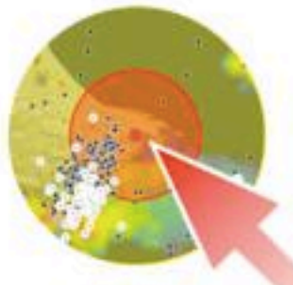
European Civil Protection

Prevention & Preparedness Projects

European Demonstration of a rainfall and lightning induced Hazard Identification nowcasting Tool

EDHIT



Coordinator:

Centre de Recerca Aplicada en Hidrometeorologia
UNIVERSITAT POLITÈCNICA DE CATALUNYA

Associated Beneficiaries:

ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

ZAMG

DIRECCIÓN GENERAL DE PROTECCIÓN CIVIL Y EMERGENCIAS

SISÄASIAINMINISTERIÖ

NIEDERÖSTERREICH

SMHI

Stakeholders:

meteoalarm
alerting europe for extreme weather

OPERA
EIG EUMETNET PROGRAMME

ECMWF

JRC
EUROPEAN COMMISSION

ies
Institute for Environment and Sustainability

VAISALA

Coordinating Beneficiary and Associated Beneficiaries

CO: Universitat Politècnica de Catalunya (UPC, ES)

AB1: Finnish Meteorological Institute (FMI, FI)

AB2: Central Institute for Meteorology and Geodynamics (ZAMG, AT)

AB3: Department for Rescue Services (DRS, FI)

AB4: Dirección General de Protección Civil y Emergencias de España (DGPCE, ES)

AB5: Civil protection section, Provincial Government of Lower Austria (FWZIVIL, AT)

AB6: Swedish Meteorological and Hydrological Institute (SMHI, SE)

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Non-funded Stakeholders

OPERA-EUMETNET (OPERA, EU)

European Centre of Medium range Weather Forecasts (ECMWF, EU)

METEOALARM-EUMETNET (METEOALARM, EU)

Directorate General Joint Research Centre - EC (JRC, EU)

VAISALA(FI)

Budget

Total Eligible Costs: 657.255 €
EU Contribution: 492.941 €

Coordinating Beneficiary's contribution				
Coordinating Beneficiary	**Short name**	**Total costs of the actions in €**	**Own contribution in €**	**Amount of EC contribution in €**
CO	UPC-CRAHI	214.027	53.507	160.520

Associated Beneficiaries' contribution				
Associated Beneficiary	**Short name**	**Total costs of the actions in €**	**Own contribution in €**	**Amount of EC contribution in €**
AB1	FMI	134.054	33.513	100.540
AB2	ZAMG	134.000	33.513	100.500
AB3	MoI	40.444	10.111	30.333
AB4	DGPCE	40.412	10.103	30.309
AB5	LWZ-NÖ	53.521	13.380	40.141
AB6	SMHI	40.798	10.200	30.599
Total Associated Beneficiaries		443.228	110.820	332.421

Total Project	**657.255**	**164.327**	**492.941**


Why is it necessary?
EDHIT

Why is it necessary?

EDHIT

Severe Weather generates major natural hazards requiring CP responses

Why is it necessary?

EDHIT

Severe Weather generates major natural hazards requiring CP responses

Climate Change is increasing the occurrence of extreme events

Why is it necessary?

EDHIT

Severe Weather generates major natural hazards requiring CP responses

Climate Change is increasing the occurrence of extreme events

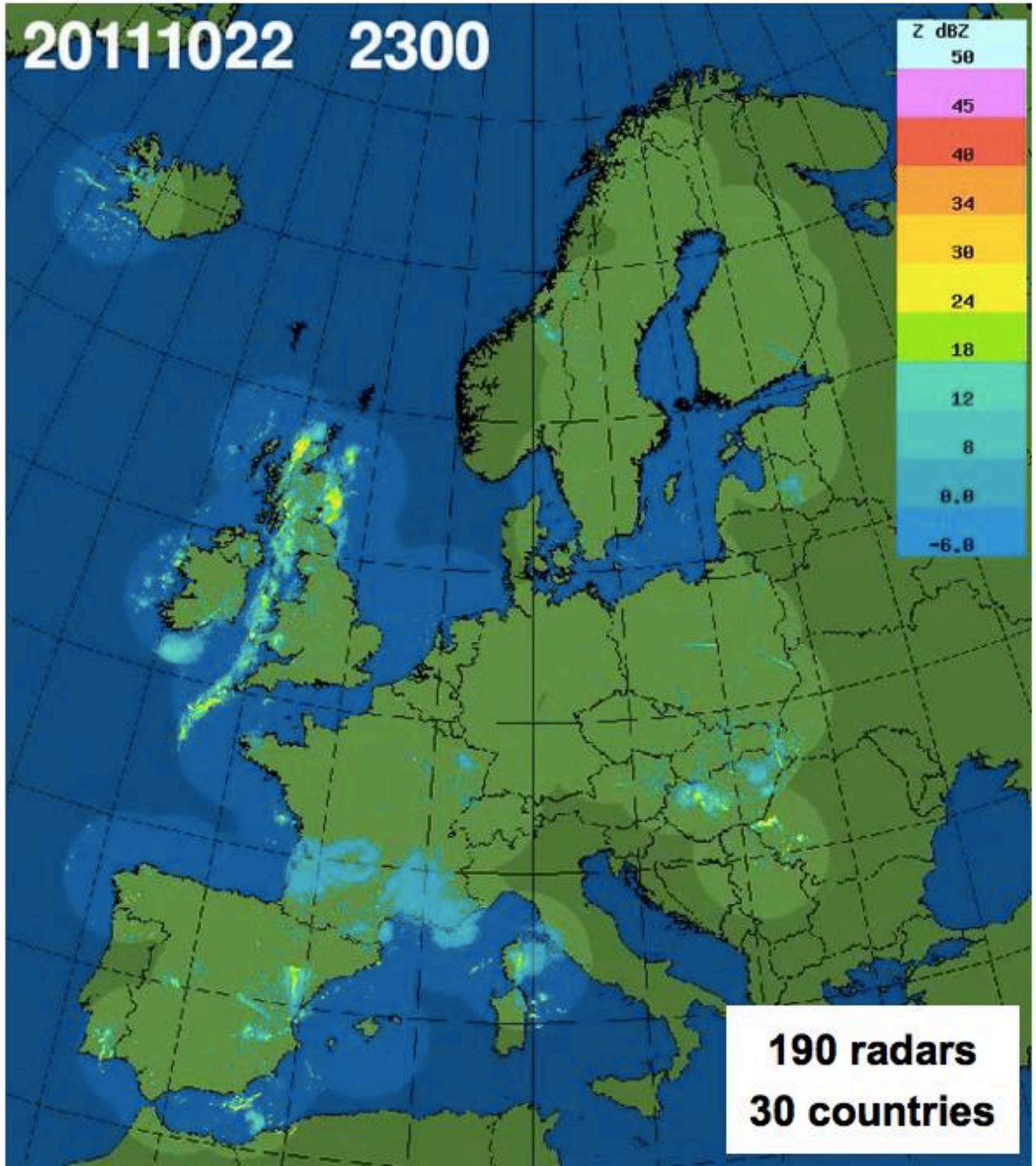
Anticipation of HAZARDS induced by heavy rainfalls and lightening are of utmost importance

EU radar mosaic

OPERA
EIG EUMETNET PROGRAMME

OPERA radar mosaic:

- Precipitation observations over Europe @2 km and every 15 minutes.
- Operationally produced since mid 2011.



