

Improving the discovery and re-use of hazard models – the PURE Portal

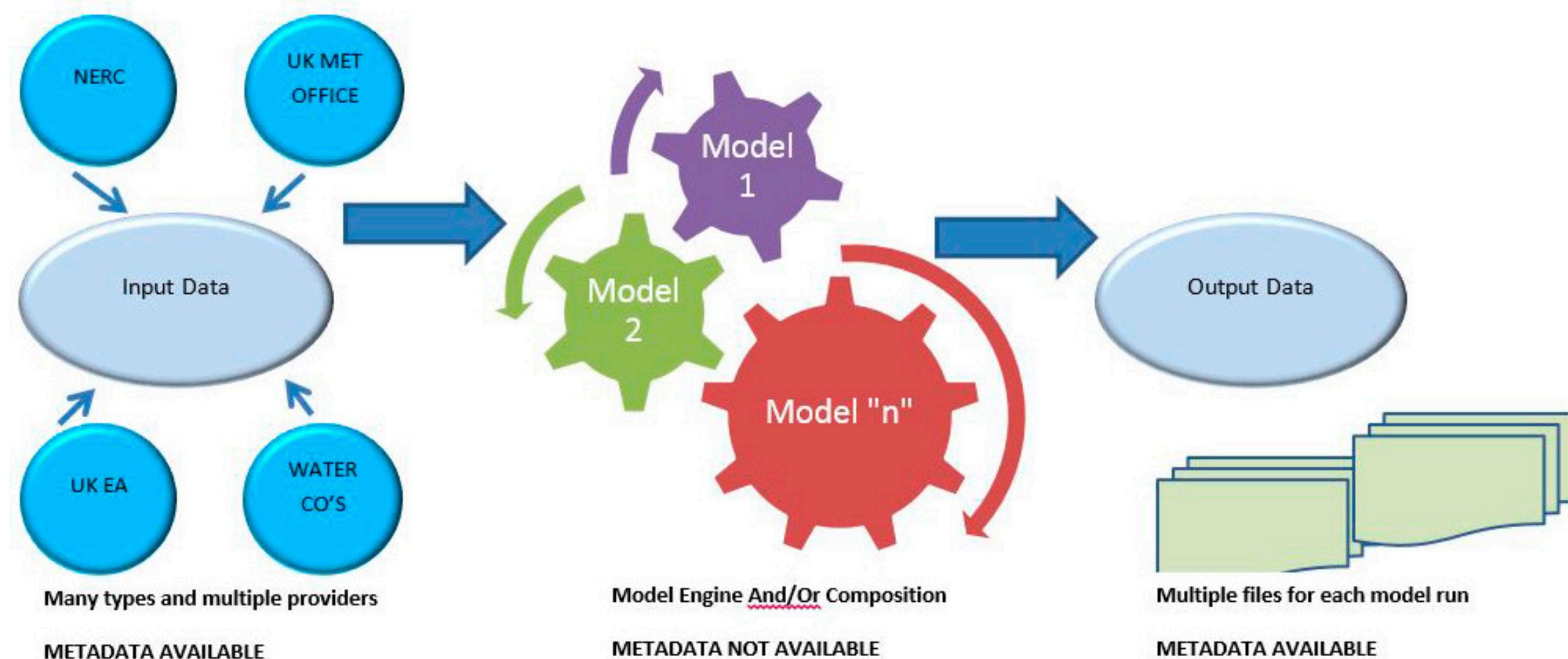
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Background – Why build the PURE Portal?

The Probability Uncertainty and Risk in the Environment (PURE) network is an action that has been prioritised by NERC in order to increase the impact of NERC Natural Hazards Research and to take a national leadership role in changing the way in which uncertainty and risk are assessed and quantified across the natural hazards community.

