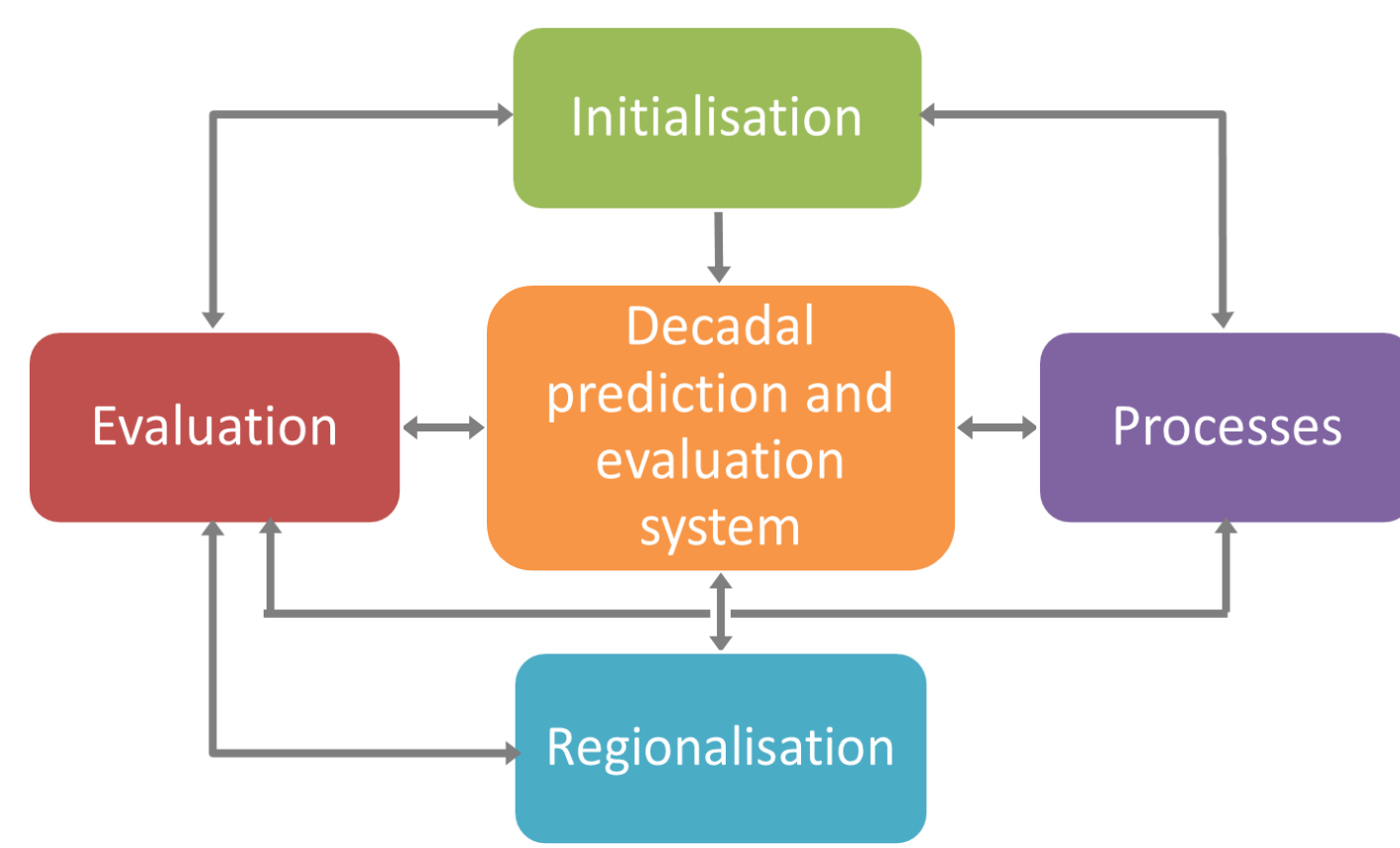


MiKlip Server

Data provision and evaluation for and with the MiKlip community

Freja Vamborg, Christopher Kadow and Holger Pohlmann



The research modules

1. MiKlip in a nutshell

- The **MiKlip project** is funded by the German Federal Ministry of Education and Research (BMBF) and pursues research on decadal climate prediction. The ultimate goal of MiKlip is to establish an operational decadal climate prediction system. Originally funded for a four-year period, the project has now been extended into a second phase of three years of additional research, plus one further year for the operational implementation. During MiKlip II, increased attention will be given to the operational use of the decadal prediction and evaluation systems, and to the direct involvement of potential users of decadal predictions.
- The **MiKlip Server** is a project-owned server used by the MiKlip community as a central data storage and exchange, and for the evaluation of the prediction system. The server is hosted at the DKRZ, with a capacity of 1PB disk space and 11 blades.

