



California's beaches and coasts are threatened by polluted stormwater runoff, which can harm marine ecosystems and cause health problems in people.

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Keeping Our Waters Clean: How smaller communities can prevent toxic runoff

Rainfall, excess watering of lawns, and other water use causes pollution on the ground to be swept into coastal waters all year round, during both dry and rainy months. The pollution carried into our oceans by this runoff can damage the environment and have serious public health impacts. NRDC has developed a three-part strategy of prevention, monitoring, and enforcement that can help smaller and midsized cities deal with this toxic stormwater runoff before it pollutes local waterways and puts public health at risk. This effective and straightforward plan has already been adopted, and once fully implemented, will successfully manage runoff in coastal communities along the Monterey Peninsula in California.



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How smaller communities can prevent toxic runoff

Stormwater Runoff Harms Public Health and the Environment

Polluted stormwater runoff can have serious health consequences, including fever, chills, nausea, and ear discharge in people who swim near runoff drains. In California, stormwater runoff is a leading source of coastal pollution. Pathogens and pollutants swept into the water by runoff can degrade beaches so much that they become unsafe for recreational use. Runoff also causes acutely toxic conditions for aquatic organisms, degrades ecosystems, and strains coastal-dependent economies with the resulting beach closures.

The best way to ensure that our beaches are safe for people and for marine life is to keep polluted stormwater runoff from reaching our waters. NRDC's three-part plan of prevention, monitoring, and enforcement can guide communities looking for solutions for cleaning up pollution in their own backyards.

A Practical Plan for Pollution Prevention

Preventing stormwater pollution can have positive effects on a community's health and economy. Using NRDC's detailed stormwater plan, the Monterey region was able to develop one of the most comprehensive written programs for smaller communities. The successful written plan that the Monterey communities will implement to manage stormwater runoff is outlined here.

Step One: Prevention

■ **Apply pollution prevention standards for new major development and redevelopment.** New development can be designed to stop pollution at the source by including low impact development, stormwater source controls, and stormwater treatment controls (such as use of sand filters, porous concrete, and preservation of open space).

1. Key Elements

- **Numeric design standards for categories of new development and re-development**
- **Pollution prevention requirements for all construction sites, which assures protection of water quality**

■ **Require inspection and cleaning of catch basins and inlets at least once prior to the rainy season,** with a focus on "hot spot" areas. This intercepts toxic debris, trash, and other pollutants before they reach the ocean. Street-sweeping efforts should include sweeping in high-priority areas at least once a week, at least twice a month for medium areas, and monthly sweeping for other areas.

■ **Use water quality standards to measure results.** If standards are violated, municipalities must redouble their efforts to come into compliance.

■ **Require, for all construction sites, specific practices to protect water quality,** including maintenance and cleanup measures. Defines targeted areas, such as paint work, cement and concrete work, and road work/pavement construction.

California Sea Otter Recovery Threatened by Polluted Runoff



Runoff not only contains harmful substances that can make swimmers sick, it can also sweep pathogens toxic to marine animals—including the California sea otter—into the ocean. The California sea otter has been listed as a "threatened" species under the Endangered Species Act since 1977. They could once be found as far north as Oregon and as far south as Punta Abreojos, in Baja California Sur, Mexico. At their peak, an estimated 16,000 to 20,000

sea otters occupied this range; now scientists estimate a population of just 2,700.

Otters are critical to the health of the marine ecosystem because they are early indicators of pollution problems and ecological change. They also help control the destruction of kelp forests by grazing urchins, which maintains a diversity of forest inhabitants and helps protect the coastline from erosion. The unique role of otters is vital to the productivity of the marine ecosystem.

But otters are vulnerable to disease, particularly a parasite called *Toxoplasma gondii* (or "*T. gondii*"), which causes the animal's brain to swell. This swelling, known as encephalitis, leads to a variety of symptoms including fine muscle tremors, recurrent seizures, dulled mental activity, and decreased or abnormal motor function. Studies have shown that *T. gondii* infection rates among sea otters go up in areas that are particularly plagued by pollution, including runoff.

The best way to keep the California sea otter population from dwindling and to protect the overall marine ecosystem is to stop stormwater pollution at its source.

- **Require, for construction sites greater than one acre, more stringent measures.** Such projects must develop and submit an effective plan for pollution control during construction as part of their grading and construction permits.

- **Establish construction site inspections during the rainy season:** weekly, for high-priority sites; twice, for medium-priority; and at least once, for low-priority. Compliance inspections ensure proper implementation.

- **Apply pollution prevention practices to the municipality's own operations,** including training staff in procedures for auto maintenance, landscape, lawn care and construction activities, and disposal of hazardous and toxic materials.

- **Pledge staff hours and annual funds for public participation programs** such as Urban Watch and Annual Coast Cleanup Day, and commit significant staff time annually to support the recruitment of college and community organizations for storm drain stenciling. This also includes annual reports of recruitment efforts, coordination efforts and financial support, and volume of waste collected.

- **Expand public education efforts** to reach at least 50 percent of all students from kindergarten to post-high school through academic education components and "hands on" field trips.

