June 2017

ERICHA PLATFORM USER GUIDE

1. Introduction

The ERICHA platform is a web application based on Google maps API focusing on assessing and nowcasting (up to 8 hours) hazards triggered by intense precipitation in real-time. The platform uses precipitation forecasts obtained from:

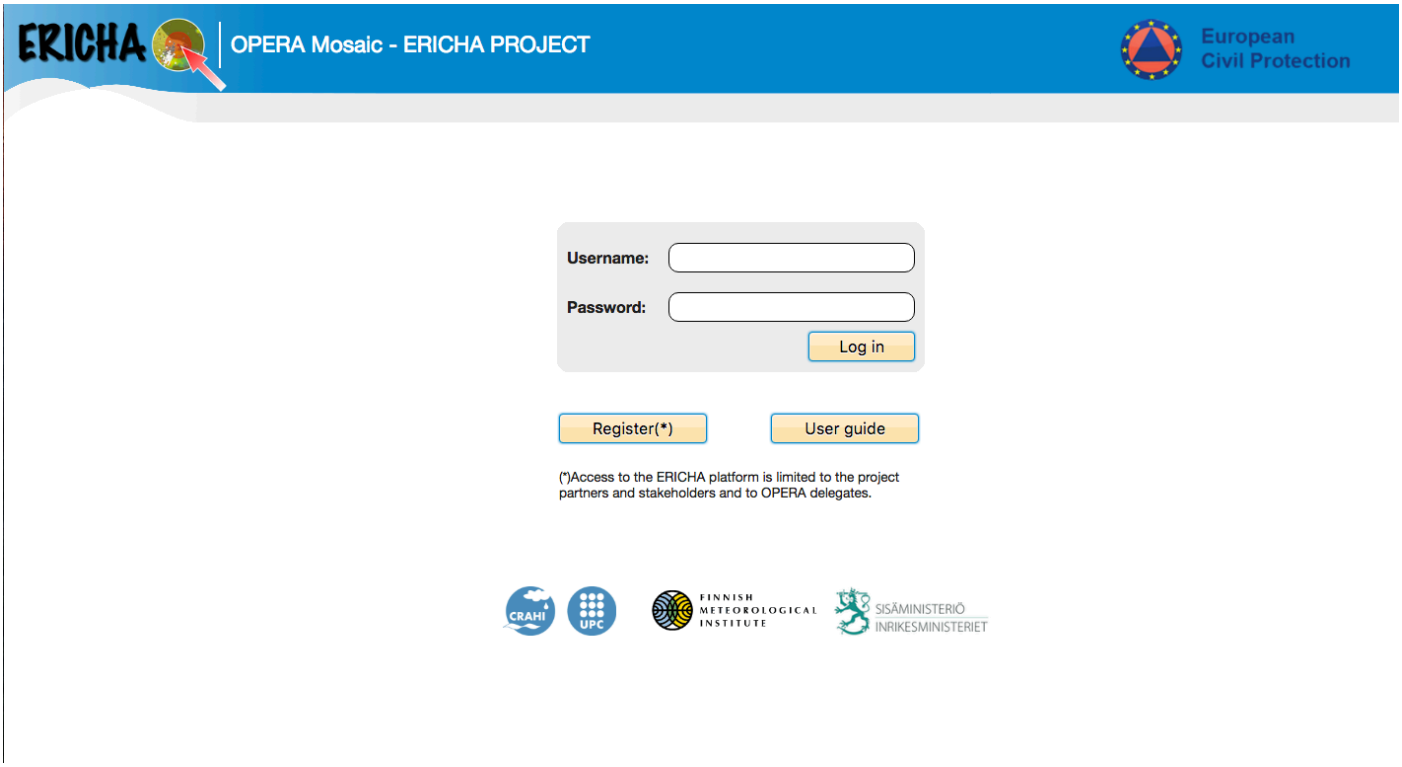
- The EU radar reflectivity mosaics (network of +150 radars) produced by the EUMETNET project OPERA with a spatial resolution of 2 km and temporal resolution of 15 minutes.
- Multi-sensor observations
- Lightning observation

