



International Environmental Modelling and Software Society (IEMSS) 7th Intl. Congress on Env. Modelling and Software, San Diego, CA, USA.

Supporting EU-US collaboration in Hydro-Meteorology Research: the DRIHM2US project

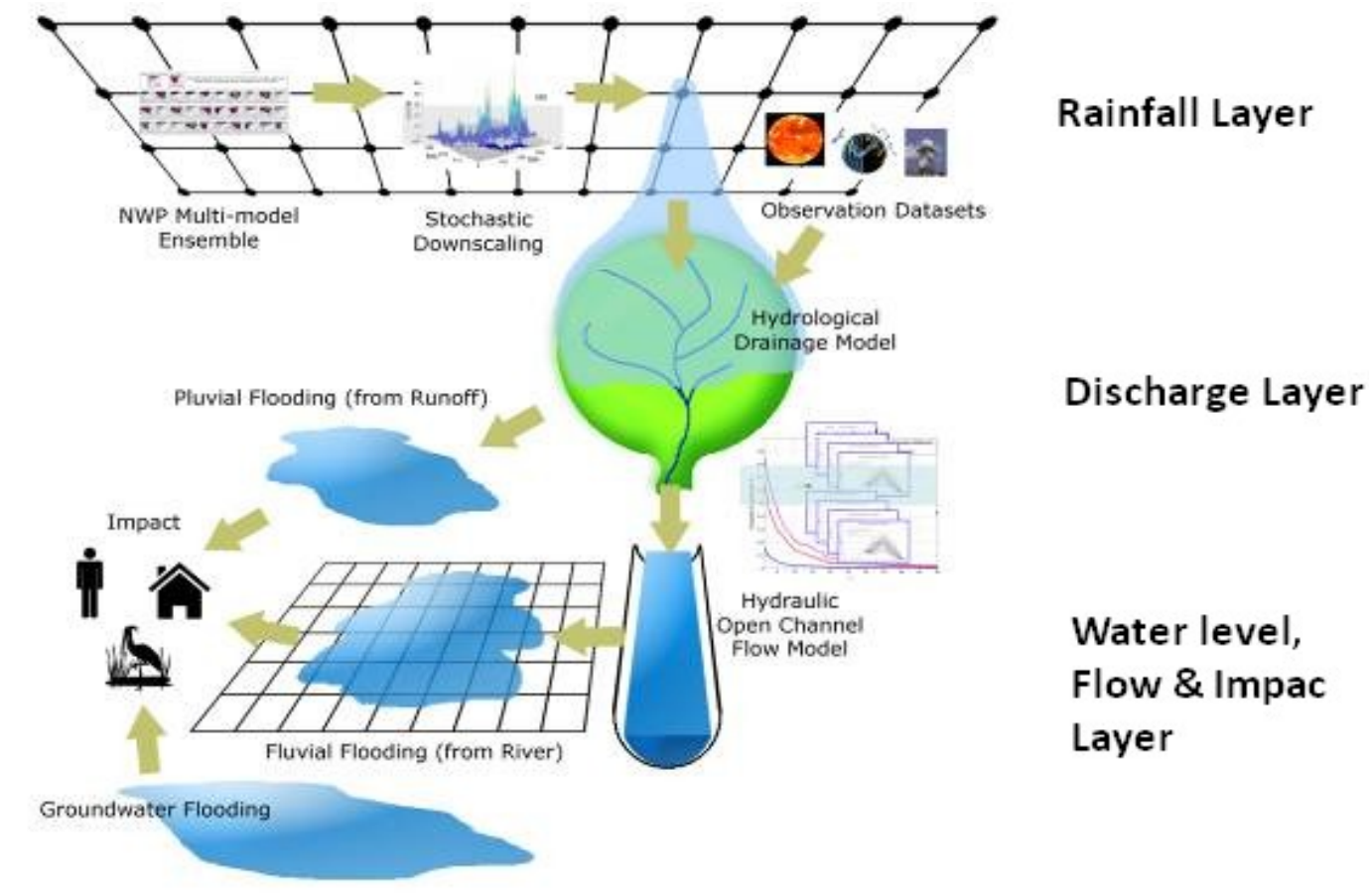
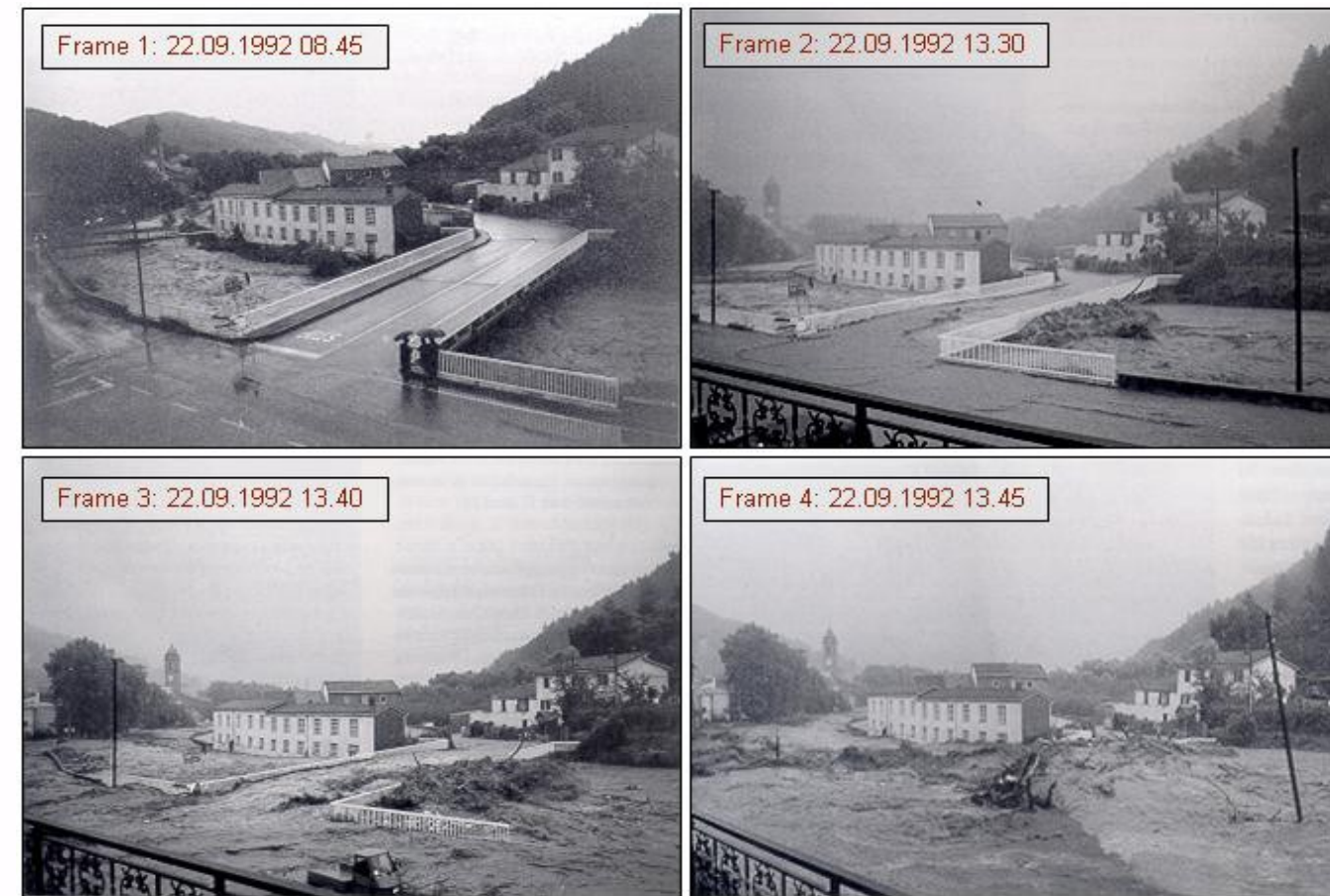


