



INSPIRE Conference 2018
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PROVIDING INTEROPERABLE INFORMATION FOR SCIENCE: UTILISING INSPIRE TO MOBILISE DATA FROM LONG - TERM OBSERVATION SITES AND PROTECTED AREAS

CHRISTOPH WOHNER, JOHANNES PETERSEIL, ALESSANDRO OGGIONI,
TOMAS KLIMENT, DIMITRIS POURSANIDIS AND ANTONELLO PROVENZALE



INTRODUCTION TO THE SET OF PROBLEMS

- Data about the changing environment is crucial
- Context information about measurements and observations is also needed to better understand data

But ...

- How can context information be linked to an observation?
- How can this information be made interoperable and accessible to everyone?

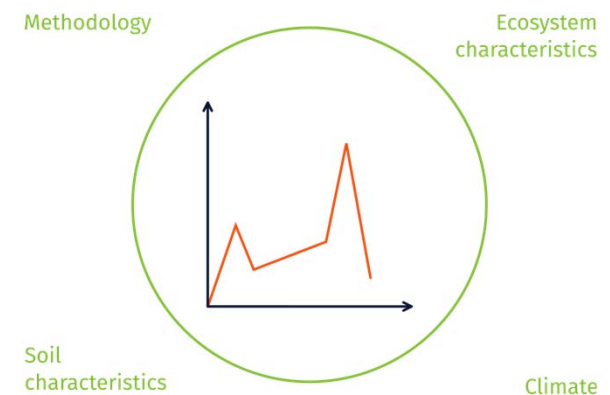


Fig. Context information of measurements

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A PIECE TO SOLVE THE PUZZLE DEIMS.ORG

DEIMS-SDR

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Welcome to DEIMS-SDR

DEIMS-SDR (Dynamic Ecological Information Management System - Site and dataset registry) is an information management system that allows you to discover long-term ecosystem research sites around the globe, along with the data gathered at those sites and the people and networks associated with them. DEIMS describes a wide range of sites, providing a wealth of information, including each site's location, ecosystems, facilities, parameters measured and research themes. It is also possible to access a growing number of datasets and data products associated with the sites. [Read more ...](#)

Do you need any help? [Read our tutorials](#)

Is something not working or do you have any change requests? [Provide feedback](#)

Do you want your site or research to be on DEIMS-SDR? [Contact us](#)

Available Resources

- Sites**
Find out about the international network of ecosystem research, monitoring and experimentation sites.
- Datasets**
Find out about the available dataset metadata records from the network.
- Persons**
Find out about the network of international researchers dealing with ecosystem research, monitoring and experimentation.
- Data Products**
Find out about data products published or contributed.

DEIMS Site and Dataset Registry (SDR) is an editor and catalogue to create, publish and share information on relevant components of research infrastructures.



DEIMS-SDR is adopted by H2020 ECO-POTENTIAL and is used by LTER Europe and ILTER to manage their site network. DEIMS-SDR is developed by contributions from different European scale projects.

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A PIECE TO SOLVE THE PUZZLE DEIMS.ORG

- DEIMS-SDR¹ is an information management system storing information about environmental research and monitoring sites, their datasets, personnel and networks
- Issues persistent identifiers for sites (DEIMS.ID) to allow distinct identification across networks and research infrastructures
 - E.g. A site can be in ICOS and LTER and have different network identifier
 - The DEIMS.ID allows to identify a site regardless of network affiliation
 - Currently 1043 sites registered (as of September 2018)
- DEIMS-SDR generates metadata in a variety of formats



Fig. DEIMS-SDR Logo

© DEIMS-SDR

¹DEIMS-SDR = Dynamic Ecological Information Management System - Site and dataset registry

DEIMS - SITE AND DATASET REGISTRY

ASSOCIATED INFORMATION

- Metadata formats include
 - Datasets → ISO19115/19139, EML, BDP
 - Sites → ISO 19115/19139, INSPIRE EF¹
 - Sensors → SensorML
- Provided services
 - All metadata → OGC CSW, OAI-PMH
 - Sites → OGC WMS, OGC WFS
- ensuring **interoperability and reusability** of MD

