



The OpenMI Association

A large, stylized graphic of the number '4' in the background. It is composed of thick, rounded lines in shades of red, white, and grey, set against a light blue circular backdrop.

The OpenMI Association

Annual Report 2011

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CHAIRMAN'S INTRODUCTION

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

The aim of the Association is to advance integrated modelling so that it becomes an effective tool for addressing the environmental challenges that face society and also for creating new opportunities for innovation and wealth creation.

In HarmonIT, we researched and developed a solution to the problem of linking models, i.e. enabling them to exchange data at run time. OpenMI-Life transformed the solution into an operational standard, demonstrated its use in real world problems and put a support organisation in place, the OpenMI Association.

In the year just completed, the Association and its members have moved on to focus on removing the barriers to the take up of the OpenMI and integrated modelling. Among these, ease of use and accreditation by an internationally recognised standards organisation are seen to be particularly important. The latter is viewed as a key step in enabling many organisations, especially government agencies, to use the OpenMI. Achieving such accreditation is now the focus of the Association's activities. It is therefore pleasing to report that during the year we have made good progress, thanks to the work of the OA Technical Committee (TC) and the support of colleagues in CSIRO in Australia and in the Open GeoSpatial Consortium (OGC), towards the OpenMI joining the OGC family of standards. The OATC expects to submit a draft for approval to the OGC in 2012.

Public recognition of excellence by the European Commission is rare. So I hope it was an especially cheering moment for everyone who has worked on or has been associated with the OpenMI when, in the spring of 2011, the European Commission announced that the OpenMI-Life project had been selected to receive a 'Best of LIFE' Award at a ceremony to be held in the European Parliament. I am sure that this was intended as acknowledgement of the contributions of all who have worked to make the OpenMI a success and to encourage us in our future endeavours.

In closing this introduction, I would like to thank all of the Association's members who have contributed the resources to enable us to continue the work of achieving the Association. These contributions have come in many forms, including sponsorship, in kind contributions and voluntary work. Without them it would be impossible to carry on and they are greatly appreciated. However, we are aware that the OA cannot rely on these forever, so the OA Executive Committee (OAEC) is working to bring in other sources of funding. We are also very grateful for all the encouragement and help we have received from people outside the Association. It is really exciting to see an International Community for Integrated Environmental Modelling beginning to grow out of the contacts we have made across the world.

Roger Moore

Chairman

REVIEW OF 2011

This section, which is in a new and hopefully more readable format, provides a short digest of the year's highlights. More information on many of the topics can be found on the Association's web site at www.openmi.org.

WORKING TOWARDS RECOGNITION AS AN OGC STANDARD

Following a series of preliminary meetings between the OA and OGC, the 2011 AGM of the OA formally accepted the OGC's invitation to make the OpenMI an OGC standard. Accordingly the two organisations agreed a MoU and work began on redrafting the OpenMI standard to match the OGC style. As often happens, this is taking much more work than initially estimated. Nevertheless, it has been a useful exercise as it has required an extension to our documentation to cover compliance testing. The major part of the task is being undertaken by the OATC with guidance being provided by Peter Cox of CSIRO. Submission of a draft for approval by the OGC is expected in 2012.

CSIRO (AU) JOINS THE EXECUTIVE COMMITTEE

David Lemon of CSIRO (Australia) has joined the OpenMI Association's Executive Committee. He will bring to the Committee his knowledge and understanding of the Open Geospatial Consortium (OGC) and its procedures, which should be of great value as the OpenMI Association works with the OGC to publish the OpenMI Version 2.0 as an OGC standard.

OPENMI-LIFE RECEIVES 'BEST OF LIFE' AWARD IN EUROPEAN PARLIAMENT

The OpenMI-Life project won a 2011 "Best of LIFE" award. The award ceremony took place as part of a LIFE-conference "LIFE for our environment: success stories and future challenges" held in the European Parliament (Brussels, BE) on May 25th-26th 2012. The OpenMI Association, represented by its chairman Roger Moore (picture below), was invited to give one of the keynote speeches at this conference.



