DRIHM

DISTRIBUTED RESEARCH INFRASTRUCTURE
FOR HYDRO-METEOROLOGY

DRIHM - Distributed Research Infrastructure for Hydro-Meteorology

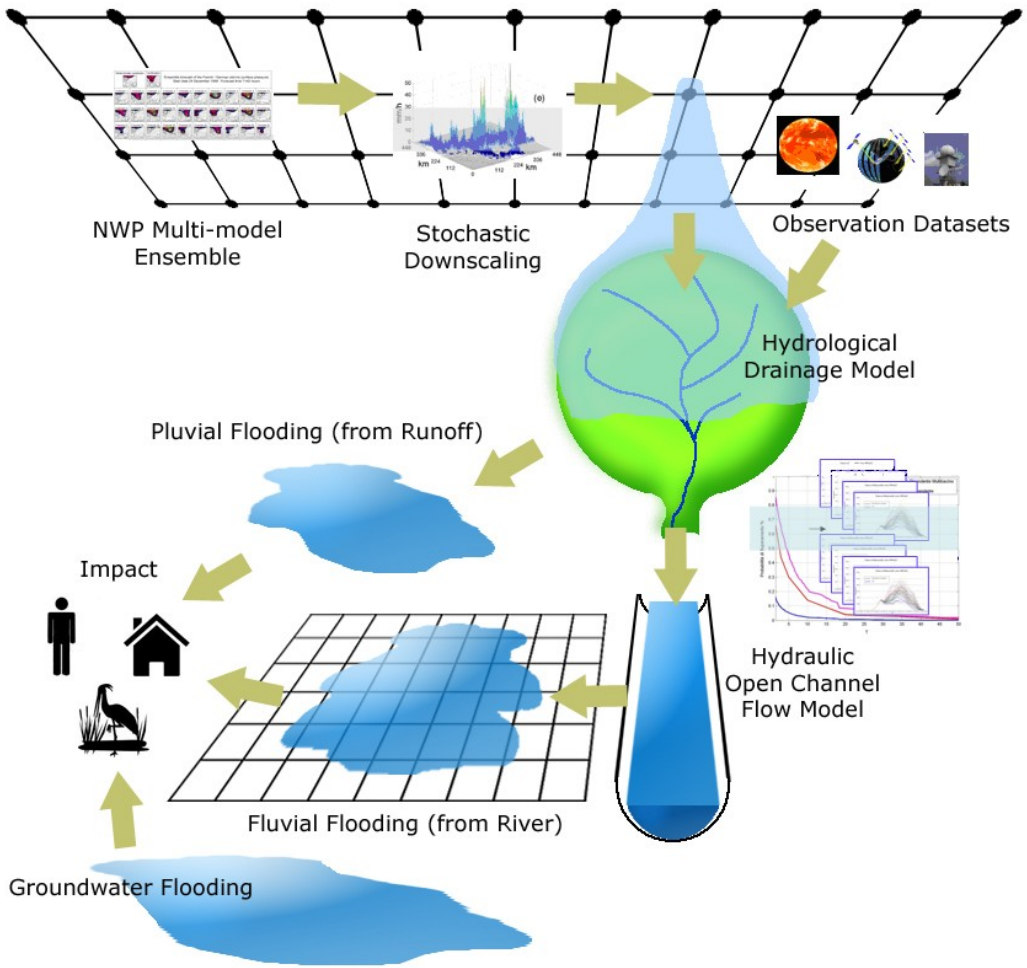
GO-ESSP, Abingdon, 25th Feb 2015
T.K.Millard, Q.K.Harpham, HR Wallingford.

European Commission
Information Society and Media

DRIHM Objectives

- **To support** the development and deployment of a **HMR e-Science environment**
- **To promote** the establishment and diffusion of a **service-oriented culture** (involving specialist scientist users, members of public services, members of the general public)
- To provide **integrated HMR services**
- To design and deploy **user-friendly interfaces**
- To provide HMR e-Science **support centres** and corresponding **training activities**
- To support hydro-meteorological **forecasting chains**