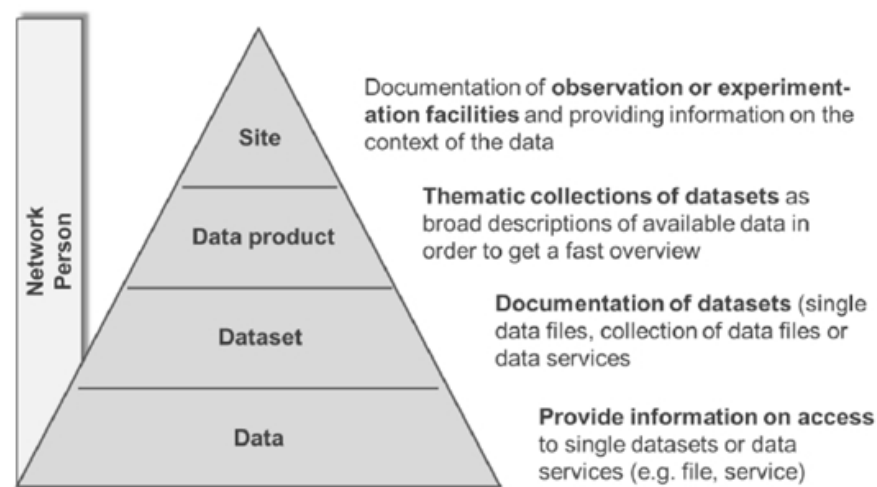


Fig. Information hierarchy

¹ <https://inspire.ec.europa.eu/theme/ef>



LTER Europe

WHAT IS A SITE

- **LTER Site:** (Long-Term Ecosystem Research Synonyms: 'traditional' LTER site): observation facility of limited size (up to 10 km²) and comprising mainly **one habitat type and form of land use**. Activities concentrate on **small-scale ecosystem processes and structures** (biogeochemistry, selected taxonomic groups, primary production, disturbances etc.). There are often unique long-term datasets associated with LTER sites.
- **LTSER Platform** (Long-Term Socio-Ecological Research): Modular LTER-facility consisting of sites which are located in an area with defined boundaries. The elements of LTSER Platforms represent the **main habitats, land use forms and practices relevant for the broader region** (up to 10000 km²) and cover all scales and levels relevant for LTSER (from local to landscape). LTSER-Platforms should represent **economic and social units** or coincide/overlap with such units where adequate information on land use history, economy and demography is available to allow for **socio-ecological research**.

ANOTHER PIECE TO SOLVE THE PUZZLE LINKING INFORMATION USING INSPIRE EF

- Inspire EF allows linking different types of information
 - Information about observation location
 - Personnel involved
 - Datasets aka observations
 - Including measurement campaigns aka activities
 - Description of observation facility including infrastructure in form of sensors
 - Networks/projects the site belongs to

Environmental Monitoring Activity (EMA)

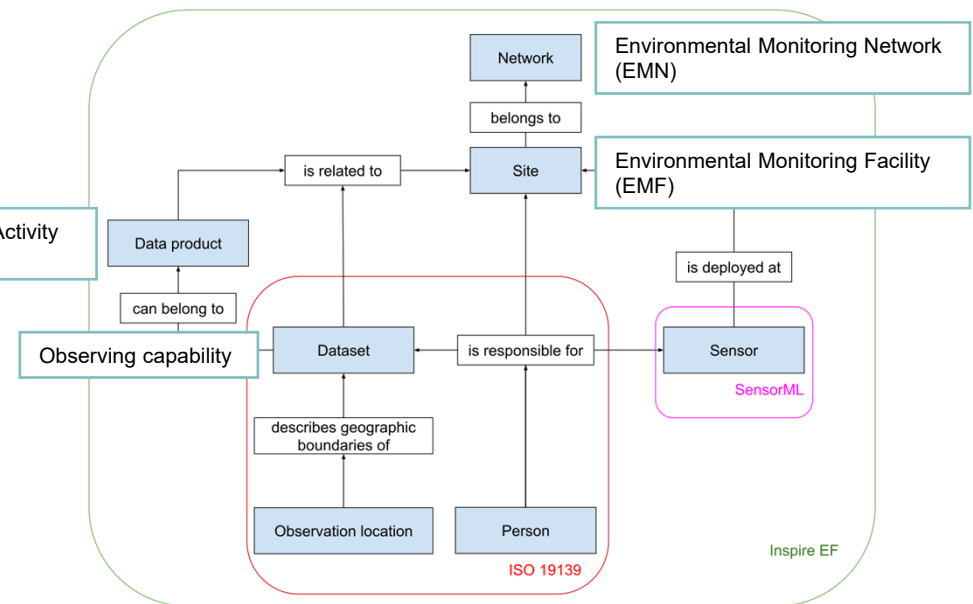


Fig. DEIMS-SDR Information Architecture

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OTHER IMPLEMENTATIONS OF INSPIRE EF

