



# Status of EFAS operation 19-20: experience, issues, challenges

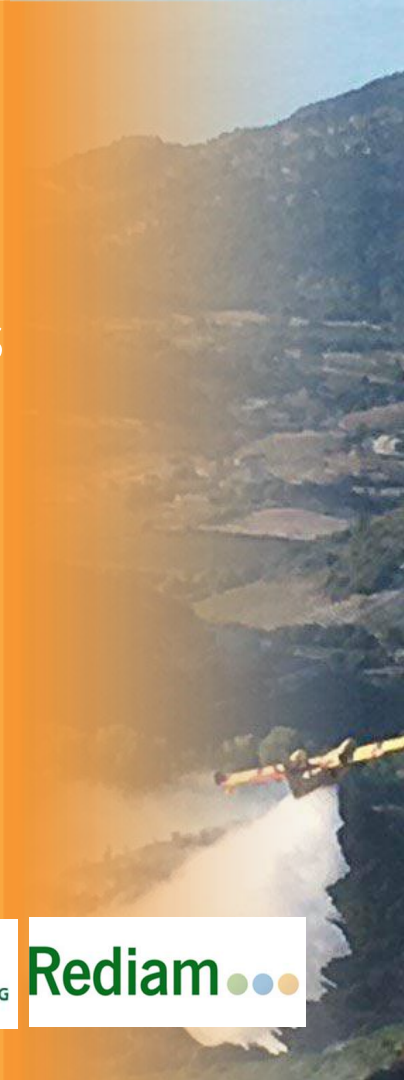


Emergency Management

## CEMS Hydrological Data Collection Centre October 2020



Environmental and Water Agency of Andalusia  
REGIONAL MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING





- The EFAS HDCC Consortium
- HDCC activity
- Current status
- Contact



# Rediam



Environmental and Water Agency of Andalusia  
REGIONAL MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING

The Environment and Water Agency belongs to the Regional Ministry of Environment and Spatial Planning of the Government of Andalusia, and is in charge of essential environmental and water services in Andalusia (Spain).



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# EFAS HDCC TEAM

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# EFAS HDCC ACTIVITY



## What the EFAS HDCC does?

Collection	<ul style="list-style-type: none"><li>• On-line Near Real-Time data collection</li><li>• Off-line Historic data collection</li><li>• Metadata collection, including threshold levels</li></ul>
Post processing	<ul style="list-style-type: none"><li>• Harmonisation: for example, all units are m and m<sup>3</sup>/s</li><li>• Normalisation: for example, timestamp always refers to the end of the aggregation interval</li><li>• Interpolation: for gap filling</li><li>• Data inference: using the rating curve when it is possible</li><li>• Quality check: for outliers detection, range control, etc.</li><li>• Aggregation (1 hour, 6 and 24 hours)</li></ul>



## E F A S H D C C A C T I V I T Y

Sharing data	<ul style="list-style-type: none"><li>• EHDCC Web Interface</li><li>• National Monitoring Layer (OGC-WMS)</li><li>• Metadata</li><li>• Near real-time data</li><li>• Historic data</li><li>• Operational Data (CSV &amp; SOS-WaterML)</li><li>• Dates interval</li><li>• Stations which not sent any data in last 24 hours (OGC-WMS)</li></ul>
Reports	<ul style="list-style-type: none"><li>• Monthly bulletin</li><li>• Annual Report</li></ul>
Comms.	<ul style="list-style-type: none"><li>• Near 120 communications by month with the data providers (mainly by email and phone calls)</li></ul>



# EFAS HDCC DATA PROVIDERS

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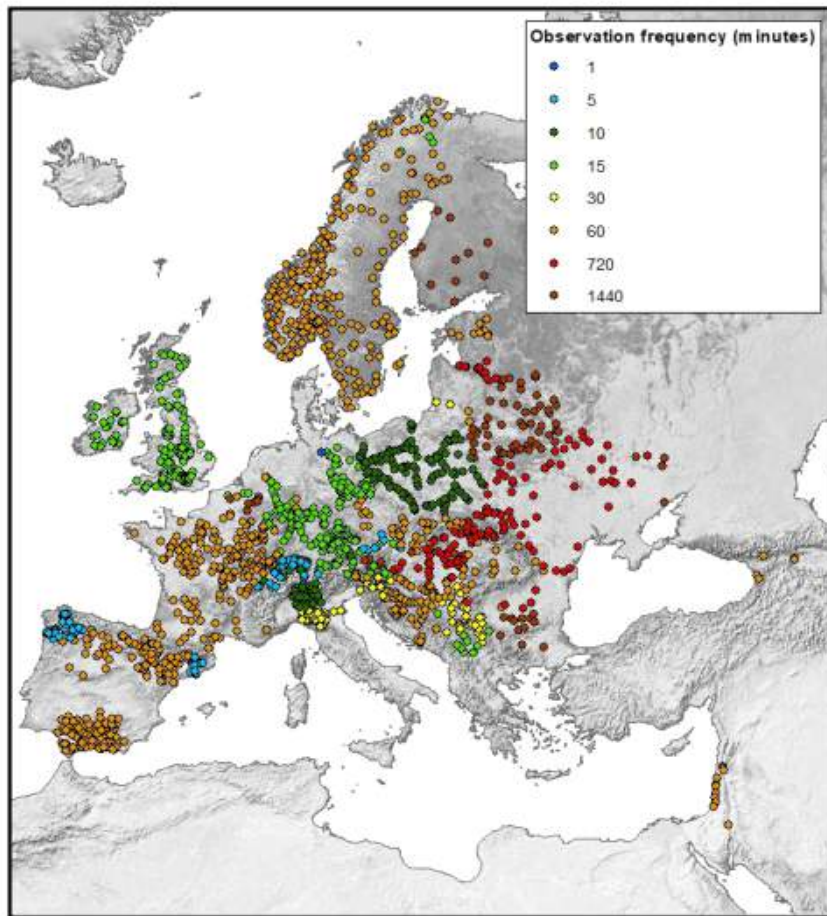






# EFAS HDCC STATIONS

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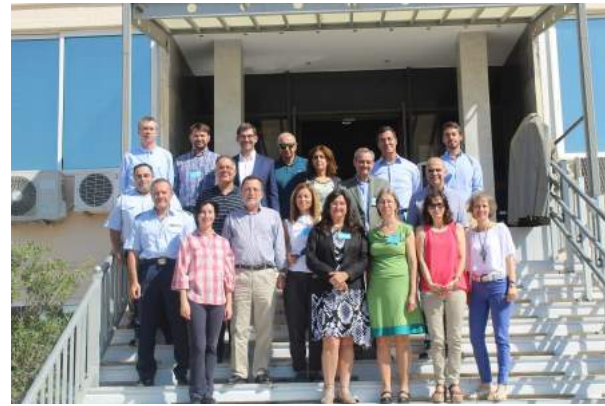
## Focusing on:

