



Burton H. Jones, research associate professor at the Hancock Institute for Marine Studies, by a storm drain at USC marked to indicate that what goes down it will eventually be deposited in the Pacific Ocean.

*Photo by Bob Calverley*

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## USC Sea Grant Program Closes in on Beach Pollution

***Huntington Beach closure blamed on urban runoff.***

**by Bob Calverley and Phyllis Grifman**

A panel of scientists and technical experts assembled by the USC Sea Grant Program has concluded that last summer's closure of Huntington State Beach was probably caused by urban runoff and not a sewage leak as originally thought.

The Orange County Sanitation District and other municipal agencies spent more than \$2 million attempting to control and investigate high levels of bacteria in the ocean by Huntington Beach. Between July 1 and Sept. 2, the height of the summer beach season, 4.5 miles of one of Southern California's most famed beaches – Surf City USA – remained closed, resulting in a major loss in recreational activities and revenue.

Judy Lemus, Sea Grant's marine adviser who served as an ex officio member of the panel, said that the panel felt the evidence was strong, but not definitive, that storm water from the Talbert Marsh or the Santa Ana River, or both, was the source of the bacteria. If officials had tested to see if the bacteria came from humans or animals, it might have led them to consider urban runoff as the

contamination source earlier instead of spending the summer looking for leaks in the sewage system. (Animal waste can only come from runoff.)

Rachel Noble, a marine biologist who is a postdoctoral fellow at USC and the Southern California Coastal Water Research Project, was on the panel. She said that the Orange County Sanitation District did a very thorough job investigating the pollution, but pointed out that the agency's responsibility is sewers.

"Everybody is slowly realizing that this is everyone's problem," Noble said. "We need dialogue among all of the groups concerned with water quality, including those in the interior, because runoff comes from the entire watershed. It isn't just a coastal problem."

Burton Jones, research associate professor at the Hancock Institute for Marine Studies (part of the Wrigley Institute for Environmental Studies), was not a member of the Huntington Beach panel, but he is an author of one of the first full-fledged assessments of the impact of urban runoff on the marine ecosystem, which was recently published by Sea Grant.

"Urban runoff is now the main source of bacteria and viruses in our ocean locally, and it does pose a threat to human health," he said.

Jones worked with Steven Bay and Kenneth Schiff from the Southern California Coastal Water Research Project on the three-year Sea Grant study sponsored by the Los Angeles County Department of Public Works. For "Study of the Impact of Stormwater Discharge on Santa Monica Bay," the researchers examined runoff entering the ocean from concrete-channeled Ballona Creek, which drains an area that is 80 percent to 85 percent populated, and through Malibu Creek, which drains an area that is far less urbanized.

"The first rain of the season basically washes the entire city down, and people are upset when they see all of the Styrofoam cups and other obvious trash floating out into the ocean," Jones said. "What you don't see may be more dangerous – polyaromatic hydrocarbons, other organic compounds, dissolved metals, viruses and bacteria from animal waste or even sewage leaks, and lots and lots of nutrients from fertilizer."

The researchers found that the freshwater runoff, lighter than seawater, forms a 2- to 10-meter-thick brownish layer on the ocean surface that can extend as far as six miles offshore. In a day or two, the brown color fades as heavier particles sink and settle on the ocean bottom, but the storm water plume with its viruses, bacteria and nutrients remains to fuel an algae bloom that is usually green but sometimes red from the single-celled dinoflagellates associated with "red tide."

Jones said he was "somewhat surprised" that the scientific examination of the sea floor by both Ballona and Malibu Creek outfalls did not show any indication that the biology of the sediment had been impaired.

"Even though toxic concentrations are high, they aren't that high," said Jones. "Environmental regulators have worked hard to contain the pollutants from industry."

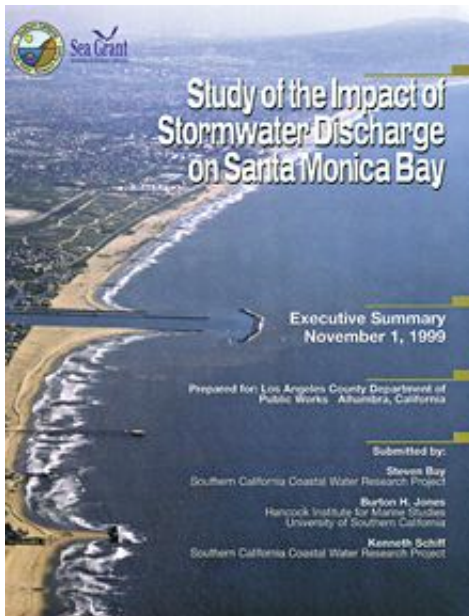
He noted that the Huntington Beach problem occurred during the summer when there is virtually no rainfall in Southern California. "Bacteria and viruses can have a relatively long lifetime in drainage channels. The light doesn't penetrate very well, so they can linger all summer," he explained.

During the summer it is practical to divert urban runoff to sewage treatment systems, Jones said. And in fact, the Huntington Beach problem began to clear when the runoff was diverted into the sewer system.

The scientific panel, drawn from academia and the federal government, encouraged Orange County officials to set up a more comprehensive watershed-based monitoring program to help elucidate the links between coastal and estuarine processes, the potential impacts of storm water diversion into the sewer system and the role of the marsh in bacterial dynamics.

“People should bear in mind that Southern California’s beaches are the most heavily monitored in the nation, perhaps in the world,” Jones said. “The fact that we have beach closures doesn’t mean our beaches are more polluted than other regions of the country. Urban runoff is a problem wherever there are cities beside oceans.”

*Phyllis Grifman is outreach programs manager for the Hancock Institute for Marine Studies.*



This study on storm water discharge was published by Sea Grant last fall.

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