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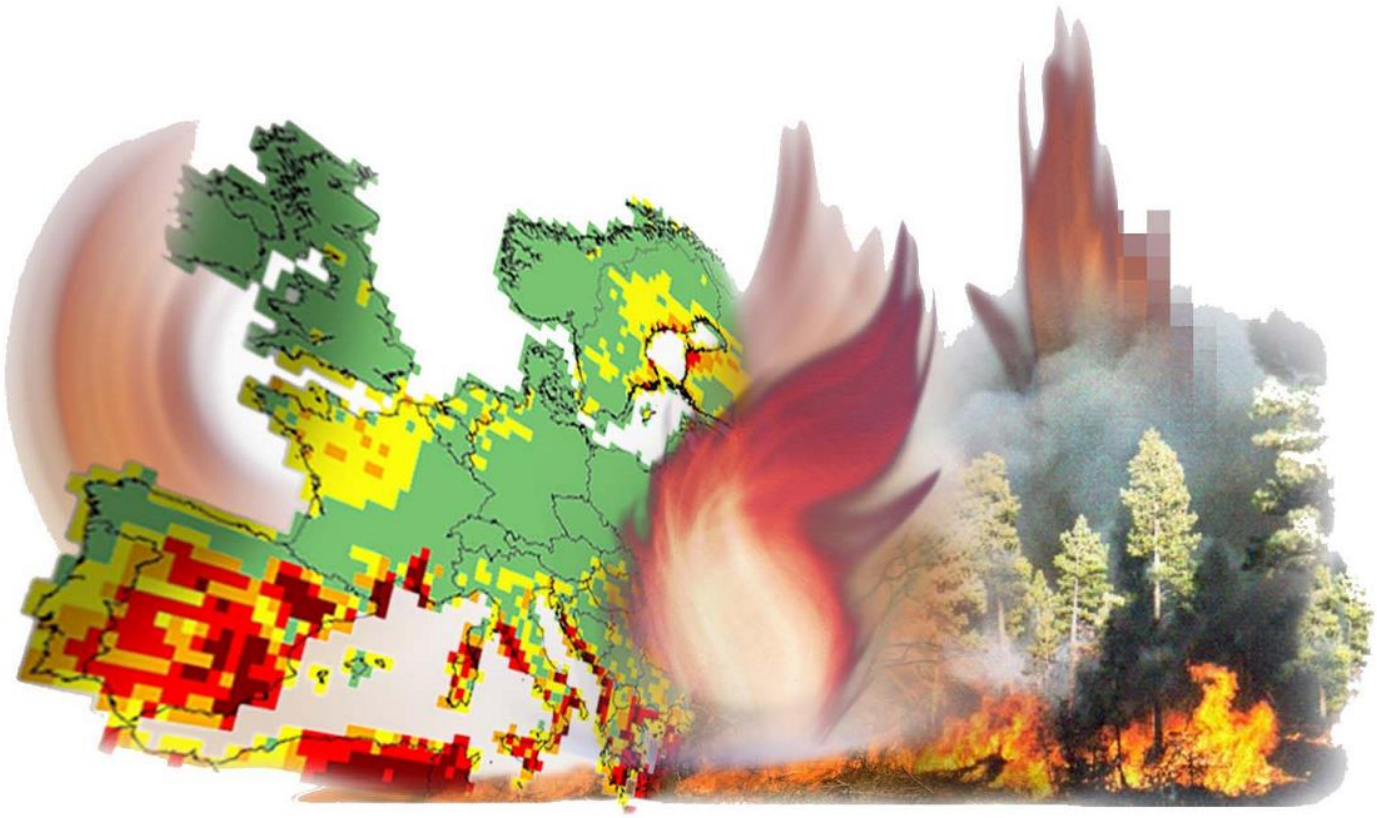

Forest Fires in Europe, Middle East and North Africa 2014

Joint report of JRC and Directorate-General Environment

2015

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Abstract

This is the 15th issue of the EFFIS annual report on forest fires for the year 2014. This report is consolidated as highly appreciated documentation of the previous year's forest fires in Europe, Middle East and North Africa. In its different sections, the report includes information on the evolution of fire danger in the European and Mediterranean regions, the damage caused by fires and detailed description of the fire conditions during the 2014 fire campaign in the majority of countries in the EFFIS network The chapter on national reporting gives an overview of the efforts undertaken at national and regional levels, and provides inspiration for countries exposed to forest fire risk.

The preparation and publication of the report aims also at improving cooperation with the members of the EGFF especially with regard to fire prevention actions. Our common aim is to maintain and protect our landscapes and natural heritage, to avoid loss of human lives and to minimise the damage caused to property by uncontrolled forest fires.

Forest Fires in Europe, Middle East and North Africa 2014

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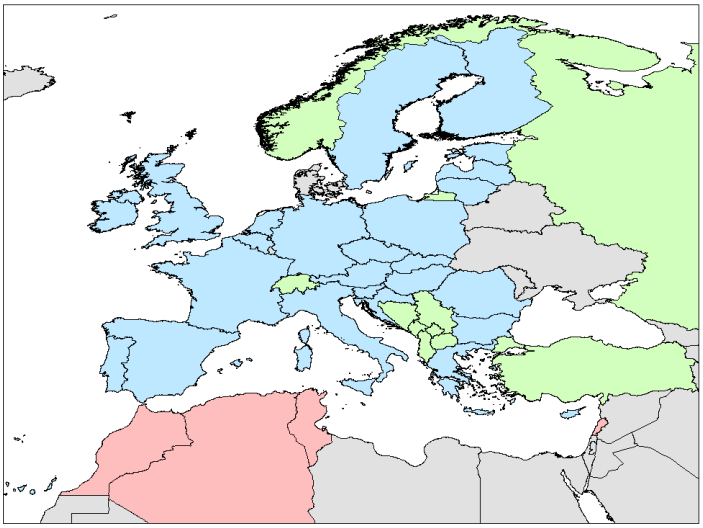
1 PREFACE

The aim of the European Forest Fire Information System (EFFIS) is to provide harmonised information on forest fires and assessment of their effects in the pan-European region. For this purpose, collaboration with EU Member States and neighbouring countries has been on-going since 1998. EFFIS provides an ideal platform for countries to exchange good practices on fire prevention, firefighting, restoration practices and other activities related to fire management, and for the European Commission to update the forest fire services in the countries on relevant initiatives at the European level.

Since its first operation in the year 2000, the number of countries contributing to the information on forest fires in EFFIS and receiving data from it has increased steadily. In the last years the system has been extended to include countries in the Middle East and North Africa (MENA). Since 2011, in collaboration with the FAO Silva Mediterranea (FAO) network, Middle East and North African (MENA) countries have been participating in the EFFIS activities and have been included as members of its Expert Group on Forest Fires (EGFF).



Currently, the EFFIS network is constituted by 39 countries, including 25 EU Member States (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, the Netherlands and the United Kingdom), 10 European non-EU countries (Albania, Bosnia & Herzegovina, former Yugoslavian Republic of Macedonia, Kosovo, Montenegro, Norway, Russia, Serbia, Switzerland and Turkey), and 4 MENA countries (Algeria, Lebanon, Morocco and Tunisia).

This is the 15th issue of the EFFIS annual report on forest fires, which is considered as highly appreciated documentation of the previous year's forest fires in the European, North Africa and Middle East region. In its different sections, the report includes information on the evolution of fire danger in the European and Mediterranean regions during the fire season, the damage caused by fires and detailed description of the fire conditions during the 2014 fire campaign in the countries in the EFFIS network. In addition to the general overview provided by EFFIS, the report includes chapters on national reporting elaborated by the national fire services, which gives an overview of the efforts undertaken at national and regional levels, and provides information of high relevance for all the countries exposed to forest fire risk. Information gathered in the report and in EFFIS supports national and European policies and is often used to reply to questions from the Members of the European Parliament regarding forest fires[1].

Also this year we are confident that we will further improve cooperation with the members of the EGFF especially with regard to fire prevention actions and lessons learned. Our common aim is to maintain and protect our landscapes and natural heritage, to avoid loss of human lives and to minimise the damage caused to property by uncontrolled forest fires.

