

EDERA

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

EDERA Final Workshop - ERCC 22 Jan 2025

Marc Berenguer

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

- **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 objectives

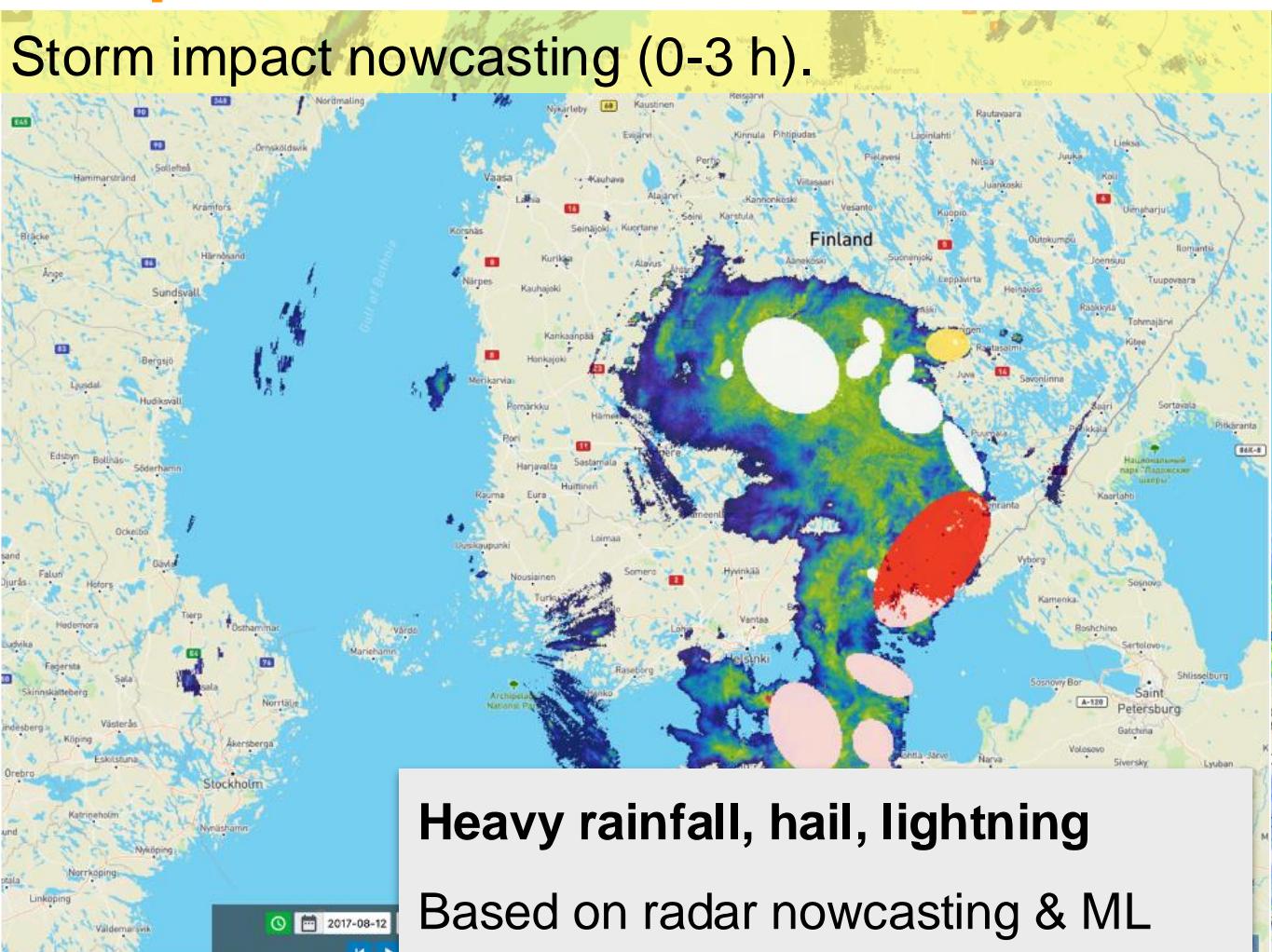
- Integrating forecasts of the impacts due to storms and heavy rainfall into the operational EWSs of national, regional and local CPAs.
- Demonstrate and assess the added value of impact forecasts through an evaluation with end-users.

