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Handling of research data in collaborative research centres: experiences from inter-disciplinary, large-scale, long-term research projects

Constanze Curdt ^{1,2}, Dirk Hoffmeister ¹, Tanja Kramm ¹, Ulrich Lang ², Georg Bareth ¹

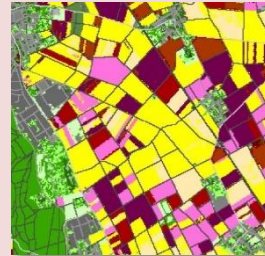
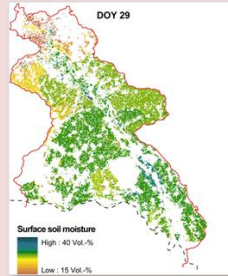
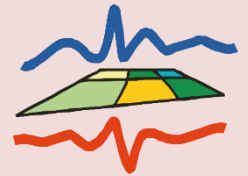
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RDM in Collaborative Research Centres / CRC Transregios

- **RDM in research projects**
 - **limited** project duration and funding
 - **data availability** during and after project duration (e.g. data re-use/exchange)
 - mostly **project-specific RDM solutions** available
 - service / infrastructure development according to **project and user requirements**
- **Collaborative Research Centre (CRC) / CRC Transregio (CRC/TR):**
 - **coordinated funding program** of the German Research Foundation (DFG)
 - **university-based** research institution (often various locations); established **for up to 12 years**
 - research field is **innovative, essential, challenging, multidisciplinary & long-term designed**
 - since 2007 **“Information Infrastructure Project”** (INF-Project)
 - “The main purpose [...] is the **management of relevant data** collected [...] with the aim of enabling **systematic and long-term use of such data.**” (DFG 2014)

RDM in the CRC/TRR32, CRC1211 & CRC/TRR228 – Project Overview

- **CRC / Transregio 32** (CRC/TRR32, www.tr32.de; funding **2007-2018**)
'Patterns in Soil-Vegetation-Atmosphere Systems: Monitoring, Modelling, & Data Assimilation'
 - **Institutions:** Universities Aachen, Bonn and Cologne & Research Centre Jülich
 - **Disciplines:** geophysics, soil & plant science, geography, meteorology, mathematics, chemistry
 - **Study site:** Western Germany
 - **Goal:** research on exchange processes btw. soil, vegetation & atmosphere
 - **RDM system:** TR32DB online **since February 2008** at www.tr32db.de



CRC/TRR32 (2007-2018)

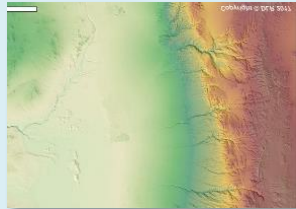


RDM in the CRC/TRR32, CRC1211 & CRC/TRR228 – Project Overview

- **CRC 1211** (CRC 1211, www.crc1211.de, funding since 2016)

‘Earth - Evolution at the Dry Limit’

- **Institutions:** Univ. Aachen, Bonn and Cologne & Research Centre Jülich
- **Disciplines:** geology, soil & plant science, geography, meteorology, biology
- **Study site:** Atacama desert, Chile
- **Goal:** research on mutual evolutionary relationships between Earth surface processes & biota
- **RDM system:** CRC1211DB online since **December 2016** at www.crc1211db.uni-koeln.de



CRC 1211 (since 2016-2020; possible until 2028)

CRC/TRR32 (2007-2018)

RDM in the CRC/TRR32, CRC1211 & CRC/TRR228 – Project Overview

- **CRC / Transregio 228** (CRC/TRR 228, www.crc228.de, funding since 2018)
'Future Rural Africa: Future-making and social-ecological transformation'
 - **Institutions:** Universities Bonn and Cologne, Berlin & Münster, BICC
 - **Disciplines:** economics, anthropology, soil & plant science, geography, virology
 - **Study site:** Kenya, Tanzania, Namibia
 - **Goal:** relationship between land use change, social-ecological transformation & future-making
 - **RDM system:** TRR228DB online since **November 2018** at www.trr228db.uni-koeln.de



CRC/TRR228 (since 2018-2021; possible until 2030)

CRC 1211 (since 2016-2020; possible until 2028)

CRC/TRR32 (2007-2018)

