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# European Flood Awareness System

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## EFAS *Bulletin*

February – March 2021

Issue 2021(2)



## NEWS

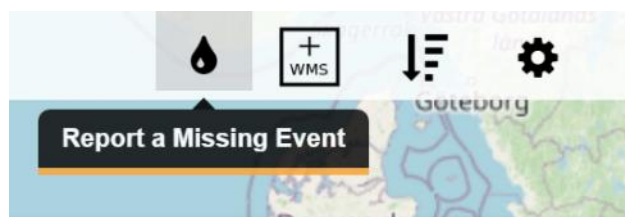
### *New features*

#### **New webinar**

A [new webinar](#) on ‘The Use of EFAS v4.0 for Forecasting’ was published on the EFAS website. This webinar provides information and a short demonstration on how different aspects of the new EFAS v4.0 release can be used for forecasting purposes. This webinar was given as a training session to users of EFAS and was hosted by the Dissemination Centre (DISS) on 10 December 2020.

#### **Problems when submitting feedback?**

Have you recently experienced any problems when submitting feedback to EFAS? We are constantly developing the feedback function and appreciate your input if something goes wrong.



**Figure 1:** To report a missing event in EFAS - click the icon in the top right corner of the map viewer.

The EFAS operational centres welcome partner feedback on the usefulness and accuracy of EFAS forecasts as it helps us provide a better product and more relevant forecasts to our partners. You can provide feedback on Formal and Flash Flood Notifications directly from the notification e-mail. Additionally, we also encourage you to provide feedback even for missed events using the dedicated function in the EFAS Map Viewer.

The feedback providing function is in constant development and, for this reason, it may sometimes not work as expected. If you encounter any problem when attempting to submit feedback, please let us know by sending an e-mail to [info@efas.eu](mailto:info@efas.eu). Your help is greatly appreciated!

### *New Partners*

#### **New EFAS Third Parties**

We gladly welcome the World Bank and the Portuguese Environment Agency (Agência

Portuguesa do Ambiente) as new EFAS Third party partners.

## RESULTS

### *Summary of EFAS Flood and Flash Flood Notifications*

The 20 formal and 20 informal EFAS flood notifications issued in February - March are summarised in Table 1. The locations of all notifications are shown in Figure 23 and Figure 25 in the appendix.

641 Flash flood notifications were issued in February - March. They are summarised in Table 2. The locations of all notifications are shown in Figure 24 and Figure 26 in the appendix.

### *Meteorological situation*

by EFAS Meteorological Data Collection Centre

#### **February**

February 2021 was characterised by lower than normal mean sea surface pressure over the Atlantic Ocean and from Russia and Kazakhstan southward to the Persian Gulf. Higher than normal mean sea surface pressure occurred from Spitzbergen, Scandinavia, central Europe, and the central Mediterranean region to northern Africa. Monthly precipitation totals were above the long-term means at the Iberian Peninsula, Great Britain and Ireland, eastern Europe, northwest Africa and around the Arabian Peninsula. Below normal monthly precipitation totals were observed in Iceland, southern Scandinavia, the Baltic Sea region, the Alps, at the northern Balkans, and in eastern and southern Mediterranean regions. Monthly mean air temperatures were below the long-term means in the north and east, and above normal in the west and south of the EFAS domain.

In the beginning of February 2021, the Azores High was shifted southward compared to its normal position and disappeared in the next days. A large low-pressure system was located over northeast Europe and the corresponding upper-level trough extended to the central Mediterranean region. Within this trough, a secondary low-pressure zone at the surface extended from the Atlantic Ocean southward of Greenland to France. As the large low-pressure system moved to the Kara Sea, two low-pressure systems developed in the low-pressure zone over the Atlantic Ocean. The upper-

level trough weakened, but a flat upper-level low-pressure system was cut-off over the eastern Mediterranean region. Severe weather was reported from many locations in this region at the beginning of February. The low-pressure systems from the Atlantic Ocean moved to Great Britain and Ireland and then continued to central Europe and was associated with large amounts of rain and snowfall. A new low-pressure system developed over the Baltic Sea and moved eastward while intensifying. An upper-level trough extended southward while moving eastward over the Atlantic Ocean, leading to a formation of a low-pressure system at the Iberian Peninsula. The low-pressure system moved eastward to the central Mediterranean region and brought high amounts of rain along its track. Another low-pressure system moved from the Atlantic Ocean via the Adriatic Sea to the Black Sea and a high-pressure system developed over southern Scandinavia. The low-pressure system then changed direction towards the northeast while a strong intensification of this formerly weak system took place. The high amounts of new snow in Russia observed at this time were associated with this system. The high-pressure system moved via central to southeast Europe. Together with low-pressure systems westward of Great Britain and Ireland, which brought also strong winds to Iceland, Great Britain and Ireland, unusual warm air was advected from northern Africa to western and central Europe. At some places in central Europe temperature differences of about 40°C between the maximum temperature in these days and the minimum temperature one week before were observed. During the same days, heavy rain and snow occurred in the eastern Mediterranean region due to a newly developed low-pressure system. Later, a trough swivelled from the Atlantic Ocean to the Iberian Peninsula while getting steeper, cutting-off an upper-level low-pressure system which then moved to northern Africa. A similar event repeated some days later while a high-pressure system developed over the Atlantic Ocean. The high-pressure system moved towards Great Britain and Ireland by the end of February and a low-pressure system shifted its location from northern Scandinavia to Russia. Except for this low-pressure system, the majority of the EFAS domain was influenced by high pressure by the end of February.

In February 2021, the highest precipitation totals were observed at the north-western Iberian Peninsula, Great Britain and Ireland, and eastward of the Adriatic,

Aegean and Black Seas (Figure 9). No or almost no precipitation fell in southern Scandinavia, east of the Baltic Sea, at the eastern Balkans, northern Africa and the Levant. Monthly precipitation totals below the long-term means occurred in Iceland, southern Scandinavia, especially east, but almost all around the Baltic Sea, in the Alps, in northern and southern Balkans, northern Levant, the Central Mediterranean region, the southeast Iberian Peninsula and the majority of the African parts of the EFAS domain (Figure 10). Monthly totals above the long-term means were reported at the north-western Iberian Peninsula, in Great Britain and Ireland, eastern Europe, the Arabian Peninsula and northwest Africa.

The monthly mean air temperature ranged from -33.4°C to 20.5°C with the highest values in the southern parts of the EFAS domain. The lowest temperature values were reported in the northern, eastern and mountainous parts (Figure 13). Air temperature anomalies ranged from -11.2°C to 7.4°C (Figure 14). Monthly mean air temperatures below the long-term means occurred in the eastern and northern parts of the EFAS domain while positive temperature anomalies appeared in the west and south of the domain.

### **March**

March 2021 was characterised by higher than normal mean sea surface pressure over the Atlantic Ocean towards central Europe, the Mediterranean Region, and some small areas of Kazakhstan. Lower than normal mean sea surface pressure occurred from Spitzbergen to Scandinavia and northern Russia. Monthly precipitation totals were above the long-term means in Scotland, northern parts of Great Britain, parts of northern Algeria, Morocco, Libya, Egypt, and in neighbouring regions of the Black Sea. Abnormally low monthly precipitation totals were observed in Iceland, Sweden, Finland, central Europe, northern Italy, northern Ukraine up to Russia, the Iberian Peninsula (except the south-eastern coastal areas), around the Caspian Sea, and in the south-eastern regions of the EFAS domain. Monthly mean air temperatures were above the long-term means in most parts of northern Europe as well as in the southeast of the EFAS domain and were below normal in the Balkans, Russia, and in regions around the Black Sea.

At the beginning of March, high-pressure systems dominated the weather situation in most parts of the

EFAS domain. Thereby, Scandinavia was influenced by a strong low-pressure system, which extended to Russia and gradually to central Europe. In the meantime, a new low-pressure system developed over the Atlantic moving towards the Iberian Peninsula. This led to heavy rain and caused flash floods in the Andalusia and Murcia regions of southern Spain on March 5. Over the next few days, low pressure increasingly became dominant over Europe, until the high-pressure system over the Atlantic extended to southern Europe. During this time, the low-pressure system over Iceland influenced the weather conditions in northern Europe. In mid-March, a high-pressure system over the Atlantic extended to Scandinavia and shifted the upper low-pressure system over northern Europe to the southeast. The upper-low-pressure system cut off over the Balkans and moved very slowly to the east of the EFAS domain. Also, this low-pressure system displaced the high pressure over most parts of Europe while on the other hand, the high-pressure system over the Atlantic had become slightly stronger. Nevertheless, it was not enough to displace the upper-low-pressure system over Europe. These weather conditions remained stable for several days. Finally, the high pressure dominated and pushed the upper-low-pressure area eastward. A new low-pressure system developed over eastern Europe, which was quite stable. By the end of the month, the low-pressure system over Greenland extended to northern Europe while the rest of the EFAS domain was dominated by high-pressure systems. The high-pressure area strengthened and moved towards Scandinavia. Nevertheless, the strong low-pressure area over Iceland remained. The upper-low-pressure trough over eastern Europe cut off and a low-pressure system developed over the Black Sea. Another low-pressure system developed and merged with this low-pressure system over the Balkans. A ridge of high pressure was located over central and southern Europe. Scandinavia was still influenced by low-pressure systems.

In March 2021, the highest precipitation totals were observed at the coastline of Norway, northern Great Britain, Scotland, Ireland, the Alps, the Strait of Gibraltar, southern Italy, Sicilia, and eastward of the Adriatic, Ionian and Black Seas (Figure 11). No or almost no precipitation fell in Sweden, central Spain, northern Portugal, southern France, northern Italy, southern Slovakia, Hungary, northern Ukraine up to Russia, central Poland, the Caspian Sea, and the Levant. Monthly precipitation totals below the long-term

means occurred in Iceland, Sweden, Finland, central Europe, the Iberian Peninsula (except along the south-eastern coastline), northern Italy, northern Ukraine up to north-eastern Russia, around the Caspian Sea, in parts of northern Africa, and the Levant (Figure 12). Monthly totals above the long-term means were reported at the south-eastern Iberian Peninsula, in northern Great Britain and Scotland, around the Black Sea, and in some parts of northern Africa.

The monthly mean air temperature ranged from -18.3°C to 24.3°C with the highest values in the southern parts of the EFAS domain. The lowest temperature values were reported in the northern, eastern, and mountainous parts (Figure 15). Air temperature anomalies ranged from -5.9°C to 8.8°C (Figure 16). Monthly mean air temperatures below the long-term means occurred in eastern Europe, around the Black Sea, and in Russia while positive temperature anomalies appeared in the Middle East, in northern Europe except Iceland, in some parts of northern Italy, Africa, the Pyrenees, northern Portugal, and southern Spain.

### *Hydrological situation*

*by EFAS Hydrological Data Collection Centre*

#### **February**

In February the hydrological situation was very similar to January with abundant rain that caused exceedances in a high number of stations, especially in central Europe. 263 stations registered exceedances in January, but this number increased to 297 in February. The affected basins and countries continue as they were in January. According to the number of stations affected, the Danube basin stands out again with 122 stations having values over their thresholds, which corresponds with the 22% of the stations located in this basin. Countries affected within this basin are southern Germany, Romania, Serbia, Hungary, Bosnia & Herzegovina, Austria, Czech Republic, and Slovenia. Another region with remarkable exceedances was found in the Po river basin, which accounted for 20% of stations located on this basin (31 stations). The Rhine basin stands out in third place with 19% of its stations with exceedances (in Germany and Switzerland). Other affected basins with more dispersed stations are the Oder, Vistula, Elbe, and Dnieper river basins (affecting Poland, Czech Republic, Belarus, and Ukraine) and in Spain along the Minho,



Guadiaro, Guadalhorce, and Velez river basins in the Mediterranean and Levante areas. Finally, scattered stations with exceedances appear in Norway, Sweden, and Iceland.

According to stations registering values above the 90% quantile, they are mostly located in central Europe. The Danube basin stands out with nearly 30% of the total stations exceeding the 90% quantile. Other basins registering a high concentration of stations are the Rhine and Elbe basins. To a minor extent in this area, stations also surpassing the 90% quantile are located in the Vistula, Oder, and Dnieper basins. Also, an isolated station on Dniester basin (Ukraine) surpassed the 90% quantile. Other high densities of stations can be found throughout the Spanish basins (Douro, Minho, Limia, Guadalquivir, and Ebro basins) and in the Scandinavian basins (mainly in southern Norway, followed by northern regions of Norway, Sweden and Finland with some scattered stations to the west of Sweden). To a minor extent, stations exceeding the 90% quantile can be observed in Ireland and the UK (all the stations in the Thames basin, England). Scattered stations surpassing the 90% quantile can be seen in France (four stations located in four different basins: Garonne, Rhône, Loire and Orb), two in the Rhone basin (Switzerland), one in the Soca/Isonzo basin (Slovenia), and the Po basin (Italy).

Lastly, regarding the stations registering values below the 10% quantile, the number has been reduced in February in contrast to the previous month. The highest concentration of stations is mainly found in central Norway, with six stations whose mean values are below the 10% quantile. In a more dispersed pattern, we also find a total of seven stations in the Danube basin (Germany and Romania), Dnieper basin (Ukraine), Rhine basin (Germany), Oder basin (Poland), and the Neman basin (Belarus). Finally, an isolated station also showing values below the 10% quantile is located in the Verde river in southern Spain.