[Read more](#) about the conference

View [pictures](#) of the award ceremony

A ROADMAP FOR INTEGRATED ENVIRONMENTAL MODELLING

Following on from the 2010 Washington Summit meeting on Integrated Environmental Modelling, a group of European and US modellers appointed by the meeting prepared a paper outlining a Roadmap for the development of integrated environmental modelling – the group included several leading OA members. It is hoped the paper will be published in the journal of iEMSs in 2012.

As a consequence of the Washington meeting's success, the UK foreign and Commonwealth Office approached the OA and the US EPA and offered funding for a follow up meeting in 2012. Its objective will be the preparation of an implementation plan.

OPENMI 2010 AWARDS

These awards reward excellence in the use and development of the Open Modelling Interface standard. They focus on the contributions of individuals and groups in furthering the application and evolution of OpenMI. The three winning entries for 2010 (announced at the 2011 OA AGM) were:

1. OpenMI based Integrated Modelling Environment (TU Darmstadt ihwb)

A river pollution integrated modelling environment based on OpenMI.

The TU Darmstadt has developed an integrated modelling environment based on OpenMI. The environment is designed for the emission based assessment of combined sewer overflow (CSO) impacts. Therefore, a hydrological pollution load model was coupled with a hydrological river model including water quality. Formerly the environment was developed as part of a project aiming at the development of a simulation based analysis and planning methodology for the German Federal State of Hessen to identify critical impacts due to CSOs and WWTP effluents. Now the environment is developed further with rural catchment areas, integration of extern rainfall data and output data in the netCDF standard.

For more information: contact [Frank Reussner](#) or [Manfred Ostrowski](#)

2. The WISKI 7/KiTSM (KISTERS) made OpenMI compliant

OpenMI compliant models can now be linked to WISKI.

WISKI7 is the result of almost 25 years experience collected in the global water industry. A WISKI today integrates hydrometric data collection processes into any kind of IT environments and provides a turnkey solution from data collection, validation, and calculation of derived data products to data dissemination. WISKI is installed around the world from small scale to enterprise solutions processing time series data in archive or real time mode.

The core of WISKI7 is the KiTSM technology. KiTSM is the KISTERS Time Series Server. It is developed in JAVA and acts as an intelligent business layer in highly scalable multi tier architecture. With its interfaces, data consumers such as models are provided with controlled open access to constantly up to date data.

Raw data, validated data, statistical data products (such as long term values) and derived data sets are accessible through the API.

The KiTSM OpenMI extension now integrates OpenMI compliant models or modules. Compliant models can browse and retrieve any source of time series data through a local area network or even through the Internet.

For more information: contact [Michael Natschke](#)

Read the [original announcement](#)

3. OpenMI wrapping of the HR Wallingford Standard Time Series Data Source (HRW Floods Group)

An OpenMI wrapper of the OGC Web Feature Server Standard

HR Wallingford has recently developed a new point-based time-series data collection, storage, retrieval and portrayal mechanism called the Future Service Chain Platform (FSCP). Service chains are built offering to the internet standardised OGC Web Features containing point time series data.

The feature types available through the FSCP are made accessible to the internet via HTTP strings from Geoserver, an open source spatial data engine, in a form that is compliant with OGC Web Feature Services (WFS) and Web Map Services (WMS). It is therefore possible to build OpenMI components that have the capability to access these data services. In this way FSCP architectures can integrate pre-prepared or real time data into model compositions acting as boundary conditions or calibration for the rest of the composition.

For more information: contact [James Lanyon](#)

Read the [original announcement](#) .

FUND RAISING

Fund raising has been an important activity for members in 2011. One FP7 bid was submitted and two further proposals initiated during the year. As those who have written them know, each of these represents a major task involving several man months of effort by the lead partners. The first was NewConneXions which unfortunately didn't succeed; the other two are CENTIEM3 led by the UK's BGS and WIDGET led by the University of Exeter. The results of these will be known in 2012. In addition, submissions were also made to a range of national sources on both sides of the Atlantic, a number of which were successful.