- Adding more stations on-board from new data providers
- Switching to collecting through web services when it is possible
- Upgrading the data license
- Reports



## Workshops

- Rome (Protezione Civile), September 2019: participants DISS, COMP, METEO, HYDRO
- Athens, October 2019: DISS & HYDRO





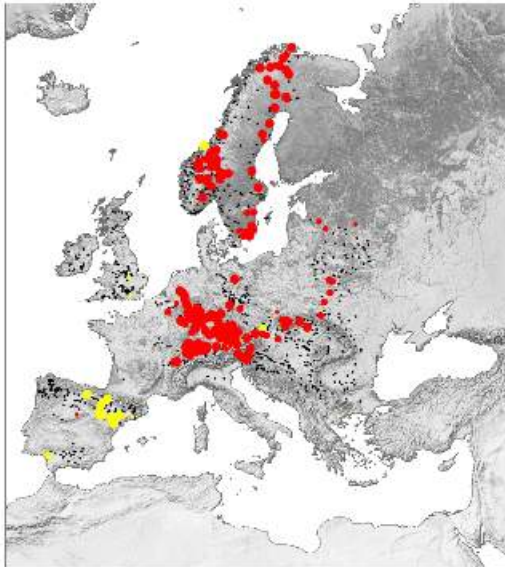
## Participation in the EFAS bulletin

### Monthly classification according to Historical Data average percentile ranges

Month: **January**  
Variable: **Mean Discharge**

EFAS Stations with Percentile Range between 10 - 90  
• EFAS Station

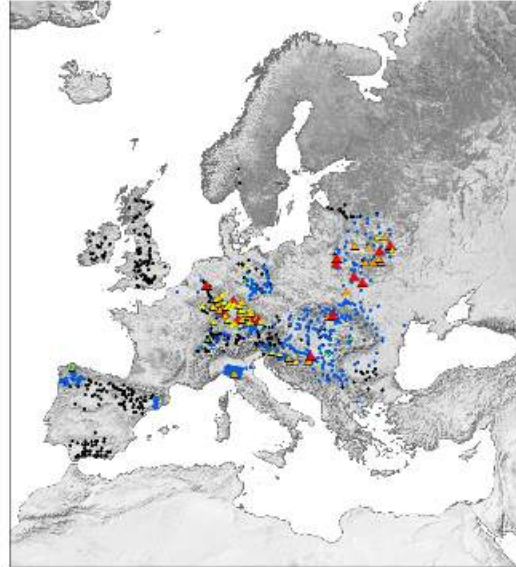
EFAS Stations with Percentile Range <=10 or >=90



### Exceedance of Lowest Alert Levels Provided by Data Providers

Month: **January**  
Variable: **Water level**

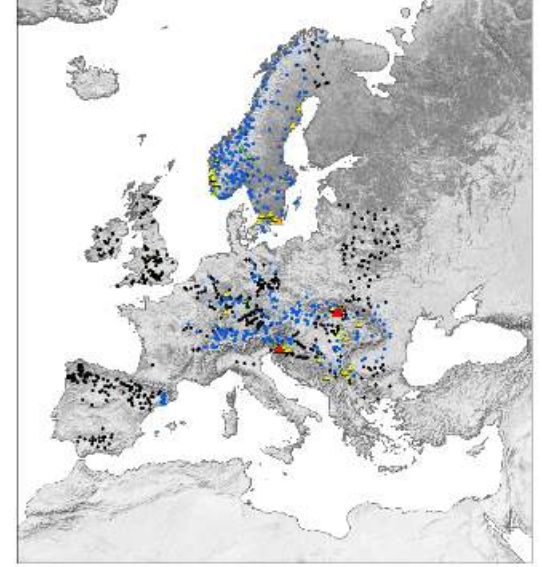
- EFAS Station with Alert Level established
- EFAS Station with Alert Level not established



### Exceedance of Lowest Alert Levels Provided by Data Providers

Month: **December**  
Variable: **Discharge**

- EFAS Station with Alert Level established
- EFAS Station with Alert Level not established





## Annual Report: Analysis on the CEMS Hydrological data collection

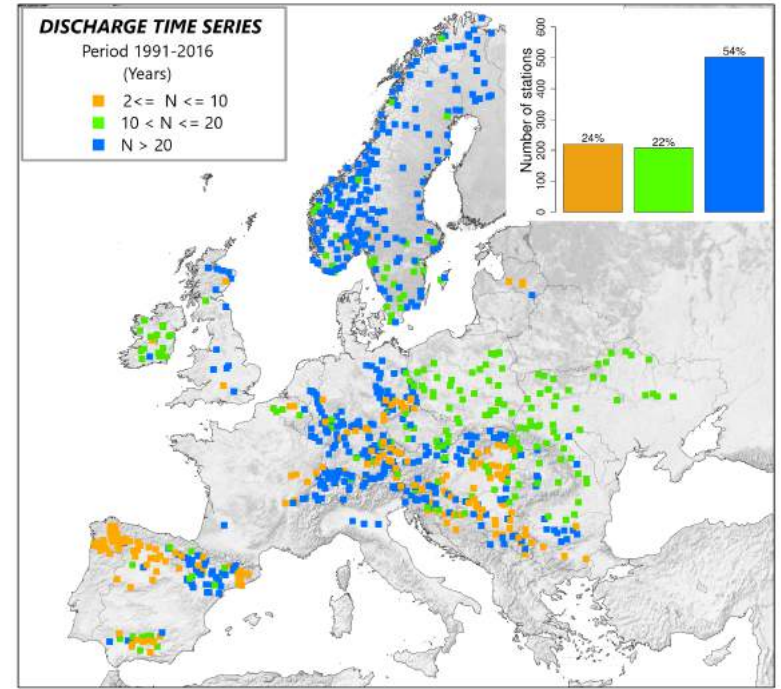
<https://www.efas.eu/en/report/report-analysis-cems-hydrological-data-collection-year-2019>





## Hydrological Conditions

- 1149 stations measuring discharge were analyzed.
- 949 stations have time series longer than 2 years from which more than 50% have more than 20 years of historical data

