



The OpenMI Association



The OpenMI Association

Annual Report 2009



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CHAIRMAN'S INTRODUCTION

Welcome to the third annual report of the OpenMI Association (OA).

The focus of this year's work by OA members has been on preparing Version 2.0 of the OpenMI for review, promoting the OpenMI in the US and Europe, navigating the OpenMI-Life project towards a successful conclusion in 2010 and securing resources for the future. In the process, much thought has been given to the issue of how the Association will work in a world without EC funding. This report will expand the details of the year's achievements and the OA's forward plans.

As always, we have received much help from DG Environment and DG research. I would like to thank all our colleagues outside the OA who have taken such an interest, especially our US colleagues but also those around the world. The LIFE project and the OA are inextricably linked. It may have been hard at times but we have survived the test. Possibly more importantly, the OpenMI survived its first venture into the real operational world through the seven OpenMI-Life demonstration and evaluation studies. Finally, I must thank the OATC for all their work in bringing forward the ideas for Version 2.0 of the OpenMI; those who have produced a standard know how much painstaking hard work you have put in. Thank you.

Roger Moore

Chairman of the OpenMI Association

HIGHLIGHTS OF 2009

OPENMI-LIFE NEARING COMPLETION

The OpenMI is the combined result of the EC research project, HarmonIT and the LIFE Environment project, OpenMI-Life; the latter is transforming the OpenMI into an operational standard and establishing the OpenMI Association to take ownership of it, post OpenMI-Life.

OpenMI-Life is testing the OpenMI in seven operational settings, four in the Scheldt basin and three in the Pinios. The evaluators are examining not only whether it meets its claimed functional specification but also whether that functionality is what is required and whether the technology is useable in an operational context.

The results will be published in January 2010 at the OpenMI-Life Final Workshop. Preliminary conclusions are that the OpenMI not only works but is probably ahead of the current requirement. However, its use in real life situations has clarified the work that model developers will need to undertake if integrated modelling is to become a useable tool. Despite being ahead of the requirement, the future capabilities that will be required can be foreseen and development of the OpenMI Version 2.0 is underway. The next areas to focus upon will be ease of use and achieving recognition of the OpenMI as an international standard.

PROGRESS WITH OPENMI VERSION 2.0

The main work of the year has concerned the development of the proposals for Version 2.0 and their release for review. Readers who would like a full description of Version 2.0 and how it differs from 1.4 are invited to visit the OpenMI wiki¹. Topics covered include:

- What's new in OpenMI 2.0
- OpenMI 'in a nutshell
- Scope document
- The OpenMI Standard Version 2 interface specification
- Standard 2.0 reference manual (C#/java)
- Source code for Standard (C#/Java) (see How to download)
- Migrating models
- 'How to ...' pages:
- Source codes for the 'How to ...' pages
- How to download the most recent source code
- How to upgrade from version 1.4 IEngine
- How to get started with OpenMI 2.x and Java
- How to turn an ASCII file reader into a Linkable Component 2.0
- How to link models with different grids (spatial mapping)
- Unit tests
- OATC Editor including examples, tutorials and associated documentation
- SDK technical documentation
- Other source code such as the SDK (see How to download)
- Examples

¹ <http://public.deltares.nl/display/OPENMI/OpenMI+AssociationTechnical+Committee>

BUILDING A COMMUNITY OF PRACTICE

The Association believes that integrated modelling has much to offer in the process of understanding how the world works and using that knowledge to find sustainable solutions to the challenges. However, the Life project has shown us that there is a huge amount of work ahead to make integrated modelling into a tool that can be easily and safely applied by almost anyone. The resources required will be comparable to or greater than those that were needed to transform paper maps into Google maps and Google Earth. In the present economic climate, it is highly unlikely that anyone is about to hand us the resources and ask us to get on with it. If that isn't about to happen, then from where are the resources to come?

In 2008, the US EPA published a White Paper² on the future of integrated modelling within the Agency. It was followed in December by an Integrated Modelling Workshop entitled 'Collaborative Approaches to Integrated Modelling: Better Integration for Better Decision Making'³. Five groups, including the OpenMI Association, explained how they had built the resources to achieve their goals, the emphasis being on how they had exploited collaboration and open source. The outcome of the meeting was the formation of the Community for Integrated Environmental Modelling, whose aim is to provide a nucleus around which a community can develop. During 2009, its main activity has been the building of a hub for information exchange www.iemhub.org.

