

## Meteorological observations

The European Flood Awareness System relies on hydro-meteorological observations, numerical weather predictions and satellite images to produce, verify, calibrate and post-process the flood forecasts.

In this context we would like to share with you

1. Which meteorological observations are of interest to EFAS
2. Information on the existing meteorological data collection
3. How you can share your data with EFAS, i.e. the Copernicus Emergency Management System (EMS)

### 1. Which meteorological observations are of interest to EFAS

In summary EFAS is interested in the collection of in situ meteorological data with the following specifications:

- **real-time data**
- **historic data:** from January 1970 onwards
- **meta data:** latitude, longitude, elevation, instrument specifications
- **temporal resolution:** highest available (minimum daily)
- **variables:**
  - Precipitation
  - 2m air temperature
  - Daily minimum 2m air temperature
  - Daily maximum 2m air temperature
  - Dew point temperature
  - 10m Wind speed
  - 10m Wind direction
  - Cloud cover
  - Water vapor pressure
  - Solar radiation
  - Sunshine duration
  - Relative air humidity
  - Evaporation

EFAS needs historic and real-time in situ meteorological data. The first are needed to calibrate the hydrological model as well as to compute long term statistics for the applied quality control procedures. Therefore observational data back to January 1970 are collected. The second, the real-time observations are needed to accurately compute the initial conditions of the forecasts.

Regarding temporal resolution we prefer to get the data at a high temporal resolution (15 minutes upwards) to be able to aggregate different totals, which can be used to run the hydrological model with a sub-daily time step. Also, high resolution data allow to compute minima, means and maxima over several periods, and contribute to the robustness of the quality control.

Correct and accurate metadata are crucial as they determine the quality of the database and hence the hydrological predictions. Therefore we are collecting latitude and longitude with at least five decimals precision (preferable WGS84) and elevation with vertical reference system. Also, for rainfall amounts, we are interested in instrument type and height above ground to be able to apply under-catch corrections.

**We know that not all existing stations observe all above mentioned variables and neither all at a high temporal resolution. However, the more comprehensive the in situ data collection, the more reliable the forecasts will become.**

## 2. Information on the existing meteorological data collection

First of all, EFAS and in particular the MDCC would like to **thank each data provider for contributing to EFAS** i.e. to the Copernicus EMS with their data and their effort! We are well aware that this is an additional burden on your side and you do it on a voluntary basis, which we appreciate and acknowledge highly!

### Data providers of real-time meteorological in situ observations:

- [Deutscher Wetterdienst \(global WMO GTS SYNOP station data + national German station data\), global; Germany](#)
- [Agenzia Regionale per la Prevenzione e l'Ambiente dell'Emilia-Romagna; Italy](#)
- [Slovenian Environment Agency, Slovenia](#)
- [Czech Hydro-Meteorological Institute, Czech Republic](#)
- [Wageningen Environmental Research](#) (ALTERRA, quality controlled European WMO GTS SYNOP and additional station data), Europe
- [MeteoSchweiz \(station data + CombiPrecip radar data\), Switzerland](#)
- [Met Éireann, Ireland](#)
- [Norwegian Meteorological Institute, Norway](#)
- [Automatic System of Hydrological Information \(SAIH\) for the Ebro river basin, Spain](#)
- [Slovak Hydro-Meteorological Institute, Slovakia](#)
- [Zentralanstalt für Meteorologie und Geodynamik, Austria](#)
- [Institute for Ocean and Atmosphere, Portugal](#)
- Hydrometeorology Institute of Kosovo, Kosovo
- MeteoConsult, global

### Data provides of historic meteorological in-situ observations:

- [NMI](#)
- [CarpatClim, Eastern Europe](#)
- [ERA-Interim-land, South and Eastern Europe + Iceland](#)
- [EURO4M-APGD, Central Europe](#)
- [MeteoSwiss](#)
- [IMW, Poland](#)
- ECA, global?

If you have data that you'd be willing to share, but you don't know if those are already part within the current meteorological data collections please contact the MDCC (see below).

### 3. How you can share your data with EFAS i.e. EMS

The company **KISTERS AG** and the **Global Precipitation Climatology Centre** (GPCC) have been contracted by the European Commission to operate the **Meteorological Data Collection Centre** (MDCC) for the Copernicus Emergency Management Service (EMS). With KISTERS hosting the data base, quality control procedures and gridding schemes, and GPCC in charge of governing and improving the quality control procedures and to act as focal point for data providers.

If you like to share your data with us, you can chose one of **four possible transfer methods**:

1. MDCC pulls the data from an ftp-server operated by your service
2. You push the data to an ftp-server operated by MDCC
3. You send the data as attachment via email to a specified email address
4. MDCC pulls the data via webservices (specific discussion and agreement required)

As data formats we ask for

1. KISTERS zrxp format (text file format)
2. WMO conform BUFR FM94
3. WMO conform TAC FM12

In case you want to provide data in other formats please provide a detailed format description.

For the data provision and further utilization the “**License agreement for the use of data and/or products for the Copernicus Services**” between the European Environment Agency (EEA) and EUMETNET, signed in December 2017, is applied (see <https://efascom.smhi.se/confluence/display/EJ/EUMETNET+Public+Data+License+Agreement+with+the+Copernicus+Services>).

If you have any further question regarding the data collection, please don't hesitate to contact Markus Ziese ([efas.mdcc@dwd.de](mailto:efas.mdcc@dwd.de), [+49-\(0\)69-8062-2973](tel:+49-069-8062-2973)).