

# EDERA

## Early warning Demonstration of pan-European Rainfall-induced impact forecasts

EDERA Workshop - Madrid, 07-8 May 2024

# Project summary

## Early warning Demonstration of pan-European rainfall-induced impact forecasts

- **Duration:** 01 Feb 2023 - 31 Jan 2025 (24 months)

- **Website:** [www.edera-project.eu](http://www.edera-project.eu)

- **Partners:**

Universitat Politècnica de Catalunya (ES)

European Centre for Medium-range Weather Forecasts (INT)

Finnish Meteorological Institute (FI)

Environment and Water Agency of Andalusia (ES)

Directorate-General for Civil Protection and Emergencies (ES)

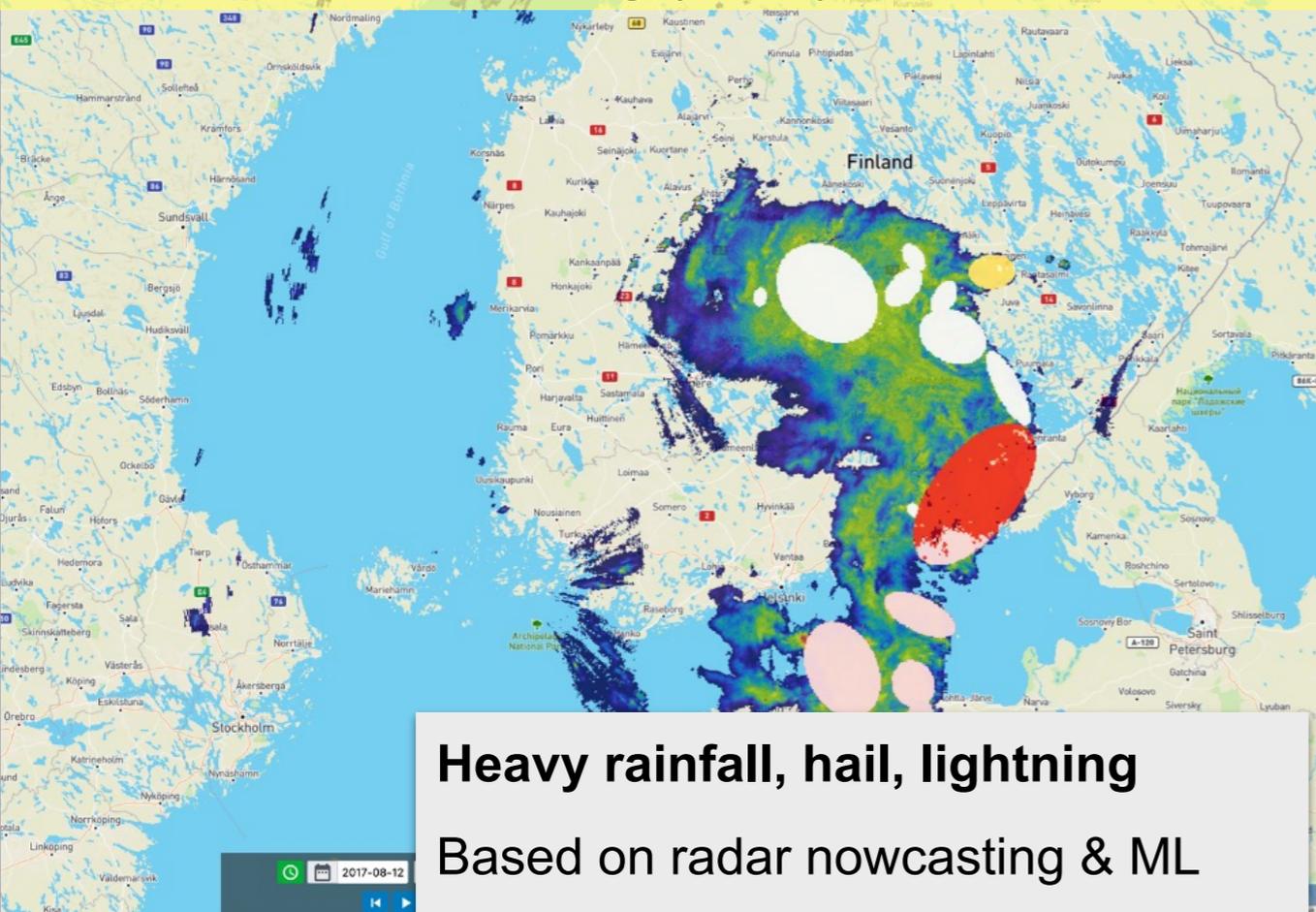
National Authority of Emergency and Civil Protection (PT)

# Main objective

Integrating forecasts of the impacts due to storms and heavy rainfall into the operational EWSs of national, regional and local CPAs, fostering sharing information and cooperation of CPAs during cross-border events and coordination between CPAs.

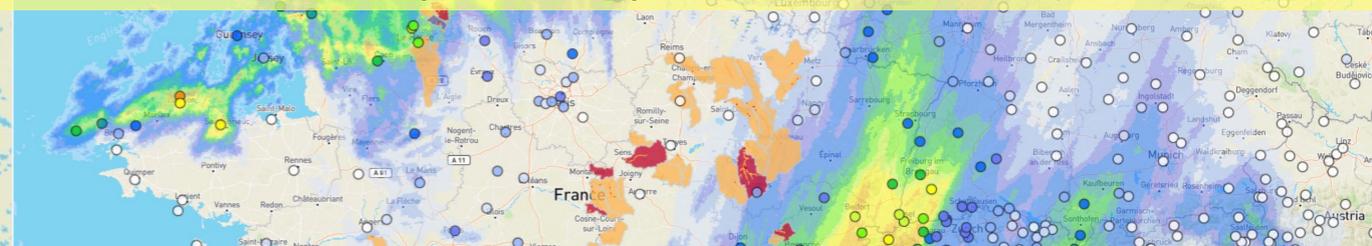
## Impact forecasting during storms and heavy rainfall events

Storm impact nowcasting (0-3 h).



**Heavy rainfall, hail, lightning**  
Based on radar nowcasting & ML  
Extended to European scale  
European-wide exposure.

Flood impacts (0-120 h).



### Flash floods (basins 10 - 2000 km<sup>2</sup>)

Resolution: 1 h, 1 km - Update: 1 h

Blended precipitation forecasts

Flash flood hazard

Flash flood impacts

- Using probabilistic nowcasting & NWP.
- Seamless blending in the first 6 hours

- Basin-aggregated precipitation on the drainage network (1 km).

- Hazard assessment by comparison with climatological thresholds.

- By combining hazard with exposure.

# Specific objectives and expected outputs

- **Extend the convective hazard and pluvial flood forecasts over Europe.**
- **Increase the adaptability of the flood impact forecasts to the needs of the end users**, applying a strategy to provide compound impact forecasts, and implement configurable user-defined notifications.
  - *Improved products for flood impact forecasting at European scale*
- **Integrate the flood impact forecasts to the EWS platforms of the end users** for improved preparedness and response management during flood events.
- **Demonstrate the added value of seamless flood impact forecasts through a robust evaluation**, at European scale and in two pilot sites, with end-users analysing the added value for CPAs cooperation in cross-border operations and coordination.
  - *Demonstration for a period of 15 months*
  - *Recommendations for coordination and cross-border cooperation between CPAs*
- **Develop comprehensive guidance material** delivered through dedicated training workshops and e-learning materials.
- **Integrate the developments within the CEMS-Floods EFAS system.**
  - *Sustainability of the products*

# EDERA pilot sites



## ES-PT pilot site

**National Authority of Emergency and Civil Protection**

*CIM Coimbra Region*

*Portuguese Institute of Sea and Atmosphere*

*Portuguese Agency of Environment*



**Directorate-General for Civil Protection and Emergencies**

**Environment and Water Agency of Andalusia**

*Civil Protection of Andalusia*

*Civil Protection of Puente Genil*

*Association of CP operators of Andalusia*

*Agency of Security and Emergency Response of Valencia*

*Civil Protection of Catalonia*

*State Agency of Meteorology*

EUMETNET OPERA

## FI+ pilot site

**Finnish Meteorological Institute**

*Helsinki Rescue Department*

*Kymenlaakso Rescue Services*

*North Karelia Rescue Department*

*Finnish Environment Institute*

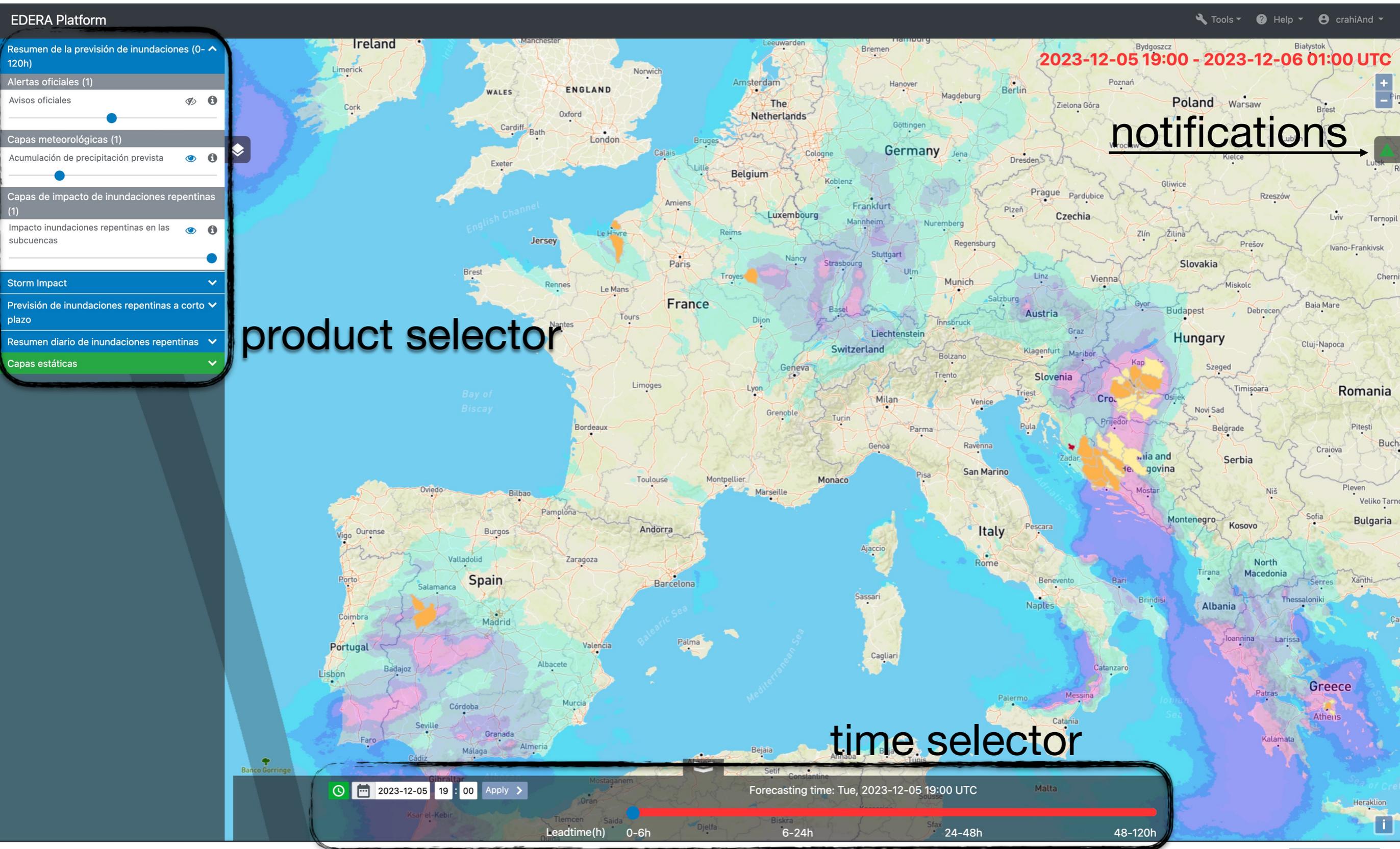


Co-funded by the European Union

# EDERA demonstration

- August 2023 – October 2024.
- With the participation of end users.
- Access to the products in real time through
  - + EDERA web-based platform.
  - + WMS
- Integration of *local* products/information (exposure, vulnerability, obs...)
- Notifications adapted to the end user.
- Contribution to the evaluation (feedback about the products, functionalities and results during events).
- Recommendations for coordination and cooperation between CPAs.
- Local training workshops.

# EDERA demonstration



# Training and guidance

## Local training at the pilot sites

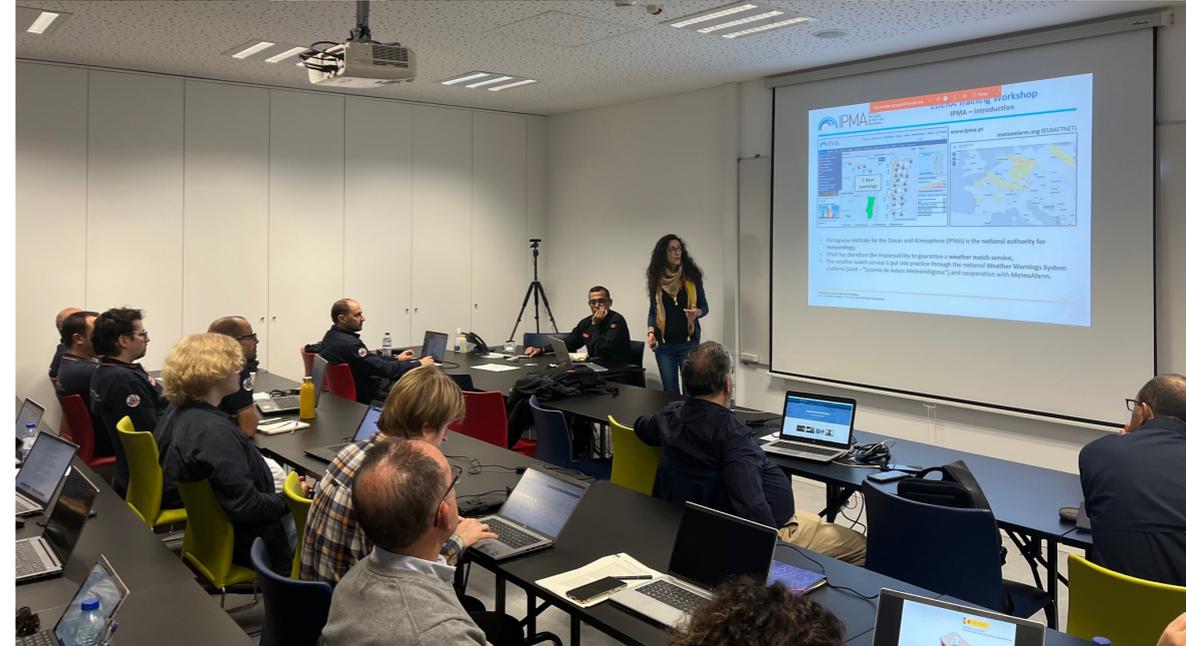
- Presentation of the features and products.
- Discussion on the flow to use the implemented products.
- Design/configuration of notifications.
- Collecting feedback from end-users (through the platform and via frequent meetings).
- Need for further training (technical staff).

