An Open Software Platform for Sharing Water Resource Models, Code and Data

Stephen Knox (1), Philipp Meier (2), Khaled Mohamed (1), Brett Korteling (3), Evgenii Matrosov (1), Ivana Huskova (4), Julien Harou (1), David Rosenberg (5), Amaury Tilmant (6), Josue Medellin-Azuara (7), and Jon Wicks (3)

(1) Department of Mechanical, Aerospace and Civil Engineering, University of Manchester, Manchester, UK (stephen.knox@manchester.ac.uk), (2) Department of Surface Waters, Swiss Federal Institute of Aquatic Science and Technology (Eawag), Kastanienbaum, Switzerland, (3) CH2M, Swindon, UK, (4) The Centre for Urban Sustainability and Resilience, UCL, London, UK, (5) Department of Civil and Environmental Engineering, Utah Water Research Laboratory, Utah State University, (6) Department of Civil and Water Engineering, Laval University, Quebec, Canada, (7) University of California, Davis, California, USA

The modelling of managed water resource systems requires new approaches in the face of increasing future uncertainty. Water resources management models, even if applied to diverse problem areas, use common approaches such as representing the problem as a network of nodes and links. We propose a data management software platform, called Hydra, that uses this commonality to allow multiple models using a node-link structure to be managed and run using a single software system.

Hydra's user interface allows users to manage network topology and associated data. Hydra feeds this data directly into a model, importing from and exporting to different file formats using Apps. An App connects Hydra to a custom model, a modelling system such as GAMS or MATLAB or to different file formats such as MS Excel, CSV and ESRI Shapefiles.

Hydra allows users to manage their data in a single, consistent place. Apps can be used to run domain-specific models and allow users to work with their own required file formats. The Hydra App Store offers a collaborative space where model developers can publish, review and comment on Apps, models and data. Example Apps and open-source libraries are available in a variety of languages (Python, Java and .NET).

The App Store can act as a hub for water resource modellers to view and share Apps, models and data easily. This encourages an ecosystem of development using a shared platform, resulting in more model integration and potentially greater unity within resource modelling communities.

www.hydraplatform.org
www.hydraappstore.com