The OA's funding for 2011 came from sponsorship and in-kind contributions by members; the former covered some of the OA's administrative and dissemination costs and the latter the work of achieving OGC recognition. Voluntary contributions of members' private time were also made and greatly appreciated. We hope to find a way of recognising these in 2012.

NEW DISSEMINATION COMMITTEE CHAIRMAN

After ten years of running the OpenMI Association's web site and Dissemination Committee (OADC), the National Technical University of Athens (NTUA), personified most recently by Ria Safiolea and Elias Sotiropoulos, handed over the task Johan van Assel of Aquafin. Many thanks are due to NTUA not only for the highly

professional look of the site but also for their long support of the OADC. Welcome to Johan as the new OADC Chairman, whose involvement in the OA is nearly as long as NTUA's already.

NEW OPENMI APPLICATIONS IN 2011

Online data access for OpenMI linked models

The development and evaluation of a Data Reader Component by Kansas State University enables online data access for OpenMI linked models to simplify data management in grid environments. [Read more](#)

The OpenMI supports the coupling of environmental process-based models with financial models

The British Geological Survey and Loughborough University have created an OpenMI composition to produce a prototype "plug and play" Catastrophe model for groundwater flooding in the Berkshire Downs. [Read more.](#)

Integration of OpenMI and web services accounting for uncertainty

Dr. Dan Cornford and his colleagues from Aston University (Birmingham, UK) have successfully integrated the OpenMI interface (v1.4 Java) with the UncertWeb SOAP/WSDL web service interface, written by Richard Jones at Aston. This has been done in a generic way. In addition to the basic wrapping of the OpenMI components they have integrated the composite service into an UncertWeb elicitation framework so that parameter uncertainty can be elicited. A simple Monte Carlo analysis is then run to propagate this uncertainty through the services.

The challenge will be now to test this setup with something more complex than the basic constants and sums from the SDK examples. Examples of intermediate complexity OpenMI compositions with some dynamic feedback between the models would be welcomed.

For further information, please contact [Dan Cornford](#)

OpenMI presentation in the Hype Open Source Community Workshop

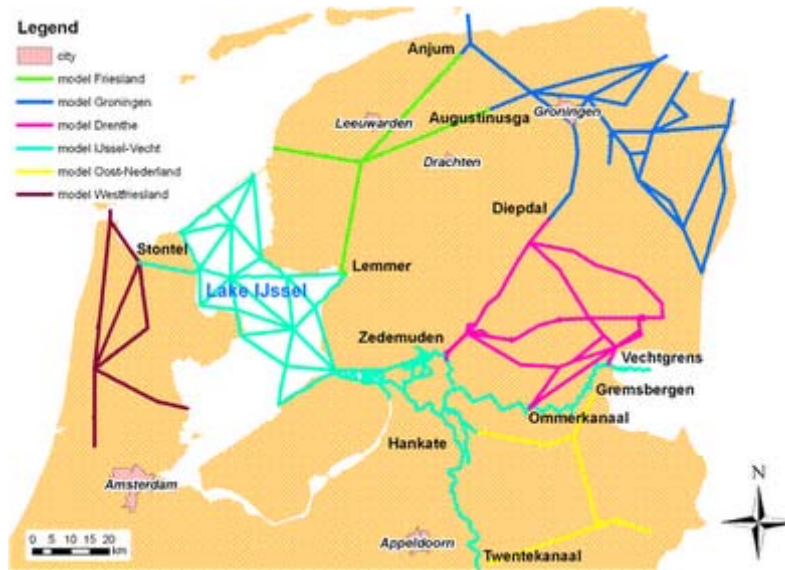
The use of OpenMI to support a successful Open Source Community in Hydrological modelling was presented in the Hype Open Source Community Workshop in Stockholm on the 23rd of November 2011.