DISCUSSIONS WITH OGC IN ATHENS AND SAN FRANCISCO

In November 2008, the OpenGeospatial Consortium (OGC) suggested informally that the OGC and the OpenMI Association should consider collaborating as they had a shared interest in linking models, interoperability standards and web services. An area of OA expertise of growing interest to the OGC was the time dimension.

Consequently, the OA was invited to two OGC Technical Committee meetings, the first in Athens, Greece and the second at Google's offices in Mountain View, California. These gave an interesting insight into the workings of an organisation seeking to establish and maintain a range of standards across many industries. It also revealed that there was a significant integrated modelling community within the OGC. Relatively recently, the OGC has established an Earth Systems Science group, with sub groups covering the major environmental domains. OGC topics of particular interest to these groups are Water ML and sensors as web services.

Having made contact with the OGC and learned about their way of working, the OA is now in a position to consider benefits and mechanics of how it might collaborate. There is clearly a significant body of modellers and their parent organisations who would feel much more comfortable about using the OpenMI, if it had the seal of approval of an international standards organisation such as ISO, WMO or the OGC. The counter argument is that model linking is still at an early stage and that the OA needs the freedom and flexibility to continue learning about the requirement. There is also a resource issue. Creating a standard involves a huge amount of work over

² <http://www.epa.gov/crem/integrated-model-paper.html>.

³ Council for Regulatory Environmental Modelling (CREM) workshop on Collaborative Approaches to Integrated Modeling: Better Integration for Better Decision Making, J. W Marriott Desert Ridge Hotel, Phoenix, AZ - 10th – 12th December, 2008.

several years. Are we at a point where we can divert our existing resources to achieving this end or find the requisite new resources? Balancing that consideration is the possibility that joining a standards organisation might give us access to funds not open to us now.

The OA will debate this issue over 2010.

COLLABORATION WITH CSDMS

The Association has had close contact with CSDMS for sometime, so it was exciting to read the following in its 2008 Annual Report to NSF (http://csdms.colorado.edu/wiki/images/2008CSDMS_AnnualReport.pdf):

"By adopting the Common Component Architecture (CCA) and its associated tools and compilers (Ccaffeine, Bocca, SIDL, and Babel), the diversity of model languages using varied operating systems becomes less of a problem. By adopting the OpenMI Interface Standard, numerical information can be efficiently transferred, allowing models and databases to better communicate."

And in Section 4.1 of the annual report it reads:

"Of the two main community standards, CSDMS has adopted OpenMI. OpenMI transcends any particular programming language, operating system or framework."

and slightly further down it reads

"In addition to the C#/.NET/Windows version, a Java/JDK version is nearly complete that allows use on non-Windows computers. CSDMS is currently combining the best features of OpenMI and CCA by implementing the Java version of OpenMI within a CCA framework. To this end, CSDMS software engineers have converted the Java version of the standard itself (not the SDK) to SIDL and then used Bocca to create an "OpenMI port". Since CCA's Babel supports Java, OpenMI's Java SDK can be used in a CCA framework without major changes. The CSDMS team has begun wrapping this Java implementation of the OpenMI interface as a CCA class."

At the 2009 AGU Fall meeting in December in San Francisco, it was reported that this work was on the point of release to the CSDMS community. This is a very useful step forward as it takes the OpenMI into the super-computing environment, something which the OA has not yet had the resources to do but which it acknowledges as being of importance.

CUAHSI

Our links with CUAHSI have continued to grow with regular informal contacts throughout the year. OA members spent much time with them at the AGU Fall meeting. CUAHSI was demonstrating the first working version of HydroDeskTop which provides a common interface to a range of US hydrological databases. It also has an OpenMI plug in which allows modellers to build model chains and link to the data. During the AGU meeting, informal discussions were held between the people from NASA's 'Climate in a box' team, HydroDeskTop and CSDMS. Who knows where that might lead to in time?

AGU FALL MEETING 2009

The AGU is an excellent place to meet modellers from all over and extend our contacts into other disciplines. A significant number of OpenMI users were present both as session organisers and the presenters of posters and papers. However, the AGU is not only a good place to meet and observe; it is also an excellent forum for initiating collaborations. If we are to build a community that actively moves things forwards in integrated modelling, then the OA must seek out individuals and organisations with a shared interest and encourage them to work together. To this end, a small group of ten or so US and EU modellers agreed to organise a meeting in 2010 with the aim of preparing a Road Map for integrated environmental modelling. To secure resources for the meeting, the OA and the British Geological Survey put in a bid to the UK Foreign and Commonwealth Office for funds. Its outcome is awaited.