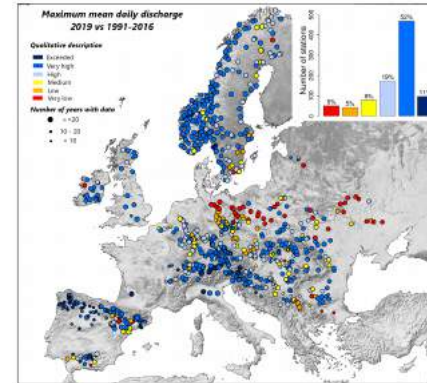
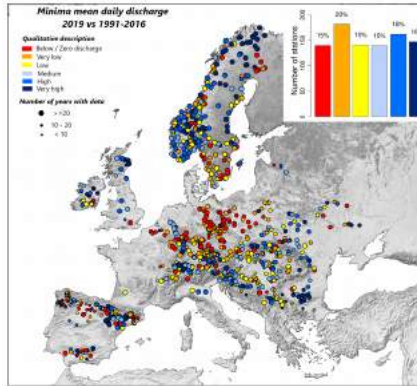
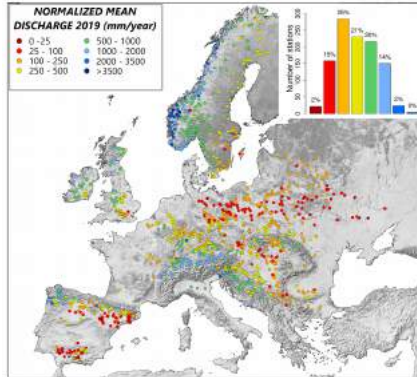




## Hydrological Conditions

The analysis of discharge values for 2019 did not differ much from 2018, although it was clearly lower than it was in the historical period 1991-2016. Especially in Elbe, Oder, Vistula and Dnieper river basins the drier conditions were very pronounced, when comparing to historical period.

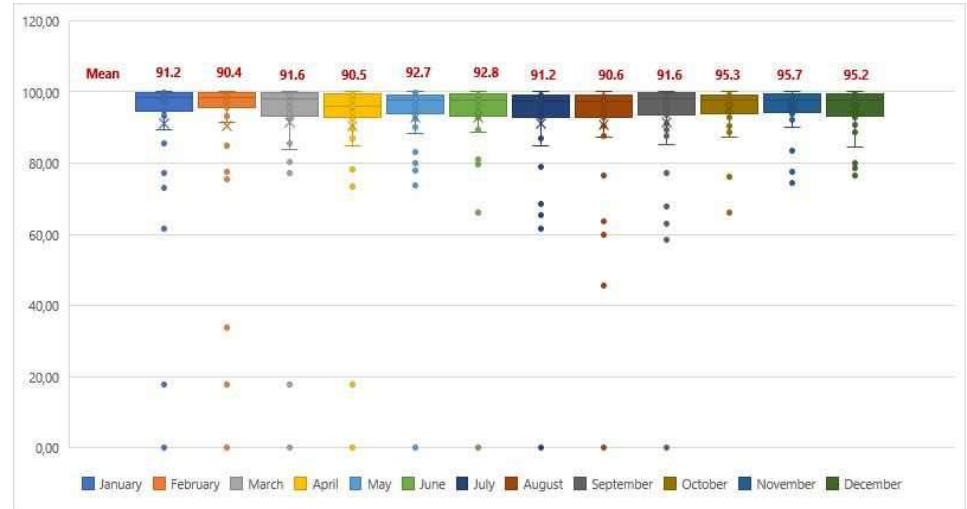
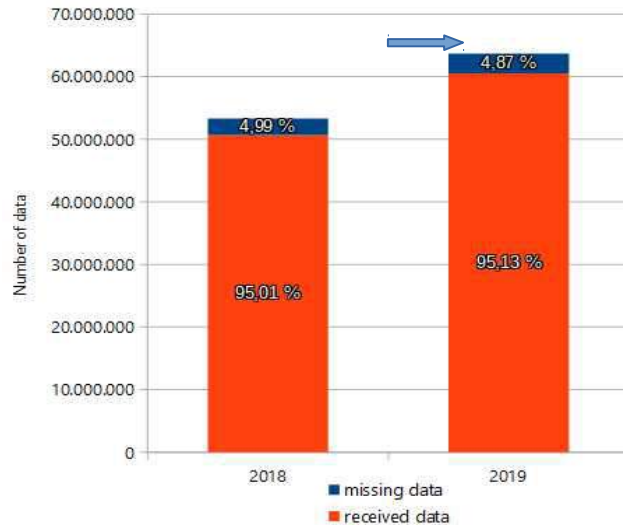
Details about the minimum, maximum and mean historical discharge events are showed in the Annual Report.





## Gaps and outliers analysis

- Gaps: No data received for a specific period of time.
- 95.1% of all expected data were received meaning only 4.9% of data were missing.
- Annual distribution by DP      Regularity in data reception. 90% - 96%.

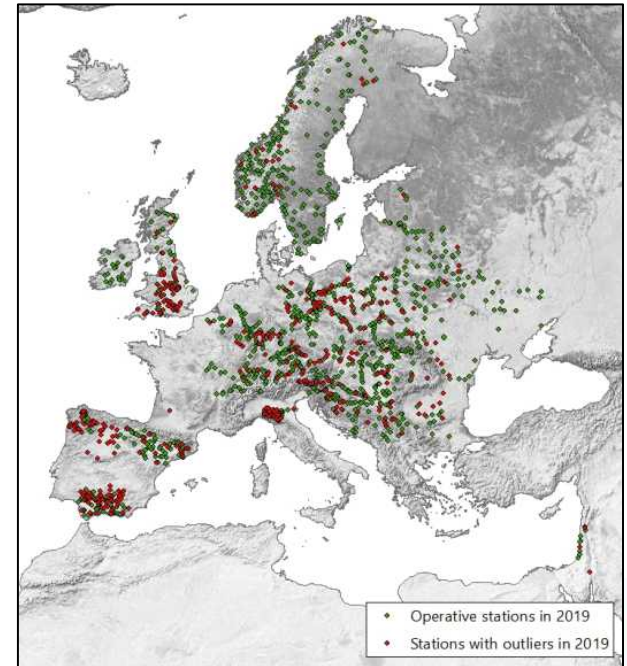
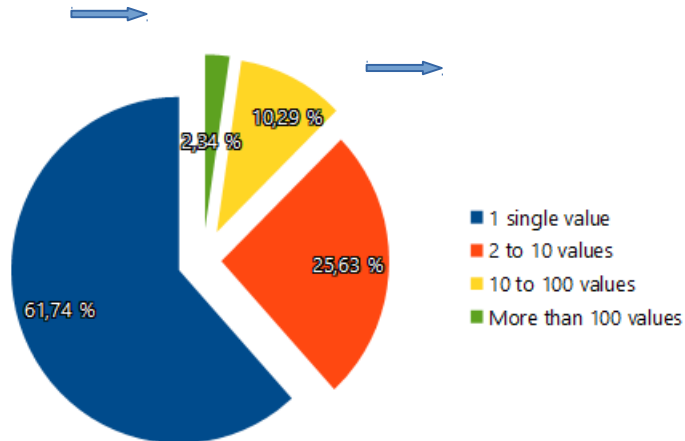