Deltares evaluates OpenMI for Dutch Deltamodel project

Coupling models of the same type with OpenMI

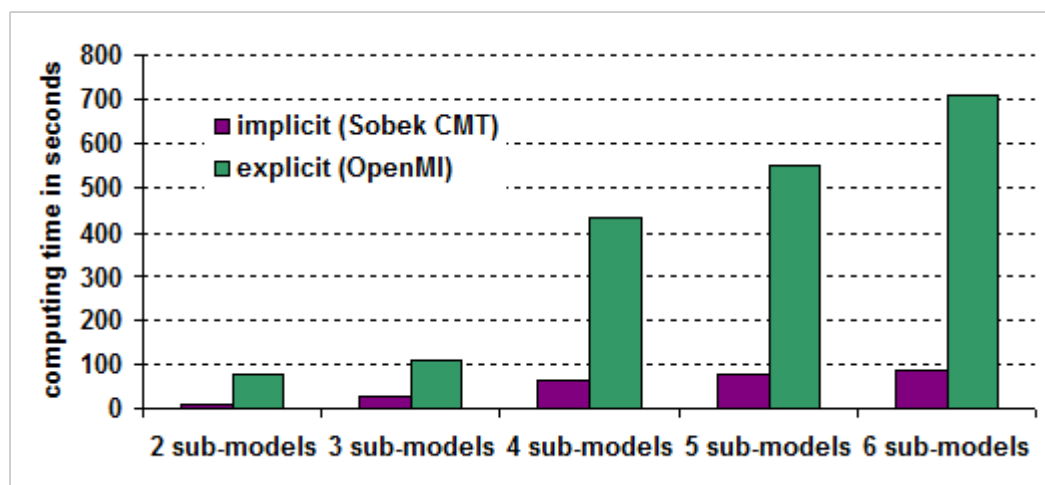
In the Netherlands, neighbouring Water Authorities have developed 1D channel flow models for their operational area, which need to be run separately for local issues, but have to be integrated when decisions are taken on a higher scale and the interaction of the neighbouring water systems can not be neglected. So there is need for coupling models of the same type (i. e. models that are based on the same software and model the same processes). The Deltamodel project aims to develop a channel flow model for the water distribution network of the whole country. The question is whether to merge the datasets of the existing models (in the following: sub-models) to a new

model by merging the datasets (implicit coupling), or to use iterative or external coupling techniques. In the latter case the sub-models remain unchanged and data is exchanged between the models during runtime on a time-step basis.



As a pilot study, two, three, four, five and six sub-models that represent the water system of the operational area of Dutch water boards (see figure above) have been coupled externally with OpenMI. An implicit coupling, where the datasets of the sub-models are merged to one new model, gives the reference case. For the merging of the datasets the flow simulation programme Sobek provides appropriate functions, while for external coupling the OpenMI standard (OpenMI 1.4) is applied. The performance of the two coupling techniques is assessed in terms of computing time and accuracy of modelled water levels and discharges.

The study proves that multiple Sobek-models can be coupled with OpenMI, but shows that no advantages in terms of computational costs are to be expected with OpenMI-coupling. The figure below shows the computing times for the implicit and external coupling simulations.



The “one-mesh”-approach, i.e. the unification of sub-models to one big model within the Sobek-Netter feature and the subsequent simulation run in the case management tool (implicit coupling) is significantly faster. The higher the number of sub-models, the larger is the advantage in terms of computational costs with respect to the correspondent OpenMI-coupling, whose computing time increases disproportionately with the number of models. The OpenMI request-reply-mechanism is made responsible for high computational costs: the sub-models do not run parallel, in case of a composition of six sub-models only one model computes at a time while the other five models remain in a waiting mode.

However, the one-mesh-approach is basically irreversible. So, a decision between implicit coupling (unification of meshes in Sobek) and external coupling (multiple sub-models coupled via OpenMI) is basically a matter of preference: if computing time and accuracy are more important, models should be unified to one large model. If priority is given to administration and maintenance issues and computational time is not a limiting factor, model coupling with OpenMI-coupling should be chosen. For a small number of sub-models computing times differ not that much. Higher computational costs can easily be accepted in return for the advantage of not having two sets of models to be maintained.