2. Access

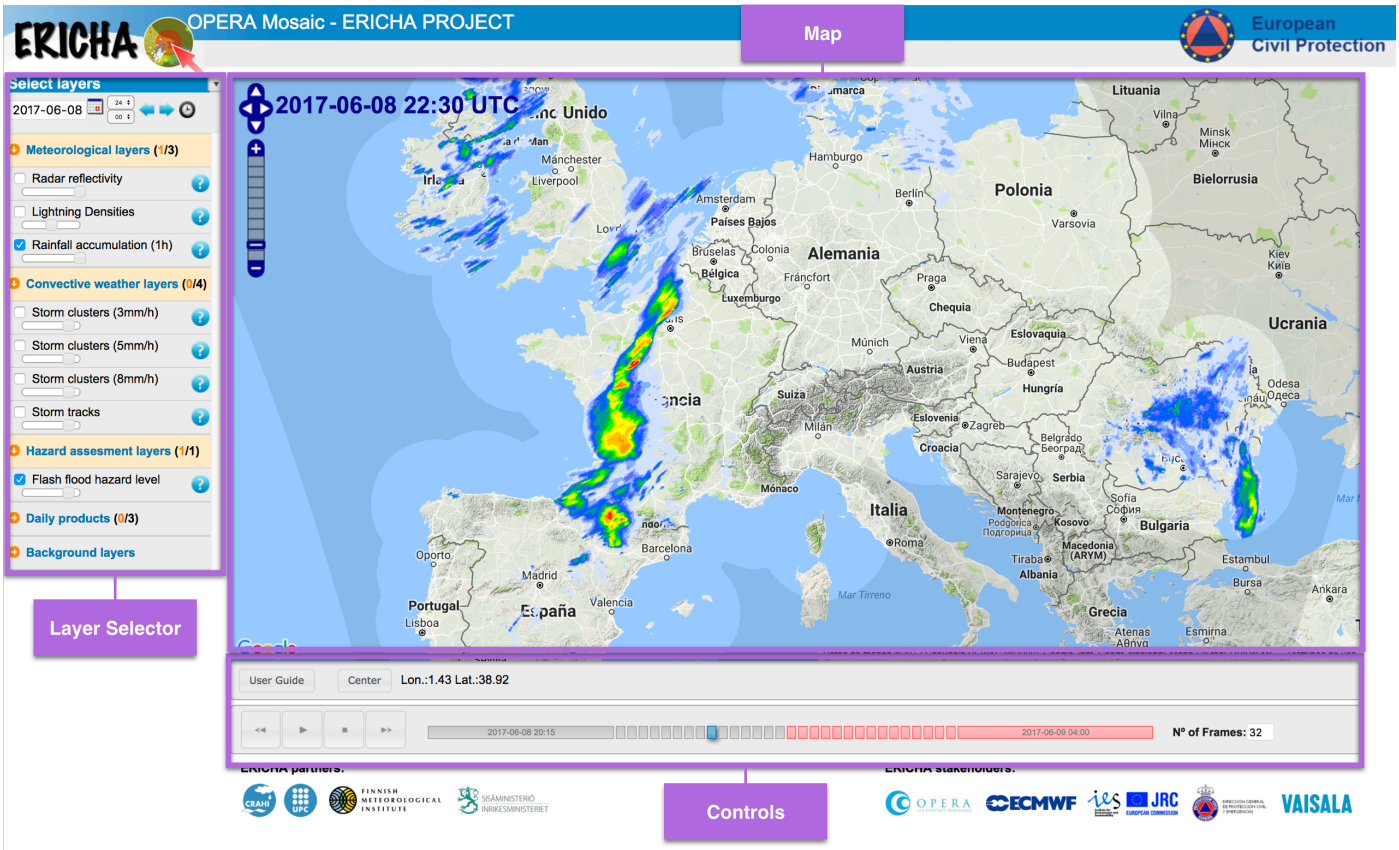
The ERICHA platform can be accessed at:

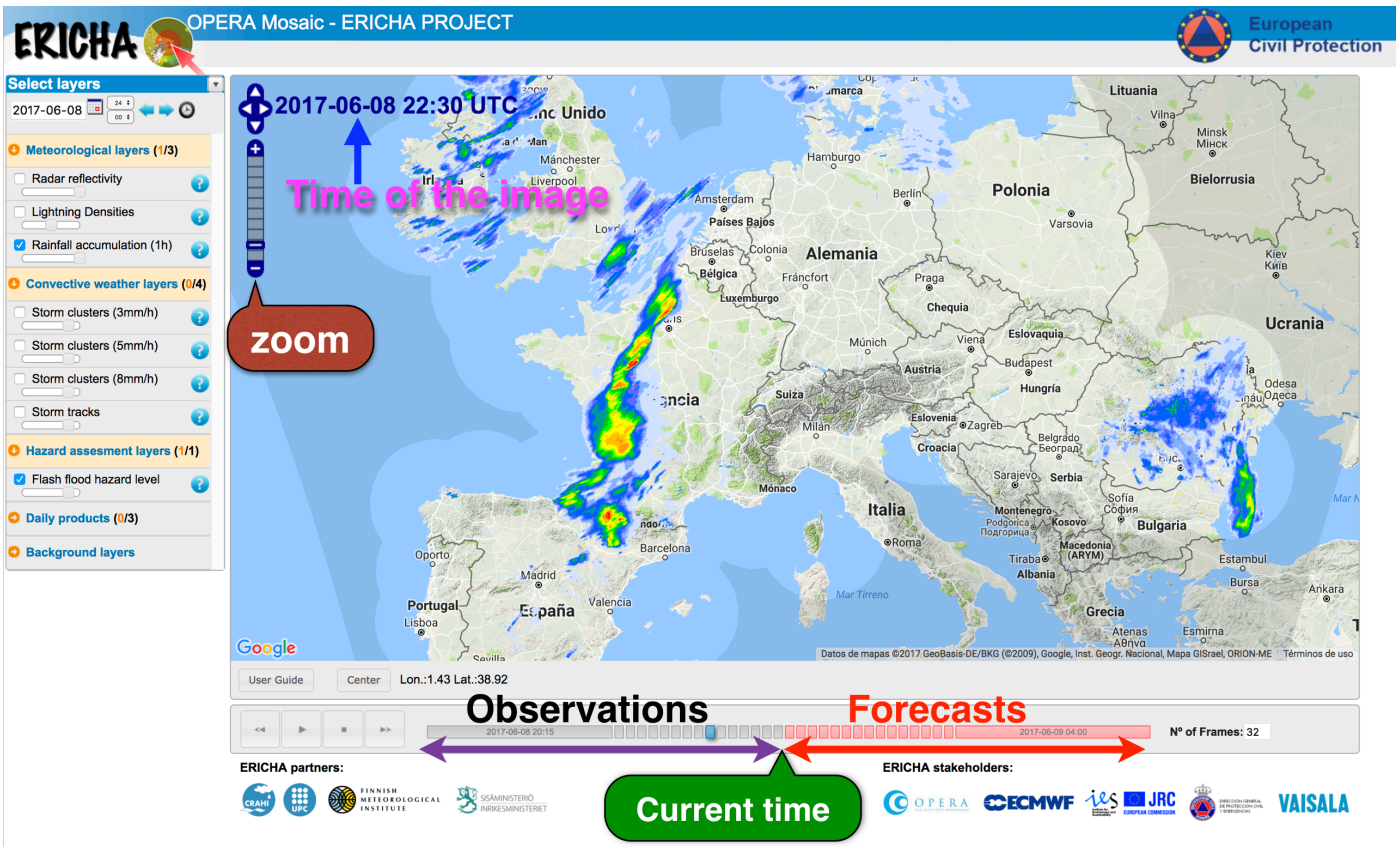
http://ericha.eu/ericha-platform/

To access the platform you will need to log in using the **username** and **password** you have been provided.



The front page of the ERICHA platform shows by default the loop with the radar-estimated rainfall accumulation (1 h) and flash flood hazard level over EU in real time, including 8-hours forecasts.





3. Features

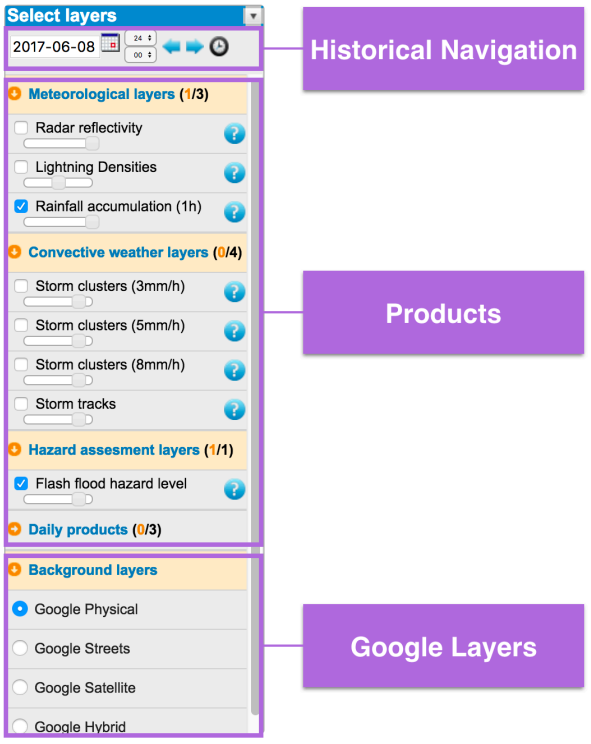
On the left side, we find a layer selector panel divided in three parts.

