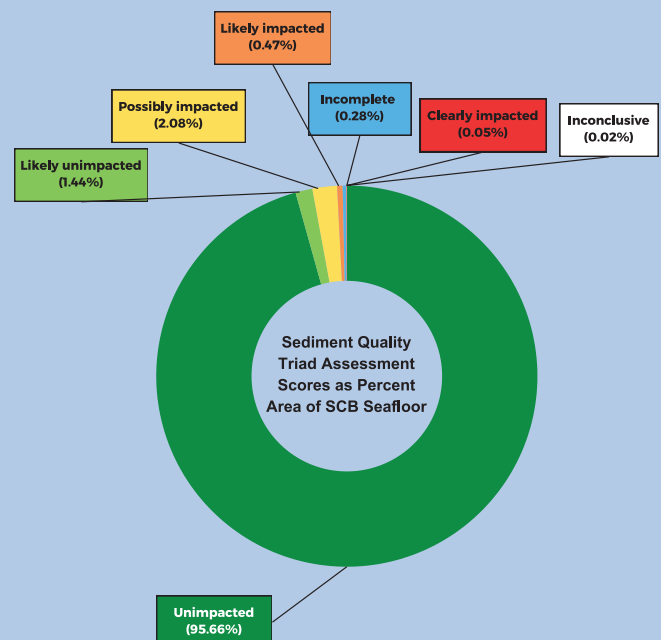
## Bight '18 Study Question #1: What is the extent and magnitude of sediment quality impacts in the Southern California Bight?

**Over 97% of the area assessed in Bight'18 is unimpacted or likely unimpacted by sediment contamination.**

- ♦ The sediment quality triad approach indicates that less than 3% of the Bight seafloor area was possibly impacted by sediment contamination.
- ♦ 0.5% was likely or clearly impacted.
- ♦ 0.3% of the Bight did not have sufficient information to calculate Sediment Quality Triad scores.

### Overall snapshot of Bight sediment quality

Although the majority of the area assessed in Bight' 18 was unimpacted or likely unimpacted by sediment contamination, the area of concern is the 1.4% that was categorized as possibly, likely, or clearly impacted. Due to a missing line of evidence, 0.02% of Bight habitat was unable to be scored and was listed as "incomplete".



## The continental shelf is not as impacted by sediment contamination as coastal embayments.

- ♦ The majority of the area assessed in Bight '18 is the continental shelf – specifically, the offshore area that starts at a depth of 3 feet and extends to a depth of 650 feet, excluding embayments.
- ♦ Just 1% of the shelf seafloor area is possibly impacted by sediment contamination.

## About 25% of embayment areas have sediment quality that is possibly, likely, or clearly impacted by sediment contamination.

- ♦ Embayments are the mostly shallow, protected areas close to shore where relatively calm waters facilitate settling of contaminant-laden particles. Embayments make up roughly 2% of the total area assessed in Bight '18.
- ♦ Brackish estuaries were a new embayment habitat sampled by the Bight Program in 2018. While they represent a small portion of the total assessed area (0.1%), they had the largest percent of area categorized as possibly to clearly impacted by sediment contamination (> 50%).
- ♦ In addition, marine estuaries and marinas had large portions of their assessed areas categorized as possibly, likely, or clearly impacted by sediment contamination (39% and 51%, respectively).



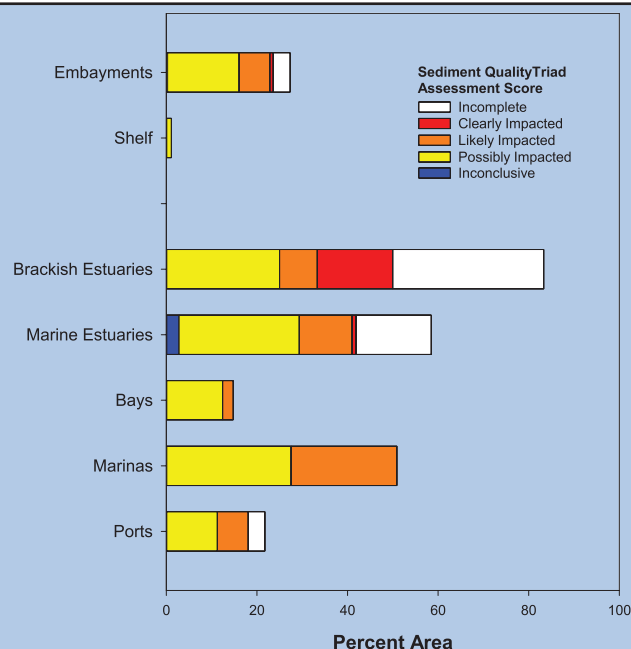
**Huntington Harbour.**  
(Photo credit: Karen McLaughlin, SCCWRP)



**Ballona Lagoon.**  
(Photo credit: Nick Miller, SCCWRP)

### Uneven impacts of sediment contamination

Just 1% of the continental shelf was possibly impacted by sediment contamination, whereas over 25% of embayment area was categorized as possibly to clearly impacted. Among the five embayment types, brackish estuaries, marine estuaries, and marinas had more than twice as much of their area impacted by sediment contamination compared to ports and bays.

