

*Integrated surface-subsurface hydrological models to better manage field irrigation and drainage scheduling*



## PRACTICE ABSTRACT

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Drought-related yield losses increased the need for reliable tools that can be used for field irrigation and drainage scheduling. We will simultaneously simulate water flow and interactions at the surface, in the unsaturated zone (i.e., soil), and in the saturated zone using integrated surface-subsurface hydrological models (e.g., HydroGeoSphere) and the Terrestrial System Modeling Platform. Such spatially distributed 3-D models will be developed for selected pilot sites of the WATERAGRI project. Spatially varying inputs such as precipitation, land use, crop types, evapotranspiration, and hydro(geo)logical properties will drive our models. In addition, current weather changes, short-term weather forecasts, as well as long-term climate change and land-use scenarios will be considered, and possible impacts evaluated. We will also include the data assimilation framework, meaning that the models will be combined with measurements and satellite information in near real-time to provide the best possible predictions of soil moisture, groundwater levels, and crop states for the next days. For some pilot sites, the prediction will come along with management options. Ideally, this will help farmers to better plan their field irrigation and drainage some days ahead and to better estimate the potential crop development.



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