

Rapid Mapping at I-Cube SERTIT



Dr Hervé Yésou,

<http://sertit.unistra.fr/>

French Lebanese summer school on Remote Sensing

Beirut May 30th to June 3rd , 2022



Copernicus services



<https://www.copernicus.eu/fr/services/urgences>

EMERGENCY SERVICE



Emergency Management Service



Mapping



**Rapid Mapping
(RM)**



**Risk & Recovery Mapping
(RRM)**



Early Warning System



Floods

EFAS
GloFAS



Fires

EFFIS



Droughts

EDO
GDO





European Flood Awareness System



EMS early warning components

The of the Copernicus EMS consists of three different systems:

- The European Flood Awareness System (EFAS), which provides overviews on ongoing and forecasted floods in Europe up to 10 days in advance.
- The European Forest Fire Information System (EFFIS), which provides near real-time and historical information on forest fires and forest fire regimes in the European, Middle Eastern and North African regions.
- The European Drought Observatory (EDO), which provides drought-relevant information and early-warnings for Europe.

Global Flood Awareness System (GloFAS), Global Wildfire Information System (GWIS) and Global Drought Observatory (GDO) complete the previous three above systems at global level.

European Forest Fire Information System EFFIS



European Forest Fire Information System -

EFFIS supports the services in charge of the protection of forests against fires in the EU and neighbor countries and provides the European Commission services and the European Parliament with updated and reliable information on wildland fires in Europe.

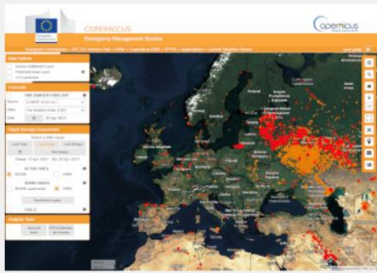
Since 1998, : network of experts from the countries in what is called the Expert Group on Forest Fires

Experts from 43 countries in European, Middle East and North African countries.

In 2015, EFFIS became one of the components of the Emergency Management Services in the EU Copernicus program.



EFFIS Applications



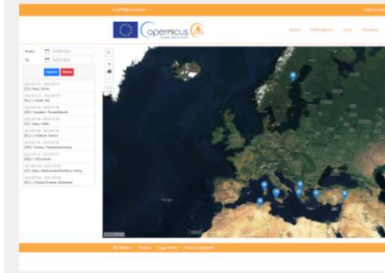
Current Situation Viewer

The most up to date information on the current fire season in Europe and in the Mediterranean area.

[Read more >](#)

Current Statistics Portal

Statistics are provided at national level and also for 3 groups of countries, EU, European non-EU countries, and Middle East and North Africa countries.

[Read more >](#)

Firenews

Fire news is an application that collects, geo-locates and stores in a database fire news published in the internet in all the EU and other languages, allowing the user to filter the news on the basis of geographical scope, keywords, etc.

[Read more >](#)

Long-term fire weather forecast

Monthly and seasonal forecast of temperature and rainfall anomalies that are expected to prevail over European and Mediterranean areas.

[Read more >](#)




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This application is made available for specific requests from applicants that are not directly available on the EGU 2015 web services. Please fill in the requested information for your request to be processed.

The size and the relevance for the email address provided for the application is not as a priority.

First address:	The e-mail address of the person who filled the request		
No-type email address:	Please, no generic email address.		
Organization:	The organization to which the person who filled the request belongs to.		
Reason:	The reason for which the address will be used.		
Date:	The type of date requested...		
File type:	Research request type...		
Send later:	 The date when the request is submitted		
End date:	 The end date of the request submitted		
Comment:	Specify the comment you want the data for.		

Data Request Form

Request for data that are not directly available via the EFFIS web services.

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Data and services

Download data and services

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Harmonized Settlement Layer	↓
Protected Areas Layer	↓
GSD Laminator	↓
Fire Danger Forecast (5 day Forecast)	↓
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Data and services

Country totals (burnt areas & number of fires) per year, as published in the Forest Fires in Europe, North Africa and Middle East reports.

[Read more >](#)

Forest fire forecasting

Fire Danger Forecast (ECMWF/FWI)

Very Low Danger
Low Danger
Moderate Danger
High Danger
Very High Danger
Extreme Danger
Very Extreme Danger

Map Options

☐ Human Settlement Layer
☐ Protected Areas Layer
☐ CCI Landcover

Forecasts

FIRE DANGER FORECAST

Source:

Index:

Date:

Rapid Damage Assessment

Select a date-range

From: 01 Jan 2022 To: 22 May 2022

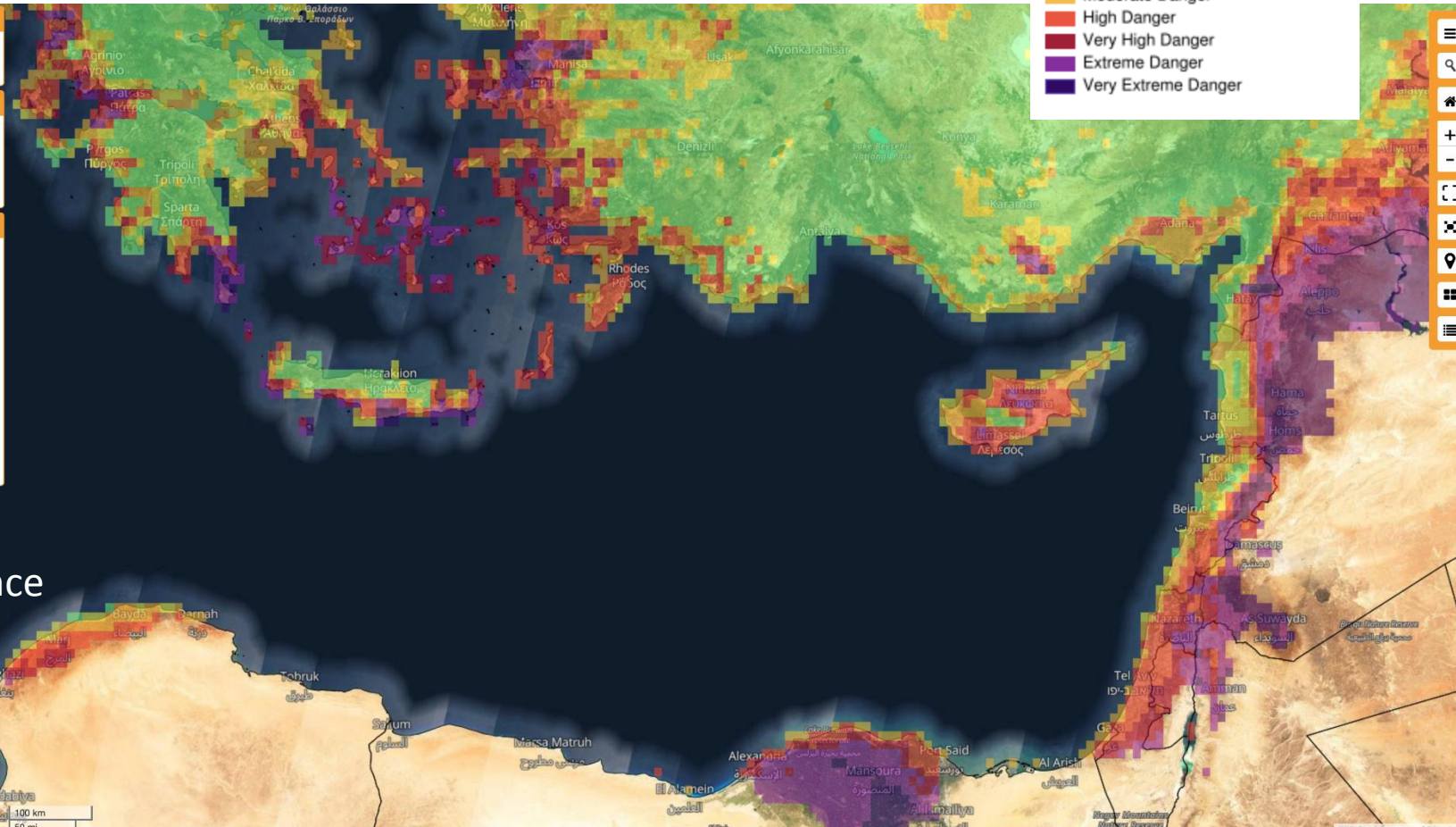
ACTIVE FIRES

☐ MODIS ☐ VIIRS

BURNT AREAS

☐ MODIS/SENTINEL2 (supervised) ☐ VIIRS

☐ FUELS



Meteo France
10km²

Based on two models for various indicators: Fire Weather Index FWI

Fire Weather Index (FWI)

Initial Spread Index (ISI)

Build Up Index (BUI)

Fine Fuel Moisture Code (FFMC)

Duff Moisture Code (DMC)

Drought Code (DC)

Anomaly

Ranking

KBDI

Keetch–Byram Drought Index (KBDI)

MARK-5

✓ Drought Factor (DF)

Rate of Spread (ROS)

Fire Danger Index (FDI)

NFDRS

NFDRS Rate of Spread (NFDRS ROS)

NFDRS Spread Component (NFDRS SC)

NFDRS Energy Release Component (NFDRS ERC)

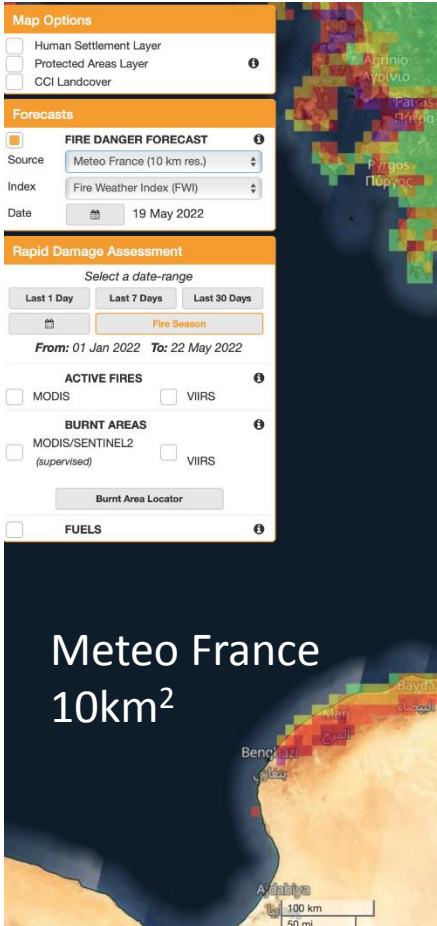
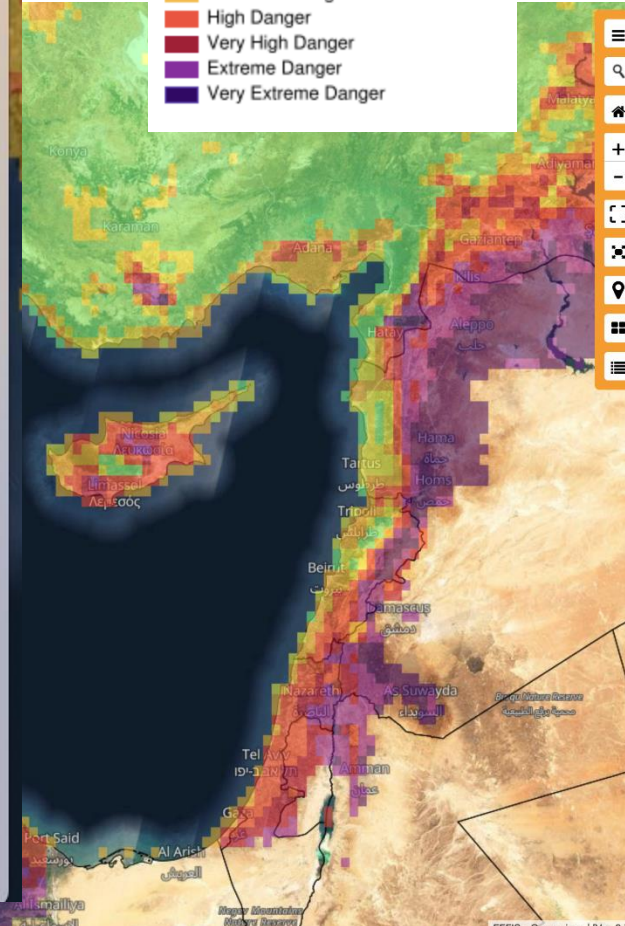
NFDRS Burning Index (NFDRS BI)

NFDRS Ignition Probability (NFDRS IC)

ng

Fire Danger Forecast
(ECMWF/FWI)

Very Low Danger
Low Danger
Moderate Danger
High Danger
Very High Danger
Extreme Danger
Very Extreme Danger



Based on two models for various indicators: Fire Weather Index FWI

Forest fire forecasting

Fire Danger Forecast
(ECMWF/FWI)

- Very Low Danger
- Low Danger
- Moderate Danger
- High Danger
- Very High Danger
- Extreme Danger
- Very Extreme Danger

Map Options

☐ Human Settlement Layer
☐ Protected Areas Layer
☐ CCI Landcover

Forecasts

☒ **FIRE DANGER FORECAST**

Source: ECMWF (8 km res.)