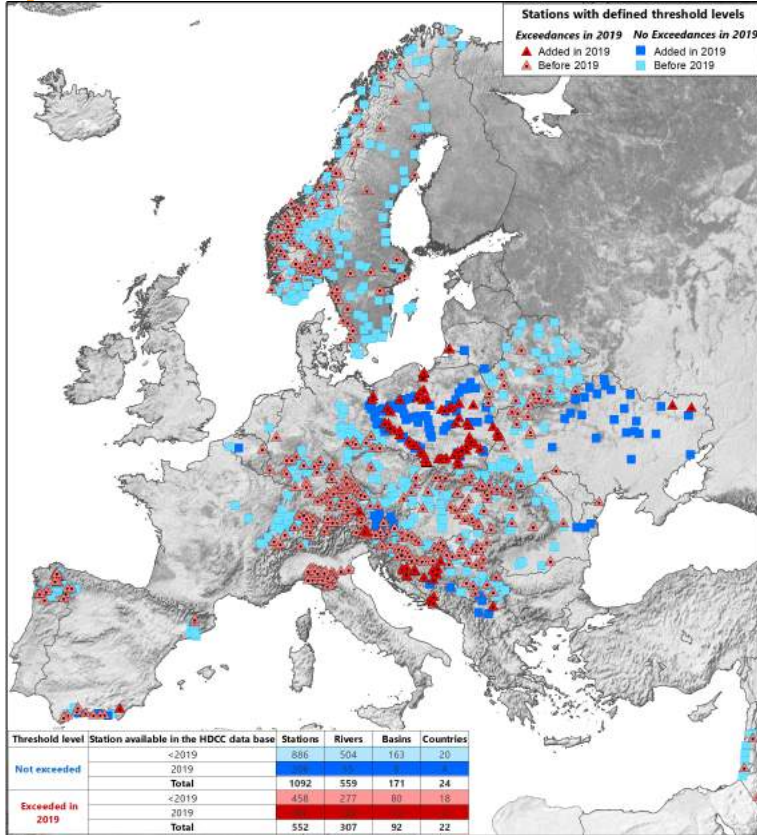
## Gaps and outliers analysis

- Outliers: Erroneous values not corresponding to the natural hydrological behavior for the variable measured.
- Detection: Out of the range established by the quality control threshold levels and further visual analysis confirmation.
- Rate of outlier occurrence 0.3 % in 2019
- Most of outliers single values

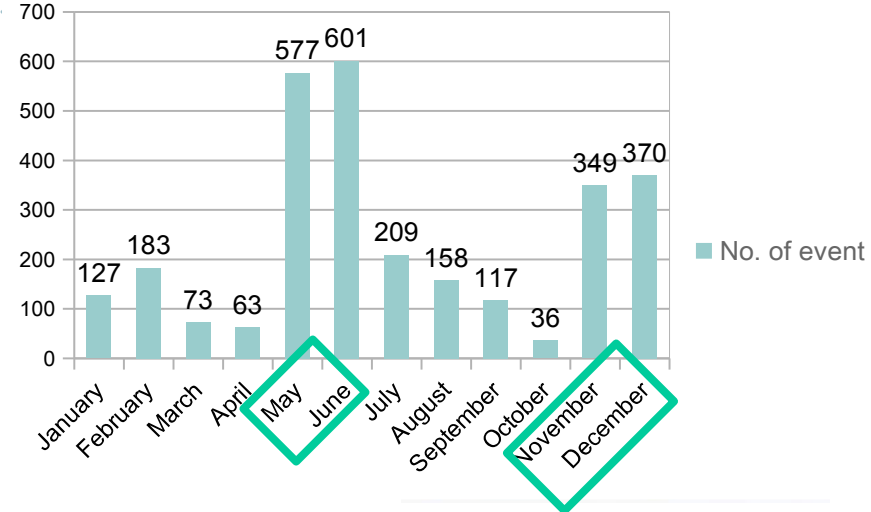




## Exceedances



- **Threshold levels** were available for **1,092 stations** (206 stations more than in 2018): 559 rivers, 171 basins and 24 countries.
- **Threshold levels exceeded in 51% of the stations:** 55% of rivers and 54% of basins.
- **2,747 exceedance events** were registered in 2019 (twice as much if compared with 2018).
- **Most events** took place during the **spring** and the **autumn** months





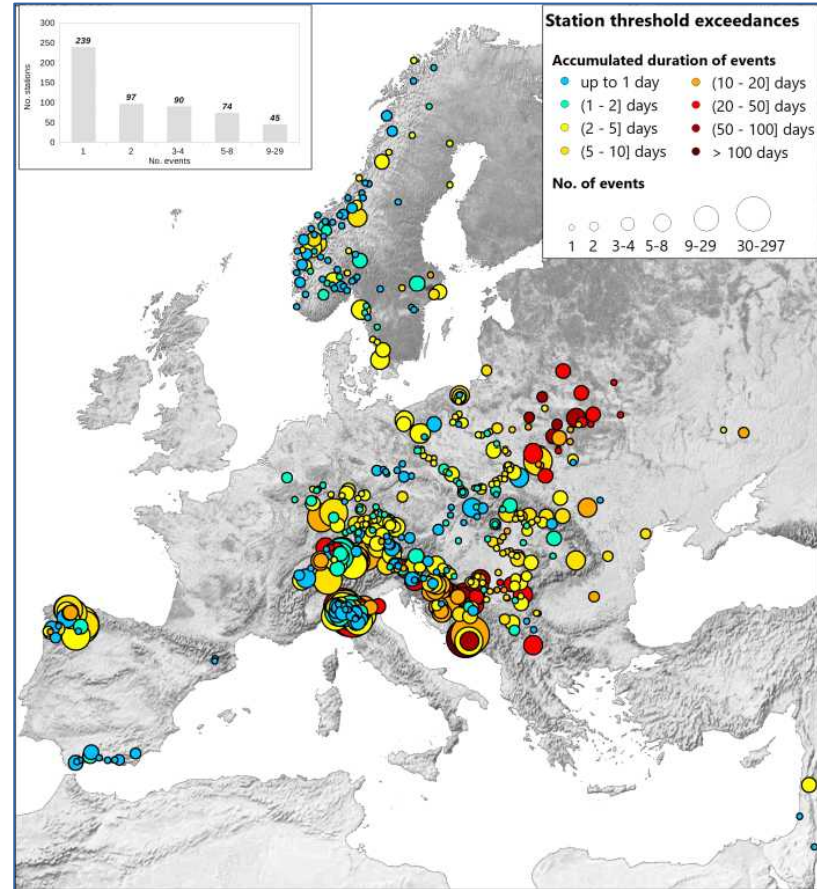
## Exceedances

### Duration



More **exceedance events in 2019** than in 2018, but with a **shorter duration**.

