Forest Fires in Europe

The JRC and the Situational Awareness Team– 14 May 2020

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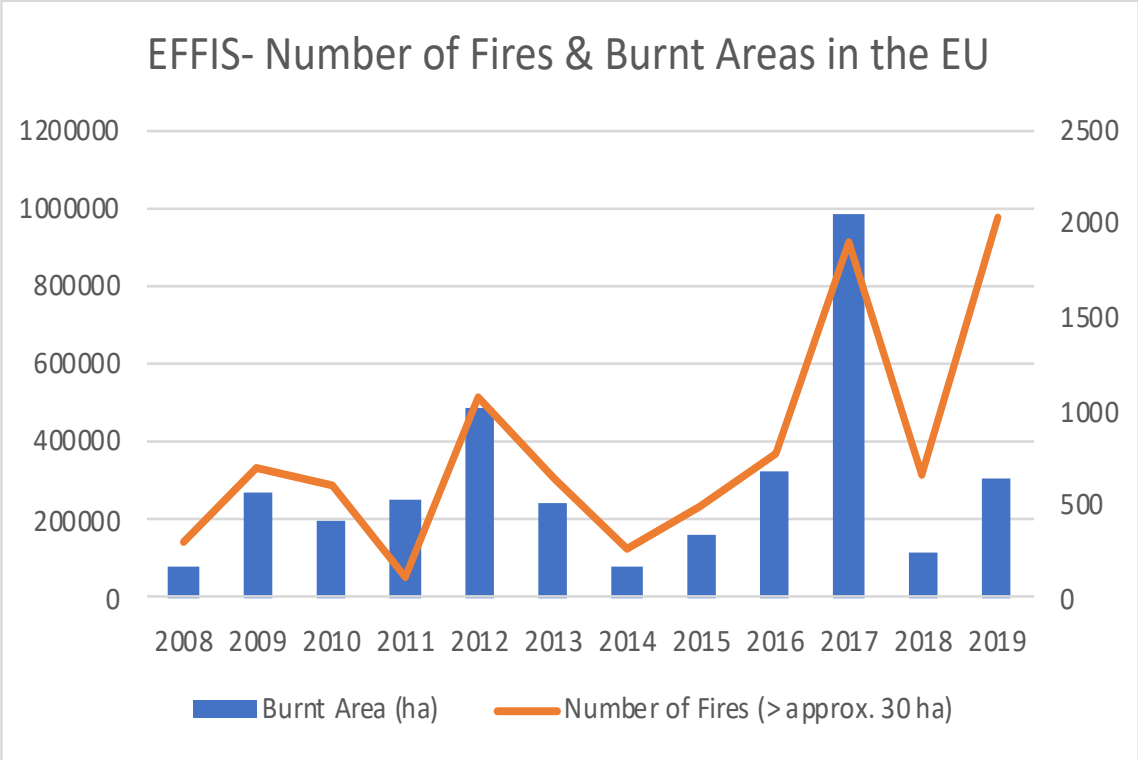
1. General trends in the last decade



The graph above shows the number of fires and burnt areas in the EU in the last decade with two main peaks in 2012 and 2017. These two years were critical and characterised by huge fires affecting large areas in the Mediterranean region. In particular, 2017 was the worst year in the history of the EU in terms of forest fires, with over 130 people killed by fires and a burnt area over 1 million ha (or 10,000 km^2, roughly the area of Cyprus or half the area of Slovenia). In 2017, Portugal was the most affected country in Europe, and requested assistance through the UCPM in June, August and October. The below map provides an overview of the contributions via the UCPM in 2017.