2. Central evaluation system (CES)

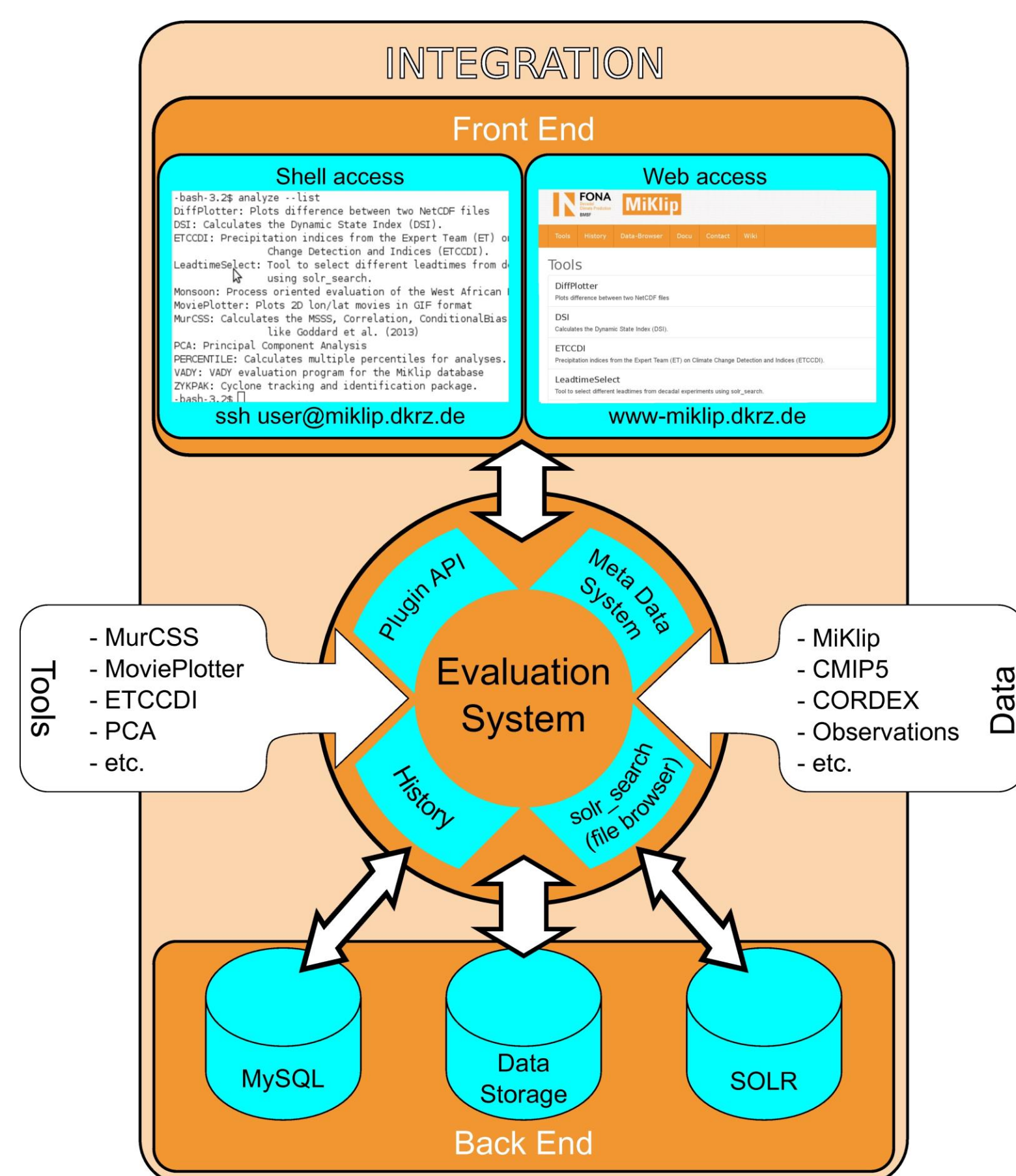
➤ Evaluation of the prediction system

In order to make any statement about the performance of the prediction system it needs to be evaluated. The different ways of evaluating the model, both the different **tools** and **datasets**, are synthesised into the **central evaluation system (CES)** by the INTEGRATION project.

➤ Aim – Standardised evaluation and comparison

The CES allows for a standardised comparison between the generations of the decadal prediction system, and also between these and other alternative hindcasts proposed within the project or from other modelling institutions.

➤ Centralised search for data – the Data Browser



➤ Central tool – MurCSS

