PROJECT OBJECTIVES

Overall objectives
- Enable scientists to link data across Earth System compartmental boundaries
- Establish coherent data workflows
- Develop and adopt processing chains connecting field and model data, in order to foster a holistic view of the Earth System as a whole

Scientific-technical objectives
- Develop a common standard for the documentation of QA/QC procedures
- Develop concenpts for visual and machine learning data exploration
- Establish new diagnostic capacities that will be used to directly confront Earth system model simulations with observations on irregular time-space grids
- Establish coherent data workflows and to develop/ adopt processing chains that link the analyses of various field and model data

Strategic objectives
- Support the scientific mission of the HGF Research Field Earth & Environment by advancing Data Science with respect to the four Grand Challenges Climate, Resources, Ecosystem Dynamics and Biodiversity and Natural Hazards
- Develop a concrete plan for the implementation of coordinated Data Sciences activities related to Earth Sciences in PoF-IV

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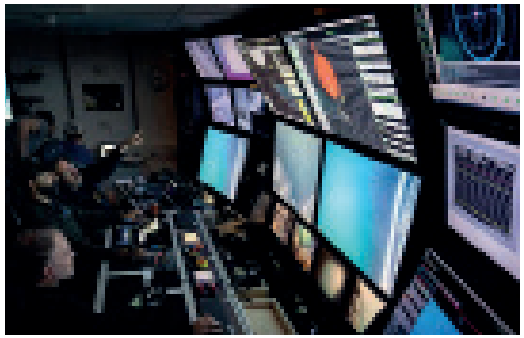
HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DIGITAL EARTH

TOWARDS SMART MONITORING AND INTEGRATED DATA EXPLORATION OF THE EARTH SYSTEM

PROJECT STRUCTURE



Work Package 1:
SMART Monitoring Designs

to explore and develop suitable frameworks for combining measurements from terrestrial, oceanic and atmospheric monitoring stations or short-term field campaigns.

Work Package 2:
Data Exploration Framework

to address challenges related to data provision and data analysis and to meet the requirements via designing methods and workflows that enable natural scientists to make use of streamlined data flows as well as tailored visual data exploration and machine learning approaches.

Work Package 3:
Sustainable Collaboration

to establish new governance structures across the centres that provide exchange of services between the centres, adopting the same standards, and allocating new IT-solutions for data management and data science, avoiding double investments and double efforts.

Work Package 4:
Success Evaluation

to develop an evaluation framework for 1) assessing the performance of new data science methods in SMART Monitoring and data exploration, 2) assessing the added value of applying these new data science methods in Earth System science for creating new scientific knowledge.

Participating partners

- Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI)
- German Research Centre for Geosciences, Helmholtz Centre Potsdam (GFZ)
- Helmholtz Centre for Ocean Research Kiel (GEOMAR)
- Helmholtz Centre Geesthacht, Centre for Materials and Coastal Research (HZG)
- Helmholtz Centre for Environmental Research (UFZ)
- Helmholtz Zentrum München German Research Center for Environmental Health (HMGU)
- Jülich Research Centre (FZJ)
- Karlsruhe Institute of Technology (KIT)