- Average number of events by station: 5** (3 in 2018).
- Average accumulated duration of the events per station : 7.6 days** (14 days in 2018)
- Total accumulated exceedances duration:
  - 80% of the stations < 10 days
  - 20% of the stations > 10 days stations in the Danube, Po, Dnieper, Rhine, Minho, Vistula, Neretva, Neman, Don and Fyris basins.
- Average event duration per station: 3 days** (7.5 days in 2018)
  - 64% of the stations  $\rightarrow \bar{\tau} < 2$  days

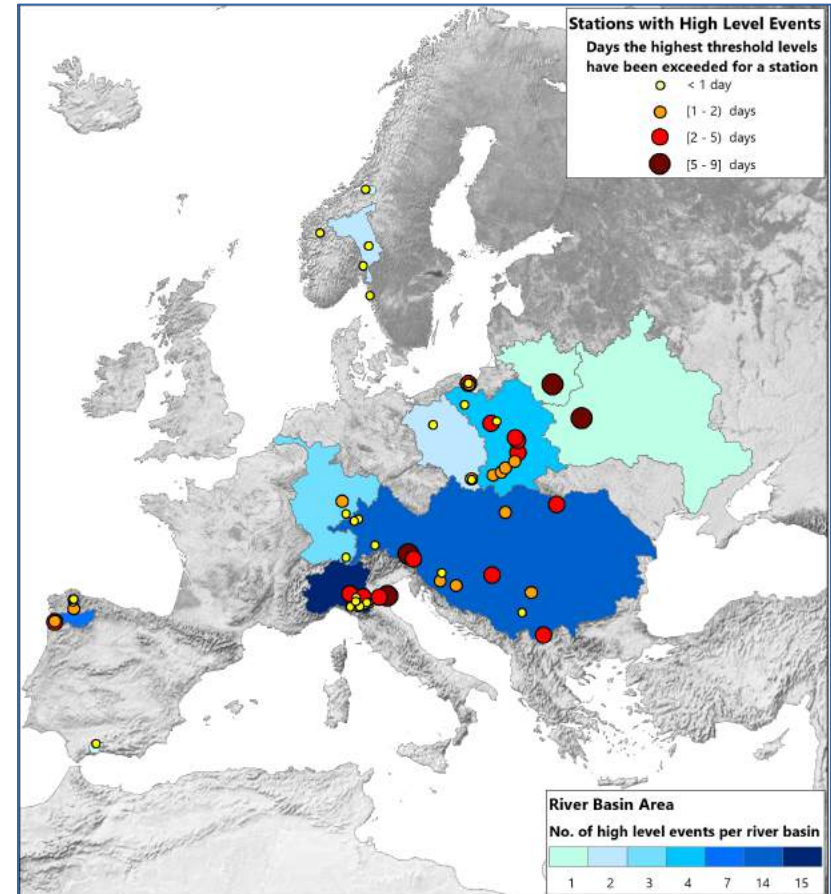




## Exceedances

### Highest threshold level events:

- **3% of all the events** in 2019 were classified as “**extreme events**”, considering stations that have:
  - **more than 1 threshold level**, and the highest threshold has been exceeded.
  - **only 1 threshold level**, and the level has been exceeded by at least 50%.
- **62 stations** registered “**extreme events**”
  - **75% of these stations** are located across the following basins: **Po** (23%), **Danube** (21%), **Vistula** (21%) and **Minho** (10%).
  - **25% are found** in the basins: **Aker**, **Anråsa**, **Dnieper**, **Glomma**, **Guadalhorce**, **Neman**, **Oder**, **Rhine**, **Stjørdal** and **Storelvi**.





## Event analysys

### Available variables

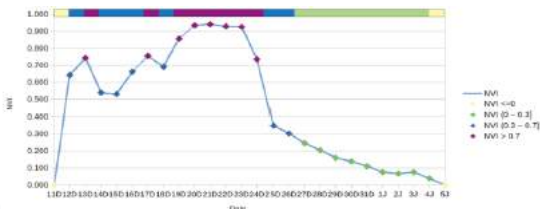
- 103 stations
- Discharge values
- Water level values

### Analysis

- Evolution

#### Normalized Variation Index NVI:

Comparisson between Daily  $D_{MAX}$  and  $D_{MAX}$  for the day 1 of the event

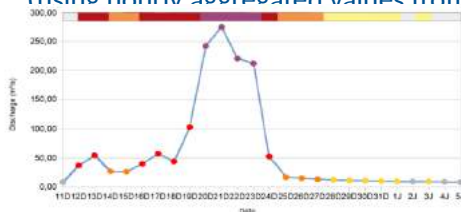


Indicator: N. of days with NVI > 0.7

- Relative Severity

#### Percentiles:

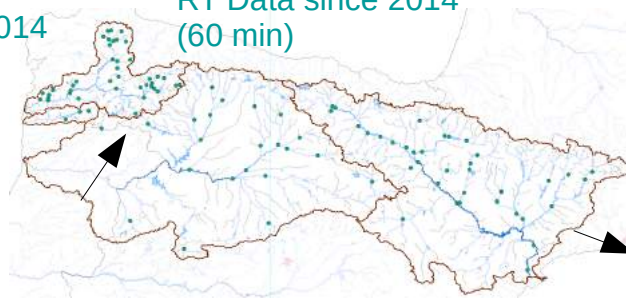
Comparisson between Daily  $D_{MAX}$  and percentiles 90, 95, 99 and Maximum. (using hourly aggregated values from