DRIHM2US

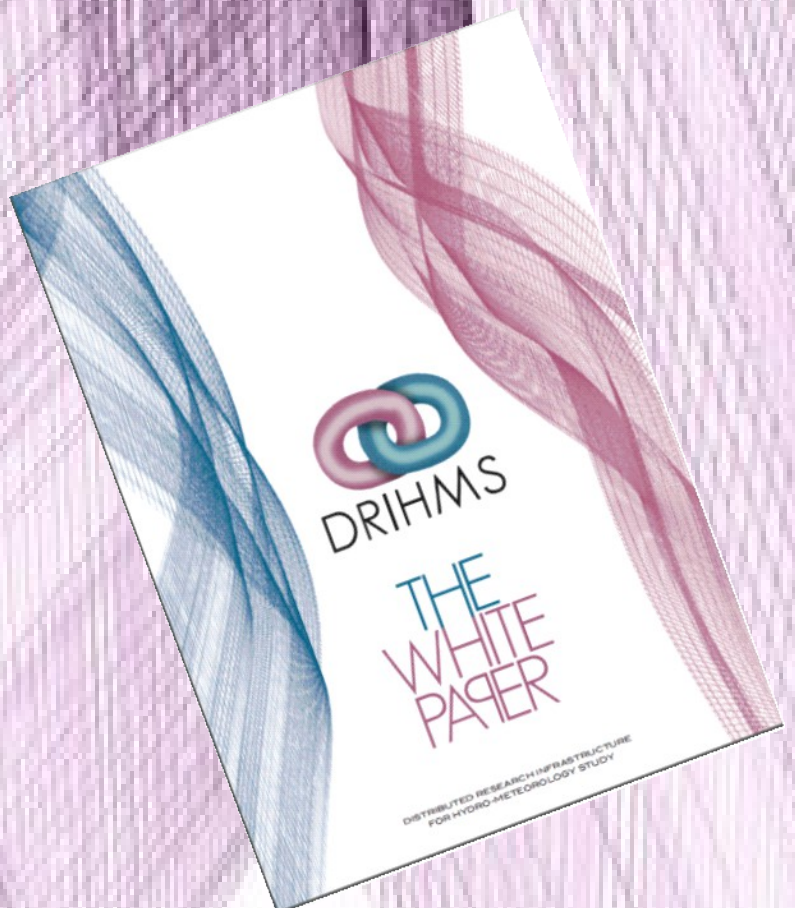
The DRIHM2US team

Hydro-meteorological forecasts rely on the execution of complex, computationally intensive, simulation models. A full simulation - from rainfall to impact on urban areas - requires the execution of several models organized through workflows, whose accuracy is strongly dependent on an extensive set of correlated configuration parameters.

The DRIHMS project (Distributed Research Infrastructure for Hydro-Meteorology Study, <http://www.drihms.eu>, co-funded by EU FP7, grant agreement RI-246703, 2009-2011) bridged the gap between ICT and Hydro-Meteorological Research (HMR) communities. An extensive analysis of the requirements of state-of-the-art HMR applications and tools lead to the design of a powerful e-Infrastructure allowing complex simulations.



STEP ONE: DRIHMS
EU project to enable collaboration between ICT and HMR scientific communities to design a powerful e-Infrastructure