Studying Flooding with DRIHM

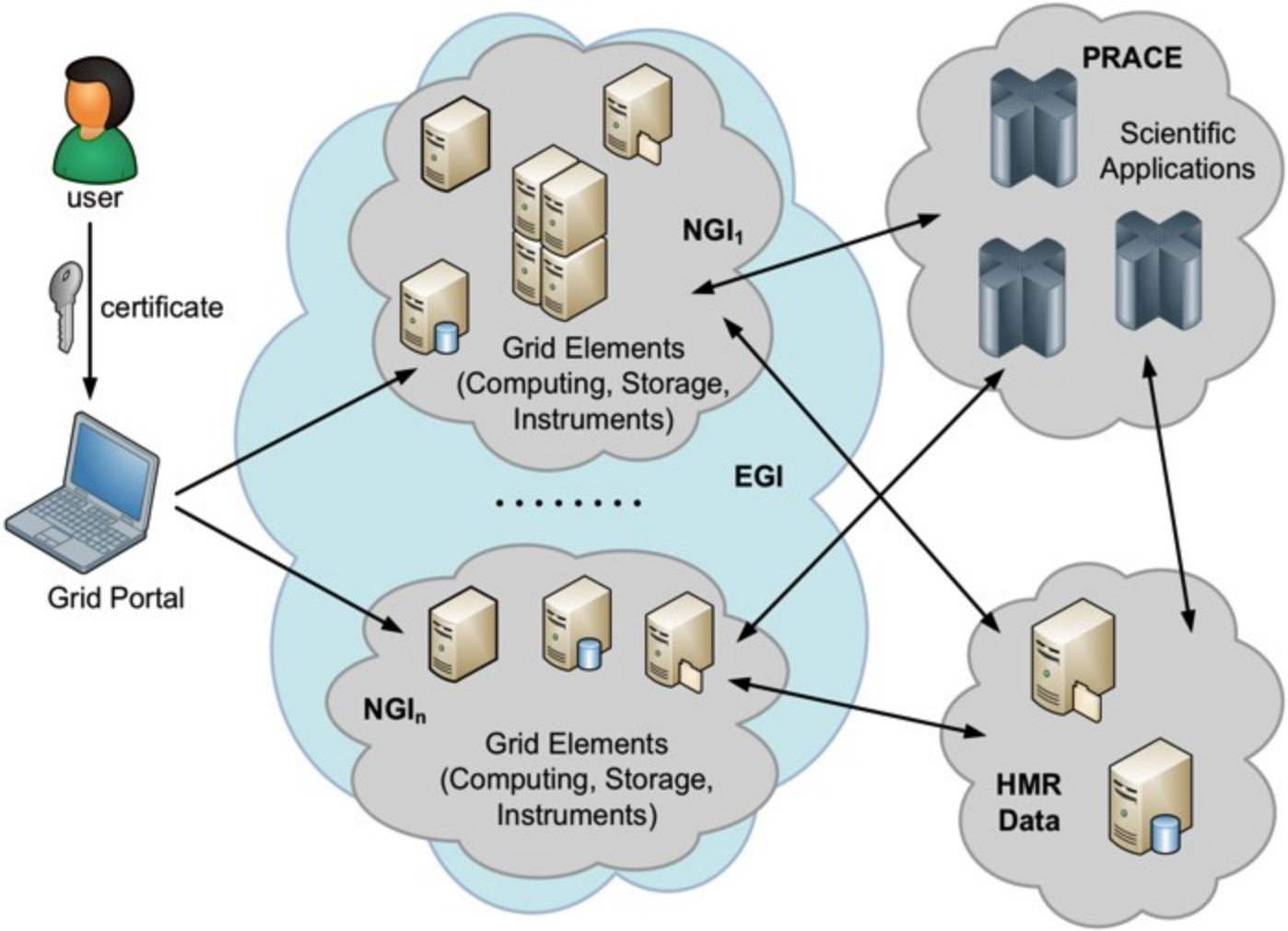


Experiment Suite 1
Rainfall

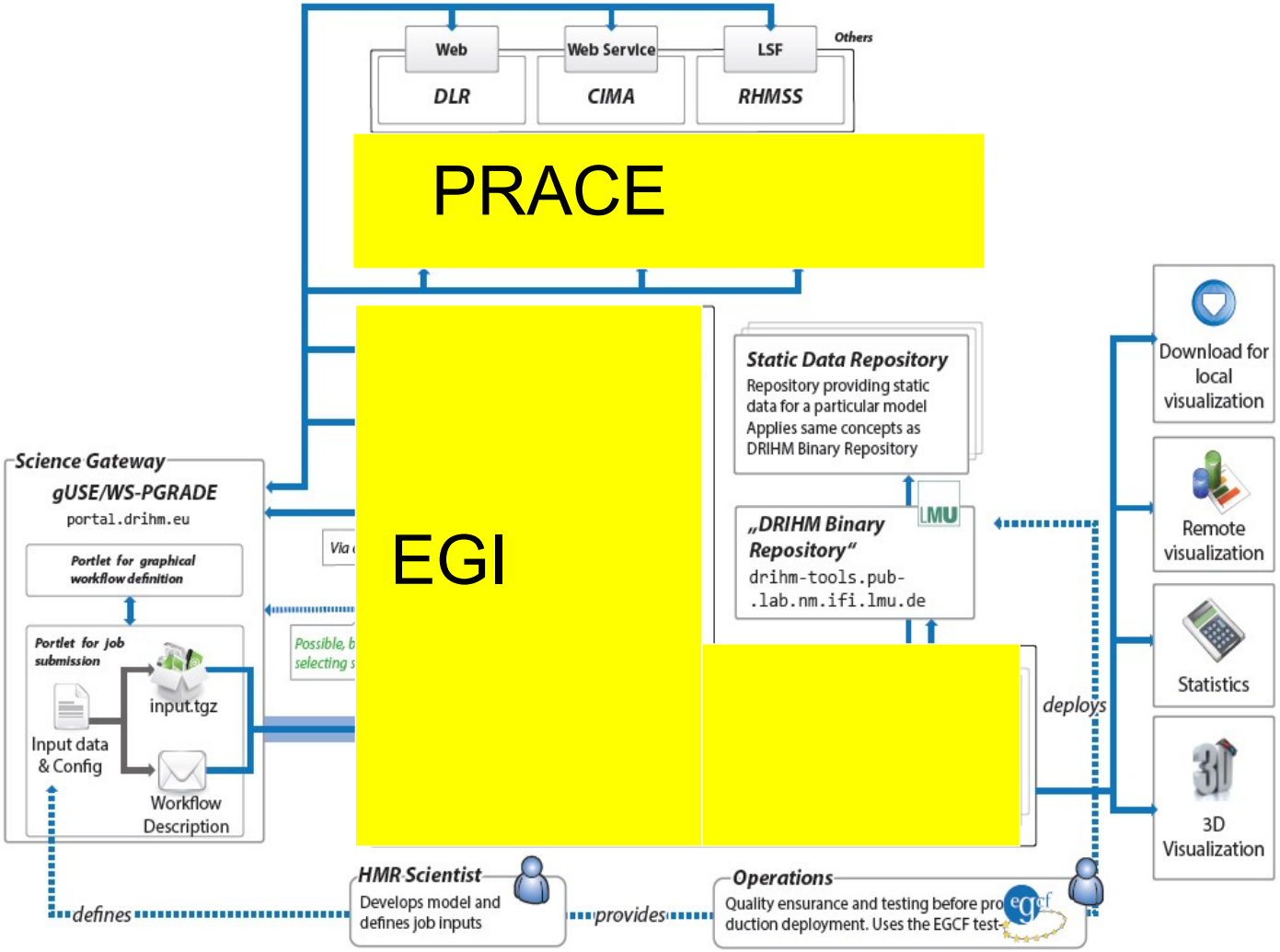
Experiment Suite 2
Discharge

Experiment Suite 3
Water Level, Flow & Impact

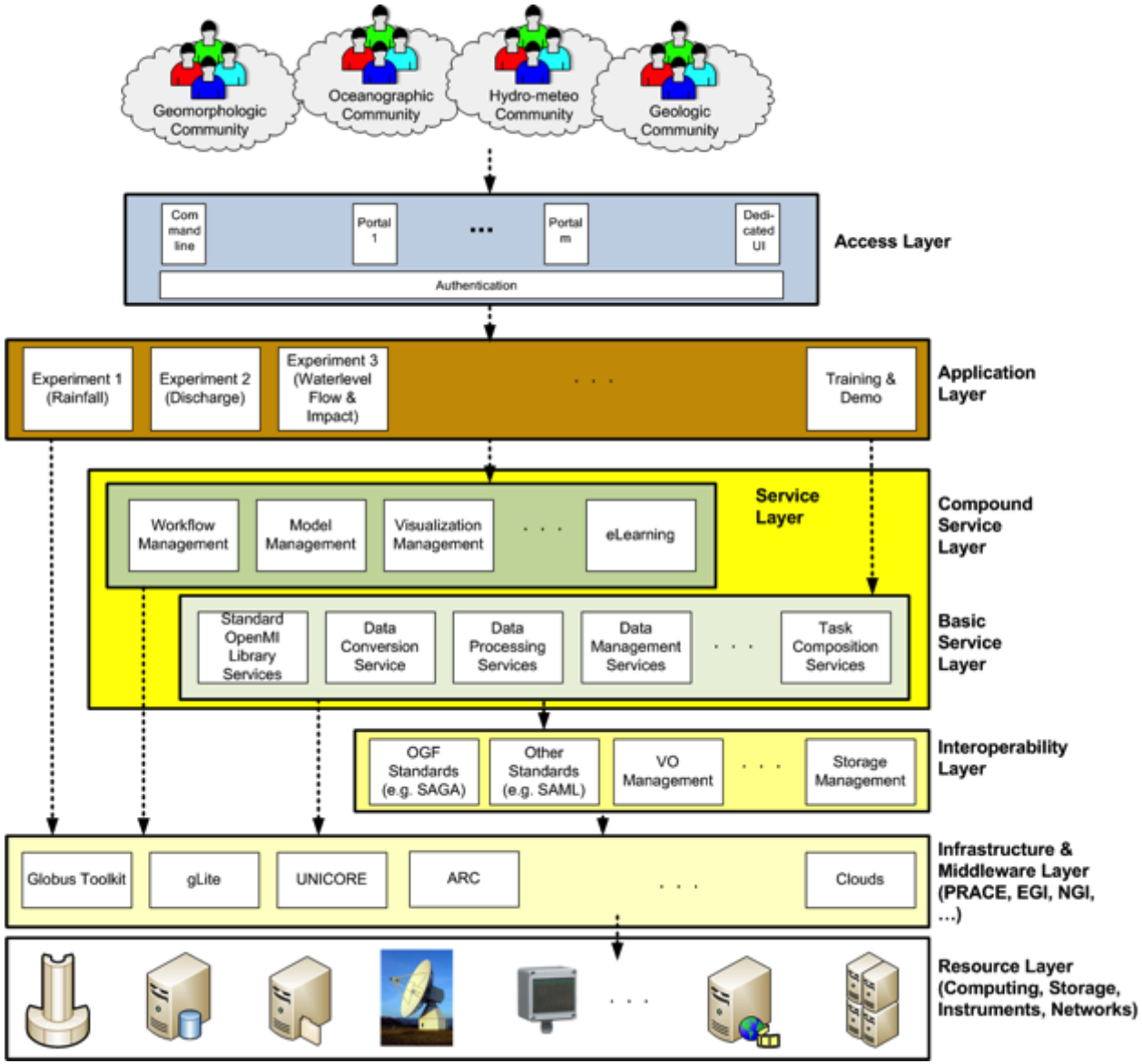
DRIHM e-Science environment



Computing Resources



The e-Science Environment Structure



DRIHM FAQs

What has been done to numerical models to enable them to run on the DRIHM eInfrastructure and exchange data?

What do I need to do to my model to get it on the DRIHM eInfrastructure?

DRIHM Model MAP

Metadata, Documentation and Licence

Adaptors to common interface standards for I/O using controlled vocabularies

Portability of model components

Metadata, Documentation and Licence

Metadata File

- Title, abstract, keywords;
- Responsible person;
- Rectangular geographic bounding box;
- Technical details (language, processors, OS, OpenMI status, run time);
- URLs to code, executables, documentation;
- Inputs and Outputs (parameter, temporal, spatial, type, feature type).