AgSAP

One of the early adopters of the OpenMI was the SEAMLESS project. SEAMLESS was concerned with assessing the impact of agricultural policy on agriculture and the impact of farmers' decisions on agricultural policy. Linked modelling was a key element of the SEAMLESS impact assessment system. The linkage interface adopted was the OpenMI. However, SEAMLESS took matters a step further and considered how the user might find models and how the linking process might be automated through the use of ontologies. If the NewConneXions proposal which was recently submitted to the FP7 programme is successful, this is an area that the Association hopes will be explored further. It may be the key to making integrated modelling accessible to a much wider community.

The last SEAMLESS event was the AgSAP conference in the Netherlands. It is pleasing to report that the Chief Information Officer of the USDA used this occasion to report that the USDA had adopted the OpenMI and had made its Object Modelling System (OMS) OpenMI compliant.

OPENWEB BECOMES FLUID EARTH

Last year it was reported that HR Wallingford had formed the OpenWeb group. It comprised a group of leading UK Universities and its aim was to facilitate the movement of models from academia to industry. It also aims to make integrated modelling much more accessible and lower some of the barriers to its use. To this end it is building much easier to use tools around the OpenMI for migrating, linking and running integrated models. An important step down this road is represented by the release of Pipestrelle, a new editor for configuring linked models. Gradually, this is introducing the semi automated matching of input and out exchange items and the computer aided linking of nodes where these have geographic positions. The first reduces the possibility for error and the second becomes more important as the number of nodes linked rises. It is probably safe to assume that the number of linkage points will rise exponentially with time and the increase in computing power; manual linking may well become a thing of the past.

Pipestrelle also recognises an important fact of life which is that most models are written in FORTRAN and that many FORTRAN programmers are unfamiliar with OO concepts. Pipestrelle therefore provides facilities to make the OpenMI much more accessible to the FORTRAN community.

PINIOS WORKSHOP

The fourth OpenMI-Life workshop (The Pinios workshop) entitled “Integrated River Basin Management using OpenMI - The case of the Pinios River in Greece” was held in Volos, Greece in May 2009. It was a one day workshop and included an afternoon field trip to the Lake Karla area (Use Case C). The workshop aims were to allow the Life partners who did not have the opportunity to attend other OpenMI-Life workshops to exchange ideas and share their OpenMI experience with the members of the Steering Committee and to introduce Greek Local Authorities and consulting companies to the potential of OpenMI integrated modelling. The workshop was concluded with an introduction to the forthcoming OpenMI E-learning tool and the future perspectives regarding the growing application of OpenMI around the world.

BAW HAMBURG

In late 2009, the BAW hosted the second OpenMI workshop at its offices in Hamburg during an OATC meeting. There was a mixture of OA and external speakers with strong representation from people with a Java/Unix/Linux background.

PLANS FOR 2010

Tasks for 2010 are for:

- The Executive Committee to :
 - Continue the promotion of integrated modelling and the OpenMI in lead organisations in the US and Europe
 - Continue to encourage the inclusion of integrated modelling and the OpenMI in academic courses and research
 - Continue to emphasize the shared responsibility of users, such that the effort for each member remains feasible to conduct within his/her resources available
 - Develop and implement succession plans
 - Seek resources
 - Create funding opportunities by influencing the funding agencies
 - Consider whether the OpenMI should be made an international standard
 - Implement the post OpenMI-Life operating plan

- The Dissemination Committee to:
 - Develop a dissemination plan
 - Implement the plan
 - Organise the FCO and EC funded workshops
 - Build on the OpenMI-Life e-learning system and encourage others to contribute
 - Disseminate the results of OpenMI-Life
 - Maintain and improve the web site

- The Technical Committee to:
 - Make any amendments arising from the version 2.0 review
 - If Version 2.0 is approved for release, make the release
 - Implement and release a matching SDK
 - Provide support to users

FINANCIAL REPORT

The treasurer reports that the Association's finances are in order and that the Association has sufficient funds in hand to cover anticipated expenses in the coming year.

The accounts for the year can be found in Appendix 7 **Financial Statement Of Accounts**

Due to his move to Deltares USA Inc., the current Treasurer, Peter Gijbers, will be stepping down. Stichting Deltares will propose to the OAEC that Bert Jagers replaces him and fills the role of Treasurer.