a) Historical and current navigation

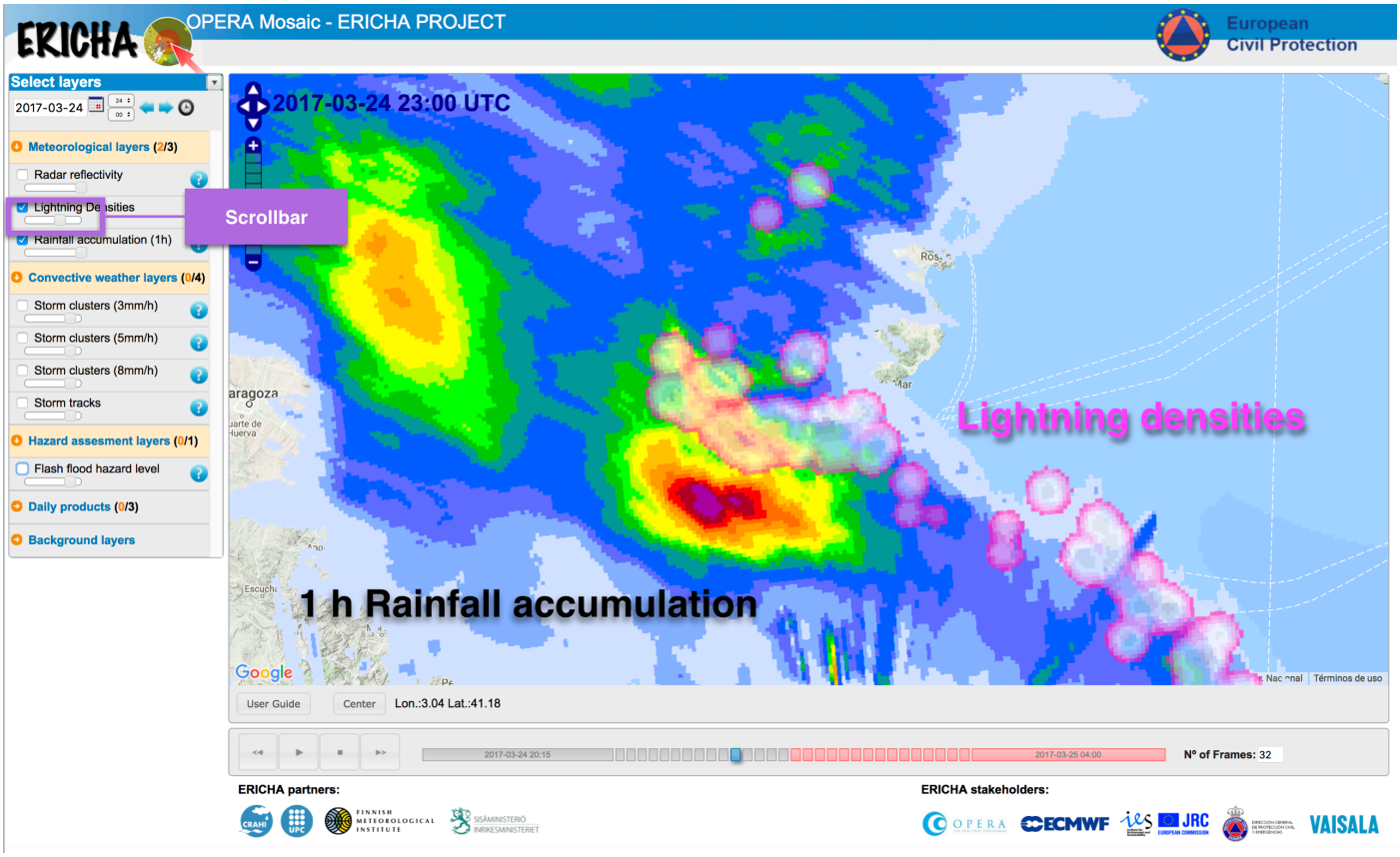
- Data are available since June 2012.
- Here, we can select a specific date/time choosing a date on the calendar.
- Select the current time by clicking on the watch.

b) Meteorological layers, Convective weather layers, Hazard assessment layers and daily products

- Meteorological products
  - Radar reflectivity
  - Lightning densities
  - Rainfall accumulation (1 hour)
- Convective weather layers
  - Storm clusters (3mm/h)
  - Storm clusters (5mm/h)
  - Storm clusters (8mm/h)
  - Storm tracks
- Hazard products
  - Flash flood hazard level
- Daily products:
  - Rainfall accumulation (24 hour)
  - Raingauge accum. (24h)
  - Flash flood hazard summary (24h)



Here, we can select or unselect the different layers/products. Note that more than one layer can be activated at the same time by checking it. With the scrollbar we can modify the transparency of the layer, which helps us to compare different layers/products.



The question mark icon in each layer/product provides a description of the displayed layer/product.

Lightning Densities

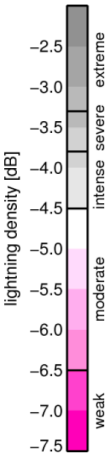
Lightning density estimated from the Vaisala Global Lightning Dataset (GLD360; http://www.vaisala.com/en/products/ with the algorithm developed by the Finnish Meteorological Institute (FMI; Pulkkinen et al., 2015).

Every 15 minutes a new forecast is generated by extrapolating lightning observations for up to 8 hours with a nowcasting algorithm based on Lagrangian persistence (Berenguer et al., 2011).

Reference:

Berenguer, M., D. Sempere-Torres and G.G.S. Pegram, 2011: SBMcast - An ensemble nowcasting technique to assess the uncertainty in rainfall forecasts by Lagrangian extrapolation, J. Hydrology, 404, 226-240

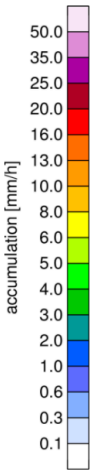
Pulkkinen, S., Rossi, P., Berenguer, M., Makela, A. 2015: Nowcasting of Lightning-related Hazards, EDHIT Deliverable B.1, 19pp.



Rainfall accumulation (1h)

Hourly rainfall accumulations estimated from the European radar composite generated by the EUMETNET project OPERA.

Every 15 minutes, a new forecast is generated by accumulating the instantaneous maps obtained for up to 8 hours with a nowcasting algorithm based on Lagrangian persistence.

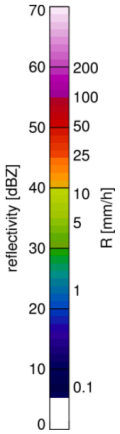


Radar reflectivity

The European reflectivity composite is generated by the EUMETNET project OPERA, composing the observations of 200+ radars from 31 countries (http://www.eumetnet.eu/opera).