### **March**

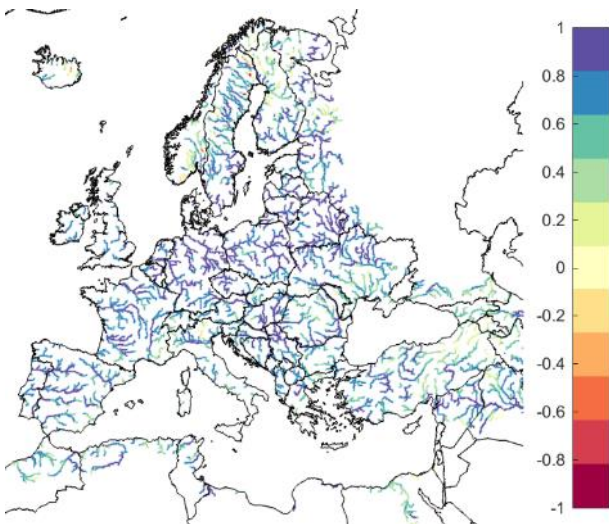
In March, the hydrological situation reveals a considerable number of stations exceeding their alert levels, mainly in the northeast of Europe, although the absolute value has decreased with respect to the previous month (106 vs 263). According to the number of stations affected, the Vistula basin stands out with 30 stations with values over their thresholds, which corresponds with the 40% of the stations with alert

levels defined located on this basin, mainly in Ukraine, Poland, and Belarus. In the second place, with 26 stations, appears the Dnieper river basin (43% of stations located on this basin). The Danube basin stands out in third place with 20 stations (6% of its defined alert level stations) located in Germany and Switzerland. To a minor extent in terms of affected basins, we found stations in the Po (7), Oder (6), Neman (3), and Rhine (3) basins surpassing their alert levels. Finally, there are scattered stations in Spain, Norway, Bosnia and Herzegovina, and Iceland.

Regarding stations registering values above the 90% quantile, few stations (64) exceeded this value in March. As it was the case of the previous three months preceding, these are mostly located in the Scandinavian basins, where the vast majority of stations are located in Norway (27 stations), followed by stations in Sweden (12 stations), and then Finland (5 stations). To a minor extent, stations also surpassing the 90% quantile can be found in the Danube basin (Austria and Bulgaria) and the Vistula basin across Poland and Ukraine. A handful of stations exceeding the 90% quantile are located in the Dnieper and Rhine basins, in Ukraine and Switzerland, respectively. Isolated stations can be seen in Spain (Barbate basin), England (Thames basin), Belarus (Pripyat basin) and Ukraine (Dniester basin).

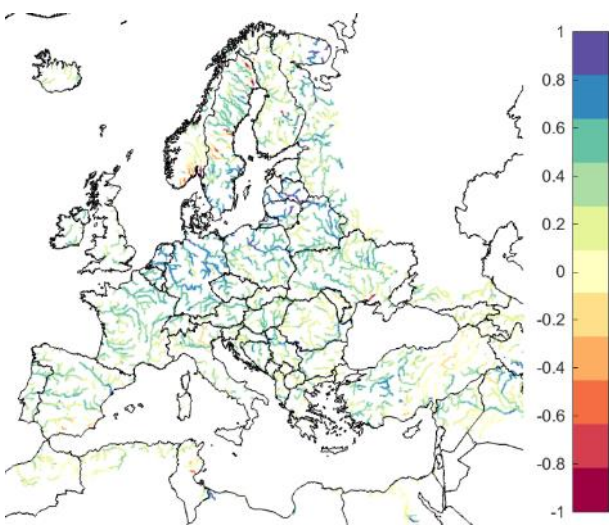
Finally, and according to those stations registering values below the 10% quantile, the number of stations involved, and their concentration has been reduced compared to the previous month. Focusing on the countries with a major presence of stations fulfilling this criterion, Spain has 4 stations spread throughout the Minho, Ebro, Llobregat and Verde basins, followed by Ukraine (Dnieper and Danube basins) and Germany (Elbe Rhine and Danube basins) with 3 stations each. Lastly, one station in Poland situated in the Oder basin experienced values under the 10% quantile.

*Verification*



**Figure 2: EFAS CRPSS at lead-time 1 day for the February 2021, for catchments >2000km<sup>2</sup>. The reference score is persistence of using previous day’s forecast.**

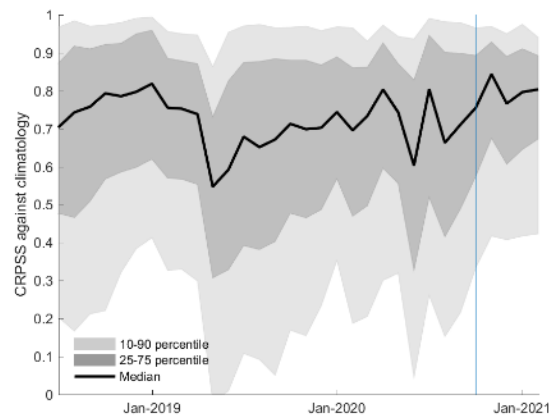
Figure 2 and Figure 3 shows the EFAS headline score, the continuous ranked probability skill score (CRPSS) for lead times 1 and 5 days for February across the EFAS domain for catchments larger than 2000km<sup>2</sup>. A CRPSS of 1 indicates perfect skill, 0 indicates that the performance is equal to that of the reference, and any value <0 (shown in orange-red on the maps) indicates the skill is worse than the reference. The reference score is using yesterday’s forecast as today’s forecast, which is slightly different than we used previously and very difficult to beat.



**Figure 3. EFAS CRPSS at lead-time 5 days for February 2021 for catchments >2000km<sup>2</sup>. The reference score is persistence of using previous day’s forecast.**

These maps indicate that across much of Europe for forecasts are more skilful than persistence at both lead times. Regions shown in blue are those where EFAS forecasts are more skilful than persistence, with darker shading indicating better performance.

The skill of the forecast was quite good over the period, and better compared to the same period last year (Figure 4). An inter-annual variability of the scores is to be expected. The long-term trend is neutral over the first two years since the domain was extended, but there is an indication of increase in skill with EFAS 4.0.



**Figure 4. Monthly means of CRPSS the for lead-time 5 days for all the major river points in Europe with ECMWF ENS as forcing. Reference forecast was climatology. The skill is largest during the winter months, when there is less variation in the flow in large parts of Europe. The blue line indicates the release of EFAS 4.0.**

**ARTICLES**

*Suggest river gauge stations for the next EFAS calibration!*

*by Cinzia Mazzetti, Mercedes Garcia Padilla, Rafael Garcia and Christel Prudhomme*

**Call for data: EFAS partners can submit feedback on calibration stations until 30th June**

As a starting point, EFAS Computational Centre (COMP) will consider all stations used for EFAS v4 calibration but will also assess if more stations in the EFAS Hydrological Data Collection Centre (HYDRO) database could be used for EFAS-next calibration. The selection process has already started, but there is still the opportunity for EFAS partners to contribute with new discharge data and take part in the selection of EFAS-

next calibration stations! *There are two ways you can take part:*

- In the next few weeks, COMP and HYDRO will contact you with a list of already pre-selected calibration stations, and alternative/new candidates for EFAS-next. You can then provide feedback on the stations, for example by letting us know which stations should be avoided (e.g. because very old and no longer in use, or because of issues with the rating curve or the sensor), replaced by alternative stations nearby already within the HYDRO database, or by offering new stations.
- You can also contact HYDRO directly with new river discharge data. As described above, the length and quality of the river discharge time series observation are not the only criteria for selection, and it might be possible that a new candidate is not selected at the end, for example, if it cannot be located accurately in the EFAS river network. However, this is seldom the case.

Increasing the calibration domain (i.e. with more stations and longer time series) is a great way to improve the quality of the EFAS system, and we are very much looking forward to working with you to achieve this. However, as mapping and additional quality check procedures are long, we can only accept new candidate stations for EFAS-next calibration until the 30th June 2021, so that we have time to inspect the data before the calibration starts. Any data received after that date will of course be included in the HYDRO database and considered for future EFAS upgrades such as reporting point upgrades or another cycle of calibration.

### Background

Like any operational forecasting systems, EFAS is always evolving with regular updates of the modelling chain, products, or information access. The latest upgrade, [EFAS v4.2](#), includes 436 new fixed reporting points on the EFAS mapviewer (bringing the total number to 3087) so that users can monitor forecasts at their stations of interest. The next step-change in the EFAS modelling chain is an increase of the spatial resolution to a 1 arcminute grid (around 1.19km size at 50° latitude) with a small eastward widening of the domain, giving around 22 times more grid points compared with the EFAS v4 5-km grid (Figure 5). The resolution increase will come with a new calibration,

which provides an opportunity for adding more calibration points.



Figure 5: Full EFAS 1arcmin domain area, with EFAS v4 domain in lighter shade.

### Hydrological model calibration

LISFLOOD is the hydrological model at the heart of EFAS. Developed at the JRC since 2000, it is [now fully open-source](#) maintained by the JRC with the support of the EFAS COMP at ECMWF.

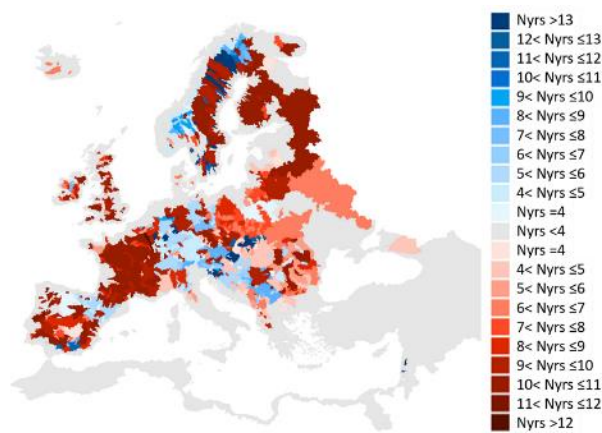
LISFLOOD is a fully distributed hydrological model, which explicitly considers the spatial distribution of physical properties across catchments and provides estimates of river discharge on the entire geographical domain. Driven by meteorological forcing data, LISFLOOD calculates a complete water balance for every grid cell, with runoff then routed through the river network using a kinematic wave approach, including options to simulate lakes and reservoirs. The water balance estimates and routing rely on a set of parameters conceptualising the different hydrological processes.

Where long enough, good quality river discharge time-series observations are available, parameter sets are searched iteratively and tested by comparing observed time-series with LISFLOOD simulations forced with observed meteorological maps so that the parameter set best representing the hydrological behaviour of the catchment can be identified. This is a process known as 'hydrological model calibration'. For catchments where there are no observations, default parameters are used along with land surface information when running LISFLOOD.

### EFAS Calibration domain

The calibration process results in an improvement in the hydrological simulation performance. For EFAS to benefit from the best hydrological simulation everywhere, the catchments represented by the

calibration stations should cover the largest area possible. For EFAS v4.0, calibration was performed using data from 1137 stations in 215 river basins covering 44.49% of the 9 million km<sup>2</sup> EFAS spatial domain (Figure 6). The calibration stations were selected from the 2927 river gauging stations in the HYDRO database in July 2018 when calibration work began. Because of the limited availability of sub-daily river discharge data, catchment with 6-hourly data (the time step of EFAS from version 4) and daily data were both considered, which increased by 180% the calibration points against only using 6-hourly data.



**Figure 6: EFAS v4. calibration domain with 6-hourly (blue) and daily (red) calibration catchments. The colour strength shows the number of years with available data**

Since then, the amount of river discharge time-series available in the HYDRO database has increased, benefiting from more data providers and a longer period of record. This gives an opportunity to extend the EFAS calibration domain for EFAS-next.

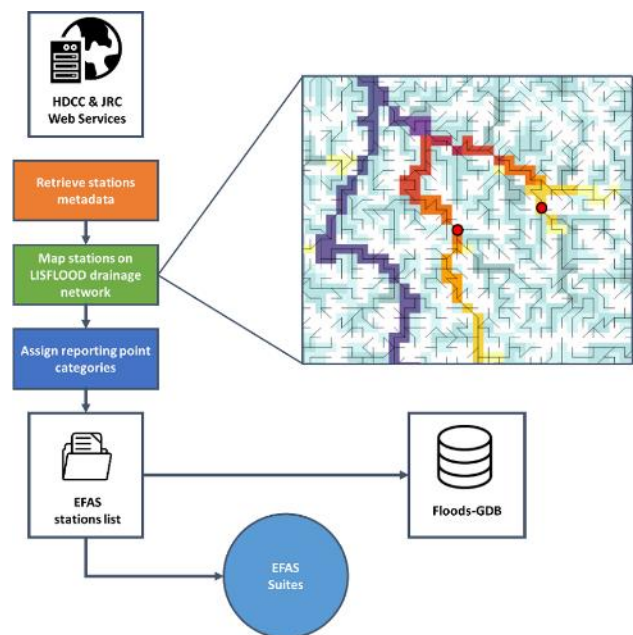
**Identification of calibration stations**

Not all stations with records available in the HYDRO database are appropriate for the EFAS calibration. First, the calibration relies on river discharge and stations with river level only data (and no rating curve) cannot be used. Second, the period of observational record needs to match with observed meteorological forcing data (1990 - 2021) and include at least 4 years of data. Third, the location of the station and the quality of the data are also considered so that the best overall calibration coverage can be achieved.

**Locating the station on the EFAS river network**

As already said, LISFLOOD is a distributed model based on a mesh of points organised on a regular grid. For EFAS-next, the grid has a 1 arcmin size. Using elevation

information, LISFLOOD pixels are connected to reproduce the natural drainage network, but the spatial resolution of the grid and inaccuracies in pixels elevation can affect the representation of rivers in LISFLOOD from the real world. It is generally not a problem for hydrological modelling, but it becomes an issue when the drainage network of the model is compared to real-world locations. This means that it is necessary to map each gauge to the pixel where discharge from the model can best represent observations at the station. This is a long process based on metadata information (e.g. catchment area, river/station name) and manual inspections (e.g. using Google maps). Location of the station relative to river confluence (i.e. upstream or downstream) and/or presence of lakes and reservoirs are also considered, and if necessary, river gauges location on EFAS grid are shifted from their geographical coordinates by few pixels. Any error or inaccuracy in river stations metadata are reported to the HYDRO and stations that could not be mapped onto the model drainage network are flagged. The workflow involved is shown in Figure 7.