APPENDIX 1 COMMITTEE MEMBERSHIP 2009

Executive Committee

- Chairman[†]: Roger Moore Centre for Ecology and Hydrology, UK
- Vice Chairman[†]: David Fortune Personal member
- Secretary[†]: Michiel Blind Deltares, NL
- Treasurer[†]: Peter Gijsbers Deltares, NL
Bert Jagers Deltares, NL
- Members: Eleftheria Safiolea (on behalf of Prof. Maria Mimikou)
Stanislav Vaneček DHI Water and Environment
Jan Gregersen Lictec
Maria Mimikou Personal member
Jan-Erik Wien Alterra
Ann van Griensven Unesco-IHE

Management Committee

The members of the Executive Committee marked † are the ‘officers’ of the Association. They are elected by the Executive Committee from the Executive Committee’s members. The elected officers form the Management Committee.

Dissemination Committee

- Chairman: Prof. Maria Mimikou (represented by Eleftheria Safiolea), National Technical University of Athens, GR
- Members: Johan Van Assel Aquafin, BE
Michiel Blind Deltares, NL

Technical Committee

- Chairman: Stanislav Vanecek DHI, CZ
- Members: Adrian Harper MWH Soft Ltd, UK
Stef Hummel Deltares, NL
Peter Gijsbers Deltares, NL
Johan Hartnack DHI, DK
Gennadii Donchyts Deltares, NL
Onno Roosenschoon Alterra, NL

Rob Knapen	Alterra, NL
Jon Goodall	USC, USA
Andrea Antonello	Univita Trento/Hydrologis, IT
Peter Schade (BAW), DE	Bundesanstalt fuer Wasserbau
Jan Gregersen	HydroInform, Denmark
Lars Ekebjærg	DHI, DK

APPENDIX 2 ASSOCIATION CONTACT DETAILS 2009

Role	Name And Address	Company	Own Address	Contact Details
Chairman of the Management and Executive Committees	Mr. Roger V. Moore CEH Wallingford Wallingford Oxon OX10 8BB. UK			Tel: +44 (0)1491 692235 Mobile: +44 7 834 184 334 Fax: +44 (0)1491 692424 Email: rvm@ceh.ac.uk
Deputy Chairman	Mr David Fortune Micro Drainage Limited Newbury Berkshire UK			Tel: +44 (0)1635 582555 Fax: +44 (0)1635 582131 Email: david.fortune@microdrainage.co.uk
Secretary	Mr Michiel Blind Personal member		Lodewijk Napoleonpla ntsoen 60-2 3582tt Utrecht	Tel: +31-88-3357816 (during working hours) Fax: Email:OpenMI.Association.Secretary@gmail.com Email:michiel.68@gmail.com
Treasurer	Dr Bert Jagers Deltares – P.O. Box 177 2600 MH Delft The Netherlands			Tel: +31 15 285 89 28 Fax: +31 15 285 85 82 Email: peter.gijsbers@deltares.nl
Chairman of Technical Committee	Stanislav Vanecek DHI a.s Na vrsich 5 Prague 10, Czech Republic			Tel: +420 267227143 Mobile: +420 271736912 Email : s.vanecek@dhigroup.com
Chairman of Dissemination Committee	Dr. Ria Safiolea Oh behalf of Prof. Maria Mimikou NTUA Iroon Polytechniou 5 157 80 Athens, Greece			Tel: +30 210 772 2885 Fax: +30 210 772 2879 Email: safiolea@chi.civil.ntua.gr

APPENDIX 3 WHAT IS THE OPENMI?

The aim of the OpenMI standard is to provide an application programming interface 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. 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 the integrated water management called for in the Water Framework Directive.

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

The OpenMI or Open Modelling Interface was originally developed under the very successful FP5 HarmonIT project, to address the need for integrated modelling created by the European Union Water Framework Directive. The second phase of development of the OpenMI, which lasted up to January 2010, was funded under the European Commission's LIFE programme through the OpenMI-Life project. For more information on the OpenMI-Life project please see <http://www.OpenMI-life.org/>. The OpenMI's support and development is now funded by contributions in kind from its members.

APPENDIX 4 OPENMI COMPLIANT MODELS

An up to date list of OpenMI compliant software can be found at:
<http://www.OpenMI.org/reloaded/users/compliant-software.php>.

OPENMI VERSION 1.4 COMPLIANT MODELS

The table below lists the models known to be OpenMI compliant to version 1.4 at the end of the OpenMI-Life project (31st January 2010).

