



Sensitivity Analysis of earth and environmental models: a systematic review to guide scientific advancement

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Sensitivity Analysis (SA) investigates how the variation in the output of a numerical model can be attributed to variations of its input factors. SA is increasingly being used in earth and environmental modelling for a variety of purposes, including uncertainty assessment, model calibration and diagnostic evaluation, dominant control analysis and robust decision-making. Here we provide some practical advice regarding best practice in SA and discuss important open questions based on a detailed recent review of the existing body of work in SA. Open questions relate to the consideration of input factor interactions, methods for factor mapping and the formal inclusion of discrete factors in SA (for example for model structure comparison). We will analyse these questions using relevant examples and discuss possible ways forward. We aim at stimulating the discussion within the community of SA developers and users regarding the setting of good practices and on defining priorities for future research.