EU radar mosaic

OPERA
EIG EUMETNET PROGRAMME

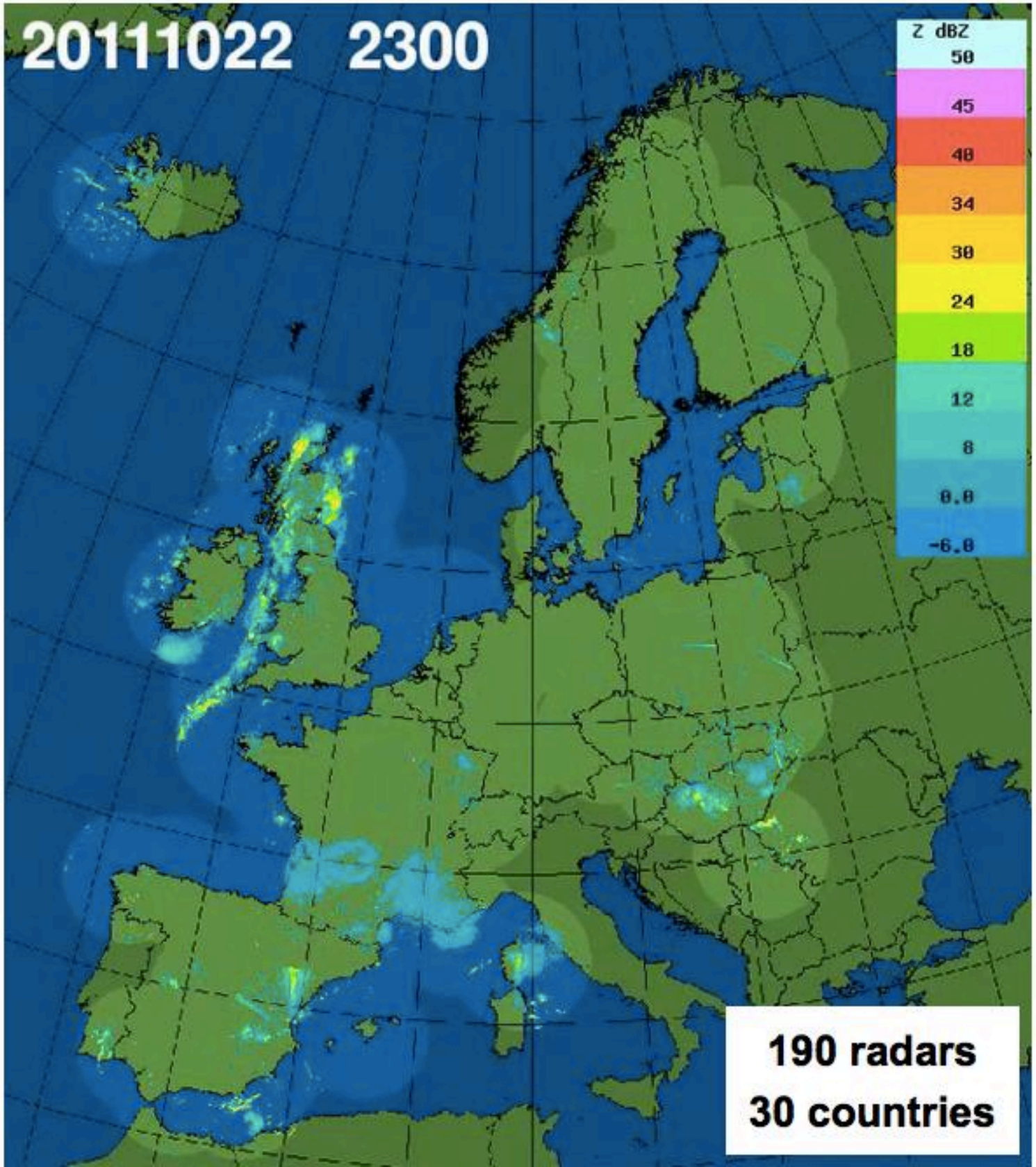
OPERA radar mosaic:

- Precipitation observations over Europe @2 km and every 15 minutes.
- Operationally produced since mid 2011.
- First nowcasting demonstration:

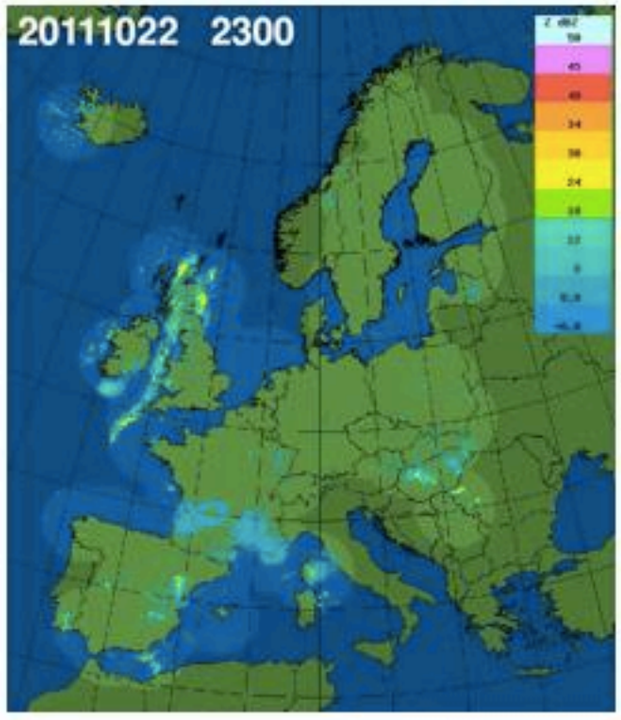
June 2012-
September 2013

HAREN

European Civil Protection

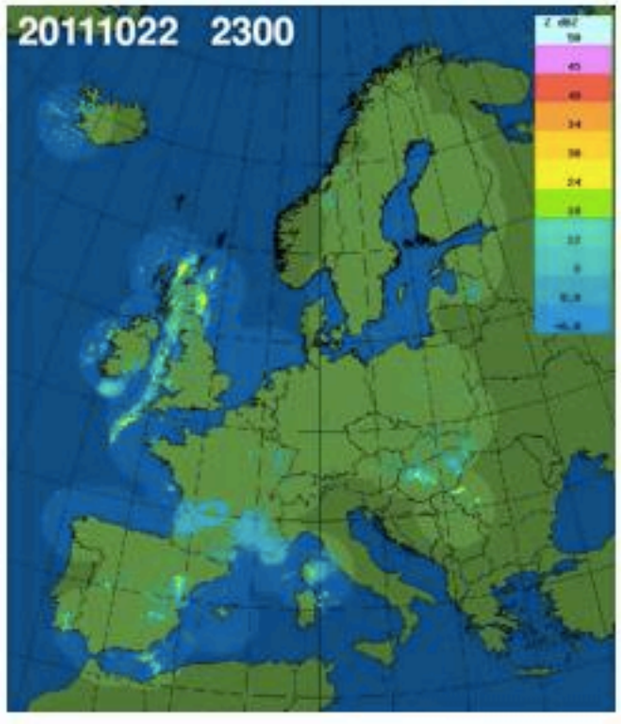


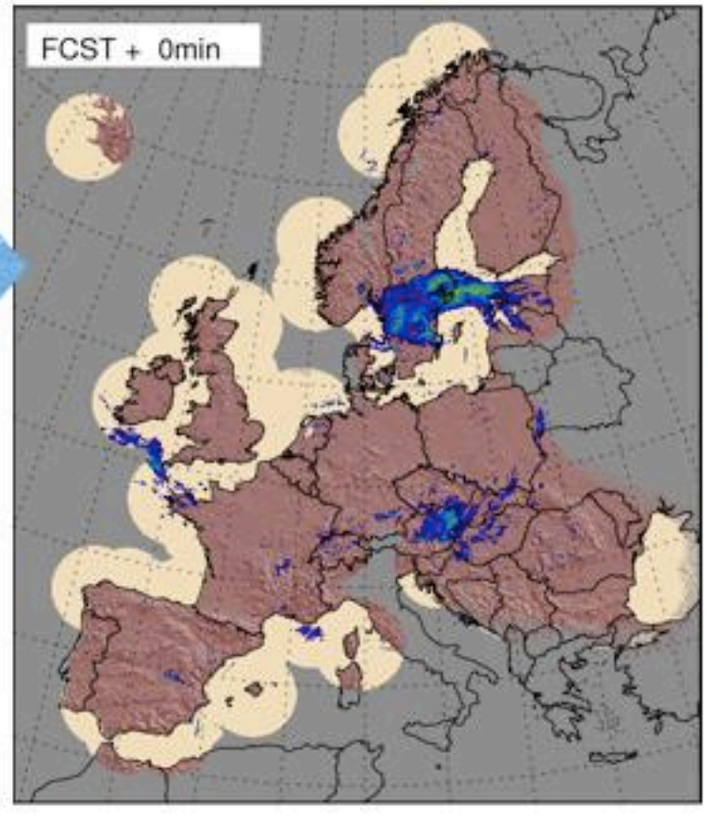
From observations



EDHIT

From observations

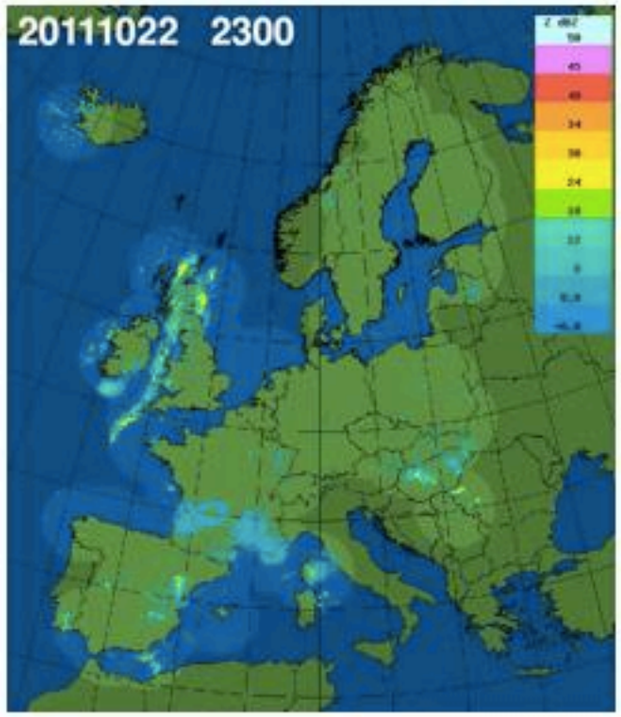


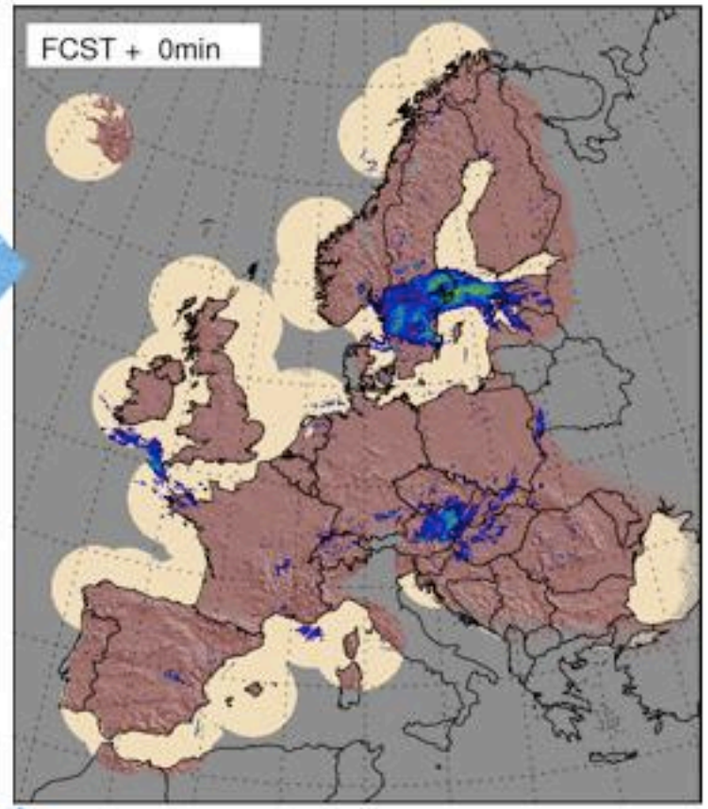