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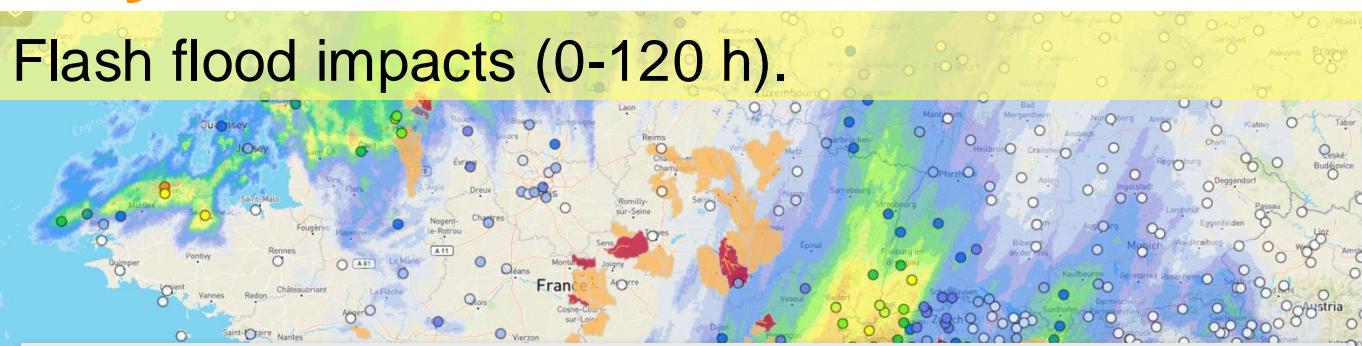
Impact forecasts for storms and heavy rainfall

Storm impact nowcasting (0-3 h).



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

Flash flood impacts (0-120 h).



Flash floods (basins 10 - 2000 km²)
Resolution: 1 h, 1 km - Update: 1 h

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graph LR; A[Blended precipitation forecasts] --> B[Flash flood hazard]; B --> C[Flash flood impacts]
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- 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.

EDERA products

Forecasts of impacts triggered by storms and heavy rainfall with European coverage.

EDERA products

Forecasts of impacts triggered by storms and heavy rainfall with European coverage.

Product families	Product Name	Resolutions
Precipitation inputs	1-h accumulation estimates	15 min, 2 km
	1-h accumulation forecasts – 80 th percentile	1h, variable
	24-h accumulation estimates	2 km
Storm impact nowcasts (0-3h)	Storm hazard level (heavy rainfall)	2 km, 15 min
	Storm impact level	2 km, 15 min
	Urban flood hazard level	2 km, 15 min
Flash flood impact forecasts (0-120h)	Flash flood hazard over the river network	1 arcmin, 1 h
	Flash flood impact over the river network	1 arcmin, 1 h
	Flash flood impact over sub-catchment	1 h
	Flooded areas	1h, 100 m
Static layers	Overall exposure	1 arcmin

Real-time compound impact forecasting for CPAs

Combining hazard and impact forecasts, official warnings and exposure and vulnerability datasets for compound impact forecasting to support coordination and cooperation of CPAs.



Hydrometeorological forecasts



Convective storms, severe winds



Floods, flash-floods, debris flow and landslides



Exposure and vulnerability

- Official NHMs warnings (Meteoalarm).
- Gauge-adjusted OPERA QPE.
- Probabilistic rainfall forecasts (0-120h).
- Storm hazard nowcasts (0-3h).
 - Hail.
 - Wind gusts.
 - Heavy rain.
 - Lightning.
- Storm impact nowcasts (0-3h).
- EDERA pluvial flood nowcasts (0-3h).
- EDERA FF hazard forecasts (0-120h).
- EDERA FF impact forecasts (0-120h).
- EFAS flood forecasts.
- EFAS rapid risk assessment.
- Other flow observations & forecasts.
- Combined exposure map (1km):
 - Population density.
 - Transportation networks.
 - Energy, health, education infrastructures.
- Flood hazard maps (Floods Directive)
- Critical points in flood areas
- Other critical points.

