Project: **1261**

Project title: **N4E - NFDI4Earth**

Principal investigator: **Ivonne Anders**

Report period: **2025-11-01 to 2026-10-31**

Introduction

The National Research Data Infrastructure (NFDI) aims to systematically develop, sustainably maintain, and provide access to research data resources, facilitating collaboration across scientific disciplines and institutions.
The German Climate Computing Center (DKRZ) is a co-applicant and partner in NFDI4Earth, contributing expertise and infrastructure for research data management, data processing, standardisation, and long-term preservation of Earth system science data.
During the reporting period, resources allocated to our project 1261 were intended to support several activities within NFDI4Earth and its collaborations with other NFDI consortia. These included computational activities associated with FAIRagro, support for an NFDI4Earth Academy event, and additional data storage requirements arising from the NFDI4Earth pilot project OcMOD.
The actual resource usage differed from the original allocation plan, primarily due to changes in the activities and requirements of collaborating projects.

FAIRagro – Use Case 7

A substantial share of the computational resources requested for 2026 was intended to support activities within FAIRagro Use Case 7, *NEXT-Gen-EXPERT (Next Generation Environmental and eXtended Tools for Extreme Events & Plant Resilience Assessment)*.
As described in previous reports, the use case focuses on the integration and processing of climate data for agricultural applications, including climate data harmonisation, downscaling, climate extremes analysis, and the application of machine-learning methods.
DKRZ resources had already been used for initial development and testing activities, including the evaluation of computational workflows and machine-learning approaches.
During 2026, however, the planned computational activities did not progress to the extent originally anticipated. Although DKRZ resources were used for testing, the collaborating partners did not carry out the larger-scale computational work that had formed the basis of the original resource estimates.
Consequently, the allocated computing resources were utilised only to a limited extent.
This deviation reflects a difference between the activities initially announced by the collaborating partners and their actual implementation during the reporting period, rather than a lack of availability of the requested DKRZ infrastructure.

Support for the NFDI4Earth Academy

The NFDI4Earth Academy event described in the 2026 resource allocation proposal took place as planned.
The DKRZ infrastructure and the resources made available through project 1261 supported the event and its associated activities.

This part of the planned resource usage was therefore successfully implemented in accordance with the original proposal.

OcMOD – Data Preservation and Long-Term Archiving

A major activity during 2026 concerned the continued preservation and curation of data originating from the NFDI4Earth pilot project *OcMOD – Observations closer to Model Data*, conducted in cooperation between DKRZ and the German Weather Service (DWD).
The pilot focused on improving the accessibility, standardisation, and reuse of observational and reanalysis data, particularly the COSMO-REA6 regional reanalysis dataset. Selected data products were prepared and published through established research data infrastructures, including the World Data Center for Climate (WDCC).
The original source data remain essential for the long-term maintenance and quality assurance of the published datasets. In particular, they are required to reproduce processing steps and correct affected data products if errors or inconsistencies are identified after publication.
During 2026, additional archive resources were requested and subsequently approved to accommodate the storage requirements associated with OcMOD.

The additionally allocated archive resources were fully utilised. In particular, the requested 64 TB of Archive long-term storage (DOKU) were completely occupied by the corresponding data holdings.

These resources provide an important foundation for the continued curation, traceability, and scientific reliability of the COSMO-REA6 dataset.

Resource Usage and Allocation Overview

The overall resource usage in 2026 reflects different levels of activity across the supported work packages. While the computational resources initially planned for FAIRagro were only partially utilised, the NFDI4Earth Academy activities were supported as planned. Furthermore, the additional archive resources requested for OcMOD were fully used.

It should be noted that the resource allocation and usage figures currently displayed in the project overview do not accurately reflect the actual storage consumption. In particular, the additionally approved 64 TB of Archive long-term storage (DOKU) are fully occupied, although this is not correctly represented in the system.

This discrepancy should be taken into account when evaluating the resource usage of project 1261.

Summary and Outlook

During 2026, we continued to support research data management activities within NFDI4Earth and its collaborations. The use of computational resources was lower than initially anticipated, mainly because the planned large-scale activities within FAIRagro Use Case 7 were not implemented by the collaborating partners to the expected extent. Nevertheless, the infrastructure was made available and used for initial testing activities.The NFDI4Earth Academy event was successfully supported, as originally planned. A particularly important outcome was the full utilisation of the additional long-term archive resources approved for OcMOD. The preservation of the COSMO-REA6 source data ensures that the published datasets can continue to be maintained, verified, and corrected when necessary.

For 2027, the resource requirements of project 1261 will therefore focus on the continued allocation of the existing long-term archive storage rather than on additional computational activities. This will support the ongoing responsibility of DKRZ for the curation and quality assurance of the published COSMO-REA6 data.