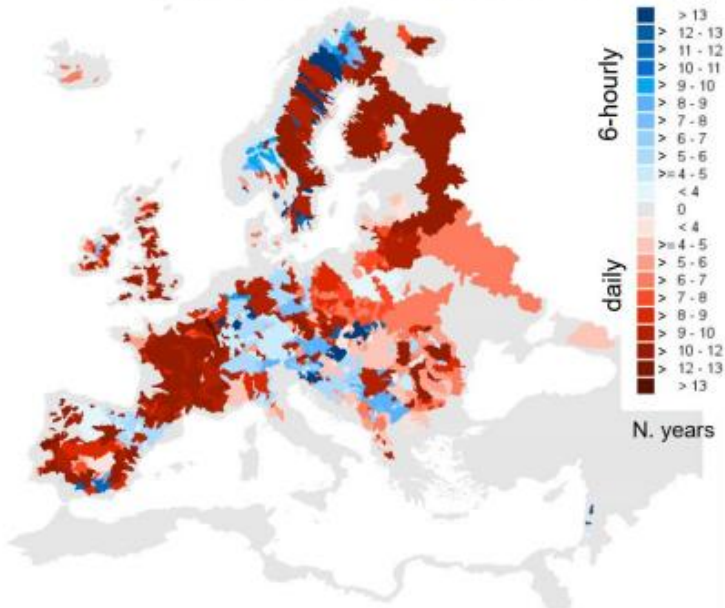


## THE CHALLENGE

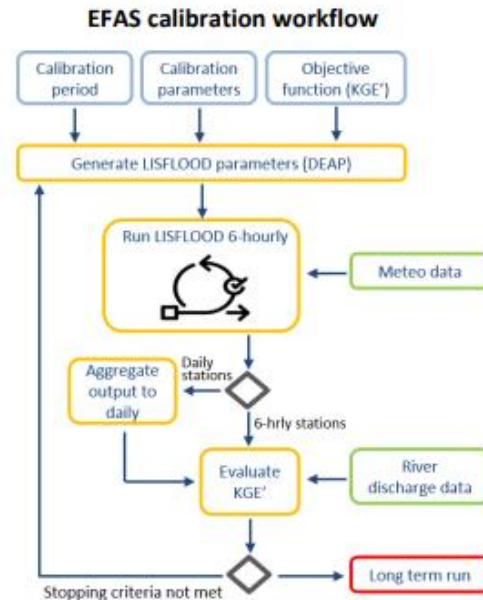
- Calibrate LISFLOOD hydrological model on an area  $\sim 4\text{Mil km}^2$  at 5km spatial resolution
- 1137 calibration stations with 6-hourly and daily data over the period 1990-2017
- Diverse catchments: from 500 km<sup>2</sup> to 800'000 km<sup>2</sup> in drainage area, from steep flashy catchments to large routing dominated ones

Spatial distribution for 6-hourly (blue) and daily stations (red) with data availability as colour hue



## EFAS CALIBRATION

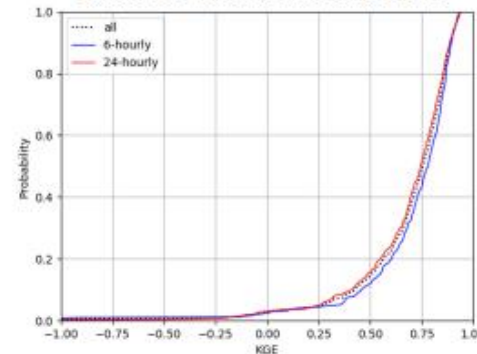
- Used an Evolutionary Algorithm (EA) (DEAP), ECMWF's work scheduler (ecFlow) and HPC infrastructure
- Performed on 14 LISFLOOD parameters with 6-hourly modelling steps
- 6-hourly model outputs were aggregated for daily stations
- Used modified KGE as metric



Spatial distribution of the EFAS v4.0 hydrological performance (KGE') across the EFAS domain combined with correlation: stations with  $KGE' < 0.7$  and correlation  $\geq 0.7$  are highlighted in cyan. For each point, size of the dot represents area of the upstream catchment.

Further reading:  
KGE' decomposition and full results on the [CEMS wiki](https://www.cems.wiki)

Cumulative distribution function of EFAS KGE' at calibration stations



## RESULTS

- Evaluation performed on the period 1991-2017 using modified KGE
- **Median KGE' = 0.75 across Europe**
- Similar performance for stations with 6-hourly or 24-hourly observations, 6-hourly slightly better

Operational since Oct 2020 [www.efas.eu](http://www.efas.eu)