[1] http://www.europarl.europa.eu/plenary/en/parliamentary-questions.html

2 FOREST FIRES 2014

2.1 *Introduction to the 2014 fire season in Europe, Middle East and North Africa.*

Although variability exists on the length and intensity of the fire season in the countries of the EFFIS network, this is normally considered as the period between March and October. However, critical fire events can occur outside this period, if the meteorological conditions and those of the fuels on the ground favour fire ignition and spread. The 2014 fire season was a particular season, as critical events occurred in areas and during periods where/when they do not normally occur.

At the start of the fire season was a critical fire occurring in Norway in the month of January. An accidentally ignited fire spread very fast and resulted in the most catastrophic fire in event in Norway's history.

During the standard fire season; i.e. March to October, the meteorological conditions were average in central and southern Europe. However, a warm weather anomaly affected northern Europe, in particular in July and August. Favourable conditions for fire ignition and spread led to a second critical fire event of the 2014 season. One of the most disastrous fire events in Swedish history started on July 31st. This fire spread during the first two days and had a sudden increase in size to nearly 13 000 ha in the third. The situation regarding forest fires led to above average burnt areas and numbers of fires in the Baltic countries, Estonia, Latvia and Lithuania, as documented in the national reports in the sections ahead.

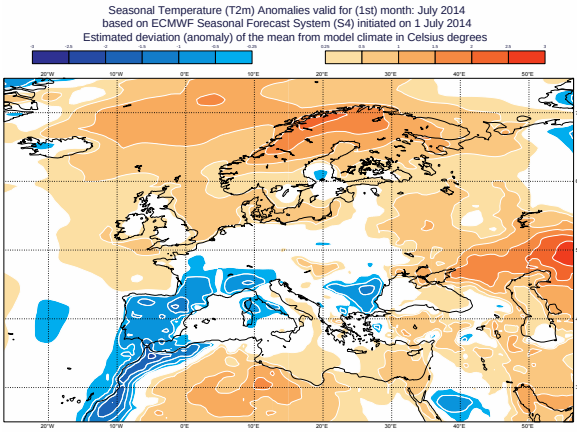
Additionally, the new long-term fire weather forecast products in EFFIS showed predominant conditions of high temperature anomalies and lack of precipitation, which favoured fire ignition and propagation in northern Europe. These are shown in the paragraphs ahead.

During the 2014 fire campaign, the new set of EFFIS products related to the long-range fire weather forecast were used in an operational way in the system. These comprise (a) seasonal and (b) monthly forecasts.

These seasonal forecast maps show temperature and rainfall anomalies that are expected to prevail over European and Mediterranean areas during the next month based on the Seasonal Forecast System (S4) of ECMWF (European Centre for Medium-Range Weather Forecasts), while monthly forecast maps show temperature and rainfall anomalies during the next 2 weeks based on the Monthly Forecast system (MFS) of ECMWF. MFS is based on an ensemble comprising 50 plus one (control) members with a forecast horizon of 32 days.

The images below show the thermal and rainfall anomalies for July and August 2014.

Temperature Anomaly July 2014



Rain Anomaly July 2014

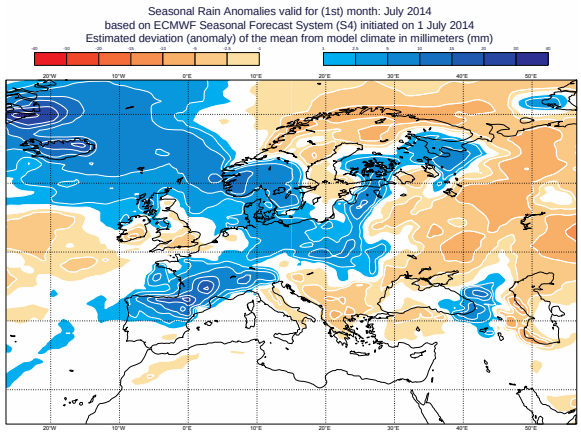


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Figure 1. EFFIS (MFS) week 1 temperature anomaly forecast initiated on 1 July 2014

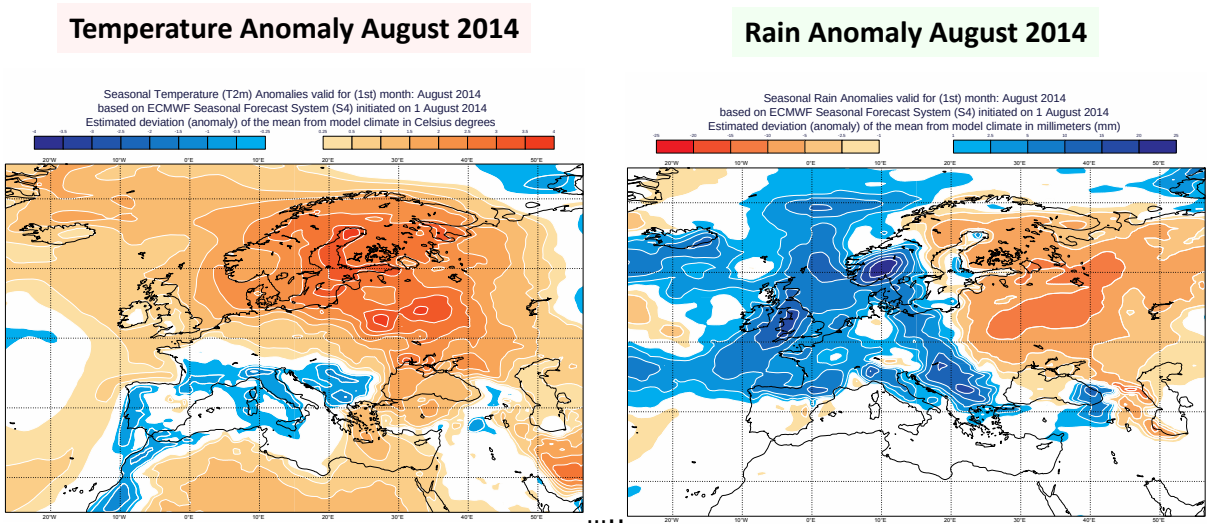


Figure 2. EFFIS (MFS) week 1 temperature anomaly forecast initiated on 1 August 2014

The total burned area mapped by the European Forest Fire Information System (EFFIS) in 2014 was 83 809 ha in the EU28 countries, 14 188 ha in the other European countries, and 78 120 ha in North Africa and the Middle East.

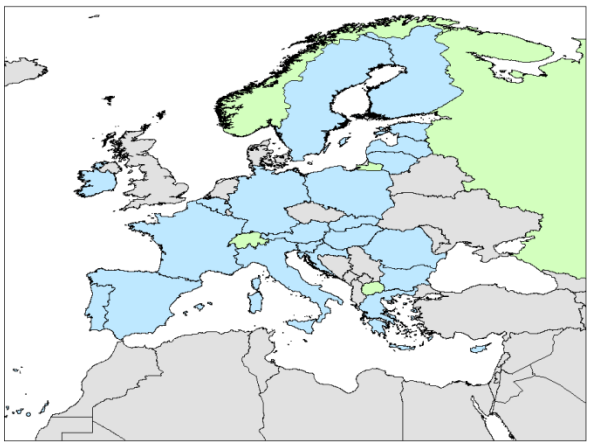
Overall, the fire season was well below the historical average, despite the very high-to-extreme fire danger level reported by EFFIS in central and northern Europe this year. Conditions in the Mediterranean, the Balkan region and North Africa were average for the season.

In 2014, the EU Civil Protection Mechanism enabled through the Emergency Response Coordination Centre was activated as a result of a request for assistance from Sweden and Greece and for a pre-alert in Norway.

The ERCC also activated the EU Copernicus Emergency Management Service satellite mapping service in response to forest fires related emergencies, as a complement to the information already provided by EFFIS.

2.2 European countries

The following chapters contain the reports from the contributing European countries. The reports are arranged in alphabetical order and comprise reports from 22 Member States and 4 other non-EU members of the EFFIS network.



