

Data and knowledge management for integrated assessment: A SEAMLESS example

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Integrated assessment can be understood as an interdisciplinary process of combining, interpreting and communicating knowledge from a range of scientific disciplines to reach a better understanding of complex problems. In SEAMLESS, an Integrated Assessment Modelling project on agriculture, these complex problems have been tackled through an integrated framework of data-intensive models, which have posed great challenges for the management of data, data sources and connections between models and their data. In SEAMLESS we have integrated these different data-sources into one common data-schema, represented in both an ontology and a relational database. This presentation presents four aspects of this work: • the use of ontologies and ontology engineering to create a shared conceptual model, • the generation of relational data schema from the shared conceptual model, • the processing of data sources to populate the database. This includes adapting the data to a common spatial framework and aggregating source data to suitable typologies. • the access of the models to the data in the database through the ontology. Through the use of ontology, ontology engineering and relational databases, the first Pan-European database on soil, climate, farm and agricultural management was created that is directly accessible for the models operational in SEAMLESS. The database holds data on model inputs and model outputs as well as contextual data for the assessments. For our developments only open-source tools were used, so the ontology has been

built in Protégé and the database schema generated through Hibernate. The data are stored in the relational database management system PostgreSQL running on a Linux server. To support visualization of results PostGIS functionality is added to a PostgreSQL database and Geoserver is used to provide Web Mapping and Web Feature services.

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