Integrated through tailored notifications

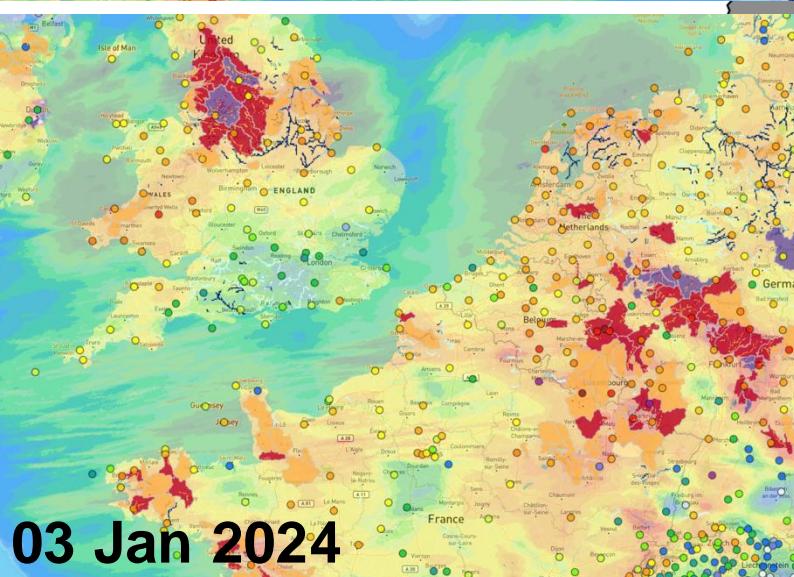
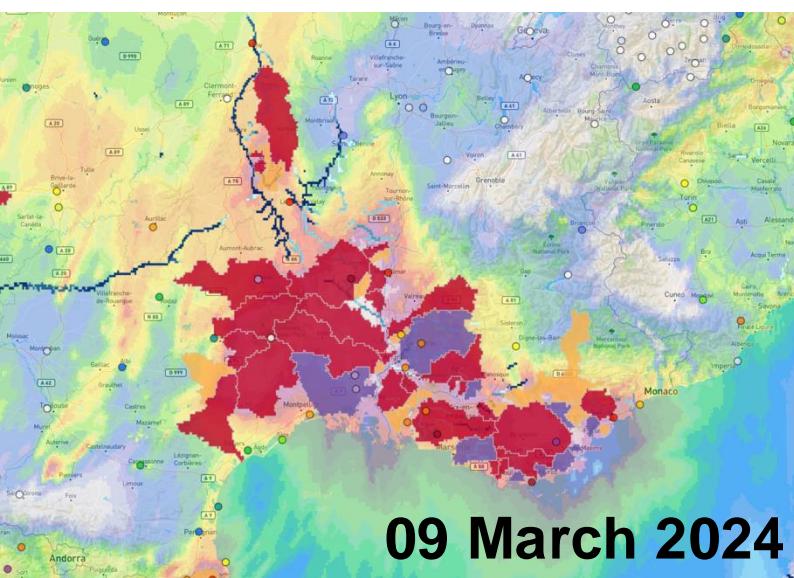
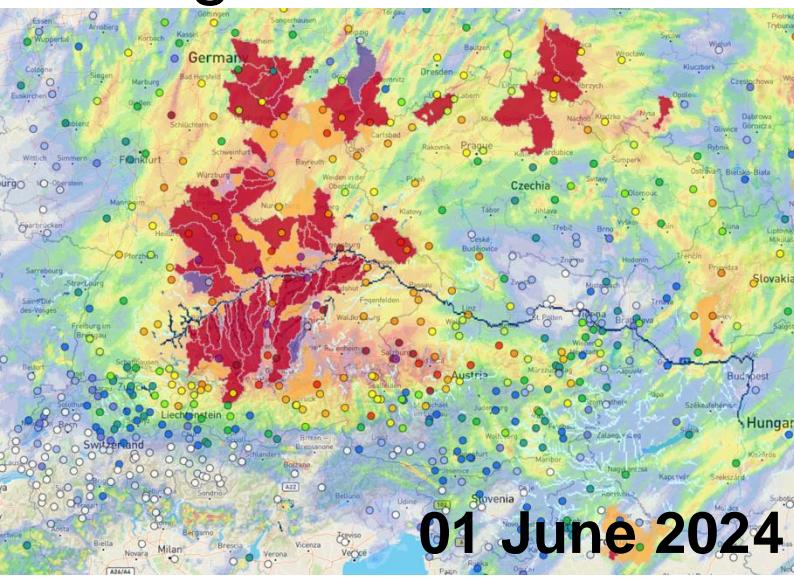
EDERA demonstration