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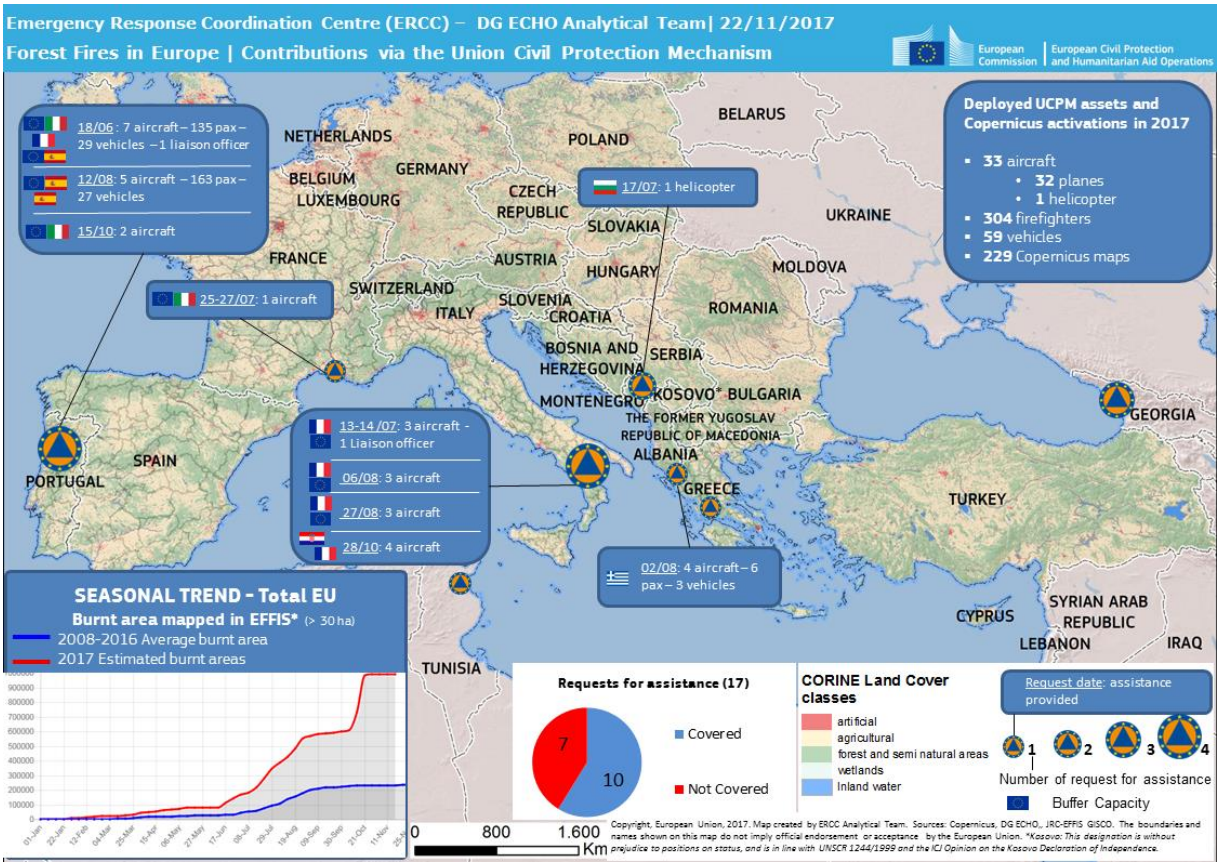
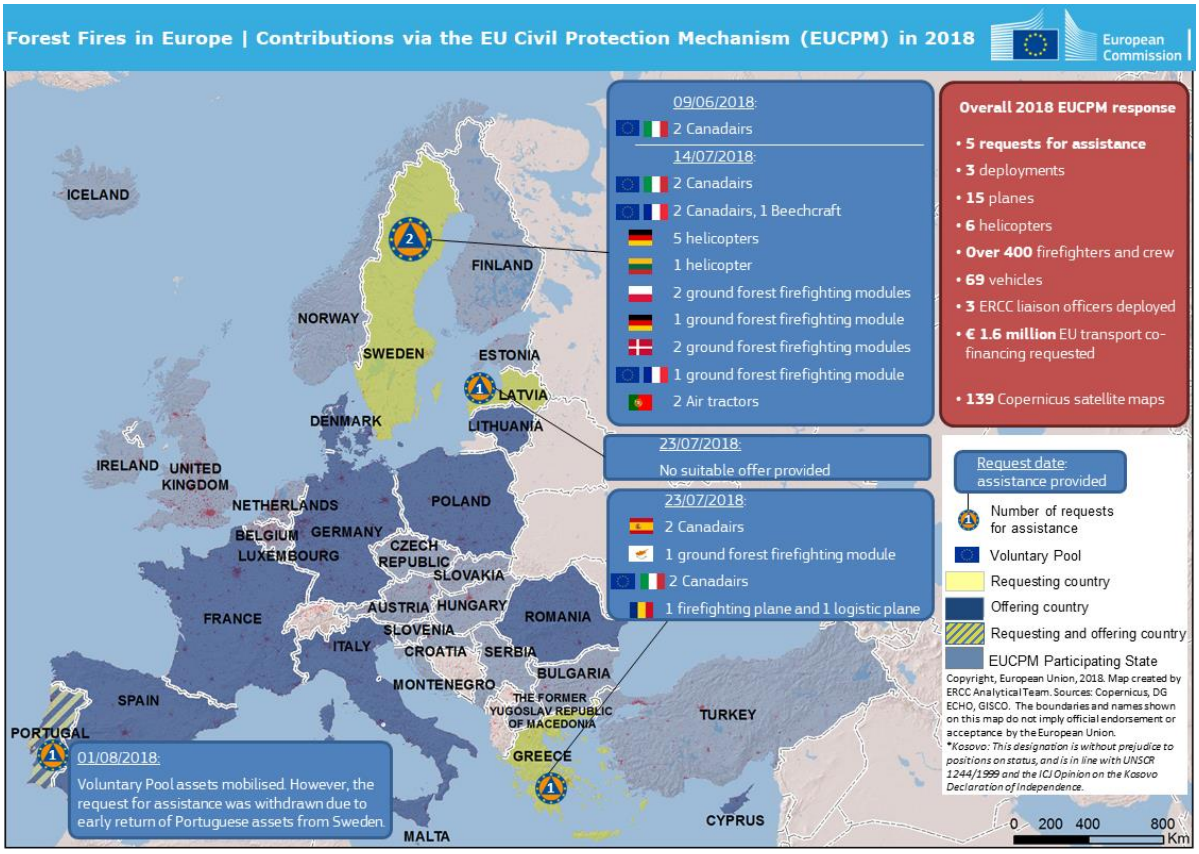