- **Use the media to effectively reach and educate the community,** and conduct regular outreach events in languages that reach all members of the community.

- **Create comprehensive education programs focused on specific local problems and targeted to specific sectors,** such as residents, green businesses, tourists, municipal staff, and construction contractors. Conduct tailored surveys of each sector to determine effectiveness.

Step 2: Monitoring

- **Monitor a minimum of 25 percent of outfalls, four times per year,** including representative samples for seasonal variation and pollutant source tracking, while prioritizing pollutants of concern. Regular monitoring helps assess the effectiveness of management efforts and identify problem areas.

2. Key Elements

- **Year-round water quality monitoring**
- **Compliance inspections for all commercial and industrial facilities**

- **Identify the geographic areas that are the sources of pollutants of concern** and reduce and eliminate these pollutant sources.

- **Inspect every commercial and industrial facility,** using both educational and compliance site visits (through detailed and industry-specific checklists). Prioritize inspections to focus first on the worst polluters and those that discharge to the most sensitive water bodies.

- **Perform source tracking of manholes in hot-spot areas** and eliminate pollutant sources in order to stop illicit connections and illegal dischargers. Twice during five years, analyze for pollutants of concern in materials removed from street sweeping and catch basin cleaning.

Step 3: Enforcement

- **Implement "no excuses" compliance and enforcement measures for polluters,** among them mandatory fines or penalties for all violations (including the cost of cleanup), and take legal action against ongoing violations.

- **Streamline municipal ordinances in the region** to achieve comprehensive and consistent legal authority in controlling urban runoff. Assure that adequate legal authority to take all steps needed to control polluted runoff is in place within three months of plan adoption.

- **Prohibit the release of non-stormwater discharges,** substances that can get into the drain system other than water (e.g., trash, oil, grease, paint).

- **Investigate all reports of actual or potential illicit discharges or connections** to the drain system within 24 to 72 hours of receiving the report. Any detection of illicit discharges, discharge sources, and connections are acted upon or eliminated immediately.

3. Key Elements

- **Strong compliance and enforcement measures, with mandatory fines or penalties for all violations**



The City of Monterey's stormwater management plan includes getting the community involved in stenciling storm drains and taking regular samples of runoff.

Stenciling photo courtesy of Maris Sidenstecker, Stormwater & Education Alliance (SEA) Educator; Sampling photo courtesy of the City of Monterey.

How smaller communities can prevent toxic runoff

“Working with NRDC created a constructive and creative tension that yielded a stormwater plan that was environmentally responsible, rational, and financeable by our local communities.”

FRED MEURER
CITY MANAGER FOR MONTEREY

Monterey, California: A Success Story in the Making

In 2004, the communities around the Monterey Peninsula became the first group of mid-sized coastal municipalities to submit a proposed stormwater management program to the Central Coast Regional Water Quality Control Board. Initial versions of the proposal, however, did not contain measures that would effectively protect the region's waters. Nor did the proposal contain measures to protect threatened marine life or beachgoers' health.

In 2005, NRDC started to identify and document a wide range of programs in place throughout California to protect water quality in mid-sized and smaller cities. The result was *A Practical Plan for Pollution Prevention*, a document packed with several “Clean Water, Healthy Economy” recommendations to assist regions like Monterey in substantially improving their stormwater management programs.

Working closely with NRDC in 2006, the County of Monterey and cities along the Monterey Peninsula incorporated our recommendations into local plans, significantly improving the region's runoff program. Today, the Monterey Stormwater Management Program is a leader, setting new written standards that combine practicality and effectiveness in controlling toxic runoff in smaller and mid-sized communities.

NRDC's pollution prevention plan addresses key issues of urban sprawl, construction regulations, illegal discharges, and cleanup responsibilities, including several fundamental provisions in the areas of prevention, monitoring, and enforcement. Other communities seeking to safeguard public health and the environment can follow Monterey's lead to successfully adapt this plan in their own cities.

Stopping Pollution at Its Source: Low Impact Development

To control runoff effectively and reduce expensive cleanup costs downstream, it is critical to stop pollution at its source. Low Impact Development (LID) strategies are a leading approach to achieve source control. Examples of LID practices include designs for natural drainage; preservation of vegetation; rain gardens; grassy swales; and reducing hardscape, such as concrete surfaces, by using porous pavement.

LID strategies mimic natural processes to maintain the natural hydrology of a development area. Undeveloped surfaces naturally infiltrate runoff and break down pollutants. But urbanization and development have paved over natural surfaces with roads, parking lots, and rooftops. These hardened surfaces alter the movement of water by increasing runoff volume and slowing infiltration.

By focusing on source control, LID retains more water on site as compared with traditional practices. LID offers myriad additional benefits over conventional practices: pollution reduction, reduced storm water runoff volume and rate, greater cost-effectiveness, increased groundwater recharge, and habitat protection.

LID strategies are used in government, residential, and commercial development and redevelopment. As smaller and mid-sized communities grow and urbanize, implementing these proven LID strategies as part of their stormwater plans is essential to both cost-efficient and effective methods for managing runoff and protecting coastal resources.



Photo courtesy of Roofscapes, Inc.