Indicator: N. of days over P99 and Max

**Douro:**  
RT Data since 2014  
(60 min)

**Minho:**  
RT Data since 2014  
(5 min)

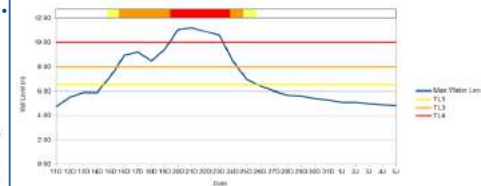


**Ebro:**  
RT Data since 2012  
(60 min)

- Absolute Severity (Minho)

#### Threshold levels:

Comparisson between Daily  $WL_{MAX}$  and Treshold levels



Indicator: N. of days over maximum threshold level exceeded



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# EFAS HDCC CURRENT STATUS



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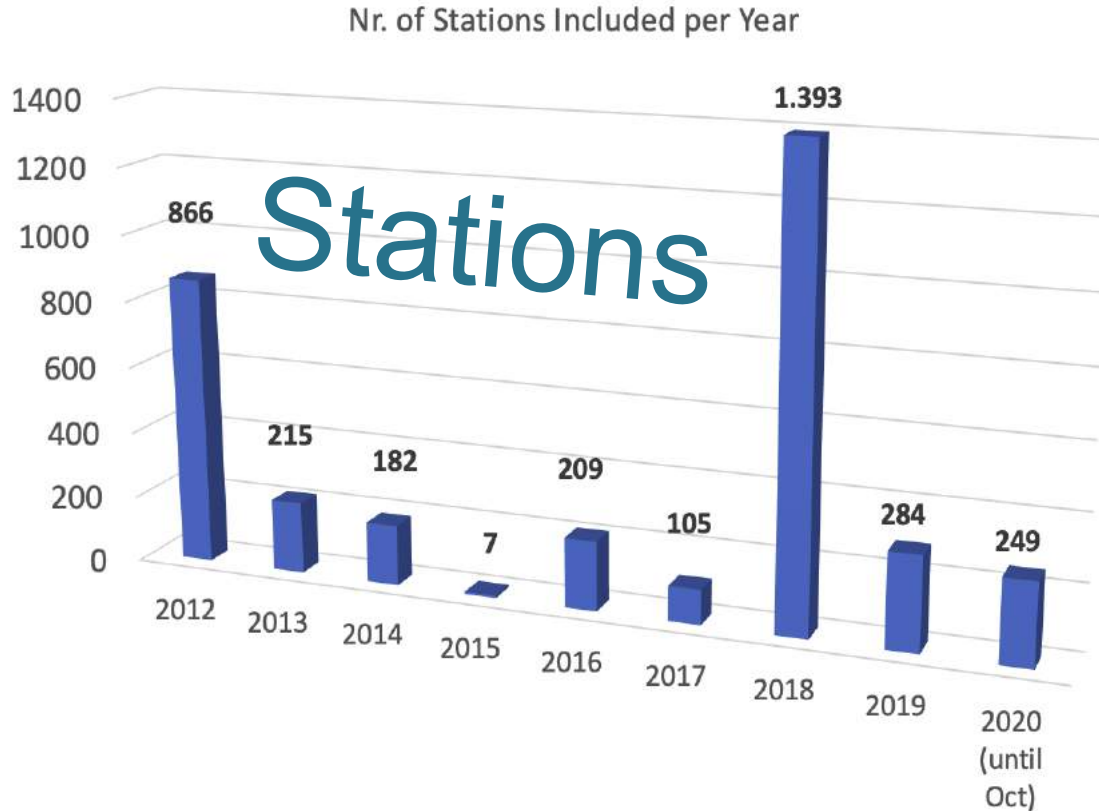
## EFAS HDCC CURRENT STATUS

### Some numbers

3.503	<b>Stations</b> managed by the HDCC, 1.824 of them are active, sending water level and/or discharge.
68	<b>data providers</b> , 44 active.
5.600.000	<b>NRT files loaded</b>
402.300.000	near <b>real-time values</b> loaded (water level & discharge)
126.000.000	<b>historic values</b> loaded (water level & discharge).



## Evolution of the number of stations registered in the HDCC:





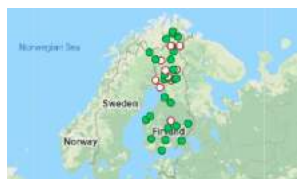
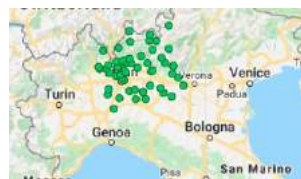


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# EFAS HDCC CURRENT STATUS

## New stations included and/or providing data since May 2019

Data Provider	Nr. Of stations	Status in the HDCC
Estonia (EE-1028)	5	Receiving data
Lithuania (LT-1061)	4	Receiving data
Georgia (GE-1064)	5	Receiving data
Iceland (IS-1065)	28	Receiving data
Finland (FI-1011)	11	Receiving data
Italy - Lombardia (IT-1063)	55	Receiving data
Slovenia (SI-1005)	102	Receiving data
Spain - Jucar (ES-1057)	66	Not receiving data yet (*)
Albania (AL-1049)	16	Not receiving data yet
Italy - PC Lazio (IT-1072)	81	Not receiving data yet (*)



