

OneRTM: an online real-time modelling platform for the next generation of numerical modelling

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Abstract

Numerical modelling has been applied in many fields to better understand and predict the behaviours of different processes. In our increasingly dynamic world there is an imperative to identify potential stresses and threats in the environment and to respond quickly with sound decisions. The limitations in the traditional modelling way, however, make it difficult for people to respond quickly to rapidly developing events, such as floods, draughts and toxic chemical leakage. For example, it is time consuming and costly to keep model up-to-date and disseminate models and modelled datasets to end-users; and it is also difficult for people who has limited numerical modelling skills to understand and use the models and modelled results. Therefore, an online real-time modelling platform (OneRTM), a new way for maintaining and disseminating numerical models and datasets, has been successfully developed. It automatically keeps models up-to-date, links models based on data flow; it makes models and modelled datasets (historic, real-time and forecasted) immediately available through an internet browser in the easy-to-understand formats of GIS layers and graphs; and it provides online modelling functions to allow non-modellers to manipulate model including running pre-defined scenarios in an internet browser by few mouse clicks. OneRTM has been successfully applied and tested in the Chalk groundwater flow modelling in the Thames Basin, UK. With the support from the Technology Strategy Board of the UK Natural Environmental Research Council, OneRTM will be further developed by working with IT and work companies. Although OneRTM is currently tested using groundwater flow modelling as an example, it can be further developed into a common platform to host many kinds of time related environmental and socio-economic models to benefit decision makers, many industries (such as water and insurance companies and precision agriculture activities), researchers and even general public.