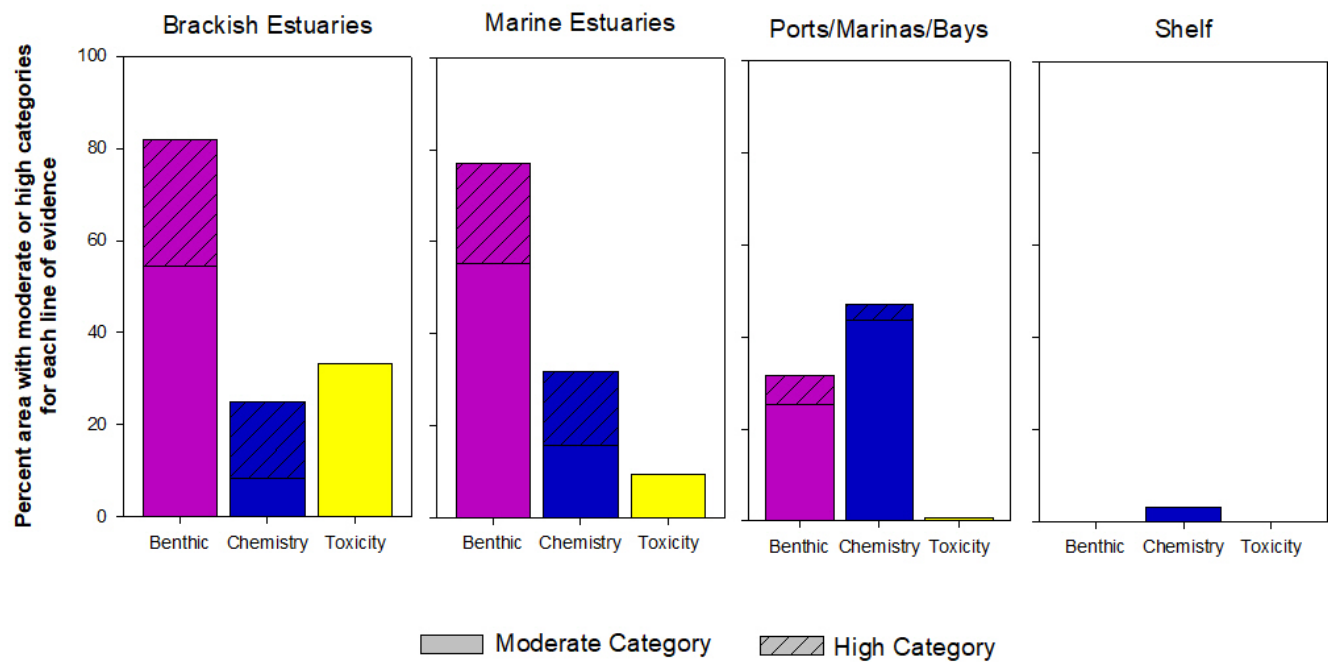




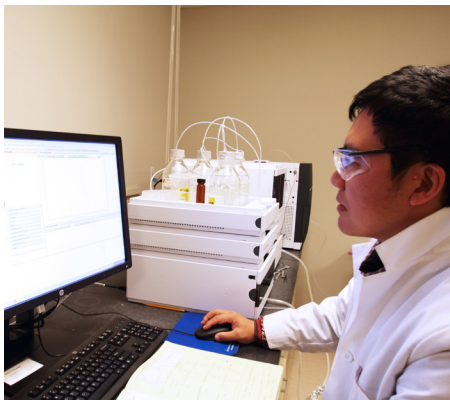
The main indicator of poor sediment quality assessment scores varied by habitat.

Understanding which lines of evidence contributed to poor sediment quality assessment scores can help managers understand the drivers of impairment and focus remediation efforts on the most likely causes of degraded condition. In the Bight, the lines of evidence indicative of poor condition varied by habitat.

- ◆ In brackish and marine estuaries, the communities of sediment-dwelling organisms were in non-reference condition, and the sediments had some of the region’s highest toxicity, both of which contributed to poor sediment quality assessment scores in these two habitats.
- ◆ In ports, bays, and marinas, high levels of sediment chemistry exposure were the main indicator of poor sediment quality.



**Benthic infauna on a sieve.**  
(Photo credit: Kevin Stolzenbach, Wood PLC)



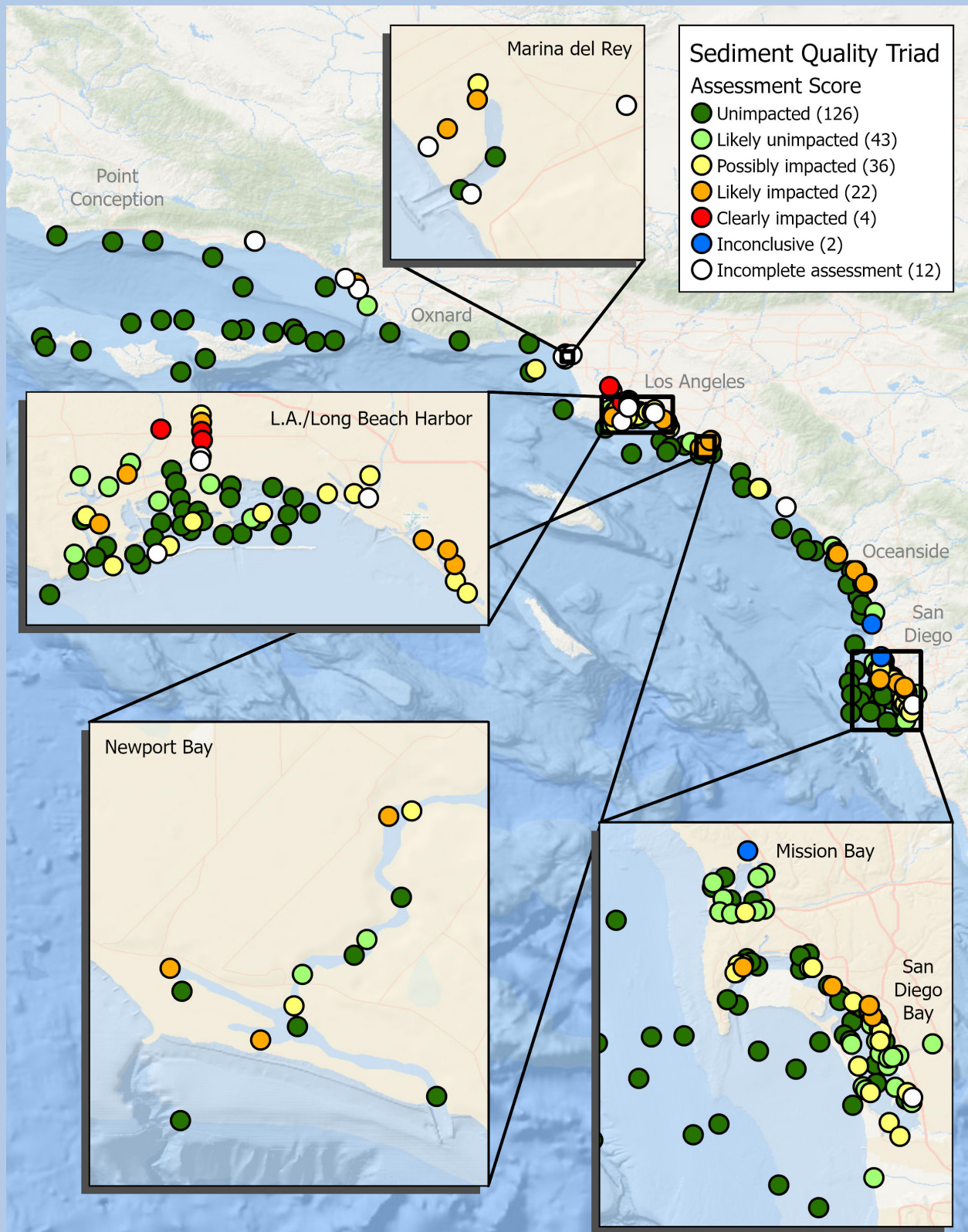
**Chemical analysis.**  
(Photo credit: Keith Maruya, SCCWRP)



**Toxicity testing.**  
(Photo credit: Chris Stranksy, Wood PLC)

## Sediment quality triad assessment scores by site.

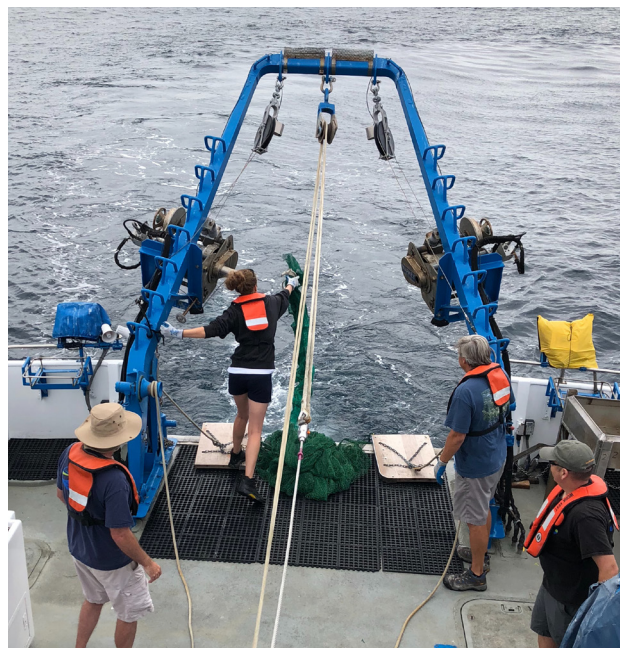
A full sediment quality triad analysis was conducted for 245 sites, generating quantitative assessment scores that fall into a five-part classification system. Twelve (12) sites did not have all three lines of evidence and could not be assessed. Another two sites were considered inconclusive because of uncertain lines of evidence.