2.2.1 Austria

Fire danger in the 2014 fire season

In 2014 in Austria we had a long season with a high level of forest fire danger for the first time. In particular, in the eastern and southern part of Austria (Niederösterreich, Burgenland und Kärnten) there were some big fires that burnt more than 100 ha. There were also large fires in the mountains of Oberösterreich, Kärnten and Tyrol.

Fire occurrence and affected surfaces

The area of Austria is 83 858 sq km and it is divided into 9 provinces, 15 towns with separate charter, 84 administration districts, and 2 350 municipalities. There are 4 567 voluntary fire brigades and 6 professional fire brigades (Vienna, Graz, Linz, Salzburg, Innsbruck, Klagenfurt). On average there are 2 fire brigades per municipality and a total of around 290 000 fire-fighters. The response time for action on the plains and near villages (excluding mountain areas) is between 10 and 15 minutes leading to a very small burnt area per fire (e.g.: ~1 000 m^2). The largest burnt area was about 7 ha.

In Austria there are special courses for forest fire fighting, in particular for actions in the mountain areas, and some of them are specialized for working with helicopters and airplanes all over Austria. The education is done in nine fire service colleges (provinces). All the courses are only for firefighters in cooperation with the army.

Table 1 shows the number of fires and burnt area in Austria in 2014, calculated by the Austrian federal fire brigade association based on the reports of the different fire brigades. 21 of the fires burned more than 5 ha.

Table 1. Number of fires and burned area in Austria in 2014

Fire type	No. of Fires	Burned area(ha)
Non forest fires	912	44
Forest fires	369	192
Total	1281	236

Fire fighting means and information campaigns

An average of two fire departments per community is standard. They have no special equipment. In the districts there is special equipment in store; for example extinguishing containers for helicopters etc. In the Alps and other mountains they will be supported by helicopters from the army or private companies.

Fire prevention activities

The risks for forest fires in Austria are not a particularly sensitive topic for the Austrian inhabitants. But in the last years there has been a change in this topic.

- The governments and the communities write more regulations on forest fire danger than they did in the past.
- TV and radio reports on current forest fire hazard in Austria. (for example based on EFFIS database)
- A working group of ÖBFV (Österreichischer Bundesfeuerwehrverband) worked intensively with the issue of forest fire danger.
- ÖBFV has installed an EU module for forest fire fighting with helicopter support and two for forest fire ground fire fighting.

Injuries and loss of human lives

In 2014 there were no deaths (either firefighters or civilians) during forest fires.

(*Source: The Austrian Federal Fire Brigade Association, Austria)*

2.2.2 **Belgium**

Fire occurrence and affected surfaces

At the time of writing this report, 39 forest fires or wildfires had been added to the national fire intervention database for the year 2014. The final number of forest fires in Belgium in 2014 will probably be even slightly higher because the interventions for three (Hainaut, Luxembourg and Namur) out of the ten provinces still have to be added to this database.

Out of the seven provinces for which the data were already registered at the time of writing this report, only one was free of wildfires and forest fires in 2014, namely Brabant Wallon. The majority of the fires (23/39) in 2014 occurred in the provinces Antwerp and Vlaams Brabant. Since most of the registered fires affected only a limited surface area and no human lives were lost, affected surfaces were not measured in 2014.

Fire fighting means and information campaigns

In Belgium, the Crisis Center of the Ministry of Internal Affairs is responsible for fighting forest and wildfires that surpass the means of local fire brigades. The Crisis Center coordinates the field actions of fire brigades, civil protection, police and other emergency services in the case of such fires. Given the fact that the communities are responsible for managing public forests and parks, and hence taking adequate fire prevention measures, these field actions are coordinated in consultation with the involved agencies (Flanders: Natuur en Bos, Wallonia: Département de la Nature et Forêts) and departments at the level of the communities.

2014 was a relatively warm and dry year, especially during the spring season, which was reflected by an increased alert level in some public nature reserves and the manning of the watch towers (e.g. Kalmthoutse Heide, Mechelse Heide,…).

On March 4, 2015, the Belgian Ministry of Internal Affairs signed a cooperation agreement with its Dutch counterpart that eases the deployment of Dutch aerial means (helicopters) in the case of wildfires in Belgium. This agreement is particularly important for Belgium because it does not have its own aerial means to fight wildfires, which turned out to be a serious shortcoming when having to fight the large wild fires in 2011.

Fire causes

Given the relatively small size of the forest fires and wildfires that occurred in 2014, typically no means were spent to retrieve their cause, though it may be assumed that most were directly or indirectly caused by human activities.

(Source: Crisis Centre of the Federal Public Service (FPS) Internal Affairs, Belgium)

2.2.3 **Bulgaria**

Activities for forest fire prevention are the priority of the Ministry of Agriculture and Foods and the Executive Forest Agency EFA. Annually before the active fire season, all regional authorities develop an annual plan for forest fire protection of the forest areas and an action plan for forest fire fighting. Those documents are to be submitted annually to the committee of representatives from EFA and to the Directorate General for Fire Safety and Protection of the Population.

The year of 2014 in the country will remain in our memory as a year of major natural disasters, mostly related to the flooding. Almost all the year rainfall was above the normal for the seasons. During the summer there were days and weeks when the rainfall in a few hours reached monthly and even seasonal norms of precipitation. This has reflected to the situation with forest fires, which for the first time in more than two decades have affected less than 1 000 ha forest areas. The number of forest fires and the burnt area in the country in 2014 was much less than the average for the last decade.

In the EFA data base for recording forest fires occurring in the country during the year we have recorded only 151 fires with 916 ha affected. The average size per forest fire in 2014 is 6 ha, which is the smallest size for the last nine years. For comparison, in 2013 burned areas were 3 314 ha and the number of fires was 408. Compared to average for the period 2005-2014 (8 591 ha burned and the average number of fires 531), the 2014 is a year with very good results for forests in the country. The largest number and area burnt by forest fires we have reported in Regional Forest Directorate /RFD/ were in Sofia - 26 fires and 371.3 ha and RFD Lovech - 29 and 337.7 ha.

According to the ownership distribution of the burnt areas in 2014 is:

- Municipal – 47%
- State - 37%,
- Private – 16%.

The main causes for the forest fires during 2014 are as follows:

- Carelessness – 123 in number (82%)
- Arson - 5 in number (3%)
- Natural - 3 in number (2%)
- Unknown - 20 in number (13%)

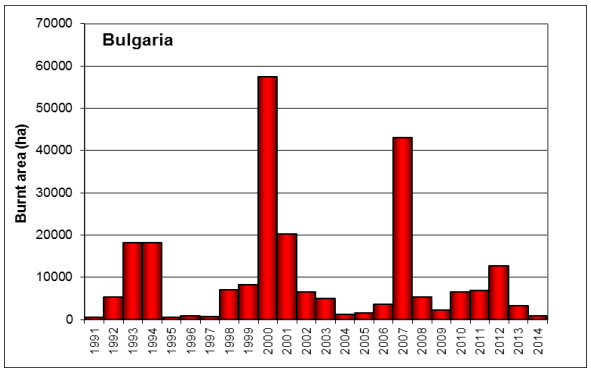
Again human negligence is the main cause of forest fires - more than 80%; arsons are 3%. Only 2% of the fires are caused by lightning, while the remaining 13% are unknown.

The direct losses by forest fires in 2014 are estimated to be less than 117 000 Euro, although the average damage for the last 10 years is about 2 500 000 Euro.

During 2014 there were no reported losses of human lives by forest fires.