EDHIT

High resolution rainfall nowcastings over Europe @2km every 15 minutes

From observations

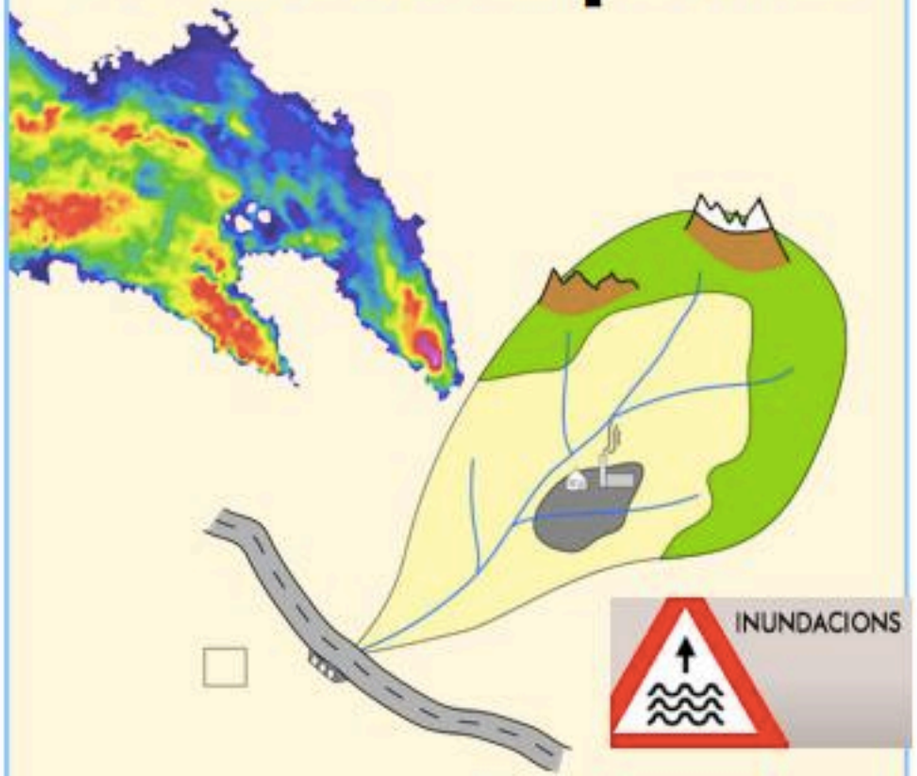




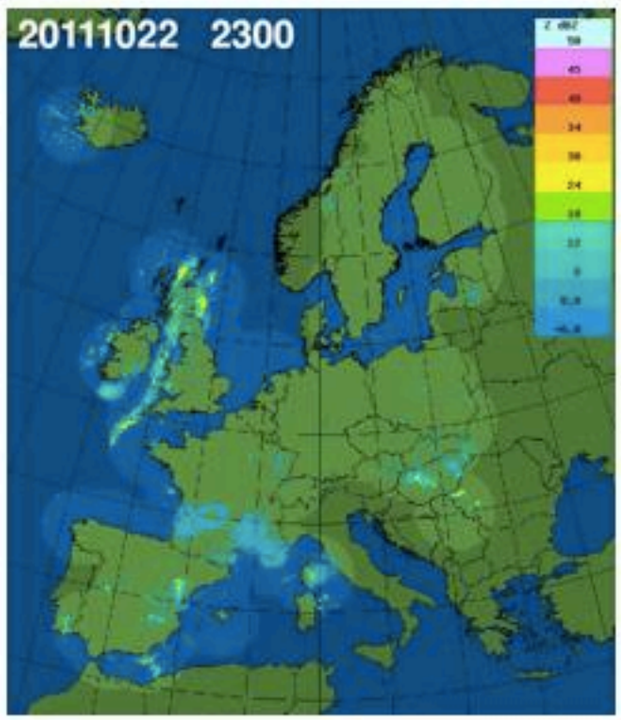
EDHIT

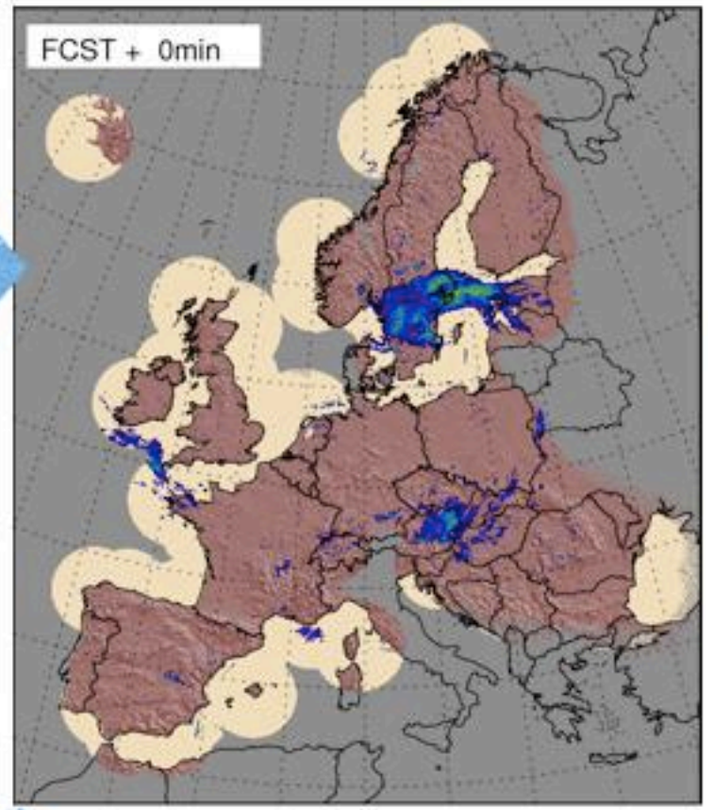
High resolution rainfall nowcastings over Europe @2km every 15 minutes

