

# SCCWRP's fact sheet series

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# Background

- We've published 8 fact sheets so far
  - We begin working on one new fact sheet every quarter
- You've affirmed these documents are useful
  - We are producing these fact sheets at your request
  - Let us know if they stop being useful

## Rapid beach testing methods

### Using DNA technology to protect beachgoers from fecal contamination

**SCOWRP FACT SHEET**  
**Using DNA technology to protect beachgoers from fecal contamination**  
 DNA-based methods provide faster, more insightful information on whether bacteria cells from fecal contamination are present in beach water.

For decades, the public health community has tested beach water for fecal contamination using established bacterial culturing methods. But advances in DNA technology are paving the way for faster, more insightful ways to assess water quality and warn beachgoers when it's potentially unsafe to enter. In 2022, San Diego County became the first coastal community in the nation to end reliance on bacterial culturing in favor of a DNA-based method.

**Key advantages of DNA technology**  
 The traditional way to test beach water for fecal contamination is via cell culturing, where bacteria cells from a water sample are grown in a laboratory overnight and then analyzed. DNA-based methods, by contrast, focus on analyzing the bacteria cells' DNA.

- **Faster:** Whereas cell culturing typically takes 24-72 hours after beach water samples reach a laboratory, DNA methods can provide same-day results. Speed is of the essence when it comes to protecting the health of beachgoers, especially following unexpected transient sewage spills. Public health agencies need to close beaches and/or post warning signs as soon as a potential risk to human health has been confirmed – and then reopen beaches and/or respond as soon as the risk has passed.
- **More insightful:** Cell culturing cannot determine if fecal contamination originated in the gut of a human or another animal, such as a bird or dog. By protecting the health of beachgoers, especially following unexpected transient sewage spills, public health agencies need to close beaches and/or post warning signs as soon as a potential risk to human health has been confirmed – and then reopen beaches and/or respond as soon as the risk has passed.

**DNA methods agree with culturing methods**  
 For DNA methods to be approved as a replacement culturing method, the two methods must produce the same results. Scientists conducted extensive side-by-side testing of the two methods across Southern California. The testing found 90% agreement between the two methods.

**SCOWRP FACT SHEET**  
**Understanding PFAS in California's aquatic systems**  
 Environmental managers use developmental strategies, monitoring programs, and modeling tools to understand PFAS in California's aquatic systems.

### Managing microplastics in California's diverse aquatic systems

**SCOWRP FACT SHEET**  
**Managing microplastics in California's diverse aquatic systems**  
 California is pursuing short-term actions to combat microplastics pollution, as well as investing in research and monitoring to advance scientific knowledge.

Microplastics are tiny plastic particles – many barely visible or invisible to the naked eye – that are found in different forms, colors, and types just about everywhere scientists look. Despite microplastics' ubiquity in aquatic systems – including water bodies where drinking water is sourced – scientific understanding of microplastics is relatively limited. Researchers are coordinating and collaborating to fill the many research gaps that need to be addressed to comprehensively manage microplastics in aquatic environments. In recent years, California has made significant investments in developing capacity to comprehensively measure microplastics, evaluate potential solutions for reducing their spread in the environment, and understand how exposure to microplastics affects humans and aquatic life.

**Where do microplastics come from?**  
 Some microplastics, such as microbeads, are intentionally produced as small sizes. Other microplastics are formed when larger plastic trash breaks down into smaller particles by waves, water, heat, and sunlight. Common sources of microplastics include:

- **Paint particles** containing plastic polymers, which leach off from roofs, buildings, and other structures.
- **Wear particles** from vehicle tires, which are composed of synthetic rubber containing plastic and chemical additives.
- **Plastic mulch film** used to cover soil in agriculture.
- **Synthetic clothing fibers** such as polyester that are shed from washing and drying fabrics.

**Standardizing methods for measuring microplastics**  
 Before managers can effectively combat microplastics pollution, they need to be able to generate high-quality, comparable data about how microplastics are spreading across diverse aquatic systems. California has made key investments in standardizing the methods that managers use to collect different types of samples and then to measure their microplastics content.

**Collection methods**  
 California is developing best practices field guides for how to collect samples from multiple environmental matrices, including ambient water, stormwater, sediment, and biota of aquatic life.

**Measurements methods**  
 California is developing laboratory methods for processing samples and quantifying the levels and types of microplastics they contain. Recently, the California State Water Resources Control Board has approved standardized methods for collecting microplastics. See <https://www.csrwrc.org/2023/08/01/standardized-methods-for-collecting-microplastics-in-drinking-water/>.

