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Management and dissemination of global high-resolution agro-hydrological model simulation data from the Virtual Water Values project

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The ViWA (Virtual Water Values) project aims to provide a global-scale assessment of the current usage of water resources, of the efficiency of water use and of agricultural yields as well as the flow and trade of 'virtual' water across country boundaries. This is achieved by establishing a global management and monitoring system which combines high-resolution (1 km²) agro-hydrological model simulations with information from high-resolution remote-sensing data from Copernicus satellites. The monitoring system is used to judge the progress in achieving water-related UN sustainable development goals on the local and global scale. Specific goals of the project are, for example, to:

- evaluate possible inefficiencies of the current water use in agriculture, industry and water management and its economic consequences.
- assess the vulnerability of agriculture and ecosystems to climate variability with a special emphasis on water availability.
- identify regional hot-spots of unsustainable water use and to analyze possible institutional obstacles for a sustainable and efficient water use.
- identify trade-offs between the commercial water use and protection of ecosystem services.

A cornerstone for reaching these project goals are high-resolution global ensemble simulations with an agro-hydrological model for a variety of crop types and management practices. These simulations provide the relevant information on agricultural yields and water demands at different scales. In this context, a considerable amount of data is generated and subsets of these data might also be of direct relevance for different external interest groups.

In this presentation, we describe our approach for managing the simulation data, with a special focus on possible strategies for data provisioning to interested stakeholders, scientists, practitioners and the general public. We will give an overview on the corresponding simulation and data storage workflows on the utilized HPC-systems and we will discuss methods for providing the data to the different interest groups. Among other aspects, we address findability (in the sense of the FAIR principles) of simulation results for the scientific community in indexed search portals

through a proper metadata annotation. We also discuss a prototypical interactive web portal for visualizing, subsetting and downloading of selected parts of the data set.