Table 2. Forest fire statistics for Bulgaria 2005-2014

Year	Burnt area (ha)		Fire causes (number)			Total number of fires
	Total	Forest lands	Human activities	Natural	Unknown	
2005	1446	1446	114	7	130	251
2006	3537	3537	191	9	192	392
2007	42999	42999	1163	18	298	1479
2008	5289	5289	484	8	90	582
2009	2276	2276	231	5	76	314
2010	6526	6526	191	1	30	222
2011	6883	6883	418	7	210	635
2012	12730	12730	669	42	165	876
2013	3314	3314	334	12	62	408
2014	916	916	128	3	20	151
Mean	**8592**	**8592**	**392**	**11**	**127**	**531**



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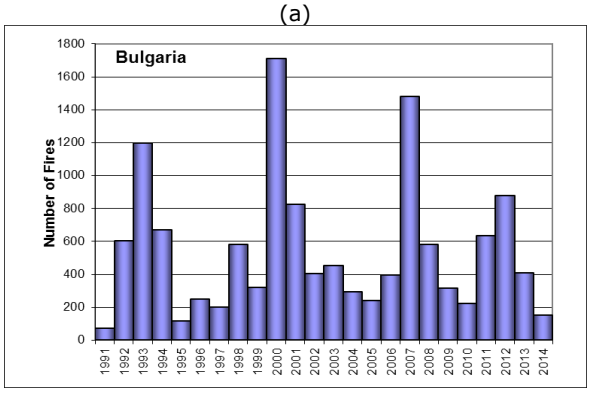

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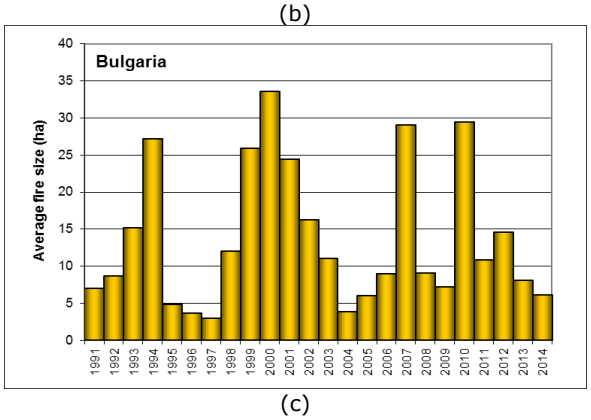

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Figure 3. Burnt areas (a), number of fires (b) and average fire size (c) in Bulgaria from 1991 to 2014

(Source: Executive Forest Agency, Bulgaria)

2.2.4 **Croatia**

Fire danger in the 2014 fire season

June 2014 and the previous spring months in 2014 were characterized by frequent incursions of moist and unstable air, not only in the continental part of the country but also in the Adriatic area. The analysis of Average monthly Fire Danger Rating for June (Figure 4) shows that it was low in Istria, Lika and central and southern Dalmatia. In Gorski Kotar and the major part of the northern Adriatic, the average monthly Fire Danger Rating has been moderate.

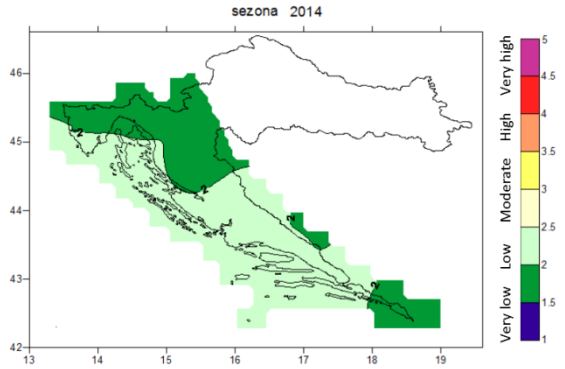


Figure 4. Average Fire Danger Rating for forest fires for summer (June, July, August) 2014.

July 2014 was one of the rainiest in the coastal area in recent years. Throughout the month of July there were more than 300 mm of precipitation in some places, which is ten times more than the usual monthly average.

Particularly dangerous were extreme amounts of rain that fell in a few hours and caused flooding in many places. Also, with abundant rain, stormy weather and thunder, there were stormy winds, so the fire brigade interventions in some parts of the Adriatic were frequent but not in the extinguishing of vegetation fires (which would be usual for this time of year), but in dealing with the consequences of floods and wind storms caused by such heavy storms.

The analysis of the Average monthly Fire Danger Rating for July 2014 shows that average ratings were mostly low or even very low (Rijeka, Gorski Kotar and parts of Lika), which is unusual for this time of year and has not been recorded in recent years.

Highly variable and unstable weather with frequent rainfall in the northern Adriatic and the inland area continued in August 2014. In Dalmatia, however, the atmospheric disturbances were somewhat less frequent than in the previous summer months.

It should be noted that the summer of 2014, including August, was with more rain and cooler compared to the last fifteen years. Such weather conditions were not favorable for the creation and spreading of vegetation fires. The Canadian Forest Fire Danger Rating for Croatia in August was lower than in previous years.

Average Fire Danger Rating for forest fires for August (Figure 4) was low in the northern Adriatic, the inland area, and in the far south of Dalmatia. In the remaining part of Dalmatia, Average Fire Danger Rating was moderate with the highest average value in Ploče, Lastovo and the island of Mljet. Such low average values of Fire Danger Rating in August have not been recorded in the last ten years, so there were only few vegetation fires in regard to the period and firefighters generally did not have to extinguish forest fires. However, due to extreme rainfall, they had a large number of interventions related to dealing with the consequences of floods.

The analysis (Figure 4) shows that the average seasonal rating (June, July and August) of 2014 was unusually, mostly low as a result of primarily large amounts of precipitation. Only in June and in some parts of Dalmatia in August, it was moderate. July had the lowest average rating. To show how unusually low it was, the best is to compare it with the 2013 season, which also was slightly lower than the average values for ten years, but had far larger Fire Danger Rating (Figure 5).

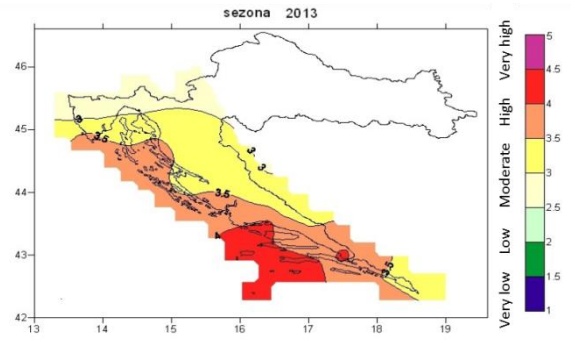
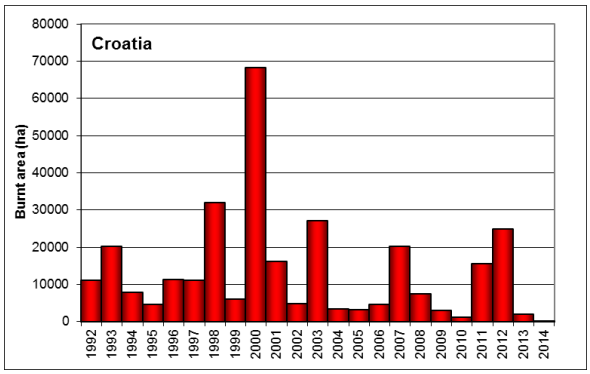


Figure 5. Average monthly Fire Danger Rating for forest fires for June 2013.

To conclude, the 2014 fire season was unusual, mostly due to weather conditions, whereby it should note the lack of significant impact of fields of high pressure air from the Azores and the thermobaric ridge from the south in the higher layers of the atmosphere.

Fire occurrence and affected surfaces

During 2014, 43 wildfires affected 188 hectares of land. Most fires (104) occurred in Split area (76% of the number of fires and 88% of the affected surfaces). The trend of number of fires, burnt area and average fire size can be seen in Figure 6.