**Figure 7: Workflow for locating hydrological gauging stations on the EFAS drainage network**

**River discharge data check**

Data in the HYDRO database are inspected by COMP to identify available record length, low-quality data (e.g. missing/invalid data, outliers, location error), or influenced regime (e.g. from reservoirs/lakes). This is done using automatic procedures, statistical analysis



(e.g. flow duration curves, annual hydrograph, annual totals) and visual time-series inspections. In addition to acceptable quality and reduced influence from reservoirs and lakes, calibration stations are selected according to the following criteria:

- **Drained area:** > 500 km<sup>2</sup> for EFAS 5-km grid. For EFAS-next, we now will consider stations for catchments larger than 200 km<sup>2</sup>.
- **Record length:** >= 4 years (excluding missing data)
- **Time step:** sub-daily or daily (both historical and near real-time data are considered)
- **Spatial coverage:** as large as possible, including some tolerance on data quality and availability but excluding nearby stations on the same river branch, prioritising first sub-daily data and then longest available record

Part of the quality check procedure is the consistency between discharge values at adjacent river stations on the same river, the removal of outliers and suspicious zeros, and visual inspection of the time-series. At the end of the process, a data quality flag is associated with the station.

**Don't forget to submit your feedback on calibration stations by the 30th of June!**

*Flash Floods in Greece and Turkey, Early February 2021*

by Richard Davies, [floodlist](#)

Early February saw flash flooding in parts of north eastern Greece and western Turkey, where homes and vehicles were damaged. Three people tragically lost their lives in the floods, including one firefighter.



**Figure 8: Flood damage in Menderes District, Izmir, Turkey, 02 February 2021. Photo credit: Izmir Governorship/Izmir Valiliği**

## Greece

The fire-fighter died while carrying out flood rescues in north eastern Greece. The tragedy occurred in a village on the outskirts of Alexandroupolis in the Evros Region of Greece on 01 February 2021. Flash flooding was reported in other areas of the region, including in the city of Alexandroupolis and the town of Soufli.

Alexandroupolis saw around 200 mm of rain 01 to 02 February. Athens-Macedonian News Agency (AMNA) said “roads turned into rivers” in areas around the city. The Greek Fire Service helped evacuate people from flooded areas, including students and teachers from a secondary school. The service said it responded to a total of 55 calls for assistance in Alexandroupolis and 11 calls for assistance in Soufli, where damage to homes and businesses was reported. Prime Minister Kyriakos Mitsotakis and President Katerina Sakellaropoulou both expressed their condolences on the death of the firefighter.

## Turkey

Severe flooding was also reported in Izmir Province of western Turkey during this period. Flooding blocked roads and caused widespread traffic disruption in the city of Izmir and surrounding districts on 02 February 2021. Around 50 homes and businesses as well as 40 vehicles were damaged. [Local media](#) reported 2 flood-related fatalities in Menderes district on 02 February 2021.

Turkey’s meteorological agency, Meteoroloji Genel Müdürlüğü (MGM) reported that 123.9mm of rain fell in 24 hours to 02 February in Konak district of Izmir and 130.9 mm in 24 hours to 03 February in Menderes district.

## **Acknowledgements**

The following partner institutes and contributors are gratefully acknowledged for their contribution:

- DG GROW - Copernicus and DG ECHO for funding the EFAS Project
- All data providers including meteorological data providers, hydrological services & weather forecasting centres
- The EFAS Operational Centres
- Richard Davies, Floodlist.com

**Cover image:** Flood damage in Menderes District, Izmir, Turkey, 02 February 202. Photo credit: Izmir Governorship/İzmir Valiliği.

## Appendix – figures

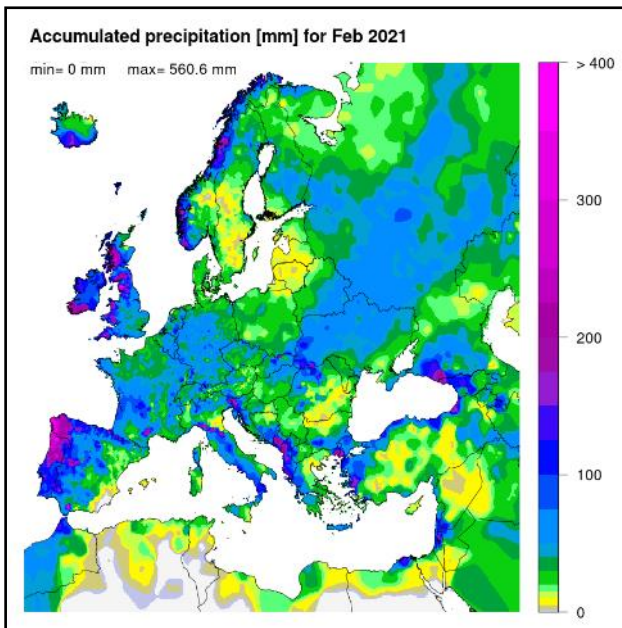


Figure 9: Accumulated precipitation [mm] for February 2021.

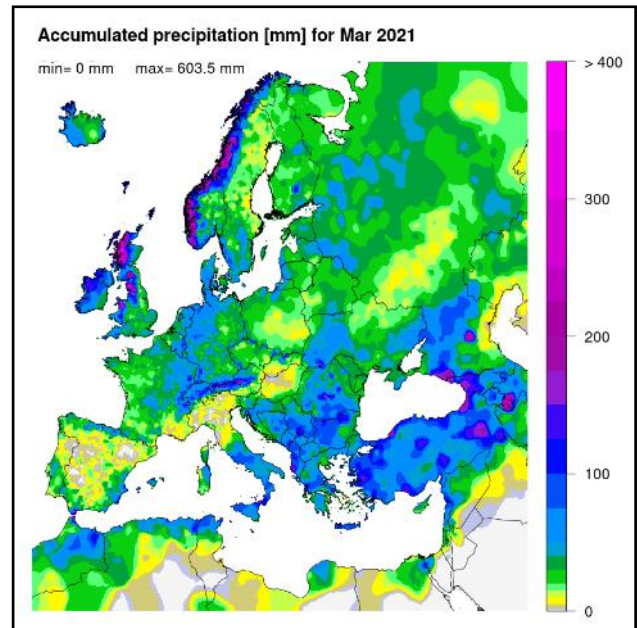


Figure 11: Accumulated precipitation [mm] for March.

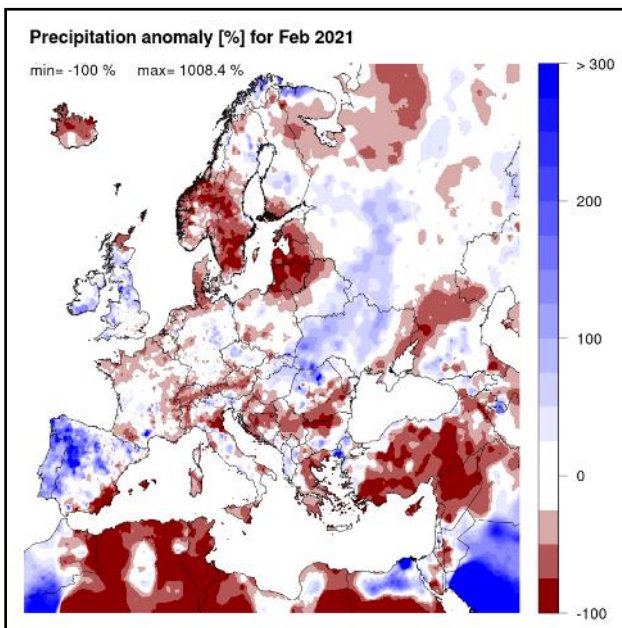


Figure 10: Precipitation anomaly [%] for February, relative to a long-term average (1990-2013). Blue (red) denotes wetter (drier) conditions than normal.

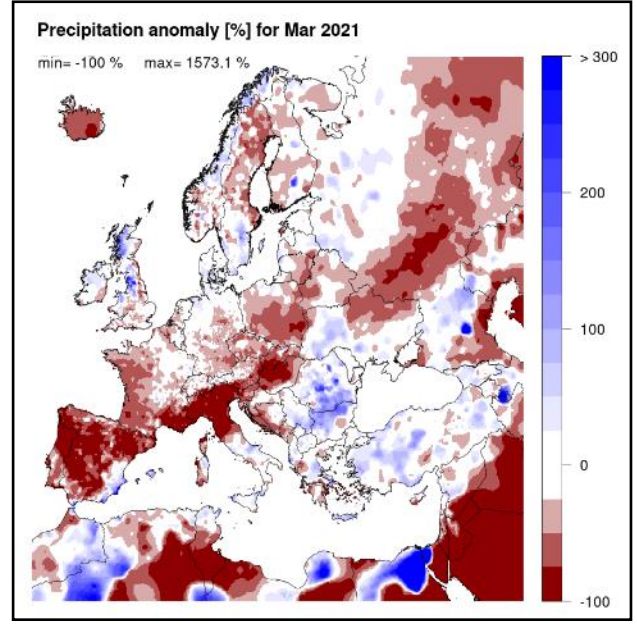


Figure 12: Precipitation anomaly [%] for March, relative to a long-term average (1990-2013). Blue (red) denotes wetter (drier) conditions than normal.



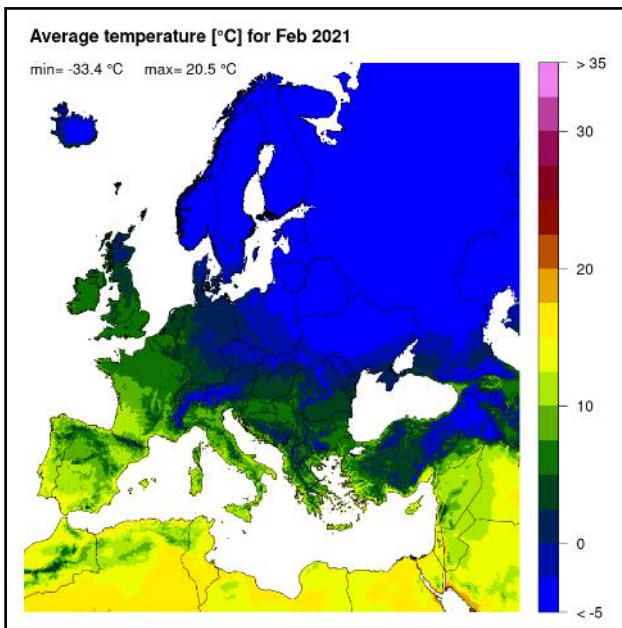


Figure 13: Mean temperature [ $^{\circ}\text{C}$ ] for February 2021.

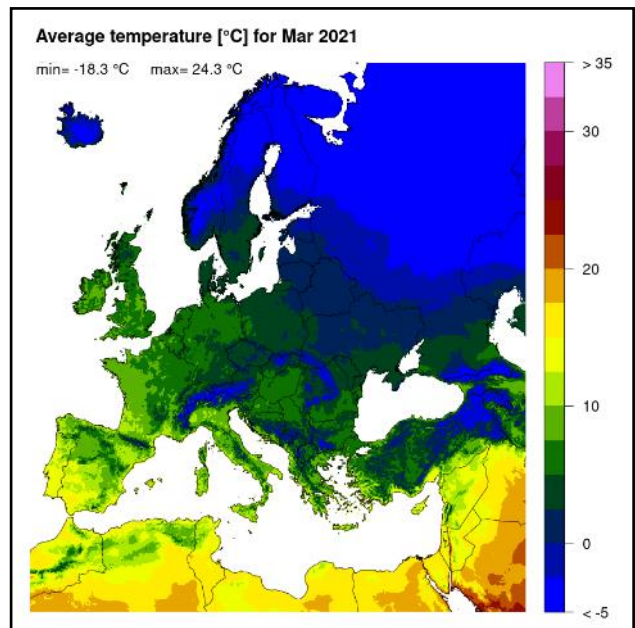


Figure 15: Mean temperature [ $^{\circ}\text{C}$ ] for March.

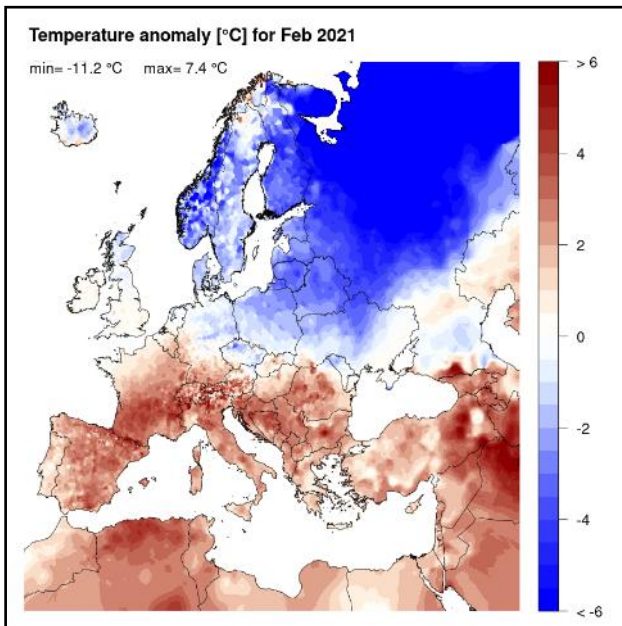


Figure 14: Temperature anomaly [ $^{\circ}\text{C}$ ] for February 2021, relative to a long-term average (1990-2013). Blue (red) denotes colder (warmer) temperatures than normal

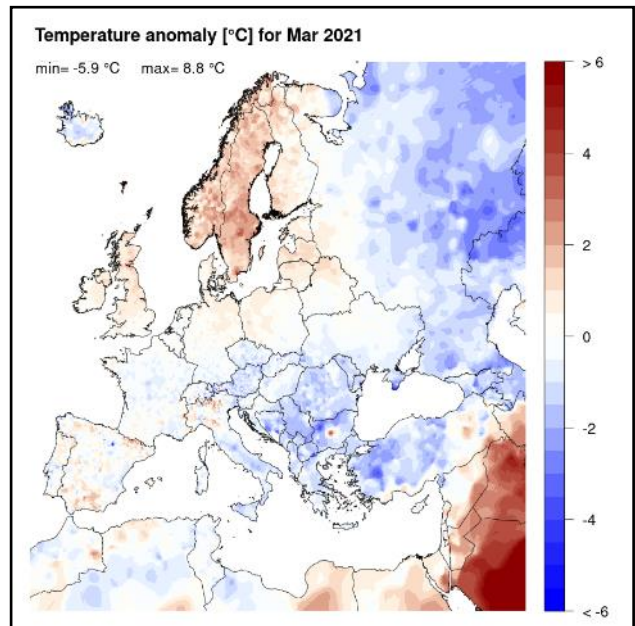


Figure 16: Temperature anomaly [ $^{\circ}\text{C}$ ] for March, relative to a long-term average (1990-2013). Blue (red) denotes colder (warmer) temperatures than normal.



