



Jul 12th, 3:30 PM - 3:50 PM

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Kralisch, S.; Künne, A.; Santos, J. M.; Selsam, P.; and Schwartze, C., "ILMSweb - a Modular, Web-based Software Platform for Integrated Environmental Modelling, Data Management and Decision Support" (2016). *International Congress on Environmental Modelling and Software*. 132.  
<https://scholarsarchive.byu.edu/iemssconference/2016/Stream-D/132>

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# ILMSweb - a Modular, Web-based Software Platform for Integrated Environmental Modelling, Data Management and Decision Support

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**Abstract:** Integrated water resources management in river basins and related impact assessment of changing climate and landuse typically demand for the integration of a variety of software tools and methods. These often include data management and information systems, classification tools for deriving spatial input data from satellite or airborne imagery, GIS tools for pre-processing and integration of spatial information, hydrological simulation models and multi-criteria comparison methods. While there is a plethora of individual solutions and tools available that address these requirements, their seamless and user-friendly integration in decision support tools remains challenging. We are presenting ILMSweb, a modular, web-based software platform that addresses this demand by linking a spatial data management system with tools that support the development and application of environmental models. These include (i) a software for object-based classification of remote sensing data, (ii) a tool for the delineation of environmental modelling entities from spatial input data based on GRASS-GIS and FOSS libraries, and (iii) a service-based runtime environment for simulation models based on the JAMS modelling framework. Within the presented system, each of the components can be used either individually or in a semi-automated sequence which is controlled by the Taverna workflow management system. While the centralized data management system allows to store input and result data for the different ILMSweb processing tools, it also serves as a backend for metadata storage, ensuring a transparent management of processing parameters and reproducibility of results. The overall approach is demonstrated using the real-world application of developing and applying a spatially distributed hydrological model in a mesoscale river basin.

**Keywords:** service-based modelling; data management; geospatial data processing; hydrological modelling; decision support.