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Georgia Southern University

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Georgia Southern Examines the Impact of Tides on Microbial Water Quality

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Most coastal freshwater ecosystems in the United States have semi-tidal movements during the day. Routine monitoring of these environments is conducted once during the day when tides can be at either ebb or flood conditions, causing variability in bacterial concentrations and misinterpretation of the illness risk associated with human activities. In this study, the occurrence and levels of enterococci (enterococci 23S rDNA [Ent23S]) and human- (HF183) and avian- (GFD) associated microbial source tracking (MST) markers were investigated during the ebb and flow tide conditions at an inland beach used mainly for fishing purposes by low-income families. Results showed that unlike the general assumption that ebb tide flow in a river would likely carry pollutants via runoff from the land, the microbial contaminants, in this case, were transported from upstream from ocean water to the river during the flood tide. These results suggest that hydrology and land use patterns must be considered in sampling design when conducting future microbial water quality monitoring programs to characterize recreational water safety in tidal rivers better.

“The Impact of Tides on Microbial Water Quality at an Inland River Beach” was recently published in the Journal of Environmental Quality.

Dr. Asli Aslan, Assistant Professor of Environmental Health Sciences at the Jiann-Ping Hsu College of Public Health Georgia Southern University was the lead author with her students Mr. Kendall W. Anderson and Ms. Ashley Chapman as co-authors.

Georgia Southern Investigates Asymptotic Properties of Kernel Density Mode Based Estimation using RSS

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The mode is a measure of the central tendency as well as the most probable value. Additionally, the mode is not influenced by the tail of the distribution. In the literature the properties and the application of mode estimation is only considered under simple random sampling (SRS). However, ranked set sampling (RSS) is a structural sampling method which improves the efficiency of parameter estimation in many circumstances and typically leads to a reduction in sample size. In this paper we investigate some of the asymptotic properties of kernel density based mode estimation using RSS. We demonstrate that kernel density based mode estimation using RSS is consistent and asymptotically normal with smaller variance than that under SRS. Improved performance of the mode estimation using RSS compared to SRS is supported through a simulation study. An illustration of the computational aspect using a Duchenne muscular dystrophy data set is provided.

“Notes on kernel density based mode estimation using more efficient sampling designs,” was recently published in Computational Statistics.

Dr. Hani Samawi, Professor of Biostatistics at the Jiann-Ping Hsu College of Public Health Georgia Southern University (JPHCOPH) was the lead author. Dr. Haresh Rochani, Assistant Professor and Director of the Karl E. Peace Center for Biostatistics, Dr. JingJing Ying, Assistant Professor of Biostatistics and Dr. Robert Vogel, Department Chair at the at JPHCOPH were co-authors.