



CEE691 Seminars in Civil and Environmental Engineering

“Application of rapid qPCR-based tests for enterococci (Method 1611) in Hawaiian coastal waters”

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Location: Bilger Hall 335, Date: Wednesday, April 6, 2016, Time: 1:30 – 2:20 pm

Speaker: Marek Kirs is an assistant researcher at the Water Resources Research Center. Marek received his BSc from Tartu University (Estonia), MSc from the University of Edinburgh (UK), PhD from the University of Rhode Island and completed his postdoctoral training at the University of North Carolina at Chapel Hill. More recently he worked at the Cawthron Institute (New Zealand) where he was involved in establishing microbial source tracking services and lead microbial water quality research and consultancy projects. His research focuses on a wide range of microbial water quality and related public health issues.

Abstract

The first part of the talk evaluates Hawaii coastal water quality and the applicability of the enterococcus qPCR (USEPA Method 1611) to be used for rapid beach notification purposes. The research is based on 127 water samples collected from 12 beaches on Oahu over a 10-month period. Although there was good agreement between the different methods for enterococci, our data indicates serious shortcomings for the qPCR method as 69% coastal water samples were compromised by PCR inhibitors when a rapid DNA extraction protocol is used.

The second part of the talk focuses on the application of microbial source tracking methods in Hawaii. Identification of contamination source(s) is important as indicator bacteria such as enterococci and *Escherichia coli*, which are conventionally used to evaluate recreational water quality, can originate from various non-human enteric and extra-enteric sources. Hence they may not be indicative of human health risk nor do they provide information on the sources of contamination. Identification of contamination source(s) enables us to: 1) determine the health risk associated with recreational water use, and 2) implement appropriate management practices to alleviate the health risk and protect the environment. This part of the presentation evaluates two human-associated molecular markers (*Bacteroides* HF183Taqman) and human polyomaviruses) for host sensitivity and specificity using human and animal fecal as well as wastewater samples collected on Hawaiian Islands. The decay rates of those markers and indicator bacteria were identified in the marine and freshwater microcosms exposed and not exposed to sunlight, followed by field implementation (one year of monthly samples) in the Manoa watershed with a parallel application of microbial community analyses tools.