Metadata, Documentation and Licence

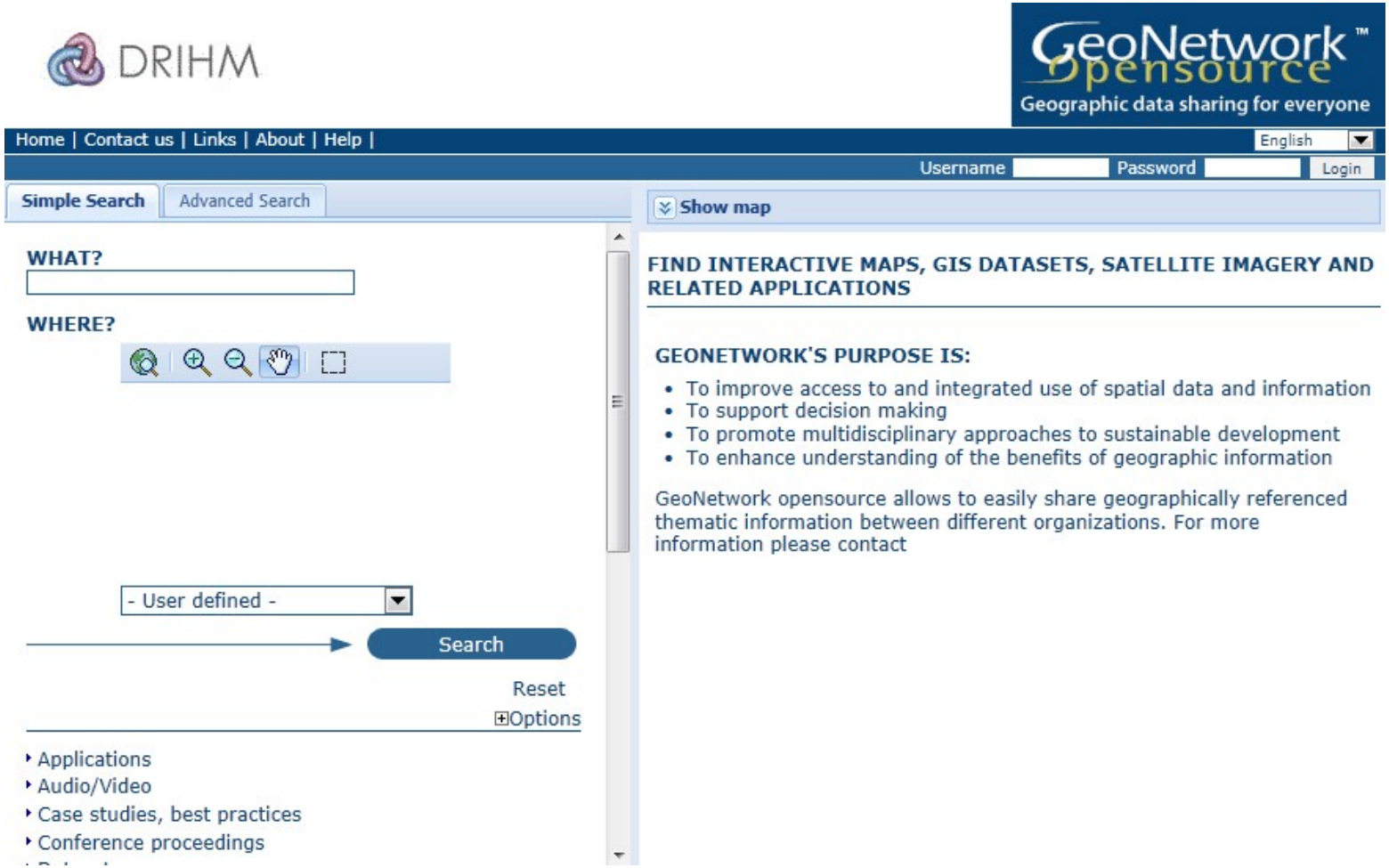
Documentation

- General description;
- How to install;
- How to use;
- Full manual;
- Technical changes made for DRIHM.

Licence

- To use;
- Open Source.

Metadata, Documentation and Licence



Adaptors and Controlled Vocabularies

Standard Parameter (from CF Standard Names)	**level**	**Unit**
lwe_thickness_of_precipitation_amount	surface	m
