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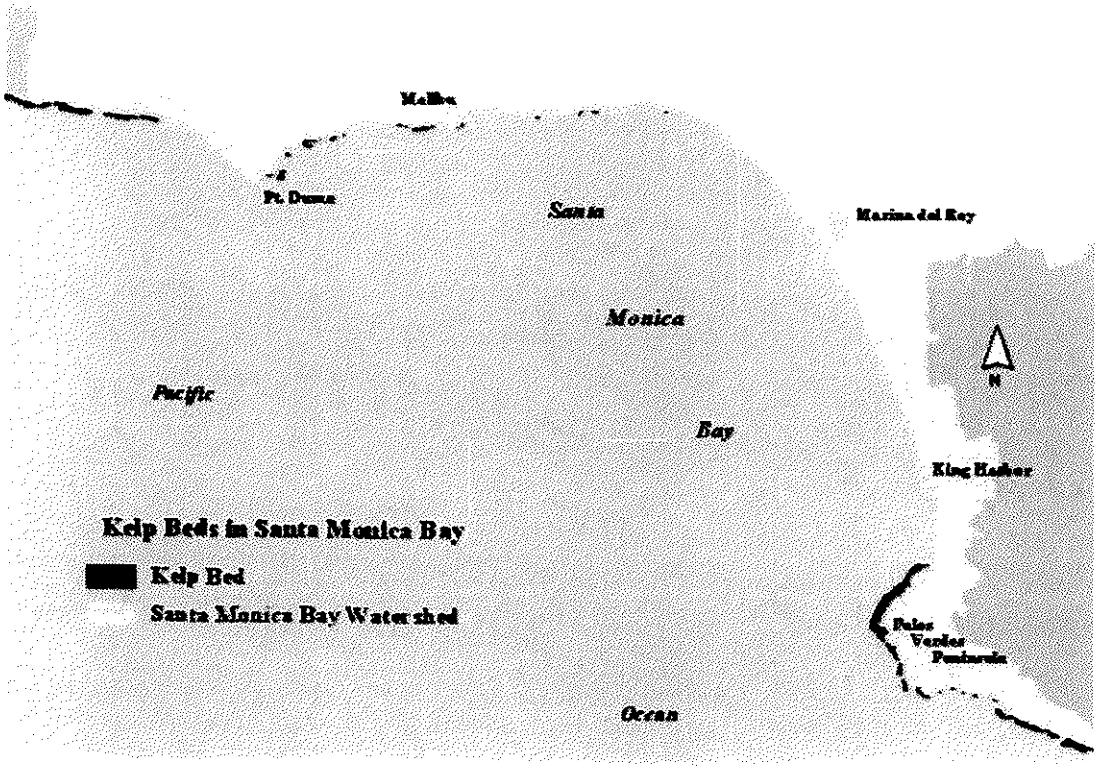
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Santa Monica Bay Water shed
Palos
Verdes
Peninsula
Ocean

UCLA Engineering professor Jennifer Jay and researcher Christine Lee.
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New Study by UCLA Engineering Researcher Shows High Levels of Unhealthy Bacteria Found in Sand at L.A. Area Beaches

Sunbathers heading for a day at the beach in Southern California may have more to worry about than sunscreen. A new study by researchers at the UCLA Henry Samueli School of Engineering and Applied Science shows that bacteria known as *Escerichia coli* and *enterococci* are prevalent in the top layer of sand at some of the area's most popular beaches, even when the surrounding ocean water tests "clean."

UCLA civil and environmental engineering professor Jennifer Jay and graduate researcher Christine Lee conducted a survey of beaches in the Santa Monica Bay, ranging from Redondo Beach to Malibu. Their research study, due to be published in an upcoming issue of the journal Water Research, shows that while the water bacteria levels at area beaches may meet state health standards, the sand itself may act as a source of bacteria. More disturbing, however, is that the bacteria were found in their highest concentrations in the sand of enclosed beaches often favored by parents with toddlers because of their lack of surf and more protected coastline.

Usually associated with feces, both *Escerichia coli* and *enterococci* bacteria levels are used routinely to determine the quality of water at recreational beaches, and both are used as indicators of the possible presence of other harmful microorganisms. But while water quality at local beaches is monitored on a daily basis by local city officials, the microbial quality of beach sand is continuously overlooked.

"Southern Californians are aware of swimming advisories and beach closings due to contamination of the water. But what is startling about our findings is that even when the water shows low bacteria levels, there are still high levels of bacteria that persist in the sand," Jay said.

"This is particularly relevant when we're talking about sheltered beaches such as 'Mother's Beach' and the enclosed part of Cabrillo Beach, for example, which appear to be more conducive to the persistence of these bacteria. The levels of *enterococci* were approximately 1,000 times higher than the levels observed at the beaches open to the ocean," Jay said.

Other high offenders included the enclosed portion of Cabrillo Beach in San Pedro, and Topanga Beach, just north of Topanga Canyon Road in Malibu. High levels of bacteria also were found at Santa Monica Beach near the pier. Both Malibu's Surfrider Beach and Redondo Beach showed lower levels of bacteria relative to the other test sites.

"Due to their enclosed nature, 'pocket' or enclosed beaches show the highest levels of bacteria present in the sand. These more enclosed locations are, for good reason, popular with families. As a parent of two young infants, I know firsthand children tend to put things in their mouths, including sand," Jay said. "That concerns me."

Because health standards for beach sediments have not been developed, there is no strict standard to evaluate exactly how much of a health risk these bacteria actually pose.

"The survival of these 'indictor bacteria' organisms in sand points to the persistence of other disease-causing organisms in the sand, which could be very significant," Jay said. "But we don't yet have enough data to know how significant. More research needs to be done in this area."

"What this study ultimately shows is the importance of monitoring bacteria in the sand as well as the water, particularly at enclosed recreational beaches," Jay said.

The beaches tested by UCLA Engineering's study include Malibu's Surfrider Beach, Topanga, Will

Rogers Beach, Santa Monica (north and south), Dockweiler, Venice Beach, Manhattan Beach, Redondo Beach, Cabrillo (open and enclosed) and Mother's Beach (enclosed).

Jay and her researchers are now working on a second study that will focus on the persistence of viruses in beach sediments.

Jay will be delivering a lecture **at UCLA Engineering** on this recent study, called **"Santa Monica Bay Beaches: What You Need to Know About Bacteria in the Sand,"** at 7 p.m. **on** Wednesday, May 24. Admission is free, but R.S.V.P.s are requested. Parking is available in campus Lot 9 for $8. Interested participants should register at http://www.engineer.ucla.edu/events/jay.html.

Last year, UCLA Engineering's Jay was chosen as one of only 20 young National Science Foundation-supported scientists and engineers to receive the prestigious Presidential Early Career Award for Scientists and Engineers. Bestowed by President George W. Bush, the award is the highest national honor for investigators in the early stages of promising scientific careers.

Established in 1945, the **UCLA Henry Samueli School of Engineering and Applied Science** offers 28 academic and professional degree programs, including an interdepartmental graduate degree program in biomedical engineering. Ranked among the top 10 engineering schools among public universities nationwide, the school is home to six multimillion-dollar interdisciplinary research centers in space exploration, wireless sensor systems, nanotechnology, nanomanufacturing and nanoelectronics, all funded by federal and private agencies. For more information, visit http://www.engineer.ucla.edu/.

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