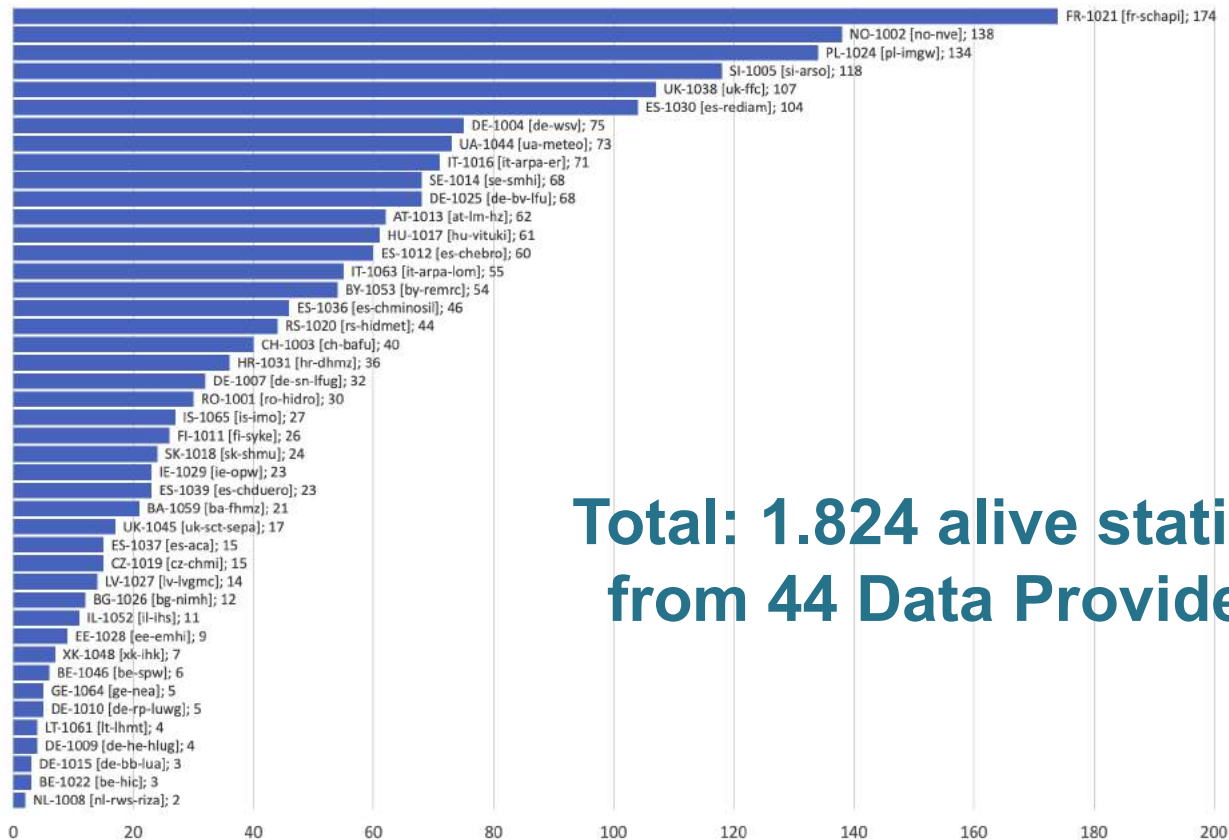
(\*) Very close of data transmission.



# EFAS HDCC CURRENT STATUS

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### Alive Stations per Data Provider