lwe_thickness_of_stratiform_precipitation_amount;	surface	m
lwe_thickness_of_convective_precipitation_amount;	surface	m
air_temperature;	2m	K
specific_humidity;	2m	1
surface_net_downward_longwave_flux;	surface	$W\ m^{-2}$
eastward_wind;	10m	ms^{-1}
northward_wind;	10m	ms^{-1}
surface_air_pressure;	surface	Pa

Adaptors and Controlled Vocabularies

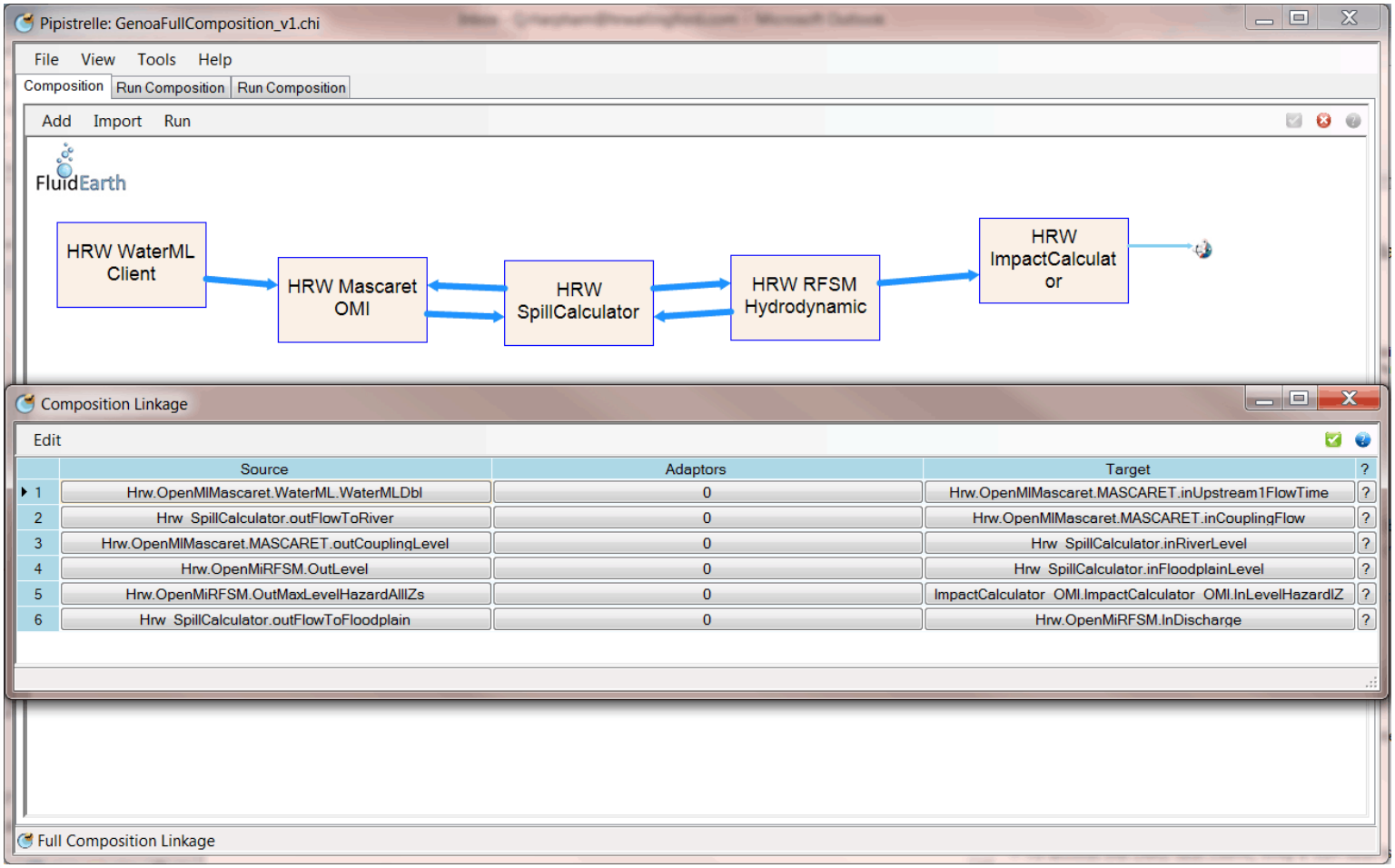
File-based interface standards:

