



**MUMS Agent-Based Modeling and
Uncertainty Quantification Workshop
March 11-12, 2019**

SPEAKER TITLES/ABSTRACTS

Mevin Hooten

Colorado State University

“First-order Statistical Emulators”

Statistical emulators have been critical for providing inference based on complex differential equation models, computer models, and agent-based models. By approximating true model outputs while accounting for uncertainty in the approximation, emulators offer a way to fit statistical models to real data much more efficiently than when using the original model. In contrast to more classical second-order statistical emulators (i.e., based on covariance structure), I present first-order statistical emulation ideas that may be easier for practitioners to implement, can be used in a regularization setting, and can be used to fit agent-based models (ABMs). In particular, some ABMs in ecology present a unique set of challenges for emulation. I summarize these challenges for emulating ecological ABMs and propose possible remedies.