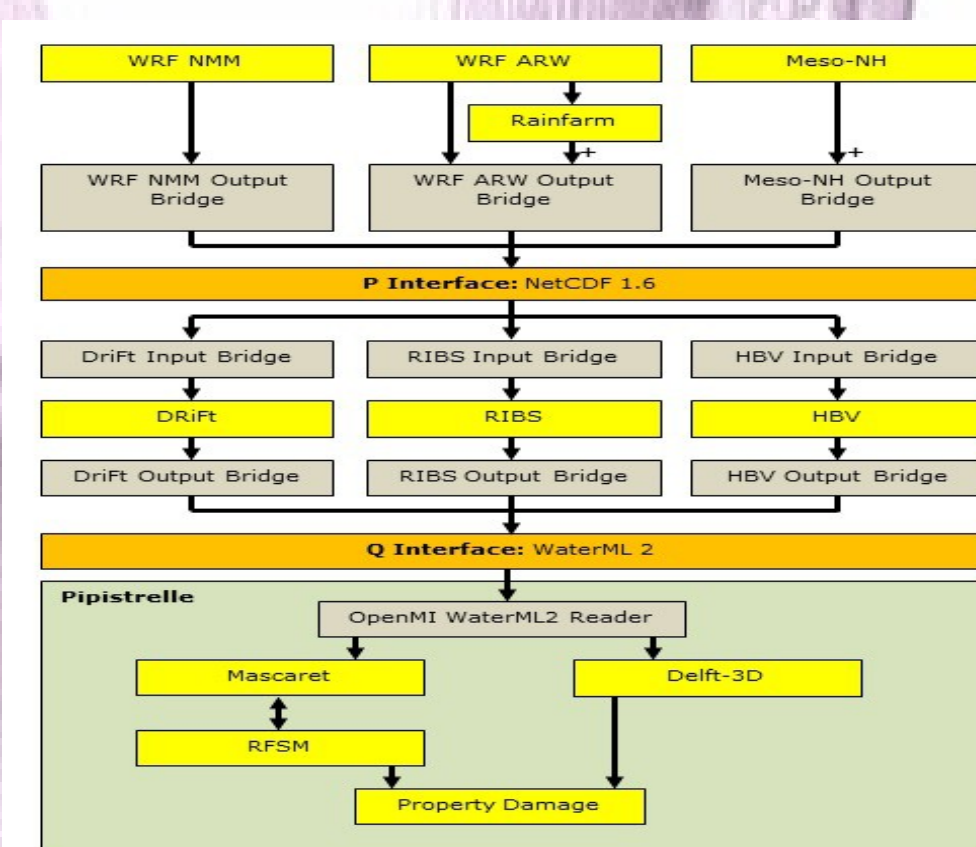


STEP TWO: DRIHM
EU project to shape the DRIHMS vision and deploy a prototype of HMR e-Science infrastructure

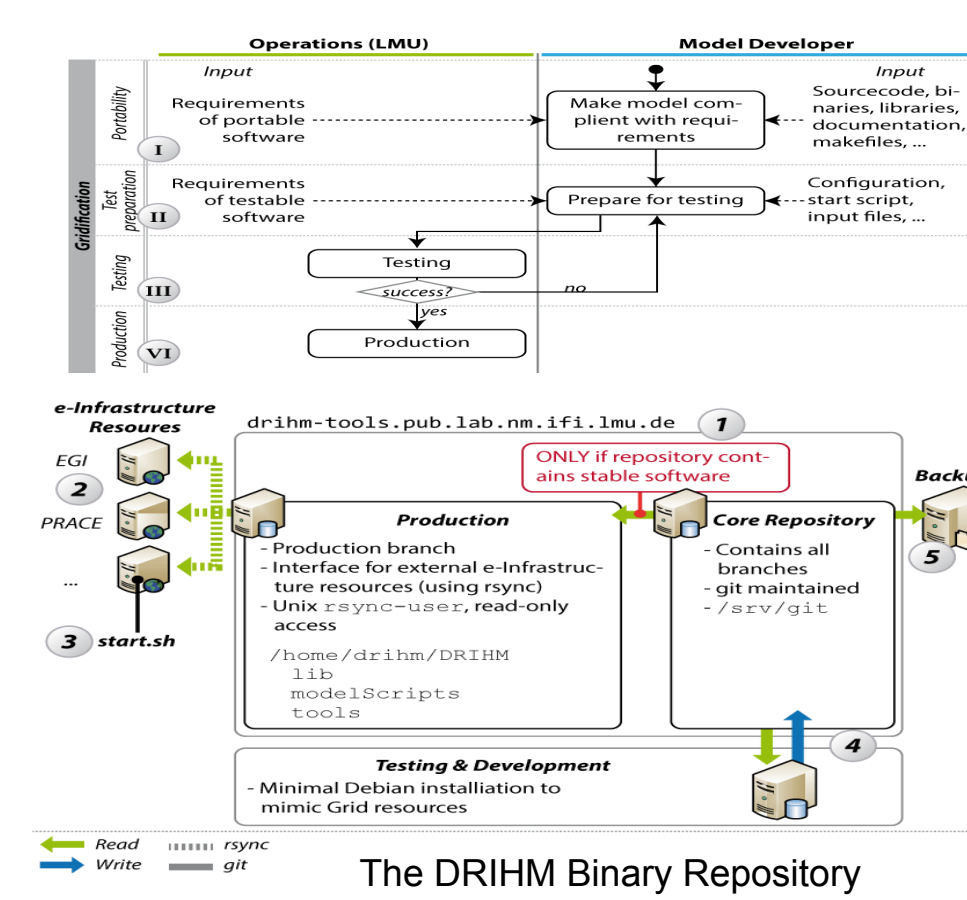
Starting from the goals achieved in the DRIHMS project, the DRIHM project (Distributed Research Infrastructure for Hydro-Meteorology, <http://www.drihm.eu>, co-funded by EU FP7, grant agreement RI-28356, 2011-2015) aims at setting the stage for a new way of doing HMR. In particular, the goal is the development of a science gateway that allows users, from scientists to environmental agencies and citizen scientists, to access and combine data and forecasting models using integrated services, user-friendly interfaces and resources from European - and in perspective worldwide - infrastructures. The main ingredients of DRIHM are depicted in the figures below.



