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Traditionally, the cleanliness of a beach is monitored by sampling the bathing water a few meters from shore. But since sand is an effective filter, it follows that fecal bacteria (those from sewage) may be concentrated in the sand as the tide flows and ebbs. Moreover, trapped bacteria are offered a large surface area for attachment, nourishment from nutrients in sand crevices, and protection from sunlight. These bacteria might be afforded greater survival opportunities and may even be nourished enough to replicate in the beach environment. Dr. Andrew Rogerson, formally of the Oceanographic Center of Nova Southeastern University, Florida, headed an Environmental Protection Agency study to determine the levels of fecal-derived bacteria in Florida beach sand and look for health implications. Early results showed that wet sand (in the intertidal zone) and dry sand above the intertidal zone had significantly more fecal bacteria than near-shore seawater. This lead to the question do indicator bacteria survive longer in sand relative to open water" A series of laboratory experiments were conducted to answer this question and the results are presented in the May-June issue of Journal of Environmental Quality.

All the feces-derived bacteria (i.e. traditional indicators of sewage contamination) were capable of enhanced survival in sand and, more importantly, were capable of growth in the sand leading to much higher numbers. Conversely, in seawater the bacteria steadily decreased in number over time. Results also showed a rapid drop off in bacterial numbers in bathing water sampled close to the sand compared with 5, 10 or 20 m from shore. This indicates that the shoreline water is affected by bacterial run-off from the sand.

This has implications for beach managers since the number of bacteria from feces (fecal bacteria) in the water is used to assess the presence of sewages. A high count of these indicator bacteria would require the beach to be closed, an action with financial consequences in tourist rich regions such as Florida. Any bacteria washed from the sand complicates the interpretation of counts in the water and could lead to unnecessary beach closures. On the other hand, high numbers of fecal-derived bacteria growing in the sand could constitute an increased health risk.

The authors suggest that water quality managers should consider sampling water further from shore than is routinely practiced (say 10 m from the swash zone) to avoid the complications of bacteria being washed from sand. However, further studies are required to determine whether these higher counts pose a health hazard to bathers. The results of a beach questionnaire designed to look for incidences of illness after beach use were inconclusive.
