Integrated modelling for integrated science

The role of the OpenMI

Thursday 5 June 2008

Programme

Hosted by the Centre for Ecology and Hydrology, Wallingford, UK

Introduction

Purpose of the workshop

The aim of the workshop is to raise awareness of the Open Modelling Interface (OpenMI) and its potential for use in integrated modelling within NERC and NERC collaborative centres.

An important NERC objective is to understand how environmental processes interact, and hence how the 'whole earth system' works. The knowledge of individual processes is often encapsulated in models. These models take a wide variety of forms and come from many groups and organisations. Linking them in order to model and predict process interactions can therefore be difficult from both the technological and scientific perspectives.

Because a generic solution to this problem is important to the implementation of the Water Framework Directive, the EC commissioned a four year €6 million research project, HarmonIT. This developed the OpenMI and a three year €4 million follow up project is transforming it from research output into an operational standard.

Model linking is a topic of widespread interest around the world. The workshop will describe the opportunities and challenges thrown up by the OpenMI and explain the steps involved in its application.

Who should attend?

The workshop is designed for NERC and NERC collaborative research centre directors, researchers and modellers with an interest in integrated modelling. It will be particularly useful for those with science questions and problems that they believe could be better answered using an integrated modelling approach. For those who are considering applying the OpenMI, a number of operational case studies that have used the OpenMI for research and commercial purposes will be described. No prior knowledge of the OpenMI will be assumed.

For more information on the OpenMI, please see www.openmi.org, or the background notes below.

The OpenMI

The OpenMI standard defines an interface that allows time-dependent models to exchange data at run-time. When the standard is implemented, existing models can be run simultaneously and share information at each time step. This is the key to making model integration feasible at the operational level. Model integration helps the understanding and prediction of process interactions and is an essential capability for the achievement of the integrated approach to environmental management including integrated water management called for in the Water Framework Directive.

The aim of the OpenMI is to provide a mechanism by which physical and socio-economic process models can be linked to each other, to other data sources and to a variety of tools at run-time, hence enabling process interactions to be better modelled.

Specific objectives are that the mechanism's design should:

- Be applicable to new and existing models
- Impose as few restrictions as possible on the modeller's freedom
- Be applicable to most, if not all, time-based simulation techniques
- Require the minimum of change to the program code of existing applications
- Keep the cost, skill and time required to migrate an existing model to a minimum so that these factors are not a deterrent to the OpenMI's use
- Be easy to use
- Not unreasonably degrade performance

CEH's role in the OpenMI

CEH has played a leading role in the development of the OpenMI, first under the HarmonIT project and now the OpenMI-LIFE project, in which Roger Moore is project coordinator and Hazel Murphy is project manager. OpenMI-LIFE is a €4m, three-and-a-half year LIFE Environment Programme project, co-funded by the European Commission. Its objective is to transform the OpenMI, which was developed in the Framework 5 HarmonIT project, from a research output to a sustainable operational product.

CEH is also a founder member of the OpenMI Association. Roger Moore is currently chairman of the OpenMI Association and is assisted by Hazel Murphy.

Workshop speakers

The workshop will be introduced by Prof Alan Jenkins, Director of CEH Water Programme. The workshop will be presented by a number of speakers who have been involved with the development of the OpenMI. They will include Jan Gregersen from DHI in Denmark who has played a major role in the technical development of the OpenMI. Jan is also currently Chairman of the OpenMI Association Technical Committee. David Fortune, from Wallingford Software will be introducing some of the current applications of the OpenMI. Christel Prudhomme from CEH, Wallingford will present her work on CLASSIC (Climate and Land-use Scenario Simulation In Catchments) hydrological model and the OpenMI. Geoff Pearce from HR Wallingford will be presenting the OpenWeb project which provides both a platform for model linking and a shop window for academic model. CEH staff will be presenting proposals for integrated science projects which use the OpenMI.

Funding of the OpenMI-Life Project

The OpenMI Association and OpenMI-Life are supported by the European Commission under the LIFE Programme and contributing to the implementation of the thematic component LIFE-Environment under the policy area "Sustainable management of ground water and surface water management". Contract no: LIFE06 ENV/UK/000409

Workshop Information

Venue

The workshop will be held in the Conference Room and Thames Room, at the CEH Wallingford offices in Crowmarsh Gifford:

Maclean Building
Benson Lane
Crowmarsh Gifford
Wallingford, Oxfordshire, OX10 8BB

How to get to CEH Wallingford?