**In Bight '18, fish communities living near the seafloor were generally healthy, with 99% of the area assessed in reference condition.**

- ◆ Demersal fish – or fish that live near the seafloor – are a key focus of monitoring efforts because they consume sediment-dwelling organisms and can come into direct contact with contaminated sediment.
- ◆ Abnormalities such as fin rot, lesions, and tumors are considered indicators of stressed individuals and were found in less than 0.05% of all 46,000+ fishes sampled – the lowest of any Bight survey and within expected background levels for fish populations.



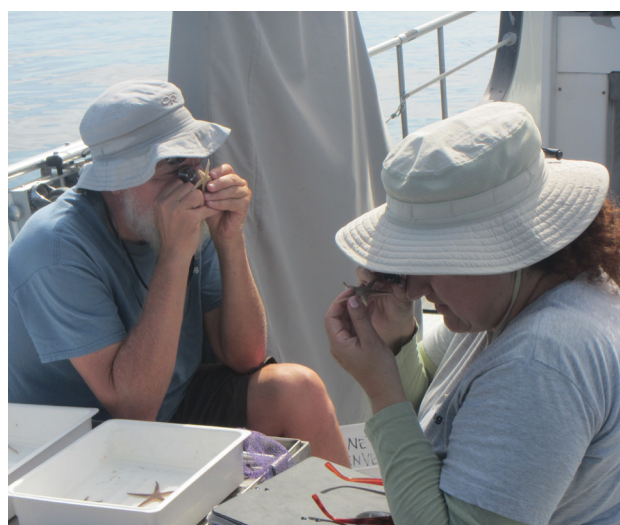
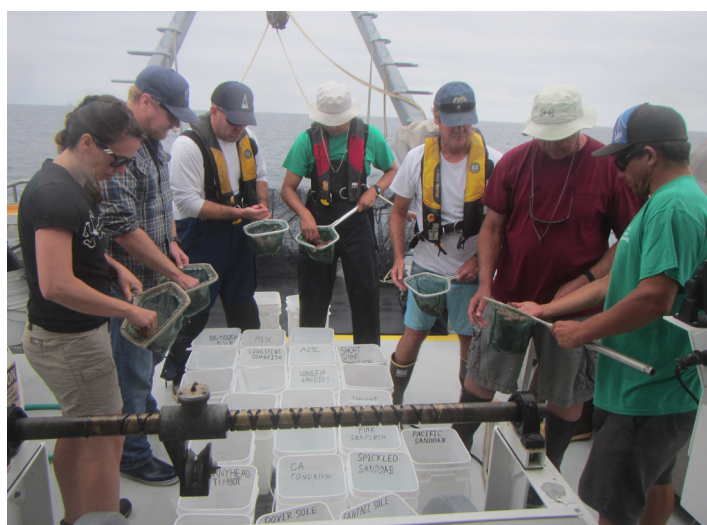
**Deployment of trawl net.**  
(Photo credit: Curtis Cash, CLAEMD)



**Spotted Sand Bass.**  
(Photo credit: Chris Stranksy, Wood PLC)

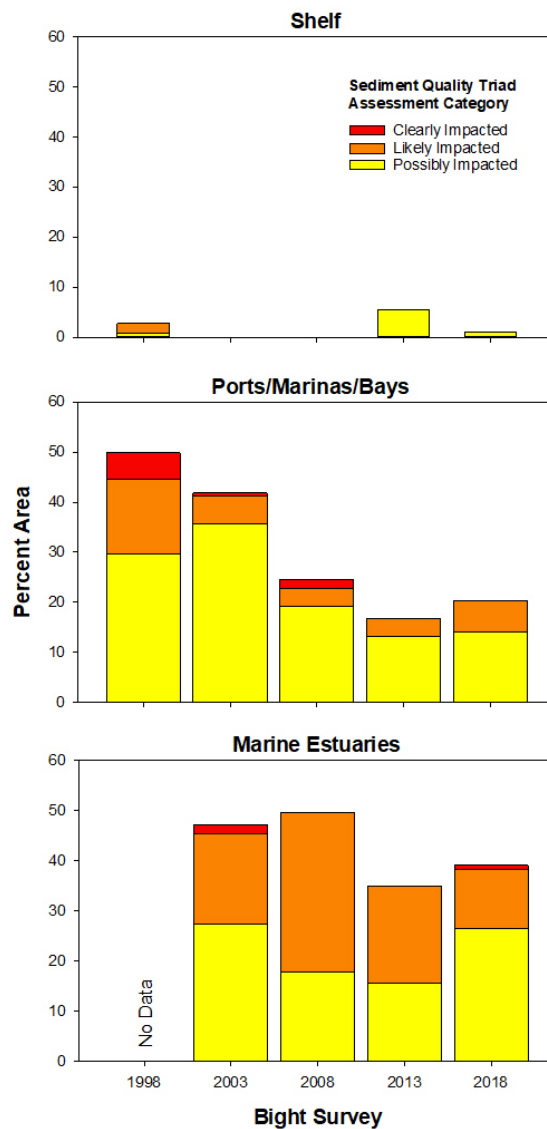


**Graceful Rock Crab.**  
(Photo credit: Greg Lyon, CLAEMD)



## Sediment quality on the continental shelf continues to remain in good overall condition; sediment quality in embayments has not improved over the past decade.

- ♦ The continental shelf has had consistently good sediment quality over time.
- ♦ The total area of ports, bays, and marinas impacted by sediment contamination initially decreased between the 1998 and 2008 assessments but has not improved since then.
- ♦ The percent of impacted habitat has not significantly changed in marine estuaries since they were first assessed in 2003, although more area has a “clearly impacted” score.



## Channel Islands National Marine Sanctuary was found to be in good condition in 2018.

- ♦ In 2013, the Channel Islands sediment-dwelling communities (the only indicator collected there during that survey) suggested that the areas sampled may have early signs of stress; however, in 2018, those communities were in reference condition.
- ♦ In 2018, all three lines of evidence were assessed, and 100% of the Channel Islands area were unimpacted or likely unimpacted.





Bioaccumulation monitoring provides a direct linkage to human health.

Over 6 million sportfish were caught by recreational anglers in 2018; however, much of the Bight coastline is under one or more sportfish consumption advisories that recommend limiting the amount and frequency of fish consumed from coastal waters. By measuring contaminants in the fish species people consume from the Bight and comparing them to established “safe to eat” advisory thresholds developed by the California Office of Environmental Health and Hazard Assessment (OEHHA), managers can assess magnitude of risk.

Sportfish tissue contamination was moderate but widespread in the Southern California Bight.

- ♦ All fish tissues collected during the 2018 survey were below the “do not consume” threshold.
- ♦ Some tissues exceeded OEHHA thresholds for mercury and total PCBs that advise limiting fish consumption to fewer than three servings per week.