Running in parallel with the PURE research programme a requirement was identified by the PURE project board to increase the level of sharing and re-use of hazard models. This provides an important knowledge exchange facility and help to ensure maximum exposure for NERC funded models. The PURE portal consists of a web interface underpinned by a model metadata database.

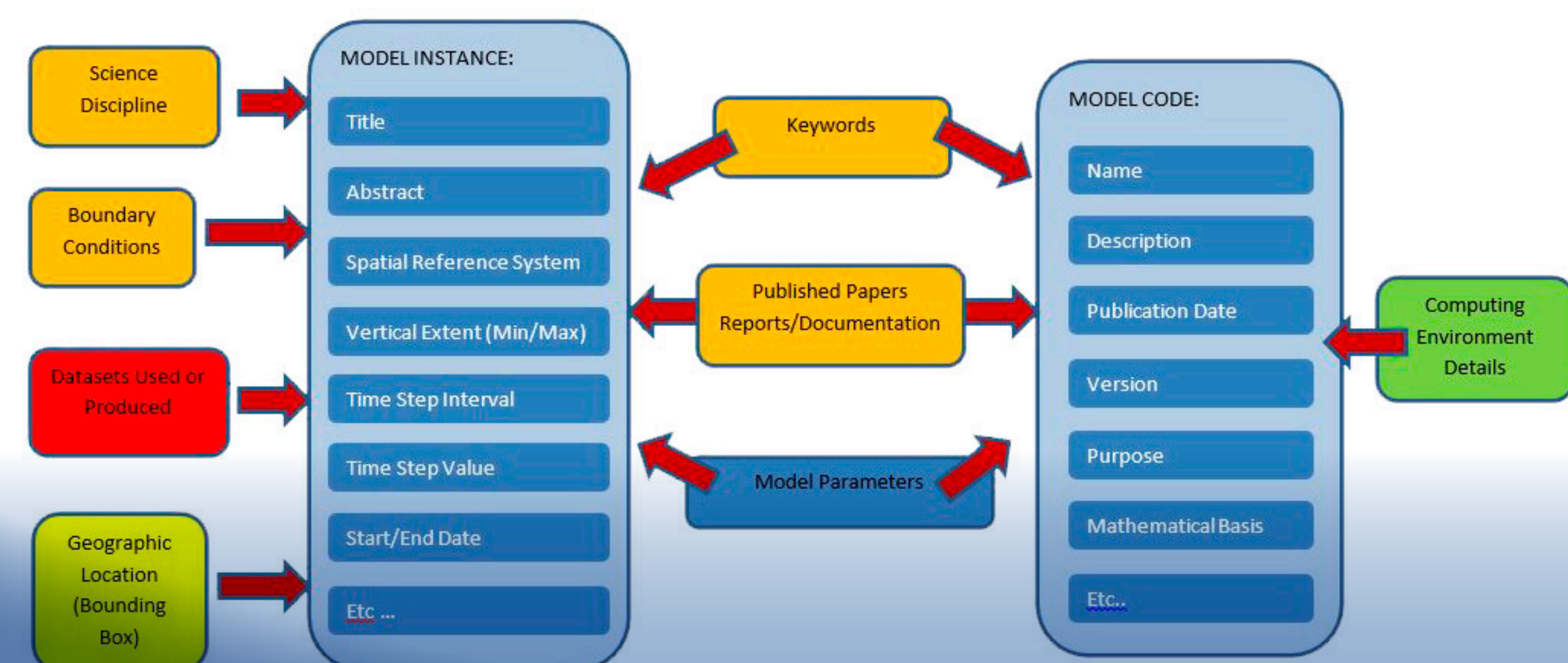
Whilst there are many metadata catalogues and repositories for spatial data sets, e.g. data.gov.uk, the same is not the case for process models. Zaslavsky et al (2014) review five existing ones which mainly contain model codes, examples include the US-based CSDMS model catalogue (Peckham et al., 2014) and the TESS model funded by the EU which was created to store metadata for ecosystem management. In the UK, the FluidEarth 2 catalogue holds metadata on linkable models (Harpham et al., 2014). The PURE portal is specifically designed to hold metadata for both model code and model instance for Hazard models and their implementations created within the research community.