- August 2023 – October 2024.



EDERA demonstration

- August 2023 – October 2024.



Germany – Thousands Evacuate Floods in Bavaria and Baden-Wuerttemberg

3 JUNE, 2024

Thousands of people have evacuated their homes in southern Germany after heavy rain caused multiple rivers to break their banks. At least two people have died and another is reported...

[Read Full Article](#)



France – Seven People Missing After Severe Floods in Gard, Ardèche and Var

10 MARCH, 2024

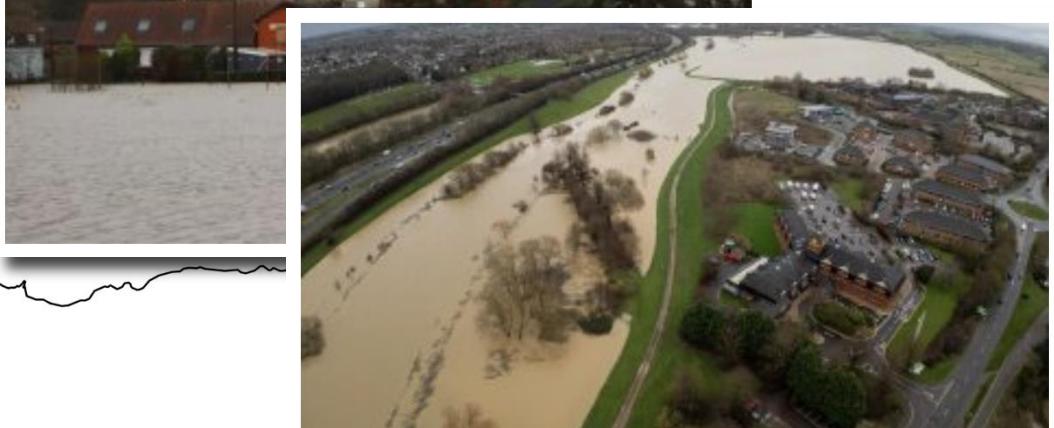
Rescuers in France are searching for at least seven people reported missing following severe flooding in the south of the country. Storm Monica swept across the country from 08 March...

[Read Full Article](#)



France – Hundreds Evacuated Again After Further Floods in North

4 JANUARY, 2024



UK – Evacuations and Rescues After Storm Henk Leaves Widespread Flooding

4 JANUARY, 2024

Heavy rain from consecutive storms, most recently Storm Henk, has left wide areas of the United Kingdom under water once again. Dozens of people have been rescued from vehicles trapped...