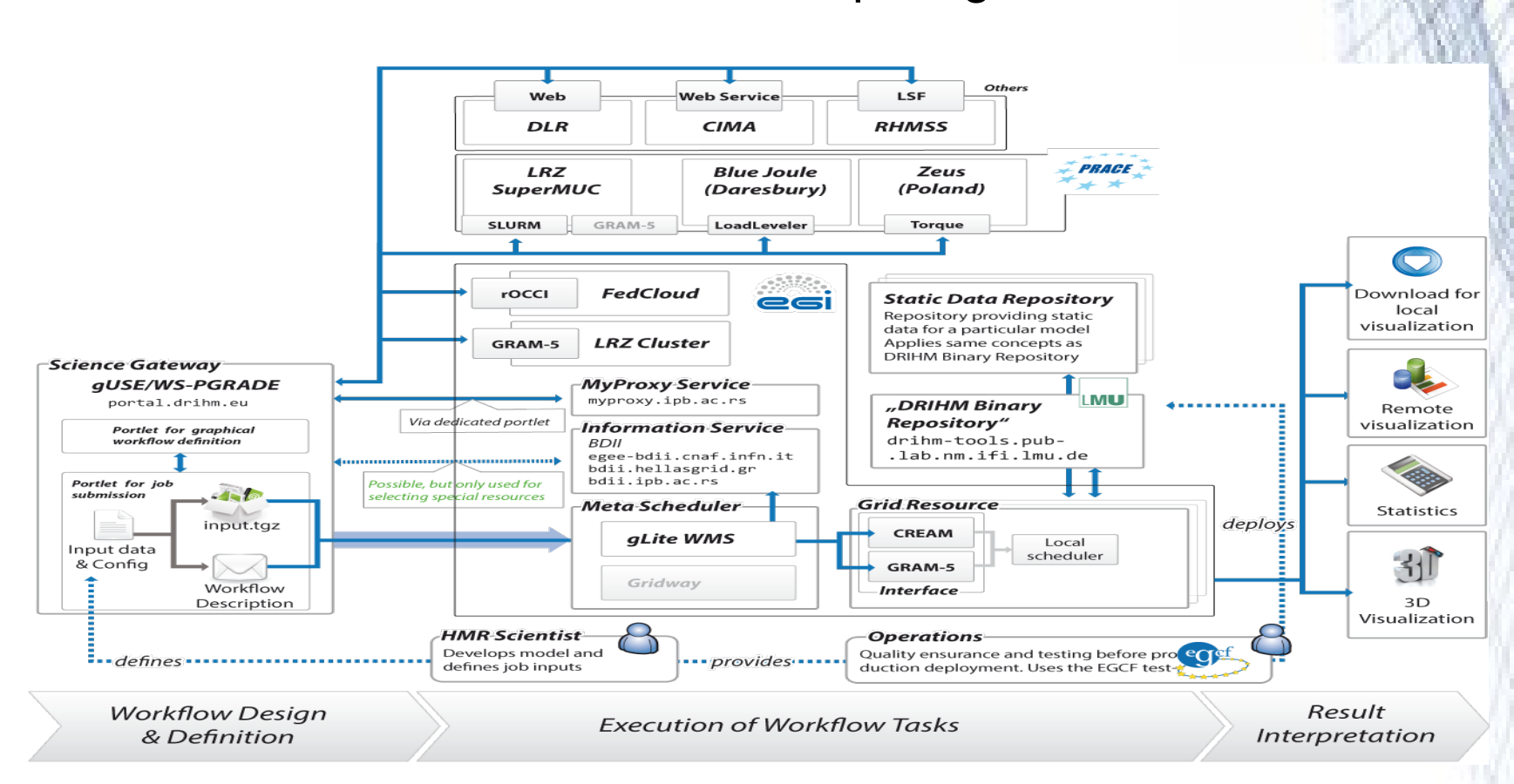
The HMR Models and Bridges



DRIHMIFICATION of HMR Models

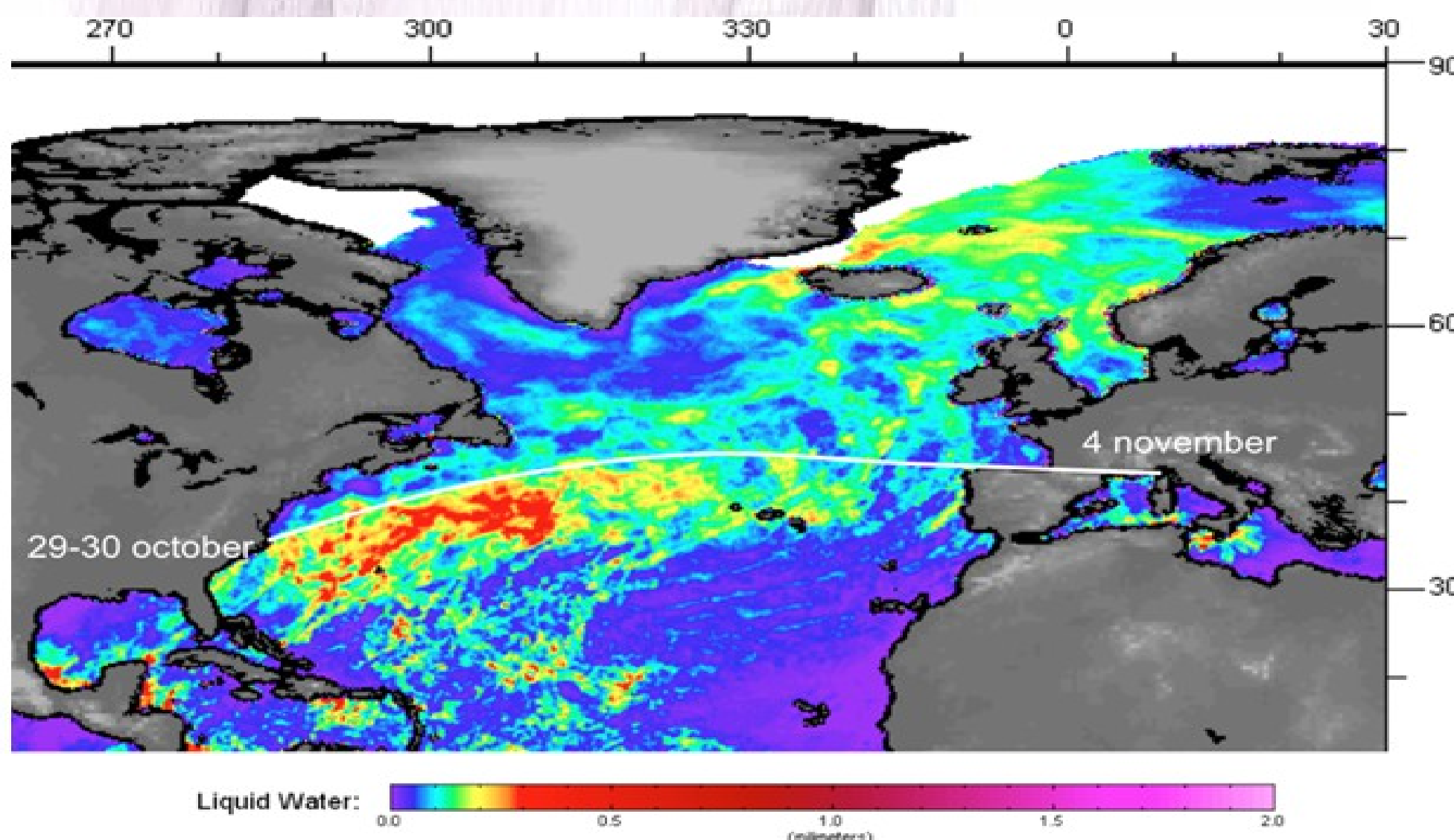


The DRIHM Distributed Computing Infrastructure



STEP THREE: DRIHM2US
EU project to promote the cooperation between Europe the USA, both sides of the Atlantic, to develop a joint/common HMR e-Infrastructure

Recent examples of severe hydro-meteorological events (e.g. North America and Western Mediterranean, autumn season 2011) call for a more comprehensive cooperation between Europe and USA in the study of severe hydro-meteorological events and climate changes effects. The DRIHM2US project (Distributed Research Infrastructure for Hydro-Meteorology to United States of America, <http://www.drihm2us.eu>, co-funded by EU FP7, grant agreement RI-313122, 2012-2014) aims at understanding the utilization of e-Infrastructures for advancing scientific collaboration on both sides of the Atlantic towards improving the predictive ability of severe storms and utilization of these predictions for hazard prediction and control under climate change effects.