## International training Workshop

- Presentation to interested end users.

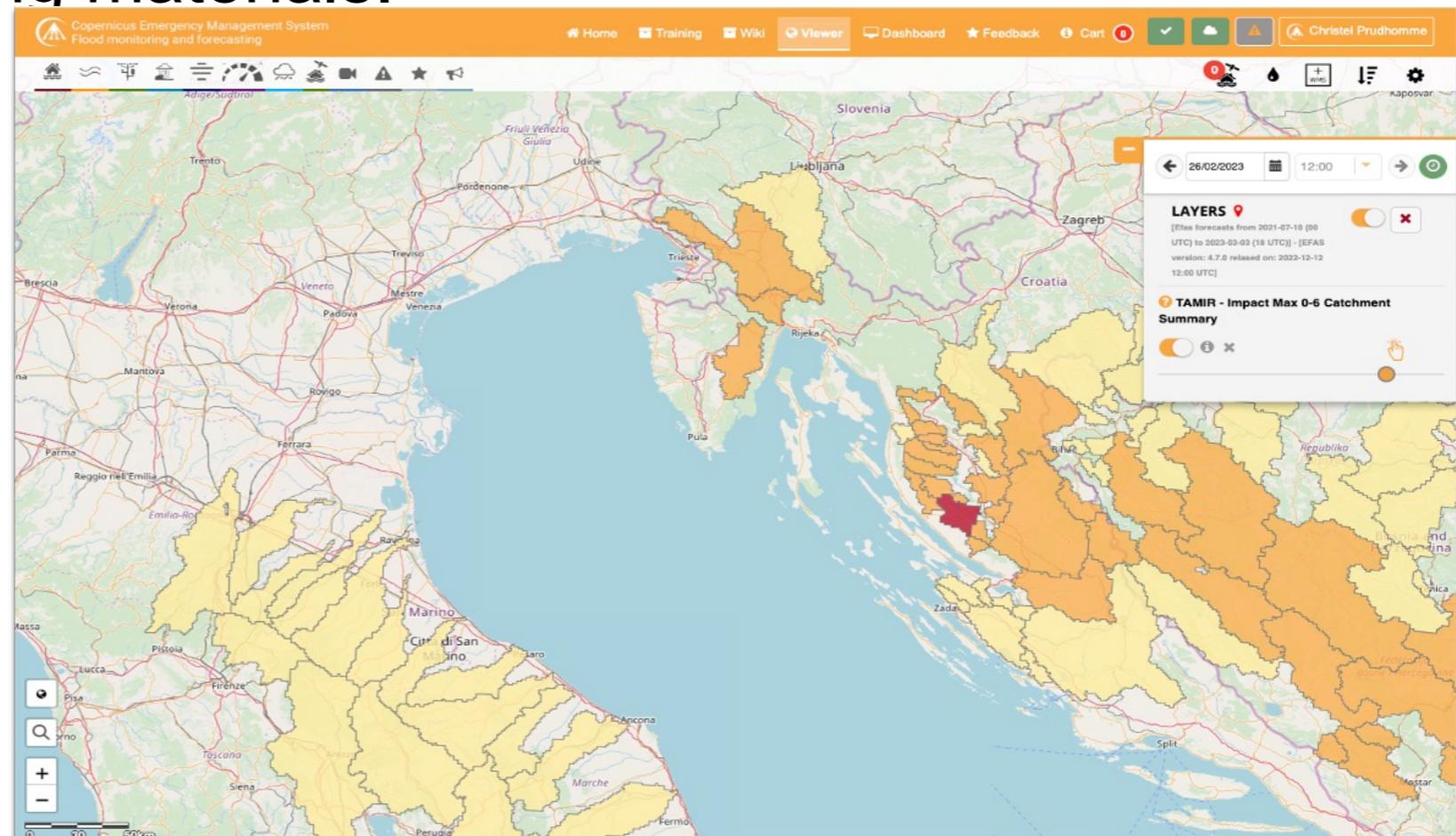
## Other

- Preparation of e-learning materials.



# Summary

- Improvement of products for storms and flash floods impact forecasting and development of new functionalities.
- Real-time demonstration.
- Evaluation of the added value with end users.
- Discussion on coordination among CPAs and cooperation during cross-border events.
- Training and e-learning materials.
- Integration in EFAS.



# EDERA Platform

EDERA Workshop - Madrid, 07-8 May 2024

# EDERA platform

- Web-based platform providing real-time access to the products.
- Organised in 4 blocks of real-time products.
- Access to historical datasets available.

# The EDERA platform

EDERA Platform

http://gebrada.upc.es/edera-platform

Documentation Contact us

### Login

Login

(\*) Access to the platform is limited to the EDERA project partners and stakeholders.

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Login

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# The EDERA platform

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Flash flood forecast summary (0-120h) ^

Official warnings (1)

Official warnings

Meteorological layers (1)

Seamless precipitation accumulation

Flash flood impact layers (1)

Flash flood impact over sub-catchment

Animated flash flood nowcasting

Flash flood past 24-h summary

Static layers

2024-05-05 06:00 - 2024-05-05 12:00 UTC

notifications

product selector

date & time selector

Forecasting time: Sun, 2024-05-05 06:00 UTC

Leadtime(h) 0-6h 6-24h 24-48h 48-120h

METEOROLOGICAL INSTITUTE ECMWF CRAH UPC Junta de Andalucía

# Product selector

EDERA Platform <http://gebrada.upc.es/edera-platform>

Flash flood forecast summary (0-120h) **Fcst Summary**

Official warnings (1)

Official warnings  **Official warnings**

Meteorological layers (1)

Seamless precipitation accumulation  **Seamless precipitation accumulation**

Flash flood impact layers (1)

Flash flood impact over sub-catchment  **Flash flood impact over sub-catchment**

Storm Impact  **Storms monitoring**

Animated flash flood nowcasting  **Floods monitoring**

Flash flood past 24-h summary  **24-h summary**

Static layers  **Static layers**

2024-05-05 06:00 - 2024-05-05 12:00 UTC

Forecasting time: Sun, 2024-05-05 06:00 UTC

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# Date & time selector

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Flash flood forecast summary (0-120h)

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2024-05-05 06:00 - 2024-05-05 12:00 UTC

Oct 2023

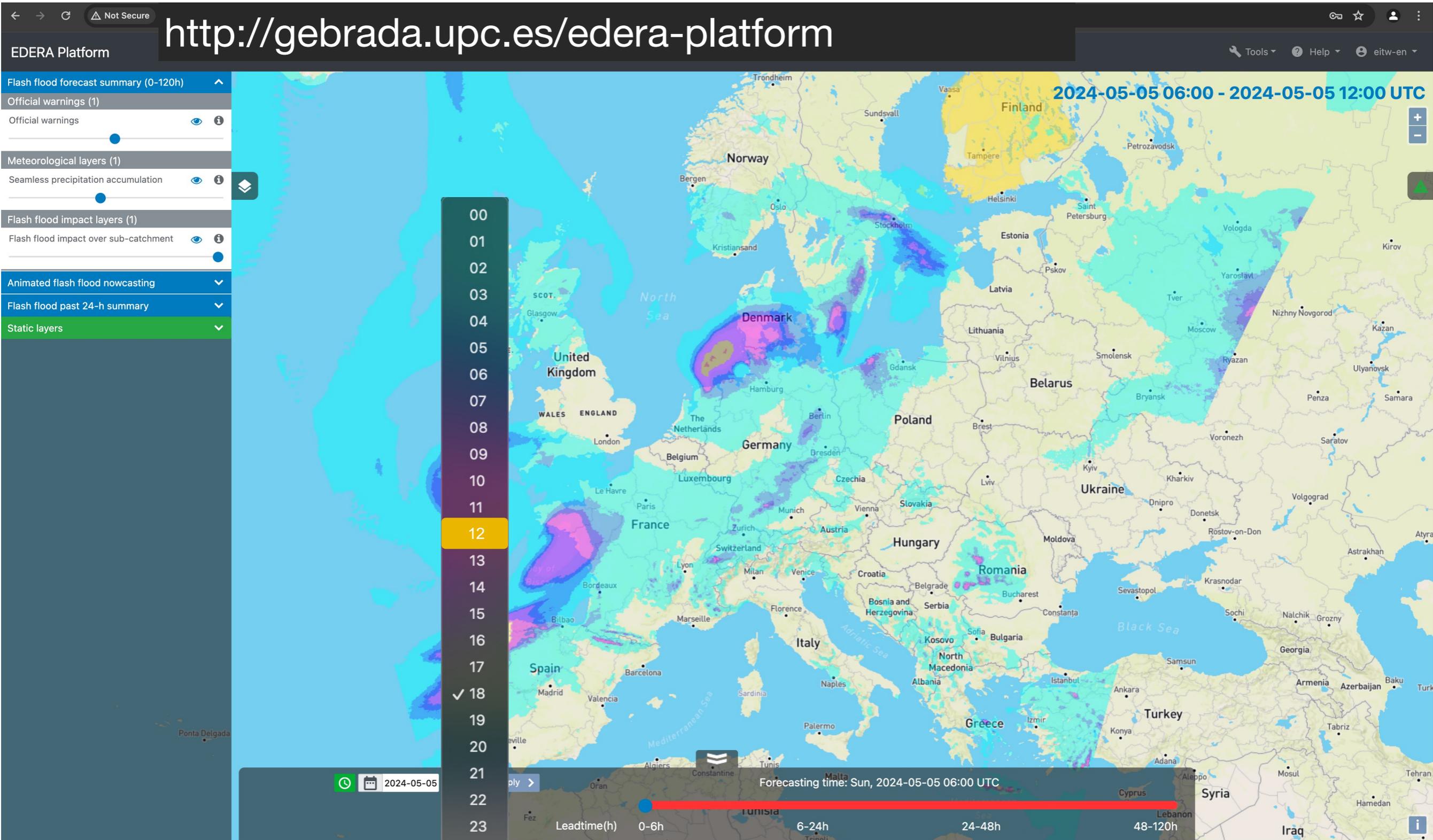
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Today Done