Provider	Component	Description
British geological survey & University of Birmingham	ZOOMQ3D Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Finite-difference groundwater flow model
MWH Soft Ltd (UK) (formerly Wallingford Software Ltd)	InfoWorks CS 10.0 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Hydrological modeling for the urban water cycle
	InfoWorks RS 10.0 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Flow simulation for rivers, channels and floodplains
	InfoWorks RS WQ 10.0 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Water Quality analysis for rivers, channels and floodplains
	InfoWorks CS 9.5 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Hydrological modeling for the urban water cycle
	InfoWorks RS 9.5 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Flow simulation for rivers, channels and floodplains
	InfoWorks RS WQ 9.5 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Water Quality analysis for rivers, channels and floodplains
TU Darmstadt - Section of Engineering Hydrology and Water Management	SMUSI.OpenMI Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Hydrologic runoff and pollution load model (urban sewer systems)
	BlueM.Sim Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Hydrological modeling
	BlueM.Analyser Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Monitoring and evaluation tool (IListener)
Halcrow Group Ltd	ISIS Professional v.3.1 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	River and flood risk modelling system
	ISIS Free v.3.1 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	River and flood risk modelling system (free version)
UNESCO-IHE Institute for Water Education	SWAT, version IHE Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	River basin modelling tool for soil, water and pollution
National and Technical University of Athens	RISH-1D Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Fortran Hydraulic River Model
	RMM-NTUA Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Delphi Reservoir Management Model
Deltares	Sobek-Rural-CF	0/1D hydraulic simulation software for rural

Provider	Component	Description
	Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	applications
	Sobek-RE Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	1D hydraulic simulation software for Rivers and Estuaries
Dutch Rijkswaterstaat, Waterdienst	Waqua, version Simona0811 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	2D/3D hydraulic simulation software for Seas, Rivers and Estuaries
BAW, Bundesanstalt für Wasserbau	GEI Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Generic access to initial and boundary condition data files
LicTek	RegularGrid Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Facilitates testing of exchange items with ElementSets of type XYPolygon
DHI	MIKE 11 Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Hydraulic and hydrological model for river flow
	MIKE SHE Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Integrated GroundWater/Surface Water model
	MIKE URBAN Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Industry standard in modeling water distribution and urban drainage networks
Schlumberger Water Services	Visual Modflow Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Groundwater model
University of Thessaly	UTHBAL Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Hydrological model
University of liege	PEGASE Compliant to: OpenMI Standard 1.4 .Net XML Info , HTML info	Water quality model

COMPONENTS COMPLIANT TO PREVIOUS VERSIONS OF THE OPENMI STANDARD

The models listed below are compliant to OpenMI standard versions prior to version 1.4, and as such not regarded as formally OpenMI compliant. However, since upgrading from previous versions to version 1.4 is a relatively small task for the software providers, we expect many of these models to become OpenMI 1.4 compliant when new versions of the models are released. So, if you are interested in using some of these models as OpenMI compliant component please contact the software provider and ask when such upgrade is expected.

The table below lists the models known to be OpenMI compliant to earlier versions of the OpenMI standard at the end of the OpenMI-Life project (31st January 2010).

Company *	Compliant Models & Components	.NET	JAVA	General description/ Compliance
Alterra	Capri		x	Agricultural policy impact model
	FSSIM		x	Bio-economic model
	Apes		x	Biophysical model
	MetaSwap en Simgro		x	Hydrological model
BAW	GEI Wrapper	x		Access to proprietary data for Delft 3D flow
CEH	Classic	x		Hydrological model
CRWR	ArchHydro	x		Hydrological model
Delft Hydraulics Software	Delft3D	x		2D/3D flow model
DHI software	MIKE 11	x		Hydraulic model
	MIKE SHE	x		Hydrological model
	MIKE URBAN	x		Urban drainage model
Hydrologic Engineering Center	HEC-RAS	x		Hydraulic model
Utrecht University	PCRaster	x		Data interface component
RIZA	DM	x		Surface water transport model component
	Mozart	x		Unsaturated zone model component
	Agricom	x		Agricultural model
	NwSim	x		1D network model
	DemNat	x		Ecohydrological model
	DistConn	x		Water distribution rules component
Wallingford Software	SULIS	x		3D lake and estuary model
Schlumberger Water Services	Visual Modflow	x		Groundwater model
University of Liege	PEGASE	x		River quality model
University of Thessaly	UTHBAL	x		Hydrological model
WRc Plc	STOAT	x		Wastewater treatment model

APPENDIX 5 PUBLICATIONS

Publications, posters and presentations

The most up to date details of OpenMI publications and posters can be found at:

<http://www.OpenMI.org/reloaded/about/publications-documents.php>.

The table below list all OpenMI Association and related papers up to 31st January 2010.