# 174

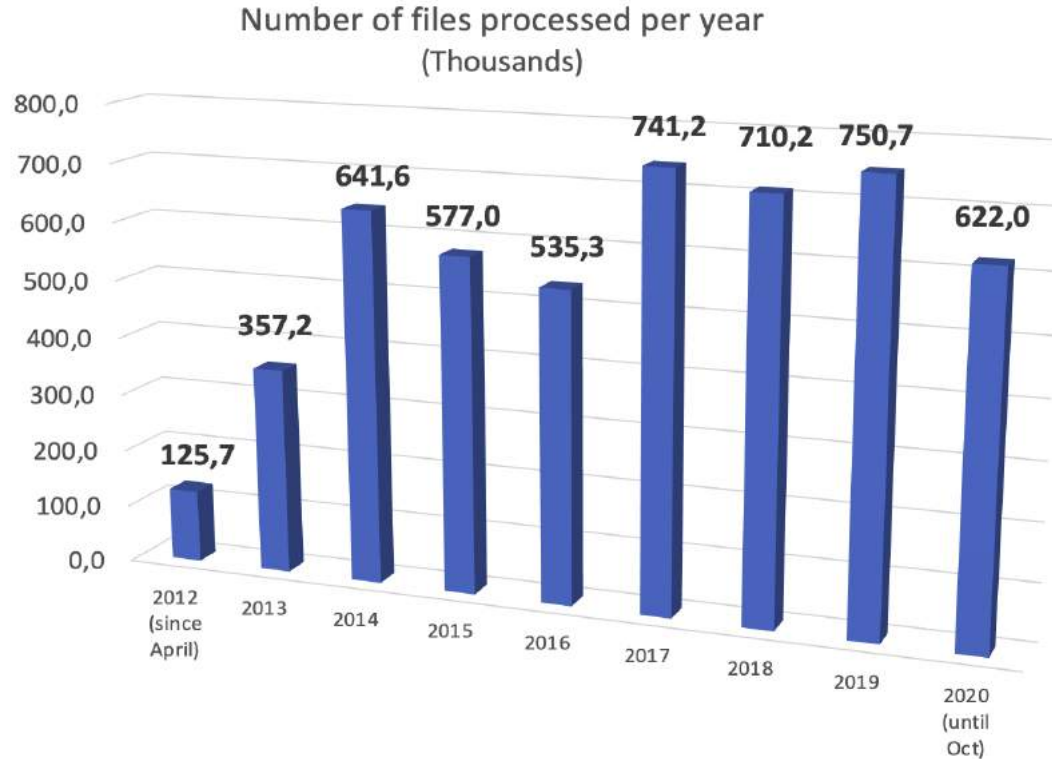


# 2

## Total: 1.824 alive stations from 44 Data Providers



## Operating the HDCC: Figures

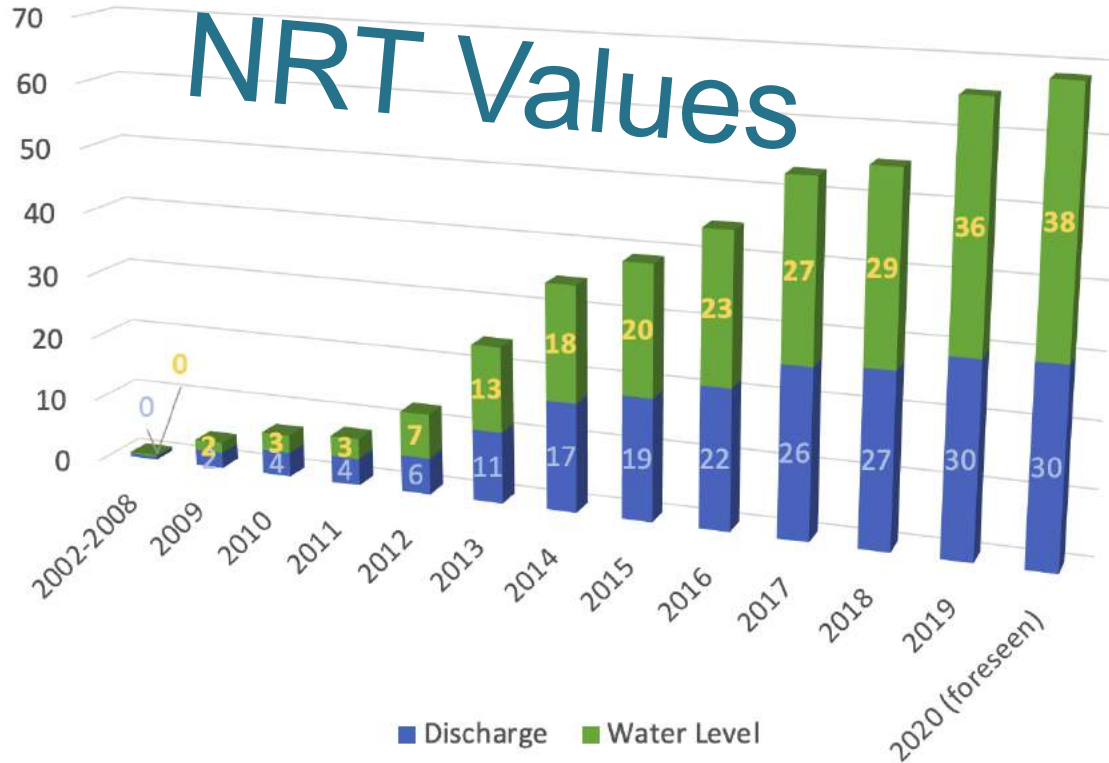


# Data files



# Operating the HDCC: Figures

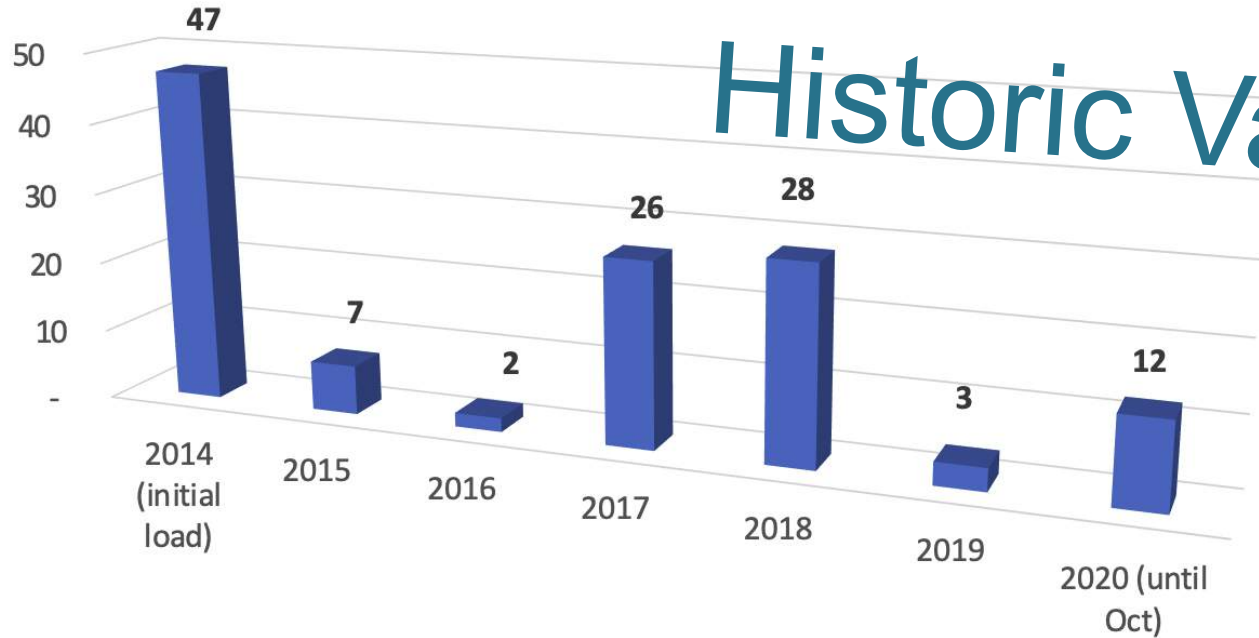
Valid Real Time Data Loaded  
(Millions of values)





# Operating the HDCC: Figures

Historic values loaded by year  
(Millions of values)



# Historic Values



# EFAS HDCC CURRENT STATUS

## New developments: Following the Post-processing, Real Time and Fixed Reporting Points Layers (more enhancements under development)

**hDMS** PROVIDERS STATIONS DATA REPORTS DATA ANALYSIS MAP 3D MAP EFAS Hydrological Data Collection Centre WELCOME, USER: RGS

Home / Stations / COMP Layers Status

EFAS ID HDCC	EFAS ID COMP	HDCC Name	Provider ID	Provider Alias	Provider Manager	Post Proc.	Realtime	Fixed Rep. Point	COMP Name	Loc.Check
1	1	Schwabelweis	1004	de-wsv	Irene Carpintero	True	True	True	Schwabelweis	True
2	2	Hofkirchen	1004	de-wsv	Irene Carpintero	True	True	True	Hofkirchen	True
3	3	Pfelling	1004	de-wsv	Irene Carpintero	True	True	True	Pfelling	True
4	4	Barby	1004	de-wsv	Irene Carpintero	True	True	True	Barby	True
5	5	Wittenberg / Lutherstadt	1004	de-wsv	Irene Carpintero	True	True	True	Wittenberg / Lutherstadt	True
6	6	Malissa OP	1004	de-wsv	Irene Carpintero	True	True	True	Malissa OP	True
7	Missing	Schnackenburg	1004	de-wsv	Irene Carpintero	Missing	Missing	Missing	None	Missing
8	8	Grosse Traenke Wehr UP	1004	de-wsv	Irene Carpintero	False	False	True	Grosse Traenke Wehr UP	True
9	9	Rathenow UP	1004	de-wsv	Irene Carpintero	False	False	True	Rathenow UP	True

1 - 100 / 19 100 Items per page 1 - 100 of 1827 Items

Comparison Overview (Updated at: 2020-10-14 08:34:12)  Show/Hide Legend



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## How to contact CEMS-HDCC

### Contact us:

Thematic and administrative issues: Mercedes García  
[mercedes.garcia.padilla@juntadeandalucia.es](mailto:mercedes.garcia.padilla@juntadeandalucia.es)

Technical issues (IT): Rafael J. García  
[rafael.garcia@soologic.com](mailto:rafael.garcia@soologic.com)

# ¡ Thank you very much!

\* \* \* \* \*



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**Dziękuję Merci beaucoup დიდი  
მადლობა Много Благодаря**

**Obrigado Paldies Ευχαριστώ Tack  
Dank u Muchas gracias**

**Hvala вялікі дзякуй Köszönöm Dekuj  
Multumesc Dakujem Danke**

**Takk Aitäh Grazzi Kiitos Grazie  
Tesekkur Ederim Dêkuji**