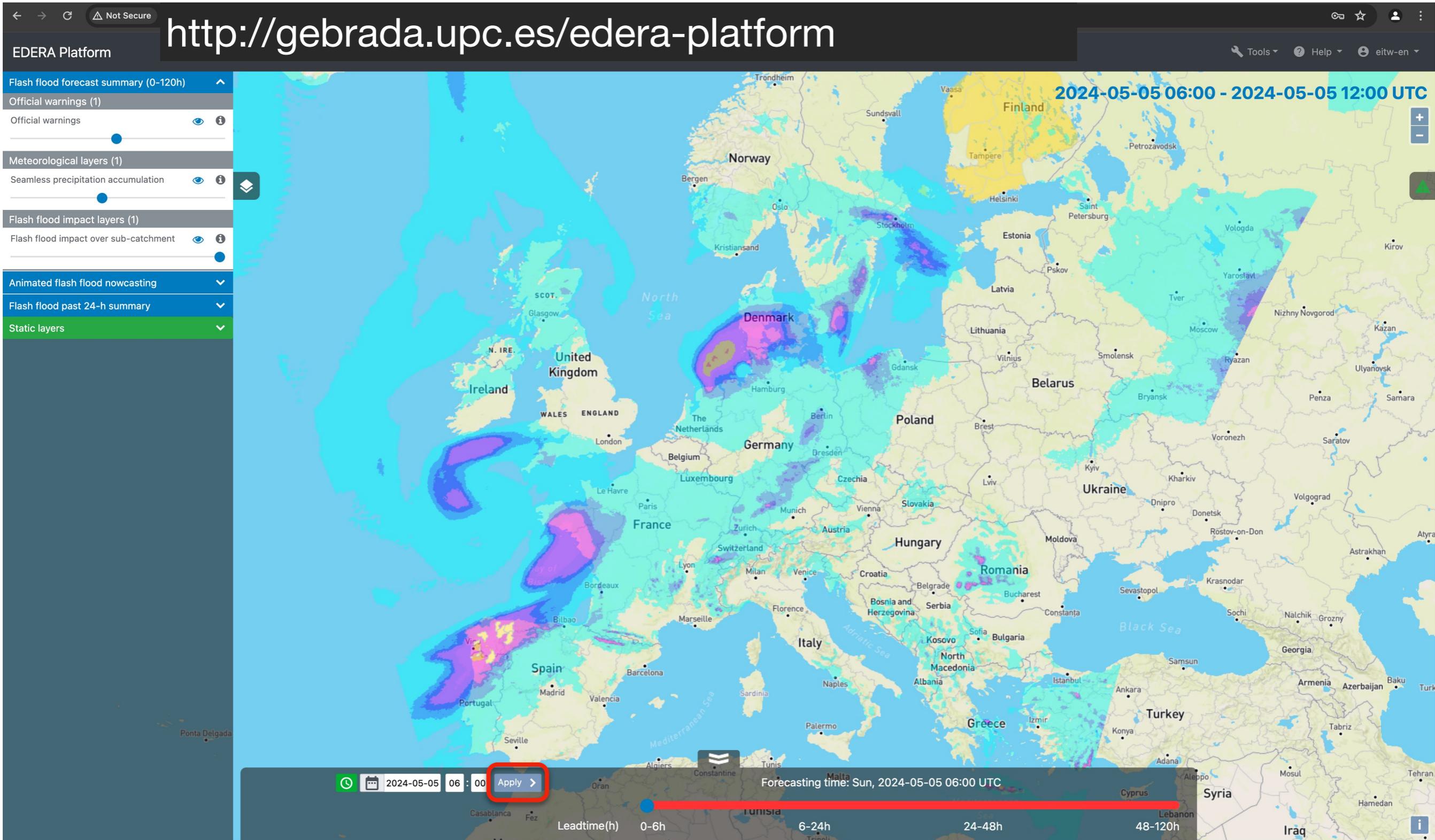
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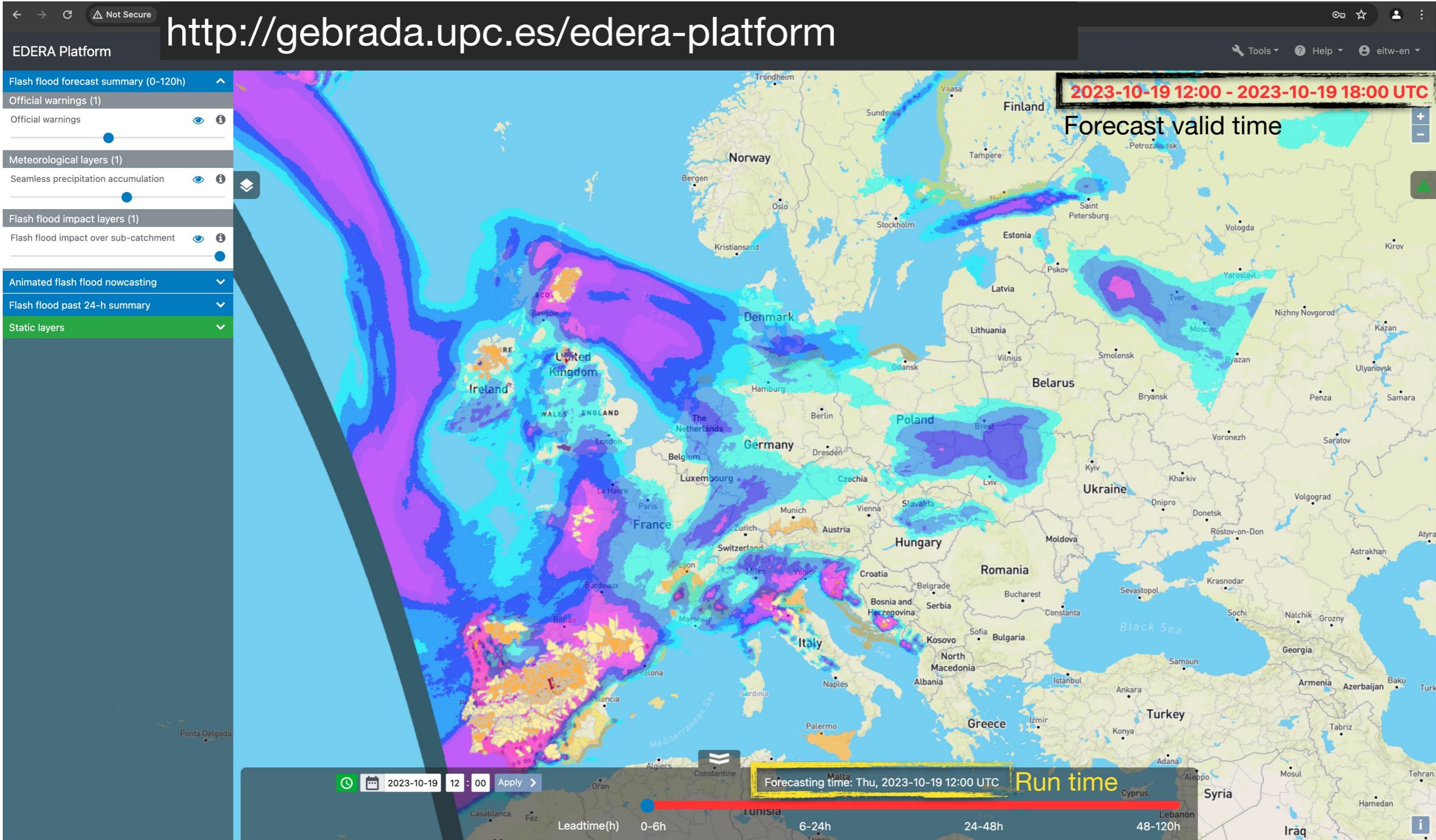
# Date & time selector



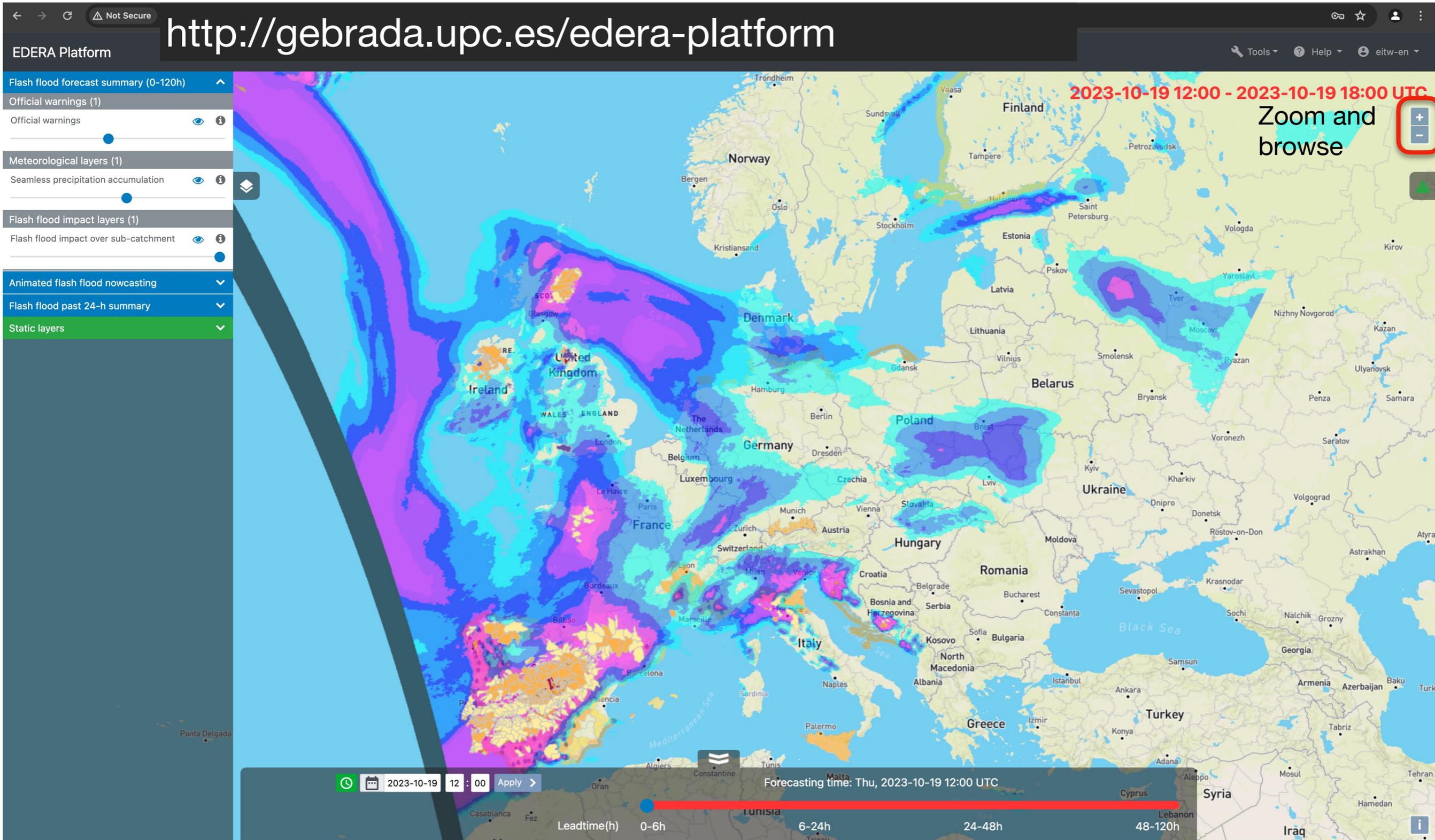
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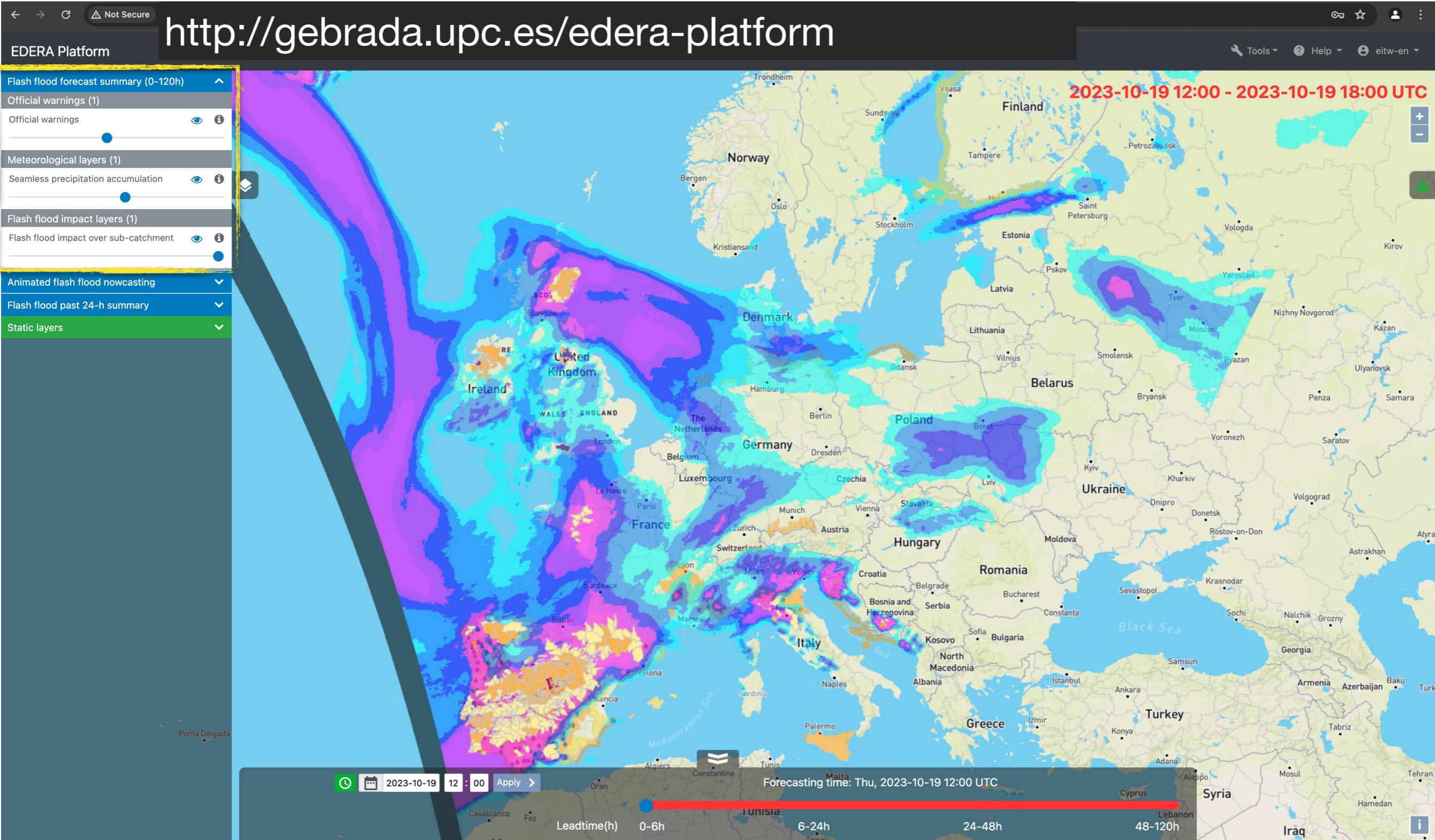
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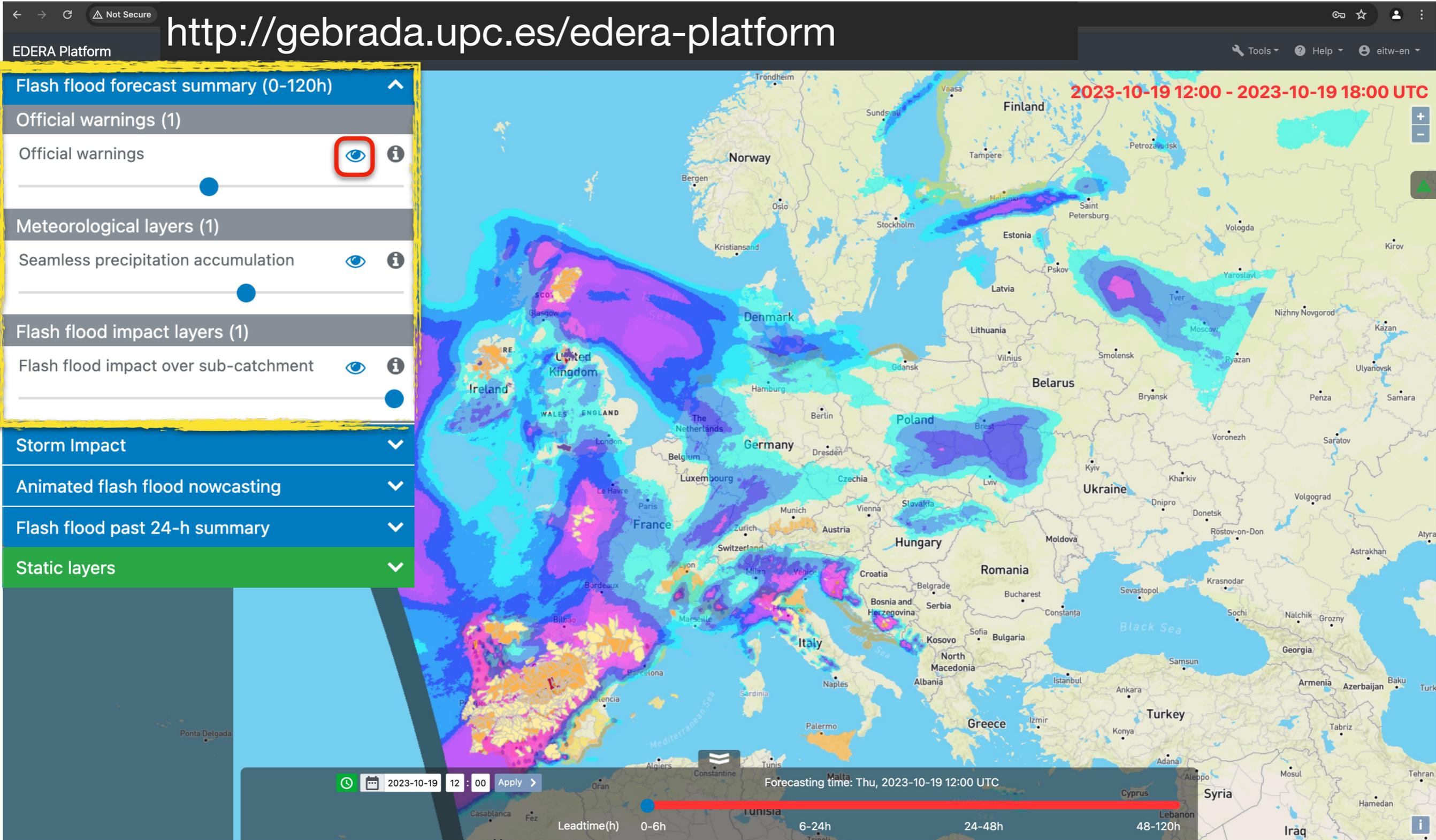
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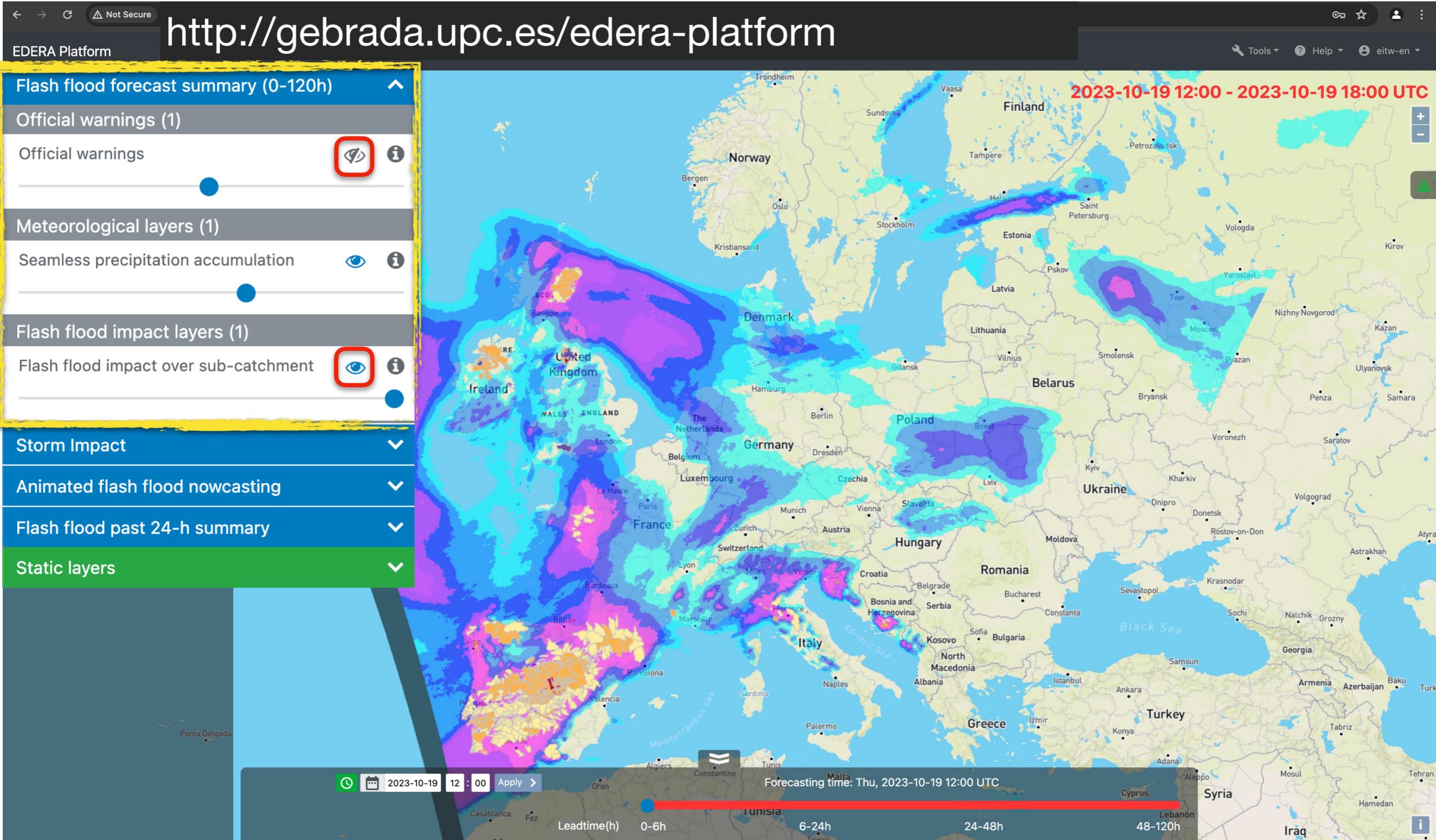
# Block 1: Forecast summary (0-120 h)



