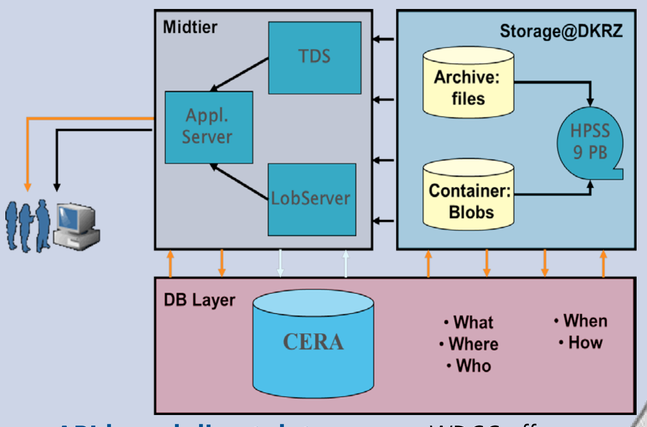
Data life cycle management

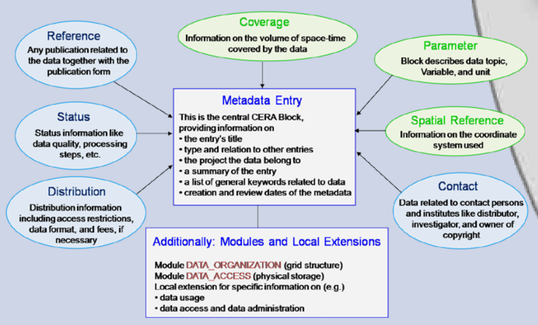
DKRZ - DATA INTENSIVE CLIMATE SCIENCE

GUI based catalogue and data access: The World Data Center Climate (WDCC) offers catalogue and transparent data access by a number of community adapted data portals, which implement community specific views for the available data services. Examples are data portals for research projects like ENSEMBLES, for communities like ENES or international programs like IPCC. Additionally the WDCC is integrated in international data federations via standardized metadata and data interfaces.



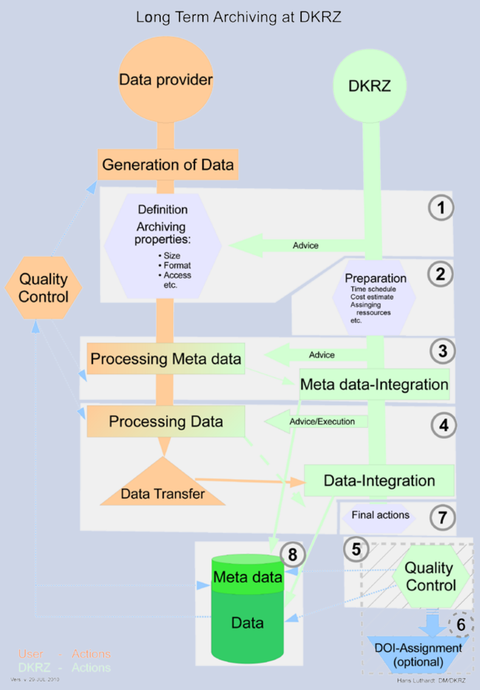
API based direct data access: WDCC offers data access services for data stored in files as well as data stored in a specific DKRZ container format. The storage location (disc or tape) is transparent to the user, only data access times are different.

Data federations:
Poster 4

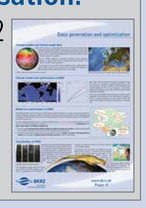


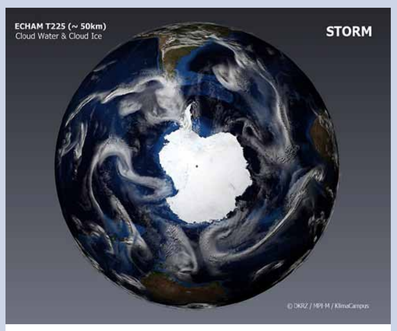
Data documentation: WDCC uses the CERA-2 metadata model to describe its data entities. CERA-2 has been developed as modular description system which allows for easy adaption to new description requirements by adding new modules without affecting the existing ones. CERA-2 is in operation for more than 10 years now and left practically unchanged since 2000.

