

Abstract for General Meeting of the American Society for Microbiology, Philadelphia, May 2009

Title: “Levels of Viable Enterococci Fecal Indicator Bacteria at a Marine Subtropical Beach: Assessing Temporal and Spatial Variability. “

Topic:

Environmental and General Applied Microbiology (Division Q)
topic Q11 "Indicators of Fecal Pollution")

list of authors:

Diana I. Aranda^{1,2}, Julia Capri³, Richard Zepp⁴, Emily White⁴, Marirosa Molina⁴, Maribeth Gidley^{1,2}, Chris Sinigalliano^{1,2}.

Affiliations: ¹NOAA Atlantic Oceanographic and Meteorological Laboratory, Miami, FL; ²NSF Oceans and Human Health Center, Rosenstiel School for Marine and Atmospheric Sciences, University of Miami, Miami, FL; ³Eastern Research Group, Cincinnati, OH; ⁴EPA Ecosystems Research Division, Athens, GA.

Beach water quality monitoring is an important tool to inform the public of health risks from recreational beach use, as well as to assess the impacts of land-based sources of pollution on coastal ecosystems. Many beach monitoring programs in the US currently utilize a strategy of sampling a particular beach for enterococci and/or fecal coliforms at one or two sample sites once or twice on a weekly basis and inferring weekly microbial water quality from these “snapshots”. We report here a study conducting an intense surveillance effort to determine if a single, weekly field grab sample accurately reflects the enterococci levels observed from more extensive sampling at several beach locations. The surveillance effort was conducted for a three month period in the summer of 2008 at a popular sub/tropical marine beach in Miami, Florida. Water column sampling involved 6 different transect locations, three times a day on four distinct days each week. Enterococci were enumerated by traditional membrane filtration (EPA Method 1600) and EnteroLert. Data representing single weekly points were randomly chosen from the compiled intensive data set of averaged enterococci colony forming units. The analysis compared weekly single sampling, to that of an intense surveillance effort that indicated a high temporal and spatial variability of enterococci levels. Due to the highly variable enterococci levels in the different locations and times, we conclude that single weekly sampling is not particularly representative of enterococci levels at different beach locations during a particular week. This may provide further insight for the improvement of water quality surveillance efforts and better means of informing the public that recreate in marine subtropical beaches.

Keywords: 1) fecal indicator bacteria
2) beach water quality
3) Enterococci