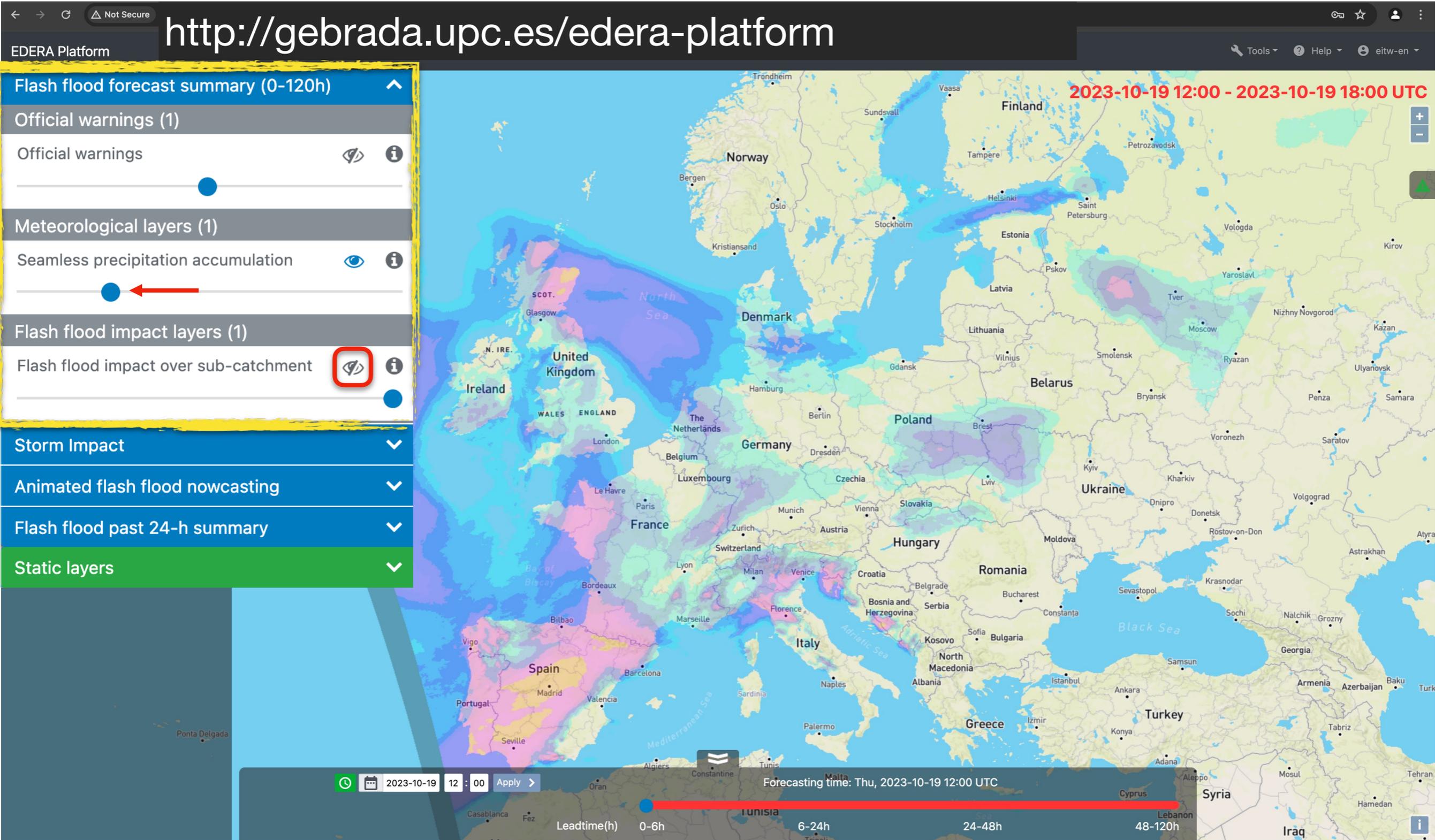
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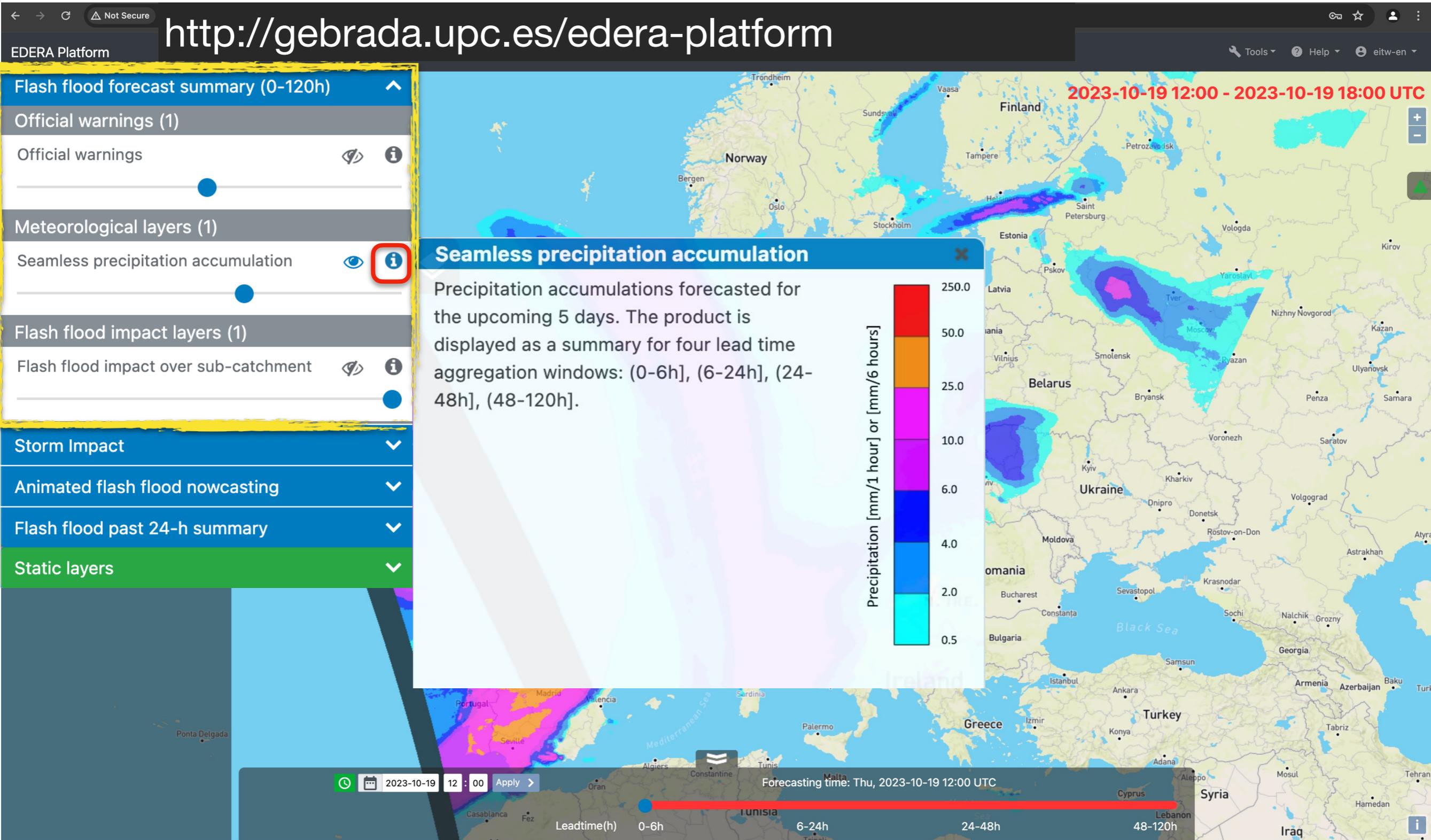
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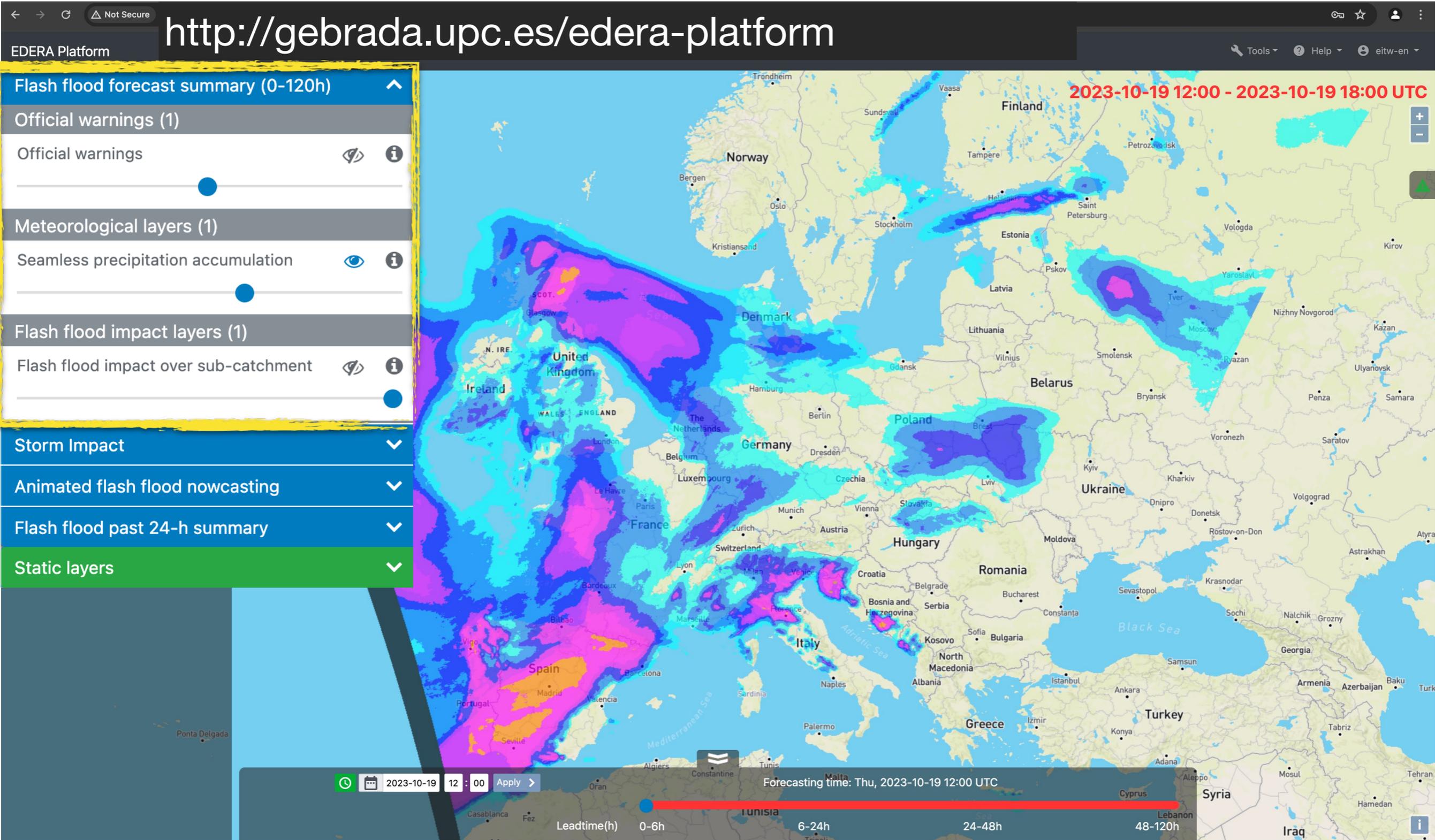
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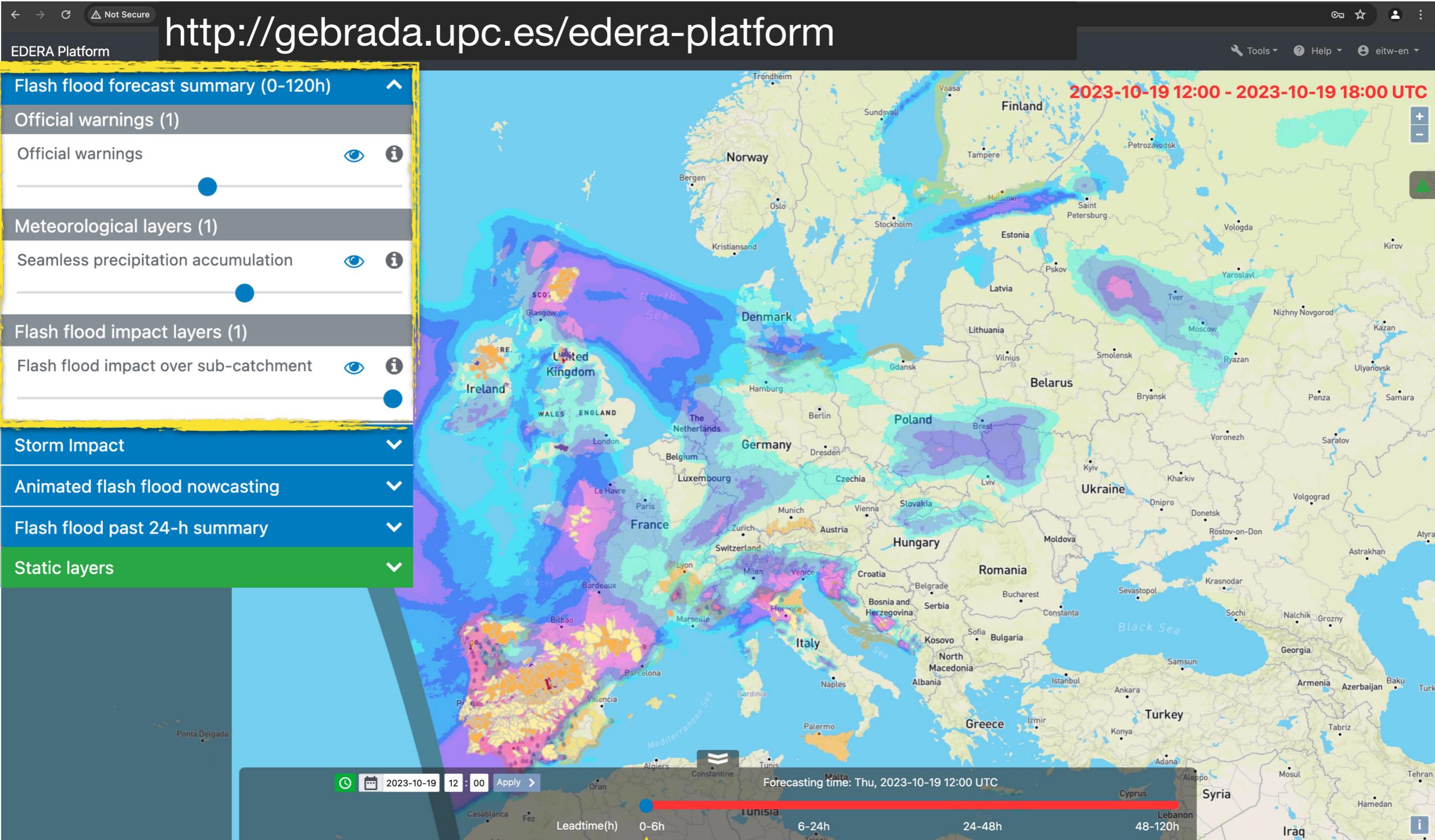
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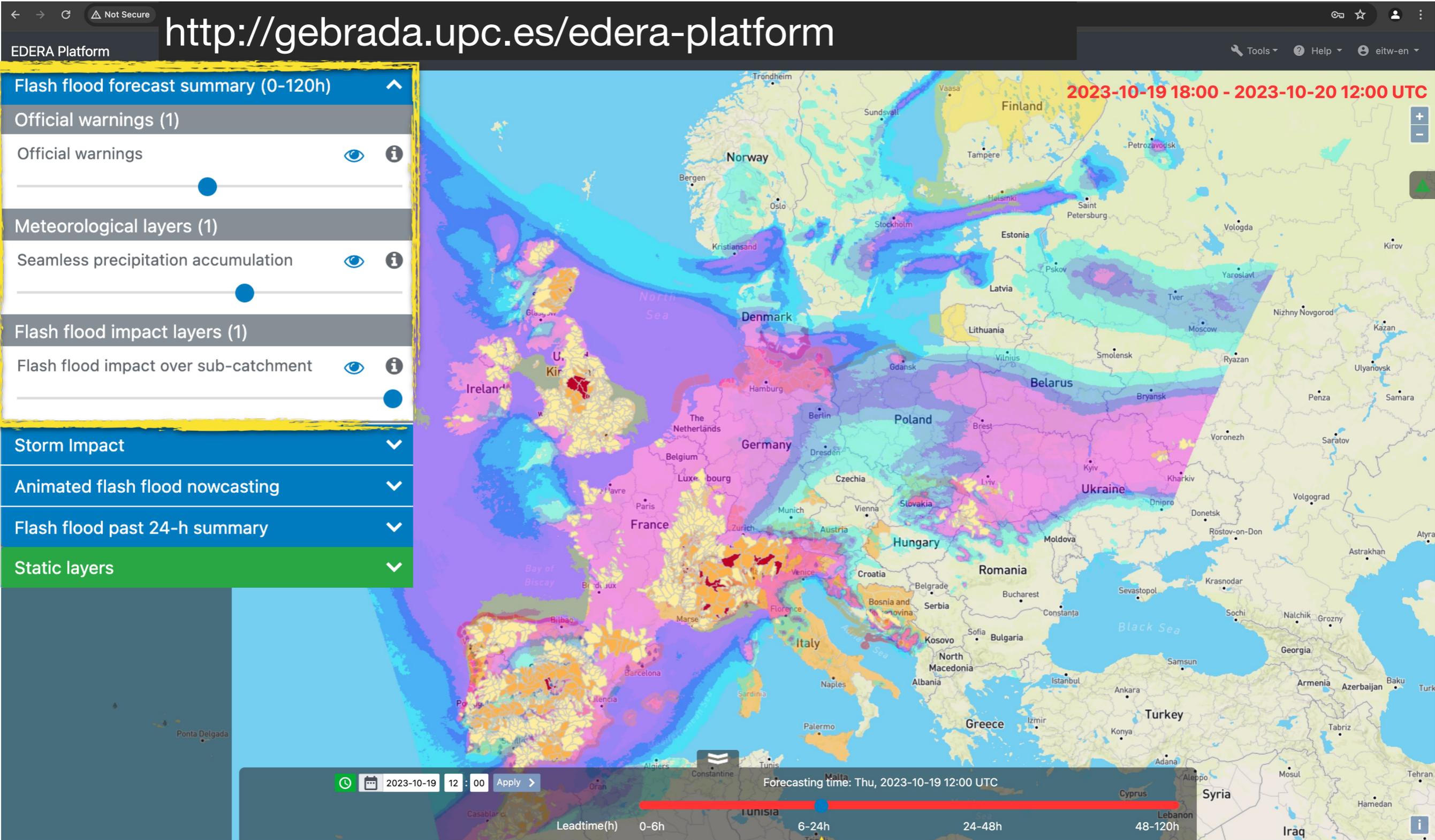