[Read Full Article](#)

from: floodlist.com

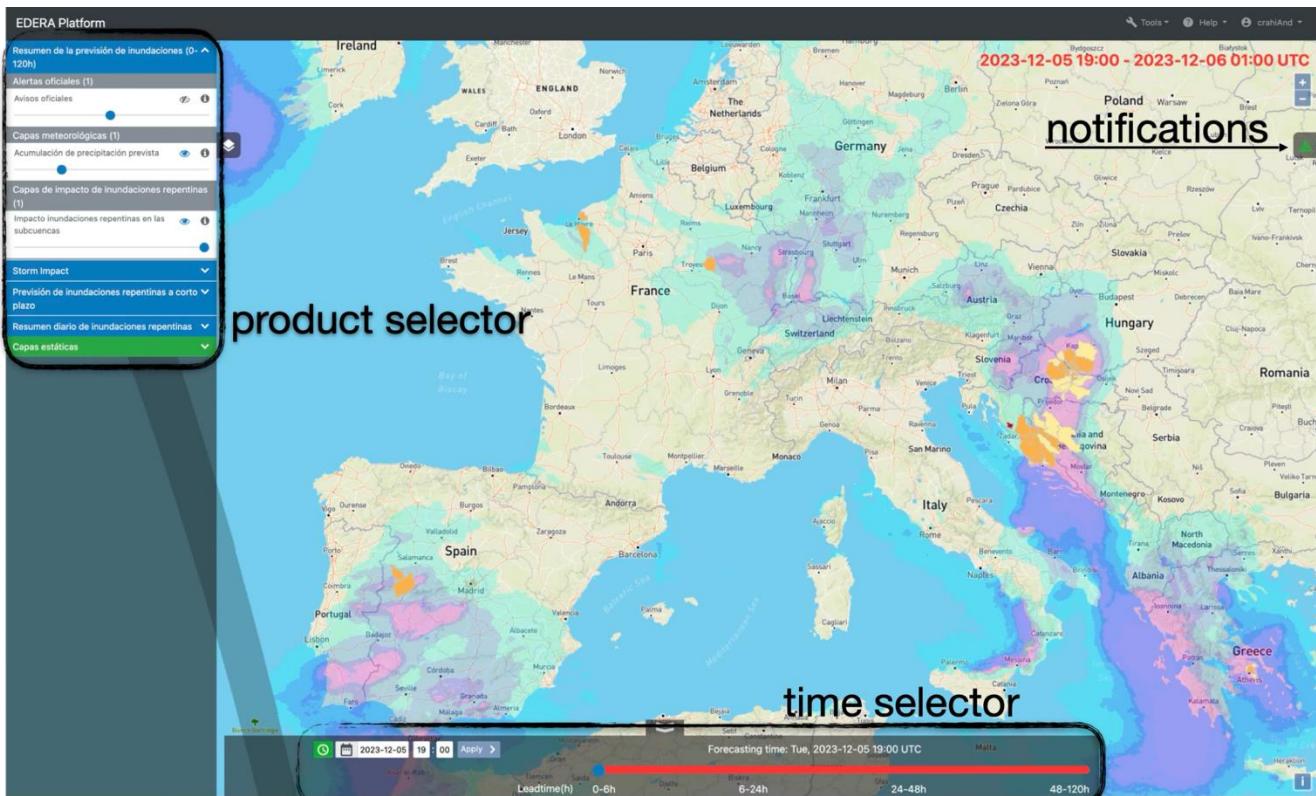
EDERA demonstration

- August 2023 – October 2024.