In the last three years, the pattern on the number of fires and burnt areas had evident variations, as shown in the graph above. Despite the sharp decrease in burnt areas from 2017 to 2018, in 2018 Europe experienced one of the deadliest fires ever recorded, with over 100 people killed in Greece. Furthermore, many of the central and northern countries experienced a high number of fires, especially in Sweden, which requested twice assistance through the UCPM. The below map provides an overview of the contributions via the UCPM in 2018.

The impact of the fires in 2017 and 2018 triggered the revision of the UCPM legislation and led to the creation of rescEU.

The year of 2019 was also unusual with very high number of winter and spring fires, which drove the total number of fires in the EU to almost 2,000 fires, the highest number in the last decade.



2. 2019 Forest Fire season

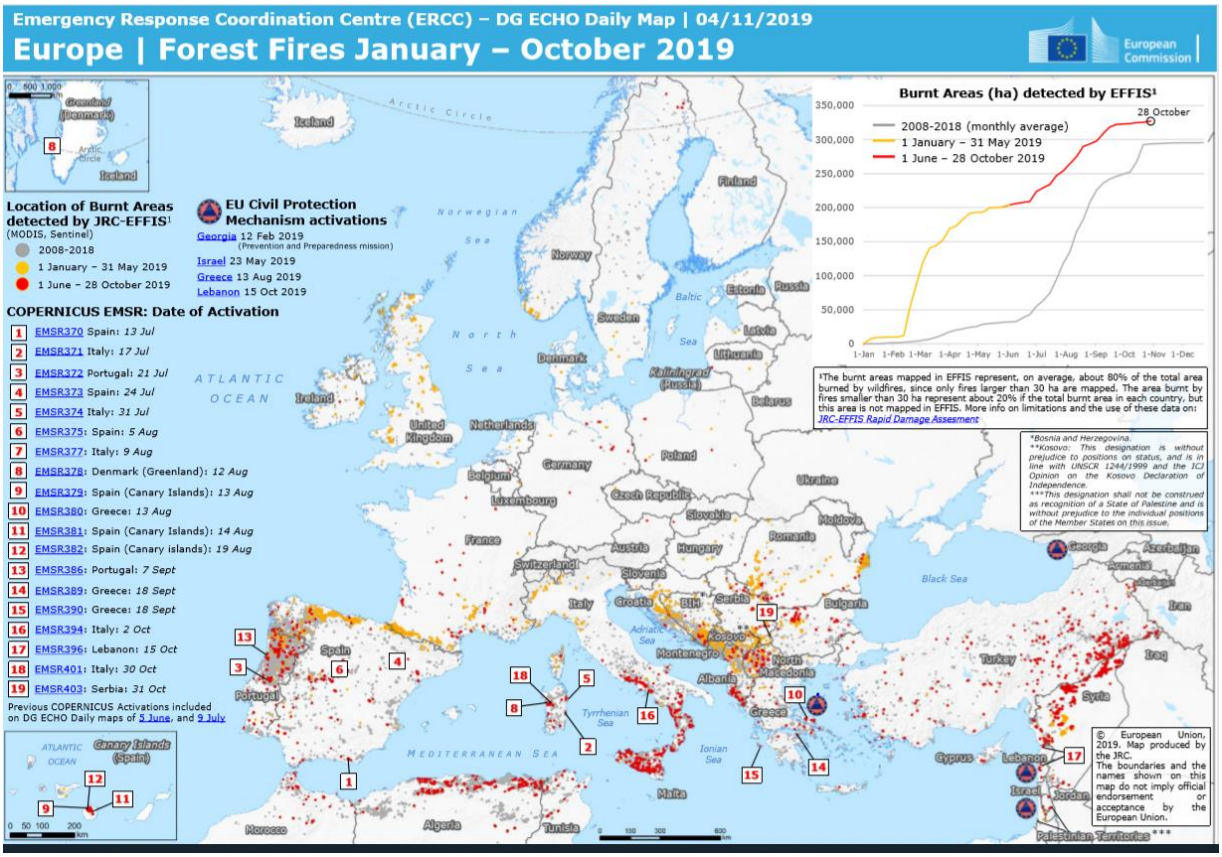
The year 2019 was atypical. Despite the high number of fires due to a large number of off-season (winter and spring) fires, the overall value of the burnt area in 2019 was below the average for the period 2008-2018. Winter fires affected mainly mountain ranges such as the Pyrenees and the Alps. The most affected countries during winter were Spain, France and Italy. Spring fires affected central Europe and specially the Balkans region. By May 2019, the number of fires in the EU was already above to total average number of fires for the period 2008-2018. Additionally, an unusual number of large fires affected the Danube delta early in the year, which brought the values of burnt areas and number of fires above average values. Due to the large fires in the Danube delta, Romania was the most affected country in Europe, both in terms of total burnt area and affected Natura2000 sites.

