

Earth system models are numerical models that simulate several aspects of the Earth system. They use coupled systems of partial differential equations to model the fluid dynamics of the atmosphere and the oceans, as well as other chemical and biological processes. With increases in computational power and model complexity, as well as the availability of calibration datasets, there is an increased need for accurate model assessment to inform decision making. In this paper we provide an overview of common statistical methods and protocols for the validation of Earth system models. We present some popular numerical metrics and summary diagrams used for the qualitative and quantitative evaluation of model performance. An example procedure is demonstrated and applied to the simulation of nearshore ocean temperatures in the Scotian Shelf.