OpenMI 2, an extended open standard for linking models and tools

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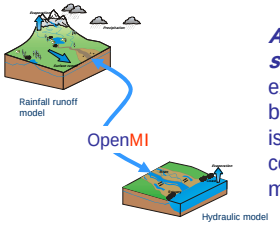
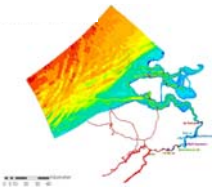
What is the Open Modelling Interface OpenMI?



An open source interface standard for run time data exchange between models, databases and tools, whose purpose is to improve the ability to model complex scenarios in the environmental domain.

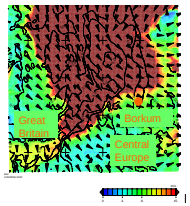
A variety of use cases for OpenMI 1.4



Coupling of 2D and river models at the Scheldt, source http://www.openmi-life.org/project/scheldt.php

OpenMI-LIFE use case D: linking a river model to 2D tidal models

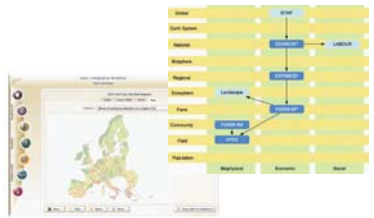
Objective: to improve flood maps and information accessibility in Antwerp harbour. Two alternative 2D models (Waqua and Delft3D) have been linked to the 2D river model MIKE11.
Study Case: river Scheldt, Leye & Bovenscheldt
Institutions: Flanders HR, Deltares & DHI



DWD wind field on 1.11. 2006 Computed water level (Borkum)

Import of a 2d wind field into a 3D hydronumerical model

Objective: better flood forecasts due to more precise boundary conditions, wind fields varying in space and time. Due to powerful interpolation features the user does not have to know about different geometries and time scales.
Study Case: North Sea
Institutions: BAW, Deltares & DWD (wind fields)



The SEAMLESS web tool showing a scenario study. Chain of models linked by OpenMI in SEAMLESS

Linking Models for Assessing Agricultural Land Use Change

Objective: Ex-ante assessment of the likely impacts of policy changes and technological innovations on agriculture to provide insight in policy effects on land use and other resources.
Study Case: EU Agriculture Policy, High Price Scenario
Institutions: Alterra, and other partners of the SEAMLESS 6th Framework EU Project.

More use cases and how to download OpenMI Standard 2.0 on the site of the OpenMI Association www.openmi.org

OpenMI Standard 2.0

What is exchanged? ***Where?*** ***How?*** ***When?***

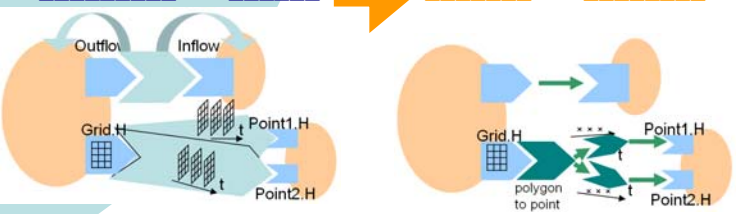
Source: The OpenMI Association (2010), OpenMI Standard 2 Specification for the OpenMI (Version 2.0)

- separation into base interfaces and extension interfaces, a component has to comply to the base interface and can comply to one or more extensions.
- values can be of type quantity or categorized data, qualities as “dry” and “wet”; many more features

Domain analysis leading to OpenMI 2 requirements

1. Classical case of linking numerical models: _____ 1.4 _____ → _____ 2.0 _____

- more flexible output/input connections
- direct provider / consumer relationship or
- adapted outputs for adapting the output to the requirements of the input: interpolation in space and time and unit conversion
- series connection of adapted outputs



Legend:

2. Constant Value Provider

3. 0-Dimension, Time Series

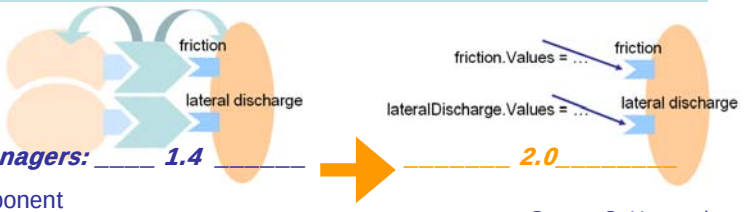
4. GIS

5. Analytic Function f (x,y,z,t)

6. Data Base or File Reader

7. Optimizers, calibration tools, scenario managers: ____ 1.4 _____ → _____ 2.0 _____

- setting of values is possible without output component



Source S. Hummel:
http://public.deltares.nl/download/attachments/28189064/FromOpenMI14_to20.pps?version=1&modificationDate=1261557144000

What's next?

An SDK and a GUI for interactive linking of components and running networks

- replacement GUI of the configuration editor
- available in 2011 from the Fluid Earth Project
- on http://sourceforge.net/projects/fluidearth/

Probably close cooperation with the Open Geospatial Consortium OGC

- wide acceptance of OGC standards

Further extensions in the future:

- support of ontologies, dictionaries
- combination of extensions