



MOSES Data Management Platform – Concept and status of implementation

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The Helmholtz research infrastructure MOSES (Modular Observation Solutions for Earth Systems, www.moses-helmholtz.de) is a novel "system-of-systems" for Earth Observation, designed to decipher the interactions of short-term extreme events, i.e. heat waves, hydrological extremes, abrupt permafrost thaw, and ocean eddies and long-term trends in Earth and environmental change. The Helmholtz Observatories provide essential data and concepts to monitor long-term trends. MOSES now expands these capabilities towards short-term events and their interaction with long-term trends across different compartments. This poses strong challenges on the integration of distributed and heterogeneous data management infrastructure components that are already being developed in different domains across the Earth Sciences.

Data management and analysis platforms play an effective role in the advancement of technology and subsequent scientific knowledge generation in many scientific disciplines. Through high quality services and derived analysis tools, these platforms provide efficient and innovative research environments. Well designed data systems can facilitate the sustainable utilization, exchange, and re-use of scientific data and functionality by using standardized community models. Together with visualization, these concepts provide added value in improving scientific knowledge-gain, even across the boundaries of disciplines.

For MOSES in combination with Digital Earth (www.digitalearth-hgf.de), an architectural blueprint for a data management and analysis platform based on common and standardized data models, protocols, and encodings has been devised. Data access and dissemination information will be available as data download links or web services (e.g., WFS, WMS). Technically metadata is based on ISO / OGC standards or provider specification. Metadata will be harvested via OAI-PMH or OGC CSW allowing a full-text as well as spatial and temporal search functionality.

The MOSES infrastructure will foster the re-use of existing and proven software systems and components provided by individual Helmholtz Centers. The use of vocabulary controlled sensor description will ensure automated linkage and service of metadata to near real time-data streams that are captured by the participating Helmholtz data ingest facilities and repositories. Following the principles of service oriented architectures, the design enables novel processes by sharing and re-using functionality. Through the use of standards, this blueprint supports integrated approaches to include large-scale long-term sensor networks and observatories (e.g., TERENO, COSYNA, O₂A) that provide complementary processes for dynamic and event-driven monitoring and high quality data analysis.

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