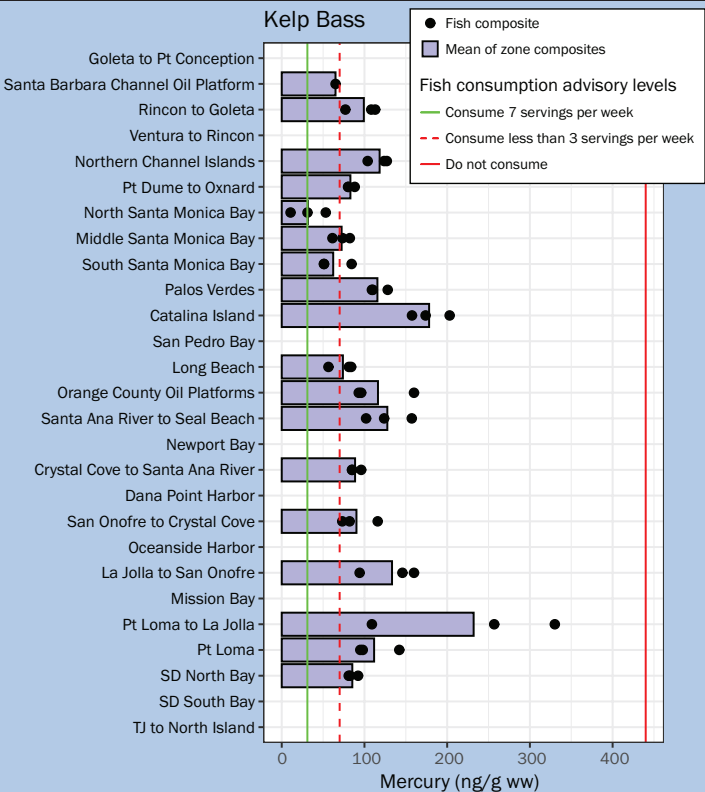
Bioaccumulation assessment is a collaborative effort.

To generate a regional assessment of sportfish contamination, the Bight Program partnered with California’s Surface Water Ambient Monitoring Program (SWAMP). Together they collected and analyzed over 900 sportfish comprising eight different species across 27 fishing zones from San Diego to Point Conception. Edible tissues were measured for the four pollutants thought to carry the most risk to seafood consumers: mercury, selenium, total PCBs, and total DDTs.



Balboa Pier, a popular recreational fishing location. (Photo credit: Richard Le Clair, SCCWRP)

Kelp Bass was one of the targeted species that had the largest regional coverage. Of the species assessed, it had the highest average tissue concentrations of mercury (represented by the blue bars on the graphic), although variability among fish within each region was sometimes large (represented by the black dots). Kelp Bass tissue mercury concentrations were higher than the thresholds that recommend limiting consumption to less than seven servings per week in all regions. One serving is eight ounces before cooking.



# Other Notable Findings

## The Bight Program is a platform for innovation in regional monitoring.

- ♦ The wide range of collaborating agencies in the Bight Program allows for researchers to borrow effort from existing elements to learn more about human impacts on coastal ecosystems.
- ♦ The Bight Program provides an opportunity to determine if emerging contaminants are widespread or in high enough concentrations to warrant further investigation. This survey included an assessment of trash and marine debris, domoic acid - a harmful algal bloom toxin - in shelf sediments, and fipronil pesticides in embayment sediments.
- ♦ It is also a mechanism to explore new habitats not typically assessed to broaden our understanding of the fate and transport of pollutants. This survey investigated brackish estuaries, as described in the sections above, for the first time.
- ♦ It is also a platform to test new monitoring techniques and technologies that help fill in gaps in our existing monitoring or make monitoring more effective and more efficient (better, faster, and cheaper). In this survey, cell bioassays and non-targeted chemical screening tools were tested to understand impacts of emerging contaminants in Bight sediments.

## Fipronils, a class of pesticides and contaminant of emerging concern, was not widespread in embayments.

- ♦ Fipronil is a broad-use insecticide used frequently in urban areas. This compound and its biologically active degradation products (fiproles) have been detected in urban runoff at concentrations exceeding toxicity thresholds for sensitive aquatic organisms, which led to its inclusion in the Bight '18 study.
- ♦ Fiproles were detected in 8% of the Bight embayment area, with the highest percent of area documented in brackish (35.2%) and marine estuaries (12.0%). Fiproles were found at concentrations indicative of low risk of acute effects (based on comparison to established thresholds for the amphipod *Eohaustorius estuarius* and midge *Chironomus dilutus*).



**Los Angeles River carries particles to the coast during a storm.**

(Photo credit: Darrin Greenstein, SCCWRP)



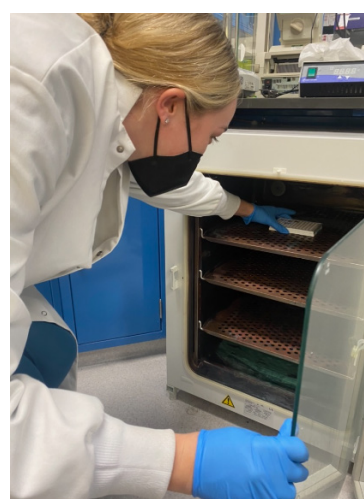
**Amphipods are benthic organisms particularly sensitive to many pesticides.**

(Photo credit: Darrin Greenstein, SCCWRP)



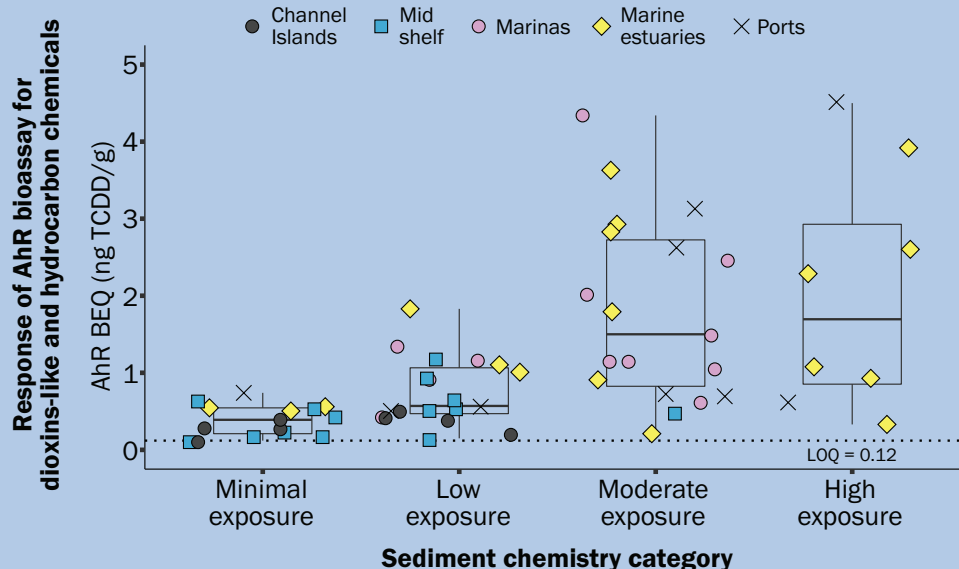
## New, rapid screening tools proved useful to prioritize contaminated sediment samples.

- ♦ Monitoring traditionally focuses on legacy contaminants and priority pollutants; however, other unknown or unexpected chemicals represent a large portion of what is present in the environment. The impact of these unknown chemicals is poorly understood.
- ♦ Bight '18 piloted the use of two screening methods to better understand the diversity of chemical contaminants and their effects in Bight sediment. The first method, cell bioassays, consists of cell lines capable of rapidly detecting the presence of toxic contaminants that effect biological activity. Two cell bioassays were applied to measure effects of two classes of chemicals (estrogenic and dioxin-like). The second approach was non-targeted chemical analysis, which was used on a smaller set of samples to identify unique fingerprints of the chemicals present in samples and new toxicants.
- ♦ Cell bioassay responses, specifically the aryl hydrocarbon receptor assay which focuses on dioxin-like compounds like PCBs and PAHs, showed promise for identifying impacted sites.
- ♦ Chemical fingerprints from the non-targeted chemical analysis showed that different Bight habitats had unique chemical signatures, demonstrating how this analysis could be used in source tracking.
- ♦ Together, the cell bioassays and the non-targeted analysis could improve toxicity identification and narrow the search for sources of contaminants.