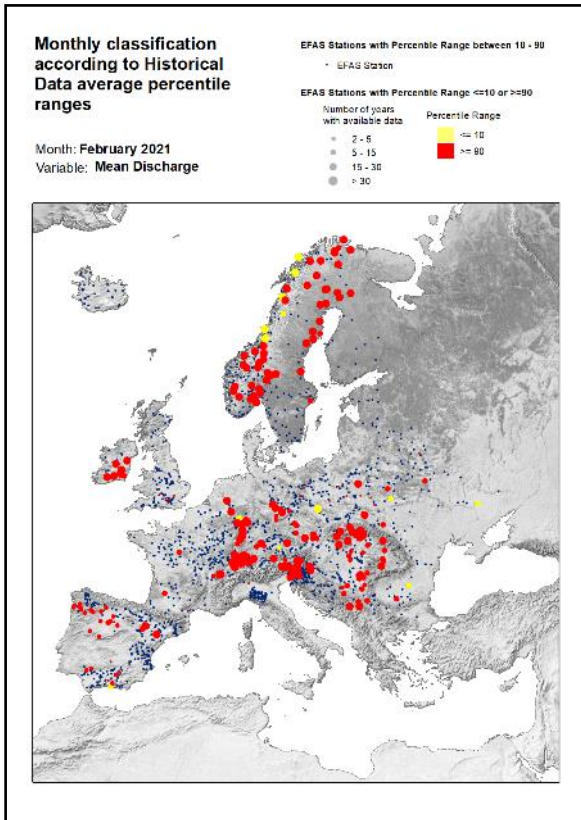


Figure 17: Monthly discharge anomalies February 2021.

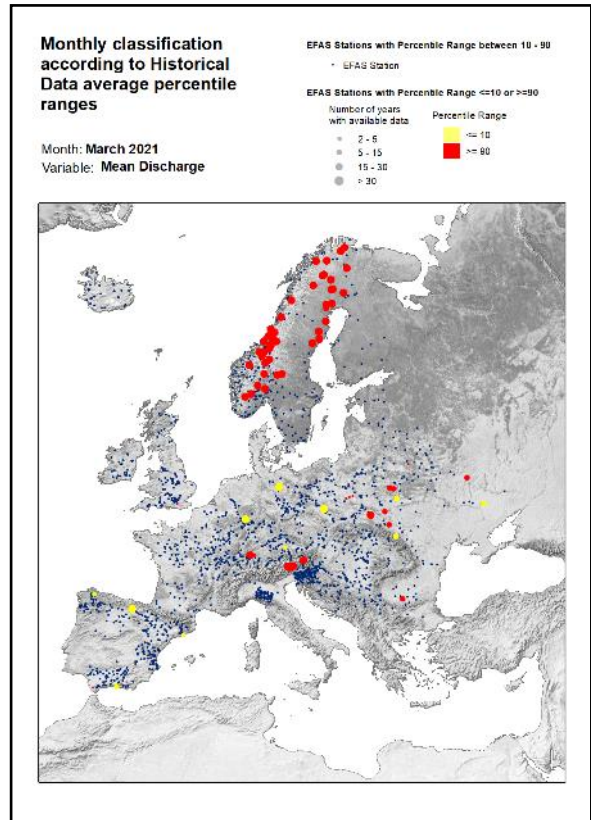


Figure 19: Monthly discharge anomalies March 2021.

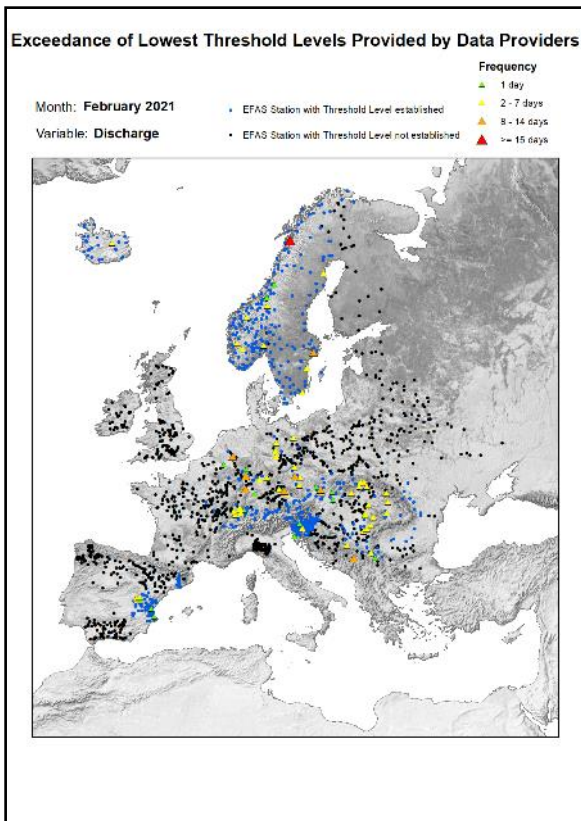


Figure 18: Lowest alert level exceedance for February

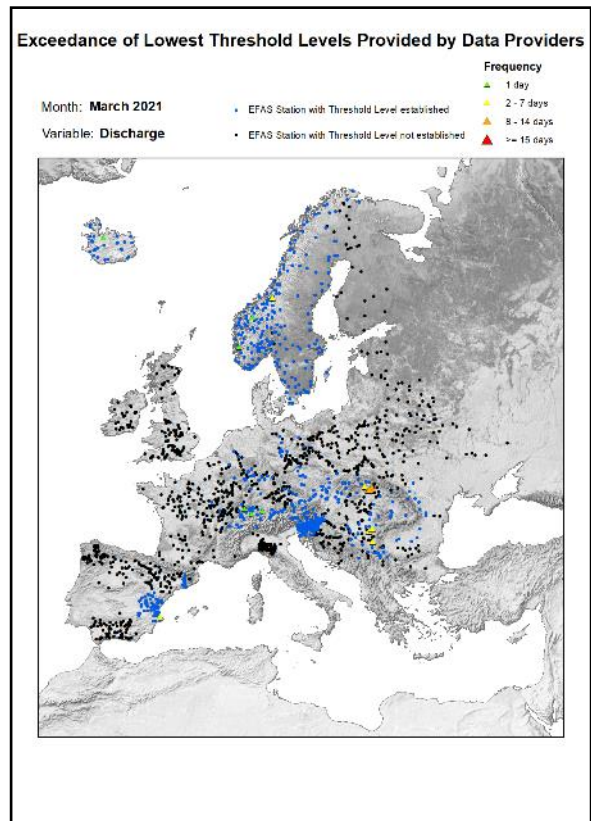


Figure 20: Lowest alert level exceedance for March 2021.

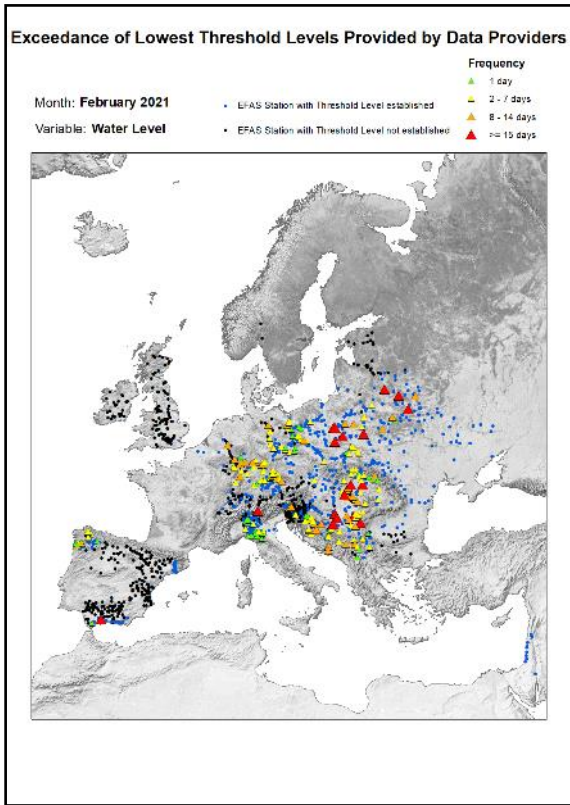


Figure 21: Lowest threshold exceedance for February 2021.

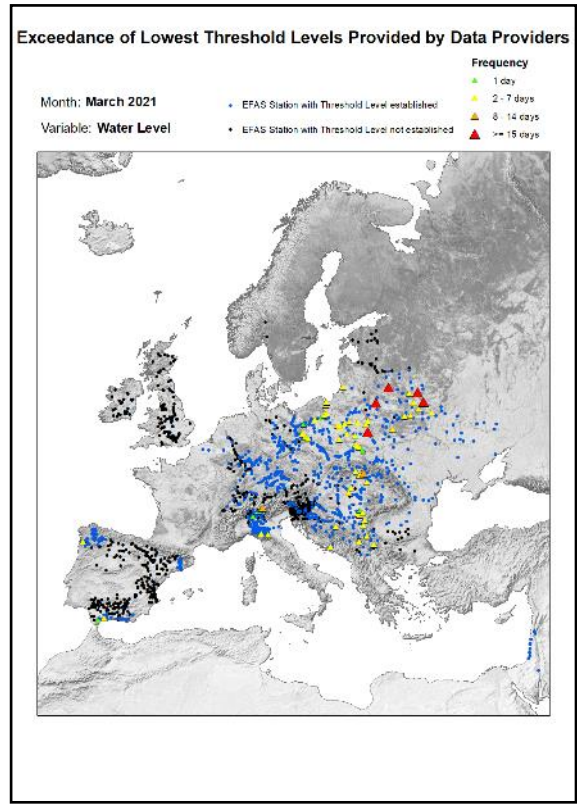


Figure 22: Lowest threshold exceedance for March 2021.

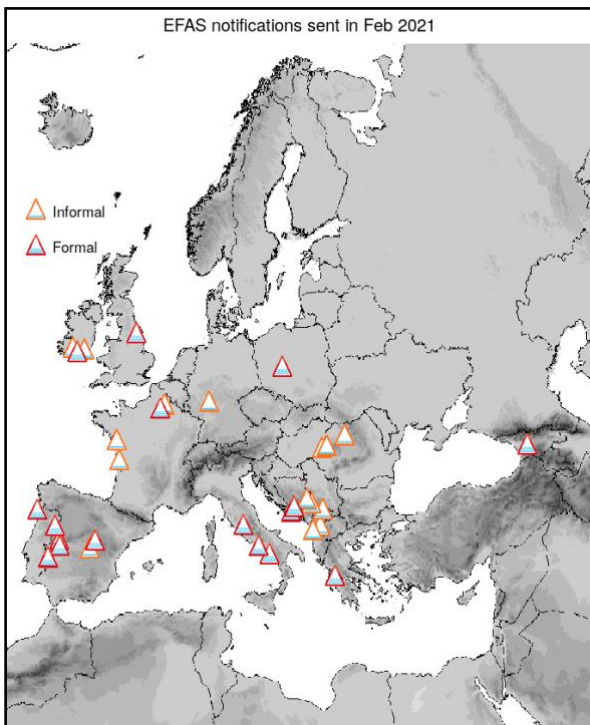


Figure 23: EFAS flood notifications sent for February.

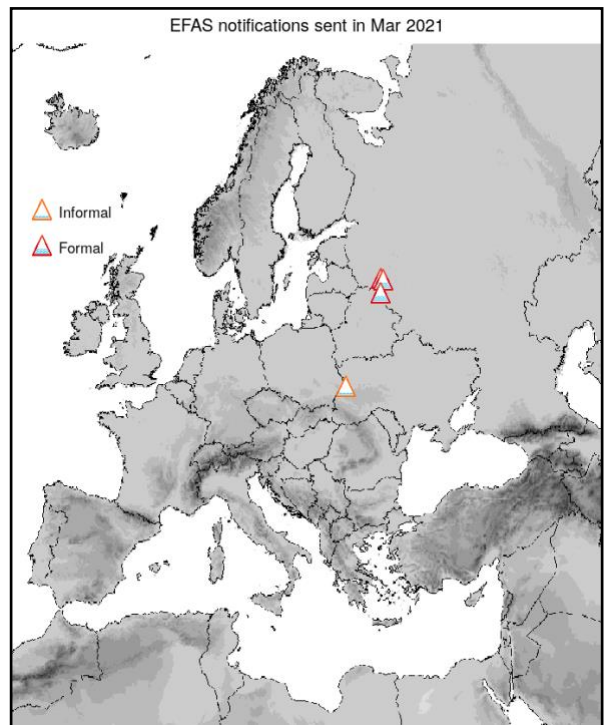


Figure 25: EFAS flood notifications sent for March.

