

## SWAMP Watershed Health Indicator and Data Science Symposium, June 29-30, 2017

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### **Test-driving a new CEC framework to effectively screen for chemical occurrence and effects in aquatic environments**

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#### **Abstract**

Current monitoring programs target individual groups of chemicals for which robust analytical methods exist, but do little to address the presence of unexpected contaminants (e.g. metabolites, transformation products). Moreover, this approach doesn't consider the ecotoxicological risk that complex environmental mixtures may present. In vitro cell assays have shown promise as screening tools to assess environmental mixtures. In recent years, we have conducted a series of laboratory and field studies to adapt and apply these tools for water quality benchmarking. Our initial work focused on the evaluation and optimization of endocrine related cell assays such as estrogen receptor assay. Standardized protocols were then applied to screen aqueous samples from various environments across California (e.g. freshwater streams) and final wastewater effluents. Results of these studies indicated that wastewater effluents had the highest levels of endocrine bioactivity followed by samples from effluent-dominated rivers, while most perennial streams showed little to no bioactivity. Cell assay results compared favorably to the targeted chemistry data. To further evaluate the potential of cell assays for toxicity screening, the relationship between bioactivity and animal/community responses were examined. Altogether, these studies indicate that cell assays can provide valuable information on both occurrence and potential adverse effects of contaminants in the environment.