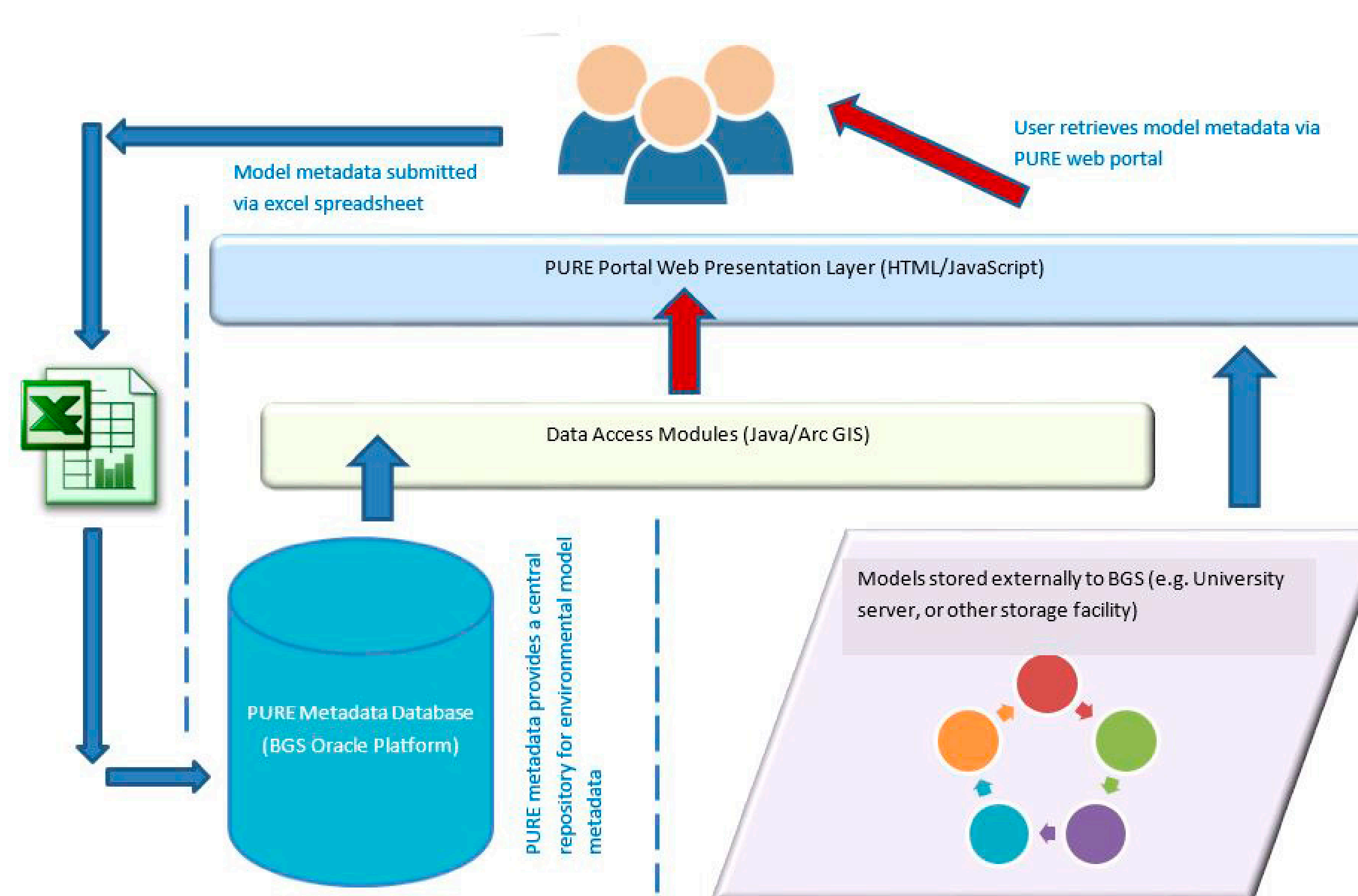
Model metadata

There are no internationally recognised standards for mathematical model metadata. However, this is recognised as an issue by those who seek to promote the use of model metadata. Several initiatives (e.g. Harpham et al., 2015) have attempted to define "de-facto" standards and common features required have emerged. Zaslavsky report five model catalogues each with their own metadata, but that arrive at common features such as describing the model developers and code guardians. We have drawn on these common features as well as the results of the NERC funded Meta-model NED project (Hughes et al., 2013).

In lieu of an overarching model metadata standard the elements of the PURE portal are based on ISO standards where appropriate. An example of this is the definition of location which is based on WGS 84.