Index: Fire Weather Index (FWI)

Date: 19 May 2022

Rapid Damage Assessment

Select a date-range

Last 1 Day Last 7 Days Last 30 Days

Fire Season

From: 01 Jan 2022 To: 22 May 2022

ACTIVE FIRES

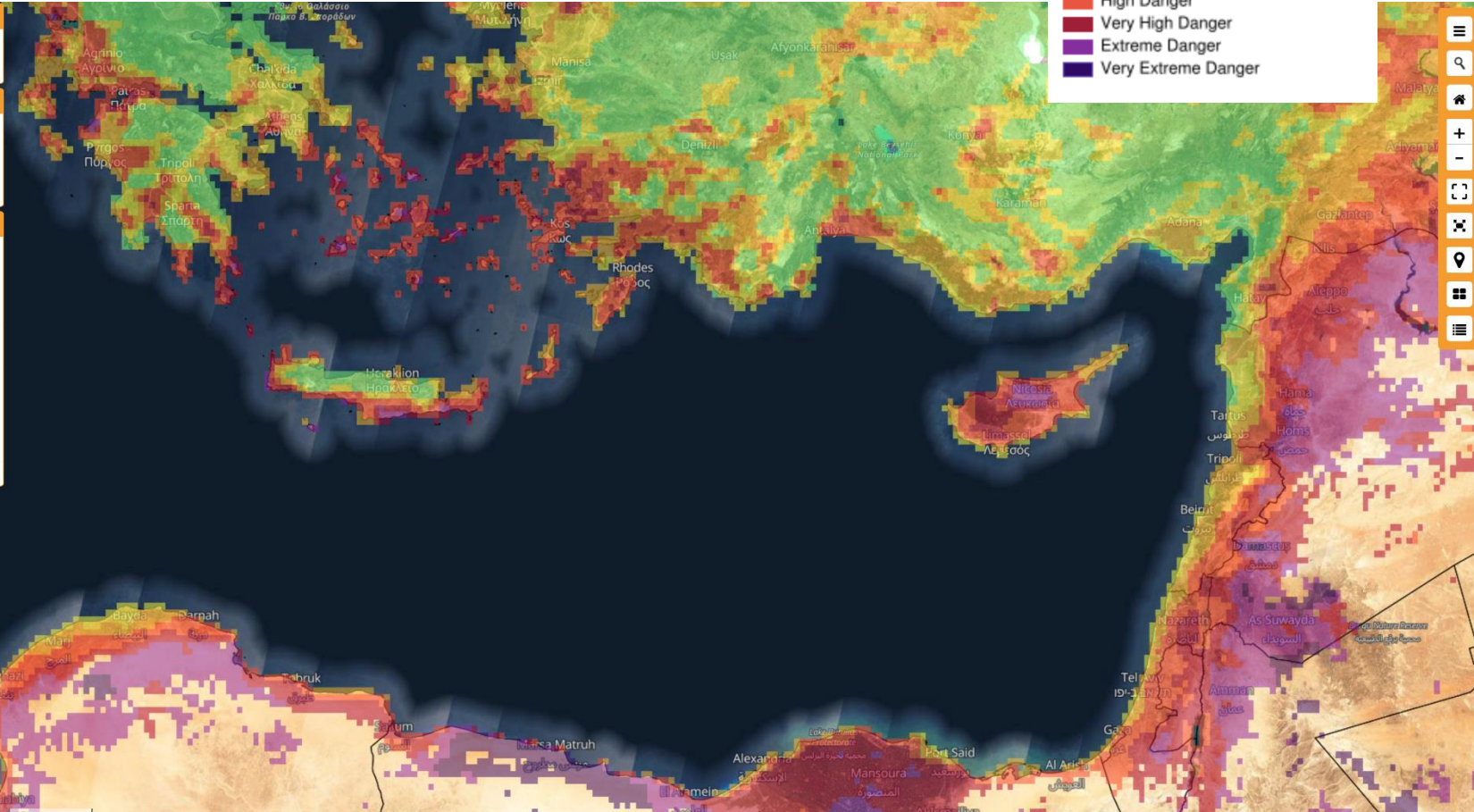
☐ MODIS ☐ VIIRS

BURNT AREAS

☐ MODIS/SENTINEL2 (supervised) ☐ VIIRS

Burnt Area Locator

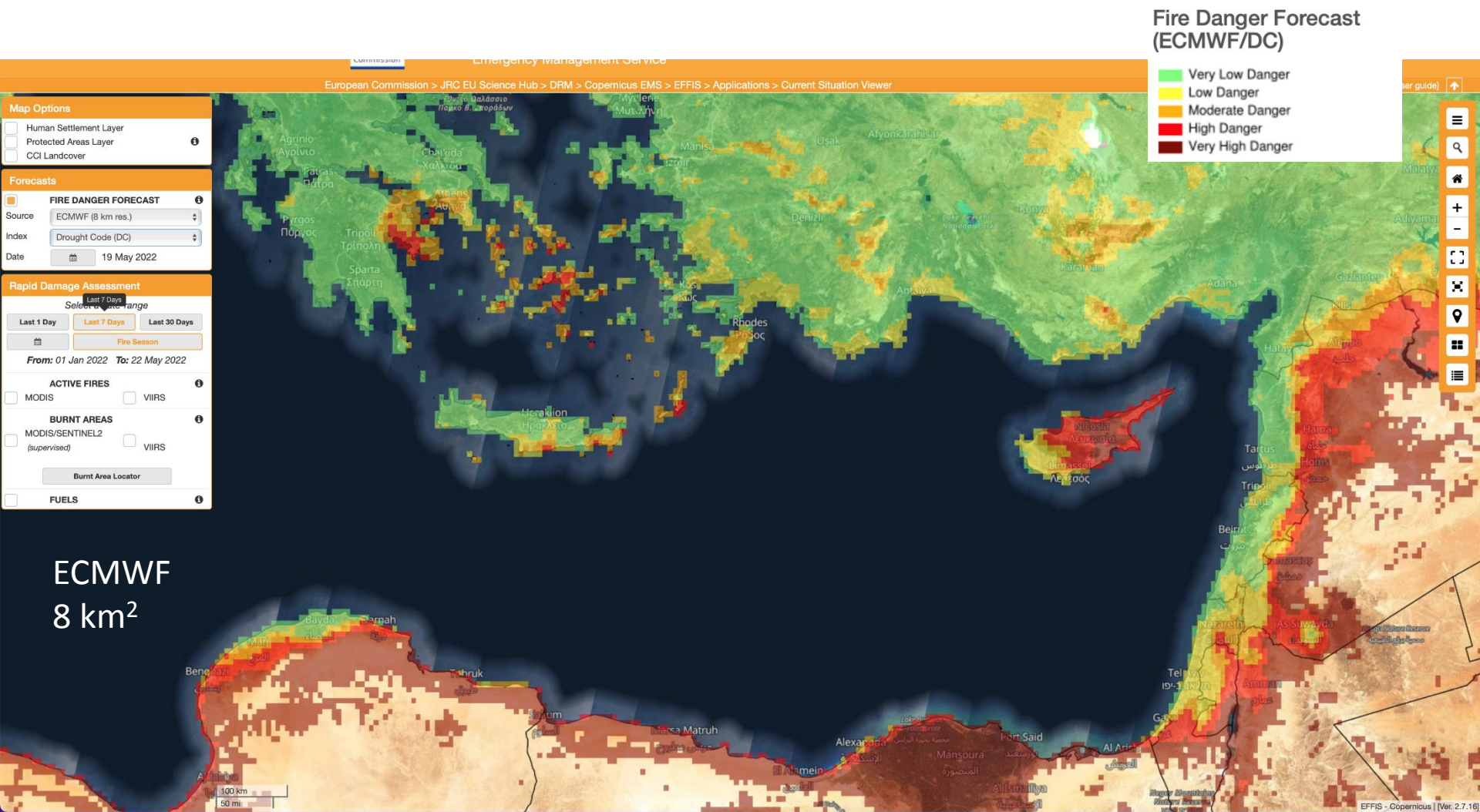
FUELS



ECMWF

Based on two models for various indicators: Fire Weather Index FWI

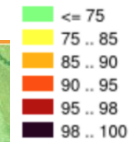
Forest fire forecasting



Based on two models for various indicators: Drought Code

Forest fire forecasting

Fire Danger Forecast
(ECMWF/Ranking)



Map Options

- ☐ Human Settlement Layer
- ☐ Protected Areas Layer
- ☐ CCI Landcover

Forecasts

☒ FIRE DANGER FORECAST

Source: ECMWF (8 km res.)