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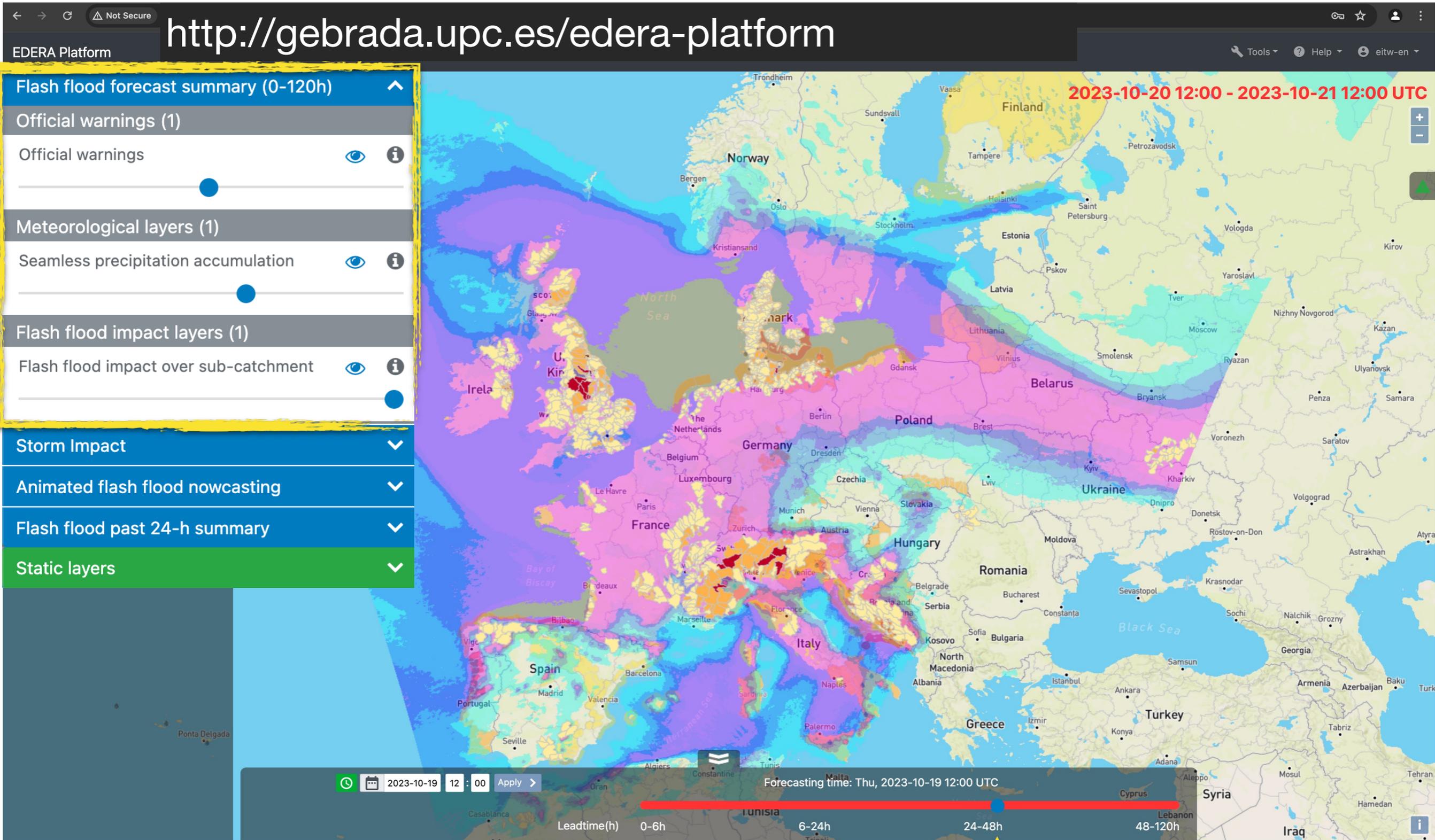
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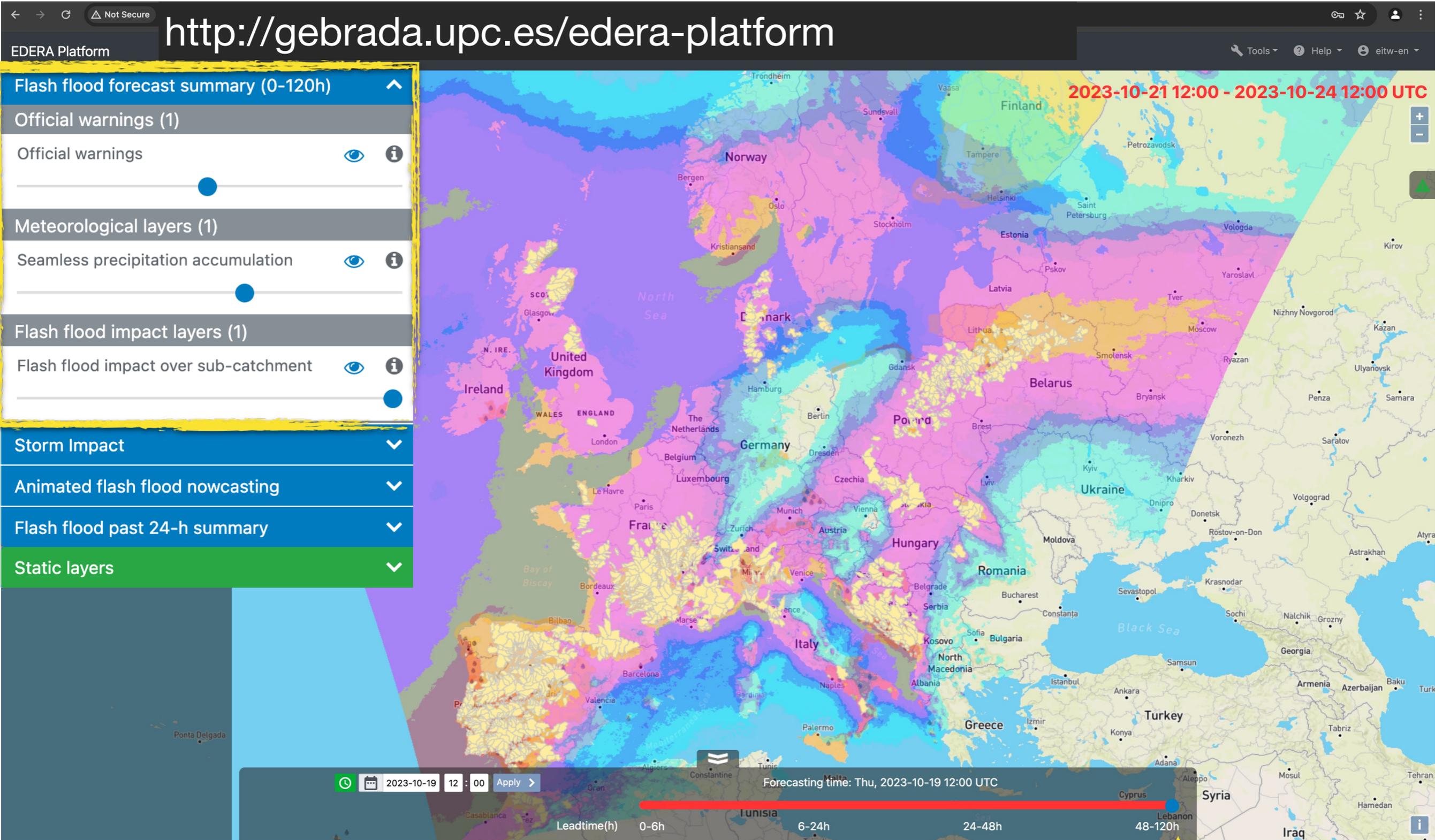
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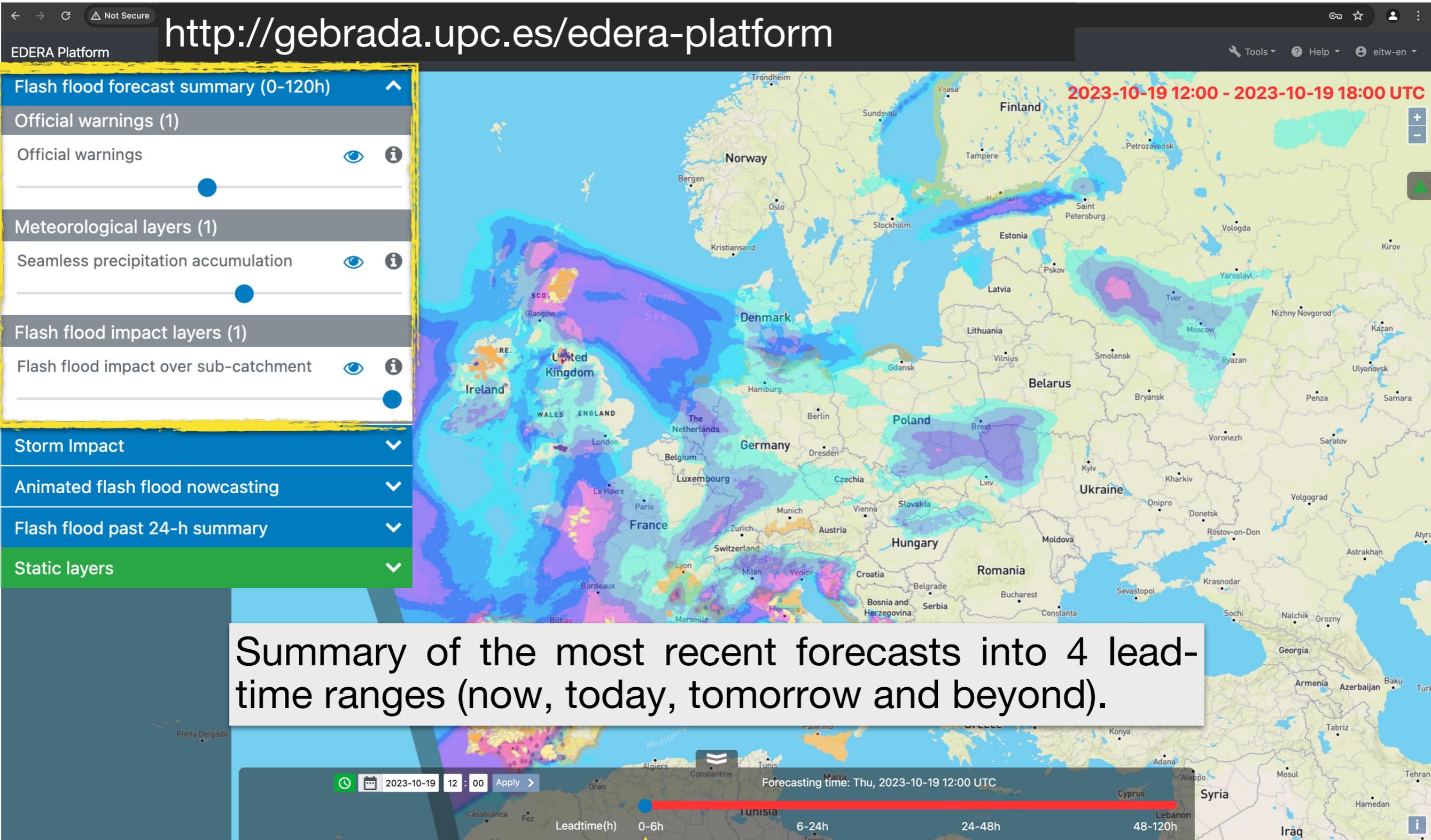
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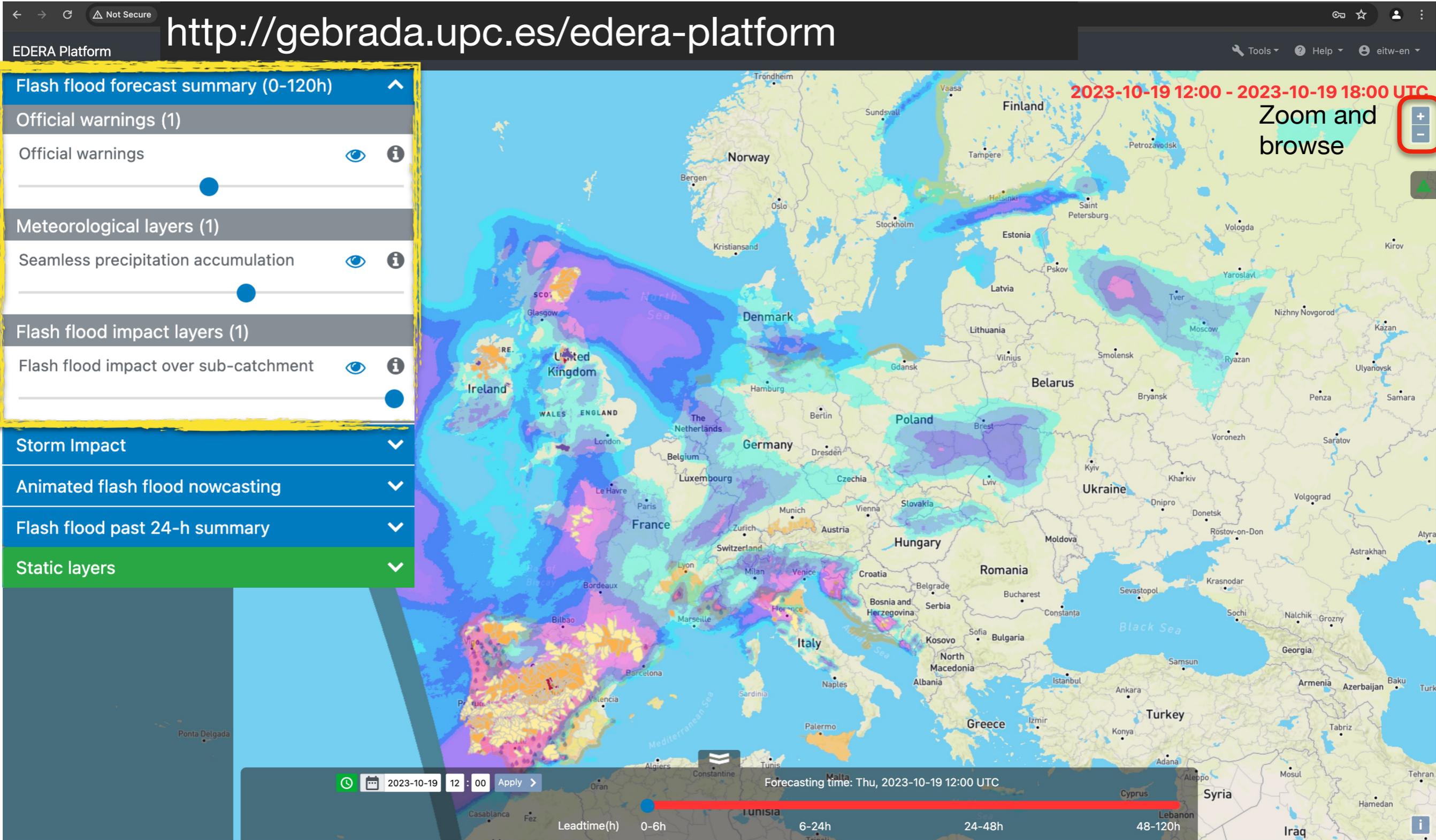
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EDERA Platform <http://gebrada.upc.es/edera-platform>