Reflectivity is the variable measured by radars. It relates to rain rate, R, through a relationship of the kind $Z=aR^b$. (where a and b are parameters that depend on the type of precipitation).

Every 15 minutes a new forecast is generated by extrapolating radar observations for up to 8 hours with a nowcasting algorithm based on Lagrangian persistence (Berenguer et al., 2011).



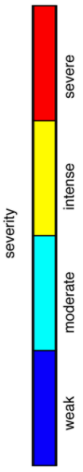
Reference:

Berenguer, M., D. Sempere-Torres and G.G.S. Pegram, 2011: SBMcast - An ensemble nowcasting technique to assess the uncertainty in rainfall forecasts by Lagrangian extrapolation, J. Hydrology, 404, 226-240

Storm clusters (3mm/h)

First, a storm cell is defined as a contiguous region (polygon contour) where the rain rate exceeds a predefined threshold (3 mm/h). Then, a cluster is defined as a group of cells, where each cell is within a distance of 4 km from the nearest one.

Every 15 minutes, the storm clusters are shown as colored contours that correspond to the hydrological severity, determined from the strom areas and maximum hourly rainfall accumulation within the storm clusters.



Reference:

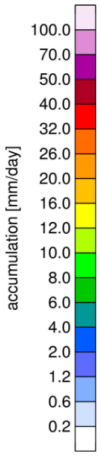
Rossi, P. J., V. Hasu, K. Halmevaara, A. Mäkelä, J. Koistinen, and H. Pohjola, 2013: Real-time hazard approximation of long-lasting convective storms using emergency data. J. Atmos. Oceanic Technol., 30, 538–555

Rossi, P.J., V. Chandrasekar, V. Hasu, and D. Moisseev, 2015: Kalman filtering- based probabilistic nowcasting of object-oriented tracked convective storms, J. Atmos. Oceanic Tech., 32, 461–477

Tyynelä, J., S. Pulkkinen, J. Koistinen, 2016: Statistical convective storm severity estimation through real-time lightning and hail location information, ERICHA Deliverable B.1, 25 pp.

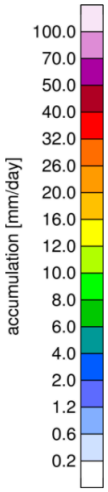
Rainfall accumulation (24h)

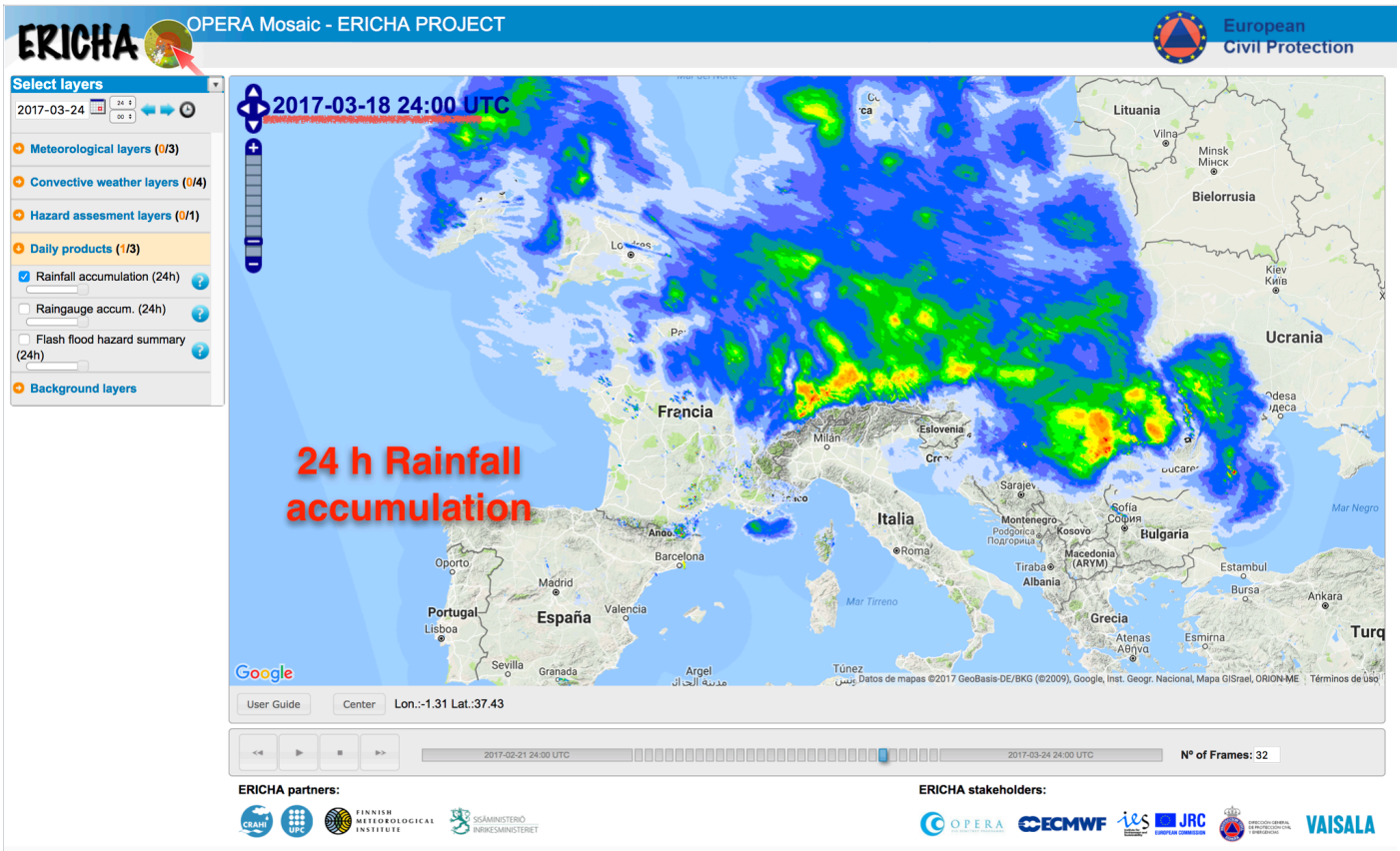
Daily rainfall accumulations estimated from the European radar composite generated by the EUMETNET project OPERA.