1. WaterML 2.0 for Point Series data, using standard parameter names.

2. NetCDF-CF1.6 for Grid and Grid Series data, using standard parameter names.

Adaptors and Controlled Vocabularies

Memory-based interfaces with OpenMI 2.0



	Source	Adaptors	Target
1	Hrw.OpenMIMascaret.WaterML.WaterMLDbl	0	Hrw.OpenMIMascaret.MASCARET.inUpstream1FlowTime
2	Hrw SpillCalculator.outFlowToRiver	0	Hrw.OpenMIMascaret.MASCARET.inCouplingFlow
3	Hrw.OpenMIMascaret.MASCARET.outCouplingLevel	0	Hrw SpillCalculator.inRiverLevel
4	Hrw.OpenMiRFSM.OutLevel	0	Hrw SpillCalculator.inFloodplainLevel
5	Hrw.OpenMiRFSM.OutMaxLevelHazardAllIZs	0	ImpactCalculator OMI.ImpactCalculator OMI.InLevelHazardIZ
6	Hrw SpillCalculator.outFlowToFloodplain	0	Hrw.OpenMiRFSM.InDischarge

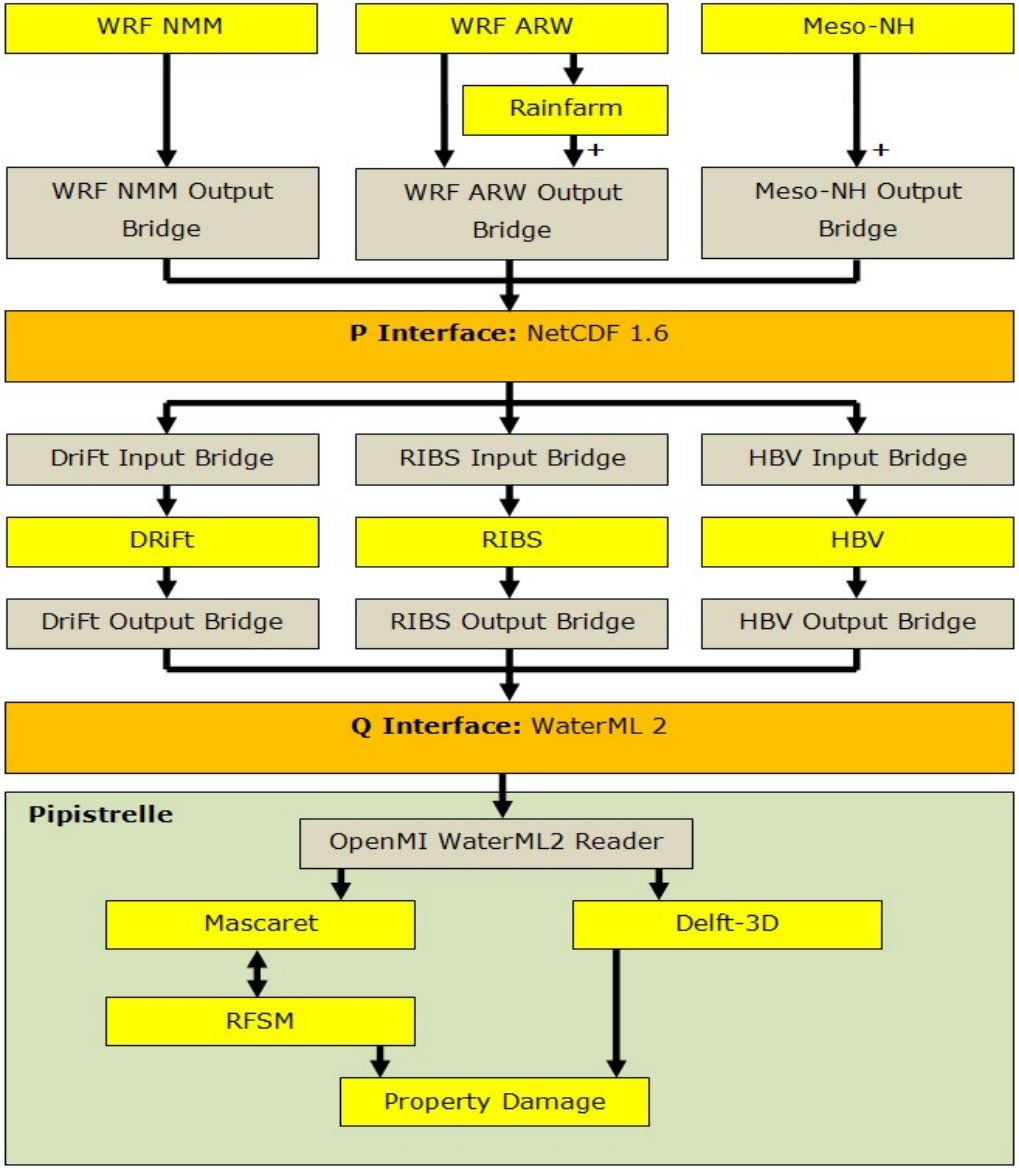
Portability of Model Components

1. The component requires only **standard installations** of its supporting system software.

2. The component provides **all binaries and libraries** on which it depends.

3. The component makes **no assumptions** about **absolute directory** structure.

The DRIHM Model Suite



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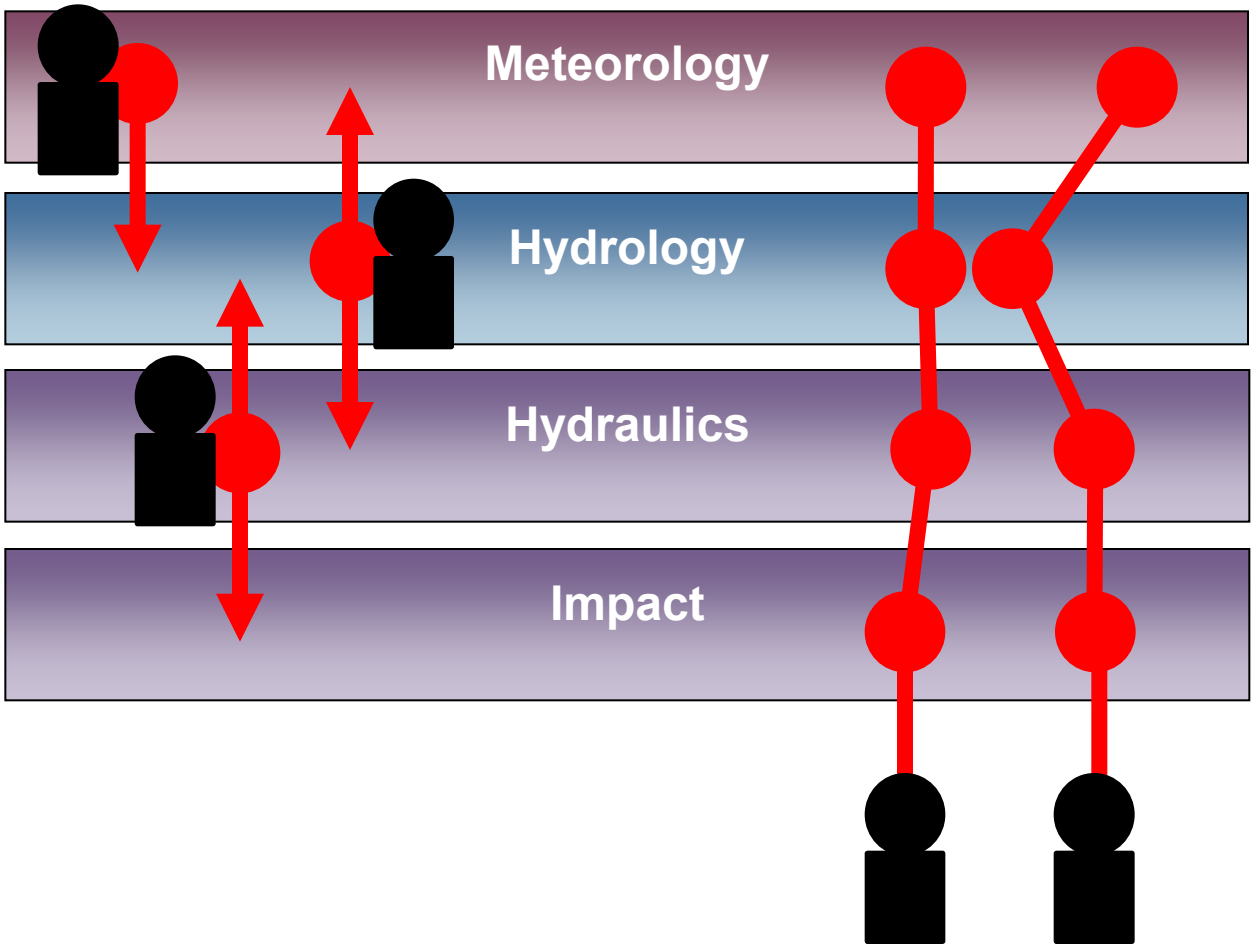
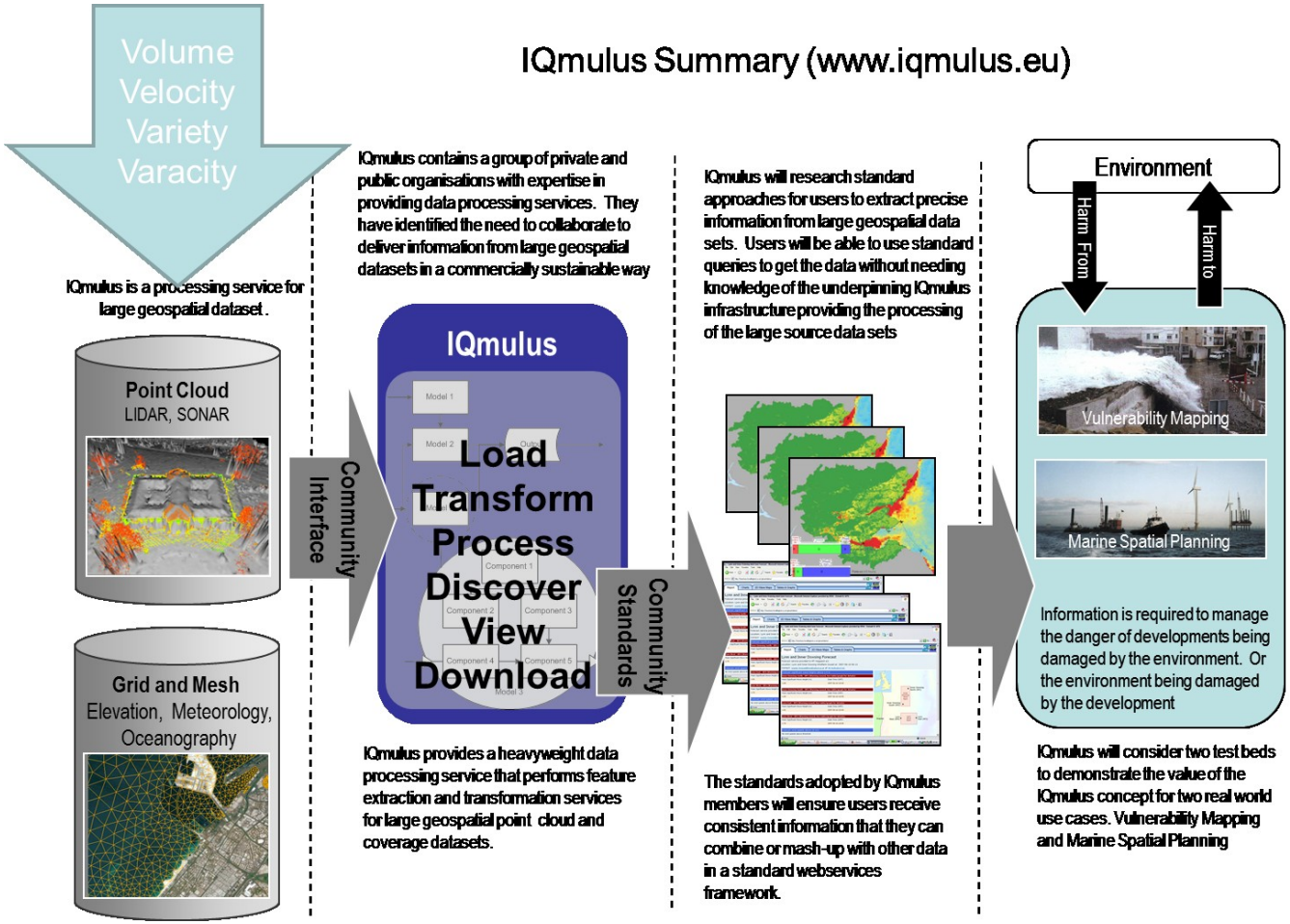
Vision for User Engagement