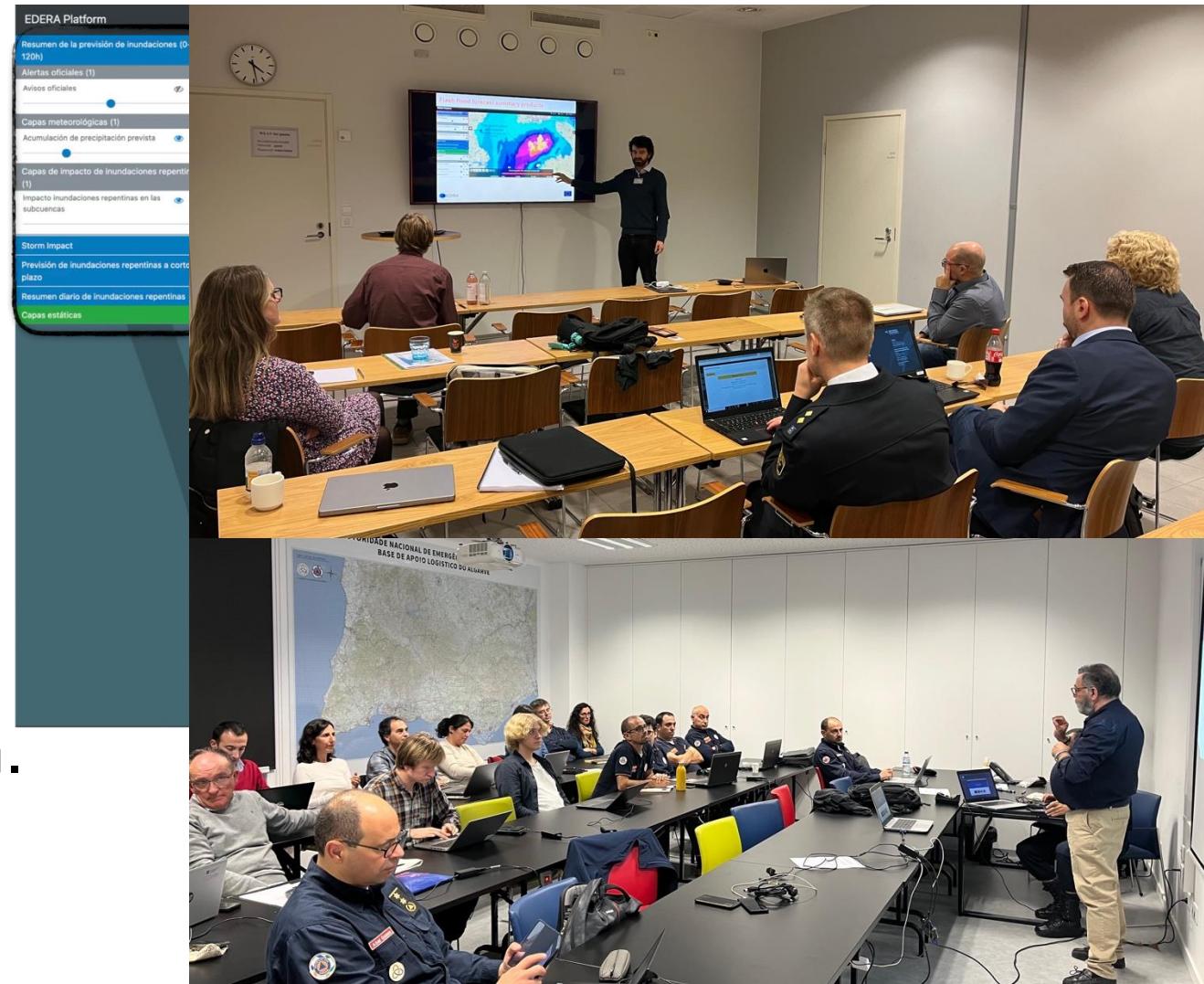
EDERA demonstration

- August 2023 – October 2024.
- With the participation of end users.
- Access to the products in real time:
 - + WMS
 - + Web-based platform



EDERA demonstration

- August 2023 – October 2024.
- With the participation of end users.
- Access to the products in real time:
 - + WMS
 - + Web-based platform
- Integration of *local* products/information.
- Training workshops.
- Notifications adapted to end users



EDERA Platform

Resumen de la previsión de inundaciones (0-120h)

Alertas oficiales (1)

Avisos oficiales

Capas meteorológicas (1)

Acumulación de precipitación prevista

Impacto inundaciones repentinas (1)

Impacto inundaciones repentinas en las subcuencas

Storm Impact

Previsión de inundaciones repentinas a corto plazo

Resumen diario de inundaciones repentinas

Capas estáticas

Notification details: Cádiz

Type	Product	Start Date	End Date	Description
Flash flood impact	Flash flood impact	2024-03-31 06:00	2024-04-01 00:00	Advertencia de inundación en Campi2a gaditana.
Flash flood impact	Flash flood impact	2024-03-31 06:00	2024-03-31 18:00	Advertencia de inundación en Estrecho.
Flash flood impact	Flash flood impact	2024-03-31 06:00	2024-03-31 12:00	Advertencia de inundación en Grazalema.
Flash flood impact	Flash flood impact	2024-03-31 06:00	2024-03-31 12:00	Advertencia de inundación en Litoral gaditano.

