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Impact of Earth and Space Science Informatics (ESSI) in the knowledge society

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The access and the cross-domain usage of data, information and knowledge within an interoperable digital environment become the key elements in the development of a knowledge society of the 21th century. Earth and Space Science Informatics (ESSI) is a cross-science discipline, which is connecting informatics research, development and practice with the processing and solution of very specific but also general science and societal questions related to the research areas of the system Earth and the space domain. A main task of ESSI is the scientific research and the development of applications for a sustainable handling of the life cycle of geoscience and space science data from the experiment, the processing of data and information until the generation of knowledge. Such objectives as the classification of geoscience data and information, the metadata extension of data, the development of concept models for the discovery of relations between data classes and the usage of taxonomies and ontologies play an important role for an on-demand discovery, a sustainable management and a systematic use of multi-domain data and information for the generation of knowledge for a better understanding of the complex system Earth. Other ESSI research fields deal with the analysis and evaluation of the interaction of the provision of data, information and knowledge on one hand and appropriate user feedback mechanism on the other hand in order to ingest the often almost uninvested user communities' knowledge.

This paper presents the main challenges and appropriate approaches for the right usage of ESSI concepts, methods and applications in the geoscience domain on the basis of more than 10 years experiences at the German Research Center for Geosciences' data center and the results of the author's activities as European representative of the Electronic Geophysical Year 2007 – 2008.