Demands of RDM in the CRCs

■ Identification of demands

- check funding proposal, join project meetings
- user surveys (every funding phase) and personal interviews

■ Summary of demands

– number of data

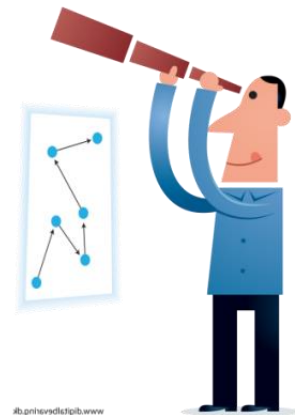
- potential project duration of 12 years → approx. 45-70 project sections

– data variety

- heterogeneous data; discipline specific file formats; various file sizes (few kB to GB)

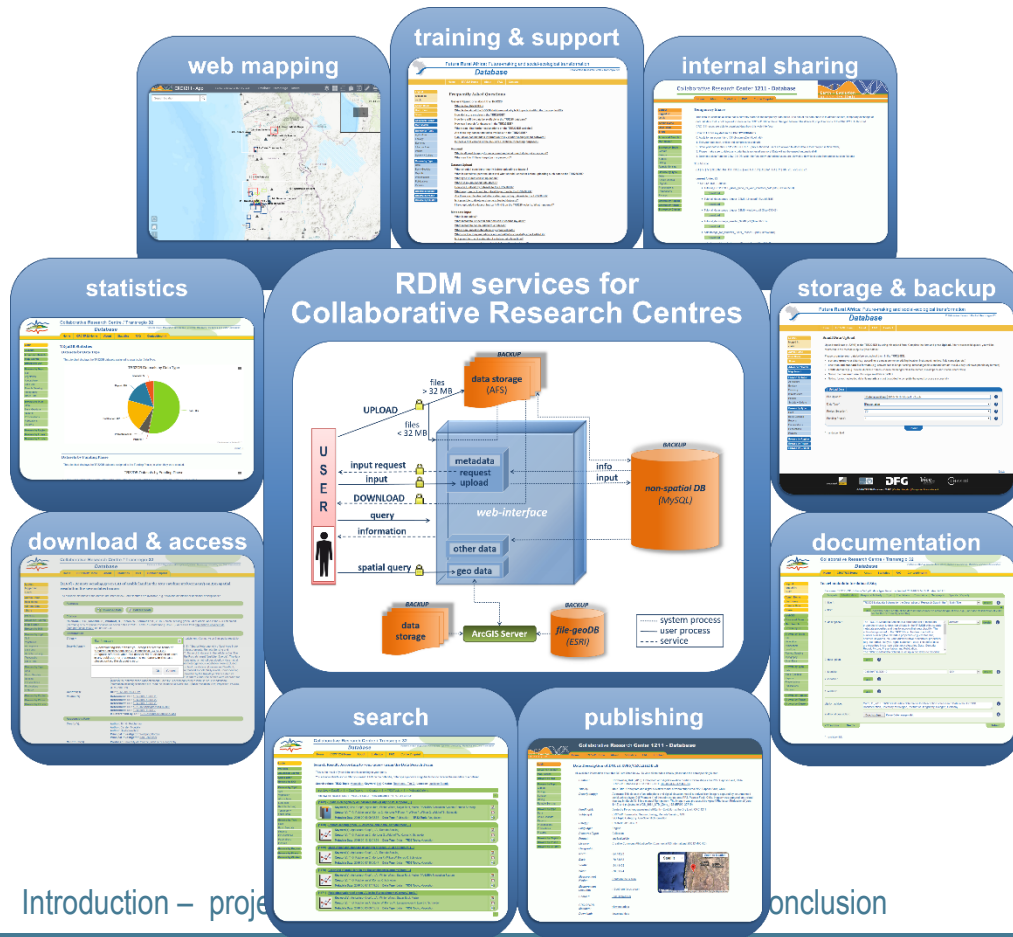
– DFG recommendations

- collaboration with library / computing centre, re-use of existing infrastructures, technologies & tools
- data availability beyond project duration (e.g. data storage for 10 years)



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Establishing RDM Services for the CRCs (and special services)



CRC / Transregio 32:

- special section for purchased climate data incl. visualization tool
- online WebGIS for data visualization

CRC 1211:

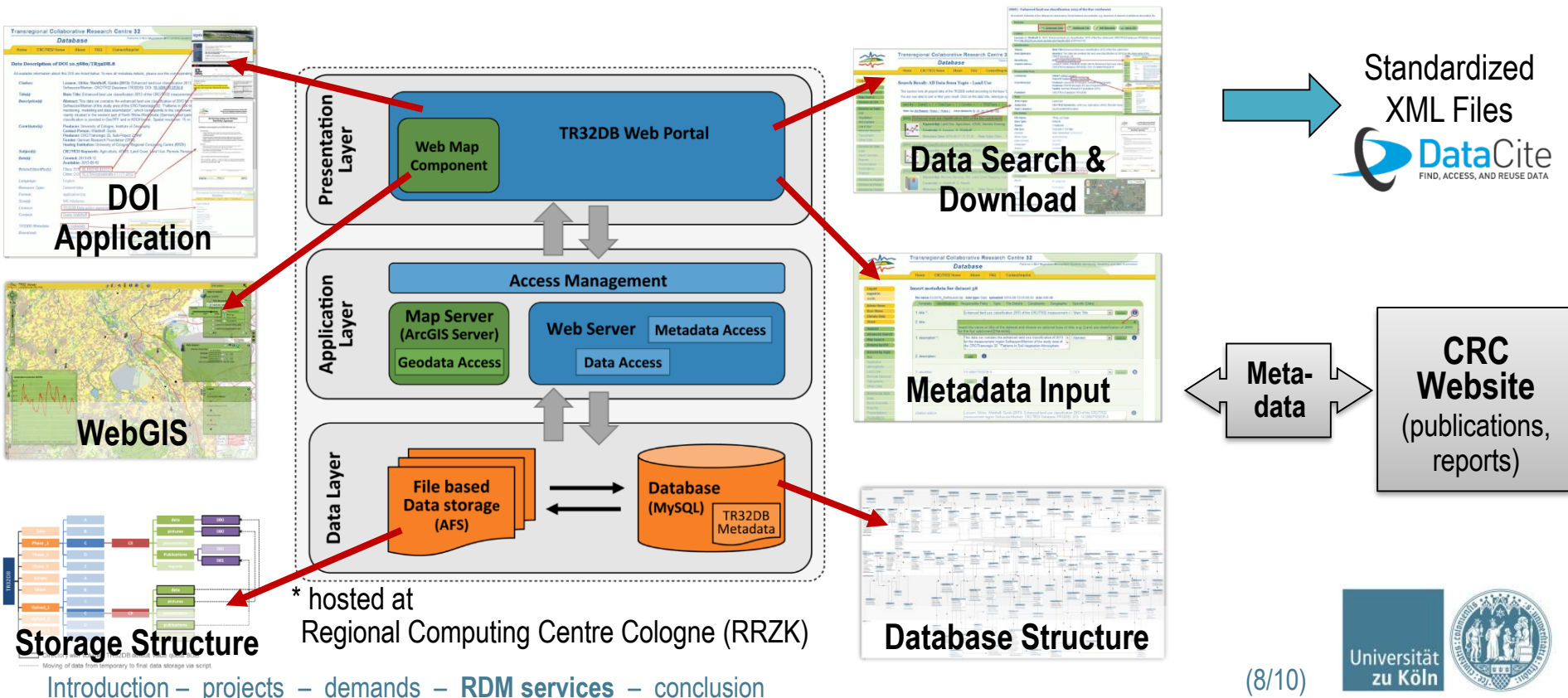
- special section for project weather station data; data provision and visualization tool
- online WebGIS for data visualization

CRC / Transregio 228:

- special exchange platform for stories ('Transdisciplinary Diary'); in prep.
- workshop series on RDM topics

Project Databases for the CRCs – technical infrastructure

Available at: www.TR32DB.de, www.crc1211db.uni-koeln.de, www.trr228db.uni-koeln.de



Conclusion

- **Project RDM services and systems / project databases**
 - limited duration due to funding
 - preferable project-specific solutions available
 - cooperation with libraries / computing centers / projects → reuse existing infrastructure / services
 - system design in close cooperation with scientists
- **Research data**
 - heterogeneous, discipline specific data formats and data size
 - data documentation, interoperable metadata
 - data quality (not covered by the project)
- **Dealing with scientists**
 - early integration and cooperation
 - service development in compliance with user requirements
 - adequate training and support is essential; patience and understanding





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