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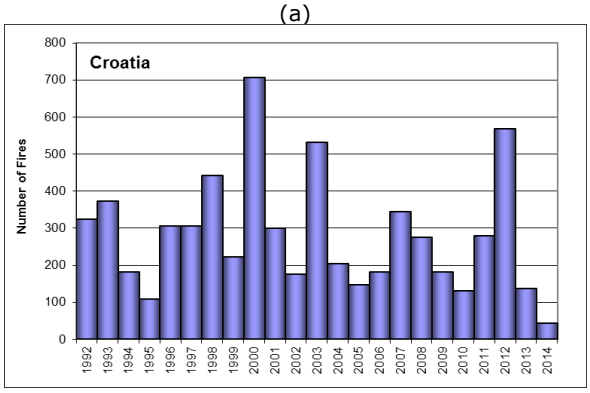

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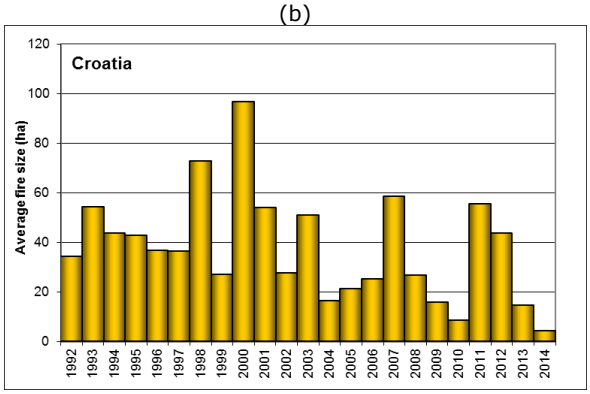


(c)

Figure 6. Burnt areas (a), number of fires (b) and average fire size (c) in Croatia from 1992 to 2014.

Of the total affected surfaces, 32 hectares or 17% of tall forests were affected, 88 ha or 47% of other forests (medium forest, coppice, bushes and shrubbery, macquis, garigue) and 68 ha or 36% of unwooded forest and agricultural land.

As far as the ownership structure of the affected surfaces is concerned, it can be noted that 125 ha or 66% of state owned surfaces were affected and 63 ha or 34% were private surfaces (forest and agricultural land).

Table 3. Burnt area in Croatia by land type

Year	Area burned in forest fires (ha)			
	Forest	Non-forest	Other/ Agricultural	Total
2008	4119	2865	356	7343
2009	2316	446	138	2900
2010	753	267	101	1121
2011	6937	3106	5512	15555
2012	15515	6201	3106	24804
2013	942	628	429	1999
2014	**120**	**45**	**23**	**188**

Fire prevention activities

Measures for fire protection and prevention and operational activities of firefighting systems are defined in the Fire Protection and Prevention Act, the Fire Service Act and corresponding bylaws. In addition to the above mentioned Acts, each year the Government of the Republic of Croatia adopts an additional Program of fire protection measures. The Program of measures is implemented by state administration bodies, public institutions and firefighting organizations, and additional financial resources for operational action by the firefighting system shall be granted pursuant to the Program. The National Protection and Rescue Directorate is responsible for coordinating and monitoring the implementation of fire protection measures.

In accordance with the Program of measures, National Protection and Rescue Directorate has prepared a National Engagement Plan for Firefighting forces. The National Plan establishes Fire Fighting Commands and standard operating procedures for the firefighting system. Standard operating procedures also determine activities of an aircraft during extinguishing of forest fires. Before the start of the fire season, assessments are made and Fire Protection Plans are drafted for particularly vulnerable areas: islands Korčula, Lastovo, Brač, Hvar, Vis, Šoltu, Dugi otok and Pelješac peninsula.

Firefighters and fire-fighting equipment from the continental part of the country were deployed during the summer months to 14 vulnerable coastal locations in total. In average, 21 firefighting vehicles with 56 firefighters were preventively deployed during one shift to the coastal part of the Republic of Croatia. During the summer, in addition to local firefighting forces an additional 1110 seasonally employed firefighters were engaged in the coastal area and they were allocated to professional and voluntary fire brigades.

Firefighting means and information campaigns

During the fire season, the Fire-fighting Operations Centre was coordinating ground and air fire-fighting forces for the entire coastal area and communicating with the Air Forces Command operating under the Ministry of Defence. Fire-fighting Operations Centre informed the Centre in Brussels (Emergency Response Coordination Centre - ERCC) once a week about the situation at fire sites, together with providing an account of weekly events in the Republic of Croatia via video conferencing. A Fire Weather Index was produced daily by the Meteorological and Hydrological Service. Before the start of the fire season, additional training of fire-fighters was conducted in extinguishing forest fires (assault operations and joint operations with aircrafts).

The Air force consists of six aircrafts of the type "Canadair" CL-415, five aircrafts of type "air Tractor" AT-802 and two helicopters of type Mi-8 MTV1. These aircraft have realised 62.05 hours of flight time during forest fire interventions.

The Ministry of Interior had performed additional inspections of fire-prone areas, forests, tourist destinations, hotels, camp-sites and national parks. Also, promotional activities were carried out to inform residents and tourists of fire hazards. Other relevant inspection services have conducted inspections of all other fire-prone areas. Inspections included forest fire prevention roads and firebreaks, railways, public roads of national importance and objects on these roads, as well as those areas where fires occurred during previous years that had hampered the flow of road traffic. Also an inspection was conducted of road routes of local importance that are additionally burdened with increased traffic during the tourist season (access roads to resort hotels, campsites, public garages, cultural and historical sites and other facilities where large numbers of guests or tourists are staying or gathering). Furthermore, inspections were carried out and measures were taken in national parks, nature parks and other protected forest areas, municipal landfills with controlled disposal of municipal waste, particularly in coastal areas.

Operations of mutual assistance

In accordance with signed intergovernmental Agreements on mutual assistance in case of major disasters, contacts with Bosnia and Herzegovina, Montenegro and Slovenia are continuing. There is a standard operating procedure signed with Bosnia and Herzegovina and Montenegro with regard to unhindered crossing of state borders by ground and air forces in a case of major fire in the border area. A standard operating procedure with regard to unhindered crossing of state borders by ground and air forces in a case of major fire in the border area was also signed with Slovenia in July.

The Republic of Croatia has also assisted other countries with fire extinguishing. During 2014, aircrafts took action beyond the borders of our country on one occasion, in Portugal. Due to extreme rainfall in the region, Croatia also provided assistance in other countries with flooding, particularly in Bosnia and Herzegovina.

Loss of human lives

During extinguishing of vegetation fires in coastal and karst areas, 3 fire fighters sustained minor injuries, while there were no fatalities among fire fighters.

(Source: National Protection and Rescue Directorate, Republic of Croatia; Ministry of Agriculture, Registry on Forest Fires, Croatia).

2.2.5 **Cyprus**

Fire danger in the 2014 fire season

Following a series of years with particularly difficult fire seasons, the 2014 fire season in Cyprus compared to historical averages, will go down in history as one of the best ever recorded. Cool and wet conditions during spring and early summer months delayed fire activity until later in the summer. Moreover, wet conditions that prevailed in the island during early autumn months reduced fire activity significantly.

From January to March 2014, the weather in Cyprus was relatively dry and warm. Unstable weather conditions prevailed during certain periods, giving rain, local thunderstorms, hail and snow in the mountainous areas. The mean air temperature was about 2.5 - 3.0 ºC above normal and the average precipitation was below normal.

In April the weather was relatively dry and the mean temperature was around normal. Unstable weather conditions prevailed during certain periods of the month, giving local rain, isolated thunderstorms and hail over some areas. The average precipitation was 44% of normal.

In May and June the weather was relatively wet and the mean monthly temperature was around normal. Unstable weather conditions prevailed during certain periods, giving local rain, isolated thundery showers and hail over some areas. The average precipitation during May and June was 321% and 240% of normal, respectively.

In July, the mean temperature was around normal and the average precipitation was below normal. Relatively high temperatures were recorded during the first half of the month. Maximum temperatures, on several occasions exceeded 37 ºC inland and 28 ºC in the mountains.

In August the weather was relatively warm. The mean air temperature was 1.5 ºC above normal and the average precipitation was 155% of normal. On the 5th day of August, heavy rainfall was recorded over different areas of the island and especially over Troodos Mountain. Relatively very high temperatures were recorded during the period 21-31 of the month, when maximum temperatures were about 2 to 5 ºC above normal, exceeding on many occasions 37 ºC inland and 27 ºC in the mountains.

In September and October the weather was relatively wet and the mean monthly temperature was around normal. Unstable weather conditions prevailed during certain periods of these months, giving local rain, thunderstorms and hail over some areas. The average precipitation during September and October was 240% and 125% of normal, respectively. During September, maximum temperatures exceeded on several occasions 34 ºC inland and 24 ºC in the mountains whilst during October it exceeded 28 ºC inland and 19 ºC in the mountains.