Index: Ranking

Date: 19 May 2022

Rapid Damage Assessment

Select a date-range

Last 1 Day Last 7 Days Last 30 Days

Fire Season

From: 01 Jan 2022 To: 22 May 2022

ACTIVE FIRES

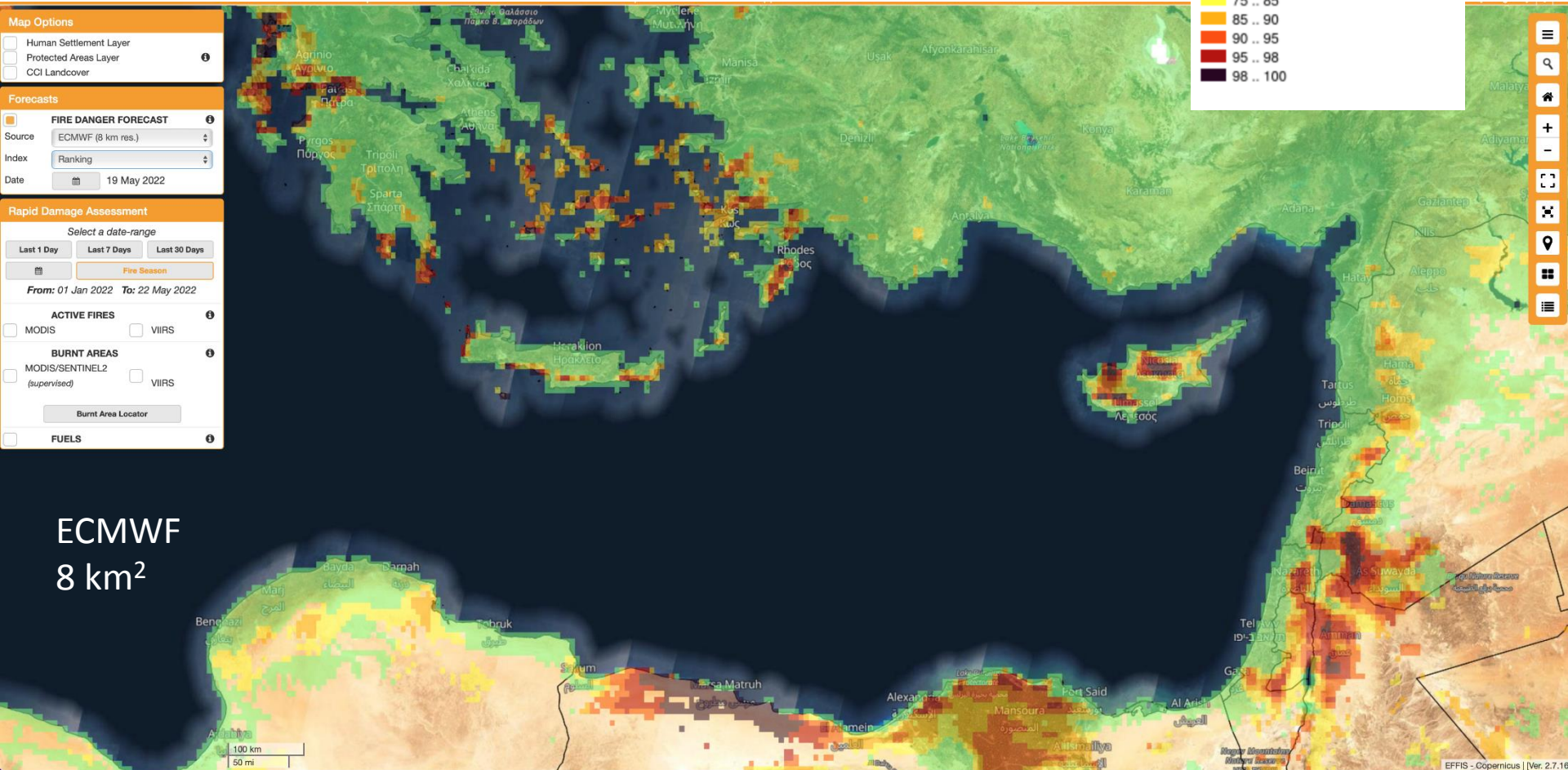
☐ MODIS ☐ VIIRS

BURNED AREAS

☐ MODIS/SENTINEL2 (supervised) ☐ VIIRS

Burnt Area Locator

FUELS

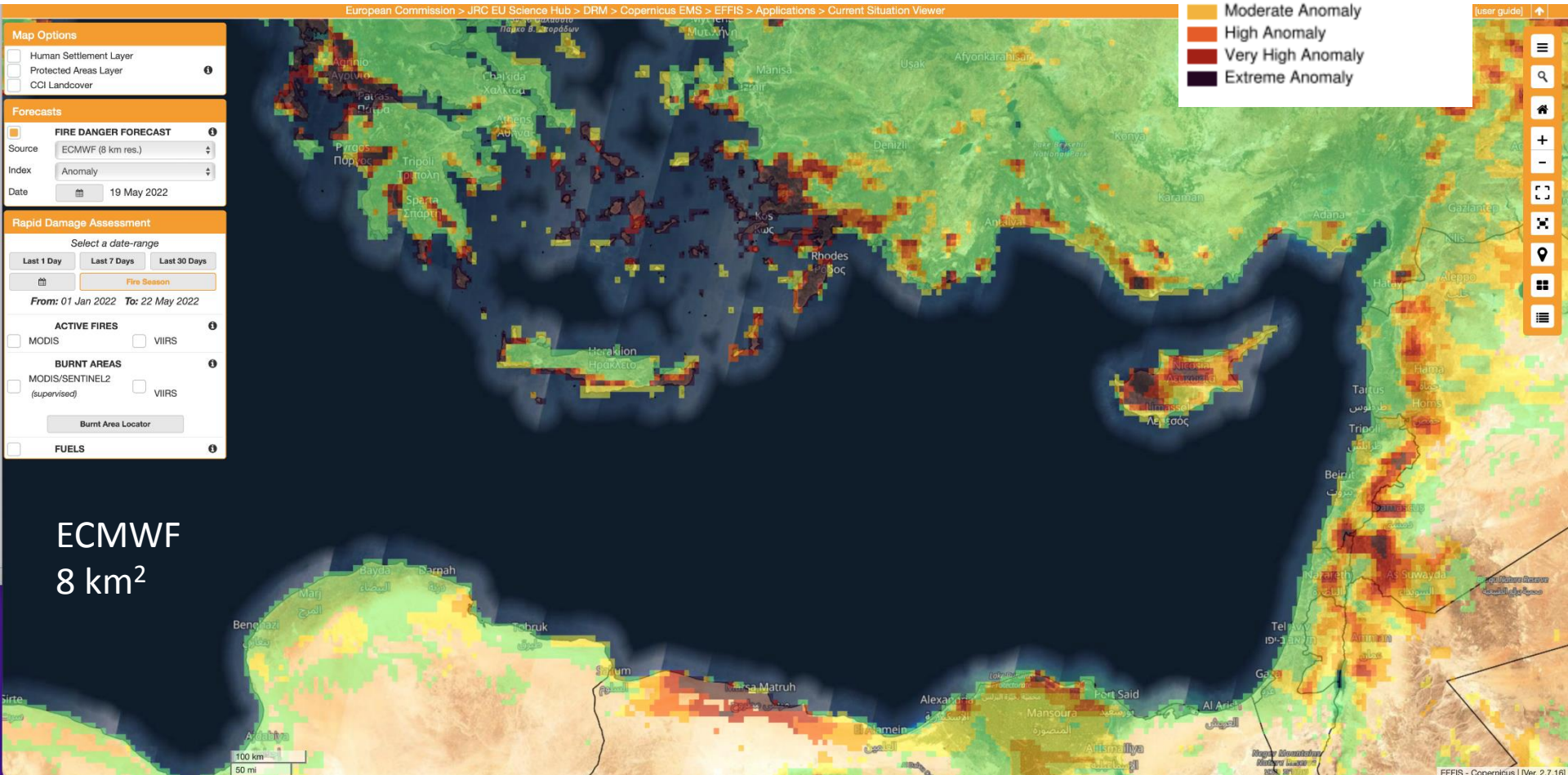
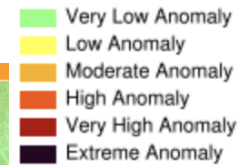


ECMWF
8 km²

Based on two models for various indicators: Ranking

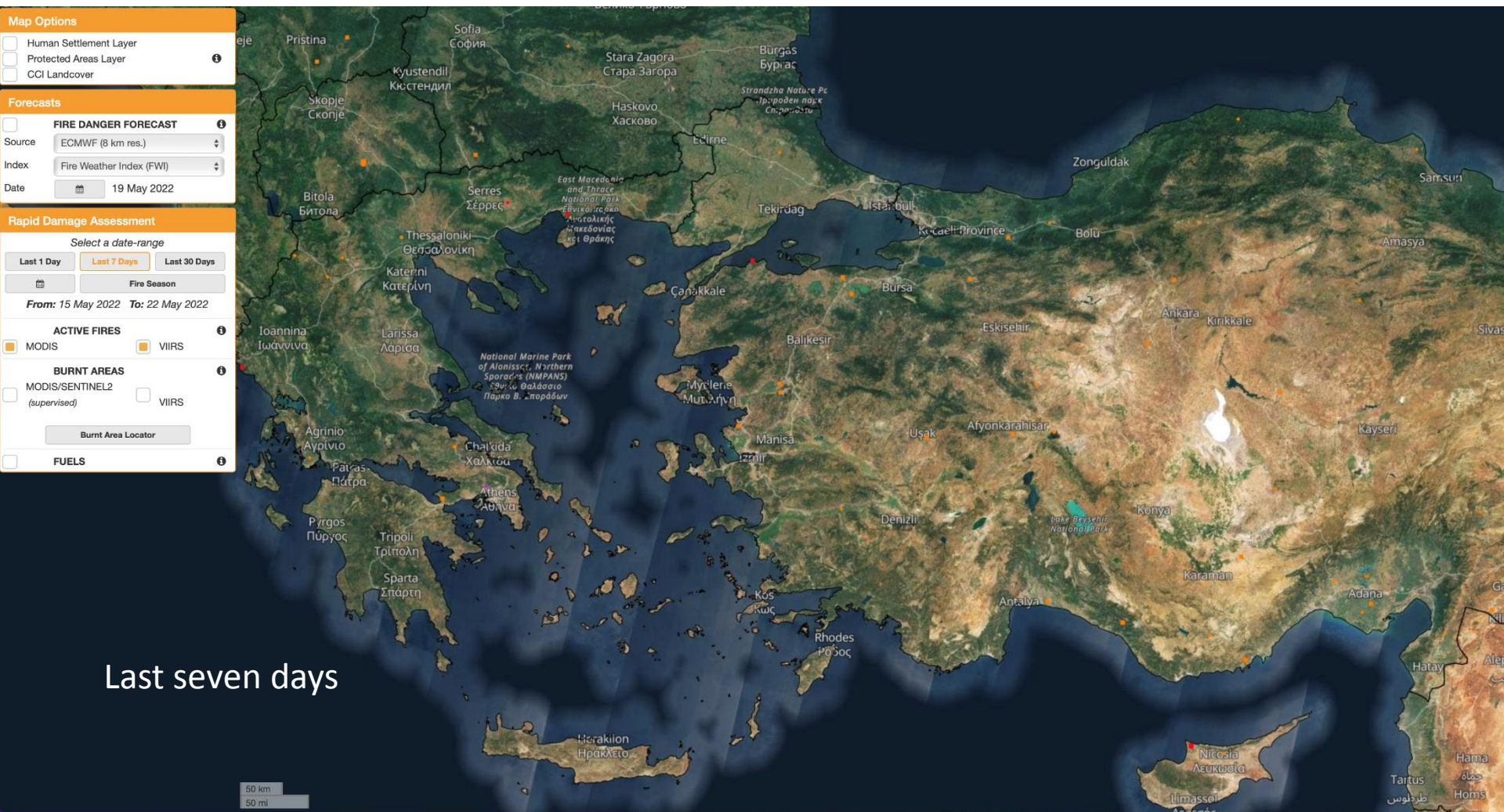
Forest fire forecasting

Fire Danger Forecast (ECMWF/Anomaly)



Based on two models for various indicators: Anomaly

Current situation: different time scales



Last seven days

Rapid damage assessment

Current situation: different time scales

Map Options

- ☐ Human Settlement Layer
- ☐ Protected Areas Layer
- ☐ CCI Landcover

Forecasts

☐ **FIRE DANGER FORECAST**

Source: ECMWF (8 km res.)

Index: Fire Weather Index (FWI)

Date: 19 May 2022

Rapid Damage Assessment

Select a date-range

Last 1 Day Last 7 Days Last 30 Days

From: 01 Jan 2022 To: 22 May 2022

ACTIVE FIRES

☐ MODIS ☐ VIIRS

BURNT AREAS

☐ MODIS/SENTINEL2 (supervised) ☐ VIIRS

Burnt Area Locator

☐ **FUELS**



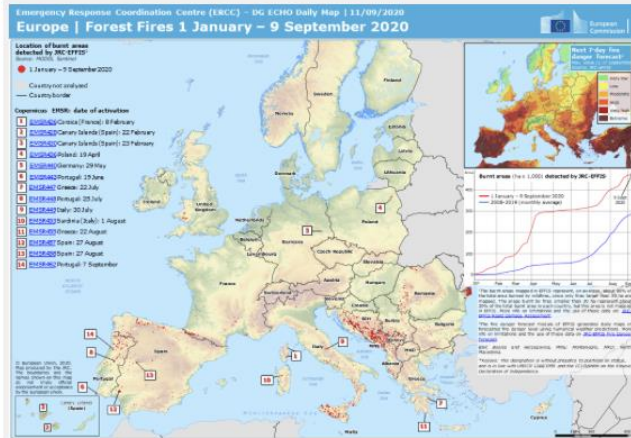
One fire season

Rapid damage assessment

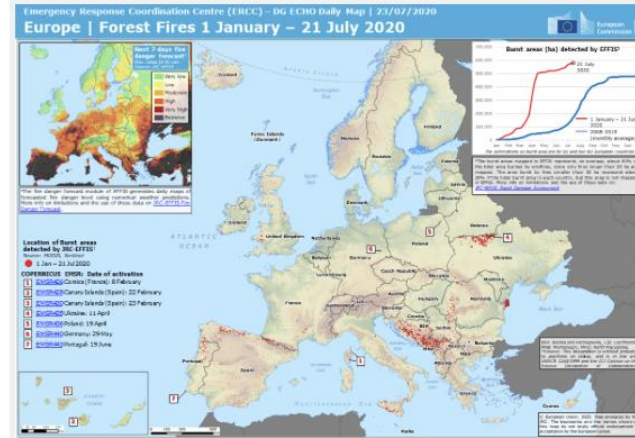
Country/Regional Wildfire Maps

In relations with EMSR activity

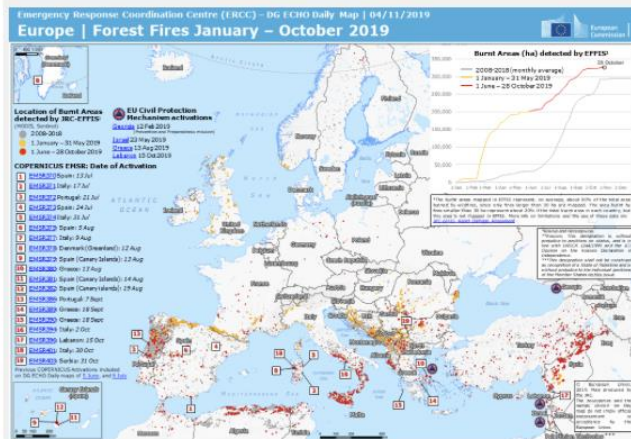
11 September 2020 - ECHO Daily Map
Forestfires Europe



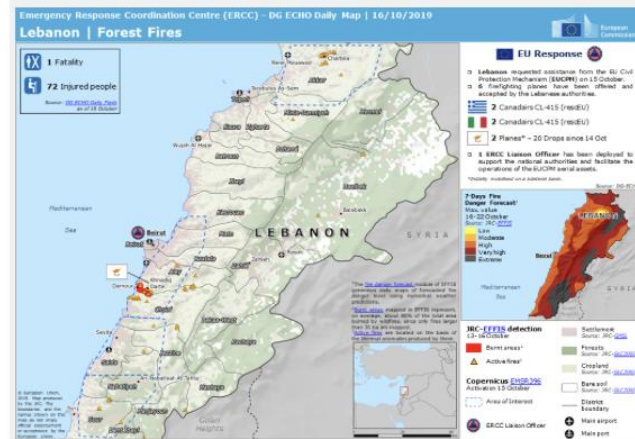
23 July 2020 - ECHO Daily Map
Forestfires Europe