**Preparing a cell bioassay analysis.**  
(Photo Credit: Alvine Mehinto, SCCWRP)

The aryl hydrocarbon receptor assay, which detects biological impacts of compounds like PCBs and PAHs, was similar to the sediment chemistry exposure line of evidence score which is part of the sediment quality triad (e.g., higher biological response in the cell assay corresponded with moderate and high chemical exposure), demonstrating its use in prioritizing sites for further investigation.

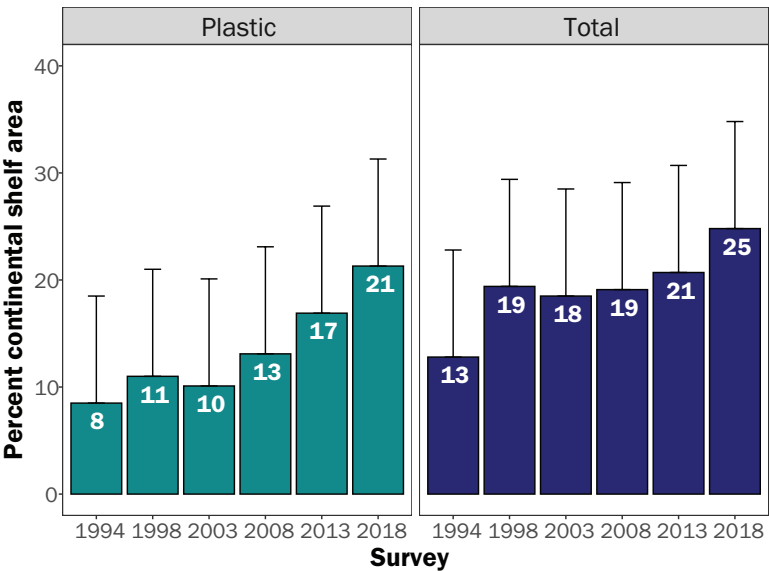


# Leveraged Bight Program elements provide additional insight into Sediment Quality.

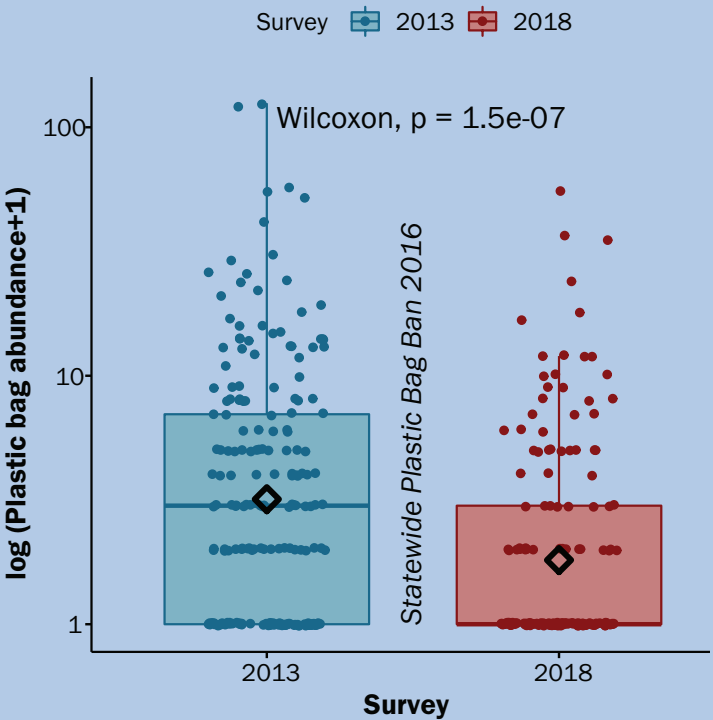
Benthic habitat quality can be negatively impacted by stressors other than chemical contaminants from land-based sources. The Bight Program provides leverage to investigate additional factors to better understand what is affecting coastal habitat quality throughout the region. Two of these stressors were examined in Bight '18 as independent elements: trash and marine debris and harmful algal bloom toxins, the results of which are summarized below.

## Trash was pervasive offshore, and the area affected is increasing.

- ◆ During Bight '18, an estimated 25% of the continental shelf seafloor area contained at least one trawl-caught debris item. However, the abundance of trash caught in each trawl was low.
- ◆ Plastic was the most pervasive of all debris types, with at least one piece of trawl-caught plastic occurring on an estimated 21% of the shelf area.
- ◆ The extent of trash – particularly plastic – occurrence on the shelf has been increasing through time.



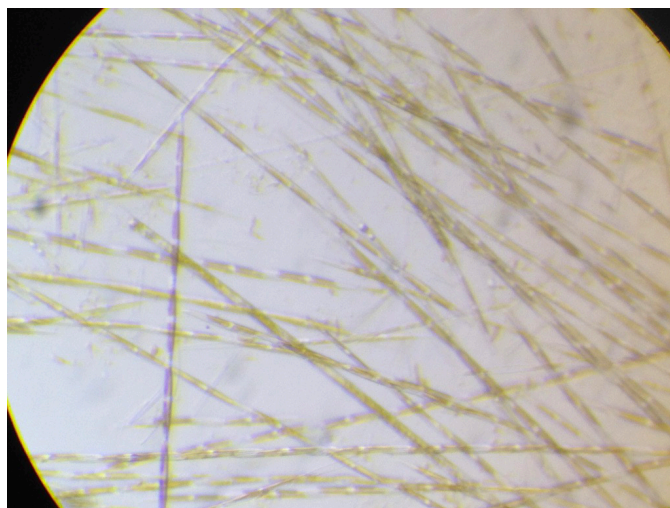
The Bight '18 Trash and Marine Debris element demonstrated that trash management policies can have a positive impact on trash. The Southern California Stormwater Monitoring Coalition regional monitoring program of wadeable streams found that there was a significant decrease in plastic bag abundance in streams following implementation of the State's bag ban in 2016.





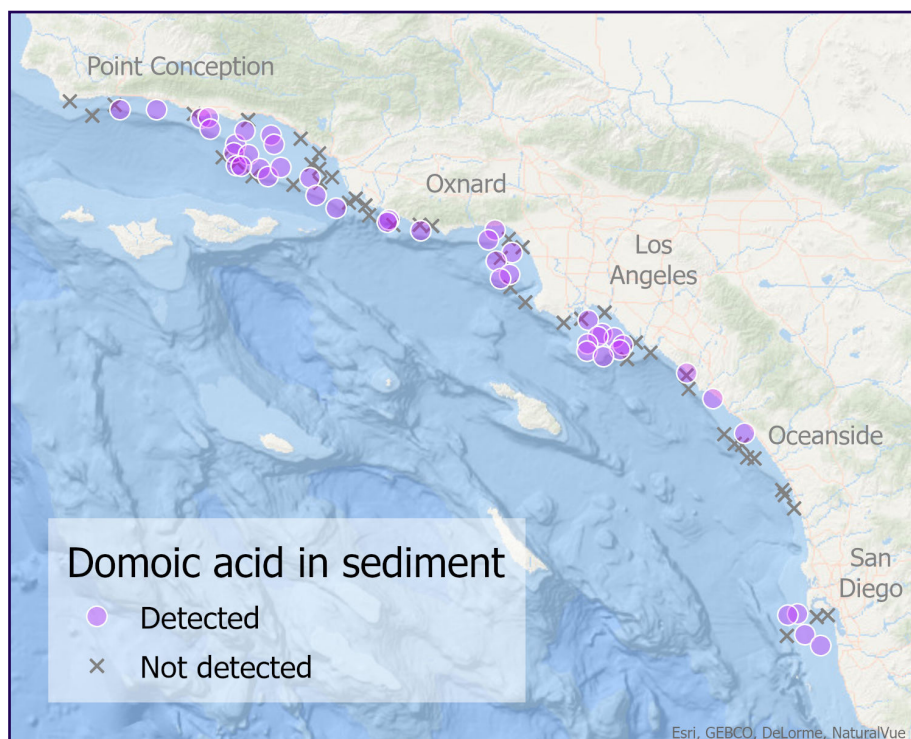
## Persistence of a harmful algal bloom toxin, domoic acid, was widespread in sediment over a year after a significant toxic bloom.