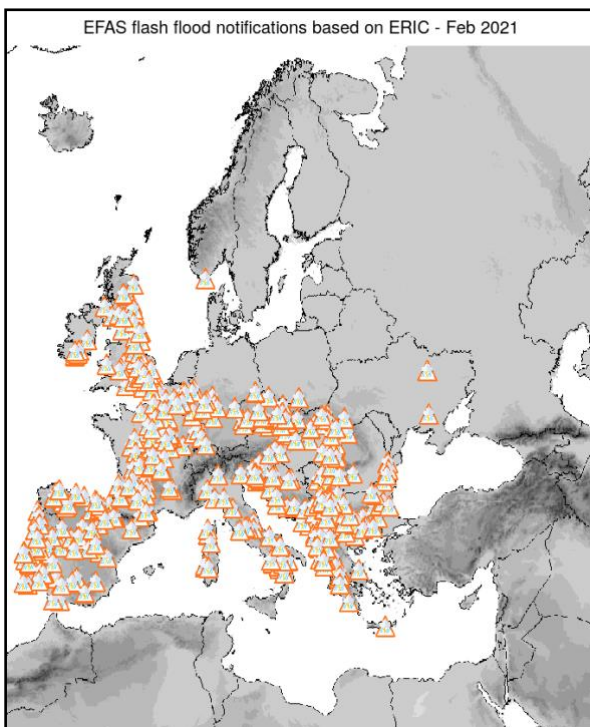


Figure 24: Flash flood notifications sent for February.

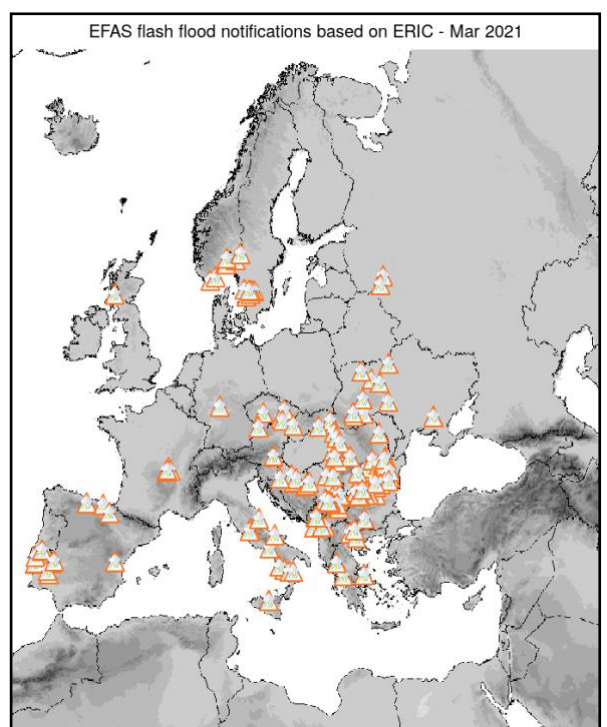


Figure 26: Flash flood notifications sent for March.



## Appendix - tables

Table 1: EFAS flood notifications sent in February - March

Type	Forecast date	Issue date	Lead time	River	Country
Informal	01/02/2021 00UTC	01/02/2021	24	Charente	France
Formal	02/02/2021 00UTC	02/02/2021	84	Rioni	Georgia
Informal	02/02/2021 00UTC	02/02/2021	42	Oise	France
Formal	02/02/2021 12UTC	03/02/2021	30	DERWENT (TRIB. NORTH SEA)	United Kingdom
Informal	02/02/2021 12UTC	03/02/2021	30	Nidda	Germany
Informal	03/02/2021 12UTC	04/02/2021	78	Loire	France
Formal	04/02/2021 00UTC	04/02/2021	96	Sele	Italy
Formal	04/02/2021 00UTC	04/02/2021	102	Nera	Italy
Formal	04/02/2021 12UTC	04/02/2021	6	Tietar	Spain
Formal	04/02/2021 12UTC	04/02/2021	0	Oise	France
Informal	04/02/2021 12UTC	05/02/2021	90	Black Drin	Albania
Formal	04/02/2021 12UTC	04/02/2021	42	Tajo	Spain
Formal	05/02/2021 00UTC	05/02/2021	90	Neretva	Croatia
Informal	05/02/2021 00UTC	05/02/2021	84	Neretva	Bosnia And
Formal	05/02/2021 12UTC	06/02/2021	0	Duoro, below Tormes	Spain
Formal	05/02/2021 12UTC	06/02/2021	96	Volturno	Italy
Formal	05/02/2021 12UTC	06/02/2021	72	Achelooos	Greece
Informal	06/02/2021 00UTC	06/02/2021	60	Somesul Mare	Romania
Informal	06/02/2021 00UTC	06/02/2021	60	Somesul Mare	Romania
Informal	06/02/2021 00UTC	06/02/2021	60	Somesul Mare	Romania
Informal	06/02/2021 00UTC	06/02/2021	72	Crisul Negru	Romania
Informal	06/02/2021 12UTC	07/02/2021	42	-	Kosovo
Formal	07/02/2021 12UTC	08/02/2021	54	Guadiana, below Zujar	Spain
Formal	08/02/2021 00UTC	08/02/2021	48	TEJO	Spain
Informal	09/02/2021 00UTC	09/02/2021	24	Mati	Albania
Informal	09/02/2021 12UTC	10/02/2021	36	Lim	Bosnia And
Informal	09/02/2021 12UTC	10/02/2021	42	Lim	Serbia
Informal	09/02/2021 12UTC	10/02/2021	42	Crisul Negru	Hungary
Informal	10/02/2021 00UTC	10/02/2021	0	Crisul Negru	Romania
Formal	12/02/2021 00UTC	12/02/2021	-97	Neretva	Bosnia And
Formal	16/02/2021 12UTC	17/02/2021	42	Prosna	Poland
Formal	17/02/2021 12UTC	18/02/2021	12	Limia	Portugal
Formal	21/02/2021 00UTC	21/02/2021	60	Blackwater Youghal	Ireland
Informal	21/02/2021 12UTC	22/02/2021	48	Suir	Ireland
Informal	22/02/2021 00UTC	22/02/2021	30	Munster Blackwater	Ireland
Informal	22/02/2021 12UTC	23/02/2021	42	Tajo	Spain
Informal	03/03/2021 00UTC	03/03/2021	72	Bug, above Mukhavyets	Ukraine
Formal	28/03/2021 12UTC	29/03/2021	120	Daugava or Western Dvina	Russia
Formal	28/03/2021 12UTC	29/03/2021	78	Zapadnaya Dvina, above	Russia
Formal	30/03/2021 00UTC	30/03/2021	78	Kasplya	Russia

a. \* Lead time [days] to the first forecasted exceedance of the 5-year simulated discharge threshold.

Table 2: EFAS flash flood notifications sent in February - March



Type	Forecast date	Issue date	Lead time	Region	Country
Flash Flood	31/01/2021 12UTC	01/02/2021	42	Poltava	Ukraine
Flash Flood	31/01/2021 12UTC	01/02/2021	24	Sumadijska oblast	Serbia
Flash Flood	31/01/2021 12UTC	01/02/2021	18	Sliven	Bulgaria
Flash Flood	31/01/2021 12UTC	01/02/2021	36	Campania	Italy
Flash Flood	31/01/2021 12UTC	01/02/2021	60	North Yorkshire	United Kingdom
Flash Flood	31/01/2021 12UTC	01/02/2021	60	East Yorkshire and	United Kingdom
Flash Flood	31/01/2021 12UTC	01/02/2021	18	Kentriki Makedonia	Greece
Flash Flood	31/01/2021 12UTC	01/02/2021	42	Leicestershire, Rutland and	United Kingdom
Flash Flood	31/01/2021 12UTC	01/02/2021	30	Pirotska oblast	Serbia
Flash Flood	31/01/2021 12UTC	01/02/2021	42	Lincolnshire	United Kingdom
Flash Flood	31/01/2021 12UTC	01/02/2021	66	Tees Valley and Durham	United Kingdom
Flash Flood	31/01/2021 12UTC	01/02/2021	18	Pazardzhik	Bulgaria
Flash Flood	31/01/2021 12UTC	01/02/2021	12	Beogradska oblast	Serbia
Flash Flood	01/02/2021 00UTC	01/02/2021	54	Alto Minho	Portugal
Flash Flood	01/02/2021 00UTC	01/02/2021	36	Shkoder	Albania
Flash Flood	01/02/2021 00UTC	01/02/2021	60	Loir-et-Cher	France
Flash Flood	01/02/2021 00UTC	01/02/2021	12	Aude	France
Flash Flood	01/02/2021 00UTC	01/02/2021	60	Karlsruhe	Germany
Flash Flood	01/02/2021 00UTC	01/02/2021	54	North Yorkshire	United Kingdom
Flash Flood	01/02/2021 00UTC	01/02/2021	60	Leon	Spain
Flash Flood	01/02/2021 00UTC	01/02/2021	60	Unterfranken	Germany
Flash Flood	01/02/2021 00UTC	01/02/2021	48	Cumbria	United Kingdom
Flash Flood	01/02/2021 00UTC	01/02/2021	24	Ariege	France
Flash Flood	01/02/2021 00UTC	01/02/2021	30	Basilicata	Italy
Flash Flood	01/02/2021 00UTC	01/02/2021	48	Lugo	Spain
Flash Flood	01/02/2021 00UTC	01/02/2021	48	Cher	France
Flash Flood	01/02/2021 00UTC	01/02/2021	30	Calabria	Italy
Flash Flood	01/02/2021 00UTC	01/02/2021	24	Sardegna	Italy
Flash Flood	01/02/2021 00UTC	01/02/2021	36	Dakovica	Kosovo
Flash Flood	01/02/2021 00UTC	01/02/2021	36	Kosovska Mitrovica	Kosovo
Flash Flood	01/02/2021 00UTC	01/02/2021	36	Kukes	Albania
Flash Flood	01/02/2021 12UTC	02/02/2021	60	Jihomoravsky kraj	Czech Republic
Flash Flood	01/02/2021 12UTC	02/02/2021	60	Olomoucky kraj	Czech Republic
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Prov. Namur	Belgium
Flash Flood	01/02/2021 12UTC	02/02/2021	24	Prizren	Kosovo
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Trier	Germany
Flash Flood	01/02/2021 12UTC	02/02/2021	24	Lezhe	Albania
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Jihocesky kraj	Czech Republic
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Plzensky kraj	Czech Republic
Flash Flood	01/02/2021 12UTC	02/02/2021	42	Haute-Saone	France
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Vosges	France
Flash Flood	01/02/2021 12UTC	02/02/2021	60	Kralovehradecky kraj	Czech Republic
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Aisne	France
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Yonne	France
Flash Flood	01/02/2021 12UTC	02/02/2021	24	Crna Gora	Montenegro
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Marne	France
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Seine-et-Marne	France
Flash Flood	01/02/2021 12UTC	02/02/2021	42	Indre-et-Loire	France
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Bas-Rhin	France

Flash Flood	01/02/2021 12UTC	02/02/2021	48	Eure	France
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Niederbayern	Germany
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Loir-et-Cher	France
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Oberpfalz	Germany
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Freiburg	Germany
Flash Flood	01/02/2021 12UTC	02/02/2021	48	Niederosterreich	Austria
Flash Flood	01/02/2021 12UTC	02/02/2021	54	Saarland	Germany
Flash Flood	01/02/2021 12UTC	02/02/2021	60	Kraj Vysocina	Czech Republic
Flash Flood	02/02/2021 00UTC	02/02/2021	36	Hampshire and Isle of	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	60	Slaskie	Poland
Flash Flood	02/02/2021 00UTC	02/02/2021	60	Caras-Severin	Romania
Flash Flood	02/02/2021 00UTC	02/02/2021	42	Outer London - East and	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	54	Transcarpathia	Ukraine
Flash Flood	02/02/2021 00UTC	02/02/2021	36	Bedfordshire and	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	36	Surrey, East and West	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	36	Kent	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	48	Presovsky kraj	Slovakia
Flash Flood	02/02/2021 00UTC	02/02/2021	54	Maramures	Romania
Flash Flood	02/02/2021 00UTC	02/02/2021	54	Arad	Romania
Flash Flood	02/02/2021 00UTC	02/02/2021	36	Essex	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	12	East Anglia	United Kingdom
Flash Flood	02/02/2021 00UTC	02/02/2021	36	Giessen	Germany
Flash Flood	02/02/2021 12UTC	03/02/2021	54	Medio Tejo	Portugal
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Pas-de-Calais	France
Flash Flood	02/02/2021 12UTC	03/02/2021	48	Alto Alentejo	Portugal
Flash Flood	02/02/2021 12UTC	03/02/2021	42	Satu Mare	Romania
Flash Flood	02/02/2021 12UTC	03/02/2021	42	Hunedoara	Romania
Flash Flood	02/02/2021 12UTC	03/02/2021	42	Cluj	Romania
Flash Flood	02/02/2021 12UTC	03/02/2021	54	Kherson	Ukraine
Flash Flood	02/02/2021 12UTC	03/02/2021	36	Kosicky kraj	Slovakia
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Toledo	Spain
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Freiburg	Germany
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Caceres	Spain
Flash Flood	02/02/2021 12UTC	03/02/2021	48	Salamanca	Spain
Flash Flood	02/02/2021 12UTC	03/02/2021	54	Leziria do Tejo	Portugal
Flash Flood	02/02/2021 12UTC	03/02/2021	48	Baixo Alentejo	Portugal
Flash Flood	02/02/2021 12UTC	03/02/2021	36	Eszak-Magyarország	Hungary
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Prov. West-Vlaanderen	Belgium
Flash Flood	02/02/2021 12UTC	03/02/2021	42	Bihor	Romania
Flash Flood	02/02/2021 12UTC	03/02/2021	30	Southern Scotland	United Kingdom
Flash Flood	02/02/2021 12UTC	03/02/2021	48	Dresden	Germany
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Nord	France
Flash Flood	02/02/2021 12UTC	03/02/2021	36	Moravskoslezsky kraj	Czech Republic
Flash Flood	02/02/2021 12UTC	03/02/2021	48	Bistrita-Nasaud	Romania
Flash Flood	02/02/2021 12UTC	03/02/2021	42	Alba	Romania
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Northumberland and Tyne	United Kingdom
Flash Flood	02/02/2021 12UTC	03/02/2021	24	Eastern Scotland	United Kingdom
Flash Flood	03/02/2021 00UTC	03/02/2021	42	Regiao de Coimbra	Portugal
Flash Flood	03/02/2021 00UTC	03/02/2021	48	Oeste	Portugal
Flash Flood	03/02/2021 00UTC	03/02/2021	24	Oberfranken	Germany
Flash Flood	03/02/2021 00UTC	03/02/2021	48	Regiao de Leiria	Portugal