In 2019, although, 23 EU Member States[1] and UK were affected by fires of over 30 ha, burning 333,542 ha in total (around 2.5 times the amount that was recorded in 2018), the ERCC received a request for assistance from Greece and three from third countries (Georgia, Israel and Lebanon).

Following the Greek request for assistance on 13 August, the ERCC deployed for the first time the rescEU aerial firefighting capacity, 2 Canadairs located in Italy and 1 Canadair located in Spain. The

[1] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

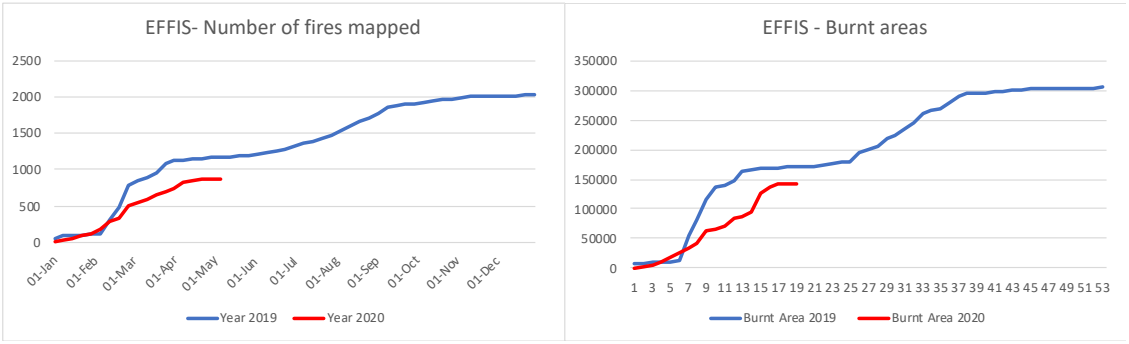
RescEU aerial assets assisted in the aerial firefighting operations over 3 days, performing 172 water drops (approximately 1,032 tonnes) during 39 flying hours. In 2019, the UCPM had seven rescEU capacities, totalling 9 planes and 6 helicopters, located in Greece, Spain, France, Croatia, Italy and Sweden.