For the Dutch Deltamodel which contains model components from different institutions usually more working hours are spent in model maintenance, model updates, adjustments, and administration than in simulations. Administration issues are thus considered to be more important than computational costs. Thus, coupling multiple models with OpenMI is recommended for the Deltamodel, in particular if the number of models to be coupled is small. For further developments of the OpenMI standard a coupling mechanism where models can run parallel should be considered in order to reduce computational costs for compositions with multiple model components.

Jan Talsma, Bernhard Becker, Quanduo Gao and Erik Ruijgh

OPENMI MANUAL AVAILABLE IN CHINESE

On a lighter note, the OAEC were delighted to discover that the OpenMI documentation had been translated into Chinese. This only came to light when we received an email pointing out a typo. Further investigation revealed that this had come about as a result of the collaboration between Nanjing Hydraulic Research Institute and HR Wallingford.

The manual is provided [here](#) for your convenience by kind permission of the author. The document can also be found on the [NHRI website](#).

OPENMI RELATED PUBLICATIONS

Appendix 4 lists all known OpenMI related publications. If you know of others, please let us know and we will be very happy to add them to the list.

PLANS FOR 2012

Looking ahead, the tasks which the OA has set itself for 2012 are for:

- The Executive Committee to :
 - Work with the OGC and achieve the adoption of the OpenMI Version 2.0 as an OGC standard
 - Continue the promotion of integrated modelling and the OpenMI among lead organisations in Europe and the US
 - Contribute to the development of an internationally agreed Roadmap for Integrated Environmental Modelling and its implementation
 - Continue to encourage the development of a Community for IEM
 - Continue to encourage the inclusion of integrated modelling and the OpenMI in academic courses and research
 - Seek resources
 - Develop and implement succession plans

- The Dissemination Committee to:
 - Maintain and increase awareness of the OpenMI
 - Release and continue the development of a new OA website
 - Contribute to the planning and delivery of follow up events to the Washington Summit
 - Build on the OpenMI-Life e-learning system and encourage others to contribute

- The Technical Committee to:
 - Work with the OGC to have the OpenMI Version 2.0 adopted as an OGC standard
 - Monitor and support users of the OpenMI Versions 2.0

FINANCIAL REPORT

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

APPENDIX 1 OPENMI ASSOCIATION MEMBERS

Table 1 and Table 2 show the OpenMI Association's membership at 31-12-2011.

Table 1 OpenMI Association Institutional members

ID	Organisation name	Role	Represented by:				
			Organisation	Last name	First names	Title	Gender
0001	HydroInform ApS	OAEC	HydroInform	Gregersen	Jan Børge	Mr.	M
0003	Bundesanstalt für Gewässerbau	OATC	Bundesanstalt für Gewässerbau	Schade	Peter	Mr.	M
0004	Centre for Ecology and Hydrology	Member	Centre for Ecology and Hydrology	Boorman	David	Dr	M
0006	HALCROW	Member	HALCROW	Wicks	Jon	Dr.	M
0008	DHI Water • Environment • Health	OAEC	DHI Water • Environment • Health	Harnack	Johan	Prof.	M
0009	Alterra	OAEC	Alterra	Wien	Jan-Erik	Mr	M.
0010	AquaFin	OADC - Chairman	AquaFin	van Assel	Johan	Mr	M
0011	UNESCO-IHE	OAEC	UNESCO-IHE	van Griensven	Ann	Dr.	F
0012	RWTH Aachen, Institute for Hydraulic Engineering and Water Resources	Member	RWTH Aachen, Institute for Hydraulic Engineering and Water Resources	Schüttrumpf	Holger	Prof. Dr.-Ing.	M
0013	Deltares	OAMC OAEC Treasurer	Deltares	Jagers	Bert	Dr.	M
0014	University di Trento - CUDAM	Member	University di Trento - CUDAM	Rigon	Riccardo	Prof.	M
0015	Consortium of Universities for the Advancement of Hydrologic Sciences, Inc.	Member	Consortium of Universities for the Advancement of Hydrologic Sciences, Inc.	Hooper	Richard	Dr.	M
0016	Universidad de Cantabria / IH Cantabria	Member	Universidad de Cantabria / IH Cantabria	Kakeh Burgada	Nabil	Mr.	M
0017	CSIRO	Member	CSIRO	Lemon	David	Dr.	M
0018	Technical University of Civil Engineering from Bucharest	Member	Technical University of Civil Engineering from Bucharest	Drobot	Radu	Prof..	M