Flash flood forecast summary (0-120h)

Official warnings (1)

Official warnings

Selected feature information

Official Warnings Flash flood impact over sub-catchment

Lat, Lon: 40.385047,-3.759737

### Impact matrix

	Low Exposure	Medium Exposure	High Exposure
High Likelihood			
Medium Likelihood			✓
Low Likelihood			

### Exposure information

	#
<b>Total population affected</b>	<b>279450</b>
<b>Education facilities affected</b>	<b>24</b>
<b>Health facilities affected</b>	<b>14</b>
<b>Energy generation facilities affected</b>	
<b>Time of the event peak</b>	<b>2023/10/19 15:00:00</b>

Forecasting time: Thu, 2023-10-19 12:00 UTC

Leadtime(h) 0-6h 6-24h 24-48h 48-120h

# Block 2: Storm impact nowcasting (0-3h)

EDERA Platform <http://gebrada.upc.es/edera-platform>

Flash flood forecast summary (0-120h)

**Storm Impact**

Meteorological layers (2)

- Radar reflectivity OPERA
- Hourly precipitation - radar nowcasting

Storm impact layers (6)

- Storm Hazard**
- Hail Hazard
- Wind Hazard
- Precipitation Hazard
- Lightning Hazard
- Storm Impact

Flash flood impact layers (1)

- Pluvial flood hazard in urban areas

Animated flash flood nowcasting

Flash flood past 24-h summary

Static layers

**Meteorological**

2023-10-19 12:00 UTC

Thu, 2023-10-19 12:00 UTC

3 h (past) 3 h (nowcast)

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2023-10-19 12:00 UTC

Thu, 2023-10-19 12:00 UTC

3 h (past) | 3 h (nowcast)

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EDERA Platform <http://gebrada.upc.es/edera-platform>

Flash flood forecast summary (0-120h) **Storm Impact** Meteorological layers (2) Storm impact layers (6) Flash flood impact layers (1)

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- Lightning Hazard
- Storm Impact
- Pluvial flood hazard in urban areas