4 November 2019 - ECHO Daily Map
Forestfires Europe



16 October 2019 - ECHO Daily Map
Lebanon Forest-fires



Country/Regional
Wildfire Maps

Country/Regional Wildfire Maps

In relations with EMSR activity

11 September 2020 - ECHO Daily Map

23 July 2020 - ECHO Daily Map

Emergency Response Coordination Centre (ERCC) - DG ECHO Daily Map | 11/09/2020

Europe | Forest Fires 1 January – 9 September 2020



Location of burnt areas
detected by JRC-EFFIS¹

Source: MODIS, Sentinel

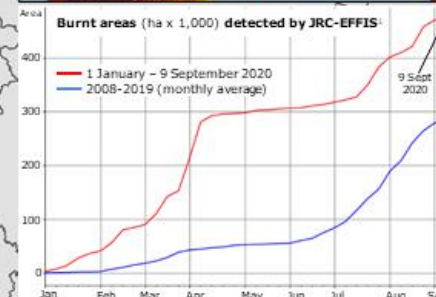
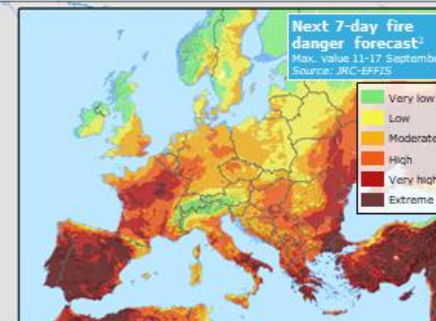
● 1 January – 9 September 2020

Country not analysed
— Country border

Copernicus EMSR: date of activation

- 1 EMSR426 Corsica (France): 8 February
- 2 EMSR428 Canary Islands (Spain): 22 February
- 3 EMSR430 Canary Islands (Spain): 23 February
- 4 EMSR436 Poland: 19 April
- 5 EMSR440 Germany: 29 May
- 6 EMSR443 Portugal: 19 June
- 7 EMSR447 Greece: 22 July
- 8 EMSR448 Portugal: 25 July
- 9 EMSR449 Italy: 30 July
- 10 EMSR453 Sardinia (Italy): 1 August
- 11 EMSR455 Greece: 22 August
- 12 EMSR457 Spain: 27 August
- 13 EMSR458 Spain: 27 August
- 14 EMSR462 Portugal: 7 September

© European Union, 2020.
Map produced by the JRC.
The boundaries and the names shown on this map do not imply official endorsement or acceptance by the European Union.



¹The burnt areas mapped in EFFIS represent, on average, about 90% of the total area burned by wildfires, since only fires larger than 30 ha are mapped. The areas burnt by fires smaller than 30 ha represent about 20% of the total burnt area in each country, but this area is not mapped in EFFIS. More info on limitations and the use of these data on: [JRC-EFFIS Rapid Damage Assessment](#).

²The fire danger forecast module of EFFIS generates daily maps of forecasted fire danger level using numerical weather predictions. More info on limitations and the use of these data on: [JRC-EFFIS Fire Danger Forecast](#).

BiH: Bosnia and Herzegovina, MNE: Montenegro, MKD: North Macedonia.

*Kosovo: This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Country/Regional Wildfire Maps

In relations with EMSR activity

Emergency Response Coordination Centre (ERCC) – DG ECHO Daily Map | 16/10/2019

Lebanon | Forest Fires



- 1 Fatality
- 72 Injured people

Source: [DG ECHO Daily Flash](#)
as of 16 October



¹The [fire danger forecast](#) module of EFFIS generates daily maps of forecasted fire danger level using numerical weather predictions.

²[Burnt areas](#) mapped in EFFIS represent, on average, about 80% of the total area burned by wildfires, since only fires larger than 30 ha are mapped.

³[Active fires](#) are located on the basis of the thermal anomalies produced by them.



EU Response

- Lebanon requested assistance from the EU Civil Protection Mechanism (EUCPM) on 15 October.
- 6 firefighting planes have been offered and accepted by the Lebanese authorities.

2 Canadairs CL-415 (rescEU)

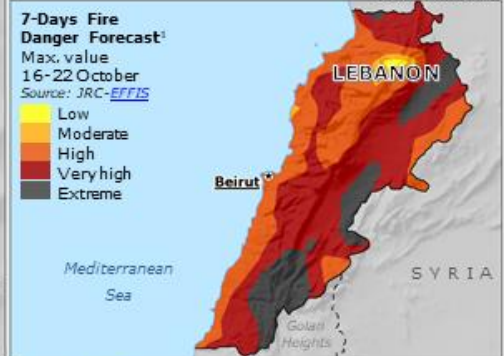
2 Canadairs CL-415 (rescEU)

2 Planes* – 20 Drops since 14 Oct

- 1 ERCC Liaison Officer has been deployed to support the national authorities and facilitate the operations of the EUCPM aerial assets.

*Initially mobilised on a bilateral basis.

Source: DG-ECHO



JRC-EFFIS detection 13-16 October

Burnt areas²

Active fires³

Copernicus EMSR396 Activation 15 October

Area of Interest

ERCC Liaison Officer

Settlement
Source: JRC-[GHS](#)

Forests
Source: JRC-[GLC2000](#)

Cropland
Source: JRC-[GLC2000](#)

Bare soil
Source: JRC-[GLC2000](#)

District boundary

Main airport

Main port

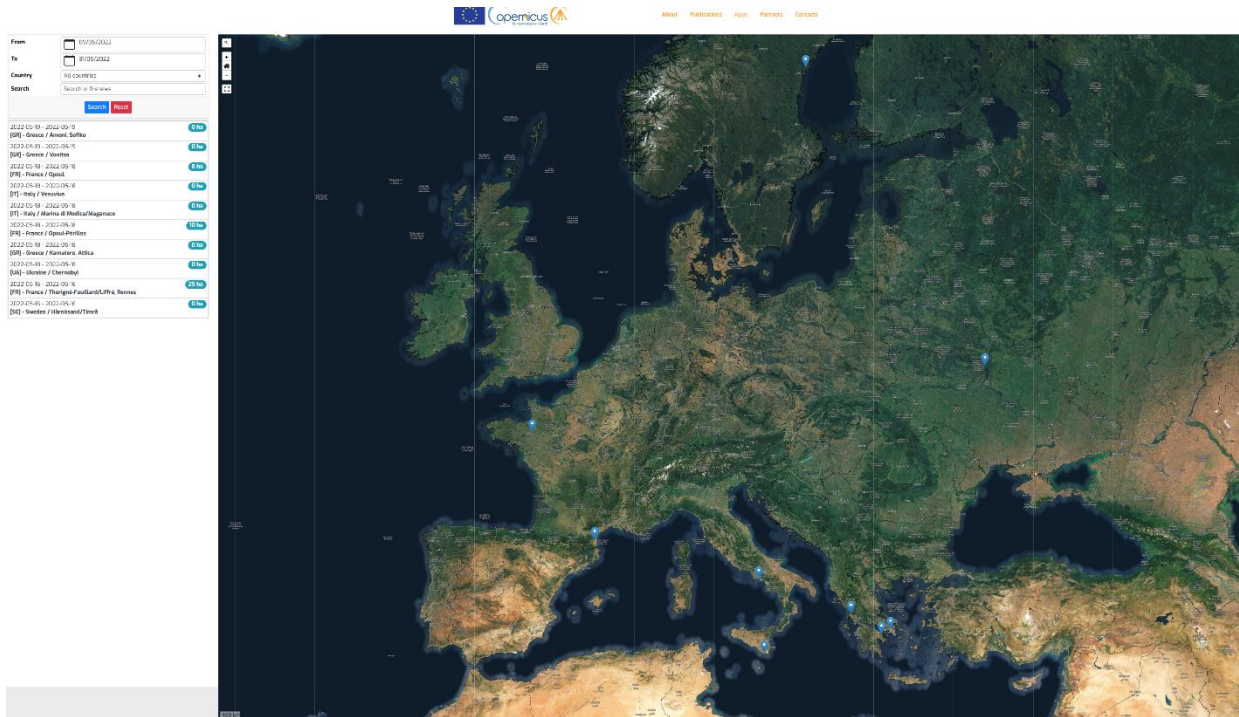
Country/Regional Wildfire Maps

© European Union, 2019. Map produced by the JRC. The boundaries and the names shown on this map do not imply official endorsement or acceptance by the European Union.

Fire news

Firenews

Fire news is an application that collects, geo-locates and stores in a database fire news published in the internet in all the EU and other languages, allowing the user to filter the news on the basis of geographical scope, keywords, e



Fire news



[About](#) [Publications](#) [Apps](#) [Partners](#) [Contacts](#)



From

To

Country

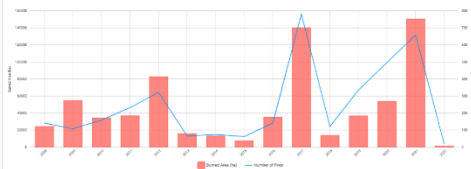
Search

2022-05-19 - 2022-05-19 [GR] - Greece / Amoni, Sofiko	0 ha
2022-05-19 - 2022-05-19 [GR] - Greece / Vonitsa	0 ha
2022-05-18 - 2022-05-18 [FR] - France / Opoul	8 ha
2022-05-18 - 2022-05-18 [IT] - Italy / Vesuvius	0 ha
2022-05-18 - 2022-05-18 [IT] - Italy / Marina di Modica/Maganuco	0 ha
2022-05-18 - 2022-05-18 [FR] - France / Opoul-Périllos	10 ha
2022-05-18 - 2022-05-18 [GR] - Greece / Kamatero, Attica	0 ha
2022-05-18 - 2022-05-18 [UA] - Ukraine / Chernobyl	0 ha
2022-05-16 - 2022-05-16 [FR] - France / Thorigné-Fouillard/Liffré, Rennes	25 ha
2022-05-16 - 2022-05-16 [SE] - Sweden / Härnösand/Timrå	0 ha

EFFIS Statistics Portal

EFFIS Estimates

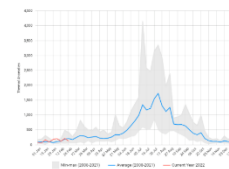
of Burned Areas and Number of Fires



[Open](#)

Seasonal Trend

of Burned Areas, Number of Fires and Thermal Anomalies



[Open](#)

Information available for












EU Countries

Overview

	AUT - Austria
	BEL - Belgium
	BGR - Bulgaria
	HRV - Croatia
	CYP - Cyprus
	CZE - Czechia
	DNK - Denmark
	EST - Estonia
	FIN - Finland
	FRA - France
	DEU - Germany
	GRC - Greece
	HUN - Hungary
	IRL - Ireland









European non EU Cou...

Overview

	ALB - Albania
	BIH - Bosnia and Herzegovina
	GEO - Georgia
	MNE - Montenegro
	MKD - North Macedonia
	NOR - Norway
	SRB - Serbia
	CHE - Switzerland
	TUR - Turkey
	UKR - Ukraine
	GBR - United Kingdom