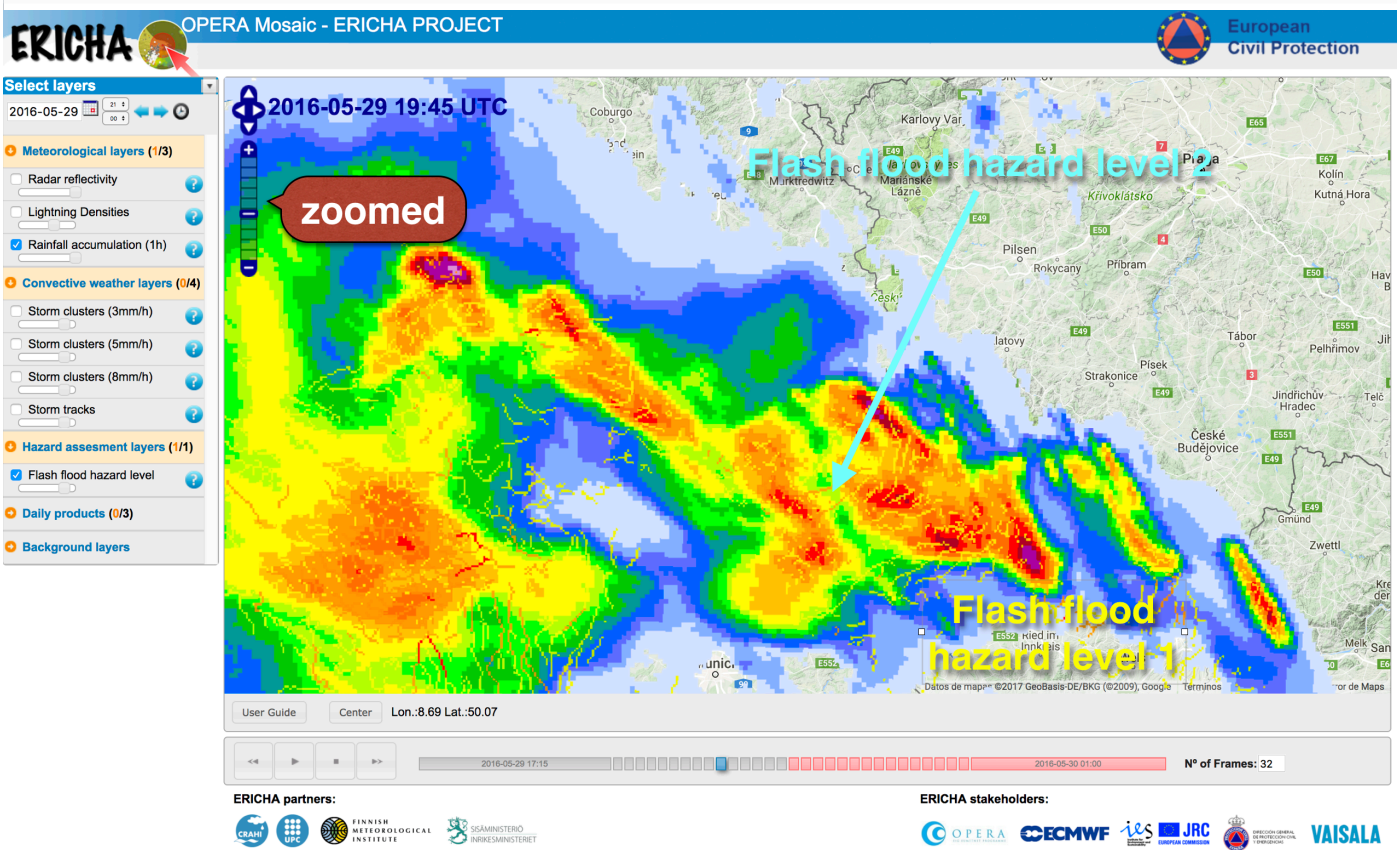


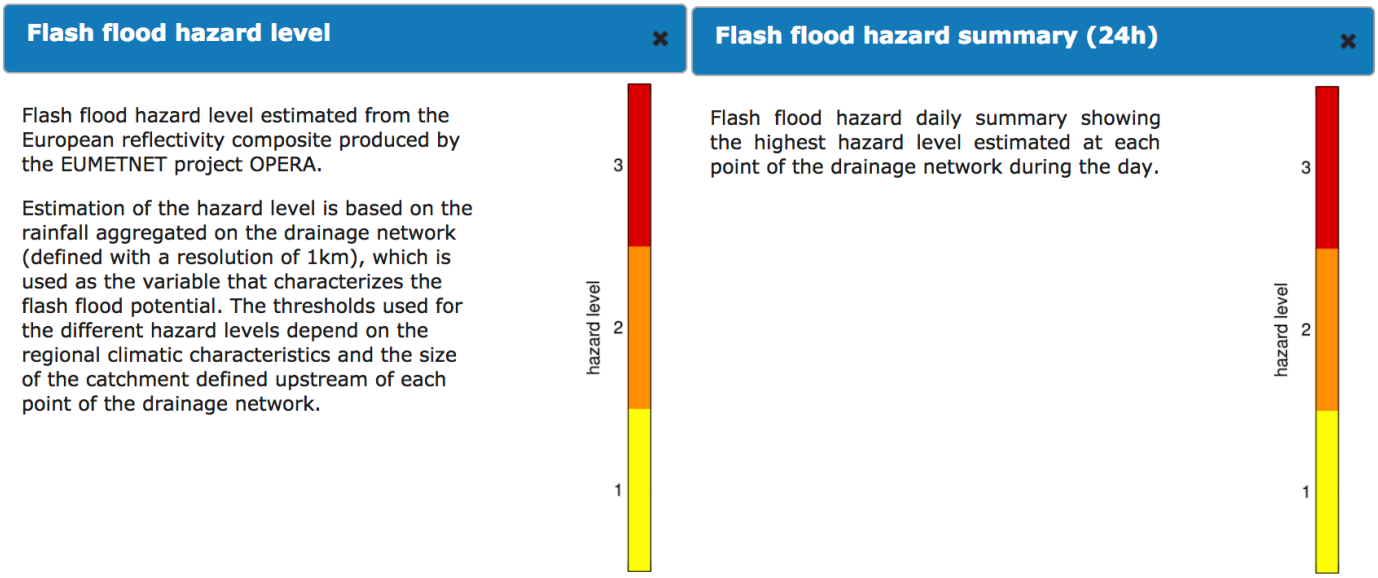
Raingauge accum. (24h)

24-hour rainfall accumulations measured by SYNOP weather stations (SYNOP raw data are obtained from http://www.ogimet.com/).




ERICHA
OPERA Mosaic - ERICHA PROJECT
European Civil Protection
Select layers
2017-03-24
Meteorological layers (0/3)
Convective weather layers (0/4)
Hazard assesment layers (0/1)
Daily products (1/3)
Rainfall accumulation (24h)
Raingauge accum. (24h)
Flash flood hazard summary (24h)
Background layers
2017-03-18 24:00 UTC
24 h Rainfall accumulation
Lituania
Vilna
Minsk
Минск
Bielorrusia
Kiev
Київ
Ucrania
Francia
Milán
Eslovenia
Sarajevo
Italia
Montenegro
Podgorica
Подгорица
Kosovo
Sofía
София
Bulgaria
Macedonia (ARYM)
Albania
Tirana
Roma
Barcelona
Oporto
Madrid
Portugal
Lisboa
España
Valencia
Sevilla
Granada
Mar Tirreno
Grecia
Atenas
Αθήνα
Estambul
Bursa
Ankara
Esmirna
Mar Negro
Google
Datos de mapas ©2017 GeoBasis-DE/BKG (©2009), Google, Inst. Geogr. Nacional, Mapa GISrael, ORION-ME