Flash Flood	03/02/2021 12UTC	04/02/2021	24	Timis	Romania
Flash Flood	03/02/2021 12UTC	04/02/2021	30	Alentejo Litoral	Portugal
Flash Flood	03/02/2021 12UTC	04/02/2021	60	Cantabria	Spain
Flash Flood	03/02/2021 12UTC	04/02/2021	30	Area Metropolitana de	Portugal
Flash Flood	03/02/2021 12UTC	04/02/2021	24	Southern Scotland	United Kingdom
Flash Flood	03/02/2021 12UTC	04/02/2021	30	Avila	Spain
Flash Flood	03/02/2021 12UTC	04/02/2021	24	Region Vojvodine	Serbia
Flash Flood	03/02/2021 12UTC	04/02/2021	36	North Eastern Scotland	United Kingdom
Flash Flood	03/02/2021 12UTC	04/02/2021	24	Highlands and Islands	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Kraj Vysocina	Czech Republic
Flash Flood	04/02/2021 00UTC	04/02/2021	42	Beira Baixa	Portugal
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Loir-et-Cher	France
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Indre-et-Loire	France
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Darmstadt	Germany
Flash Flood	04/02/2021 00UTC	04/02/2021	30	Soria	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	66	Cher	France
Flash Flood	04/02/2021 00UTC	04/02/2021	18	Gloucestershire, Wiltshire	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	18	Herefordshire,	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	24	East Yorkshire and	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	24	North Yorkshire	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	60	Indre	France
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Bizkaia	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	42	Asturias	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	30	Segovia	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	30	Avila	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	48	Guadalajara	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	30	Tees Valley and Durham	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	18	Southern Scotland	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	18	Northumberland and Tyne	United Kingdom
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Olomoucky kraj	Czech Republic
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Jihomoravsky kraj	Czech Republic
Flash Flood	04/02/2021 00UTC	04/02/2021	54	Eszak-Magyarorszag	Hungary
Flash Flood	04/02/2021 00UTC	04/02/2021	60	Stredocesky kraj	Czech Republic
Flash Flood	04/02/2021 00UTC	04/02/2021	42	Sevilla	Spain
Flash Flood	04/02/2021 00UTC	04/02/2021	60	Unterfranken	Germany
Flash Flood	04/02/2021 00UTC	04/02/2021	66	Maine-et-Loire	France
Flash Flood	04/02/2021 00UTC	04/02/2021	60	Eure-et-Loir	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Lot-et-Garonne	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Derbyshire and	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Surrey, East and West	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Somme	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Leicestershire, Rutland and	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	54	East Anglia	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Bedfordshire and	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Essex	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Kent	United Kingdom
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Essonne	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Seine-et-Marne	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Vienne	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Jaen	Spain
Flash Flood	04/02/2021 12UTC	04/02/2021	48	Landes	France

Flash Flood	04/02/2021 12UTC	04/02/2021	48	Gironde	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Dordogne	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Sarthe	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Charente	France
Flash Flood	04/02/2021 12UTC	04/02/2021	24	Algarve	Portugal
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Drome	France
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Ardeche	France
Flash Flood	04/02/2021 12UTC	04/02/2021	48	Huesca	Spain
Flash Flood	04/02/2021 12UTC	04/02/2021	48	Navarra	Spain
Flash Flood	04/02/2021 12UTC	04/02/2021	6	Badajoz	Spain
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Puy-de-Dome	France
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Allier	France
Flash Flood	04/02/2021 12UTC	04/02/2021	48	Burgos	Spain
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Saone-et-Loire	France
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Nievre	France
Flash Flood	04/02/2021 12UTC	04/02/2021	60	Oise	France
Flash Flood	04/02/2021 12UTC	04/02/2021	54	Aisne	France
Flash Flood	05/02/2021 00UTC	05/02/2021	60	Dusseldorf	Germany
Flash Flood	05/02/2021 00UTC	05/02/2021	30	Jihocesky kraj	Czech Republic
Flash Flood	05/02/2021 00UTC	05/02/2021	42	Stredocesky kraj	Czech Republic
Flash Flood	05/02/2021 00UTC	05/02/2021	54	Piemonte	Italy
Flash Flood	05/02/2021 00UTC	05/02/2021	48	Giessen	Germany
Flash Flood	05/02/2021 00UTC	05/02/2021	48	Koblenz	Germany
Flash Flood	05/02/2021 00UTC	05/02/2021	60	Karnten	Austria
Flash Flood	05/02/2021 00UTC	05/02/2021	60	Lombardia	Italy
Flash Flood	05/02/2021 00UTC	05/02/2021	42	Marne	France
Flash Flood	05/02/2021 00UTC	05/02/2021	48	Yonne	France
Flash Flood	05/02/2021 00UTC	05/02/2021	42	Loiret	France
Flash Flood	05/02/2021 00UTC	05/02/2021	42	Marne	France
Flash Flood	05/02/2021 00UTC	05/02/2021	60	Corse-du-Sud	France
Flash Flood	05/02/2021 00UTC	05/02/2021	30	Kraj Vysocina	Czech Republic
Flash Flood	05/02/2021 00UTC	05/02/2021	42	Haute-Vienne	France
Flash Flood	05/02/2021 00UTC	05/02/2021	60	Dusseldorf	Germany
Flash Flood	05/02/2021 00UTC	05/02/2021	60	Friuli-Venezia Giulia	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Shkoder	Albania
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Kukes	Albania
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Crna Gora	Montenegro
Flash Flood	05/02/2021 12UTC	06/02/2021	24	Lincolnshire	United Kingdom
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Outer London - East and	United Kingdom
Flash Flood	05/02/2021 12UTC	06/02/2021	30	Inner London - East	United Kingdom
Flash Flood	05/02/2021 12UTC	06/02/2021	30	Creuse	France
Flash Flood	05/02/2021 12UTC	06/02/2021	30	Correze	France
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Lot	France
Flash Flood	05/02/2021 12UTC	06/02/2021	24	Pyrenees-Atlantiques	France
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Nord	France
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Cote-dOr	France
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Koblenz	Germany
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Nitriansky kraj	Slovakia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Bratislavsky kraj	Slovakia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Trenciansky kraj	Slovakia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Trnavsky kraj	Slovakia



Flash Flood	05/02/2021 12UTC	06/02/2021	60	Zilinsky kraj	Slovakia
Flash Flood	05/02/2021 12UTC	06/02/2021	42	Koln	Germany
Flash Flood	05/02/2021 12UTC	06/02/2021	42	Prov. Limburg (BE)	Belgium
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Eszak-Alfold	Hungary
Flash Flood	05/02/2021 12UTC	06/02/2021	66	Kosicky kraj	Slovakia
Flash Flood	05/02/2021 12UTC	06/02/2021	48	Liguria	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Regiao de Aveiro	Portugal
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Banskobystricky kraj	Slovakia
Flash Flood	05/02/2021 12UTC	06/02/2021	24	Araba/Alava	Spain
Flash Flood	05/02/2021 12UTC	06/02/2021	12	Madrid	Spain
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Transcarpathia	Ukraine
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Raska oblast	Serbia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Splitsko-dalmatinska	Croatia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Republika Srpska	Bosnia And
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Federacija Bosna i	Bosnia And
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Osrednjeslovenska	Slovenia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Zasavska	Slovenia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Nyugat-Dunantul	Hungary
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Aube	France
Flash Flood	05/02/2021 12UTC	06/02/2021	18	Valladolid	Spain
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Calabria	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	24	South Yorkshire	United Kingdom
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Primorsko-goranska	Croatia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Campania	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Abruzzo	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Umbria	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Marche	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Sardegna	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Istarska zupanija	Croatia
Flash Flood	05/02/2021 12UTC	06/02/2021	36	Aude	France
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Burgenland	Austria
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Dubrovacko-neretvanska	Croatia
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Basilicata	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	54	Toscana	Italy
Flash Flood	05/02/2021 12UTC	06/02/2021	66	Bihar	Romania
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Dakovica	Kosovo
Flash Flood	05/02/2021 12UTC	06/02/2021	60	Pecki	Kosovo
Flash Flood	06/02/2021 00UTC	06/02/2021	24	Prov. Namur	Belgium
Flash Flood	06/02/2021 00UTC	06/02/2021	42	Obalno-kraska	Slovenia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Steiermark	Austria
Flash Flood	06/02/2021 00UTC	06/02/2021	42	Veneto	Italy
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Licko-senjska zupanija	Croatia
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Sibensko-kninska zupanija	Croatia
Flash Flood	06/02/2021 00UTC	06/02/2021	48	Zlatiborska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	42	Lazio	Italy
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Branicevska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Zajecarska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Pomoravska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Dytiki Makedonia	Greece
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Stereia Ellada	Greece
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Kyustendil	Bulgaria

Flash Flood	06/02/2021 00UTC	06/02/2021	60	Thessalia	Greece
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Ipeiros	Greece
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Poloski	N. Macedonia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Jugozapaden	N. Macedonia
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Rasinska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Nisavska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Toplicka oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Pcinjska oblast	Serbia
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Kosovska Mitrovica	Kosovo
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Prizren	Kosovo
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Elbasan	Albania
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Berat	Albania
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Gjirokaster	Albania
Flash Flood	06/02/2021 00UTC	06/02/2021	24	Prov. Liege	Belgium
Flash Flood	06/02/2021 00UTC	06/02/2021	24	Prov. Hainaut	Belgium
Flash Flood	06/02/2021 00UTC	06/02/2021	24	Limburg (NL)	Netherlands
Flash Flood	06/02/2021 00UTC	06/02/2021	48	Zlinsky kraj	Czech Republic
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Ivano-Frankivs'k	Ukraine
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Presovsky kraj	Slovakia
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Caras-Severin	Romania
Flash Flood	06/02/2021 00UTC	06/02/2021	42	Primorsko-notranjska	Slovenia
Flash Flood	06/02/2021 00UTC	06/02/2021	48	Alto Alentejo	Portugal
Flash Flood	06/02/2021 00UTC	06/02/2021	24	Ardennes	France
Flash Flood	06/02/2021 00UTC	06/02/2021	48	Area Metropolitana do	Portugal
Flash Flood	06/02/2021 00UTC	06/02/2021	54	Lezhe	Albania
Flash Flood	06/02/2021 00UTC	06/02/2021	60	Skopski	N. Macedonia
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Cher	France
Flash Flood	06/02/2021 12UTC	07/02/2021	42	Alentejo Central	Portugal
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Plovdiv	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Allier	France
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Ardennes	France
Flash Flood	06/02/2021 12UTC	07/02/2021	36	Zadarska zupanija	Croatia
Flash Flood	06/02/2021 12UTC	07/02/2021	48	Sumadijska oblast	Serbia
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Jugostocen	N. Macedonia
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Bedfordshire and	United Kingdom
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Haskovo	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Prov. Luxembourg (BE)	Belgium
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Yambol	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Valcea	Romania
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Satu Mare	Romania
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Sliven	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	18	Kent	United Kingdom
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Gironde	France
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Lot	France
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Landes	France
Flash Flood	06/02/2021 12UTC	07/02/2021	42	Malaga	Spain
Flash Flood	06/02/2021 12UTC	07/02/2021	42	Jaen	Spain
Flash Flood	06/02/2021 12UTC	07/02/2021	42	Baixo Alentejo	Portugal
Flash Flood	06/02/2021 12UTC	07/02/2021	60	Aude	France
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Bizkaia	Spain
Flash Flood	06/02/2021 12UTC	07/02/2021	48	Brodsko-posavska zupanija	Croatia

Flash Flood	06/02/2021 12UTC	07/02/2021	12	Marne	France
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Aisne	France
Flash Flood	06/02/2021 12UTC	07/02/2021	48	Pazardzhik	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Essonne	France
Flash Flood	06/02/2021 12UTC	07/02/2021	48	Anatoliki Makedonia,	Greece
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Aube	France
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Essex	United Kingdom
Flash Flood	06/02/2021 12UTC	07/02/2021	6	East Anglia	United Kingdom
Flash Flood	06/02/2021 12UTC	07/02/2021	42	Cluj	Romania
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Puy-de-Dome	France
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Burgas	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Creuse	France
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Dytiki Ellada	Greece
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Yonne	France
Flash Flood	06/02/2021 12UTC	07/02/2021	18	Saone-et-Loire	France
Flash Flood	06/02/2021 12UTC	07/02/2021	48	Blagoevgrad	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	54	Smolyan	Bulgaria
Flash Flood	06/02/2021 12UTC	07/02/2021	12	North Yorkshire	United Kingdom
Flash Flood	06/02/2021 12UTC	07/02/2021	30	Molise	Italy
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Oise	France
Flash Flood	06/02/2021 12UTC	07/02/2021	6	Eure-et-Loir	France
Flash Flood	06/02/2021 12UTC	07/02/2021	12	Nievre	France
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Leziria do Tejo	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	30	Ciudad Real	Spain
Flash Flood	07/02/2021 00UTC	07/02/2021	42	Pernik	Bulgaria
Flash Flood	07/02/2021 00UTC	07/02/2021	30	Soria	Spain
Flash Flood	07/02/2021 00UTC	07/02/2021	30	Segovia	Spain
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Zamora	Spain
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Leon	Spain
Flash Flood	07/02/2021 00UTC	07/02/2021	54	Regiao de Aveiro	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	54	Tamega e Sousa	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Viseu Dao Lafoes	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Beiras e Serra da Estrela	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	54	Regiao de Leiria	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Beira Baixa	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	6	Puy-de-Dome	France
Flash Flood	07/02/2021 00UTC	07/02/2021	54	Medio Tejo	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	60	Area Metropolitana de	Portugal
Flash Flood	07/02/2021 00UTC	07/02/2021	54	Haute-Corse	France
Flash Flood	07/02/2021 00UTC	07/02/2021	36	Korce	Albania
Flash Flood	07/02/2021 00UTC	07/02/2021	48	Cuenca	Spain
Flash Flood	07/02/2021 00UTC	07/02/2021	24	Puglia	Italy
Flash Flood	07/02/2021 12UTC	08/02/2021	48	Alentejo Litoral	Portugal
Flash Flood	07/02/2021 12UTC	08/02/2021	54	Vlore	Albania
Flash Flood	07/02/2021 12UTC	08/02/2021	60	Valencia / Valencia	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	48	Regiao de Coimbra	Portugal
Flash Flood	07/02/2021 12UTC	08/02/2021	54	Oeste	Portugal
Flash Flood	07/02/2021 12UTC	08/02/2021	60	Madrid	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	60	Albacete	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	18	Cadiz	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	54	Istocen	N. Macedonia

