



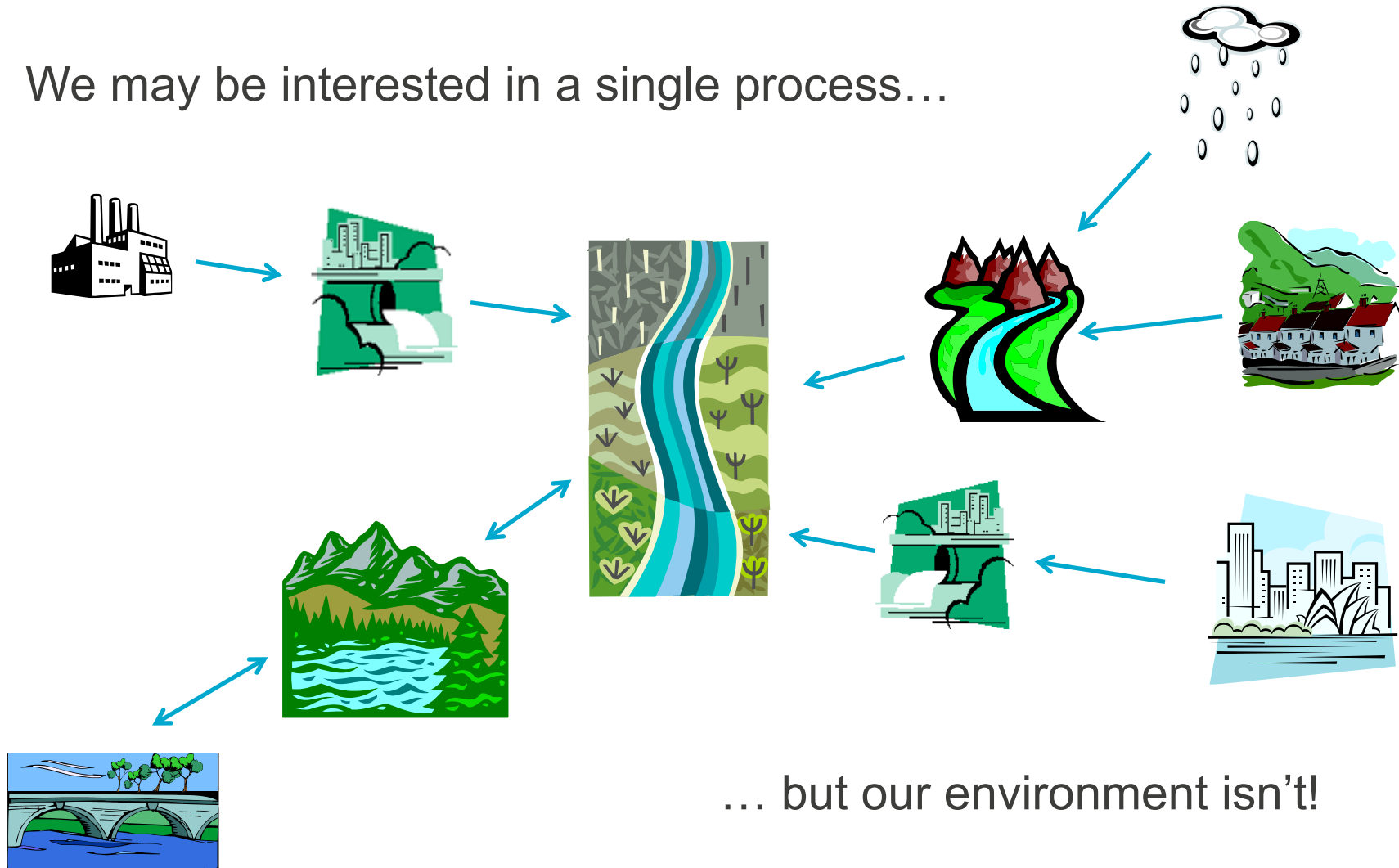
The FluidEarth 2 Implementation of OpenMI 2.0

iEMSs, San Diego, Mon 16th June 2014

- What is OpenMI?
- What is FluidEarth?
- Ratification and Take-up
- Under the Hood / Bonnet
- Confluence Workflow Methodology
- Example

The Integrated Nature of the Environment

We may be interested in a single process...