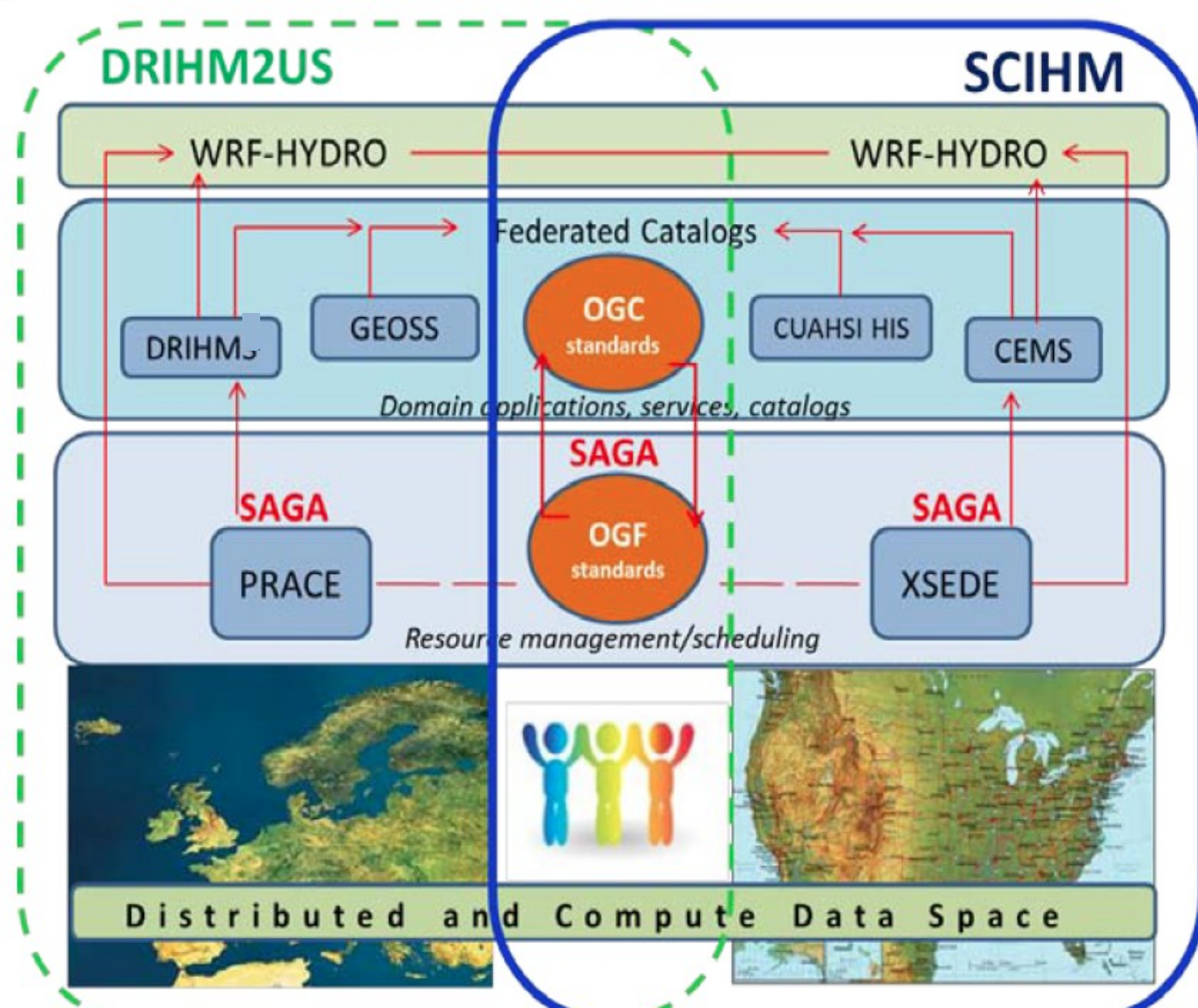


Satellite cloud liquid water composite (week ending 5th Nov. 2011) clearly shows the cyclone track from USA east coast to Genoa, Italy: storms do not respect country boundaries!