Showing 1 to 4 of 4 entries

Filter (ex: Litoral gaditano)

Severe (2) High (5) Medium (20)

Cádiz

Source: Edera

Type: Edera event notification

Hazards:

Costa - Estrecho

Source: MeteoAlarm (AEMET)

Type: Official warning

Hazards:

Costa - Litoral gaditano

Source: MeteoAlarm (AEMET)

Type: Official warning

Hazards:

Almería

Source: Edera

Type: Edera event notification

Hazards:

Córdoba

Source: Edera

Type: Edera event notification

Hazards:

Forecasting time: Sat, 2024-03-30 18:00 UTC

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

the European Union

EDERA final Workshop

- Introduce existing datasets and tools over Europe for supporting the management of emergencies triggered by storms and heavy rainfall.
- Demonstrate the results of the project.
- Present the experiences of the end users on the use of the developments.
- Present the integration of the products in EFAS (including extensive e-learning materials).
- Promote the adoption of the developments of the project and the participation as stakeholders.
- Debate on the complementarity of the results of the project with other existing systems.

EDERA final Workshop

EDERA Final Workshop - 22 Jan 2025, ERCC (Brussels)		
Systems and tools to support the management of emergencies triggered by storms and heavy rain over Europe Chair person: Marc Berenguer		
09:15 - 09:20	Welcoming words	Gaetano Vivo (DG-ECHO)
09:20 - 09:35	EDERA: Early warning demonstration of pan-European rainfall-induced impact forecasts	Marc Berenguer (UPC)
09:35 - 09:50	EUMETNET - OPERA	Annakaisa von Lerber (FMI)
09:50 - 10:05	ARISTOTLE	Michaela Mikulickova (SHMU)
10:05 - 10:20	EFAS	Jesús Casado (JRC)
10:20 - 10:35	ERCC Platforms for Early Warning	Jaime Abad (DG-ECHO)
10:35 - 10:45	Questions and discussion	
10:45 - 11:15	Coffee break	
EDERA tools for impact forecasting Chair person: Cristina Marugán, DGPCE		
11:15-11:55	Demonstration of the use of the EDERA products and developments	Antonio Santiago (AMAYA), Shinju Park (UPC), Seppo Pulkkinen (FMI), Calum Baugh (ECMWF)
11:55 - 12:15	Large scale event in Spain	Rosa M. Torres (DGPCE)
12:15 - 12:35	Use of convective storm products in Finland	Teemu Veneskari (Kymenlaakso RD), Mika Viertola (North Karelia RS)
12:35 - 12:50	Selected case in Algarve (Portugal)	Abel Gomes (ANEPC)
12:50 - 13:00	Questions and discussion	
13:00 - 14:15	Lunch	
Results of the EDERA demonstration Chair person: Esther el Haddad		
14:15 - 14:35	Selected case in Murcia (Spain)	M. Fernanda Arbáizar (CP Murcia)
14:35 - 14:50	Evaluation of EDERA products in Andalusia (Spain)	Antonio Santiago (AMAYA)
14:50 - 15:20	Integration of the products in EFAS (including the presentation of the training materials)	Calum Baugh & Karen O'Regan (ECMWF)
15:20 - 15:40	Engagement of stakeholders and follow-up (INLINE)	Marc Berenguer (UPC)
15:35 - 16:10	Coffee break	
Towards efficient cross-border response during rainfall-induced emergencies in Europe Chair person: Calum Baugh (ECMWF), Pekka Tiainen (FMol, TBC)		
16:10 - 17:00	Open debate	ALL



Co-funded by
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www.edera-project.eu

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