At the core of the evaluation system is the plugin MurCSS (Illing et al, 2014) - *Murphy-Epstein decomposition of the MESS and the CRPSS*, a tool, which uses and extends the verification framework for decadal predictions suggested by Goddard et al. (2013), and which is the recommended first step to take when analyzing the hindcasts.

➤ Flexible and user-oriented

Access either via the shell or via a web-interface, allowing for a very flexible user-oriented utilisation of the system.



Interested?
www-miklip.dkrz.de
 Click on „guest?“

3. Central data storage

➤ Global hindcasts

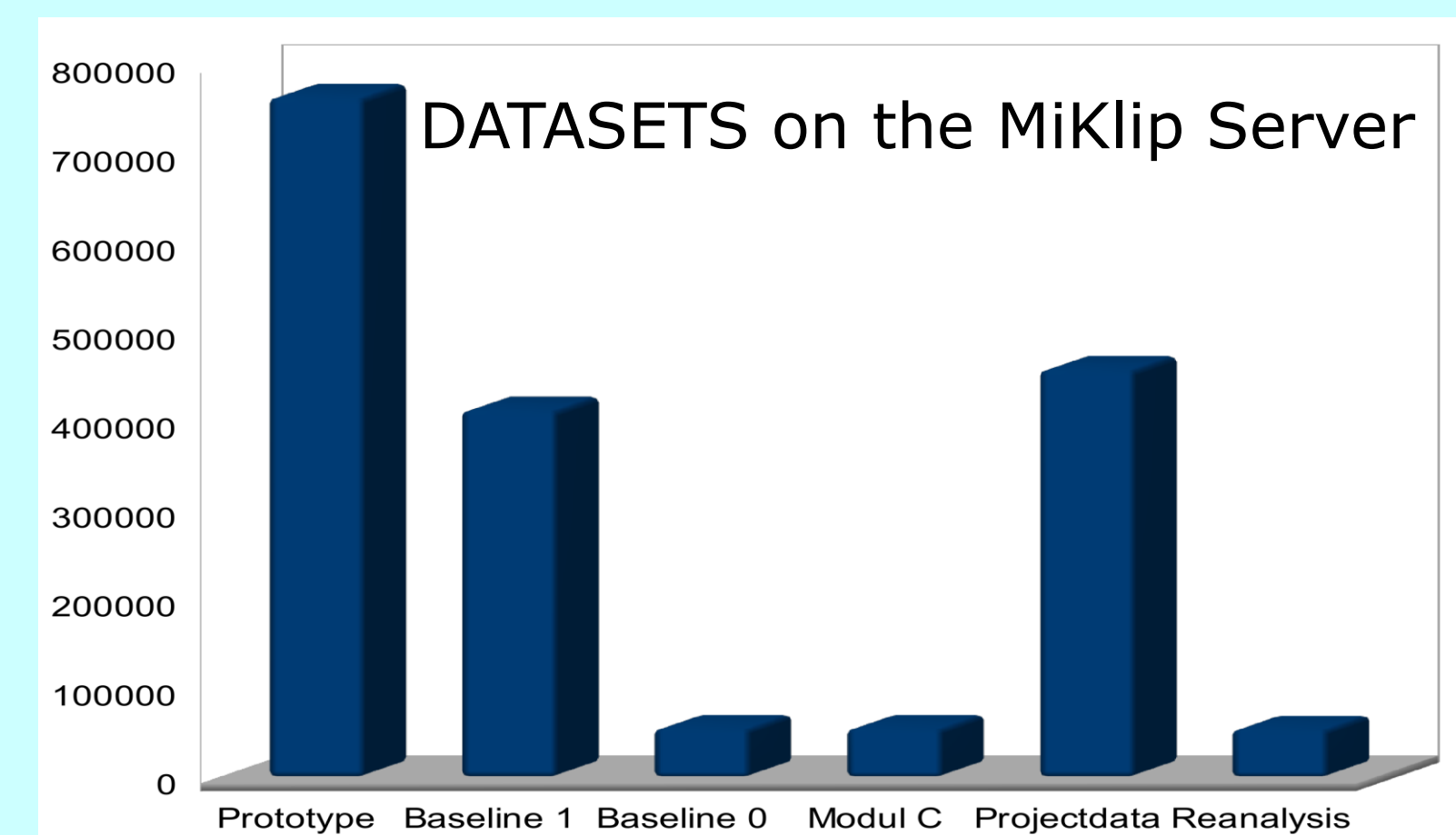
The decadal hindcasts (retrospective forecasts) from the prediction system are at the core of MiKlip research. Hindcasts from three generations of the system have been produced by the FLEXFORDEC project and added to the server (CMIP5 or Baseline 0, Baseline 1 and Prototype). → See poster [bm0807](#)