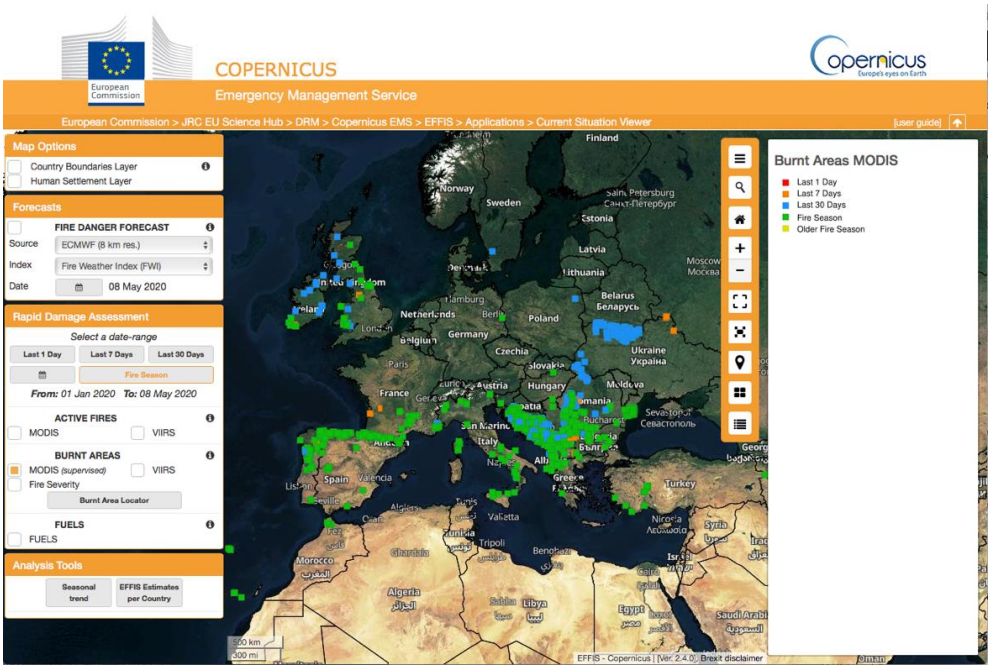
3. 2020 Forest Fire season

3.1. Comparison with 2019

The 2020 forest fire season has followed, so far, similar patterns to the forest fire season 2019. In January and February 2020, large number of fires took place in mountain ranges. However, compared to 2019, spring 2020 has been relatively calm so far, with fires in central Europe that have not had a major impact in terms of burnt areas. As shown below, the number of fires mapped in EFFIS in 2020 is below the number of fires recorded in 2019. The total burnt area so far is also below that of 2019 (right hand figure below).

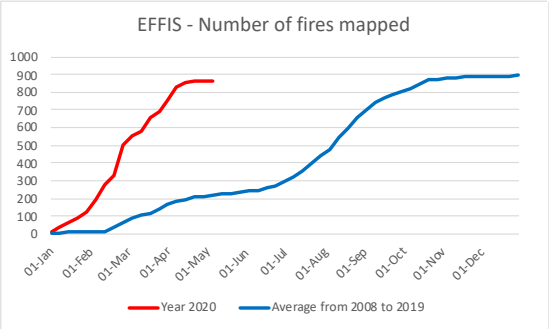


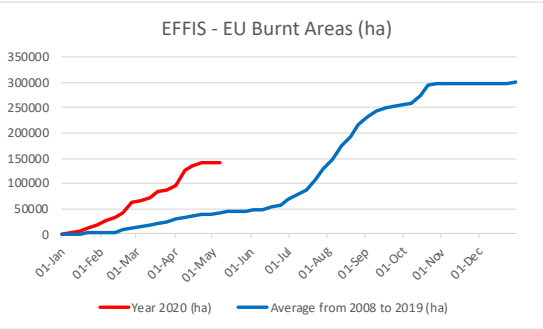
The fires mapped in the European Forest Fire Information System (EFFIS) to date are as follows:



3.2. Comparison with the period 2008-2019

The current pattern for the 2020 season is similar to that of 2019, in which many fires happened in winter. The steep curve showed in the figure below (left hand side) shows how the number of fires grew steadily between January and March; however, April and May have been calm, which has flattened the curve as the number of fires stabilised. In any case, the number of fires is nearly the same as the total average in the period 2008-2019. The steep rise of the burnt area curve in the first months of the year has led to a situation in which the burnt area values are above the average in the period 2008-2019 as shown in the figure below (right hand side).





4. 2020 RescUE Forest Fire capacity

To date, seven EU Member States and UCPM Participating States have offered forest firefighting aircrafts under rescEU (transition legal base).