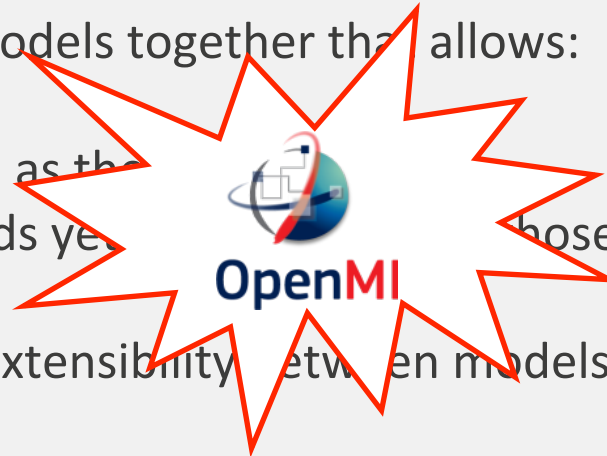


... but our environment isn't!

What is OpenMI?

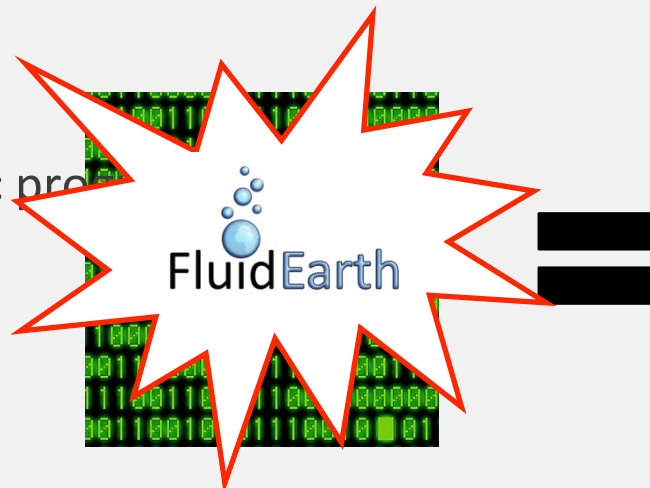
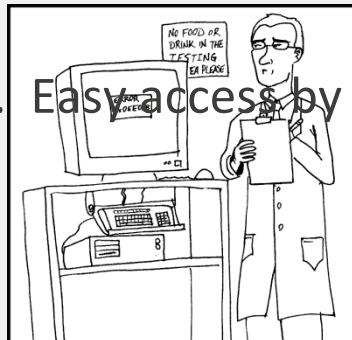
We need a way of coupling models together that allows:

1. Two-way exchange of data as the models run
2. Experts to stay in their fields yet work with those from other disciplines;
3. Easy interoperability and extensibility between models.

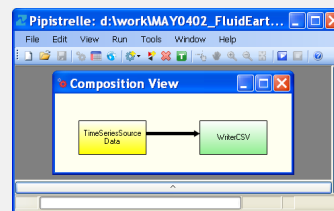
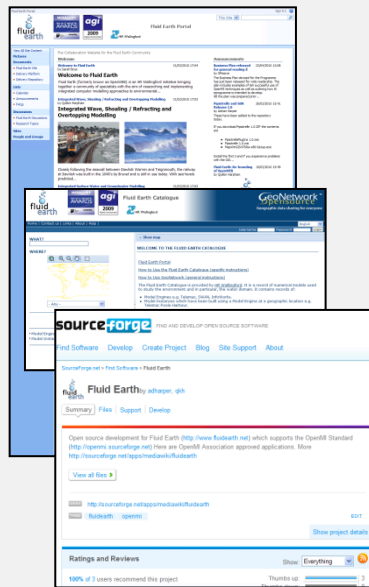


But also ...

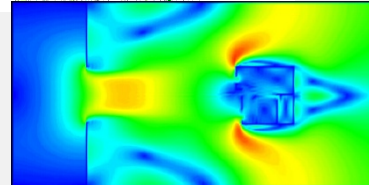
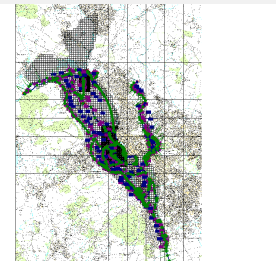
4. Easy access by scientific professionals



FluidEarth is a functional and technical platform for using OpenMI.



