



## **Impact of objective function choice on model parameter sensitivity**

Manfred Kleidorfer<sup>1</sup>, Shujian Chen<sup>2</sup>, Cintia Dotto<sup>3</sup>, David McCarthy<sup>4</sup>

<sup>1</sup> University of Innsbruck, Innsbruck, Austria, Manfred.kleidorfer@uibk.ac.at

<sup>2</sup> Civil Engineering Department, Monash University, Victoria, Australia, 3800, shujian.chen@monash.edu

<sup>3</sup> Centre for Water Sensitive Cities, Civil Engineering Department, Monash University, Victoria, Australia, 3800, cintia.dotto@monash.edu

<sup>4</sup> Centre for Water Sensitive Cities, Civil Engineering Department, Monash University, Victoria, Australia, 3800, david.mccarthy@monash.edu

### **ABSTRACT**

Urban rainfall-runoff models are commonly used to estimate stormwater flows from urbanised catchments, which is important for drainage planning and water resource management. Objective and likelihood functions are often used to calibrate or conduct uncertainty analyses by comparing measured observations of real systems to model predictions. In this paper, we analyse the impact of objective function choice on parameter sensitivity, parameter interaction and calibration accuracy. To do this, a rainfall runoff model is applied to a single catchment for which two years of continuous rainfall and flow rate measurements are available. Eight different objective functions are evaluated for a Monte Carlo simulation to address these points. Results indicate that different behaviour of different objective functions is caused by different weighting of peak values compared to low flows in the hydrograph. Such considerations are important for practical model calibration and uncertainty estimation methods. Hence it is important for the model user to define a clear aim for the modelling study and to appropriately choose objective functions which reflect this aim.

### **KEYWORDS**

Rainfall runoff model, simulation, objective function, MOPUS