

# Tracking the health of aquatic ecosystems through regional monitoring

*Southern California managers rely on regional monitoring to understand changing environmental conditions*

Regional monitoring is a type of environmental monitoring that focuses on holistic evaluation of ecosystems across time and space. Unlike site-specific monitoring that tends to focus on smaller areas, regional monitoring often calls on multiple agencies with overlapping responsibilities for protecting ecosystem health to pool their resources and work together on more ambitious, comprehensive scientific investigations. In Southern California, the insights provided by regional monitoring help environmental managers to better direct resources and maintain focus on the areas and issues that pose the greatest risks to ecosystem integrity.



A field crew for the Southern California Bight Regional Monitoring Program collects sediment samples in San Diego Bay.

## Complement to site-specific monitoring

Southern California’s water-quality management community spends tens of millions of dollars every year to monitor aquatic environments affected by pollution and other human-caused stresses. Much of this monitoring is focused on understanding the ecological effects of specific human activities, such as wastewater and stormwater discharges.

While this type of monitoring provides critical management insights, the data cannot be combined to produce a holistic picture of regional ecosystem health. Regional monitoring helps fill this data gap. Through regional monitoring, managers can contextualize site-specific monitoring insights and answer big-picture questions like:

- » Which water bodies in Southern California are most polluted?
- » Is the overall condition of Southern California’s water bodies declining or improving?
- » How safe is it to swim at Southern California beaches and consume fish from Southern California waters?

## Closing a knowledge gap

In 1990, the National Research Council – the scientific advisory arm of the prestigious National Academies of Sciences, Engineering, and Medicine – cited Southern California as a poster child for a densely populated region that, despite its high-quality investments in monitoring, could not answer broader-scale questions about how human activities have impacted the health of its aquatic ecosystems. Southern California also could not assess overall compliance with the federal Clean Water Act.

» In 1994, Southern California responded by developing the Southern California Bight Regional Monitoring Program – a coordinated, cyclical monitoring collaboration that is now one of the nation’s premier coastal marine monitoring programs. Other regional monitoring programs have since followed.

## Signature regional monitoring programs

Southern California is home to two expansive, cyclical regional monitoring programs that probe multiple aspects of regional ecosystem health.

» **Southern California Bight Regional Monitoring Program:** Conducted in five-year cycles, the Bight program examines the health of about 1,500 square miles of coastal waters and includes more than 90 participating organizations. The seventh and newest cycle – Bight '23 – features seven major study elements: Sediment Quality, Water Quality, Harmful Algal Blooms, Trash, Microplastics, Microbiology, and Submerged Aquatic Vegetation.



Southern California seafloor sediment and a California halibut

» **SMC Regional Watershed Monitoring Program:** Founded in 2009 by the Southern California Stormwater Monitoring Coalition (SMC), this cyclical five-year program probes multiple aspects of the ecological condition of more than 4,000 miles of streams that drain to Southern California’s coastal ocean. The SMC’s stream survey serves as the Bight program’s freshwater counterpart, and is aligned with California’s statewide stream assessment program.



A field crew for the SMC stream monitoring program

## Benefits of regional monitoring

Organizations with diverse agendas and priorities come together to participate in regional monitoring because of the enormous benefits they receive from these programs. Key benefits include:

- » **Method standardization:** Regional monitoring serves as a platform for participants to standardize their data collection and analysis methodologies. Participants work together to ensure that all data they're generating – not just regional monitoring data – are comparable and of high quality.
- » **Technology vetting:** Regional monitoring provides a large-scale platform for testing and vetting prototype monitoring technologies and methods that have the potential to save time, cut costs and/or generate more insightful, relevant information.
- » **Monitoring expansions:** The collaborative nature of regional monitoring enables participants to pool resources to push the boundaries of what can be monitored, including new habitat types and new classes of pollutants.
- » **Trust-building:** Regional monitoring helps build collegiality and trust within the water-quality management community, including between regulated parties and the regulators that oversee them.
- » **Consensus-building:** Participants work toward consensus about which investigations they most want to conduct, how to design and administer the studies, and how to interpret and report on findings.
- » **Unified messaging:** Regional monitoring unites participants around shared messages grounded in sound science, enabling everyone to speak with a common, unified voice that amplifies the resonance and impact of findings.
- » **Springboard for follow-up work:** Regional monitoring serves as a springboard for pursuing follow-up investigations on issues of pressing management concern.

## Inspiration for statewide monitoring

Southern California's investments in regional monitoring have helped inform how monitoring programs across California are developed and managed. Regional monitoring programs that have been inspired and shaped by methods, tools and approaches developed in Southern California include:

- California Marine Protected Areas (MPAs) Monitoring Program
- California Surface Water Ambient Monitoring Program (SWAMP)
- California Harmful Algal Bloom Monitoring and Alert Program (HABMAP)
- California Areas of Special Biological Significance (ASBS) Monitoring Program
- Southern California Kelp Monitoring Consortium

## Newer regional monitoring programs

Southern California remains a national leader in developing regional monitoring programs that focus on new habitat types and produce new types of ecosystem insights. Newer regional monitoring programs being piloted in Southern California include:



Upper Newport Bay, one of California's estuarine MPAs

**California Estuary Marine Protected Areas (EMPA) Monitoring Program:** This statewide program will use standardized approaches developed in Southern California to evaluate the health of California's two dozen coastal estuaries designated estuarine MPAs, focusing on their ability to provide critical ecological functions.



A biofiltration BMP under construction in Riverside County

**SMC Regional BMP Monitoring Network:** This regional monitoring network developed by the Southern California Stormwater Monitoring Coalition (SMC) will generate data on the performance of structural stormwater best management practices (BMPs), which are engineered solutions for reducing pollution in runoff and protecting downstream ecosystems.

### More reading

- [Southern California Bight Regional Monitoring Program documents portal](#)
- [SMC Regional Watershed Monitoring Program 2018-2019 Report](#)
- [California Estuary Marine Protected Areas \(EMPA\) Monitoring Program portal](#)
- [1990 NRC report on the state of Southern California environmental monitoring](#)

