Geophysical Research Abstracts
Vol. 13, EGU2011-3096, 2011
EGU General Assembly 2011

The Open Environmental Modelling Platform concept – an approach to information fusion in geoscience and environmental modelling

Andrew Riddick and Holger Kessler
British Geological Survey (NERC), Nottingham, United Kingdom (atr@bgs.ac.uk,hke@bgs.ac.uk)

The construction of computer models of environmental processes is becoming an increasingly important tool to address some of the key environmental problems facing Europe and the world today. For example, government and other agencies are under increasing pressure to make well informed decisions about the management of environmental resources in the light of population growth and environmental change. There is also a need to provide affordable housing, effective transport infrastructure and sources of sustainable food production. For scientists to contribute to addressing issues of this kind there is an increasing need to better understand the interaction of various environmental processes such as ground water flow, sea level rise, climate trends, and how these impact on the economy and society in order to create sustainable well-being. Accordingly many environmental models have been constructed by environmental science organisations.

Currently published environmental models are frequently discipline based, addressing a specific part of the earth system, and are often constructed to solve specific (and often localised) problems. In order to harness the significant intellectual and financial investment made by many organisations in existing models to solve the types of environmental issues described above, there is a need to be able to link environmental models together and pass parameters between them. There is clearly also great scientific and economic value in being able to link for example geological framework and groundwater flow models with models created in other earth system science disciplines, as well as socio-economic disciplines, in order to obtain a holistic understanding of the way in which geological and environmental processes interact.

In order to address these challenges the British Geological Survey is seeking to build on our existing experience in linking geological framework and groundwater models by creating an Open Environmental Modelling Platform (OEMP) which will support the development and visualisation of large integrated environmental models. Key components of the OEMP are envisaged to include the development of open source software tools to facilitate model linking, under-pinned by data management procedures plus metadata and data quality standards to support data interchange between models. Further development of semantic links between models developed in different disciplines will form another component of the platform. This will be important in facilitating better linking between different earth systems science disciplines and other types of models, for example socio-economic models of population trends and natural resource usage. The development of visualisation systems to visualise the output of linked models, and also to allow non-specialists to interrogate complex linked models for decision support purposes is also in progress. The technology development of the environmental modelling platform will be supported by promoting the development of an open research community which will accelerate the development of these concepts.

This paper will introduce the vision of an Open Environmental Modelling Platform and highlight the work being undertaken at the British Geological Survey on the various concepts under-pinning the platform outlined above. Initial work undertaken on linking geological framework and numerical process models will also be described.