Flash Flood	07/02/2021 12UTC	08/02/2021	54	Lleida	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	60	Granada	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	60	Cordoba	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	54	Sevilla	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	60	Pirotska oblast	Serbia
Flash Flood	07/02/2021 12UTC	08/02/2021	54	Zaragoza	Spain
Flash Flood	07/02/2021 12UTC	08/02/2021	30	Sofia	Bulgaria
Flash Flood	08/02/2021 00UTC	08/02/2021	54	Emilia-Romagna	Italy
Flash Flood	08/02/2021 00UTC	08/02/2021	42	Huelva	Spain
Flash Flood	08/02/2021 00UTC	08/02/2021	48	Dordogne	France
Flash Flood	08/02/2021 00UTC	08/02/2021	36	Leon	Spain
Flash Flood	08/02/2021 00UTC	08/02/2021	12	Landes	France
Flash Flood	08/02/2021 00UTC	08/02/2021	48	Lugo	Spain
Flash Flood	08/02/2021 12UTC	09/02/2021	60	Moravicka oblast	Serbia
Flash Flood	08/02/2021 12UTC	08/02/2021	42	Landes	France
Flash Flood	08/02/2021 12UTC	08/02/2021	36	Dordogne	France
Flash Flood	08/02/2021 12UTC	08/02/2021	48	Puy-de-Dome	France
Flash Flood	08/02/2021 12UTC	09/02/2021	60	Primorsko-notranjska	Slovenia
Flash Flood	08/02/2021 12UTC	09/02/2021	60	Kozep-Dunantul	Hungary
Flash Flood	08/02/2021 12UTC	08/02/2021	36	Cher	France
Flash Flood	08/02/2021 12UTC	09/02/2021	30	Diber	Albania
Flash Flood	08/02/2021 12UTC	09/02/2021	60	Zagrebacka zupanija	Croatia
Flash Flood	08/02/2021 12UTC	08/02/2021	48	Gironde	France
Flash Flood	09/02/2021 00UTC	09/02/2021	24	Saone-et-Loire	France
Flash Flood	09/02/2021 00UTC	09/02/2021	24	Cher	France
Flash Flood	09/02/2021 00UTC	09/02/2021	54	Korce	Albania
Flash Flood	09/02/2021 12UTC	10/02/2021	36	Karlovacka zupanija	Croatia
Flash Flood	09/02/2021 12UTC	10/02/2021	42	Sumadijska oblast	Serbia
Flash Flood	09/02/2021 12UTC	10/02/2021	48	Durres	Albania
Flash Flood	09/02/2021 12UTC	10/02/2021	36	Gorj	Romania
Flash Flood	09/02/2021 12UTC	10/02/2021	42	Hunedoara	Romania
Flash Flood	09/02/2021 12UTC	10/02/2021	42	Timis	Romania
Flash Flood	09/02/2021 12UTC	10/02/2021	12	Satu Mare	Romania
Flash Flood	09/02/2021 12UTC	10/02/2021	42	Del-Alfold	Hungary
Flash Flood	09/02/2021 12UTC	09/02/2021	12	Lot	France
Flash Flood	09/02/2021 12UTC	09/02/2021	6	Lot-et-Garonne	France
Flash Flood	09/02/2021 12UTC	10/02/2021	54	Silistra	Bulgaria
Flash Flood	09/02/2021 12UTC	09/02/2021	60	Asturias	Spain
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Kardzhali	Bulgaria
Flash Flood	10/02/2021 00UTC	10/02/2021	24	Goriska	Slovenia
Flash Flood	10/02/2021 00UTC	10/02/2021	24	Brodsko-posavska zupanija	Croatia
Flash Flood	10/02/2021 00UTC	10/02/2021	24	Pozesko-slavonska	Croatia
Flash Flood	10/02/2021 00UTC	10/02/2021	30	Diber	Albania
Flash Flood	10/02/2021 00UTC	10/02/2021	24	Mehedinti	Romania
Flash Flood	10/02/2021 00UTC	10/02/2021	60	Aveyron	France
Flash Flood	10/02/2021 00UTC	10/02/2021	60	Tarn-et-Garonne	France
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Calarasi	Romania
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Constanta	Romania
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Tulcea	Romania
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Braila	Romania
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Ruse	Bulgaria



Flash Flood	10/02/2021 00UTC	10/02/2021	42	Targovishte	Bulgaria
Flash Flood	10/02/2021 00UTC	10/02/2021	30	Pelagoniski	N. Macedonia
Flash Flood	10/02/2021 00UTC	10/02/2021	24	Obalno-kraska	Slovenia
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Area Metropolitana do	Portugal
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Cavado	Portugal
Flash Flood	10/02/2021 00UTC	10/02/2021	42	Ialomita	Romania
Flash Flood	10/02/2021 00UTC	10/02/2021	54	Gipuzkoa	Spain
Flash Flood	10/02/2021 12UTC	10/02/2021	42	Bizkaia	Spain
Flash Flood	10/02/2021 12UTC	11/02/2021	18	Fier	Albania
Flash Flood	10/02/2021 12UTC	10/02/2021	36	Regiao de Leiria	Portugal
Flash Flood	10/02/2021 12UTC	11/02/2021	18	Pristina	Kosovo
Flash Flood	11/02/2021 00UTC	11/02/2021	24	Burgas	Bulgaria
Flash Flood	11/02/2021 00UTC	11/02/2021	54	South-East	Ireland
Flash Flood	11/02/2021 00UTC	11/02/2021	24	Medio Tejo	Portugal
Flash Flood	11/02/2021 00UTC	11/02/2021	30	South-West	Ireland
Flash Flood	11/02/2021 12UTC	12/02/2021	42	Calabria	Italy
Flash Flood	11/02/2021 12UTC	12/02/2021	42	Basilicata	Italy
Flash Flood	11/02/2021 12UTC	12/02/2021	54	Puglia	Italy
Flash Flood	11/02/2021 12UTC	12/02/2021	36	Sardegna	Italy
Flash Flood	11/02/2021 12UTC	12/02/2021	48	Mid-West	Ireland
Flash Flood	11/02/2021 12UTC	12/02/2021	60	Ipeiros	Greece
Flash Flood	11/02/2021 12UTC	12/02/2021	60	Dytiki Ellada	Greece
Flash Flood	11/02/2021 12UTC	12/02/2021	60	Gjirokaster	Albania
Flash Flood	11/02/2021 12UTC	12/02/2021	42	Lazio	Italy
Flash Flood	11/02/2021 12UTC	12/02/2021	30	Puy-de-Dome	France
Flash Flood	11/02/2021 12UTC	12/02/2021	60	Stereia Ellada	Greece
Flash Flood	11/02/2021 12UTC	12/02/2021	36	Corse-du-Sud	France
Flash Flood	11/02/2021 12UTC	12/02/2021	42	Umbria	Italy
Flash Flood	11/02/2021 12UTC	12/02/2021	42	Campania	Italy
Flash Flood	12/02/2021 00UTC	12/02/2021	18	Aude	France
Flash Flood	12/02/2021 00UTC	12/02/2021	48	Peloponnisos	Greece
Flash Flood	12/02/2021 00UTC	12/02/2021	48	Vlore	Albania
Flash Flood	12/02/2021 12UTC	13/02/2021	18	Campania	Italy
Flash Flood	12/02/2021 12UTC	13/02/2021	24	Puglia	Italy
Flash Flood	12/02/2021 12UTC	13/02/2021	30	Basilicata	Italy
Flash Flood	12/02/2021 12UTC	13/02/2021	24	Calabria	Italy
Flash Flood	13/02/2021 12UTC	14/02/2021	36	Gloucestershire, Wiltshire	United Kingdom
Flash Flood	13/02/2021 12UTC	14/02/2021	24	Stereia Ellada	Greece
Flash Flood	13/02/2021 12UTC	14/02/2021	60	Kriti	Greece
Flash Flood	16/02/2021 12UTC	17/02/2021	24	Jihomoravsky kraj	Czech Republic
Flash Flood	17/02/2021 00UTC	17/02/2021	18	Rasinska oblast	Serbia
Flash Flood	18/02/2021 00UTC	18/02/2021	42	South-West	Ireland
Flash Flood	18/02/2021 00UTC	18/02/2021	42	South-East	Ireland
Flash Flood	18/02/2021 12UTC	19/02/2021	42	Arad	Romania
Flash Flood	19/02/2021 00UTC	19/02/2021	42	Badajoz	Spain
Flash Flood	19/02/2021 00UTC	19/02/2021	42	Vest-Agder	Norway
Flash Flood	19/02/2021 00UTC	19/02/2021	42	West Wales and The	United Kingdom
Flash Flood	19/02/2021 00UTC	19/02/2021	48	Toledo	Spain
Flash Flood	19/02/2021 00UTC	19/02/2021	42	Medio Tejo	Portugal
Flash Flood	19/02/2021 00UTC	19/02/2021	48	Alto Alentejo	Portugal
Flash Flood	19/02/2021 00UTC	19/02/2021	42	Leziria do Tejo	Portugal

Flash Flood	19/02/2021 00UTC	19/02/2021	42	Area Metropolitana de	Portugal
Flash Flood	19/02/2021 00UTC	19/02/2021	42	Alentejo Litoral	Portugal
Flash Flood	19/02/2021 00UTC	19/02/2021	48	Alentejo Central	Portugal
Flash Flood	19/02/2021 12UTC	20/02/2021	48	Huelva	Spain
Flash Flood	19/02/2021 12UTC	20/02/2021	30	Raska oblast	Serbia
Flash Flood	19/02/2021 12UTC	20/02/2021	30	Rasinska oblast	Serbia
Flash Flood	19/02/2021 12UTC	20/02/2021	30	Nisavska oblast	Serbia
Flash Flood	19/02/2021 12UTC	20/02/2021	48	Baixo Alentejo	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	48	Soria	Spain
Flash Flood	20/02/2021 00UTC	20/02/2021	30	Tamega e Sousa	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	30	Regiao de Aveiro	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	30	Regiao de Coimbra	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	30	Oeste	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	30	Area Metropolitana de	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	36	Algarve	Portugal
Flash Flood	20/02/2021 00UTC	20/02/2021	18	Toplicka oblast	Serbia
Flash Flood	20/02/2021 00UTC	20/02/2021	48	Bizkaia	Spain
Flash Flood	20/02/2021 00UTC	20/02/2021	48	Guadalajara	Spain
Flash Flood	20/02/2021 00UTC	20/02/2021	30	Area Metropolitana do	Portugal
Flash Flood	20/02/2021 12UTC	21/02/2021	48	Zaragoza	Spain
Flash Flood	20/02/2021 12UTC	21/02/2021	48	Navarra	Spain
Flash Flood	22/02/2021 00UTC	22/02/2021	48	Midland	Ireland
Flash Flood	22/02/2021 00UTC	22/02/2021	42	South-East	Ireland
Flash Flood	22/02/2021 00UTC	22/02/2021	42	South-West	Ireland
Flash Flood	22/02/2021 00UTC	22/02/2021	48	Mid-West	Ireland
Flash Flood	22/02/2021 00UTC	22/02/2021	48	Eastern Scotland	United Kingdom
Flash Flood	22/02/2021 00UTC	22/02/2021	48	Southern Scotland	United Kingdom
Flash Flood	22/02/2021 12UTC	23/02/2021	42	Cumbria	United Kingdom
Flash Flood	26/02/2021 12UTC	27/02/2021	12	Jihomoravsky kraj	Czech Republic
Flash Flood	03/03/2021 12UTC	04/03/2021	48	Area Metropolitana de	Portugal
Flash Flood	03/03/2021 12UTC	04/03/2021	48	Jihomoravsky kraj	Czech Republic
Flash Flood	03/03/2021 12UTC	04/03/2021	36	Stredocesky kraj	Czech Republic
Flash Flood	03/03/2021 12UTC	04/03/2021	48	Leziria do Tejo	Portugal
Flash Flood	03/03/2021 12UTC	04/03/2021	48	Alentejo Litoral	Portugal
Flash Flood	04/03/2021 00UTC	04/03/2021	36	Medio Tejo	Portugal
Flash Flood	04/03/2021 00UTC	04/03/2021	42	Eszak-Magyarország	Hungary
Flash Flood	04/03/2021 00UTC	04/03/2021	36	Badajoz	Spain
Flash Flood	04/03/2021 00UTC	04/03/2021	42	Baixo Alentejo	Portugal
Flash Flood	04/03/2021 00UTC	04/03/2021	36	Alentejo Central	Portugal
Flash Flood	04/03/2021 00UTC	04/03/2021	36	Alto Alentejo	Portugal
Flash Flood	04/03/2021 00UTC	04/03/2021	48	Raska oblast	Serbia
Flash Flood	04/03/2021 00UTC	04/03/2021	42	Arad	Romania
Flash Flood	04/03/2021 12UTC	05/03/2021	36	Rasinska oblast	Serbia
Flash Flood	05/03/2021 00UTC	05/03/2021	18	Bihor	Romania
Flash Flood	07/03/2021 00UTC	07/03/2021	48	Umbria	Italy
Flash Flood	07/03/2021 00UTC	07/03/2021	48	Lazio	Italy
Flash Flood	08/03/2021 00UTC	08/03/2021	48	Molise	Italy
Flash Flood	08/03/2021 00UTC	08/03/2021	48	Campania	Italy
Flash Flood	08/03/2021 12UTC	09/03/2021	42	Crna Gora	Montenegro
Flash Flood	08/03/2021 12UTC	09/03/2021	36	Marche	Italy
Flash Flood	08/03/2021 12UTC	09/03/2021	42	Calabria	Italy