Tools
Fluid Earth SDK
Pipistrelle GUI
(Reference
Implementations for
OpenMI 2.0)



Community
Model providers and
users



Models
A library of models
available for
compositions

eInfrastructure

<http://fluidearth.net>

<http://catalogue.fluidearth.net>

<http://sourceforge.net/projects/fluidearth/>

<http://eLearning.fluidearth.net>

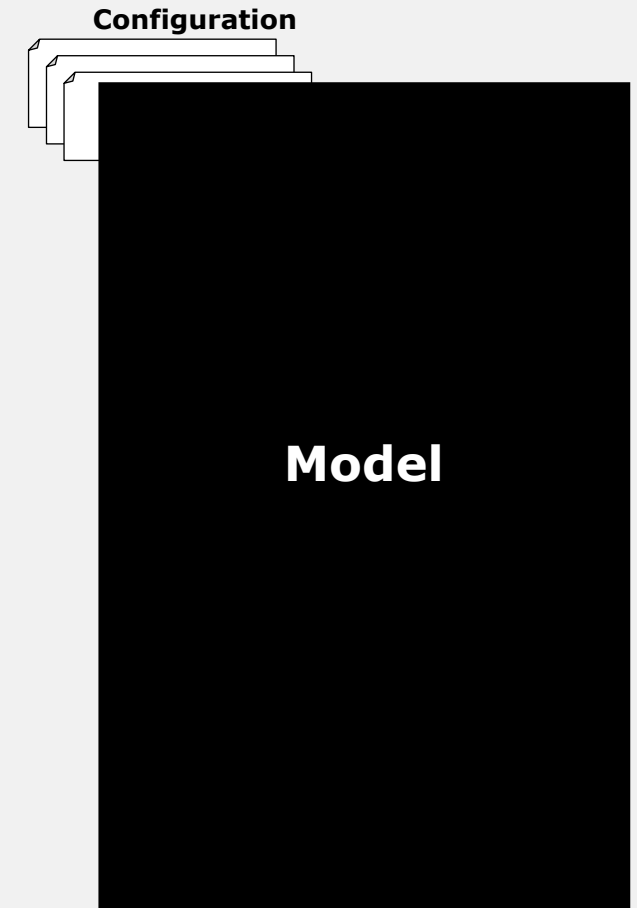
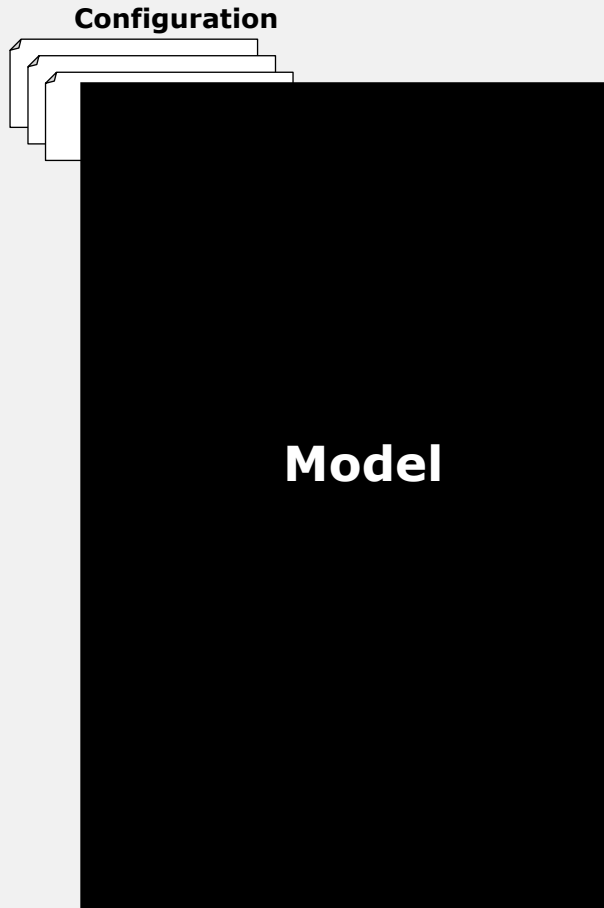
OpenMI 2.0 Take-up