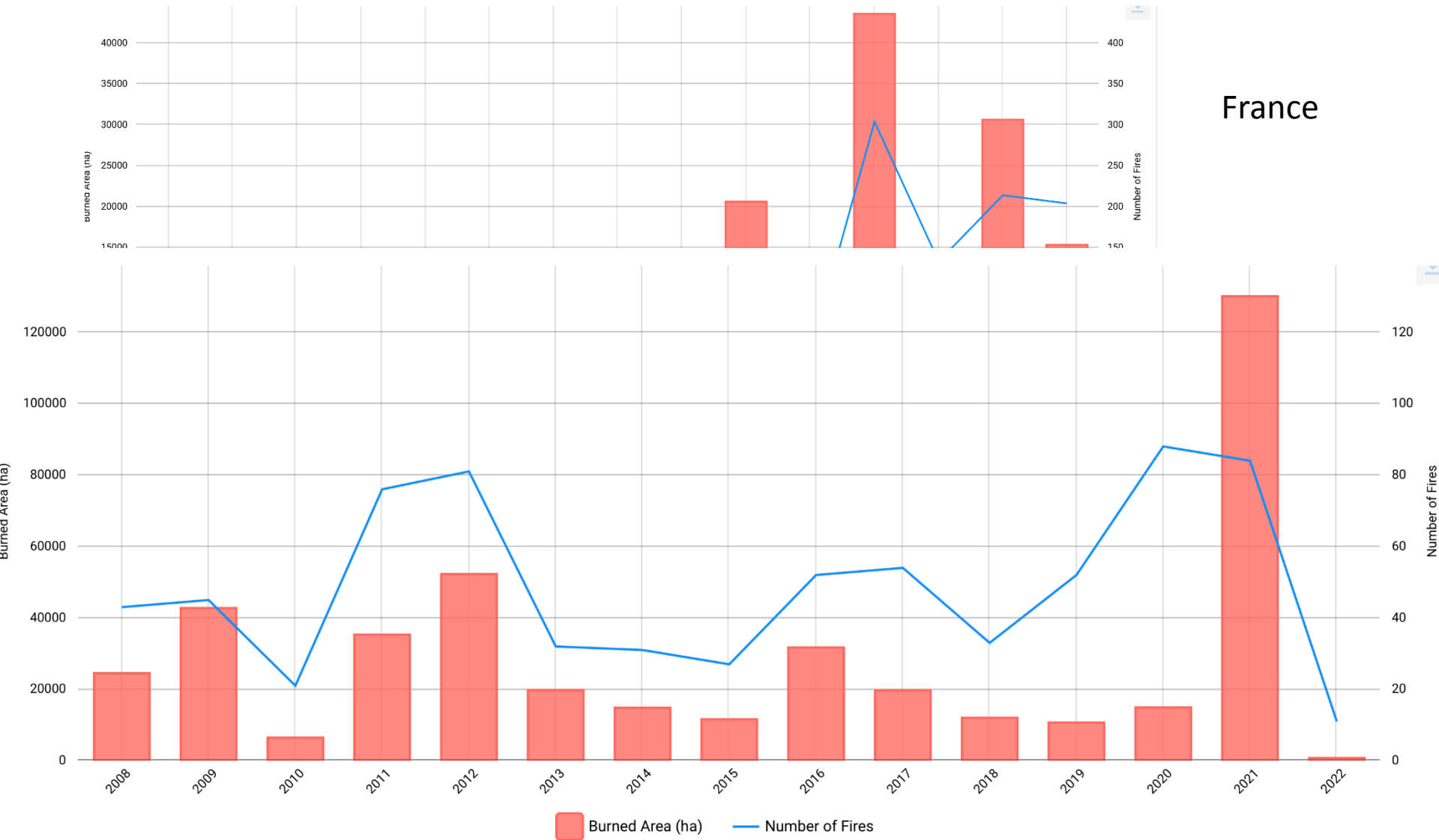
MENA Countries

Overview

	DZA - Algeria
	ISR - Israel
	LBN - Lebanon
	LBY - Libya
	MAR - Morocco
	PSE - State of Palestine
	SYR - Syrian Arab Republic
	TUN - Tunisia

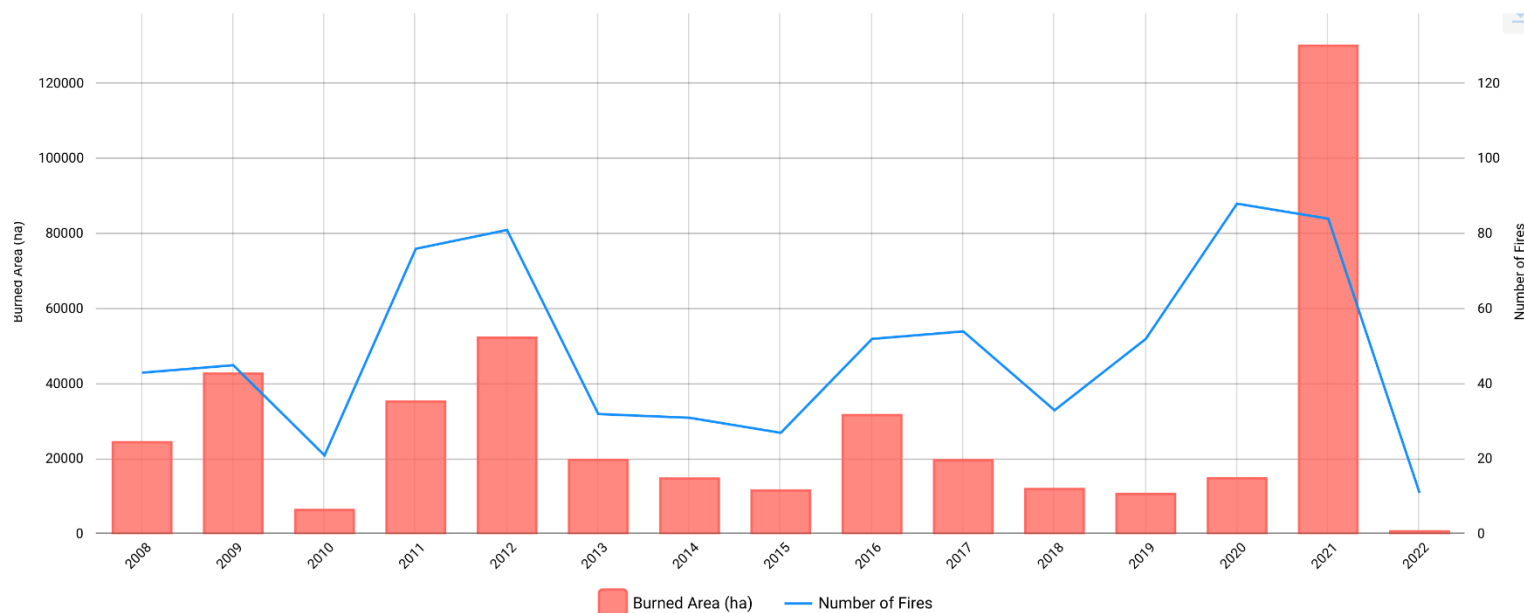
EFFIS Statistics Portal

France



EFFIS Statistics Portal

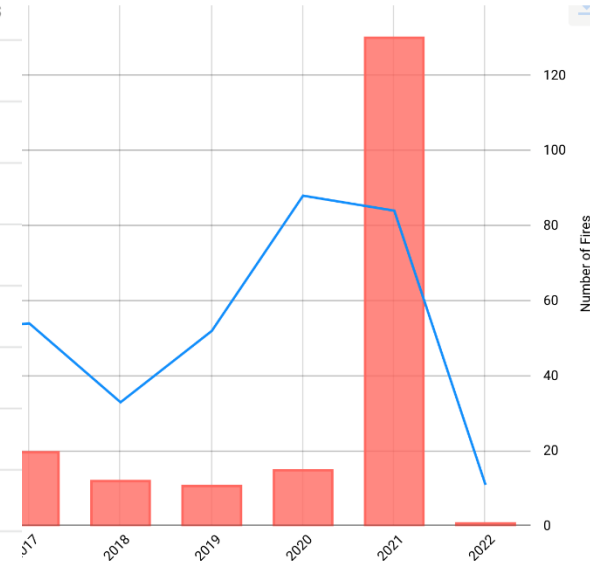
Greece



EFFIS Statistics Portal



Year	Burned Area (ha)	Number of Fires
2008	24502	43
2009	42757	45
2010	6472	21
2011	35305	76
2012	52269	81
2013	19762	32
2014	14815	31
2015	11613	27
2016	31707	52
2017	19682	54
2018	12037	33
2019	10689	52
2020	14915	88
2021	130058	84
2022	756	11



Greece

2020-2021 same amount of fires
But in terms of surface *10 in 2021

EFFIS Statistics Portal









EFFIS Annual Statistics for Lebanon

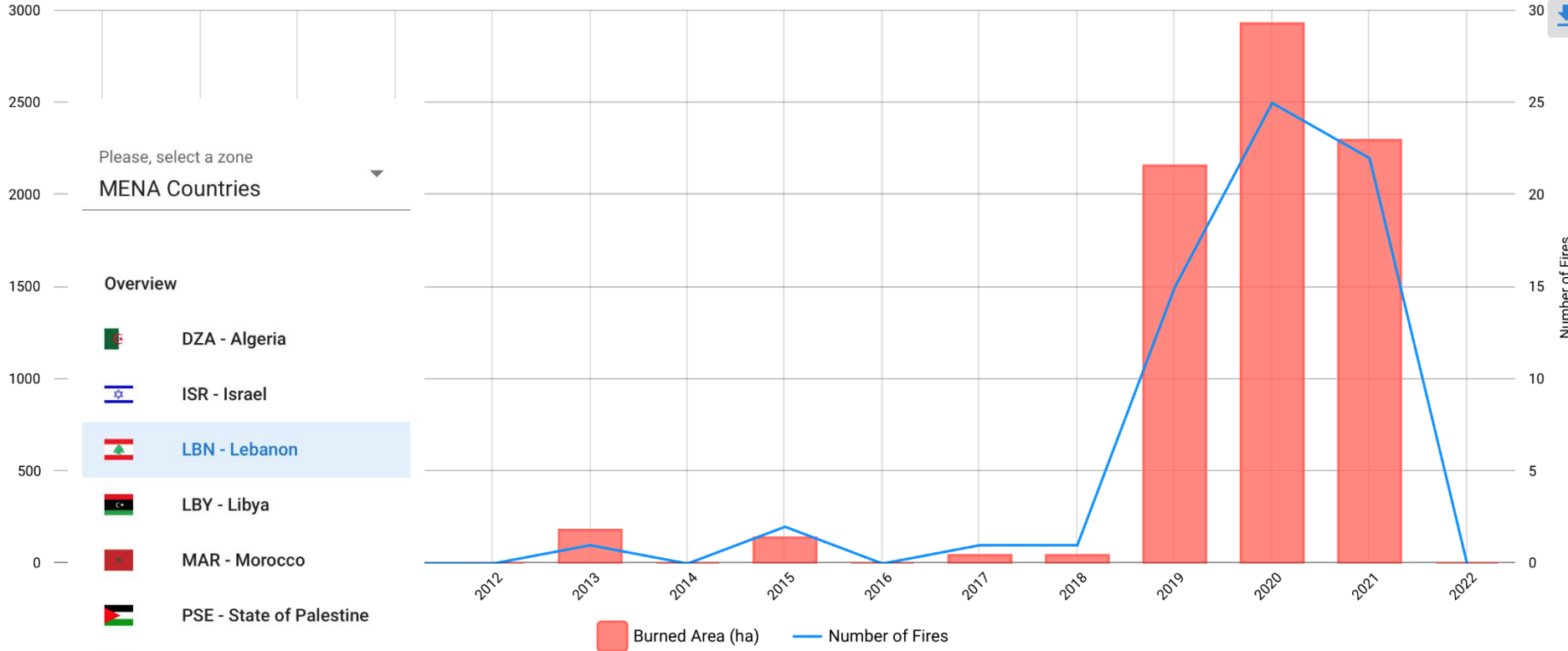
[Country Profile](#)[Copy URL](#)

Please, select a zone

MENA Countries

Overview

-  DZA - Algeria
-  ISR - Israel
-  **LBN - Lebanon**
-  LBY - Libya
-  MAR - Morocco
-  PSE - State of Palestine
-  SYR - Syrian Arab Republic
-  TUN - Tunisia



GWIS



GWIS : a joint initiative of the [GEO](#) and the [Copernicus](#) Work Programs.

GWIS : Bring together existing information sources at regional and national level in order to provide a comprehensive view and evaluation of fire regimes and fire effects at global level and to provide tools to support operational wildfire management from national to global scales.

GWIS builds on the ongoing activities of the European Forest Fire Information System ([EFFIS](#)), the Global Terrestrial Observing System (GTOS) Global Observation of Forest Cover- Global Observation of Land Dynamics (GOFC-GOLD) Fire Implementation Team ([GOFC Fire IT](#)), and the associated Regional Networks,

GWIS



Current Situation Viewer

Provides fire danger forecast up to 10 days in advance, 1-day lightning forecast and near-real time information on active fires...

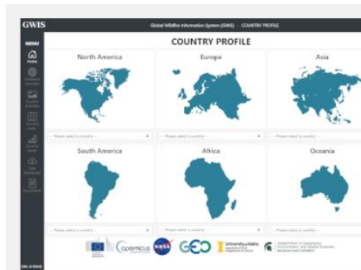
[Read more >](#)



Current Statistics Portal

Statistics are provided at national level and for regions of interest, such as the "Brazilian Legal Amazon" and the Arctic Monitoring and Assessment Program (AMAP).

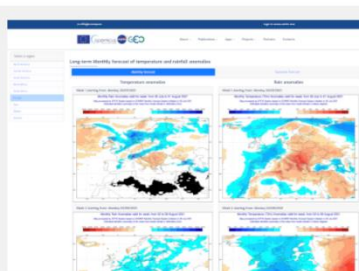
[Read more >](#)



Country Profile

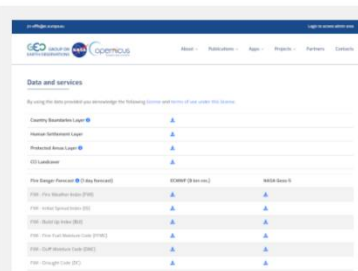
Provides historical overviews of fire regimes at country and sub-country level for the period 2002-2019.