➤ Regional hindcasts

A subset of the global hindcasts were downscaled to regional hindcasts by Module C – Regionalisation. → See posters [bm0849](#) and [bm0859](#)

➤ Observational and reanalysis datasets

To facilitate a common evaluation of the hindcasts, standard datasets from Obs4MIPs (Observations for Model Intercomparisons) and the ECMWF are provided centrally.



Shown is the aggregated number of datasets of MiKlip project phases, different users (20) in "projectdata" and validation data.

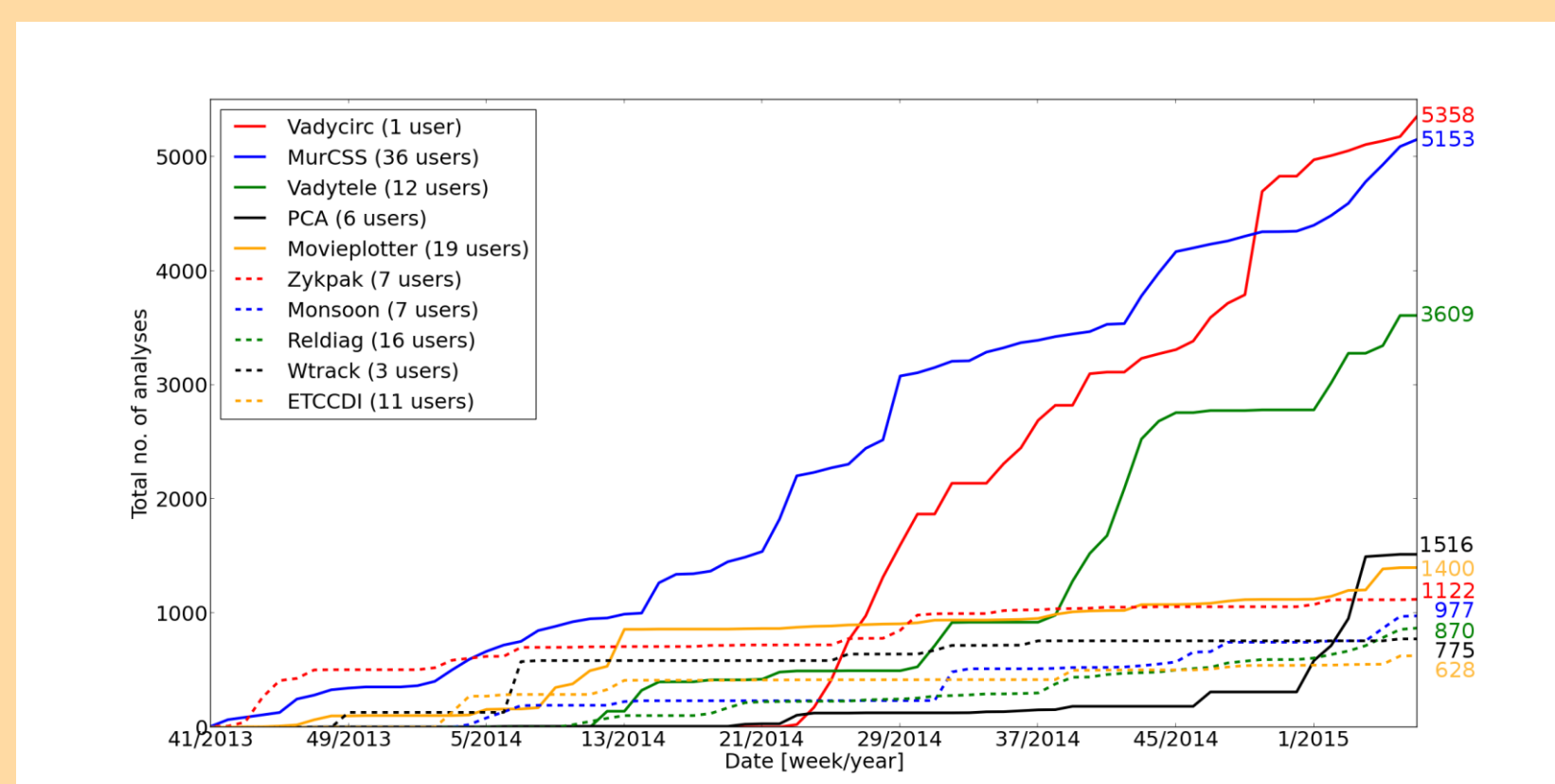
➤ CMIP5 and CORDEX CMOR standards

To facilitate the use of the data, all model output is provided according to the CMOR-standard, as it was used for CMIP5, with an extended list of variables, to cover the needs of all project partners. Observational and reanalysis datasets follow the Obs4MIPs convention.

4. Tools and plug-ins from the MiKlip community

Due to the flexible modular nature of the CES, users can easily add their tools to the evaluation system, which now contains some 20 plug-ins, ranging from pure plotting routines to tools for statistical analysis.

TOP 10 PLUGINS OF THE CES



Shown is the aggregated number of analyses performed with the 10 most used tools as a function of time starting from October 2013.

6. Next developments

- MiKlip II server as extension of Mistral → increased usability.