In November the mean air temperature and the average precipitation were around normal. Unstable weather conditions prevailed during certain periods of the month, giving local rain, isolated thunderstorms, hail and light snowfall over the highest peaks of the mountainous areas.

In December unstable weather conditions prevailed during certain periods of the month, giving local rain and isolated thundery showers. The mean air temperature was 2.5 ºC above normal and the average precipitation was 78% of normal.

Fire occurrence and affected surfaces

The year 2014 can be considered as the best ever year on record, for both the number of forest fires and the total burnt area. A total number of 68 forest fire outbreaks were recorded, burning a total area of 669 hectares.

Compared to the figures of the previous year 2013, the number of forest fires was reduced by 50% and the total burnt area was reduced by 76%. For 49 out of 68 fires, or as a percentage, 72% of the total number of fires, the burnt area was smaller than 1 ha. Also, 3 fires with burnt area greater than 50 ha were recorded.

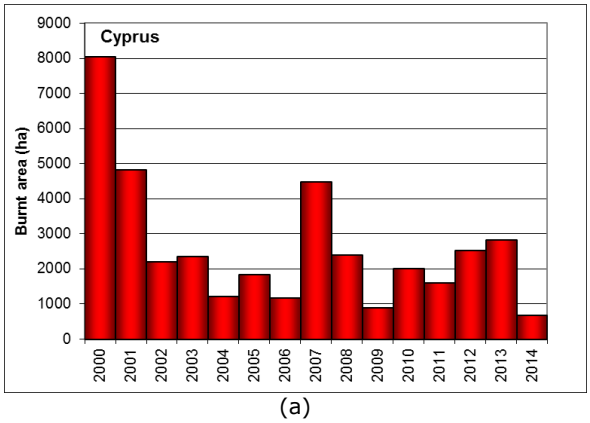
<u>Major fires in 2014</u>

- Malia,Pafos District. At noon of the 4th of June 2014, a fire broke between Malia and Dora villages. Due to strong winds, the fire raged out of control, burning 392 hectares of wild vegetation and agricultural crops.

Table 4. Number of forest fires and burnt areas in Cyprus from 2010 to 2014

Year	*Number of fires*	*Burned area (ha)*		
		Total	*Forest and other wooded land*	*Agriculture and other artificial land*
2010	133	2 000	1 559	441
2011	85	1 599	1 220	379
2012	78	2 531	2 330	201
2013	135	2 835	1 681	1 154
2014	68	669	496	173

The trends regarding both the number of fires and burnt areas over the last 15 years (2000-2014) are shown in Figure 7.



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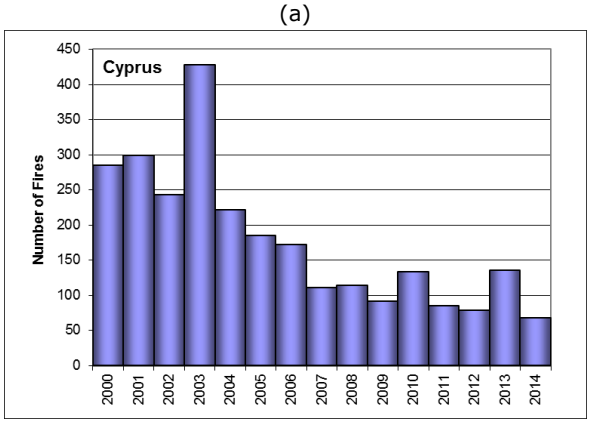

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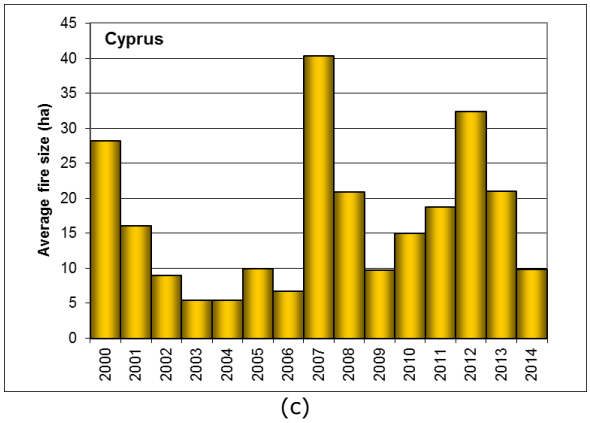

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Figure 7. Burnt areas (a), number of fires (b) and average fire size (c) in Cyprus from 2000 to 2014.

Injuries and loss of human lives

There were no casualties reported during the fire suppression operations.

Fire prevention activities and fighting means

Throughout the year 2014, information and education campaigns were organized, in order to increase people's knowledge and awareness on forest fires. The means used for spreading information included campaigns through the media and seminars. Fire prevention and suppression means and infrastructure were maintained before the starting of the fire season.

For fire detection purposes, 26 lookout stations operated during the fire season. The Fire Fighting Task Force consisted of a total number of 424 fire fighters. The aerial means that were used in fire fighting operations during 2014 included two fire fighting aircrafts and a number of fire fighting helicopters.

Operations of mutual assistance

There were no operations of mutual assistance during 2014.

(Source: Ministry of Agriculture, Rural Development and Environment, Department of Forests, Cyprus).

2.2.6 **Estonia**

Fire occurrence and affected surfaces

In 2014 a total number of 2 418 forest fires and wildfires were recorded; 91 of these were classified as forest fires. Forest fires and wildfires destroyed 5 buildings.

Table 5. Forest fires in Estonia 2000-2014

Year	*Number*	*Area (ha)*			
		Forest	*Non-forest*	*Total*	*Average*
2000	158	487.5	196.4	683.9	4.3
2001	91	54.6	7.2	61.8	0.7
2002	356	1055.1	1026.6	2081.7	5.9
2003	111	129.5	77.1	206.6	1.9
2004	89	297.2	81.7	378.9	4.3
2005	65	76.2	10.3	86.5	1.3
2006	250	2467.0	628.6	3095.6	12.4
2007	64	61.3	231.1	292.4	4.6
2008	71	340.4	939.4	1279.8	18.0
2009	47	41.4	17.9	59.3	1.3
2010	30	20.6	4.1	24.7	0.8
2011	24	15.5	3.8	19.3	0.6
2012	5	2.5	-	2.5	0.5
2013	15	33.4	45.1	78.5	5.2
2014	91	68.0	9.8	77.8	0.9

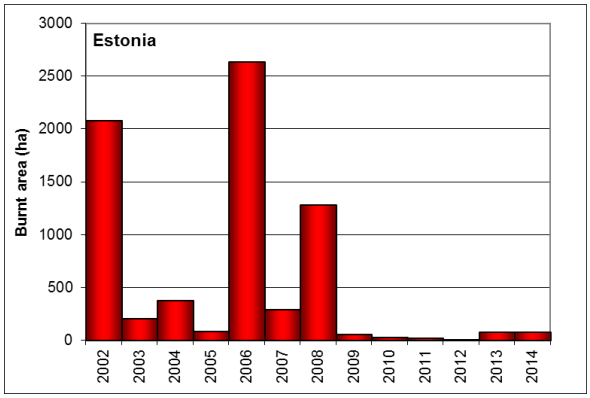
Forest fires in 2014 were recorded in all 15 counties. The first fire in 2014 was recorded in March, the last one in September. Almost half of the forest fires took place in April. The largest fire of 2014 occurred in July in Ida-Viru county Vaivara and burnt an area of 5.6 ha.

In 2014, 97 % of forest fires were of human direct or indirect origin. 60 % fires were caused by accident/negligence.

The burnt area, number of fires and average fire size for the years 2002-2014 are shown in Figure 8.

Fire fighting means and intervention campaigns

The Estonian Rescue Board is responsible for fighting forest and wildfires. The Estonian Rescue Board cooperates in its operations with the Police and Border Guard Board, Estonian Defence Forces, Environmental Board, State Forest Management Centre, Private Forest Centre, Environmental Inspectorate and local governments. Regional cooperation training sessions in fighting forest fires and wildfires are held for institutions engaged in the process.