Términos de uso
User Guide
Center
Lon.:-1.31 Lat.:37.43
2017-02-21 24:00 UTC
2017-03-24 24:00 UTC
Nº of Frames: 32
ERICHA partners:
ERICHA stakeholders:
ECMWF
JRC
VAISALA


ERICHA
OPERA Mosaic - ERICHA PROJECT
European Civil Protection
Select layers
2016-05-29
Meteorological layers (1/3)
Radar reflectivity
Lightning Densities
Rainfall accumulation (1h)
Convective weather layers (0/4)
Storm clusters (3mm/h)
Storm clusters (5mm/h)
Storm clusters (8mm/h)
Storm tracks
Hazard assesment layers (1/1)
Flash flood hazard level
Daily products (0/3)
Background layers
2016-05-29 19:45 UTC
zoomed
Flash flood hazard level 2
Flash flood hazard level 1
Karlovy Var
Marktredwitz
Mariánské Lázně
Křivoklátsko
Kolín
Kutná Hora
Pilsen
Rokycany
Příbram
Tábor
Pelhřimov
Strakonice
Písek
Jindřichův Hradec
České Budějovice
Gmünd
Zwettl
Datos de mapas ©2017 GeoBasis-DE/BKG (©2009), Google
Términos de Maps
User Guide
Center
Lon.:8.69 Lat.:50.07
2016-05-29 17:15
2016-05-30 01:00
Nº of Frames: 32
ERICHA partners:
ERICHA stakeholders:
ECMWF
JRC
VAISALA