Authors	Date	Title	Event	Reference	Type
Gijsbers P.J.A., Gregersen J.B.	2005	OpenMI: a glue for model integration	MODSIM 2005		Paper accepted for publication in conference proceedings
Fortune, D	17-19/4/2007	The relevance of the OpenMI to the Yangtze River Forum	Yangtze River Forum		Oral presentations
Moore, R. V., Tindall, C. I.	30/04/2007	OpenMI Progress Report. October 2006 – March 2007.			Customer Report to the European Commission. April 2007.
Moore, R. V., Tindall, C. I.	30/04/2007	Collaboration agreement for LIFE Project No LIFE06 ENV/UK.000409			Collaboration agreement
Vits, S. (VMM-AWA)	03/05/2007	Interaction between models: OpenMI-Life Project	Congress: Conference on Water Systems Symposium: Modelling for integrated water management in Flanders		Oral presentation
Van Assel, J	22/05/2007	OpenMI- Linking of InfoWorks CS and	InfoWorks Benelux User meeting in		Oral

Authors	Date	Title	Event	Reference	Type
		RS, applied in the Scheldt basin (in Dutch)	Hoeven, The Netherlands.		presentation
Safiolea E. (NTUA)	03/07/2007	Bringing the OpenMI to Life	Floodmed Workshop, Sofia, Bulgaria		Poster Presentation
AquaFin	15/07/2007	Models co-operate better with OpenMI-Life (in Dutch)		Aqua Magazine 2007/02, Belgium	Promotional article
National Technical University of Athens and Centre for Ecology and Hydrology	31/07/2007	OpenMI-Life poster		Imprint: Greece: Athens, National Technical University of Athens, July 2002	Poster
Mylopoulos N. and P. Sidiropoulos (University of Thessaly)	9-13/09/2007	Uncertainty analysis and management in an overexploited aquifer	ModelCARE 2007 Calibration and Reliability in Groundwater Modelling, Credibility of Modelling, Copenhagen, Denmark		Poster presentation
Van Assel, J	12/09/2007	Integrated modelling in the Scheldt River Basin	InfoWorks International User Conference, Wallingford, UK		Oral presentation
Moore, R. V.	27/09/2007	Tools and technologies for river basin management, HarmonIT - OpenMI-Life	Harmoni-CA Final Conference, Brussels, Belgium		Oral presentation
Gregersen, J.B., Gijssbers, P.J.A., and Westen, S.J.P.	2007	OpenMI: Open modelling interface		Journal of Hydroinformatics, 9(3), 175-191.	Refereed paper
Hummel, S	03/10/2007	Presentation of OpenMI for IDSW” (IDSW is the InformationDesk for Standards in the Water domain, the Netherlands)	IDsW-informative meeting on external developments.		Oral presentation.
National Technical University of Athens		OpenMI leaflet		Imprint: Greece: Athens, National	Leaflet

Authors	Date	Title	Event	Reference	Type
and Centre for Ecology and Hydrology				Technical University of Athens, July 2007	
Moore, R. V., Tindall, C. I.	31/10/2007	OpenMI second Progress Report. April 2007 – September 2007.			Customer Report to the European Commission. October 2007.
Devroede, N., Vits, S.		Interacties tussen modellen: het OpenMI-LIFE project	Article for a Flemish magazine reporting on a presentation given by Vits S. on 03/05/2007. It describes the OpenMI-LIFE project and TaskB-the Scheldt in particular.		Article
Moore, R. V., Murphy, H. M.	3-4/12/2007	OpenMI Association poster	CEH Annual Staff Conference		Poster
Holvoet, K., Vereecken, H., Devroede, N., Ronse, Y., Cauwenberghs, K., Van Assel, J., and Waterschoot, G.	6-7/12/2007	OpenMI helps water managers in the future with integrated water management	Knowledge of Water Systems Conference, Antwerp, Belgium		Poster presentation in Dutch
Gregersen, J., Gijssbers, P.	03/2008	OpenMI Standard poster			Poster
Moore, R. V., Murphy, H. M.	28/02/2008	OpenMI Association Annual Report			Association Annual Report
Moore, R. V., Murphy, H. M.	30/04/2008	OpenMI Interim Report. October 2006 – March 2008			Customer Report to the European Commission. April 2008