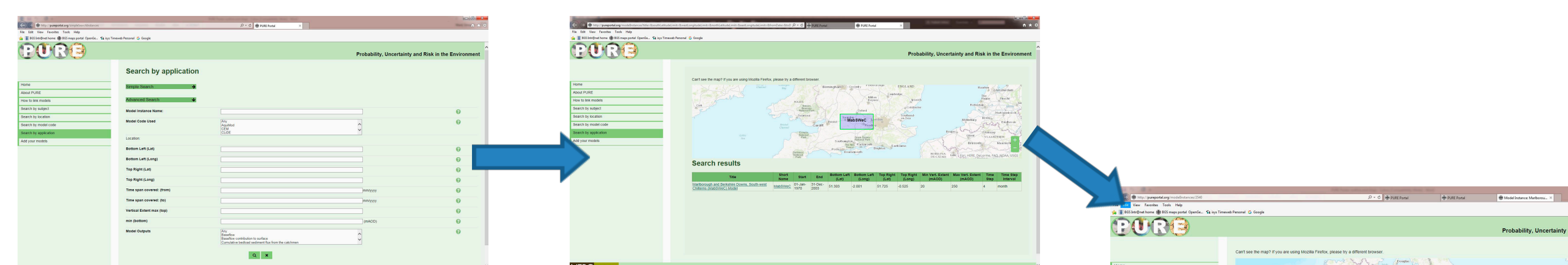


System architecture and development process

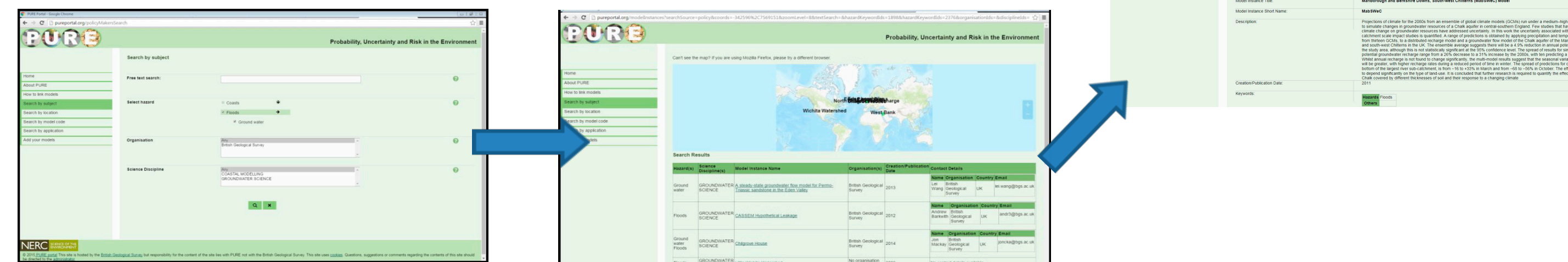


Functionality provided

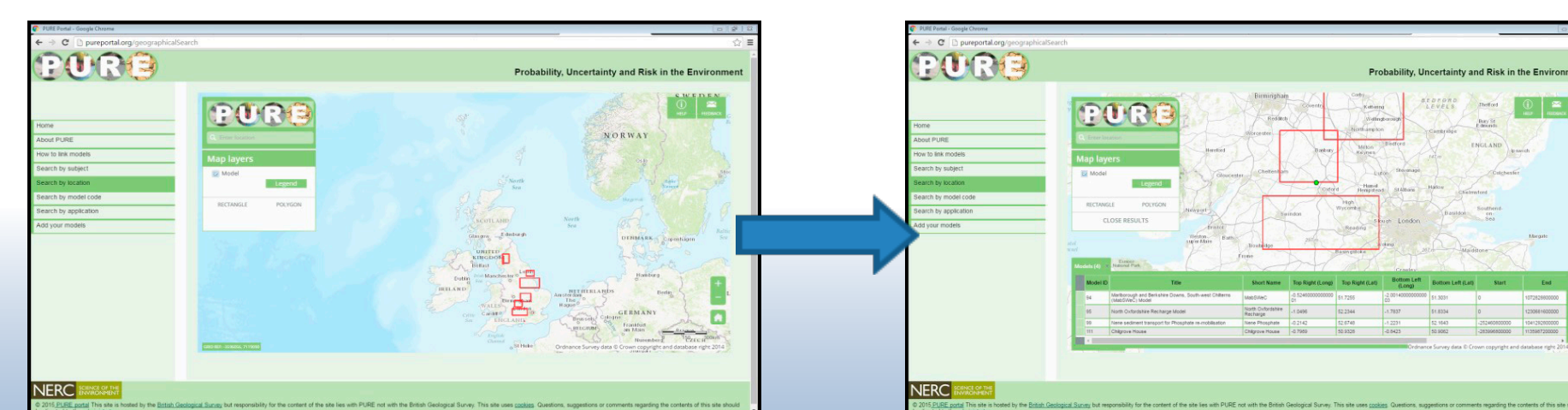
Search by Model Application (Model Instance):



Search for decision/policy makers:



Search by location:



PURE Portal available at: www.pureportal.org

Key results

- initial metadata interface released in March 2015
- upgraded version (including GIS search facilities and high level "Decision Maker" search) released January 2016
- further upgrade to be released September 2016
- information about system disseminated widely e.g. initially to PURE projects, BGS modellers
- good feedback also received from NERC Data Centres and a number of UK universities
- model metadata population on-going
- the PURE Model metadata schema and portal has been designed as the central repository for model metadata arising from NERC funded and other modelling research
- a separate version of the portal front end, branded and tailored to the requirements of NERC Data Centres is currently in development

Getting involved

The on-going success of the PURE Portal depends on continued use and population of the system. We would very much like to encourage researchers and others involved in environmental modelling to make use of the Portal, by for example:

- Add Data**
 - provide metadata for additional models, so that it becomes a key resource
- Feedback**
 - provide feedback on application usability and potential improvements to system and data
- Engage**
 - use the portal to search and retrieve models, encouraging model re-use

References

Harpham, Q., Cleverley, P., & Kelly, D., 2014. The FluidEarth 2 implementation of OpenMI 2.0. *Journal of Hydroinformatics*, 16(4), 890-906.
 Harpham, Q., & Danovaro, E., 2015. Towards standard metadata to support models and interfaces in a hydro-meteorological model chain. *Journal of Hydroinformatics*, 17(2), 260-274.
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 Peckham, S. D., 2014. The CSDMS standard names: Cross-domain naming conventions for describing process models, data sets and their associated variables. <http://scholarsarchive.byu.edu/iemssconference/2014/Stream-A/12/>
 Zaslavsky, I., Whitenack, T., & Valentine, D., 2014. Exploring environmental model catalogs. <http://scholarsarchive.byu.edu/iemssconference/2014/Stream-A/22/>