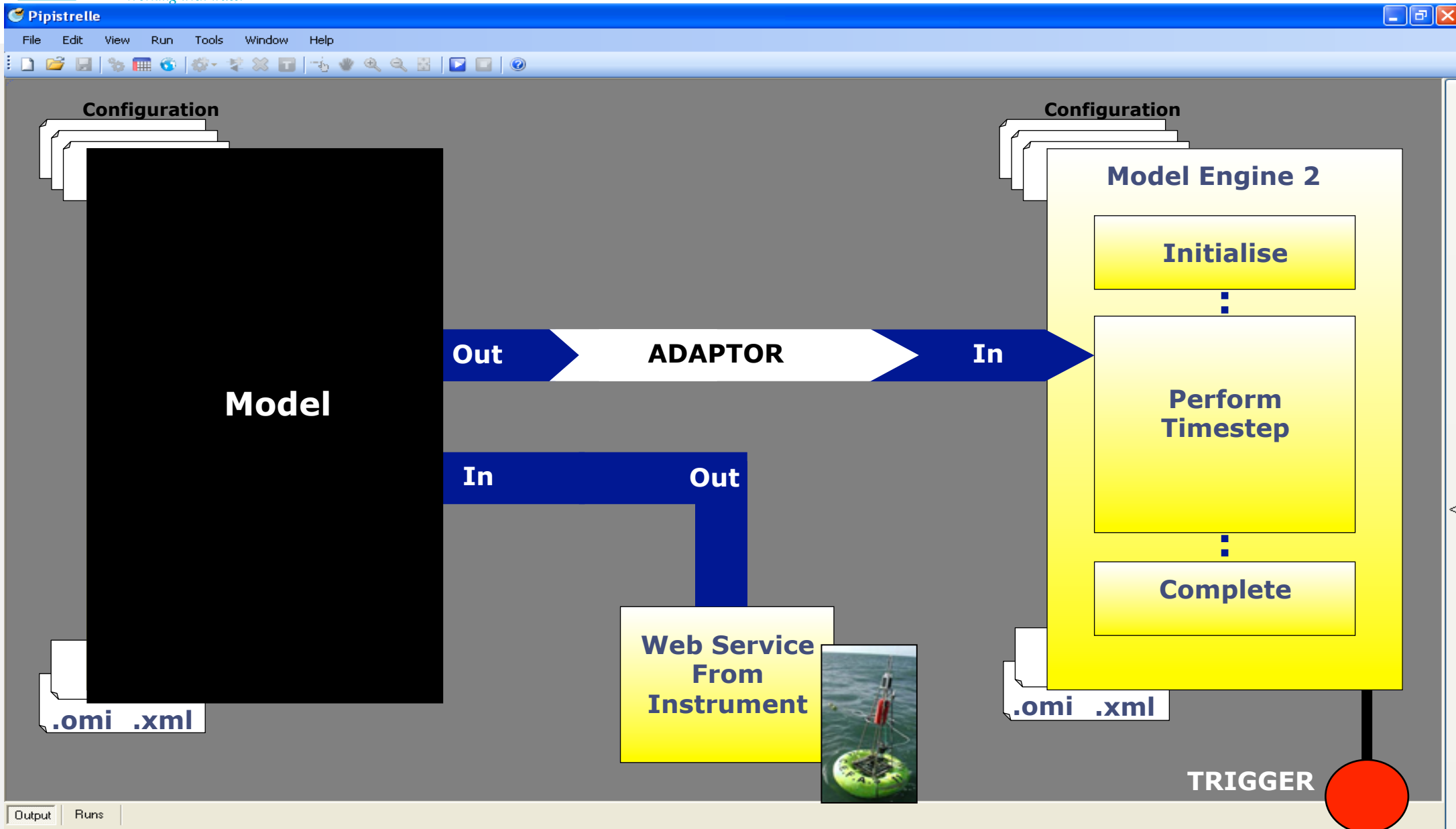
- OGC Standardisation;
- 2013 OpenMI 2.0 Download Statistics:
 - 1740 Downloads;
 - 59 Countries (China 1037, UK 164, Germany 94, USA 67);
 - Increasing number of papers.