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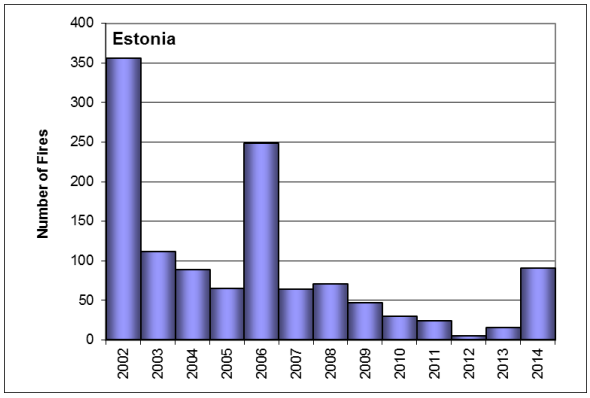

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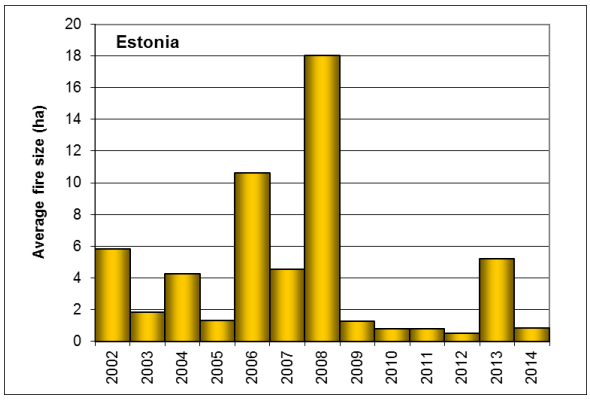

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Figure 8. Burnt areas (a), number of fires (b) and average fire size (c) in Estonia from 2002 to 2014

(Source: The Estonian Environment Agency, Estonia)

2.2.7 **Finland**

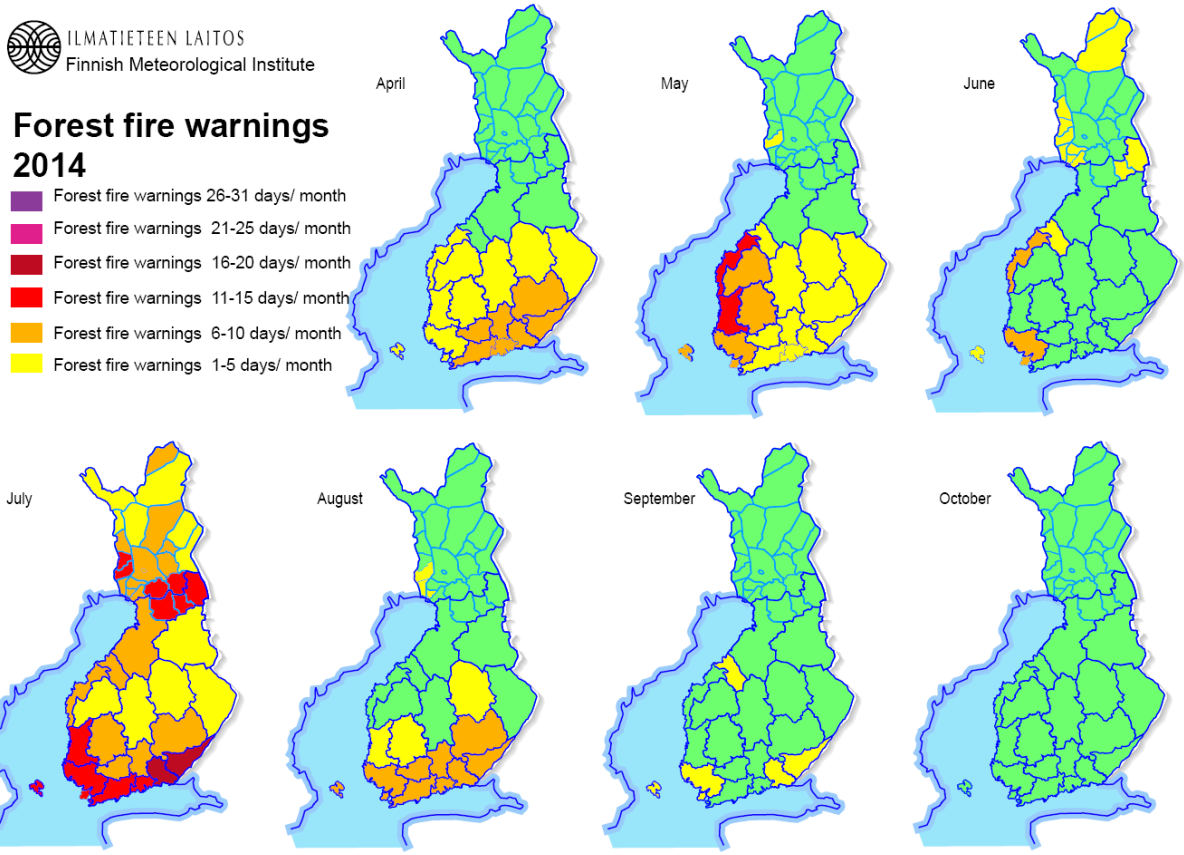
Fire danger in the 2014 fire season

Based on information from the Finnish meteorological institute, summer 2014 was typical in terms of average temperature. However, July and August were very warm and dry in Finland. Fire danger days for 2014 are presented in Figure 9.

Fire occurrence and affected surfaces

The number of forest fires in 2014 in Finland was slightly higher than the normal average level. There were 3 511 wildfires in Finland last year and 1 660 of them were reported as forest fires. The total burned area was around 1 302 ha, of which 881 ha was forest land. The average burned forest area per fire was 0.53 ha. The yearly trends in terms of number of fires and burnt area from 1996-2014 in Finland are shown in Figure 10 and Figure 11 below.

Figure 9. Fire danger days in Finland 2014

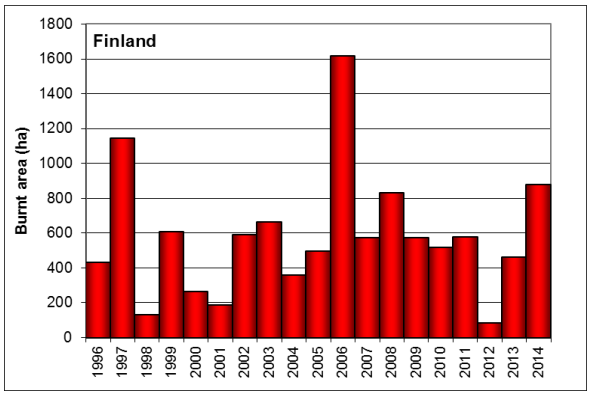


Fire causes

The most common cause of wildfires in Finland was human actions. These caused about 2 fires of 3, mainly accidents. The second biggest reason was natural: 10% of fires. The reason for the fire could not be found in over 15 % of the cases (average from 2007 to 2011).

Loss of human lives

One person died in forest fires in Finland in 2014. Three persons were injured in different wildfires, with burns. Some of the wildfires caused damage to buildings, and also a few wildfires were caused by fires in buildings or vehicles.