Authors	Date	Title	Event	Reference	Type
Moore, R. V., Murphy, H. M., Sotiropoulos, E.	04/2008	OpenMI Association poster			Poster
Gijsbers, P.J.A., J.B. Gregersen, P.Sinding, S.Hummel	19-21/05/2008	OpenMI design patterns for river- groundwater interaction	Modflow and More 2008 Conference, organised by IGWMC, Golden, CO		paper accepted for publication in conference proceedings
Gijsbers, P.J.A.	22/05/2008	OpenMI training course	post-event Modflow and More 2008 Conference, organised by IGWMC, Golden, CO		course
E.A.H. Vollebregt	June, 2009	Waterbeweging en golven gekoppeld via OpenMI		Imprint: Company- brochure "Vortech Nieuws", nr. 11, 2009	Article (dutch)
Holvoet, K., Vereecken, H., Devroede, N., Ronse, Y., Cauwenberghs, K., Van Assel, J., Waterschoot, G. Sotiropoulos, E	06/2008	Demonstration of Integrated Modelling in the Scheldt River Basin using the OpenMI			Poster
Loukas, A., K. Kokkinos, L. Vasiliades, and A. Liakopoulos (University of Thessaly)	6-10/07/2008	The migration of the UTHBAL hydrologic model into OpenMI	iEMSs 2008: International Congress on Environmental Modelling and Software, Integrating Sciences and Information Technology for Environmental Assessment and Decision Making, 4th Biennial Meeting of iEMSs, Barcelona, Spain		paper accepted for publication in conference proceedings
N. Devroede, Y. Ronse, J. Van Assel	6-10/07/2008	Demonstration of Integrated Modelling using the OpenMI in the Scheldt River	iEMSs 2008: International Congress on Environmental Modelling and Software,	http://www.iemss.o rg/iemss2008/index	Oral presentation +

Authors	Date	Title	Event	Reference	Type
and H. Vereecken		Basin	Integrating Sciences and Information Technology for Environmental Assessment and Decision Making, 4th Biennial Meeting of iEMSs, Barcelona, Spain	.php?n=Main.Proceedings	paper in conference proceedings
Gijsbers, P., Moore, R.V.	6-10/07/2008	Taking the OpenMI Forward	iEMSs 2008: International Congress on Environmental Modelling and Software, Integrating Sciences and Information Technology for Environmental Assessment and Decision Making, 4th Biennial Meeting of iEMSs, Barcelona, Spain		paper accepted for publication in conference proceedings
OpenMI Association & Sotiropoulos, E	07/2008	2 nd OpenMI Newsletter			Newsletter
Moore, R. V., Murphy, H. M., Sotiropoulos, E., Safiolea, R., Van Assel, J., Blind, M.	08/2008	OpenMI Association leaflet			Leaflet
Neyskens, I., Smolders, S., Willems, P., Vaes, G., Van Assel, J.,	1-5/09/2008	Integrated modelling using the OpenMI	11th International Conference on Urban Drainage, Edinburgh, Scotland, UK, 2008		Oral presentation + paper in conference proceedings
Fortune, D	10/2008	The OpenMI-LIFE Project - putting integrated modelling into practice in flood management	FloodRisk2008		Oral presentation
Moore, R.V.	07/10/2008	The OpenMI - Planning for success	NERC IT Awareness, Warwick University, UK		Oral presentation
J. Stout	31st October	Integrated modelling with OpenMI in the	Workshop "Integrated Modelling with		Presentation

Authors	Date	Title	Event	Reference	Type
	2008	Netherlands	the OpenMI", at the BAW in Hamburg		
Moore, R. V., Murphy, H. M.	31/10/2008	OpenMI fourth Progress Report. April 2008 – September 2008.			Customer Report to the European Commission. October 2008.
Moore, R.V.	31/10/2008	The potential of Integrated Modelling (with the OpenMI)	Integrated Modelling with the OpenMI, Workshop at the Bundesanstalt Fur Wasserbau, Hamburg, Germany.		Oral presentation
J. Stout	31st October 2008	Integrated modelling with OpenMI in the Netherlands	Workshop "Integrated Modelling with the OpenMI", at the BAW in Hamburg		Presentation
A.J. Mourits, P. Schade, G. Lang	31st October 2008	How (the import of BAW data into) Delft3D has been made OpenMI compliant	Workshop "Integrated Modelling with the OpenMI", at the BAW in Hamburg		Presentation
Moore, R.V.	10/11/2008	An introduction to the OpenMI	Thirteenth Session of the Commission for Hydrology, WMO, Geneva, Switzerland.		Oral presentation
Moore, R.V.	12/12/2008	Title to be decided	The US EPA Office of Environmental Information Annual Symposium, Phoenix, Arizona, USA		
Moore, R.V.	17/12/2008	The OpenMI – its transformation from research output to global integrated modelling community standard	AGU Fall Meeting, San Francisco, USA		Abstract
Donchyts G, Baart F, Jagers H.R.A.	12/2008	DelftShell - integrated modeling environment with elements of GIS, Data Management and OpenMI support	AGU, Fall-meeting 2008, San Francisco, USA		Poster presentation
Moore, R.V.	29/01/2009	To be decided	PEER Workshop, CEH, Wallingford, UK.		Oral presentation

