

Technical Readme

The datasets, provided as NetCDF files, contain the underlying data analysed in the report [Evaluation of discharge extremes in the Meuse river and her tributaries](#) (Couasnon et al., 2023), which is available on the Rijkswaterstaat Publicatie Platform.

The datasets include block maxima (annual, summer, and winter maxima) and the corresponding Generalized Extreme Value (GEV) distribution parameters. These results are derived from synthetic daily and hourly discharge time series for the Meuse River and its tributaries. The synthetic discharge time series were generated by forcing synthetic meteorological time series representing the current climate (available here: <https://dataplatform.knmi.nl/dataset/access/emfloodresilience-meuse-discharge-1-0>) into the wflow_sbm hydrological model of the Meuse basin.

The synthetic meteorological data consist of 16 ensemble members of 65 years each, yielding a total of 1,040 years of data representing the current climate. As the analysis is performed using the hydrological year (from 1 October to 30 September), this results in 1,024 years of synthetic discharge data. Annual maxima are extracted from the modelled discharge time series and used to fit a GEV distribution; the estimated GEV parameters are included in the datasets.

From the synthetic daily discharge data, the following gridded datasets are provided:

- Annual maxima values for each of the 16 ensemble members;
- Summer maxima values for each of the 16 ensemble members;
- Winter maxima values for each of the 16 ensemble members;
- GEV parameters derived from the 1,024 years of annual maxima;
- GEV parameters derived from the 1,024 years of summer maxima;
- GEV parameters derived from the 1,024 years of winter maxima;
- Daily discharge values for each of the 16 ensemble members.

For the 15 stations analysed in detail in the report, the following scalar datasets are provided:

- Annual maxima values at the daily time step for each of the 16 ensemble members, including the corresponding dates;
- Annual maxima values at the hourly time step for each of the 16 ensemble members, including the corresponding dates;
- GEV parameters estimated from the 1,024 years of synthetic daily annual maxima;
- GEV parameters estimated from the 1,024 years of synthetic hourly annual maxima;
- Daily discharge for each of the 16 ensemble members
- Hourly discharge for each of the 16 ensemble members

The coordinates of the stations is provided in the coordinates of each netcdf file.

The data were produced by Deltares in collaboration with Rijkswaterstaat and KNMI as part of the EMfloodResilience project, carried out within the framework of Interreg V-A Euregio Meuse-Rhine. The project is 90 % funded by the European Regional Development Fund. For questions regarding the data or for additional data requests, please contact Anaïs Couasnon (anaïs.couasnon@deltares.nl) or Laurene Bouaziz (laurene.bouaziz@deltares.nl).

The overview of the datasets is summarised in the Table below:

Description	Data type	Time step	Dimensions	Variable	Name
Annual maxima (AM) values from each ensemble member	Gridded	Daily	lat, lon, member, year	Q (m3/s)	Meuse_synthetic_AM_daily_discharge_ensembles.nc
Summer maxima (SM) values from each ensemble member	Gridded	Daily	lat, lon, member, year	Q (m3/s)	Meuse_synthetic_SM_daily_discharge_ensembles.nc
Winter maxima (WM) values from	Gridded	Daily	lat, lon, member, year	Q (m3/s)	Meuse_synthetic_WM_daily_discharge_ensembles.nc

Description	Data type	Time step	Dimensions	Variable	Name
each ensemble member					
GEV parameters from the 1,024 years of AM	Gridded	Daily	lat, lon, dparams (dparams = shape <i>c</i> , location <i>loc</i> and scale <i>scale</i>)	Q_params	Meuse_synthetic_GEV_params_AM_daily_discharge_combined.nc
GEV parameters from the 1,024 years of SM	Gridded	Daily	lat, lon, dparams (dparams = shape <i>c</i> , location <i>loc</i> and scale <i>scale</i>)	Q_params	Meuse_synthetic_GEV_params_SM_daily_discharge_combined.nc
GEV parameters from the 1,024 years of WM	Gridded	Daily	lat, lon, dparams (dparams = shape <i>c</i> , location <i>loc</i> and scale <i>scale</i>)	Q_params	Meuse_synthetic_GEV_params_WM_daily_discharge_combined.nc
Daily discharge for each ensemble member	Gridded	Daily	time, lat, lon	Q (m3/s)	output_rXi1p5f1.nc where X is the ensemble member from 1 to 16
Annual maxima daily discharge values at selected stations	Scalar	Daily	q_station, date, member	Q (m3/s)	Meuse_synthetic_AM_report_stations_daily_discharge_ensembles.nc
Annual maxima daily discharge values at selected stations	Scalar	Hourly	q_station, date, member	Q (m3/s)	Meuse_synthetic_AM_report_stations_hourly_discharge_ensembles.nc
GEV parameters from the 1,024 years of AM	Scalar	Daily	q_station, dparams (dparams = shape <i>c</i> , location <i>loc</i> and scale <i>scale</i>)	Q_params	Meuse_synthetic_GEV_params_AM_report_stations_daily_discharge_combined.nc
GEV parameters from the 1,024 years of AM	Scalar	Hourly	q_station, dparams (dparams = shape <i>c</i> , location <i>loc</i> and scale <i>scale</i>)	Q_params	Meuse_synthetic_GEV_params_AM_report_stations_hourly_discharge_combined.nc
Daily discharge values at selected stations per ensemble member	Scalar	Daily	time, q_station	Q (m3/s)	Meuse_synthetic_report_stations_daily_discharge_rXi1p5f1.nc where X is the ensemble member from 1 to 16
Hourly discharge values at selected stations per ensemble member	Scalar	Hourly	time, q_station	Q (m3/s)	Meuse_synthetic_report_stations_hourly_discharge_rXi1p5f1.nc where X is the ensemble member from 1 to 16