- EDI EMF Editor
 - Creates EF records
 - DEMO: <http://edidemo.get-it.it/dist/EMF.html>
- Environmental Monitoring Facility (EF) catalogue
 - Parses EF records and visualises information
 - Demo: <http://www.get-it.it/objects/EF/>
- Inspire EF Map viewer
 - Visualises EF records on a map
 - Code: https://github.com/stopopol/ef_viewer
 - Production service: <https://deims.org/map>

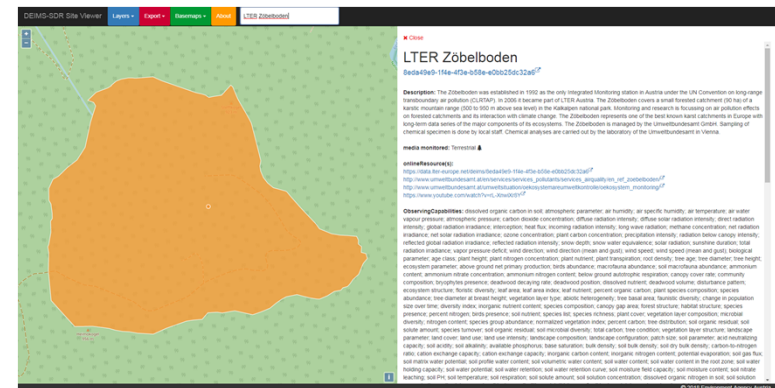


Fig. Inspire EF Map viewer

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FUTURE IMPLEMENTATIONS OF INSPIRE EF

- Federated catalogues
 - Potentially harvesting Inspire EF records from different sources and integrating them in a single catalogue
 - Would allow cross-RI search of research and monitoring sites

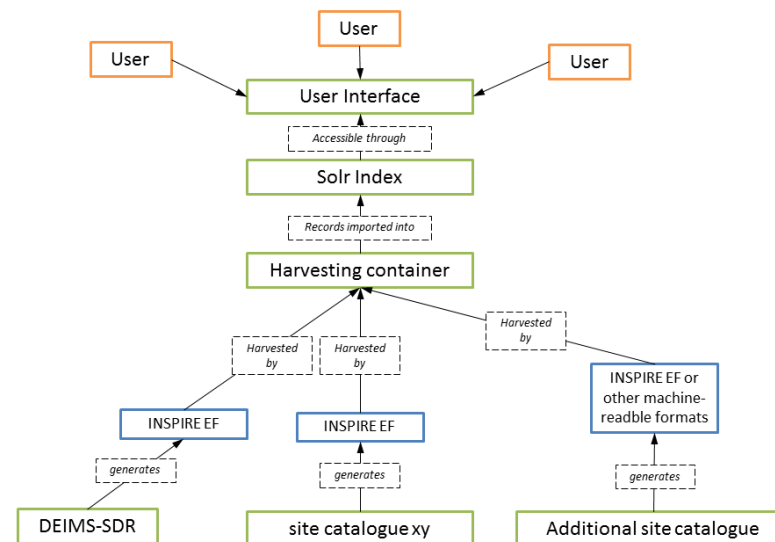


Fig. Federated catalogues architecture

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CONCLUSION

- Inspire EF can act as a standardised description of observation facilities
 - However, EF guarantees only syntactical interoperability, but not semantic IOP
- Problem that EF isn't a common standard yet and implementations are rare
 - EF is not a simple standard and implementing it takes time
 - What is the best way to exchange EF files?



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H2020 ECOPotential



H2020 eLTER



H2020 ENVRIplus



LTER Europe



ILTER



CONTACT & INFORMATION

Christoph Wohner

Environment Agency Austria (EAA) | Umweltbundesamt GmbH
Ecosystem Research & Environmental Information Management

Phone: +43 - (0)1 - 31304 - 3421

christoph.wohner@umweltbundesamt.at

Umweltbundesamt
www.umweltbundesamt.at

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