Hazard anticipation at sensitive points



From observations

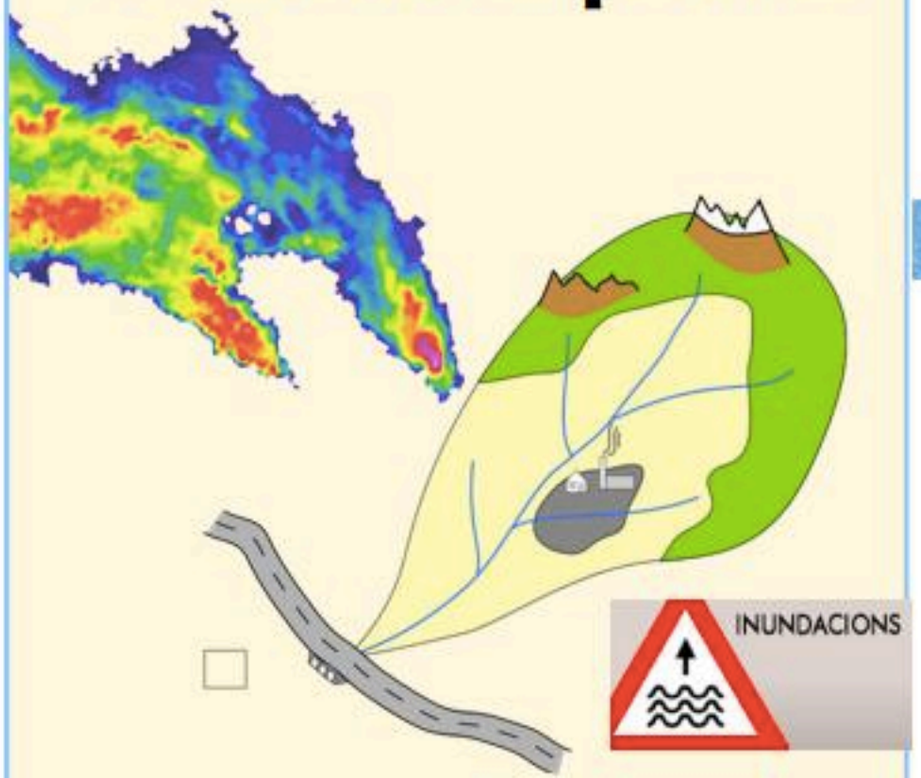


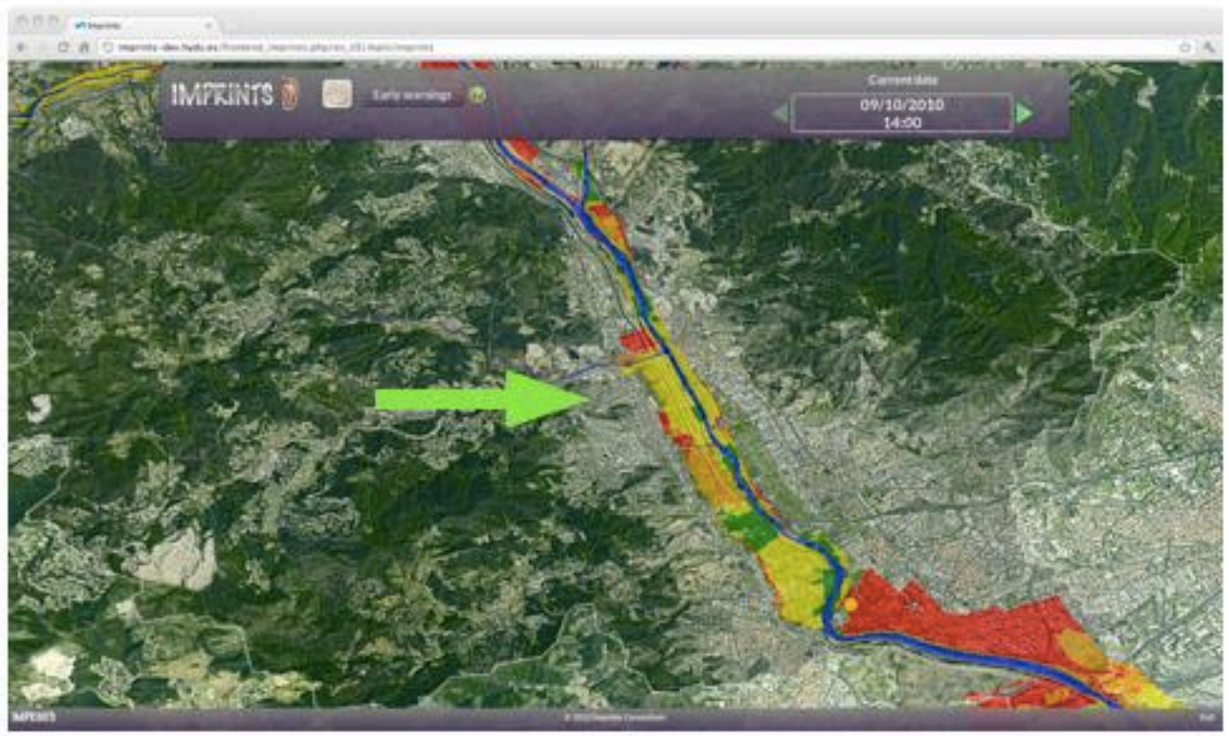


EDHIT

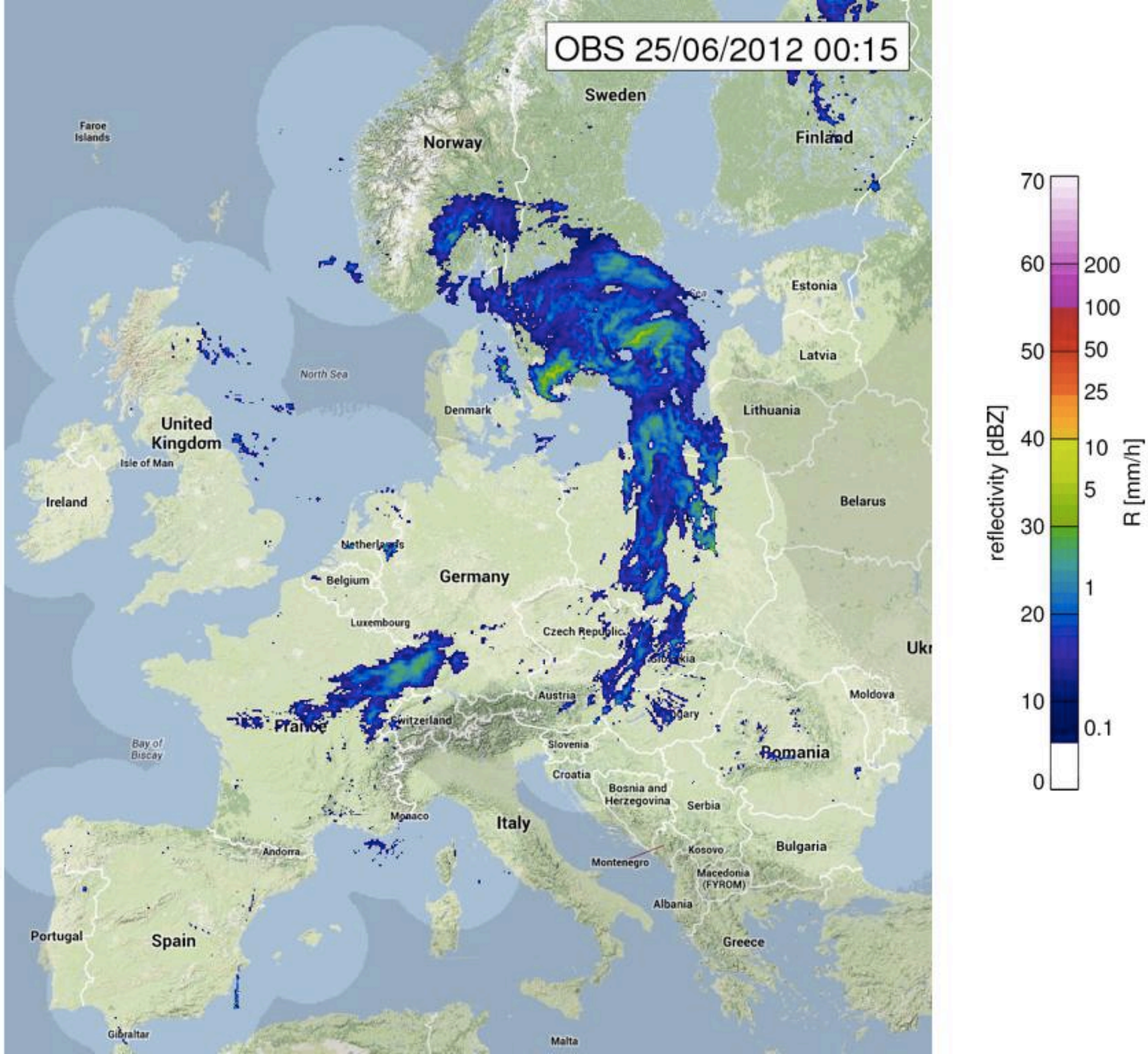
High resolution rainfall nowcastings over Europe @2km every 15 minutes