[Read more >](#)



Long-term fire weather forecast

Monthly and seasonal forecast of temperature and rainfall anomalies that are expected to prevail over the world. [Read more >](#)



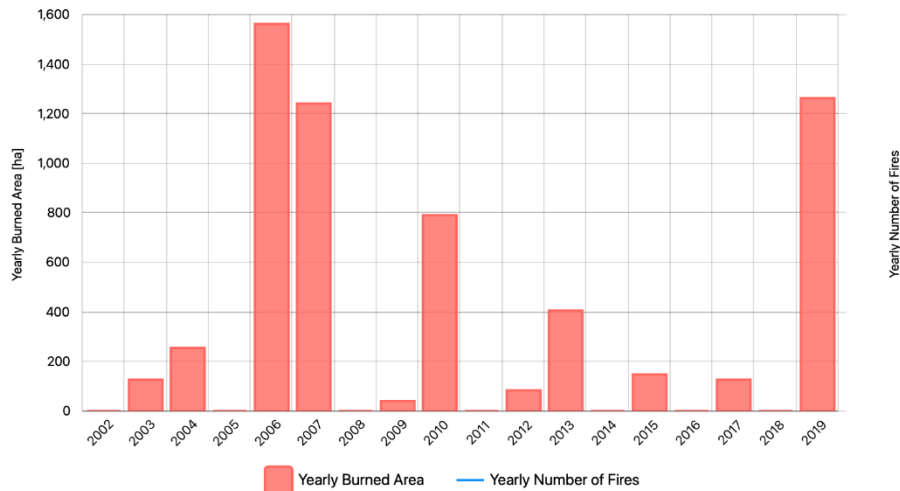
Data & Services

Provides access to the data used in the GWIS applications. Data from the Current Situation Viewer are provided from the WMS.

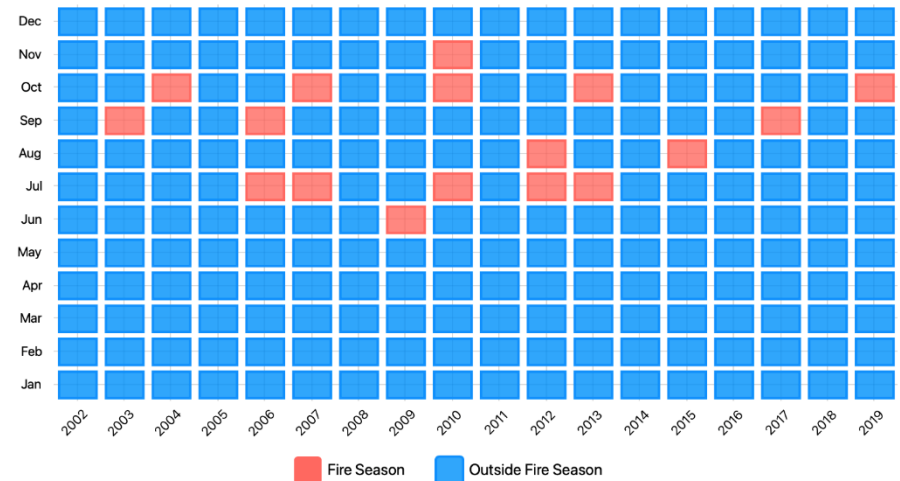
[Read more >](#)

GWIS : Country profile

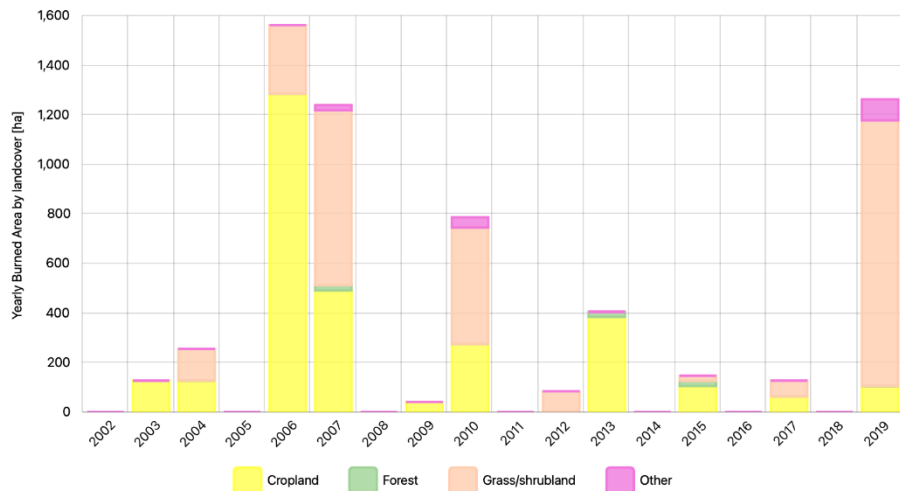
Yearly Burned Area & Number of Fires - [2002-2019]



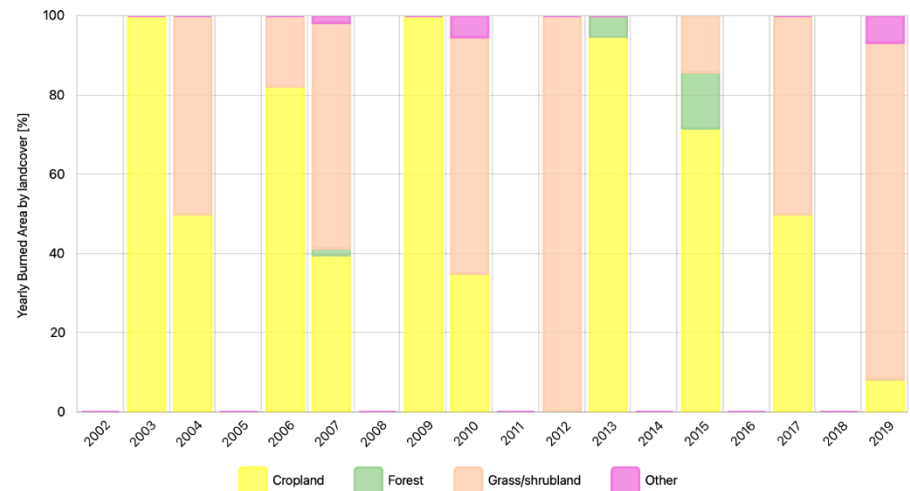
Yearly Burned Area Seasonality - [2002-2019]



Yearly Burned Area by Landcover - [2002-2019]

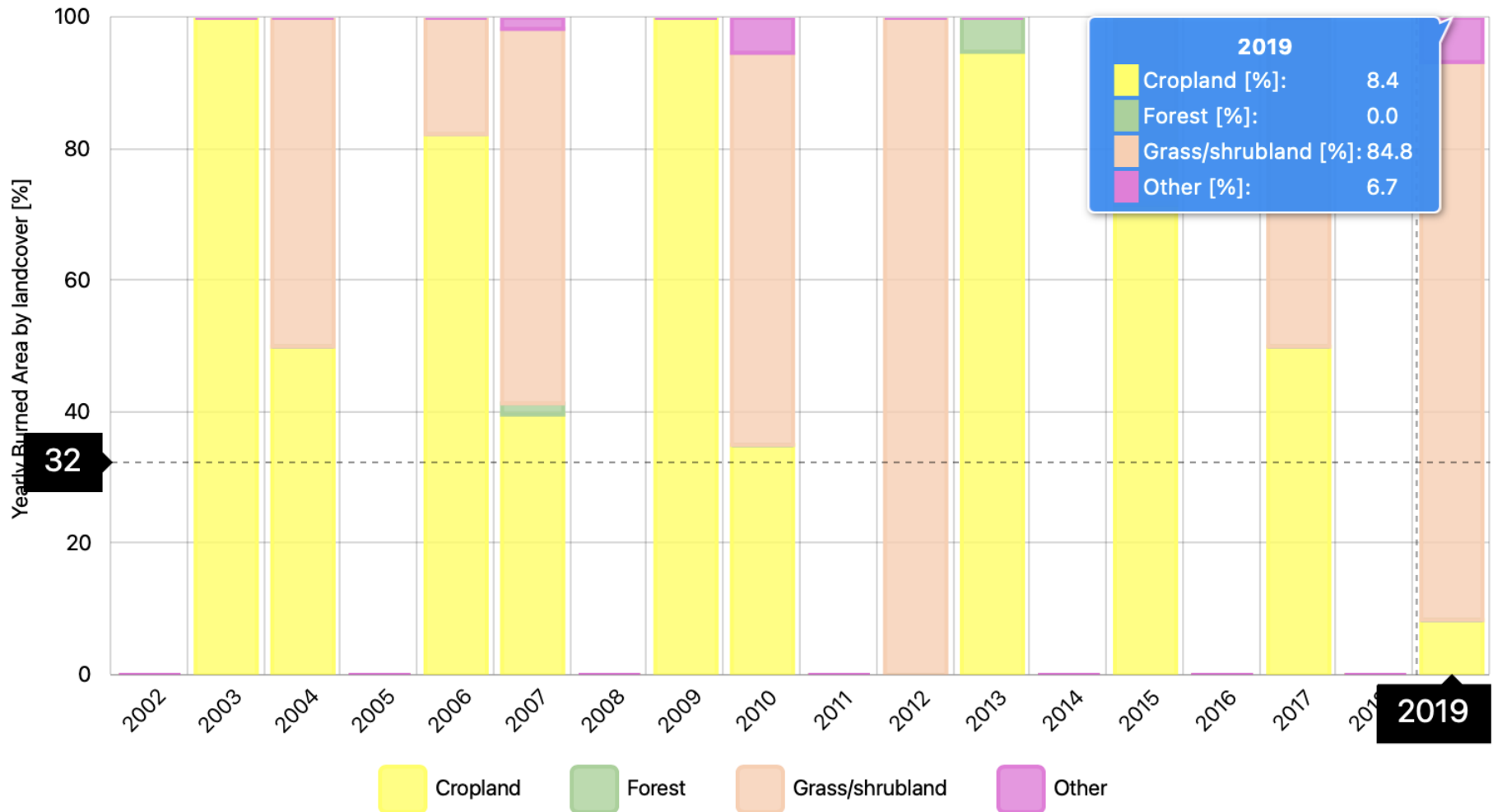


Yearly Burned Area by Landcover (100%) - [2002-2019]



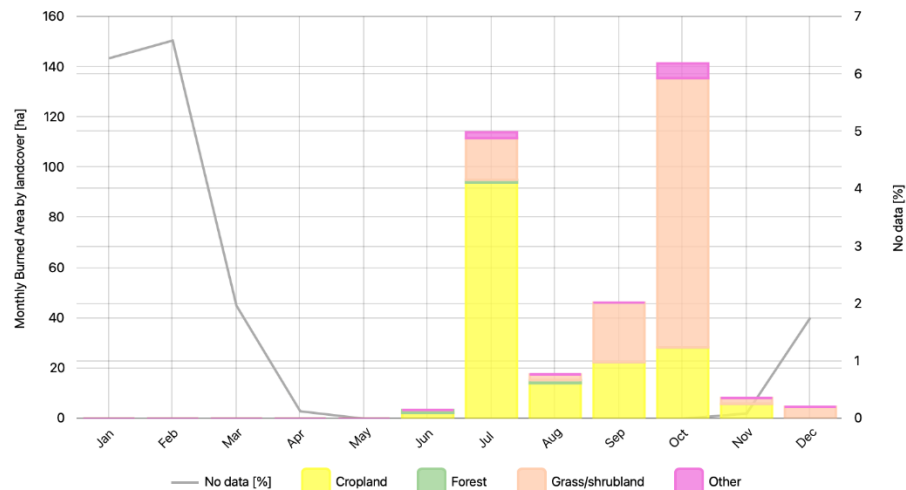
GWIS : Country profile

Yearly Burned Area by Landcover (100%) - [2002-2019]

