

Title: Global Sensitivity Analysis: who, when and why

Global Sensitivity Analysis is increasingly used to investigate the propagation of uncertainties through environmental and infrastructure models. Knowledge of model outputs' sensitivity can be used to guide the model calibration and diagnostic evaluation, and the use of model outputs for informing decisions under uncertainty. However, despite significant advances in the availability of methods, tools and application examples, the uptake of GSA widely varies within and across modelling communities. In this talk, I will discuss two "GSA paradoxes". First, that the very complex models that would most benefit from scrutiny through GSA are the ones to which this methodology is least frequently applied. Second, that the versatility of GSA – i.e. its ability to be adapted to different tasks, from prioritising efforts for model improvement, to model evaluation, to improving our understanding of systems' behaviour – makes it more difficult (rather than less) to communicate its value to potential users. Drawing on a range of recent examples from the water, natural risk and energy sector, I will present some ideas on how we can move forward past these paradoxes and better support model developers and users to conceptualise GSA experiments, and identify who, when and why can benefit from it.