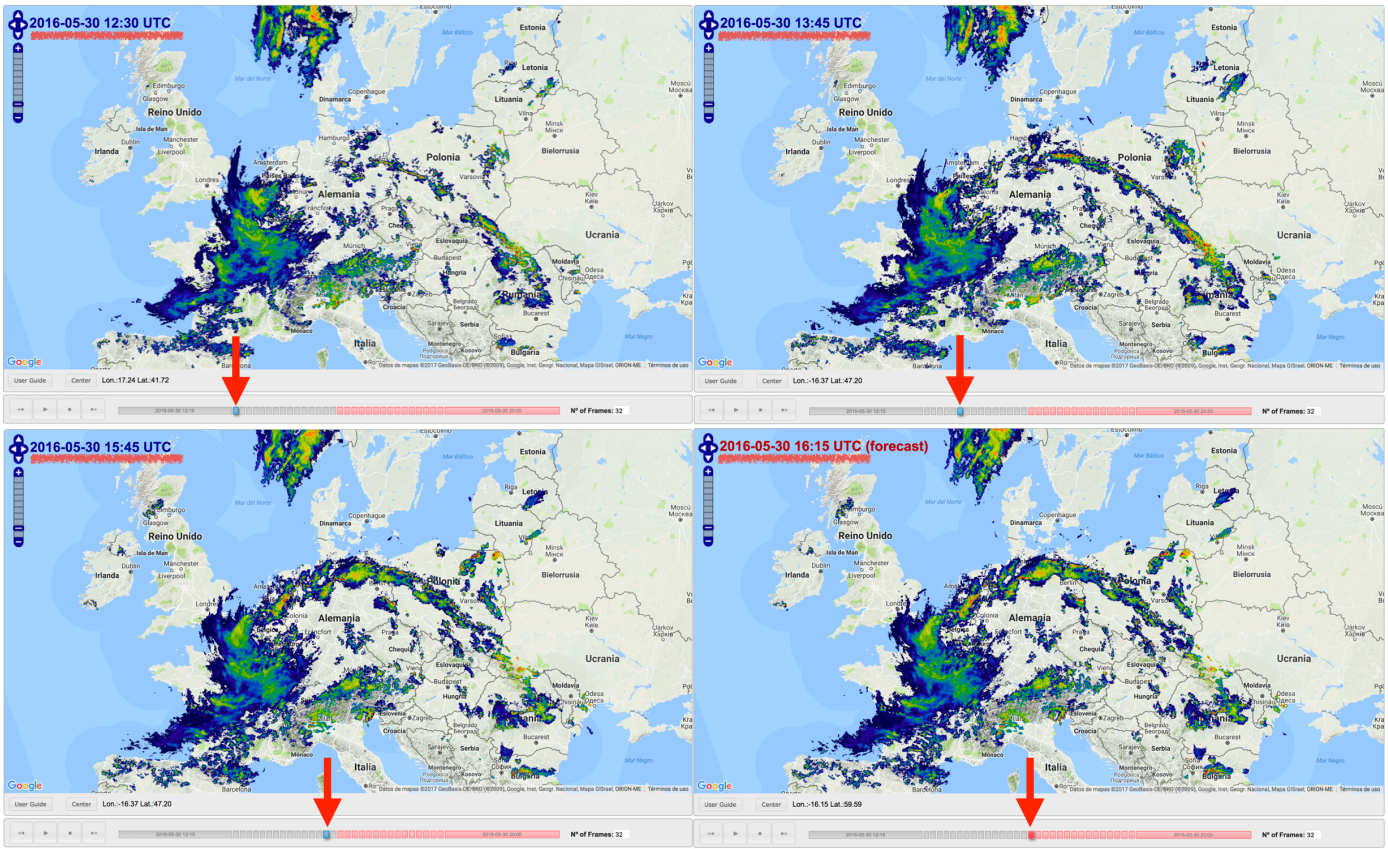
c) Background layers

Google map's API lets us to select between different maps: Physical, Streets, Satellite, Hybrid.

4. Animation

- Real time (default) or historical animation
- Rainfall forecasts up to 8 hours

The platform runs automatically in real-time mode over a loop of customizable frames. The first half of the frames corresponds to the last observed images and the other half (indicated with red) are the forecasted frames (up to 8 hours).



5. User Interface

The user interface has the typical tools of google maps apps, and the additional following information:

- Date and time of the current frame
- Date and time of the first frame
- Date and time of the last frame
- Longitude and latitude of the cursor position
- Observed frames
- Forecasted frames

Controls:

- Location control
- Zoom control
- Center: relocate the map on a specific position
- Animation controls: Play, Stop, Forward, Backward
- Number of frames: this increases of reduces the animation length.
- User Guide: Open this user guide.

6. Getting access

Access to the ERICHA platform can be requested at the following link:

http://ericha.eu/ericha-user/index.html

The access is limited to the project partners and stakeholders and to OPERA delegates. Other users shall require acceptance by the OPERA delegate of their country.