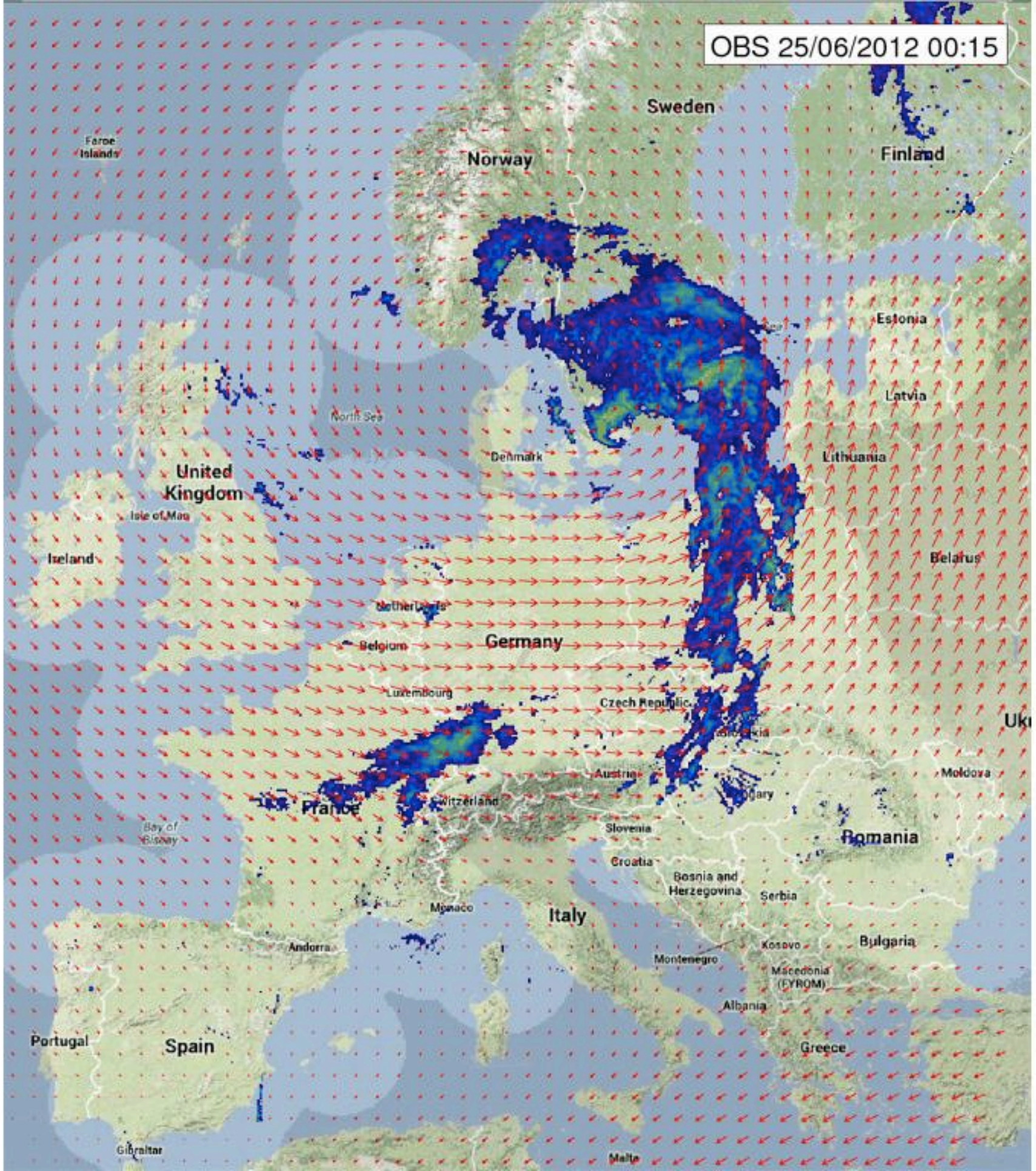
Hazard anticipation at sensitive points





Cross them with vulnerability maps

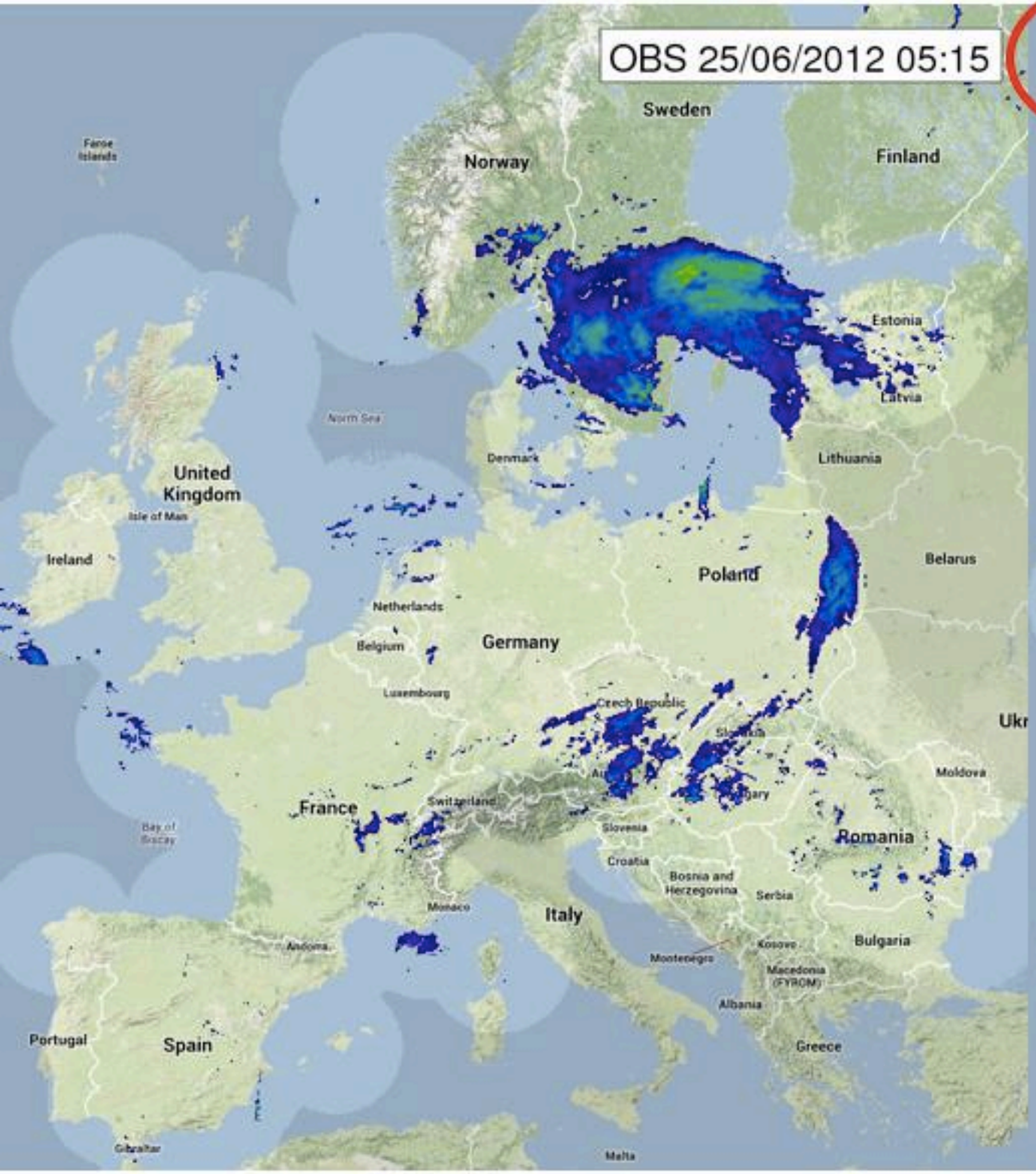

OBS 25/06/2012 00:15
Sweden
Faroe Islands
Norway
Finland
Estonia
Latvia
North Sea
Denmark
Lithuania
United Kingdom
Isle of Man
Ireland
Belarus
Netherlands
Germany
Belgium
Luxembourg
Czech Republic
Austria
Moldova
Switzerland
France
Bay of Biscay
Slovenia
Romania
Croatia
Bosnia and Herzegovina
Serbia
Monaco
Italy
Kosovo
Bulgaria
Montenegro
Macedonia (FYROM)
Albania
Andorra
Portugal
Spain
Greece
Gibraltar
Malta
reflectivity [dBZ]
70
60
50
40
30
20
10
0
R [mm/h]
200
100
50
25
10
5
1
0.1


OBS 25/06/2012 00:15
Sweden
Finland
Norway
Faroe Islands
Estonia
Latvia
Lithuania
Belarus
North Sea
Denmark
United Kingdom
Isle of Man
Iceland
Netherlands
Belgium
Germany
Luxembourg
Czech Republic
Ukr
Austria
Moldova
Hungary
France
Switzerland
Slovenia
Romania
Bay of Biscay
Croatia
Bosnia and Herzegovina
Serbia
Monaco
Italy
Andorra
Kosovo
Bulgaria
Montenegro
Macedonia (FYROM)
Albania
Portugal
Spain
Greece
Gibraltar
Malta
reflectivity [dBZ]
70
60
50
40
30
20
10
0
R [mm/h]
200
100
50
25
10
5
1
0.1

European Radar Nowcasting - OPERA mosaics

Over a network of 150+ radars.

5 hours ahead



CRAHI Algorithm of nowcasting by lagrangian persistence

Berenguer et al. J. Hydrometeorology, 2005; J. of Hydrology, 2011

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Radar-based rainfall nowcasting at European Scale based in OPERA

EDHIT products

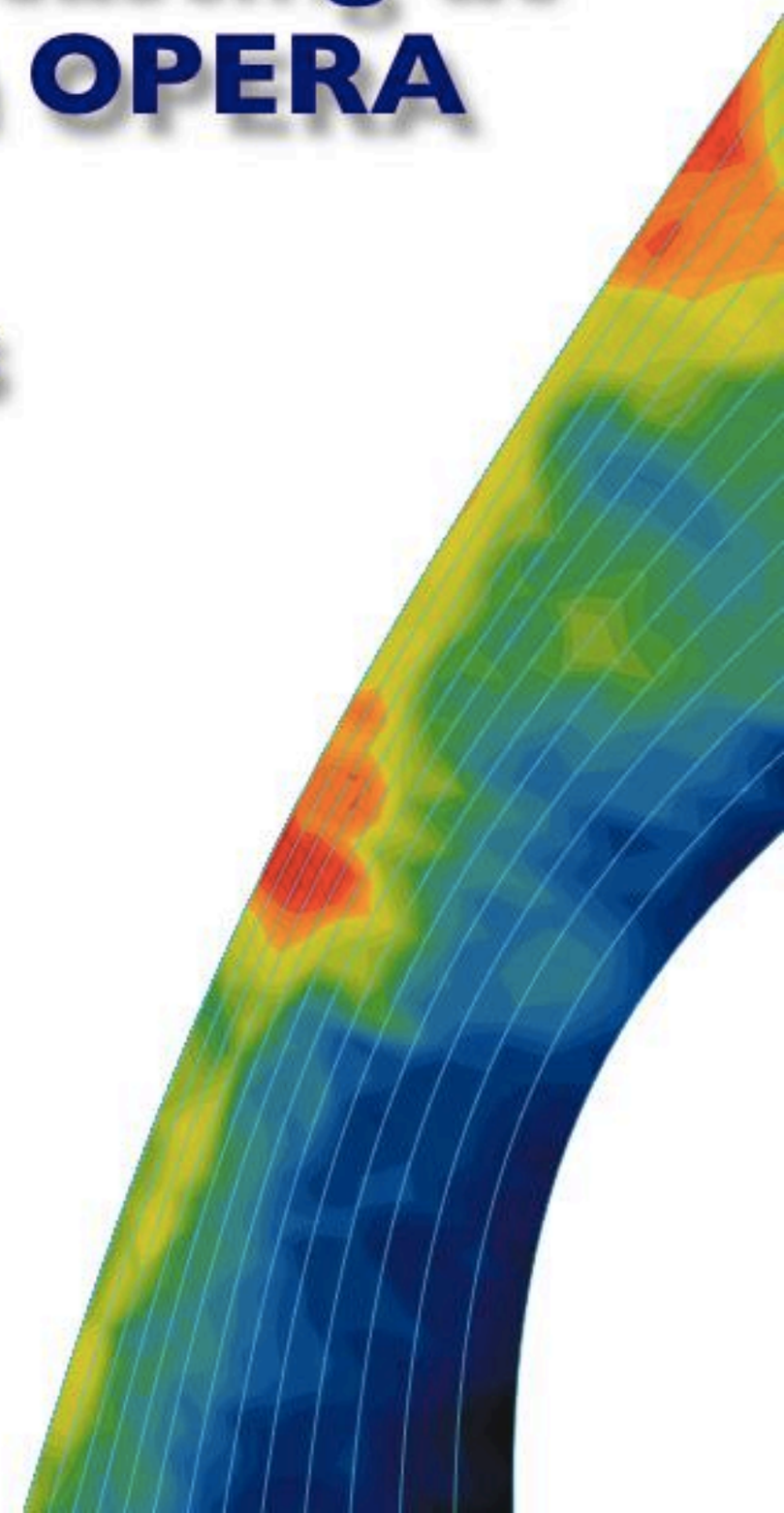
EDHIT

European Civil Protection

Radar-based rainfall nowcasting at European Scale based in OPERA

EDHIT products

Improved Nowcasting of RAINFALL INTENSITIES (up to 6h)