- ◆ Blooms of the phytoplankton *Pseudo-nitzschia* are a common occurrence in the Bight, particularly during the spring upwelling period. These algae can produce a toxin called domoic acid, which can cause amnesic shellfish poisoning in exposed humans and wildlife.
- ◆ Previous studies in the Bight have focused on water column effects of these blooms, but increasing evidence has suggested that these toxins can end up in the sediments, where they persist for extended periods of time, contaminating ecologically and economically important animals long after the end of water column blooms.



***Pseudo-nitzschia* as seen under a microscope.**

(Photo credit: Jayme Smith, SCCWRP)



- ◆ The Bight '18 study found detectable domoic acid in sediments during summer 2018 – over a year after the last large water column bloom in spring 2017.
- ◆ Domoic acid was widespread, detected in 54% of the continental shelf area.
- ◆ Domoic acid was also persistent in the sediment-dwelling organisms, even when there was little to no detectable domoic acid in the sediment, providing a pathway to contaminate higher trophic levels.



**Benthic organisms were collected with sediment at some sites.**

(Photo credit: Dana Schultz, SCCWRP)



**Domoic acid was present in benthic organisms in the Bight.**

(Photo credit: Dana Schultz, SCCWRP)

# Implications of the Findings

The Bight program uses a multiple-lines-of-evidence approach to assess the ecosystem impacts of sediment contamination across 1,539 square miles of the Bight. How can Southern California's coastal management community translate these findings into actions? This section explores some of the key management recommendations of the program.

## Managers need to identify the causes of the disproportionately poor sediment quality in embayments.

- ◆ Bight '18 showed that embayments are disproportionately impacted by sediment contamination. Understanding the drivers behind this contamination can lead to successful mitigation of impacts. For managers to take the next steps, these coastal areas should be the focus of causal assessments and sediment toxicity identification evaluations (TIEs), including source tracking and attribution. Within the causal assessment framework, cell bioassays, such as those piloted in Bight '18, could help to narrow down the classes of chemicals of concern.
- ◆ Of the five embayment strata, marine and brackish estuaries had the greatest relative extent of poor sediment quality. Marine estuaries have not shown strong trends in extent or magnitude of impacts since monitoring began in 1998, and the percent of area with clearly impacted scores has increased. Recently developed methods for assessing ecological function in estuaries, in addition to sediment quality assessments, can help managers diagnose which stressors need to be mitigated and can inform effective restoration efforts.



**Newport Bay.**

(Photo credit: Karen McLaughlin, SCCWRP)

## Fipronil pesticides are a contaminant of emerging concern that can be deprioritized in embayments.

- ◆ A key aspect of the Bight Program is to investigate new contaminants typically not part of required monitoring to determine if they are widespread or in high enough concentrations to require site-specific monitoring and/or management actions.
- ◆ The Bight '18 survey found that fipronils – a current use pesticide – were not commonly detected in sediments from coastal embayments, and when they were detected, concentrations were not typically at levels high enough to generate toxicity.



## Managers should invest in trash source control and effects-based research for continued progress in trash reduction.

- ◆ Trash continues to be a widespread problem for coastal ecosystems. The Bight Program found evidence that source control was an effective strategy for reducing trash.
- ◆ The extent to which trash – plastic in particular – is causing impacts to beneficial uses is poorly understood. Human and aquatic life effects should be characterized so we can better understand the implications of plastic pollution and identify endpoints for when clean is clean enough.
- ◆ Plastic doesn't degrade over time, but it does break down into smaller and smaller pieces. The Bight '18 survey did not include an assessment of microplastics, which may be even more pervasive than the macroplastics that were monitored. Standardized methods are being developed for water, sediment, and tissue, and should be considered for assessing the extent and magnitude of microplastics in Bight '23.



**Trash boom in Ballona Creek.**  
(Photo credit: Bill Macdonald, Algalita)



## Managers need to develop new tools for unassessed Bight habitats and update existing tools to increase accuracy and relevance of regional monitoring.

- ◆ Current Bight Sediment Quality assessments are limited to depths between 3 feet and 650 feet. However, the continental slope and basins with depths greater than 650 feet represent 63% of Bight area and are currently unassessed for sediment quality impacts. Moreover, discovery of DDT barrels in the deep coastal basins down to 3,000 feet adds urgency for developing assessment tools to characterize the status and trends of contaminant impacts in these deep-water habitats.
- ◆ Our current assessment tools, particularly those relying on biological community composition (e.g., benthic infauna and demersal fishes), may increasingly be susceptible to non-contaminant effects on scoring due to climate change. Several Bight species have documented range shifts and impacts on abundance due to changing temperatures and water chemistry related to climate change. Managers need to understand the effects of the community composition changes on assessment tools to untangle local contaminant impacts from global climate changes.

## **Bight '18 Sediment Quality element participating organizations**

Anchor QEA  
Aquatic Bioassay and Consulting Laboratories  
City of Avalon  
City of Los Angeles  
City of Oxnard  
City of San Diego Public Utilities Department  
Dancing Coyote Environmental  
EcoAnalysts  
Encina Wastewater Authority  
Eurofins  
Los Angeles County Department of Public Works  
Los Angeles County Sanitation Districts  
Los Angeles Regional Water Quality Control Board  
MBC Aquatic Sciences  
National Oceanic and Atmospheric Administration  
Natural History Museum of Los Angeles County  
Nautilus Environmental  
Naval Information Warfare Center Pacific  
Occidental College Vantuna Research Group  
Orange County Public Works  
Orange County Sanitation District  
Physis Environmental Laboratories  
Port of Long Beach  
Port of Los Angeles  
Port of San Diego  
Riverside County Flood Control and Water Conservation District  
San Diego County Department of Environmental Health  
San Diego Regional Water Quality Control Board  
San Diego State University  
San Elijo Joint Powers Authority  
Santa Ana Regional Water Quality Control Board  
Southern California Coastal Water Research Project  
State Water Resources Control Board  
U.S. Environmental Protection Agency, Region 9  
U.S. Fish and Wildlife Service  
Weck Laboratories  
Weston Solutions  
Wood Environment and Infrastructure Solutions, Inc.