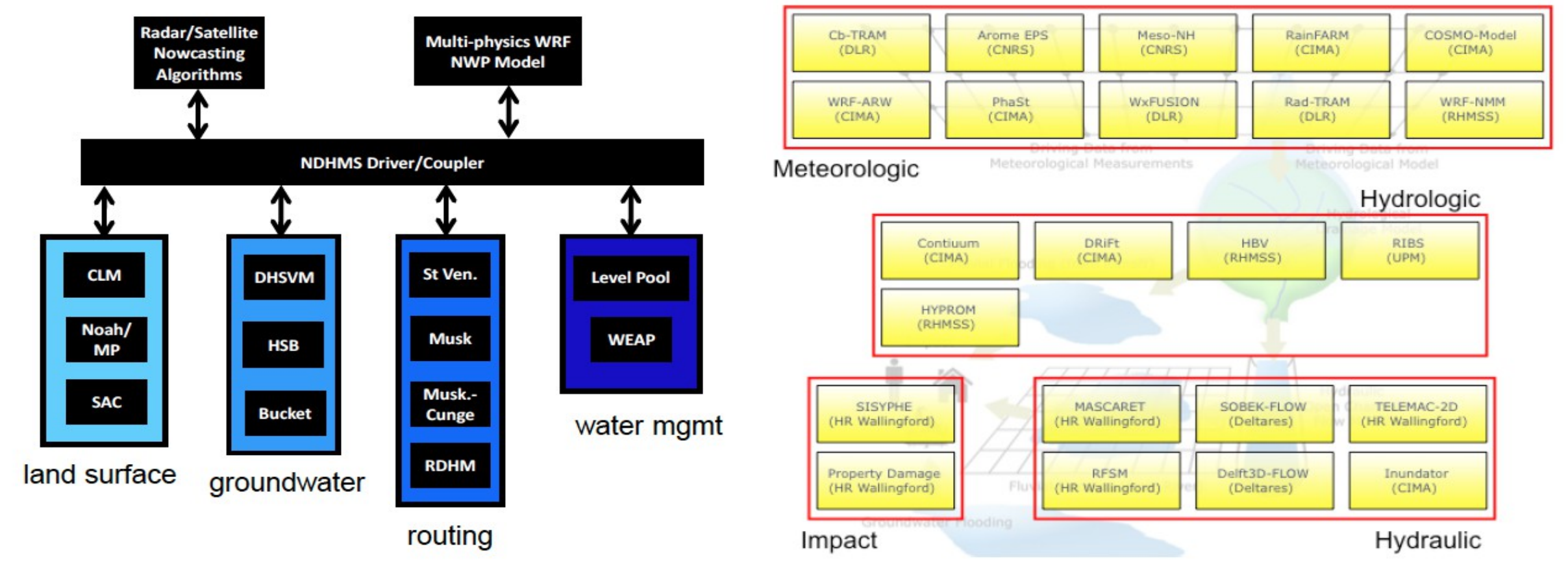


DRIHM2US promotes international cooperation between Europe and the USA for the development of a joint/common e-Infrastructure for HMR; the objective is to put in place key elements to allow persistent availability and effective sharing of data and models across scientific disciplines, institutions and national boundaries, specifically across the Atlantic.

This is achieved by creating a forum of collaboration, based on a sequence of networking activities with EU and USA participants as the analysis of requirements of the HMR community towards common e-Infrastructures within the EU and US, hands-on plug-in tests between current EU and US HMR e-Infrastructures performed by selected experts, and training events involving EU and USA participants.



Main components of the DRIHM2US multi-layer design and the interactions between collaborating projects in the US and EU, in particular as organized under DRIHM2US and its US counterpart, SCIHM (Standards-based CyberInfrastructure for HM). The two projects overlap in their reliance on open community standards developed for high performance resource management and for domain services and catalogs, and on joint use of the data and services infrastructure, as well as parallel institutional development and community engagement.



Schematic showing the suite of multi-physics options available for experimentation in the SCIHM use cases from WRF-Hydro (left) or from DRIHM (right).