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**Angela Peace\*** (a.peace@ttu.edu). *Modeling the effects of co-occurring nutrient and contaminant stressors in aquatic systems.*

Bioaccumulation of toxic compounds in aquatic food chains can pose risk to ecosystem conservation as well as wildlife and human health. Ecotoxicological modeling aims to predict how contaminants cycle through aquatic food systems. There is increasing evidence that considering resource stoichiometry and nutrient availability will improve risk assessment protocols in ecotoxicology. The interactive effects of nutrient availability and MeHg concentration may play a significant role in bioaccumulation. We develop aquatic stoichiometric food chain ODE models that incorporate the effects of nutrient availability, as well as, track MeHg through two trophic levels, primary producers and grazers. Model analysis and simulations predict that stoichiometric constraints of food quality can affect the accumulation of MeHg in Daphnia. Scenarios of Somatic Growth Dilution, where Daphnia experience a greater than proportional gain in biomass relative to MeHg under high Phosphorus concentrations are observed. These modeling efforts improve our understanding of the processes governing the trophic transfer of nutrients, energy, and toxins and offer insight on the importance of elemental food quality in ecotoxicological testing protocols for assessing risk of exposures to toxins. (Received September 21, 2015)