ID	Organisation name	Role	Represented by:				
			Organisation	Last name	First names	Title	Gender
0019	Bureau of Meteorology	Member	Bureau of Meteorology	Argent	Robert	Dr.	M
0020	Diapason Consulting Ltd	Member	Diapason Consulting Ltd	di Piero	Francesco	Dr.	M
0021	British Geological Survey	Member	British Geological Survey	Hughes	Andrew	Dr.	M
0022	HR Wallingford	Member	HR Wallingford	Pearce	Geoff	Mr.	M
0023	IDSIA	Member	IDSIA	Rizzoli	Andrea Emilio	Prof	M
0024	Waterbouwkundig Laoboratorium	Member	Waterbouwkundig Laoboratorium	Vereecken	Hans	Ir	M

Table 2 OpenMI Association Individual members

ID	Last name	First names	Title	Affiliation	Role	Gender
0002	Blind	Michiel Willem	Mr.	Deltares	OAEC OADC	M
0007	Mimikou	Maria	Prof.	National Technical University of Athens	OAEC OADC	F
0025	Fortune	David	Mr	XP Solutions	OAEC - Deputy Chairman	M
0004	Moore	Roger Vernon	Mr.	British Geological Survey	OAMC OAEC - Chairman OADC	M

APPENDIX 2 COMMITTEE MEMBERSHIP 2011

Executive Committee

- Chairman: Roger Moore Individual Member, UK
- Vice Chairman: David Fortune Individual member, UK
- Secretary: Andrew Hughes British Geological Survey, UK
- Treasurer: Bert Jagers Deltares, NL
- Members: Michiel Blind Individual member, NL
Jan Gregersen HydroInform, DK
Quillon Harpham HR Wallingford, UK
Johan Hartnack DHI, DK
David Lemon, Commonwealth Scientific and Industrial Research Organisation (CSIRO), AU
Rob Millington Innovyze, UK
Maria Mimikou Individual member, GR
Onno Roosenschoon Alterra, NL
Peter Schade Bundesanstalt für Wasserbau (BAW), DE
Ann van Griensven Unesco-IHE
Stanislav Vaneček DHI Water and Environment

Management Committee

- Chairman: Roger Moore Individual member sponsored by the British Geological Survey, UK
- Vice Chairman: David Fortune Individual member, UK
- Secretary: Andrew Hughes British Geological Survey, UK
- Treasurer: Bert Jagers Deltares, NL

Dissemination Committee

- Chairman: Johan van Assel Aquafin, BE
- Members: Michiel Blind Deltares, NL
Jan Gregersen HydroInform, DK
Prof. Maria Mimikou (represented by Eleftheria Safiolea) National Technical University of Athens, GR
Andrew Hughes British Geological Survey, UK

Roger Moore Individual member, UK

Technical Committee

- Chairman: Stanislav Vanecek DHI, CZ
- Members: Adrian Harper MWH Soft Ltd, UK
- Stef Hummel Deltares, NL
- Peter Gijbbers 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 Bundesanstalt fuer Wasserbau (BAW), DE
- Jan Gregersen_ HydroInform, Denmark
- Lars Ekebjerg DHI, DK

APPENDIX 3 ASSOCIATION CONTACT DETAILS 2011

For all general questions and feedback, please contact the [Dissemination Committee](#).

For technical questions, please contact the [Technical Committee](#) or visit the technical pages on the [Technical Committee's wiki](#) or use the [SourceForge forum](#).

For questions regarding Association membership or meetings, please contact the [Secretariat](#).