Flash Flood	08/03/2021 12UTC	09/03/2021	48	Nisavska oblast	Serbia
Flash Flood	08/03/2021 12UTC	09/03/2021	12	Valencia / Valencia	Spain
Flash Flood	08/03/2021 12UTC	09/03/2021	48	Shkoder	Albania
Flash Flood	08/03/2021 12UTC	09/03/2021	48	Kukes	Albania
Flash Flood	08/03/2021 12UTC	09/03/2021	48	Rasinska oblast	Serbia
Flash Flood	09/03/2021 12UTC	10/03/2021	48	Aust-Agder	Norway
Flash Flood	09/03/2021 12UTC	10/03/2021	48	Vest-Agder	Norway
Flash Flood	10/03/2021 00UTC	10/03/2021	48	Olomoucky kraj	Czech Republic
Flash Flood	10/03/2021 00UTC	10/03/2021	48	Hallands lan	Sweden
Flash Flood	10/03/2021 00UTC	10/03/2021	42	Telemark	Norway
Flash Flood	10/03/2021 00UTC	10/03/2021	48	Jihomoravsky kraj	Czech Republic
Flash Flood	10/03/2021 12UTC	11/03/2021	48	Jonkopings lan	Sweden
Flash Flood	10/03/2021 12UTC	11/03/2021	36	Jihocesky kraj	Czech Republic
Flash Flood	10/03/2021 12UTC	11/03/2021	36	Vastra Gotalands lan	Sweden
Flash Flood	10/03/2021 12UTC	11/03/2021	48	Arad	Romania
Flash Flood	10/03/2021 12UTC	11/03/2021	30	Vestfold	Norway
Flash Flood	11/03/2021 00UTC	11/03/2021	24	Trenciansky kraj	Slovakia
Flash Flood	11/03/2021 00UTC	11/03/2021	48	Steiermark	Austria
Flash Flood	11/03/2021 12UTC	12/03/2021	42	Caras-Severin	Romania
Flash Flood	12/03/2021 00UTC	12/03/2021	24	Zagrebacka zupanija	Croatia
Flash Flood	12/03/2021 00UTC	12/03/2021	30	Bjelovarsko-bilogorska	Croatia
Flash Flood	12/03/2021 00UTC	12/03/2021	30	Brodsko-posavska zupanija	Croatia
Flash Flood	12/03/2021 00UTC	12/03/2021	30	Pozesko-slavonska	Croatia
Flash Flood	12/03/2021 00UTC	12/03/2021	30	Crna Gora	Montenegro
Flash Flood	12/03/2021 00UTC	12/03/2021	42	Darmstadt	Germany
Flash Flood	13/03/2021 00UTC	13/03/2021	48	Kosicky kraj	Slovakia
Flash Flood	13/03/2021 12UTC	14/03/2021	42	Rasinska oblast	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	42	Moravicka oblast	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Region Vojvodine	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Branicevska oblast	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Raska oblast	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Nisavska oblast	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Bihor	Romania
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Timis	Romania
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Arad	Romania
Flash Flood	13/03/2021 12UTC	14/03/2021	36	Eszak-Magyarorszag	Hungary
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Pomoravska oblast	Serbia
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Blagoevgrad	Bulgaria
Flash Flood	13/03/2021 12UTC	14/03/2021	48	Jugoistocen	N. Macedonia
Flash Flood	13/03/2021 12UTC	14/03/2021	36	Crna Gora	Montenegro
Flash Flood	14/03/2021 00UTC	14/03/2021	42	Puy-de-Dome	France
Flash Flood	14/03/2021 00UTC	14/03/2021	48	Zhytomyr	Ukraine
Flash Flood	14/03/2021 00UTC	14/03/2021	42	Ruse	Bulgaria
Flash Flood	14/03/2021 00UTC	14/03/2021	42	Hunedoara	Romania
Flash Flood	14/03/2021 00UTC	14/03/2021	48	Pleven	Bulgaria
Flash Flood	14/03/2021 00UTC	14/03/2021	42	Ivano-Frankivs'k	Ukraine
Flash Flood	14/03/2021 00UTC	14/03/2021	42	Veliko Tarnovo	Bulgaria
Flash Flood	14/03/2021 00UTC	14/03/2021	48	Ternopil'	Ukraine
Flash Flood	14/03/2021 00UTC	14/03/2021	48	Allier	France
Flash Flood	14/03/2021 00UTC	14/03/2021	48	Loire	France
Flash Flood	14/03/2021 12UTC	15/03/2021	24	Brcko	Bosnia And

Flash Flood	14/03/2021 12UTC	15/03/2021	30	Eszak-Alfold	Hungary
Flash Flood	14/03/2021 12UTC	15/03/2021	24	Vukovarsko-srijemska	Croatia
Flash Flood	14/03/2021 12UTC	15/03/2021	48	Rivne	Ukraine
Flash Flood	14/03/2021 12UTC	15/03/2021	36	Khmel'nyts'kyy	Ukraine
Flash Flood	14/03/2021 12UTC	15/03/2021	42	Kiev	Ukraine
Flash Flood	14/03/2021 12UTC	15/03/2021	30	Satu Mare	Romania
Flash Flood	14/03/2021 12UTC	15/03/2021	30	Salaj	Romania
Flash Flood	14/03/2021 12UTC	15/03/2021	30	Teleorman	Romania
Flash Flood	14/03/2021 12UTC	15/03/2021	48	Montana	Bulgaria
Flash Flood	14/03/2021 12UTC	15/03/2021	36	Olt	Romania
Flash Flood	14/03/2021 12UTC	15/03/2021	48	Alba	Romania
Flash Flood	14/03/2021 12UTC	15/03/2021	42	Vratsa	Bulgaria
Flash Flood	14/03/2021 12UTC	15/03/2021	30	Jonkopings lan	Sweden
Flash Flood	15/03/2021 00UTC	15/03/2021	36	Dambovita	Romania
Flash Flood	15/03/2021 00UTC	15/03/2021	36	Covasna	Romania
Flash Flood	15/03/2021 00UTC	15/03/2021	30	Borska oblast	Serbia
Flash Flood	15/03/2021 00UTC	15/03/2021	30	Valcea	Romania
Flash Flood	15/03/2021 00UTC	15/03/2021	24	Toplicka oblast	Serbia
Flash Flood	15/03/2021 00UTC	15/03/2021	30	Jablanicka oblast	Serbia
Flash Flood	15/03/2021 00UTC	15/03/2021	24	Zajecarska oblast	Serbia
Flash Flood	15/03/2021 12UTC	16/03/2021	48	Kherson	Ukraine
Flash Flood	15/03/2021 12UTC	16/03/2021	24	Caras-Severin	Romania
Flash Flood	15/03/2021 12UTC	16/03/2021	48	Puy-de-Dome	France
Flash Flood	15/03/2021 12UTC	16/03/2021	36	Galati	Romania
Flash Flood	15/03/2021 12UTC	16/03/2021	36	Braila	Romania
Flash Flood	15/03/2021 12UTC	16/03/2021	42	Buzau	Romania
Flash Flood	15/03/2021 12UTC	16/03/2021	24	Dolj	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	24	Ilfov	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	30	Pleven	Bulgaria
Flash Flood	16/03/2021 00UTC	16/03/2021	36	Vrancea	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	36	Teleorman	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	48	Iasi	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	18	Ialomita	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	24	Calarasi	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	24	Giurgiu	Romania
Flash Flood	16/03/2021 00UTC	16/03/2021	36	Ruse	Bulgaria
Flash Flood	16/03/2021 00UTC	16/03/2021	36	Silistra	Bulgaria
Flash Flood	16/03/2021 00UTC	16/03/2021	36	Veliko Tarnovo	Bulgaria
Flash Flood	16/03/2021 00UTC	16/03/2021	36	Allier	France
Flash Flood	16/03/2021 00UTC	16/03/2021	24	Bucuresti	Romania
Flash Flood	16/03/2021 12UTC	17/03/2021	24	Constanta	Romania
Flash Flood	16/03/2021 12UTC	17/03/2021	24	Alba	Romania
Flash Flood	16/03/2021 12UTC	17/03/2021	24	Olt	Romania
Flash Flood	17/03/2021 00UTC	17/03/2021	36	Rasinska oblast	Serbia
Flash Flood	17/03/2021 12UTC	18/03/2021	48	Navarra	Spain
Flash Flood	17/03/2021 12UTC	18/03/2021	48	Bizkaia	Spain
Flash Flood	18/03/2021 12UTC	19/03/2021	30	Cantabria	Spain
Flash Flood	18/03/2021 12UTC	19/03/2021	42	Campania	Italy
Flash Flood	19/03/2021 12UTC	20/03/2021	42	Pleven	Bulgaria
Flash Flood	19/03/2021 12UTC	20/03/2021	48	Pazardzhik	Bulgaria
Flash Flood	19/03/2021 12UTC	20/03/2021	48	Rasinska oblast	Serbia



Flash Flood	19/03/2021 12UTC	20/03/2021	48	Kentriki Makedonia	Greece
Flash Flood	19/03/2021 12UTC	20/03/2021	42	Stereia Ellada	Greece
Flash Flood	20/03/2021 00UTC	20/03/2021	42	Vratsa	Bulgaria
Flash Flood	20/03/2021 00UTC	20/03/2021	48	Nisavska oblast	Serbia
Flash Flood	20/03/2021 00UTC	20/03/2021	48	Blagoevgrad	Bulgaria
Flash Flood	20/03/2021 00UTC	20/03/2021	24	Calabria	Italy
Flash Flood	20/03/2021 12UTC	21/03/2021	18	Ipeiros	Greece
Flash Flood	20/03/2021 12UTC	21/03/2021	30	Calabria	Italy
Flash Flood	21/03/2021 00UTC	21/03/2021	12	Sicilia	Italy
Flash Flood	21/03/2021 00UTC	21/03/2021	42	Pleven	Bulgaria
Flash Flood	21/03/2021 00UTC	21/03/2021	42	Vratsa	Bulgaria
Flash Flood	21/03/2021 00UTC	21/03/2021	42	Giurgiu	Romania
Flash Flood	21/03/2021 00UTC	21/03/2021	24	Rasinska oblast	Serbia
Flash Flood	21/03/2021 12UTC	22/03/2021	30	Olt	Romania
Flash Flood	23/03/2021 00UTC	23/03/2021	12	Stereia Ellada	Greece
Flash Flood	25/03/2021 12UTC	26/03/2021	24	Kherson	Ukraine
Flash Flood	25/03/2021 12UTC	26/03/2021	48	Ostfold	Norway
Flash Flood	25/03/2021 12UTC	26/03/2021	48	Varmlands lan	Sweden
Flash Flood	26/03/2021 00UTC	26/03/2021	36	Vestfold	Norway
Flash Flood	26/03/2021 12UTC	27/03/2021	42	Arad	Romania
Flash Flood	26/03/2021 12UTC	27/03/2021	42	Rasinska oblast	Serbia
Flash Flood	26/03/2021 12UTC	27/03/2021	42	Raska oblast	Serbia
Flash Flood	26/03/2021 12UTC	27/03/2021	30	Jonkopings lan	Sweden
Flash Flood	26/03/2021 12UTC	27/03/2021	30	Vastra Gotalands lan	Sweden
Flash Flood	28/03/2021 00UTC	28/03/2021	24	Vinnytsya	Ukraine
Flash Flood	28/03/2021 00UTC	28/03/2021	12	Ivano-Frankivs'k	Ukraine
Flash Flood	28/03/2021 12UTC	29/03/2021	24	Highlands and Islands	United Kingdom
Flash Flood	28/03/2021 12UTC	29/03/2021	24	Zhytomyr	Ukraine
Flash Flood	29/03/2021 00UTC	29/03/2021	48	Tver'	Russia
Flash Flood	29/03/2021 12UTC	30/03/2021	96	Pskov	Russia
Flash Flood	30/03/2021 00UTC	30/03/2021	48	Varmlands lan	Sweden

a. \* Lead time [hours] to the forecasted peak of the event

**The European Flood Awareness System (EFAS)** produces European overviews of ongoing and forecasted floods up to 10 days in advance and contributes to better protection of the European citizens, the environment, properties and cultural heritage. It has been developed at the European Commission's in-house science service, the Joint Research Centre (JRC), in close collaboration with national hydrological and meteorological services and policy DG's of the European Commission.

EFAS has been transferred to operations under the European Commission's COPERNICUS Emergency Management Service led by DG GROW in direct support to the EU's Emergency Response Coordination Centre (ERCC) of DG ECHO and the hydrological services in the Member States.

ECMWF has been awarded the contract for the EFAS Computational centre. It is responsible for providing daily operational EFAS forecasts and 24/7 support to the technical system.

A consortium of Swedish Meteorological and Hydrological Institute (SMHI), Rijkswaterstaat (RWS) and Slovak Hydro-Meteorological Institute (SHMU) has been awarded the contract for the EFAS Dissemination centre. They are responsible for analysing EFAS output and disseminating information to the partners and the ERCC.

A Spanish consortium (REDIAM and SOOLOGIC) has been awarded the contract for the EFAS Hydrological data collection centre. They are responsible for collecting discharge and water level data across Europe.

A German consortium (KISTERS and DWD) has been awarded the contract for the EFAS Meteorological data collection centre. They are responsible for collecting the meteorological data needed to run EFAS over Europe.

Finally, the JRC is responsible for the overall project management related to EFAS and further development of the system.

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