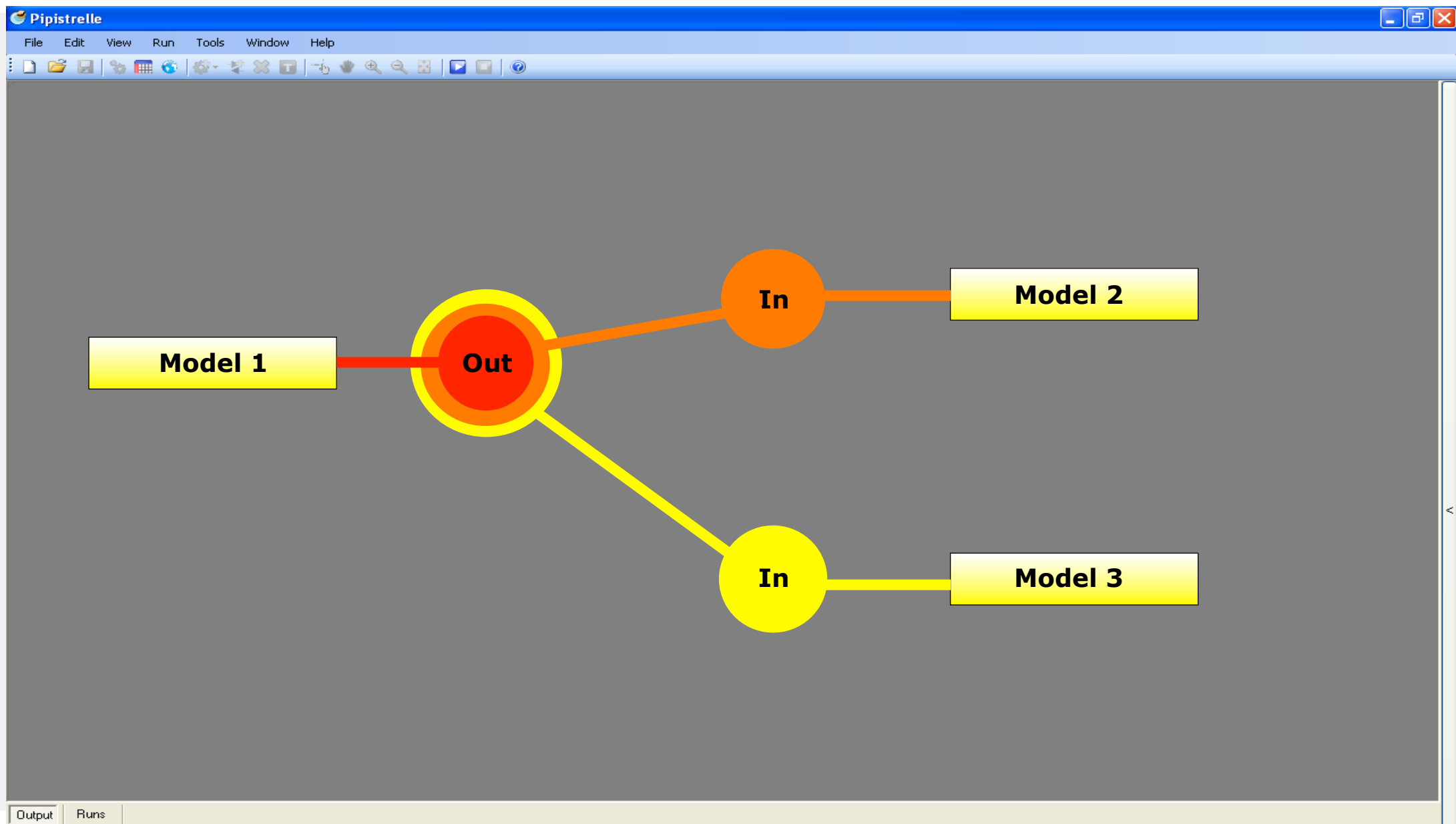
FluidEarth 2 Take-up

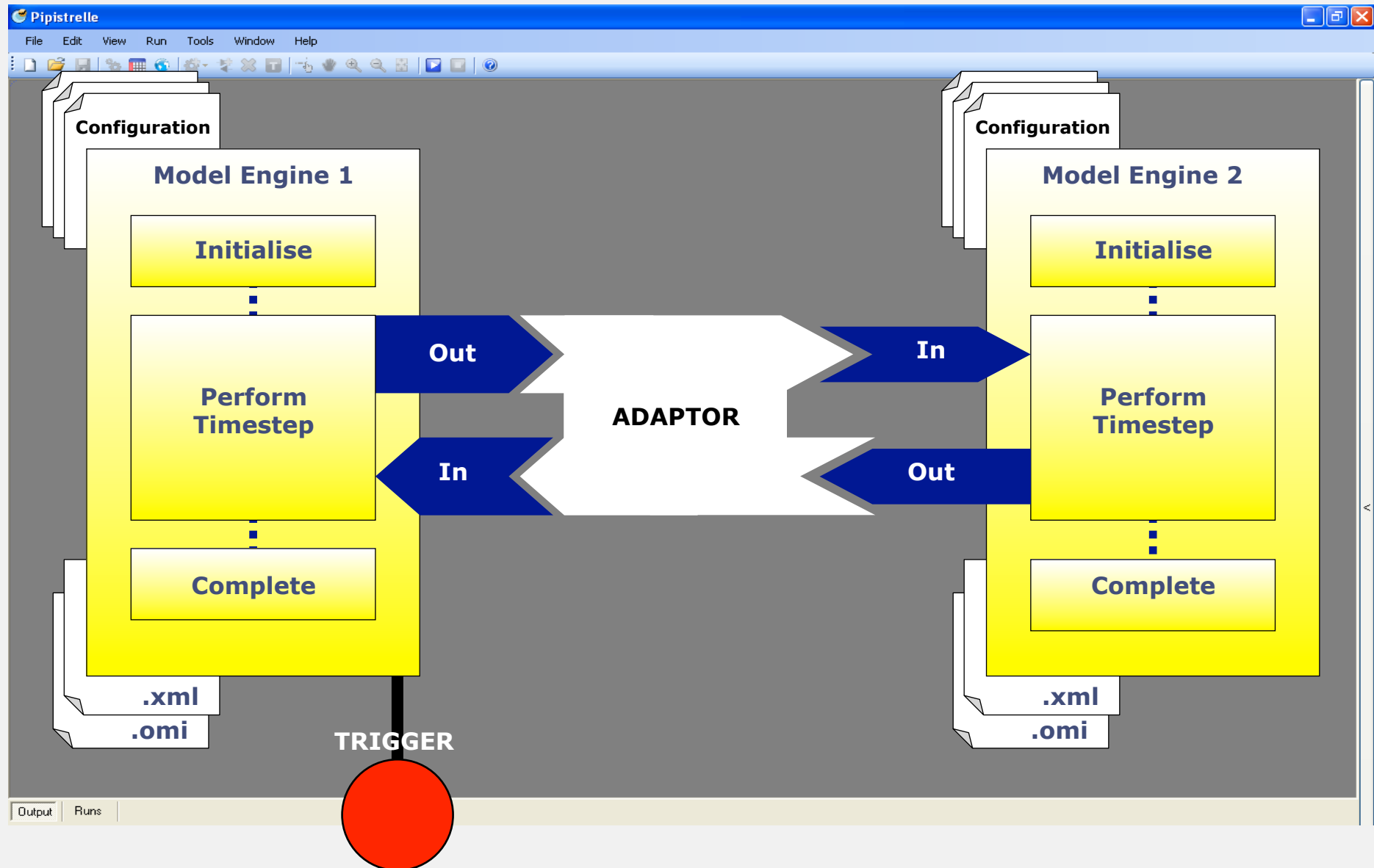
- 2013 FluidEarth Downloads;
 - 313 Downloads;
 - 29 Countries (China 97, UK 93, South Africa 18, Portugal 14).
- 2013 FluidEarth eLearning Statistics:
 - 530 Visits, 37 Countries;
 - 8:23 Average Duration.