- Integrated hindcast and forecast visualization front-end.
- Classification of tools in different tiers.

5. Datasets from the MiKlip community

➤ Project data

Users can add their own model data to the system, as long as it follows the CMOR structure. By doing so, the data becomes searchable and can be analysed with the CES. Several projects have used this opportunity: → See posters [bm0775](#), [bm801](#) and [bm870](#).

➤ New observational datasets

Several MiKlip projects have provided new observational datasets:

- ❖ (Homogenized) historical German radiosonde measurements (Project MOSQUITO), DOI: 10.5676/DWD_CDC/PAST-RS-H and ../PAST-RS-R
- ❖ Global gridded precipitation dataset (Project DAPACLIP), DOI: forthcoming
- ❖ Gridded precipitation dataset for North Africa (Project VESPA)
- ❖ Global gridded Terrestrial Water Storage (TWS) variations estimated from The Gravity Recovery and Climate Experiment (Project GeoClim)

References:

- Goddard, L., et al, 2013: A verification framework for interannual-to-decadal predictions experiments. *Climate Dynamics*, Volume 40, Issue 1-2, pp 245-272.
- Illing, S., C. Kadow, O. Kunst, and U. Cubasch, 2014: MurCSS: A Tool for Standardized Evaluation of Decadal Hindcast Systems. *Journal of Open Research Software*, 2(1):e24, DOI:10.5334/jors.bf.

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