IQmulus


IQmulus Summary (www.iqmulus.eu)
Volume
Velocity
Variety
Varacity
IQmulus is a processing service for large geospatial dataset.
Point Cloud
LIDAR, SONAR
Grid and Mesh
Elevation, Meteorology, Oceanography
Community Interface
IQmulus contains a group of private and public organisations with expertise in providing data processing services. They have identified the need to collaborate to deliver information from large geospatial datasets in a commercially sustainable way
IQmulus
Load
Transform
Process
Discover
View
Download
IQmulus provides a heavyweight data processing service that performs feature extraction and transformation services for large geospatial point cloud and coverage datasets.
Community Standards
IQmulus will research standard approaches for users to extract precise information from large geospatial data sets. Users will be able to use standard queries to get the data without needing knowledge of the underpinning IQmulus infrastructure providing the processing of the large source data sets
The standards adopted by IQmulus members will ensure users receive consistent information that they can combine or mash-up with other data in a standard webservices framework.
Environment
Harm From
Harm to
Vulnerability Mapping
Marine Spatial Planning
Information is required to manage the danger of developments being damaged by the environment. Or the environment being damaged by the development
IQmulus will consider two test beds to demonstrate the value of the IQmulus concept for two real world use cases. Vulnerability Mapping and Marine Spatial Planning

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