Authors	Date	Title	Event	Reference	Type
Safiolea, R., Makropoulos, C. and Mimikou M.	01/03/2009	Integrating Water Systems - Benefits and challenges in integrated water resources modelling using OpenMI: The case of the Pinios river basin, Greece	Computing and Control in the Water Industry 2009, Sheffield, United Kingdom		paper accepted for publication in conference proceedings
Moore, R.V	10/03/2009		Integrated Assessment of Agriculture and Sustainable Development, Hotel Zuiderduin, Egmond ann Zee, The Netherlands		Keynote speech
Moore, R.V	10/03/2009	Water System Science and Policy Inerfacing	Integrated Assessment of Agriculture and Sustainable Development, Hotel Zuiderduin, Egmond ann Zee, The Netherlands		Book Chapter
Vasiliades, L. and Liakopoulos, A.	14/04/2009	“Integrated modelling of surface water and groundwater through OpenMI: The Case of Lake Karla watershed	HydroEco’ 2009 – 2 nd International Multidisciplinary conference on Hydrology and Ecology, Vienna, Austria		paper accepted for publication in conference proceedings
Eleftheria Safiolea R., Makropoulos C., Efstratiades A., Oikonomidou E. and Mimikou M.	TBC	To be decided	11th International Environmental Conference for Science and Technology, Water resources management systems under uncertainty: urban development and climatic scenarios		
Moore R.V, Younas I.	30/04/2009	OpenMI Fifth Progress Report – October 2008 to March 2009.			Customer Report to the European Commission. April 2009.
E.A.H. Vollebregt	06/2009	Waterbeweging en golven gekoppeld via OpenMI		Imprint: Company-brochure "Vortech	Article (dutch)

Authors	Date	Title	Event	Reference	Type
Safiolea, E., Makropoulos, C. and Mimikou M.	1/9/2009	Integrating Water Systems 'Benefits and challenges in integrated water resources modeling using OpenMI: The case of the Pinios river basin, Greece	Computing and Control in the Water Industry 2009, Sheffield, United Kingdom	Nieuws", nr. 11, 2009	paper accepted for publication in conference proceedings
Makropoulos. C., Safiolea, E., Efstratiades, A., Oikonomidou, E., Kaffes, V., Papathanasiou, C., and Mimikou, M.,	5/9/2009	Multi - reservoir management with OpenMI,	11th International Environmental Conference for Science and Technology, Water resources management systems under uncertainty: urban development and climatic scenarios		paper accepted for publication in conference proceedings
G. Donchyts	8/09/2009	OpenMI 2.0 design	Workshop "OpenMI 2.0 talk",at the BAW in Hamburg		Presentation
S. H. Hummel	8/09/2009	From OpenMI standard 1.4 to 2.0	Workshop "OpenMI 2.0 talk",at the BAW in Hamburg		Presentation
Van Assel J., Waterschoot G., Devroede N., Ronse Y., Anderson S., Millington R.	30/10/2009	Modelling bidirectional interactions between sewer and river systems using OpenMI - a case study in the Scheldt River Basin (Belgium)	Novatech 2010. 7th international conference on sustainable techniques and strategies in urban water management, Lyon, France, 2010		Submitted for review and acceptance as oral presentation

APPENDIX 6 FINANCIAL STATEMENT OF ACCOUNTS

Composed by Peter Gijbers, treasurer 2009

In 2009 all financial transactions related to the OpenMI Association have been executed in-kind by Deltares on behalf of the OpenMI Association.

Profit / Loss year 2009

	Category									
	IN (€)					OUT (€)				
	Admission fee	Contribution	Donations	Subsidies	Other	T&S	Consumables	Purchases	Administration	Other
Yearly Total per Category (€)	0	200	0	0	0	0	0	0	37.50	0
Total IN/OUT	200.00					37.50				
Profit / Loss excluding outstanding invoices	162.50									

Balance 31 December 2009

	01-01-2009		31-12-2009	
	Debit (€)	Credit (€)	Debit (€)	Credit (€)
OA assets on Deltares account	693.00		883.00	
Outstanding invoices	800.00		2,100.00	
Outstanding debits		27.50		55.00
Equity		1,465.50		2,928.00
Total balance	1,493.00	1,493.00	2,983.00	2,983.00

Remarks: This financial statement is composed of a profit/loss section and a balance section. The account is based on the cost/benefit realisation at the moment of invoicing.