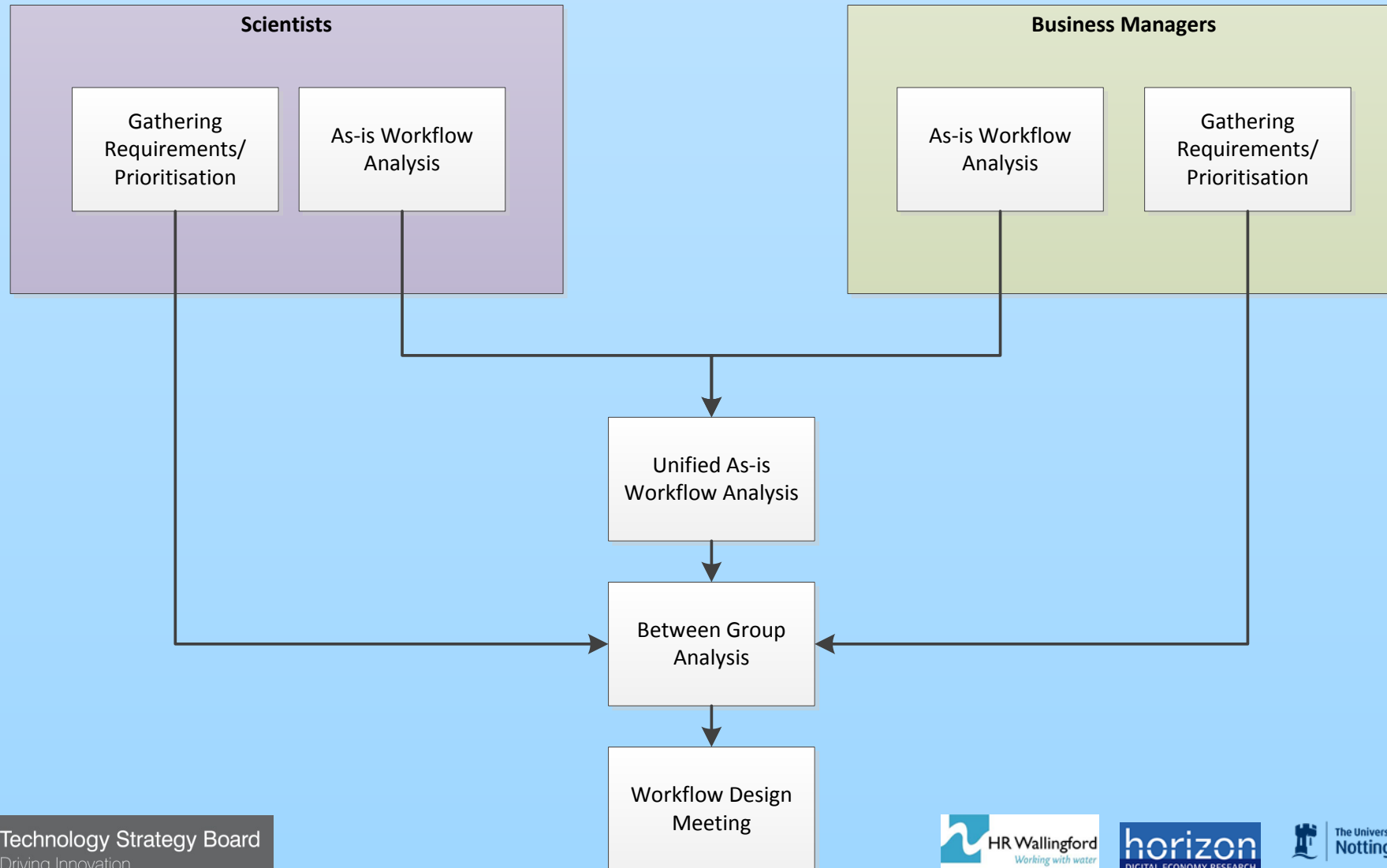
1-Way File-Based Connection











HR Wallingford

Pipistrelle: *

File View Tools Help

Composition

Add Import Run

FluidEarth

OTT2D
2D non-linear shallow water solver

EXNER
Sediment continuity solver

New Adapted Output

OTT2D → EXNER

OTT2D

	Source	Adaptors	Target
1	Velocity (Cell Centred)	1	2D Velocity (On Nodes)
2	Water Depths (Cell Centred)	0	Water Depth (On Nodes)

'OTT2D'.Velocity (Cell Centred) -> 'EXNER'.2D Velocity (On Nodes)

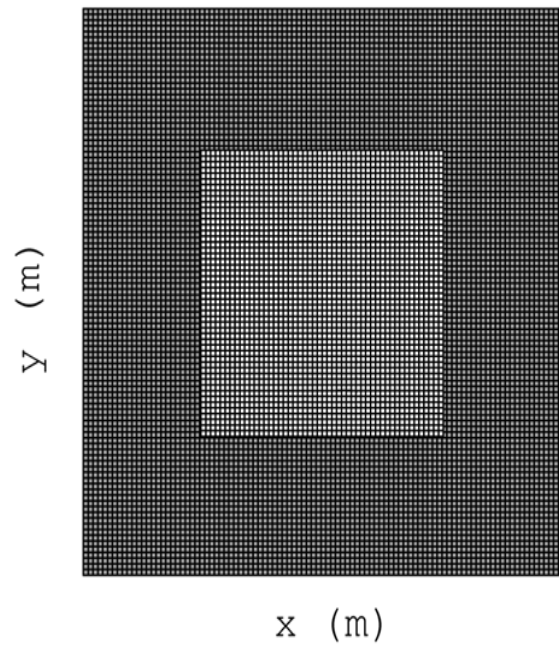
	Exchange Chain
1	Velocity (Cell Centred)
2	Bia Vector2d<double>
3	2D Velocity (On Nodes)