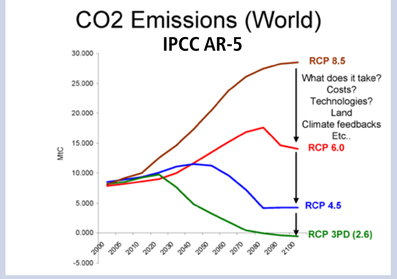
Long-term archiving: DKRZ offers long term archiving services. Storage period of at least 10 years are supported along with web-based data access. Long-term archiving is requested by the founding agencies in the context of "Rules for Good Scientific Practice" and a prerequisite to enable future research activities. This service thus includes the collection and maintenance of data documentation (metadata).



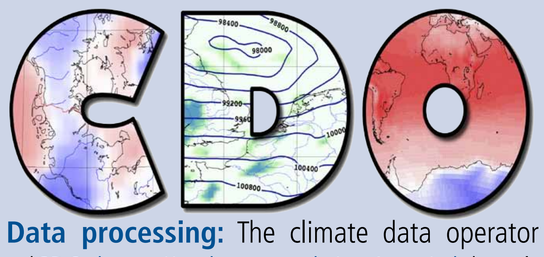
Climate modeling optimisation:
Poster 2





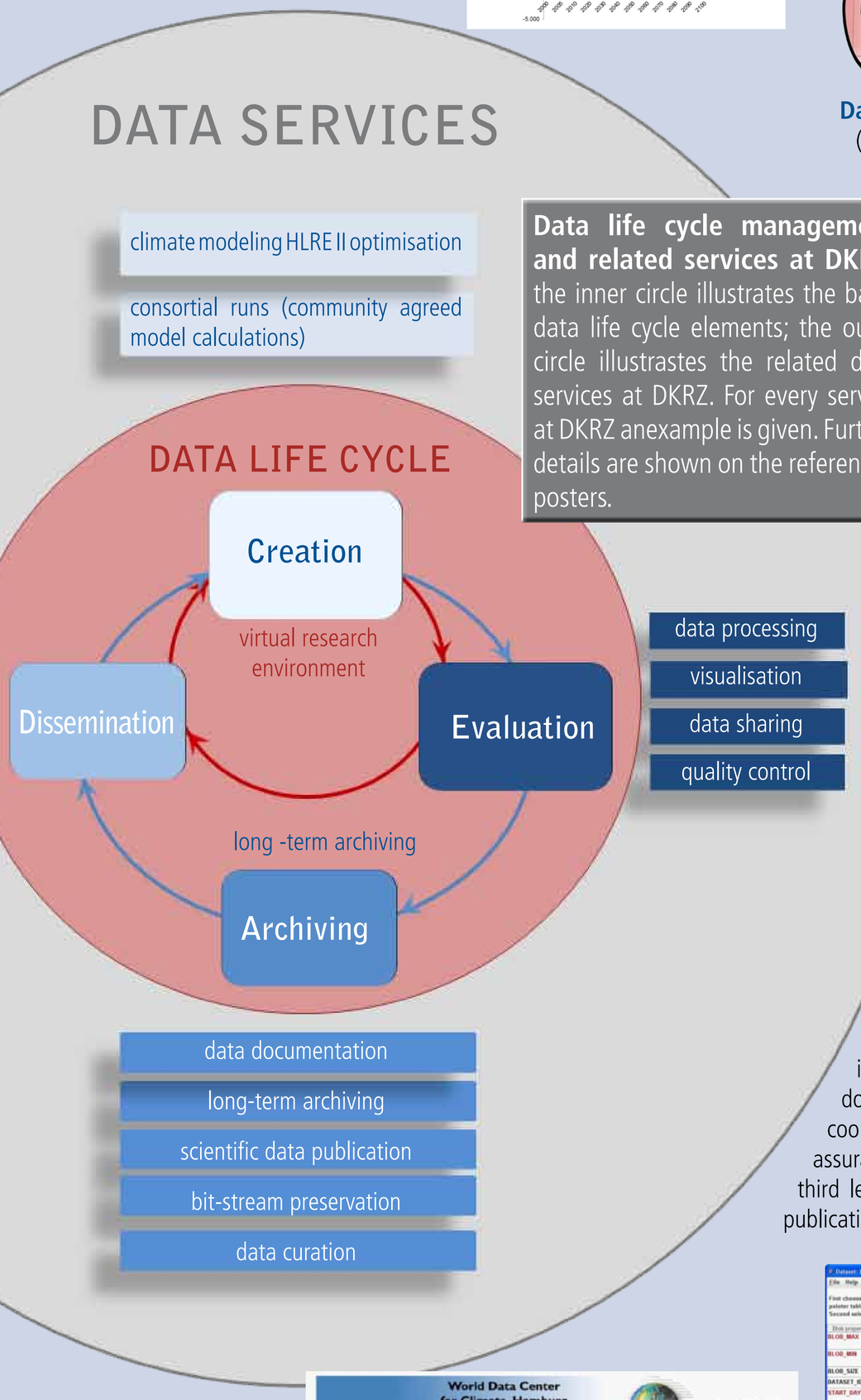


Consortial runs and visualization: DKRZ supports the execution of consortial runs – climate community agreed large model calculations – by an integrated compile and execution environment. Up to 1/3 of HLRE II („Blizzard") is reserved for consortial runs which are of interest for a larger consortium of climate scientists. Present activities are the German climate modeling contribution to the next IPCC assessment report (IPCC-AR5) and the STORM project which calculates a high resolution, ocean eddy resolving climate model for more than 300 years.

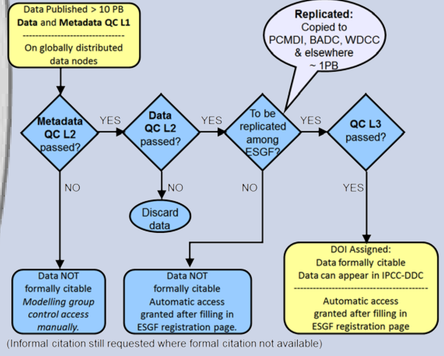


Data processing: The climate data operator (CDO, https://code.zmaw.de/projects/cdo) toolbox developed by the Max-Planck Institute for Meteorology, Hamburg, provide the basis for data (post-) processing services at DKRZ. The CDO toolbox is also widely used in the international climate research community.

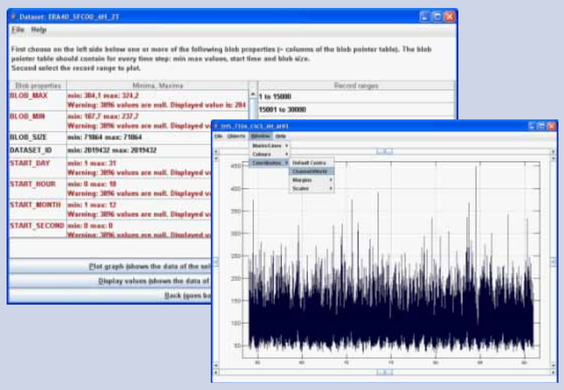
Data sharing:
Poster 4



Data life cycle management and related services at DKRZ: the inner circle illustrates the basic data life cycle elements; the outer circle illustrastes the related data services at DKRZ. For every service at DKRZ anexample is given. Further details are shown on the referenced posters.



Quality control: Climate model data becomes the basis for far reaching climate change related evaluation and decision processes. This increases the importance of formalized data and data documentation quality control processes. DKRZ coordinates a formally defined three level quality assurance process for the next IPCC-AR5. The third level is directly connected with scientific data publication and "freezing" of PetaBytes of model data.



Scientific data publication: Parallel to publications in scientific literature the scientific data publication makes data available for use in scientific articles. After finalizing the scientific data publication process research data have an accurate citation reference, a persistent identifier has been assigned (data are accessible independent from storage location) and the research data are no longer matter of change (scientific results are provable and reproducible). The graphical, web-based application "Atarrabi" has been developed in order to support the scientific data publication process.

Bit stream preservation:
Poster 3

Data curation: WDCC at DKRZ offers a metadata visualization tool to provide a web-based, graphical representation of the metadata of a database entity. The metadata visualization tool is used for quality assurance and to check the metadata.

DKRZ
DEUTSCHES KLIMARECHENZENTRUM

www.dkrz.de
Poster 1