N.B. when following these links please remember to **remove the 'nospam'** element, e.g. to contact the Dissemination Committee change oadc@nospam.openmi.org to oadc@openmi.org

APPENDIX 4 PUBLICATIONS

Publications and Posters

The table below lists all scientific and technical documents on the OpenMI up to 31st December 2011.

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 RS, applied in the Scheldt basin (in Dutch)	InfoWorks Benelux User meeting in Hoeven, The Netherlands.		Oral presentation
Safiolea E. (NTUA)	03/07/2007	Bringing the OpenMI to Life	Floodmed Workshop, Sofia, Bulgaria		Poster

Authors	Date	Title	Event	Reference	Type
					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: Athens, Greece: 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., Gijbbers, 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 and Centre for Ecology and Hydrology		OpenMI leaflet		Imprint: Athens, Greece: National Technical University of Athens, July 2007	Leaflet

Authors	Date	Title	Event	Reference	Type
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., Gijsbers, 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
Moore, R. V., Murphy, H. M., Sotiropoulos, E.	04/2008	OpenMI Association poster			Poster

Authors	Date	Title	Event	Reference	Type
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 and H. Vereecken	6-10/07/2008	Demonstration of Integrated Modelling using the OpenMI in the Scheldt River Basin	iEMSs 2008: International Congress on Environmental Modelling and Software, Integrating Sciences and Information Technology for Environmental Assessment and Decision Making, 4th	http://www.iemss.org/iemss2008/index.php?n=Main.Proceedings	Oral presentation + paper in conference proceedings

Authors	Date	Title	Event	Reference	Type
			Biennial Meeting of iEMSs, Barcelona, Spain		
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 2008	Integrated modelling with OpenMI in the Netherlands	Workshop "Integrated Modelling with the OpenMI", at the BAW in Hamburg		Presentation
Moore, R. V.,	31/10/2008	OpenMI fourth Progress Report. April			Customer Report to the

Authors	Date	Title	Event	Reference	Type
Murphy, H. M.		2008 – September 2008.			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 Wassenbrau, 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
Safiolea, R., Makropoulos, C. and	01/03/2009	Integrating Water Systems - Benefits and challenges in integrated water resources modelling using OpenMI: The case of the	Computing and Control in the Water Industry 2009, Sheffield, United		paper accepted for publication in conference

Authors	Date	Title	Event	Reference	Type
Mimikou M.		Pinios river basin, Greece	Kingdom		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 Nieuws", nr. 11, 2009	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		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 2011. 7th international conference on sustainable techniques and strategies in urban water management, Lyon, France, 2011		Submitted for review and acceptance as oral presentation
Safiolea E., Kokkinos K., Vasiliades, L., Liakopoulos A., Sotiropoulos E. and Mimikou M.	11/1/2011	Demonstration of integrated modelling in Pinios River basin (Thessaly, Greece) using OpenMI	OpenMI-Life Final Workshop, Brussels, Belgium		Poster
Safiolea E., Kokkinos K., Vasiliades, L., Liakopoulos A., Sotiropoulos E., and Mimikou M.	11/1/2011	Task C: The Pinios river use cases	OpenMI-Life Final Workshop, Brussels, Belgium		Brochure
Makropoulos C.,	(to be presented,	An integrated modelling approach for the	International Congress on Environmental		paper accepted

Authors	Date	Title	Event	Reference	Type
Safiolea E., Baki S., Douka, E., Stamou, A., and Mimikou, M.	July 2011)	assessment of water quality: lessons from the Pinios river case in Greece	Modelling and Software, July 5 - 8 2011, Ottawa, Ontario, Canada		for publication in conference proceedings
Moore R.V , et al	30/04/2011	OpenMI Final Progress Report – October 2006 to January 2011.			Customer Report to the European Commission. April 2011.
Ed.: Morris, S Authors: Van Assel, J., Waterschoot, G., Spee, E., Schaart, B., Stout, J., Holvoet, J., Neyskens, I., Vereecken, Hans., Delière, J-F., Magermans, P., Ronse, Y., Devroede.N., Safiolea, E., Baki, S., Douka, E., Stamou, A., Mimikou, M., Economidou, P., Makrouopoulos, C. and Vasilias, L.	30/04/2010	An evaluation of OpenMI-based integrated modelling in relation to water management issues from user and developer perspective			Customer Report to the European Commission. April 2011.
Ed.: Morris, S Authors: Van Assel, J., Waterschoot, G., Spee, E., Schaart, B., Stout, J., Holvoet, J., Neyskens, I.,		An evaluation report on the OpenMI from a user and developer perspective			Customer Report to the European Commission. April 2011.