Link to Multimap

By road: We are in the village of Crowmarsh Gifford, about 20-30 minutes from the following motorway junctions: M4 J8/9, M4 J12 & M40 J6 (from London and the south-east); M4 J13 (from the west/south-west), and M40 J8 (from the midlands/north). When in Crowmarsh Gifford follow signs to Maclean Building. Express bus services run from central Oxford (X39) and Reading station (X40) to Crowmarsh Gifford.

By rail: The nearest mainline station is Didcot Parkway (6 miles). Didcot is about 40 minutes journey from London Paddington Station. Taxis are available at the station.

By air: London Heathrow airport is about 40 miles/65 km away. There is a rail-air coach link to Reading station (on the London-Didcot line), or the Heathrow Express train goes to London Paddington (see above).

Accommodation

Hotels (quote CEH for discounted rate at all hotels listed)

The George Hotel (preferred option - walking distance from CEH) High Street, Wallingford, Oxon, OX10 0BS Tel +44 (0)1491 836665 or 0207 266 1100 Fax +44 (0)1491 825359 http://www.peelhotels.co.uk/hotels/george-hotel-wallingford-oxfordshire-england/

The Shillingford Bridge Hotel (a car, taxi or bicycle is required to reach CEH – walking would take about an hour and is across fields beside the river), Shillingford Hill, Near Wallingford, Oxfordshire, OX10 8LZ Tel: +44 (0)1865 858567 Fax: +44 (0)1865 858636 http://www.shillingfordbridgehotel.com/

Springs Hotel and Golf Club (a car, taxi or bicycle is required to reach CEH), Wallingford Rd, North Stoke, Wallingford, Oxon, OX10 6BE Tel +44 (0)1491 836687 Fax +44 (0)1491 836877 http://www.thespringshotel.com/contact_details.php

B&B

Little Gables, (Walking distance from CEH) 166 Crowmarsh Hill, Crowmarsh Gifford, Wallingford, Oxon, OX10 8BG Tel +44 (0)1491 837834, Fax +44 (0)1491 834426 http://www.stayingaway.com/

Programme

Date / Time	Event / Item	Responsible	Venue/Room
10:00 – 10:30	**Registration and coffee**		**Thames Room**
10:30 – 10:50	**Introduction** Welcome and house keeping Integrated science – NERC & CEH strategy Programme overview	Alan Jenkins & Roger Moore *CEH Wallingford UK*	Conference Room
10:50-11.15	**What is the OpenMI?** The bigger picture – integrated modelling The purpose of the OpenMI How it works Role of the OpenMI-Life project	Roger Moore *CEH Wallingford UK*	Conference Room
11:15 – 11:45	**Coffee**		**Thames Room**
11:45 – 12:10	**Demonstration of the OpenMI** Benefits of integrated modelling	Jan Gregersen, *DHI, Denmark.*	Conference Room
12:10– 12:30	**How to get going with the OpenMI** 1 Identify the science question 2 Identify the interacting processes 3 Identify models to represent the processes 5. Ensure these models are OpenMI compliant 6. Link, run and assess results	Christel Prudhomme *CEH Wallingford UK*	Conference Room
12:30– 13:30	**Lunch**		**Thames Room**
13:30 – 13:50	**Supporting the OpenMI and its Users** Current Availability OpenMI Association Purpose Strategy Web site, SourceForge, wiki Training	Jan Gregersen, *DHI, Denmark* Roger Moore, *CEH Wallingford UK*	
13:50 – 14:15	**Current users and uses** Why people are using the OpenMI OpenMI compliant models Collaborators Europe US Case Study examples	David Fortune, *Wallingford Software, UK*	Conference Room
14:15 – 14:45	**Making it easier** OpenWeb Supporting Tools SDK, GUI etc.	Geoff Pearce, *HR Wallingford, UK* Jan Gregersen, *DHI, Denmark*	Conference Room
14:45 –15:15	**Tea**		**Thames Room**
15:15 – 15:35	**CEH and the OpenMI** Current proposals using the OpenMI Marie Curie Actions	Roger Moore & Ian Draycott *CEH Wallingford UK*	
15:35 – 16:00	**Discussion and Questions** Scientific challenges of integrated modelling Opportunities for joint work	Alan Jenkins *CEH Wallingford UK*	Conference Room
16:00	**Close**		

Contacts

For information about the OpenMI within NERC:

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Web: http://www.ceh.ac.uk/collaboration/OpenMI-LIFE.html

For information about the OpenMI Association:

Please see the Association website at www.OpenMI.org, or email the Association at: info@openmi.org .

For information about the LIFE Environment Monitoring Team:

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For information about the LIFE Environment programme:

Web: http://ec.europa.eu/environment/life/home.htm