**Examples**

- Restraining production and use of plastics
- Reformulating products to reduce or eliminate plastics
- Implementing technology to prevent microplastics from entering aquatic environments
- Research and other actions for monitoring
- Investing in advanced scientific understanding of microplastics in the short term
- Standardizing measurement methods
- Building monitoring capacity to identify sources and pathways
- Assessing potential health risks
- Evaluating effectiveness of interventions

## Water-quality modeling

### Modeling as a tool to support coastal water-quality decisions

**SCOWRP FACT SHEET**  
**Modeling as a tool to support coastal water-quality decisions**  
 A primer on how computer modeling is used to understand the effects of human activities on Southern California's ocean.

When coastal communities face water-quality problems, they often struggle to understand the extent of the problem across space and time. Environmental monitoring programs can provide some insights, but only for a limited number of sites at discrete time points.

Moreover, as communities identify possible solutions over time to solve water-quality problems, they need assurances they'll get tangible environmental benefits – before investing millions or even billions of dollars in a particular solution. Modeling programs can quantify the solutions for those solutions once implemented, but do not provide insight about the likelihood of success for solutions that have yet to be implemented.

**Modeling helps communities make informed decisions**  
 For coastal communities, modeling can help them make informed decisions about water quality. Modeling can help them understand the extent of the problem across space and time. Environmental monitoring programs can provide some insights, but only for a limited number of sites at discrete time points.

### SCCWRP's value

**SCOWRP FACT SHEET**  
**How SCCWRP adds value to aquatic ecosystems management**  
 The applied-science research agency builds a rigorous technical foundation for management.

### eDNA: An approach to monitoring organisms using their genetic traces

**SCOWRP FACT SHEET**  
**eDNA: An approach to monitoring organisms using their genetic traces**  
 Environmental DNA (eDNA) technology is in the process of being incorporated into routine monitoring programs.

Water samples from a stream to identify eDNA signatures.

### Tracking the health of aquatic ecosystems through regional monitoring

**SCOWRP FACT SHEET**  
**Tracking the health of aquatic ecosystems through regional monitoring**  
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### Protecting ecosystems and humans from harmful algal blooms

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### Regional monitoring

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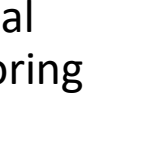
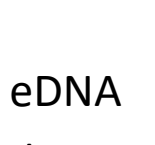
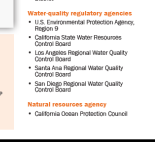
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**SCCWRP by the numbers**

- 80 full-time staff
- 8 science departments
- \$12 million annual budget

**SCCWRP member agencies**

**Wastewater treatment agencies**

- City of Los Angeles Bureau of Sanitation
- Sanitation Districts of Los Angeles County
- Orange County Sanitation District
- City of San Diego Public Utilities Department

**Stormwater management agencies**

- Los Angeles County Flood Control District
- Orange County Parks Wrecks
- San Diego County Watershed Protection Program
- Ventura County Watershed Protection District

**Water-quality regulatory agencies**

- U.S. Environmental Protection Agency
- California State Water Resources Control Board
- Los Angeles Regional Water Quality Control Board
- Santa Ana Regional Water Quality Control Board
- San Diego Regional Water Quality Control Board

**Natural resources agency**

- California Ocean Protection Council

**Watershed monitoring's reach**  
 Monitoring can serve as an effective bioassessment monitoring. But enhanced monitoring to plastics and metal monitoring isn't viable or cost-effective.

**Water quality regulatory agencies**  
 California water, a species of special concern.

**Natural resources agency**  
 Harmful algal bloom in a Southern California lake.

**Water quality regulatory agencies**  
 Pacific halibut, one of many commercial species targeted during regional fisheries stock assessments.

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# Fact sheet topics

- We've exhausted our original list of fact sheet topics
  - We asked for CTAG's input to develop a new list of proposed topics

## Original list of fact sheet topics (Completed)

1. Rapid beach testing methods
2. Water-quality modeling
3. SCCWRP's value
4. eDNA
5. Regional monitoring
6. Harmful algal blooms
7. PFAS
8. Microplastics
9. HF183 *(in progress)*
10. Ocean acidification *(in progress)*

## New list of fact sheet topics (Proposed)

1. Environmental flows
2. Wastewater-based disease surveillance
3. Bioassays
4. Coastal resiliency
5. Eutrophication
6. Bioassessment

***What topics do you want to see?***