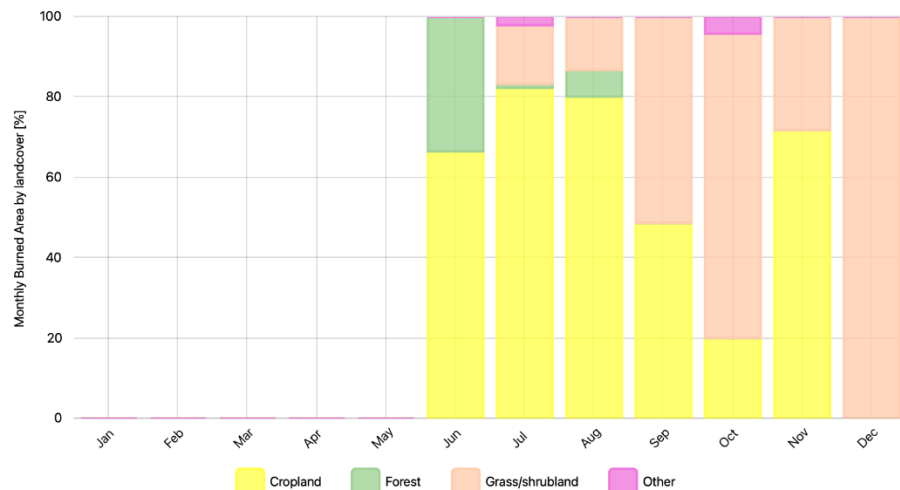


GWIS

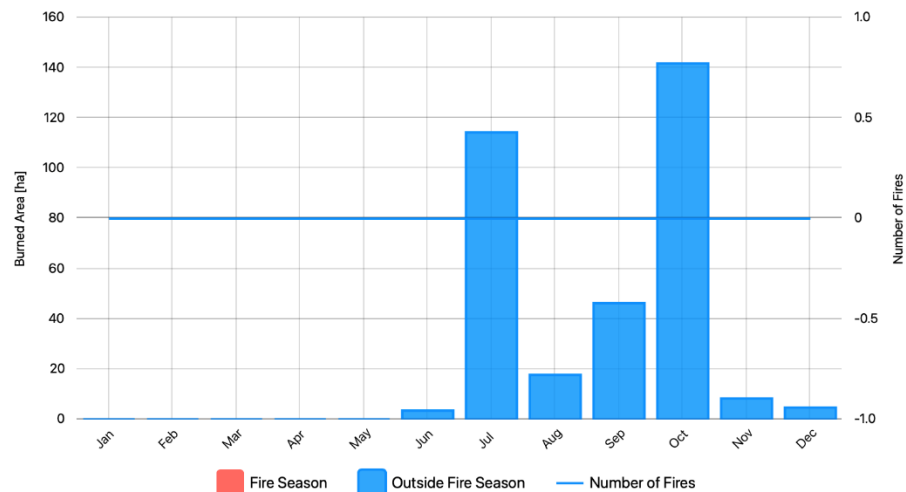
Average Monthly Burned Area by Landcover & No Data - [2002-2019]



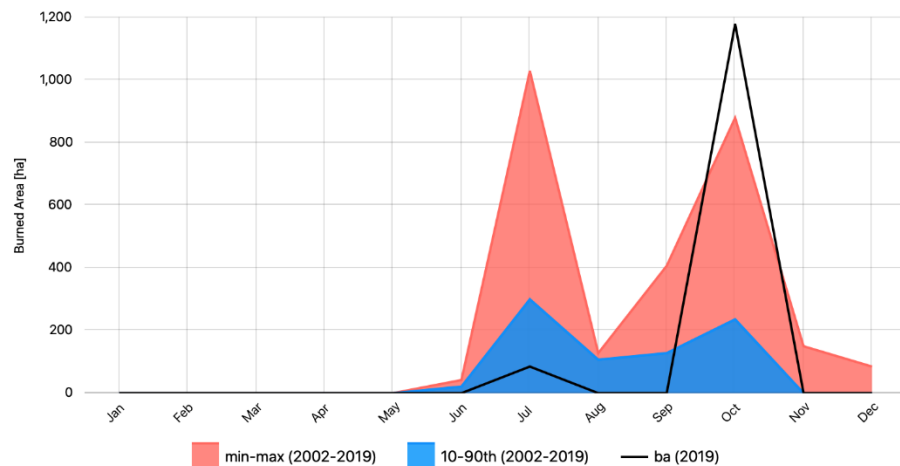
Average Monthly Burned Area by Landcover (100%) - [2002-2019]



Average Monthly Burned Area Seasonality & Number of Fires - [2002-2019]



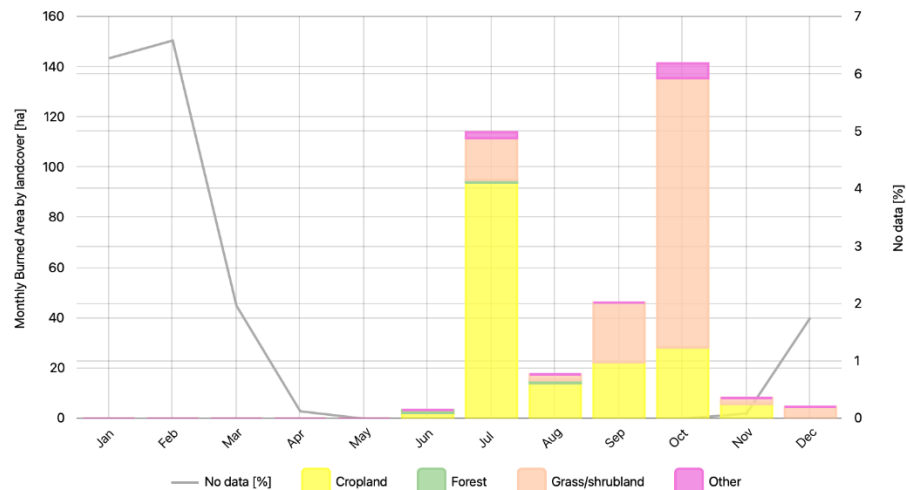
[2002-2019] → 2019 Monthly Burned Area vs Historical



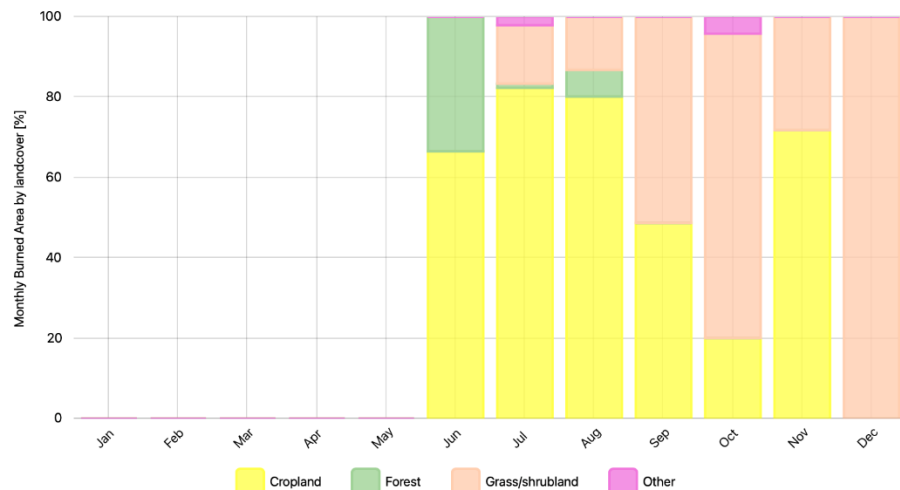
NOTE: computation for the selected period DOES NOT include the year 2019

GWIS

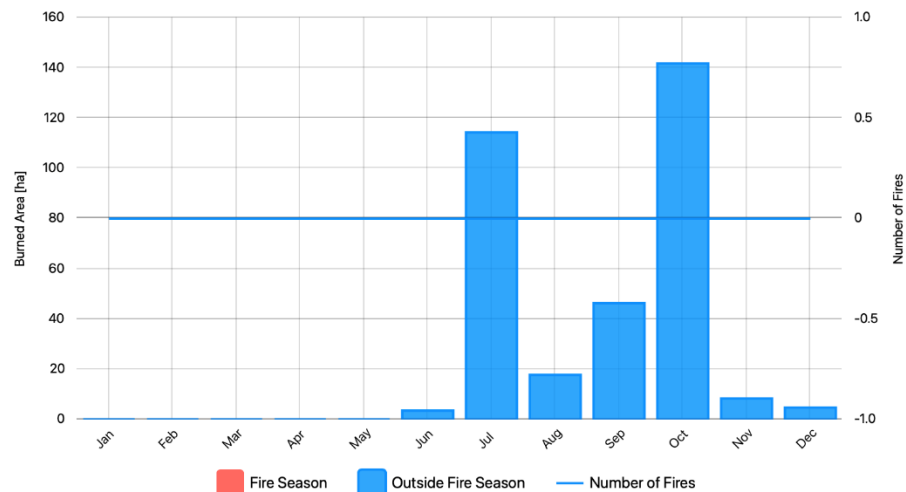
Average Monthly Burned Area by Landcover & No Data - [2002-2019]



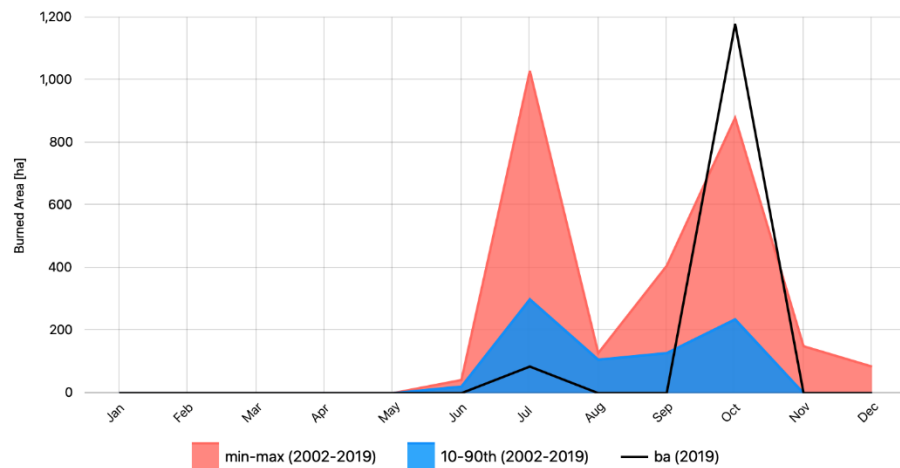
Average Monthly Burned Area by Landcover (100%) - [2002-2019]



Average Monthly Burned Area Seasonality & Number of Fires - [2002-2019]



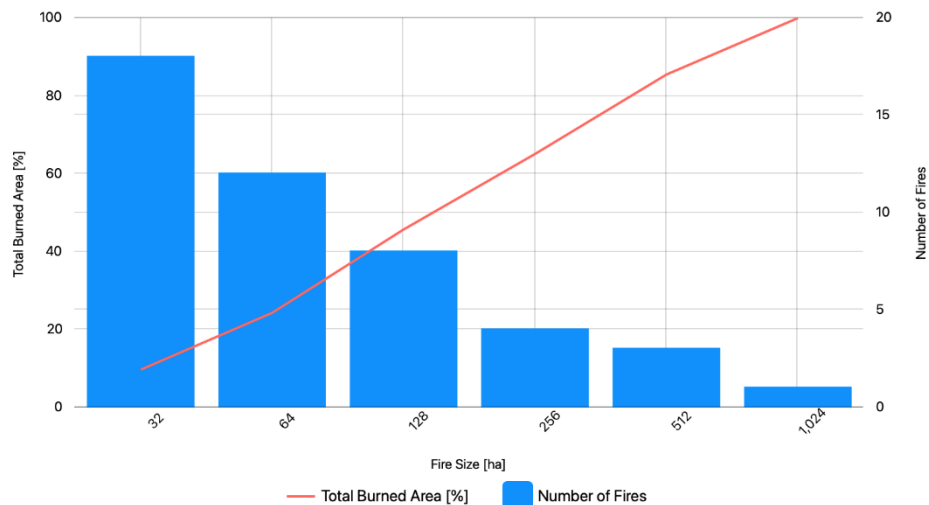
[2002-2019] → 2019 Monthly Burned Area vs Historical



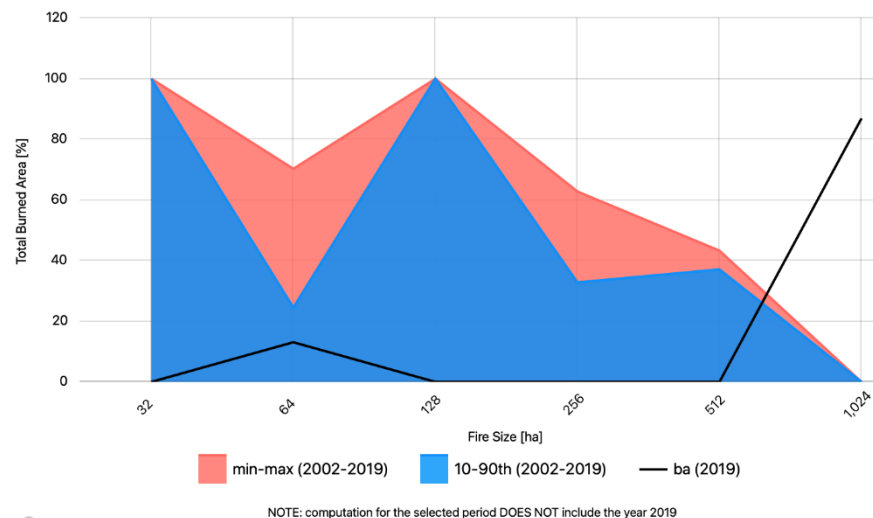
NOTE: computation for the selected period DOES NOT include the year 2019