Authors	Date	Title	Event	Reference	Type
Vereecken, Hans., Deliège, J-F., Magermans, P., Ronse, Y., Devroede.N., Safiolea, E., Baki, S., Douka, E., Stamou, A., Mimikou, M.,Economidou, P., Makroupoulos, C. and Vasilias, L.					
Ed.: Morris, S Authors: Van Assel, J., Waterschoot, G., Spee, E., Schaart, B., Stout, J., Holvoet, J., Neyskens, I., Vereecken, Hans., Deliège, J-F., Magermans, P., Ronse, Y., Devroede.N., Safiolea, E., Baki, S., Douka, E., Stamou, A., Mimikou, M.,Economidou, P., Makroupoulos, C. and Vasilias, L.		An evaluation report on the OpenMI support organization from a user perspective			Customer Report to the European Commission. April 2011.
Ed.: Morris, S Authors: Van Assel, J., Waterschoot, G., Spee, E., Schaart, B.,		An evaluation report on the OpenMI support organization from the deliverer's perspective			Customer Report to the European Commission.

Authors	Date	Title	Event	Reference	Type
Stout, J., Holvoet, J., Neyskens, I., Vereecken, Hans., Delière, J-F., Magermans, P., Ronse, Y., Devroede.N., Safiolea, E., Baki, S., Douka, E., Stamou, A., Mimikou, M., Economidou, P., Makropoulos, C. and Vasilias, L.					April 2011.
Gijsbers, P J.A. and Gregersen, J B. Environment)		The OpenMI in a nutshell			
K. Kokkinos and A. Loukas	14/03/2011	Collaborative Migration, Coupling and Simulation of Water Resources Models through OpenMI	Submitted to WETICE 2011 19th IEEE International Workshop on Enabling Technologies: Infrastructures for Collaborative Enterprises June 28 - June 30, 2011, TEI of Larissa (Greece)		Paper submitted for publication in conference proceedings
Makropoulos C., Safiolea E., Baki S., Douka, E., Stamou, A., and Mimikou, M.	(to be presented, July 2011)	An integrated modelling approach for the assessment of water quality: lessons from the Pinios river case in Greece	International Congress on Environmental Modelling and Software, July 5 - 8 2011, Ottawa, Ontario, Canada		Paper accepted for publication in conference proceedings

APPENDIX 5 FINANCIAL STATEMENT

Prepared by Bert Jagers, Treasurer 2011.

During 2011 the OA opened its own Bank Account. Up to that point the OA's accounts were managed by Deltares on behalf of the OpenMI Association. For the remainder of the year, the accounts were managed directly by the OA's Treasurer.

Profit / Loss year 2011

	Category									
	IN (€)					OUT (€)				
	Admission fee	Contribution	Donations	Subsidies	Other	T&S	Consumables	Purchases	Administration	Other
Yearly Total per Category (€)	0	0	0	0	0	0	0	0	100.76	0
Total IN/OUT for all categories	0					100.76				
Profit / Loss excluding outstanding invoices						100.76				

Balance 31 December 2011

	01-01-2011		31-12-2011	
	Debit (€)	Credit (€)	Debit (€)	Credit (€)
OA assets:				
Deltares account	3,963.00			
OA Bank Account			3,821.59	
Outstanding invoices	1,200.00		3,900.00	
Outstanding debits		82.50		210.00
Equity		5,080.50		7,511.59
Total profit/loss				

Total balance	5,163.00	5,163.00	7,721.597	7,721.59
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Remarks

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

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