Project: **1153**
Project title: **DYAMOND**
Principal investigator: **Daniel Klocke**
Report period: **2025-11-01 to 2026-10-31**

The DYAMOND 1153 project was requested repeatedly for the last few years as a dedicated project with modest compute resources, used for the server-side post-processing of data, especially output of the European project nextGEMS simulations and in support of the international DYAMOND initiative. This practice has proven very valuable for the nextGEMS community, in particular, and the wider high-resolution climate modelling community, in general. It allowed us (1) to give users access to these resources without risking them accidentally burning the substantial resources of other projects and (2) to create a platform to facilitate the exchange between users.

Currently, around 640 active users from more than 200 institutions worldwide are using the data. A significant increase in the usage of DYAMOND resources was observed in 2025 around and following the Digital Earths km-scale hackathon (May 2025). In 2026 the usage was mostly consistent with the period after the hackathon, indicating a continuous need for the resources in this project (Fig. 1). New requests for the DYAMOND Summer and Winter datasets are still being received.

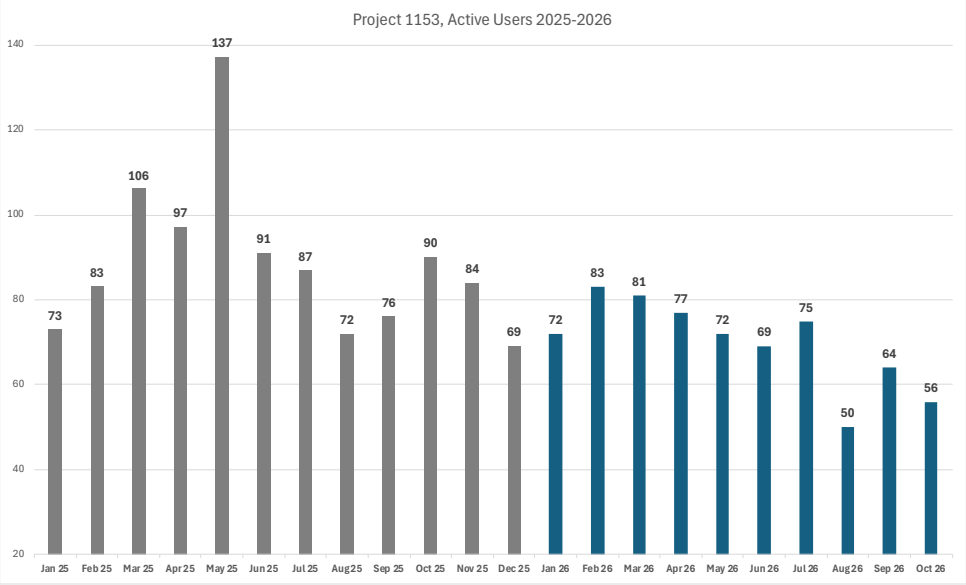


Figure 1: Count of users consuming cpu hours in a given month.

Although the nextGEMS project has ended in Aug 2025, each new simulation cycle has attracted new users to analyse these storm-resolving simulations. This community has continued to grow even after the project end and and we have received several requests for a prolongation of project 1153 as publications are currently in the making.

The DYAMOND intercomparison data sets are also attractive to scientists from all over the world. Although the last period of the initiative (DYAMOND Winter) was started in 2019 and the supporting project ESiWACE2 ended in March 2023, there still are new users requesting data access. The easy access to DYAMOND data attracts especially young scientists from all over the world, and they use these resources to learn how to work with global high-resolution data sets and make efficient use of pre-exascale simulations.

In conclusion, despite the official ends of ESiWACE2 and nextGEMS, we expect continued interest in and use of these simulations in 2027. However, we are planning year 2027 as a closing-up of the DYAMOND bb1153 project, with users being asked to remove their data or transfer these to other projects. This is related to the plans in the BMFTR WarmWorld Phase 2 project (2027 – early 2030), which will include hackathons continuing the tradition of the nextGEMS hackathons. To maintain consistency with the WarmWorld developments, bb1153-like resources will be requested within the bk1341 project, to support the hackathons, as well as the existing and expanding community.

Publications

In addition to the numbers above, the usefulness of the DYAMOND project in providing the resources for research is shown in an high number of publications referencing the data of the nextGEMS and DYAMOND simulations, and acknowledging this project at DKRZ in the storage and/or computing support, e.g. Dolores-Tesillos et al. (2026), Pedruzo-Bagazgoitia et al. (2026), and Veerman and Heerwaarden (2026).

We have compiled a list of publications referencing project bb1153 in the publications form of this resource application. This list is non-exhaustive, as the users do not report their publications to us. Publications from the nextGEMS project are also listed at `https://nextgems-h2020.eu/publications/`.

Literature

Dolores-Tesillos, E., O. Martius, and S. Pfahl (2026). "Atmospheric blocking representation in storm-resolving climate models under historical and future forcing". In: *Weather and Climate Dynamics* 7.3, pp. 1089–1116.

Pedruzo-Bagazgoitia, X., B. Sützl, E. Dutra, J. McNorton, A. Tsiringakis, and C. Rüdiger (2026). "Unlocking urban climate change analysis in global kilometer-scale climate simulations". In: *Geophysical Research Letters* 53.13, e2025GL120583.

Veerman, M. A. and C. C. van Heerwaarden (2026). "The impact of horizontal resolution on surface irradiance over land in km-scale earth system models". In: *Journal of Geophysical Research: Atmospheres* 131.3, e2025JD044845.