2023-10-19 12:00 UTC

Meteorological

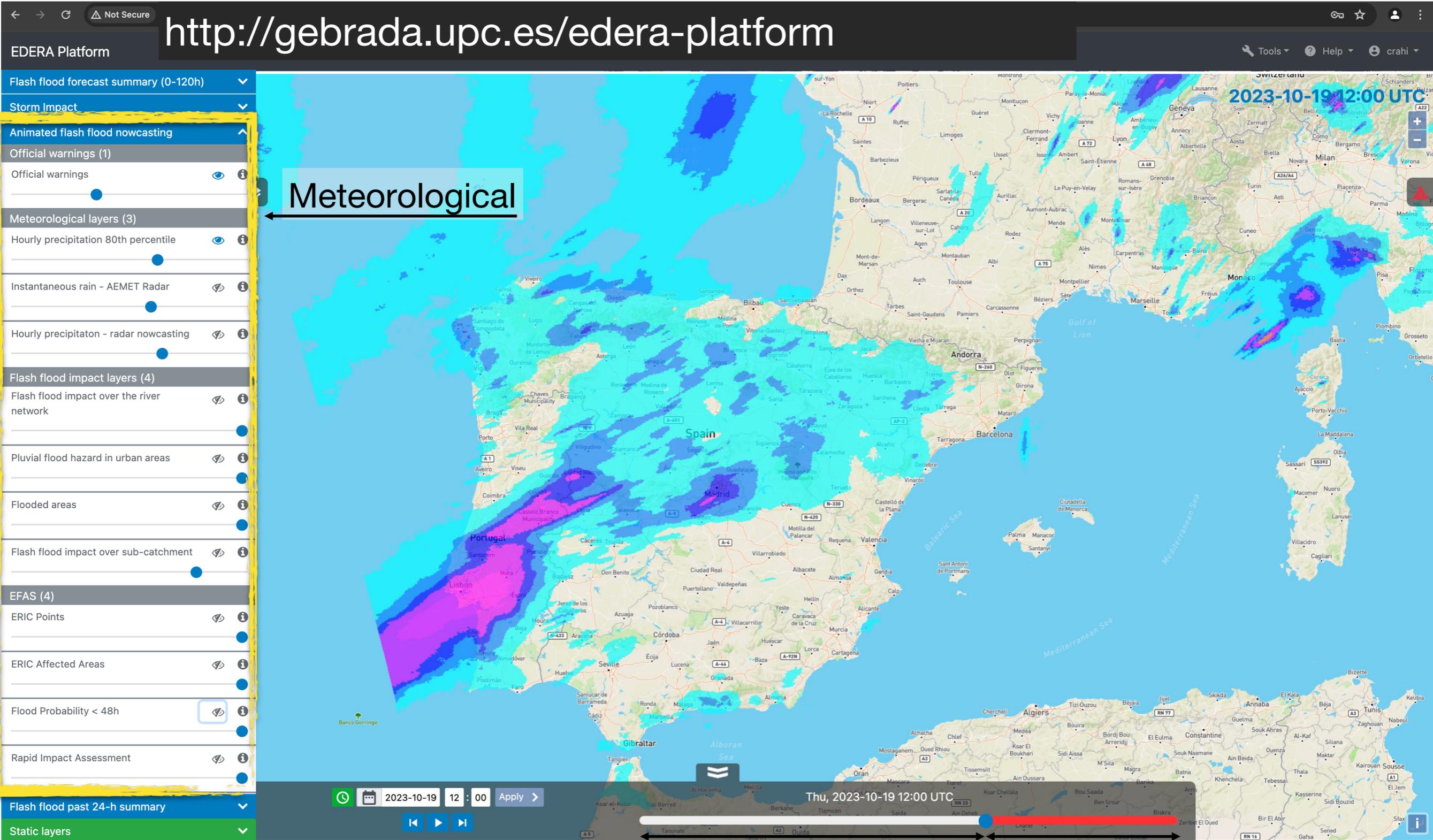
Storm impacts

Pluvial floods

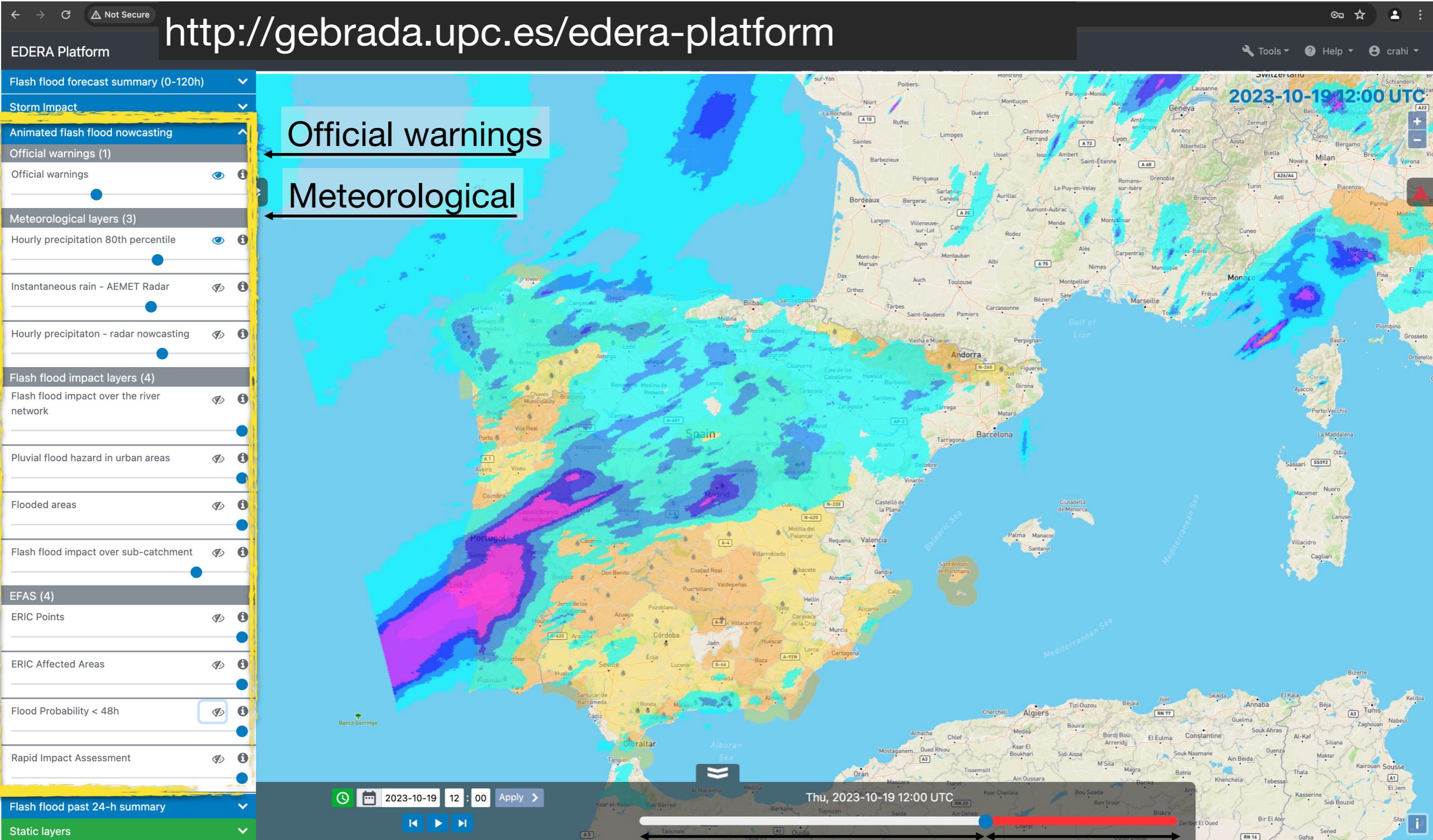
2023-10-19 12:00

3 h (past) 3 h (nowcast)

# Block 3: Flash flood nowcasting (0-6 h)



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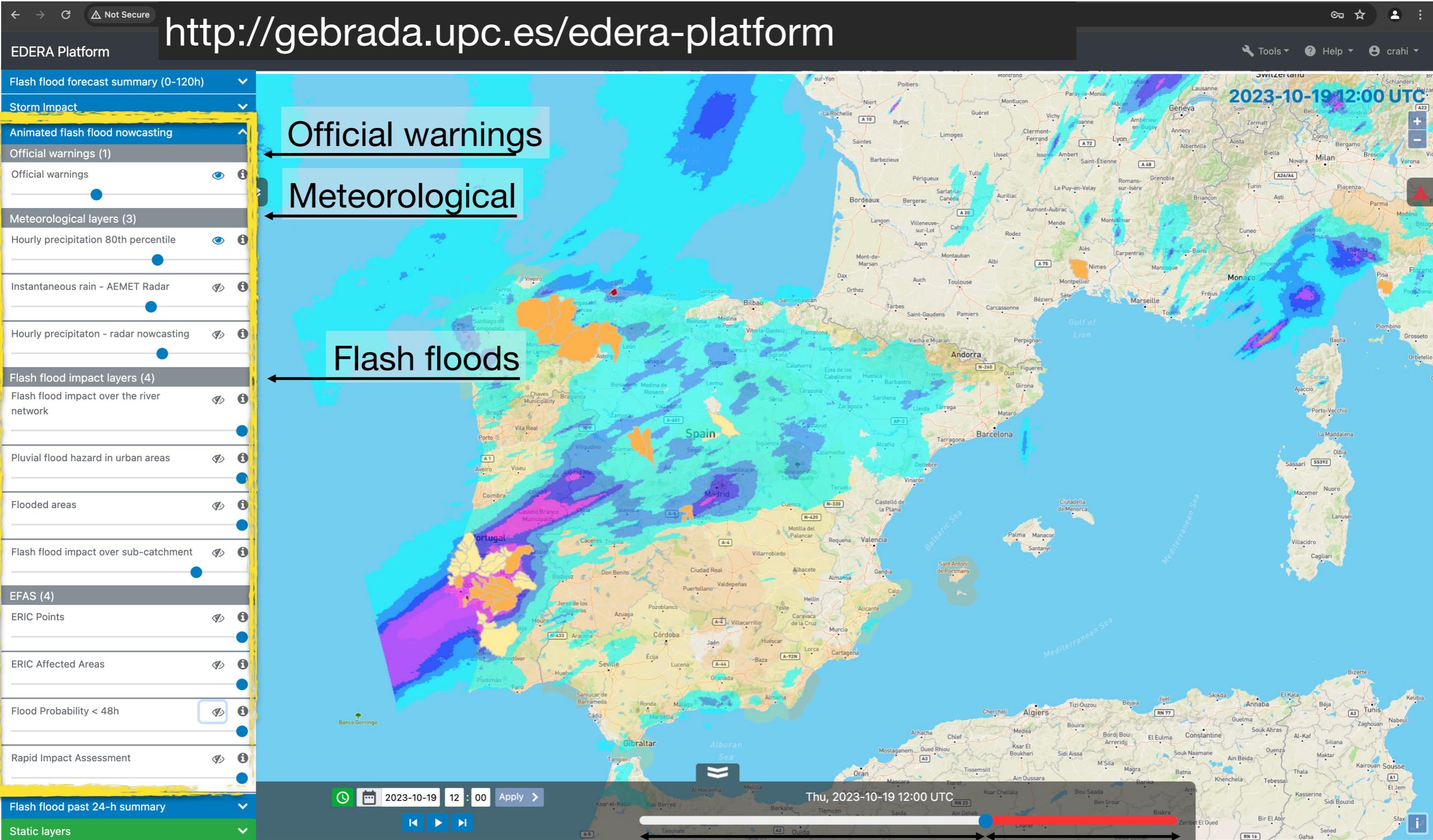
Official warnings