## **Southern California Bight Regional Monitoring Program technical reports**

Planning documents and assessment reports for the Bight Program are available online:

<https://www.sccwrp.org/about/research-areas/regional-monitoring/southern-california-bight-regional-monitoring-program/bight-program-documents/>

### **Assessment reports published or planned for Bight '18**

Volume I – Sediment Toxicity

Volume II – Sediment Chemistry

Volume III – Benthic Infauna

Volume IV – Demersal Fishes and Megabenthic Invertebrates

Volume V – Contaminant Bioaccumulation in Edible Sport Fish Tissue

Volume VI – Sediment Quality Synthesis

Volume VII – Ocean Acidification

Volume VIII – Harmful Algal Blooms

Volume IX – Trash and Marine Debris

Volume X – Shoreline Microbiology

### **Suggested citation**

Southern California Bight 2018 Regional Monitoring Program Sediment Quality Assessment Planning Committee. 2022. Southern California Bight 2018 Regional Monitoring Program Sediment Quality Executive Synthesis Report. Technical Report 1248. Southern California Coastal Water Research Project. Costa Mesa, CA.

# Appendix A

## Original Synthesis Report Data

## Revised Data (7/9/24)

Original Revised

Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10000	Moderate Exposure	Reference	Nontoxic	Unimpacted	B18-10000	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10001	Moderate Exposure	Reference	Nontoxic	Unimpacted	B18-10001	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10002	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10002	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10003	Low Exposure	Reference	Nontoxic	Unimpacted	B18-10003	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10004	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10004	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10005	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10005	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Fail	Pass
B18-10006	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10006	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10007	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10007	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10011	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	B18-10011	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10012	High Exposure	Low Disturbance	Nontoxic	Likely unimpacted	B18-10012	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10013	High Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10013	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10014	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10014	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10015	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10015	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10016	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10016	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10017	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	B18-10017	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Pass	Pass
B18-10019	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10019	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass



Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10020	Moderate Exposure	High Disturbance	Nontoxic	Possibly impacted	B18-10020	Minimal Exposure	High Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10022	Low Exposure	Reference	Nontoxic	Unimpacted	B18-10022	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10023	High Exposure	Reference	Nontoxic	Likely unimpacted	B18-10023	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10024	Low Exposure	Reference	Nontoxic	Unimpacted	B18-10024	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10029	High Exposure	Moderate Disturbance	Nontoxic	Likely impacted	B18-10029	High Exposure	Moderate Disturbance	Nontoxic	Likely impacted	Fail	Fail
B18-10030	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10030	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10031	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10031	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10032	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10032	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10034	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10034	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10035	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10035	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10036	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10036	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10037	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10037	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10038	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10038	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10039	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10039	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10040	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10040	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10041	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10041	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10042	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10042	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10043	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10043	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10044	Moderate Exposure	High Disturbance	Nontoxic	Possibly impacted	B18-10044	Low Exposure	High Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10045	Low Exposure	Moderate Disturbance	Moderate Toxicity	Likely impacted	B18-10045	Low Exposure	Moderate Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail
B18-10046	Moderate Exposure	Reference	Low Toxicity	Likely unimpacted	B18-10046	Moderate Exposure	Reference	Low Toxicity	Likely unimpacted	Pass	Pass

Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10047	Moderate Exposure	High Disturbance	Low Toxicity	Likely impacted	B18-10047	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10048	Moderate Exposure	High Disturbance	Low Toxicity	Likely impacted	B18-10048	Moderate Exposure	High Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10049	Moderate Exposure	High Disturbance	Low Toxicity	Likely impacted	B18-10049	Moderate Exposure	High Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10050	Low Exposure	Reference	Nontoxic	Unimpacted	B18-10050	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10051	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10051	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10052	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10052	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10053	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10053	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10054	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10054	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10055	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10055	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10056	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10056	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10057	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	B18-10057	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Pass	Pass
B18-10058	High Exposure	High Disturbance	Low Toxicity	Likely impacted	B18-10058	High Exposure	High Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10059	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10059	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10060	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10060	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10061	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10061	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10062	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10062	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10063	Moderate Exposure	High Disturbance	Moderate Toxicity	Likely impacted	B18-10063	Moderate Exposure	High Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail
B18-10064	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10064	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10065	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10065	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10066	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10066	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10067	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10067	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail



Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10068	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10068	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10069	High Exposure	Moderate Disturbance	Nontoxic	Likely impacted	B18-10069	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10070	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10070	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10071	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10071	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10072	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10072	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10073	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	B18-10073	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Pass	Pass
B18-10074	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10074	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10075	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10075	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10076	High Exposure	Reference	Nontoxic	Likely unimpacted	B18-10076	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10077	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10077	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10078	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10078	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10079	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10079	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10080	Moderate Exposure	High Disturbance	Nontoxic	Possibly impacted	B18-10080	Moderate Exposure	High Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10081	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10081	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10082	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10082	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10083	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10083	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10084	Moderate Exposure	High Disturbance	Nontoxic	Possibly impacted	B18-10084	Moderate Exposure	High Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10085	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10085	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10086	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10086	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10087	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10087	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10088	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10088	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail

Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10089	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10089	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10090	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10090	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10091	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10091	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10092	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10092	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10093	Moderate Exposure	Reference	Nontoxic	Unimpacted	B18-10093	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10094	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10094	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10095	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10095	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10096	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10096	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10097	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10097	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10098	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10098	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10099	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10099	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10100	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10100	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10101	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10101	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10102	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10102	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10103	High Exposure	High Disturbance	Nontoxic	Likely impacted	B18-10103	High Exposure	High Disturbance	Nontoxic	Likely impacted	Fail	Fail
B18-10104	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10104	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10105	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10105	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10106	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10106	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10107	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10107	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10108	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10108	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10109	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10109	Moderate Exposure	Low Disturbance		Incomplete	Pass	Incomplete



Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10110	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10110	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10111	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10111	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10112	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10112	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10113	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10113	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10114	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10114	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10115	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10115	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10116	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10116	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10117	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10117	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10119	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10119	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10121	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10121	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10123	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10123	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10124	High Exposure	High Disturbance	Nontoxic	Likely impacted	B18-10124	High Exposure	High Disturbance	Nontoxic	Likely impacted	Fail	Fail
B18-10126	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10126	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10127	High Exposure	High Disturbance	Nontoxic	Likely impacted	B18-10127	High Exposure	High Disturbance	Nontoxic	Likely impacted	Fail	Fail
B18-10132	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10132	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10133	High Exposure	Moderate Disturbance	Nontoxic	Likely impacted	B18-10133	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10136	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10136	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10137	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10137	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10139	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10139	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10140	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10140	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10141	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10141	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass

Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10142	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10142	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10143	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10143	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10144	High Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10144	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Fail	Pass
B18-10146	Moderate Exposure	Moderate Disturbance	High Toxicity	Likely impacted	B18-10146	High Exposure	Moderate Disturbance		Incomplete	Fail	Incomplete
B18-10148	Moderate Exposure	Moderate Disturbance	High Toxicity	Likely impacted	B18-10148	High Exposure	Moderate Disturbance		Incomplete	Fail	Incomplete
B18-10149	High Exposure	Low Disturbance	Moderate Toxicity	Likely impacted	B18-10149	High Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10150	High Exposure	Reference	Low Toxicity	Likely unimpacted	B18-10150	Moderate Exposure	Reference	Low Toxicity	Likely unimpacted	Pass	Pass
B18-10151	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10151	Minimal Exposure	Low Disturbance		Incomplete	Pass	Incomplete
B18-10152	High Exposure	High Disturbance	Nontoxic	Likely impacted	B18-10152	High Exposure	High Disturbance	Nontoxic	Likely impacted	Fail	Fail
B18-10155	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	B18-10155	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10156	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10156	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Fail	Fail
B18-10158	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10158	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10159	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10159	Moderate Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10161	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10161	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10162	Minimal Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	B18-10162	Minimal Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Pass	Pass
B18-10163	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10163	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	Fail	Pass
B18-10164	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10164	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10165	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10165	Minimal Exposure	Moderate Disturbance	Low Toxicity	Likely unimpacted	Fail	Pass
B18-10166	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10166	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10167	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10167	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10168	High Exposure	High Disturbance	Moderate Toxicity	Clearly impacted	B18-10168	Low Exposure	High Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail



Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10169	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	B18-10169	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10170	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10170	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10171	Low Exposure	High Disturbance	Moderate Toxicity	Likely impacted	B18-10171	Low Exposure	High Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail
B18-10172	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10172	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10173	Low Exposure	Moderate Disturbance	Moderate Toxicity	Likely impacted	B18-10173	Low Exposure	Moderate Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail
B18-10174	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10174	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10175	Minimal Exposure	High Disturbance	Low Toxicity	Inconclusive	B18-10175	Minimal Exposure	High Disturbance	Low Toxicity	Inconclusive	Inconclusive	Inconclusive
B18-10176	High Exposure	Moderate Disturbance	Nontoxic	Likely impacted	B18-10176	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10177	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10177	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10178	High Exposure	High Disturbance	Low Toxicity	Likely impacted	B18-10178	High Exposure	High Disturbance	Low Toxicity	Likely impacted	Fail	Fail
B18-10179	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10179	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10180	Low Exposure	High Disturbance	Nontoxic	Likely unimpacted	B18-10180	Low Exposure	High Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10181	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	B18-10181	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10182	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10182	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10184	Low Exposure	High Disturbance	Nontoxic	Likely unimpacted	B18-10184	Low Exposure	Reference		Incomplete	Pass	Incomplete
B18-10188	Low Exposure	High Disturbance	High Toxicity	Likely impacted	B18-10188	Low Exposure	Low Disturbance		Incomplete	Fail	Incomplete
B18-10192	Minimal Exposure	High Disturbance	Nontoxic	Likely unimpacted	B18-10192	Minimal Exposure	Moderate Disturbance		Incomplete	Pass	Incomplete
B18-10193	Low Exposure	High Disturbance	Nontoxic	Likely unimpacted	B18-10193	Minimal Exposure	High Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10194	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10194	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10195	Minimal Exposure	High Disturbance	Low Toxicity	Inconclusive	B18-10195	Minimal Exposure	High Disturbance	Low Toxicity	Inconclusive	Inconclusive	Inconclusive
B18-10196	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10196	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass

Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10197	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10197	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Pass	Pass
B18-10198	Low Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10198	Moderate Exposure	Moderate Disturbance	Nontoxic	Possibly impacted	Pass	Fail
B18-10199	High Exposure	High Disturbance	Nontoxic	Likely impacted	B18-10199	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	Fail	Pass
B18-10200	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	B18-10200	Low Exposure		Low Toxicity	Incomplete	Fail	Fail
B18-10201	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10201	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10203	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10203	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10210	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10210	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10217	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10217	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10218	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10218	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10224	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10224	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10226	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10226	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10227	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10227	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10228	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10228	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10229	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10229	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10233	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10233	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10237	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10237	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10238	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10238	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10239	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10239	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10240	Minimal Exposure	Reference	Nontoxic	Unimpacted	B18-10240	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10242	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10242	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10244	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10244	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass



Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10260	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10260	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10262	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10262	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10263	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10263	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10266	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10266	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10267	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10267	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10269	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10269	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10270	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10270	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10271	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10271	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10272	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10272	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10273	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10273	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10274	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10274	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10275	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10275	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10276	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10276	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10277	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10277	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10278	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10278	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10279	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10279	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10286	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10286	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10301	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10301	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10308	Moderate Exposure	Reference	Nontoxic	Unimpacted	B18-10308	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10311	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10311	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10315	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10315	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass

Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10316	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10316	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10317	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10317	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10318	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10318	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10319	Minimal Exposure	Moderate Disturbance	Nontoxic	Likely unimpacted	B18-10319	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10320	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10320	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10382	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10382	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10383	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10383	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10384	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10384	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10385	Low Exposure	Low Disturbance	Low Toxicity	Likely unimpacted	B18-10385	Low Exposure	Reference	Low Toxicity	Unimpacted	Pass	Pass
B18-10386	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10386	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10387	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10387	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10388	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10388	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10389	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10389	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10390	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10390	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10391	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10391	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10392	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10392	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10393	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10393	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10394	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10394	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10395	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10395	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10396	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10396	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10397	High Exposure	High Disturbance	Moderate Toxicity	Clearly impacted	B18-10397	High Exposure	High Disturbance	Moderate Toxicity	Clearly impacted	Fail	Fail



Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Station ID	Chemistry LOE	Benthic LOE	Toxicity LOE	Station Assessment	Pass/Fail	Pass/Fail
B18-10411	Moderate Exposure	Reference	Nontoxic	Unimpacted	B18-10411	Moderate Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10417	High Exposure	Low Disturbance	Nontoxic	Likely unimpacted	B18-10417	Moderate Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10438	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10438	Low Exposure	Low Disturbance	Nontoxic	Unimpacted	Pass	Pass
B18-10658	Minimal Exposure	High Disturbance	High Toxicity	Likely impacted	B18-10658	Minimal Exposure	High Disturbance		Incomplete	Fail	Incomplete
B18-10672	High Exposure	Moderate Disturbance	Low Toxicity	Likely impacted	B18-10672	High Exposure	Moderate Disturbance		Incomplete	Fail	Incomplete
B18-10674	High Exposure	Moderate Disturbance	Moderate Toxicity	Clearly impacted	B18-10674	High Exposure	Moderate Disturbance	Moderate Toxicity	Clearly impacted	Fail	Fail
B18-10677	High Exposure	Moderate Disturbance	High Toxicity	Clearly impacted	B18-10677	High Exposure	Moderate Disturbance		Incomplete	Fail	Incomplete
B18-10740	High Exposure	High Disturbance	Nontoxic	Likely impacted	B18-10740	Low Exposure	Moderate Disturbance		Incomplete	Fail	Incomplete
B18-10741	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	B18-10741	Low Exposure	Moderate Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10760	High Exposure	High Disturbance	Moderate Toxicity	Clearly impacted	B18-10760	Moderate Exposure	High Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail
B18-10772	Minimal Exposure	High Disturbance	Moderate Toxicity	Possibly impacted	B18-10772	Minimal Exposure	Moderate Disturbance	Moderate Toxicity	Possibly impacted	Fail	Fail
B18-10774	Moderate Exposure	High Disturbance	Moderate Toxicity	Likely impacted	B18-10774	Moderate Exposure	High Disturbance	Moderate Toxicity	Likely impacted	Fail	Fail
B18-10776	Moderate Exposure	High Disturbance	Moderate Toxicity	Likely impacted	B18-10776	High Exposure	Moderate Disturbance	Moderate Toxicity	Clearly impacted	Fail	Fail
B18-10778	High Exposure	Moderate Disturbance	Moderate Toxicity	Clearly impacted	B18-10778	High Exposure	High Disturbance	Moderate Toxicity	Clearly impacted	Fail	Fail
B18-10824	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	B18-10824	Low Exposure	High Disturbance	Low Toxicity	Possibly impacted	Fail	Fail
B18-10875	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10875	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10876	Minimal Exposure	Low Disturbance	Nontoxic	Unimpacted	B18-10876	Minimal Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10880	Low Exposure	Reference	Nontoxic	Unimpacted	B18-10880	Low Exposure	Reference	Nontoxic	Unimpacted	Pass	Pass
B18-10968	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	B18-10968	Moderate Exposure	Low Disturbance	Low Toxicity	Possibly impacted	Fail	Fail



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