Country	Aircraft model	Aircraft number	Availability period	Status
France	Canadair CL-415	2		ECPP
Croatia	Canadair CL-415	2	15 Jun – 31 Oct	rescEU transition
Greece	Canadair CL-415	2	15 Jun – 31 Oct	rescEU transition
Italy	Canadair CL-415	2	15 Jun – 31 Oct	rescEU transition
Spain	Canadair CL-415	2	15 Jun – 31 Oct	rescEU transition
France	Dash	1	15 Jun – 31 Oct	rescEU transition
Cyprus	Air tractor AT 802	3	15 Jun – 31 Oct	rescEU transition
Sweden	Helicopter AS 350	6	15 May – 30 Sep	rescEU transition
Sweden	Fire boss	2		To be confirmed

5. The European Forest Fire Information System (EFFIS)

The evolution of the fire season is followed through EFFIS at the EC Joint Research Centre. EFFIS is part of the Copernicus Emergency Management Service and provides short- and long-term information on the fire danger conditions, allowing the increase in preparedness, both at wider EU as well as country level. Additionally, EFFIS provides a continuous monitoring of active fires and burnt areas in Europe, Middle East and North Africa, supporting the activities of DG ECHO's Situational Awareness Team and the ERCC (https://effis.jrc.ec.europa.eu).

6. EFFIS Decision Support System (EFFIS DSS)

In addition to the monitoring of the forest fire season in EFFIS, a further detailed analysis of large fires is done through EFFIS DSS. This tool characterises several ongoing fires according to a series of parameters, including the potential threat to population and infrastructures, the total burnt area and the hourly potential spread of each of the fires, through a fire-behavior analysis model. EFFIS DSS has been developed in the context of RescEU to help assess the severity and eventually manage resources by allowing a standard comparison of up to five major fires at once.

7. Global Wildfire Information System (GWIS)

GWIS is one of the systems under development by the JRC. This system provides similar information and monitoring to that of EFFIS, but at a global scale. GWIS provides fire danger forecasts and monitors forest fires in near-real time based on satellite data. Data from GWIS were used in 2019 by the ERCC in support of UCPM deployments of personnel and modules in Bolivia and Guatemala. GWIS was also used in 2019 for the fires in the Amazon rainforest, and in in 2019 and 2020 for the fires in Australia. Recent events monitored through GWIS include the fires around Chernobyl (Ukraine), and the monitoring of forest fires and air pollution in the border between Colombia and Venezuela, in support of OCHA and UNEP. (https://gwis.jrc.ec.europa.eu)

8. The European Natural Hazard Scientific Partnership (ENHSP-ARISTOTLE)

The European Natural Hazard Scientific Partnership (ENHSP) is currently delivering services to the ERCC through the Consortium All Risk Integrated System TOwards The holistic Early-Warning (ARISTOTLE)[2] composed of a network of 15 top-level Member States and European research centres in the field of geophysics and meteorology. ENHSP-ARISTOTLE provides monitoring services and a 24/7 emergency reporting service to the ERCC, covering earthquakes, tsunamis, volcanic eruptions, floods, and/or severe weather. ENHSP-ARISTOTLE has also established a multi-hazard scientific network to exploit science and technology for the benefit of disaster risk management. In 2019, forest fires were added to the monitoring service. From 18 May to 31 October, DG ECHO's Situational Awareness Sector will receive three time a week a monitoring report from the ENHSP-ARISTOTLE forest fire team.[3] The service will deliver a scientific assessment complementary to EFFIS.

[2] The following Member States and Participating States are represented by Consortium Members: AT,ES, FI, FR, IT, NL, PT, RO, SE, TK and UK. The Consortium is made of the following scientific institutions: Istituto Nazionale di Geofisica e Vulcanologia (INGV); Zentralanstalt für Meteorologie und Geodynamik (ZAMG); UK MET Office; Kandilli Observatory and Earthquake Research Institute (KOERI); UK Research and Innovation UKRI UK GEO Partner; Centro Internazionale di Monitoraggio Ambientale (CIMA); European-Mediterranean Seismological Centre (EMSC); Finnish Meteorological Institute (FMI); Instituto Português do Mar e da Atmosfera (IPMA); Koninklijk Nederlands Meteorologisch Instituut (KNMI); Météo-France MF; The National Institute for Earth Physics (NIEP); The Swedish Meteorological and Hydrological Institute (SMHI); The European Centre for Medium-Range Weather Forecasts (ECMWF); Research Group at the University of Malaga (EDANYA).

[3] This report is produced by MeteoFrance, CIMA Foundation, the European Centre for Medium-Range Weather Forecasts (ECMWF) and the Instituto Português do Mar e da Atmosfera (IPMA).