Meteorological

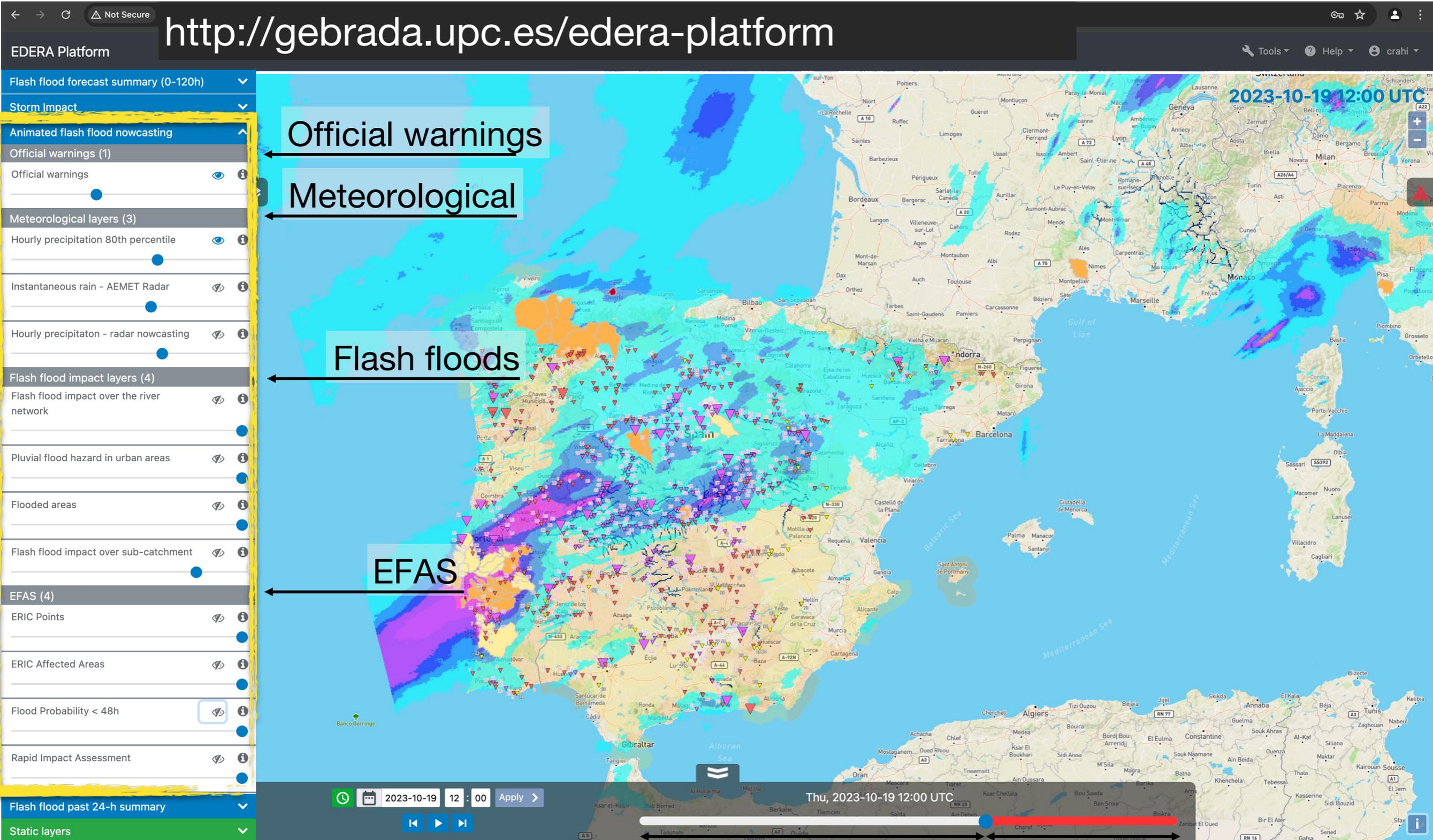


Co-funded by the European Union

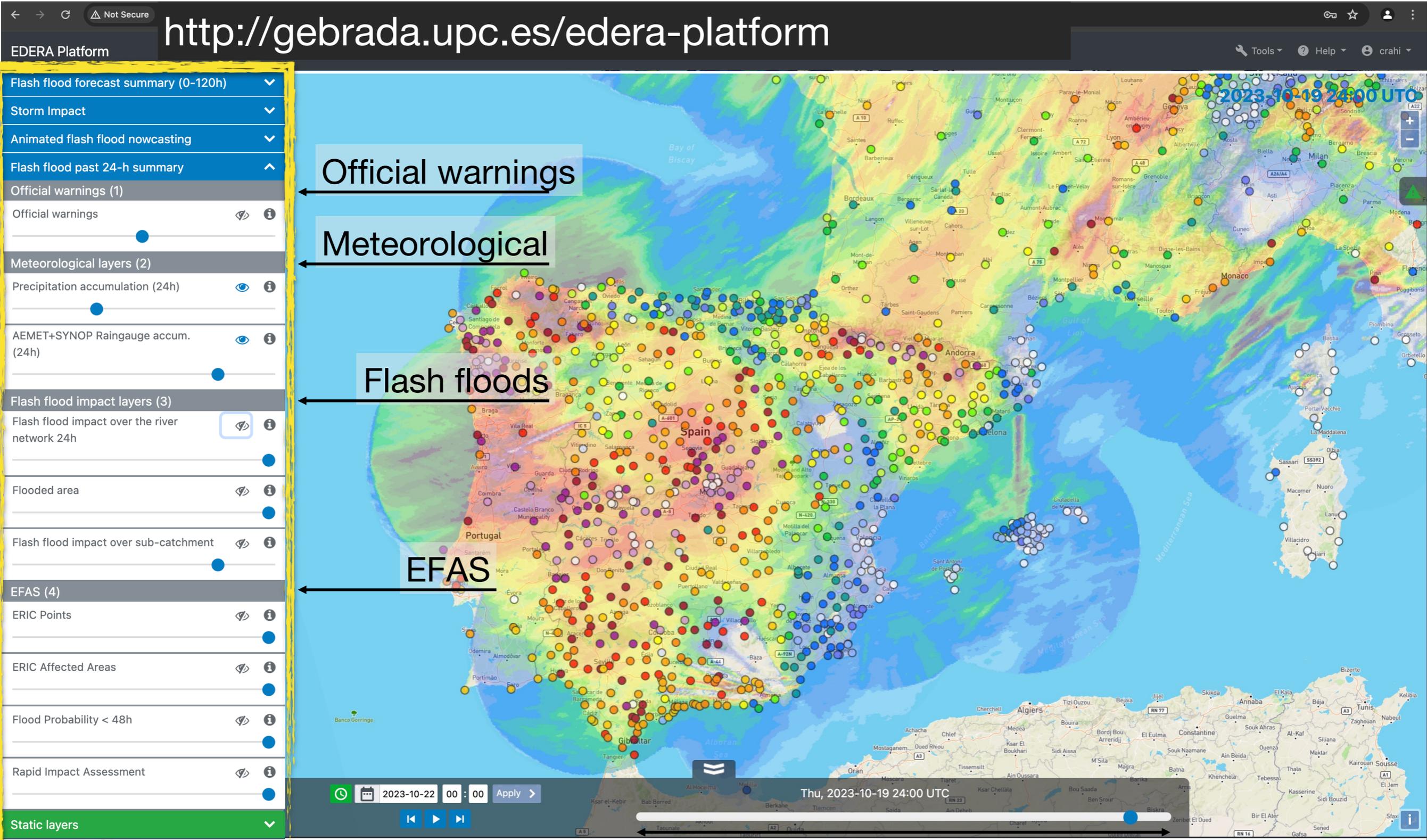
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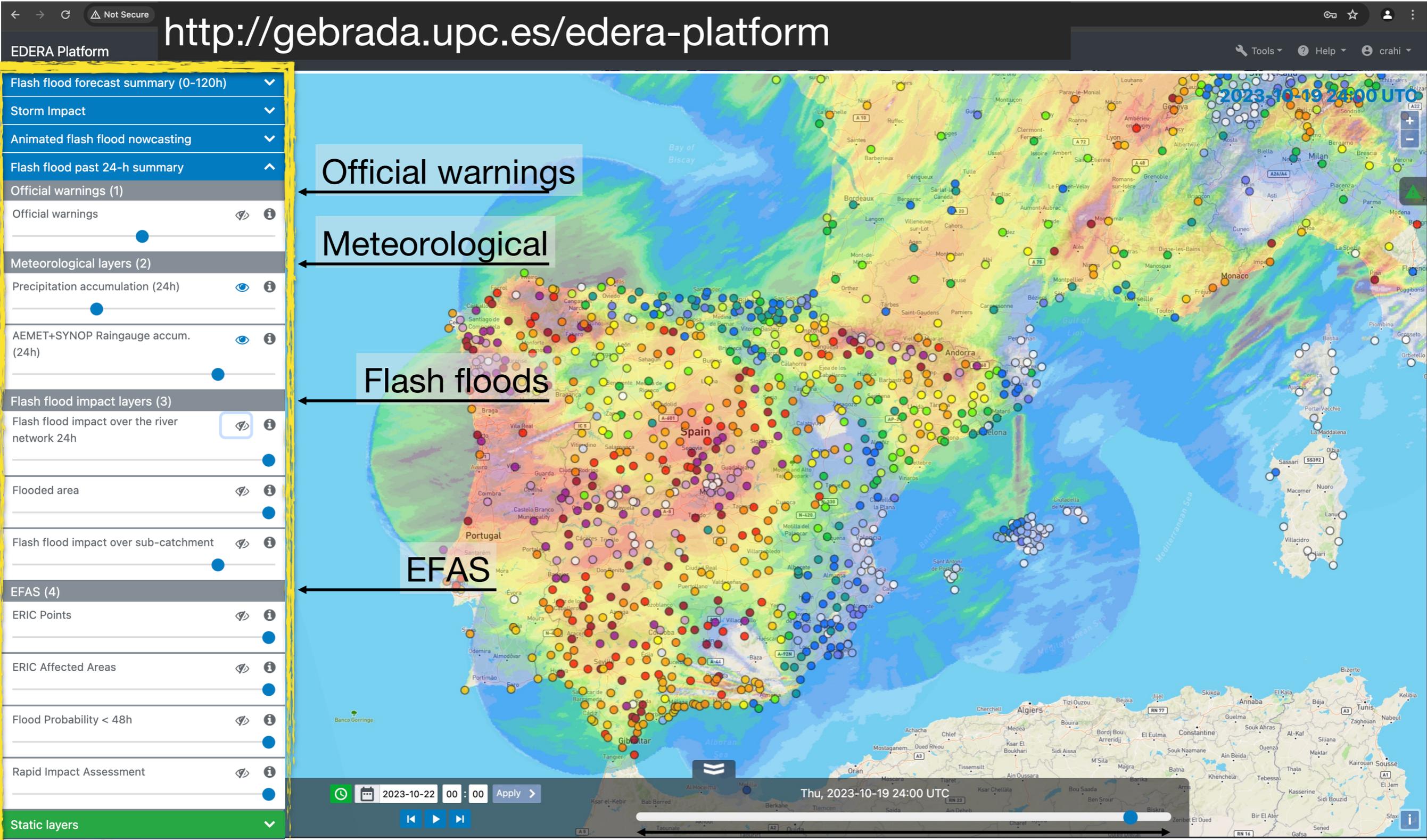
# Block 3: Flash flood nowcasting (0-6 h)



# Block 4: Past 24-h summary (based on observations)



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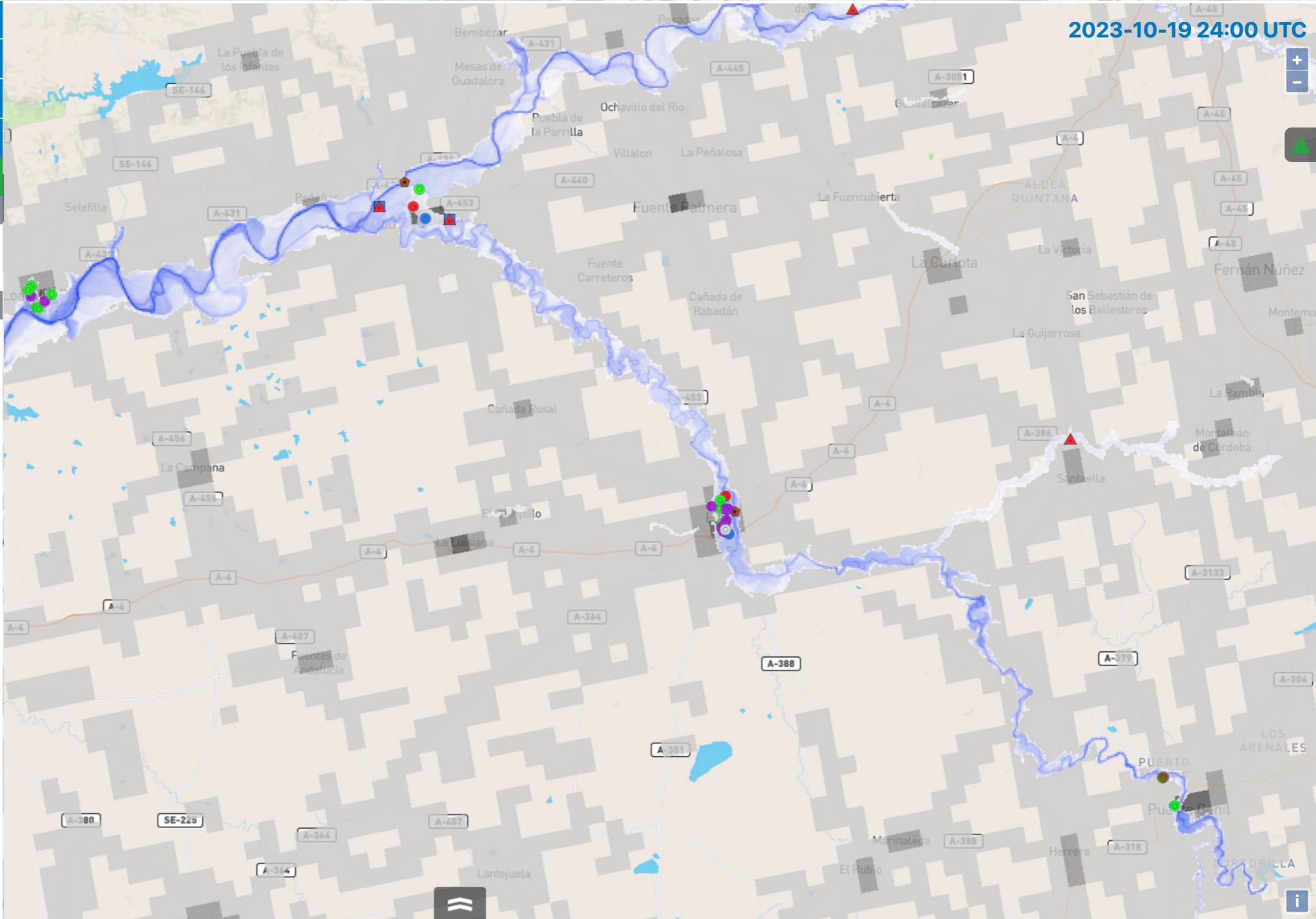
# Static layers

← → ↻ Not Secure <http://gebrada.upc.es/edera-platform> Tools ? Help crahi

EDERA Platform

- Flash flood forecast summary (0-120h) ▾
- Storm Impact ▾
- Animated flash flood nowcasting ▾
- Flash flood past 24-h summary ▾
- Static layers** ▴
- Exposure (1)
- Exposure   
- Flood hazard and risk maps (9)
- Flood Area (T500)   
- Flood Area (T100)   
- Flood Area (T010)   
- MRIF RECON (T500)   
- MRIF RECON (T100)   
- MRIF RECON (T010)   
- MRIF RPTOSMA (T500)   
- MRIF RPTOSMA (T100)   
- MRIF RPTOSMA (T010)   

2023-10-19 24:00 UTC



# Notifications

EDERA Platform <http://gebrada.upc.es/edera-platform>

Flash flood forecast summary (0-120h)

Official warnings (1)

Official warnings  ⓘ

Meteorological layers (1)

Seamless precipitation accumulation  ⓘ

Flash flood impact layers (1)

Flash flood impact over sub-catchment  ⓘ

Storm Impact

Animated flash flood nowcasting

Flash flood past 24-h summary

Static layers

2023-10-19 12:00 - 2023-10-19 18:00 UTC

Forecasting time: Thu, 2023-10-19 12:00 UTC

Leadtime(h) 0-6h 6-24h 24-48h 48-120h



Co-funded by the European Union

# Notifications

EDERA Platform <http://gebrada.upc.es/edera-platform>

Flash flood forecast summary (0-120h) ↑

Official warnings (1)

Official warnings 👁️ ℹ️

Meteorological layers (1)

Seamless precipitation accu

Flash flood impact layers

Flash flood impact over sub

Storm Impact

Animated flash flood nowcasting ▾

Flash flood past 24-h summary ▾

Static layers ▾

2023-10-19 12:00 UTC

Forecasting time: Thu, 2023-10-19 12:00 UTC

Leadtime(h) 0-6h 6-24h 24-48h 48-120h

Tools Help crahi

Filter (ex: Litoral gaditano)

Severe (7) High (104) Medium (91)

**Notification details: Ávila** ✕

Type	Product	Start Date	End Date	Description
	Flash flood impact	2023-10-19 12:00	2023-10-19 19:00	Flood warning in Ávila.
	Flooded area	2023-10-19 13:00	2023-10-19 20:00	Flood warning in Ávila.

Showing 1 to 2 of 2 entries < Previous 1 Next >

**Asturias**  
Source: Edera  
Type: Edera event notification  
Hazards:

**Ávila**  
Source: Edera  
Type: Edera event notification  
Hazards:

**León**  
Source: Edera  
Type: Edera event notification  
Hazards:

**Madrid**  
Source: Edera  
Type: Edera event notification  
Hazards:

**Salamanca**  
Source: Edera  
Type: Edera event notification  
Hazards:

**Segovia**  
Source: Edera  
Type: Edera event notification  
Hazards:

**Valladolid**  
Source: Edera  
Type: Edera event notification  
Hazards:

# EDERA

## Early warning Demonstration of pan-European Rainfall-induced impact forecasts

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