Mark Mulligan and Arnout van Soesbergen

WaterWorld: a self-parameterising, physically-based model for application in data-poor but problem-rich environments globally.

This paper describes a spatially explicit, physically based global model for water balance. It's key innovations include the fact that it comes with all data required for application, is very high spatial resolution (1km or 1-hectare resolution) and yet global in extent and is particularly well- suited to heterogeneous environments with little or no available data. The model, WaterWorld, is capable of producing a hydrological baseline representing the mean water balance for 1950-2000 and allows users to apply ensemble scenarios for climate change or examine the impact of policy options for land cover change or land management interventions. WaterWorld is focused on policy support, especially in conservation hydrology and development applications and is delivered through a simple, web interface, requiring little local capacity for use. The paper discusses the paucity of hydrological data and the urgency of hydrological problems in much of the less developed world, which reinforce the need for tools like WaterWorld. We discuss the types of hydrological problems that models might contribute to managing and the requirements of models applied to such problems. By way of example, applications of WaterWorld to understanding large scale patterns of water resources and uncertainty around adaptation to climate change are described.