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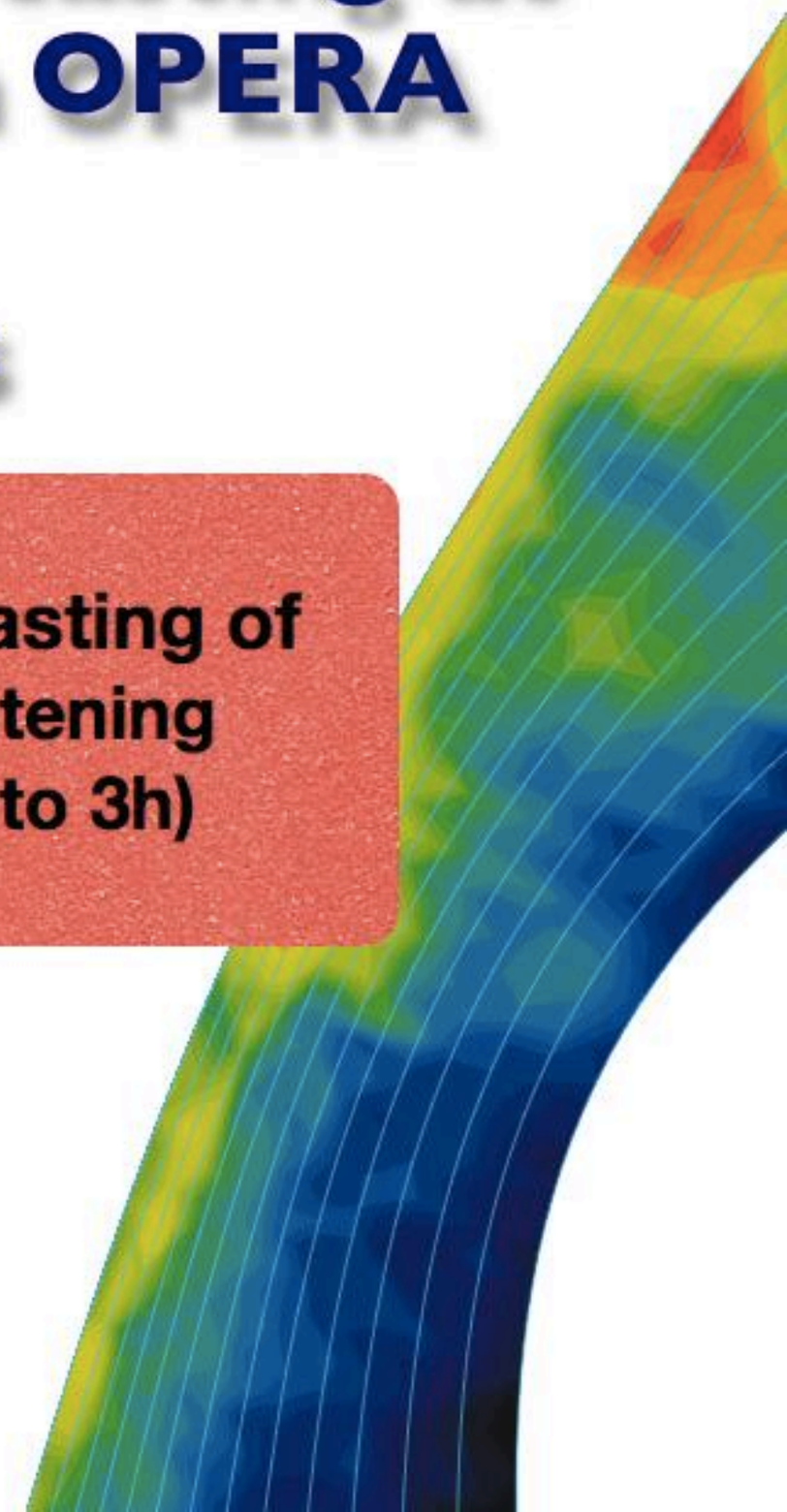
Radar-based rainfall nowcasting at European Scale based in OPERA

EDHIT products

Improved Nowcasting of RAINFALL INTENSITIES (up to 6h)

Nowcasting of Lightening (up to 3h)



EDHIT

European Civil Protection

Radar-based rainfall nowcasting at European Scale based in OPERA

EDHIT products

Improved Nowcasting of RAINFALL INTENSITIES (up to 6h)

Nowcasting of Lightening (up to 3h)

JRC EUROPEAN COMMISSION

EFAS

Hydrological Hazard Identification (up to 6h)

Hourly HAZARD IDENTIFICATION

High Resolution Hydrological Hazard Identification

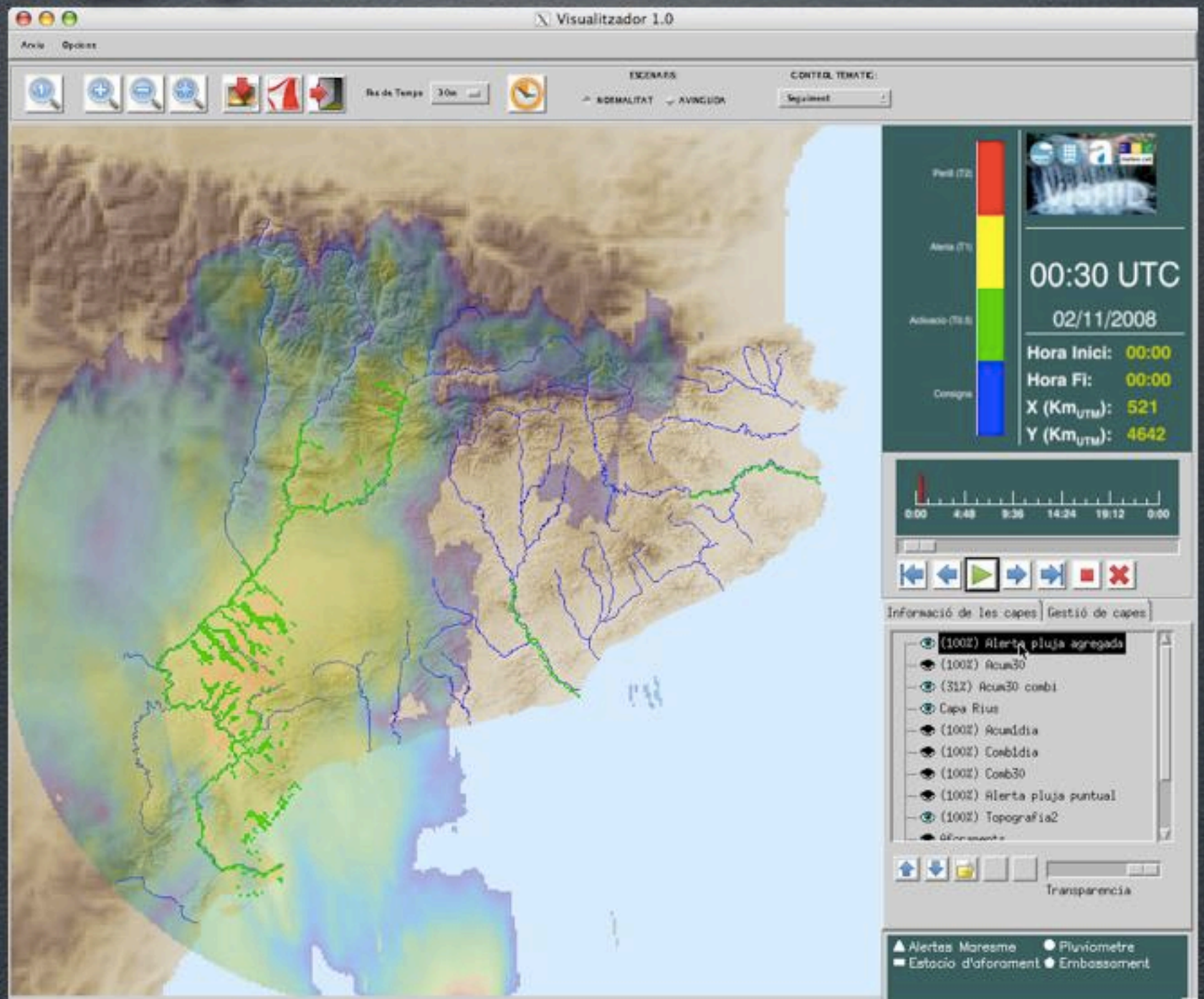
- Probabilistic Hazard Identification **based on the probability of basin-aggregated rainfall excedences**