GWIS

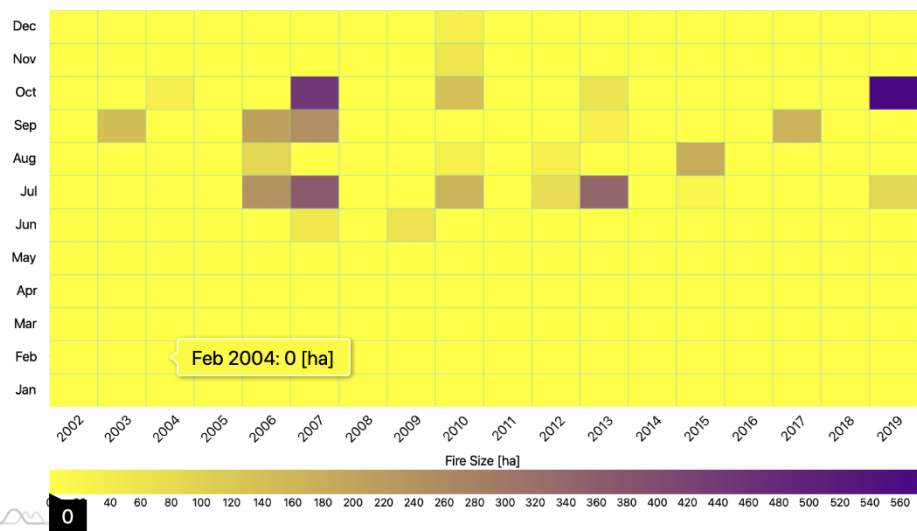
Fire Size Distribution and % Contribution to Total Burned Area - [2002-2019]



[2002-2019] → 2019 Average Monthly Fire Size Distribution vs Historical



Average Monthly Fire Size per Year - [2002-2019]



EFAS

[About](#)[Products](#)[Data access](#)[Collaborate](#)[News and events](#)[Resources](#)[Training](#)[EFAS Wiki](#)

European Flood Awareness System

The aim of the European Flood Awareness System (EFAS) is to support preparatory measures before major flood events strike, particularly in the large trans-national river basins and throughout Europe in general





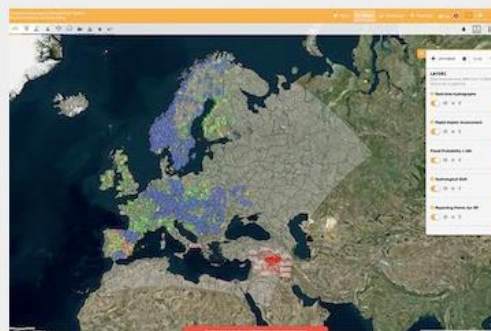
European Flood Awareness System

Latest events



CEMS MDCC Integrated NWP data of DWD's ICON model to cover data gaps in the Ukraine during the war

Access the map viewer



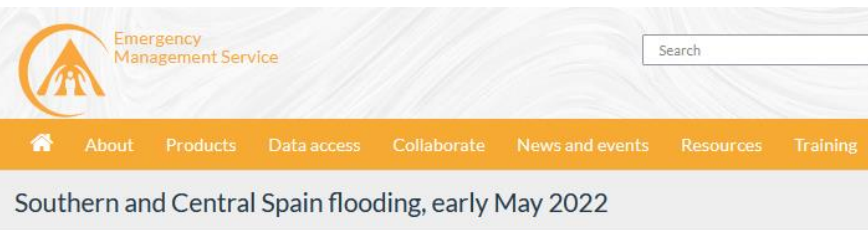
Live map

Latest news



Southern and Central Spain flooding, early May 2022

EFAS latest News



2022-05-09



Flooded tunnel in Valencia, 03 May 2022. Credit: Policía Local Valencia

Record rainfall fell in the metropolitan area of Valencia, Spain on 03 May 2022, causing flooding across the city and surrounding areas

Agencia Estatal de Meteorología (AEMET) **reported** a total of 232.4 l/m² of rain in Valencia in 24 hours, which is a record amount for the month of May and one of the highest totals on record for the city.

Figures from Associació Valenciana de Meteorologia (AVAMET) show the weather station at Camins al Grau in the city recording 260.9 l/m².

AEMET added that in the 2-month period from 03 March to 03 May, the city of Valencia accumulated 488.6 l/m², an amount higher than the normal value for an entire year (474.9 l/m²).

Firefighters rescued several occupants of vehicles trapped in floodwaters in Paterna municipality to the north of the city, and in Carlet municipality to the south.

In total firefighters carried out over 50 interventions, including clearing flooded roads and removing downed trees. Local police said their officers responded to 94 rain-related interventions in 2 hours late on 03 May. At least four road tunnels in the city were flooded at one point. Some schools were closed and rail services were interrupted or suspended.

A city official pointed out that investment in the Cano de la Molinera pumping station and clearing of drainage systems, together with natural drainage systems in the city such as the Turia riverbed, helped control the flooding at times of greatest intensity.

Other areas of the country also saw severe weather around this time. On 02 May, hail and heavy rain caused flooding and damage in parts of the Murcia Region. Murcia emergency services (112 Murcia) said around 30 mm of rain fell in 1 hour on 02 May 2022, causing floods in Caravaca de la Cruz. Emergency crews responded to 48 weather-related incidents, including 6 rescues. An intense hailstorm caused damage in Bullas, Mula, and Yecla.

Hail and heavy rain also affected areas further north, including parts of the capital, Madrid. Madrid 112 reported 29 incidents, including 16 interventions for flood water clearance, mostly in Leganés and Móstoles.

Social Media

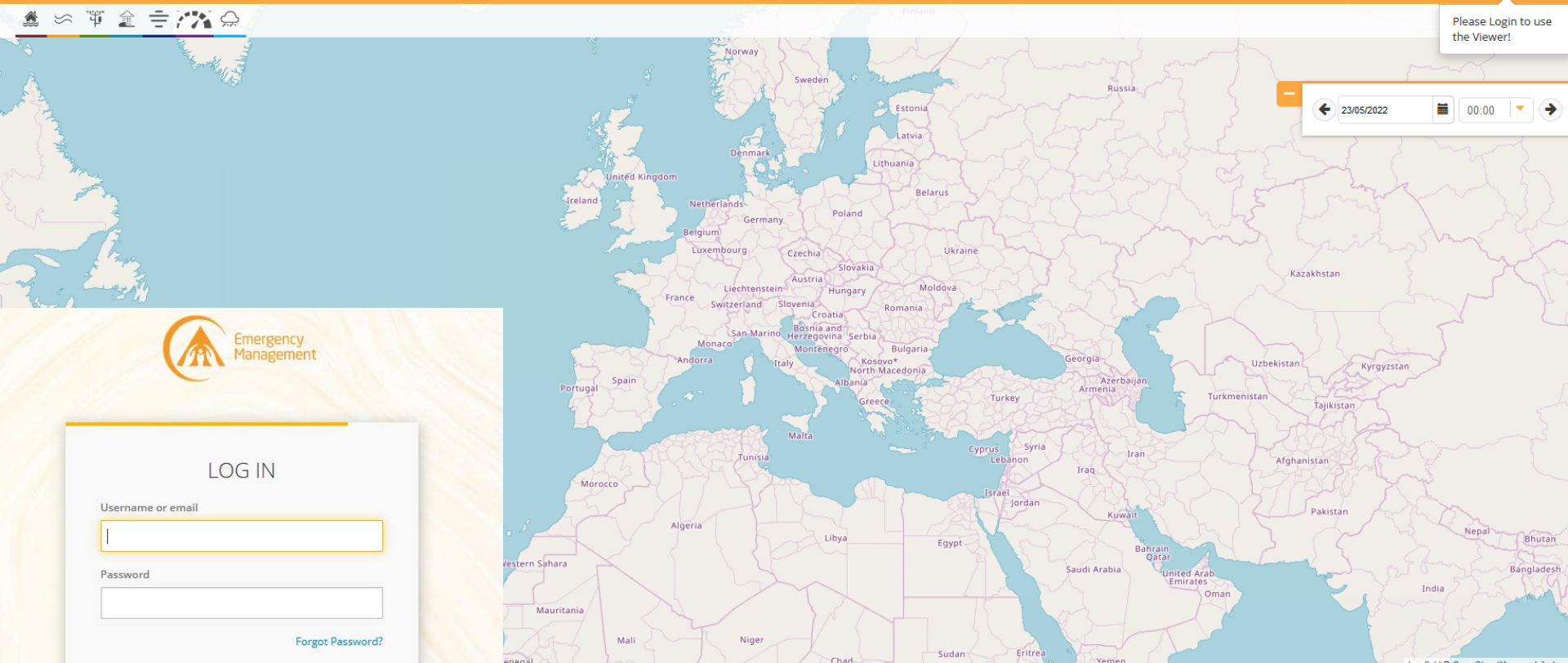
<https://twitter.com/BombersValencia/status/1521648587280683008>

https://twitter.com/AEMET_CValencia/status/1521757771544375297

<https://twitter.com/112rmurcia/status/1521207262680920070>

EFAS

Please Login to use the Viewer!



LOG IN

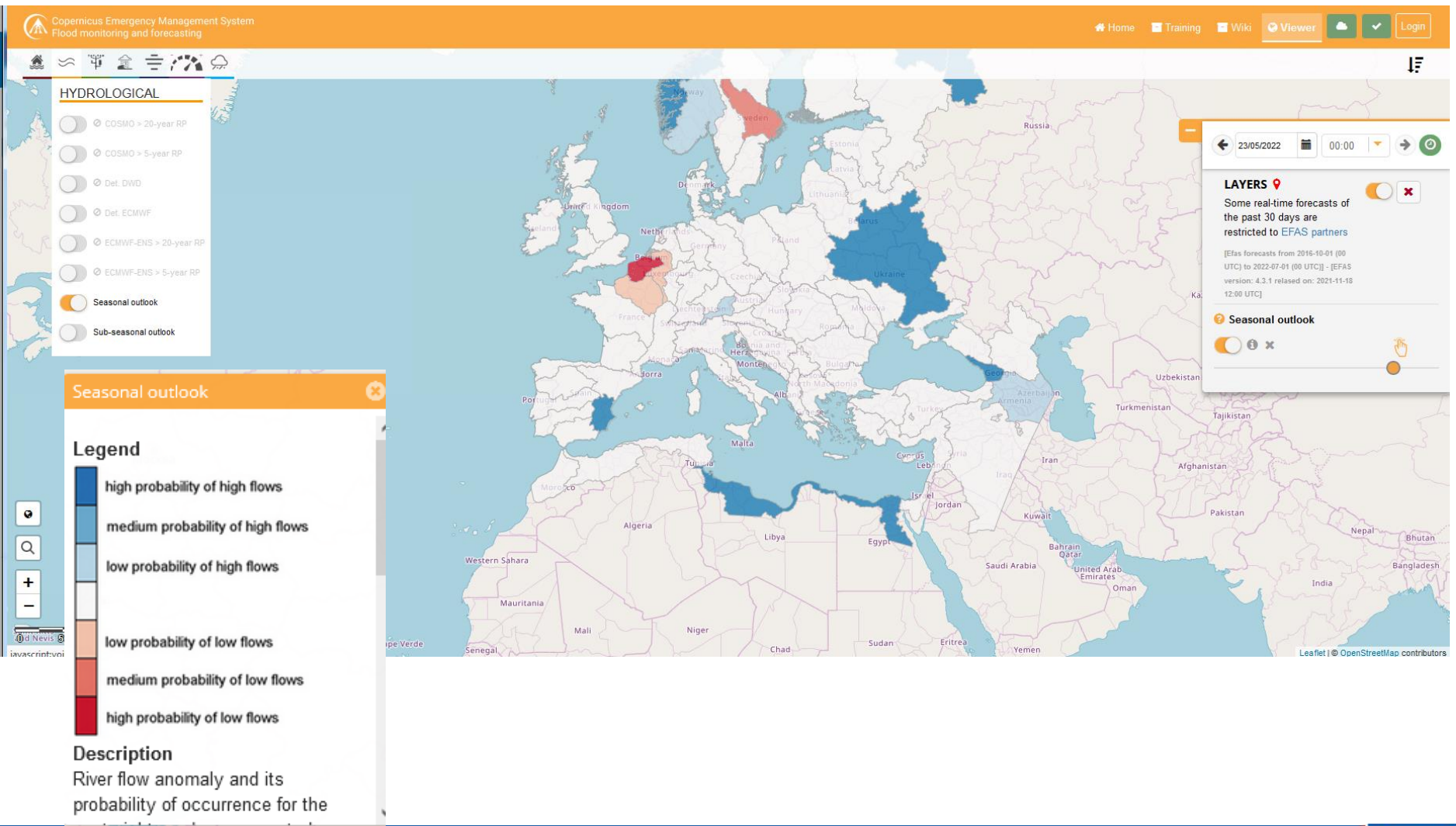
Username or email

Password

[Forgot Password?](#)

Log In

EFAS



Thank you for your attention
Merci pour votre attention

<http://sertit.unistra.fr/>

herve.yesou@unistra.fr



*« Look, this is the map
that SERTIT has sent us. »*



*« Ask them how to look at it ...
everything here is upside down ! »*