All selected item linkages

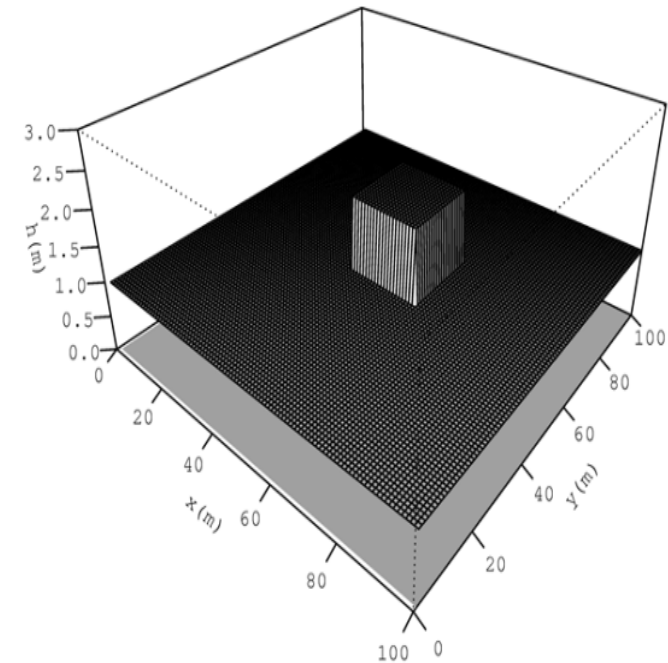
Windows taskbar: 15:20 17/04/2013

The Composition – Test Case

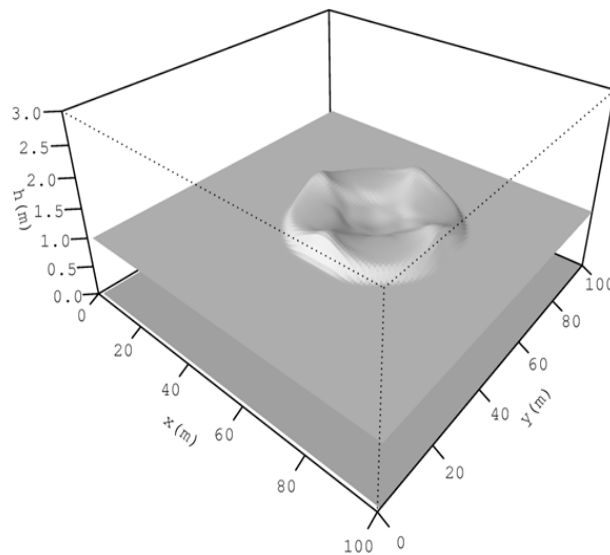
Nested Mesh System



Simple wet-wet dam-break

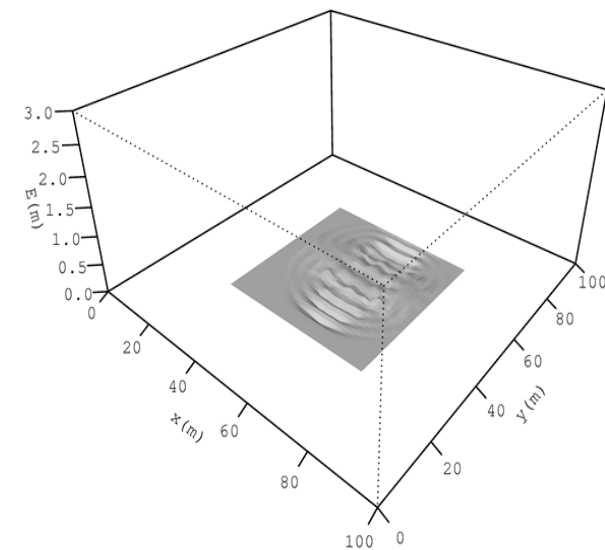


Flow Snapshot One way coupling



Cumulative Bed Evolution

$$E(i,j) = \int_0^T \Delta B(i,j) dt \forall i,j$$





Thank you