CRAHI

UPC

High Resolution Hydrological Hazard Identification

- Probabilistic Hazard Identification **based on the probability of basin-aggregated rainfall excedences**



EFAS: European Awareness Flood System

European Commission
Joint Research Centre
Institute for Environment and Sustainability

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EFAS forecasting

Forecasts available from 2009-05-01 to 2012-06-12 (12 UTC)

<< full screen opacity << 0.9 >> Print screenshot

search for location...

2011-11-02 (12 UTC) Disclaimer

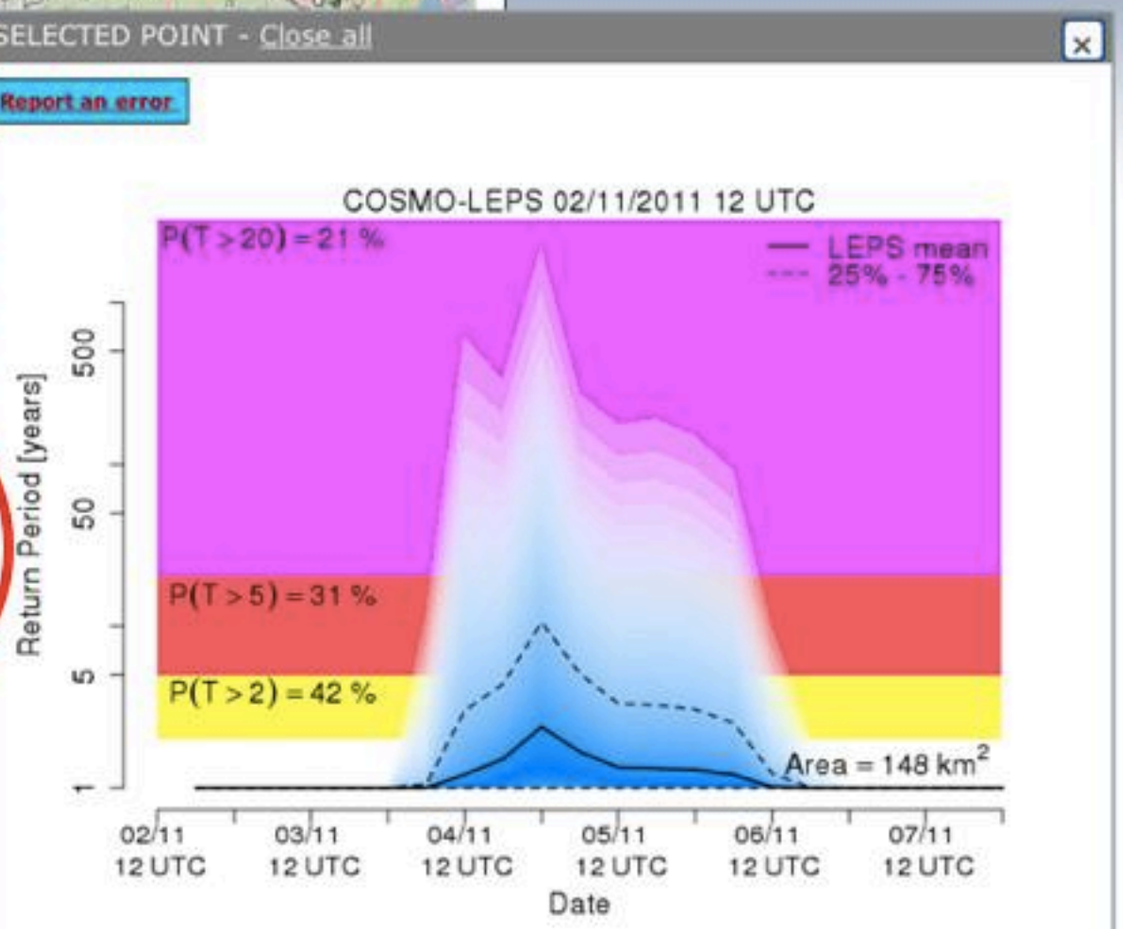
Select layers

2011-11-02 12

- Flood summary layers (0/10)
- Hydrological layers (0/7)
- Meteorological layers (0/7)
- Background layers (2/6)
- Flash flood layers (4/8)
  - IMPRINTS testbeds
  - No. COSMO Above Medium
  - No. COSMO Above High
  - No. COSMO Above Severe
  - Medium alert - T>2 years
  - High alert - T>5 years
  - Severe alert - T>20 years
  - EPIC above Medium

SELECTED POINT - Close all

Report an error



2 days ahead Forecast

Tasks and deliverables

		T1	T2	T3	T4	T5	T6
A	**Enhancing the precipitation nowcasting tools at European scale** using radar, NWP, lightening and rescue service data.						
B	**Nowcasting of Lightning related hazards**						
C	Enhanced **hydrological hazard identification** based on basin-aggregated rainfall nowcasting						
D	Adapting the platform to **complement the EFAS system**						
E	**Demonstration** of the platform in collaboration with **Civil Protection autjorities**						
F	**Publicity**						
G	**Management** and reporting to the Commission.						

18 months

Deliverables

- **A1: Improved version of the NOWCASTING PLATFORM (M10)**
- **A2: Use of the available rescue reports and the European Severe Weather Database (ESWD) to enhance the system (M10)**
- **B1: Lightning nowcasting and its use to improve heavy-rainfall forecasts (M12)**
- **C1: Hydrological hazard identification tool based on basin aggregated rainfall (M12)**
- **D1: Adapt the visualization of the outputs in a complementary way to EFAS system (M10)**
- **D2: Blending radar based probabilistic rainfall nowcasts and NWP rainfall forecasts (M12)**
- **E1: Organization of a European Training School for meteorological forecasters and Civil Protection operational agents (M15)**
- **E2: Guidelines for a better integration of the hazard identification outputs in the Civil Protection protocols (M18)**
- **F1: ORGANIZATION OF AN INTERNATIONAL WORKSHOP IN BRUSSELS (M18)**
- **F2: WEBSTREAMING OF THE WORKSHOP (M18)**
- **G1: Project Website (M3)**

Meetings

EDHIT

1st Project Meeting

Madrid (Spain) February 2014

2nd Project Meeting

Helsinki (Finland) October 2014

3rd Project Meeting

Wien (Austria) February 2015

Final Project Workshop

Brussels (Belgium) May 2015

Training School for Civil Protection and Meteorological Forecasters

Training School of Lower Austria Civil Protection

MARCH 2015

www.edhit.eu