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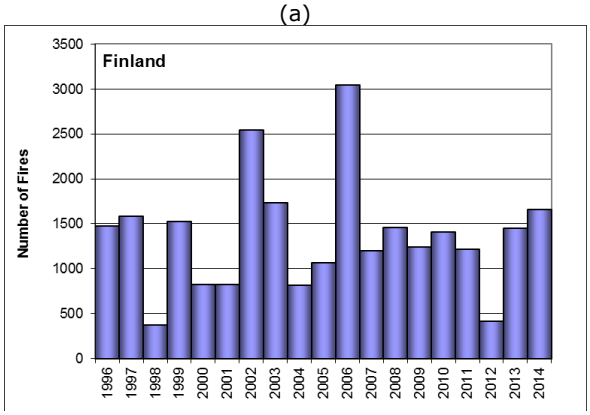

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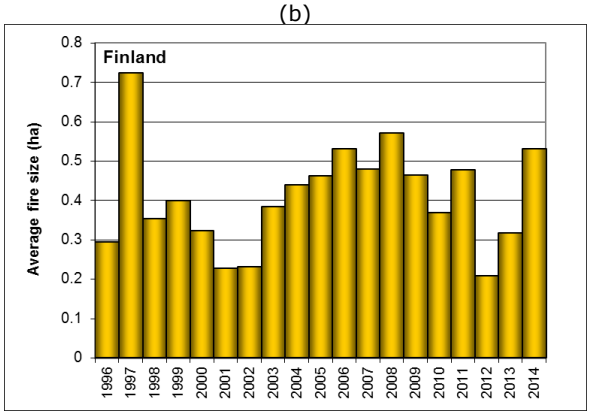

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Figure 10. Burnt areas (a), number of fires (b) and average fire size (c) in Finland from 1996 to 2014.

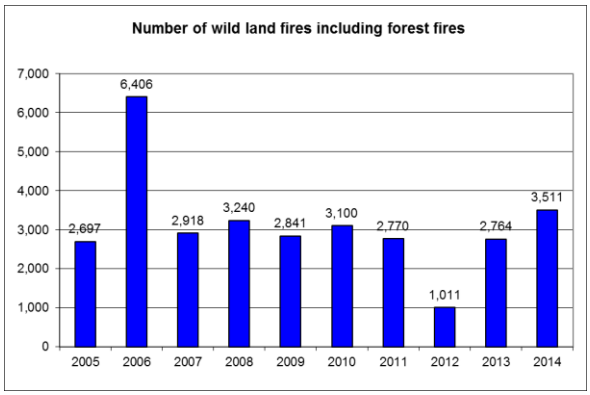


Figure 11. Total number of wildfires including forest fires from 2005-2014.

Fire prevention activities

There was more cooperation with institutes such as the Finnish meteorological institute, for example projects for improving situation awareness.

Fire fighting means and information campaigns

- Finnish military forces NH 90 helicopters are available to extinguish forest fires.
- More co-operation between other authorities such as the border guard.
- Continuation of forest fire aerial officer education for some fire officers.
- Development and integration between operative forest fire management system and prediction system for smoke spread.
- Development of the forest fire index system.

Operations of mutual assistance

Forest fire experts went to EU forest fire training, and there was other information sharing with neighbouring countries and the EU.

(Source: Ministry of the Interior, Finland).

2.2.8 **France**

Fire danger in the 2014 fire season

The positive results of 2014 should be analysed taking into account the favourable risk conditions. Although temperatures were high and rain was often deficient in the Mediterranean region and in the Landes forest during the first half of the year, several rainy episodes from mid-June helped to mitigate this danger in most regions in the summer.

In the Mediterranean region, drought was generally less marked than usual in summer. It was only in the second part of the season over a limited area: the Var coast and in Corsica, where it was pronounced from September until November with an exceptional intensity for the season.

The moisture content of plants usually remained high, which limited their susceptibility to fire. Corsica, where desiccation was strong in late summer, is an exception.

In general, during the summer, the level of risk was low. The total sectors classified into severe risks for the summer amounted to 43, whereas the average over the last 10 seasons was 490.

In the Landes forest the level of danger was also limited during the summer, and only slightly raised during the month of September.

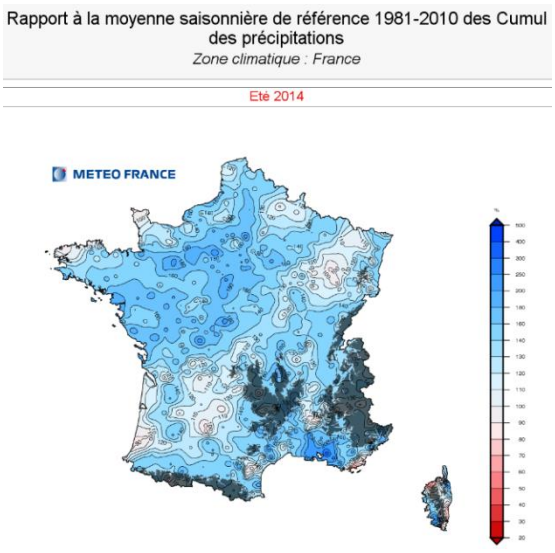


Figure 12. Difference between 2014 and the seasonal average 1981-2010 of total rain

Fire occurrence and affected surfaces

With favourable meteorological conditions, in particular during summer, the overall results obtained in France in 2014 are positive since 7 440 hectares were affected by fire in mainland France, the decade average being 10 700 ha. This favourable assessment is part of a positive trend over several years (on average, 26 600 hectares burned annually over the 1994-2003 period).

The Mediterranean region was the most affected by the fire, but its share in the total (55% in 2014) has tended to decline over several years (it previously stood at over 70%).

Years	Burnt area (ha)			Number of fires
	Forest	Non-forest	Total	
2006	6 791	1 173	7 964	4 615
2007	6 727	1 846	8 573	3 367
2008	4 405	1 641	6 046	2 809
2009	13 717	3 319	17 036	4 888
2010	9 431	1 887	11 318	3 862
2011	8 955	2 813	11 768	4 290
2012	6 423	1 910	8 333	3 927
2013	2 546	1 062	3 608	2 223
2014	4 988	2 505	7 493	2 778

<u>Mediterranean departments</u>

4 110 ha were affected by fire in the Mediterranean regions (the ten-year average is 7 120 ha). The area affected by fire in the summer – 1 350 hectares – represents less than 30% of the average over the last 10 summers.

During the summer, the two most important summer fires both developed in the Aude:

- The first was in Laure-Minervois on July 17 and burnt 130 ha. Ten water bomber aircraft, one retarding intervention and one support detachment of a military section of the civil defence system were engaged.

- The second fire was in Peyriac-de-Mer on 30 July. It covered 300 ha on a site with a variety of facilities to protect. 12 water bombers were engaged in support of Aude firefighters, reinforced by 80 firefighters from neighboring departments and by a retarding intervention detachment of the military section of the civil defence system.

- A third significant episode, in terms of impact to property, developed in Corsica on 15 August. 200 hectares in total, distributed among several fires, were burnt on the east coast. Infrastructure affected by fire had to be protected and the safety of a thousand people had to be assured.

In total, during the summer, two fires burnt more than 100 ha, against an average of ten. 82% of fires were contained before reaching 1 ha in size.

However, because of the particular weather conditions, fire activity was sustained throughout October in Corsica, and intensified at the end of the month with the establishment of strong winds from 21 to 23 October.

In total, during those three days, even though air assets were pre-positioned to reflect the expected level of danger, 1 160 ha were burnt by 35 fires in Corsica (1 130 ha and 30 fires for Haute-Corse alone). There were 3 particularly large fires in:

Albertacce (2B): 430 ha on October 21,

Velone-Orneto: 110 ha on October 22,

Talasoni 540 ha on October 22.

This required the implementation of national resources to reinforce the local means: 12 water bomber aircraft, hundreds of soldiers of the military formations of civil security, and hundreds of firefighters and members of marine brigades.

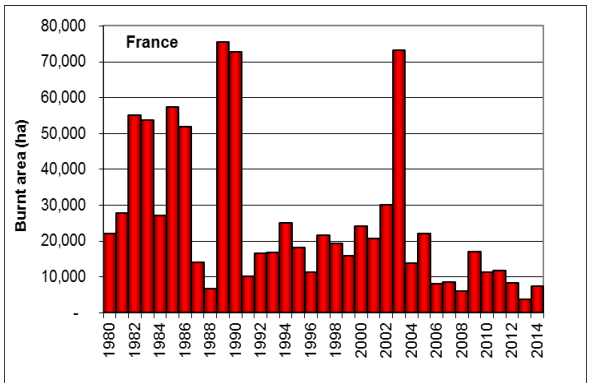
Southwest regions

2 960 ha were affected by fire in the south-western departments (including 1 100 hectares in the Landes forest), which is consistent with the ten year average.

It should be noted however that a fire that developed in April in the shooting range of the Captieux military camp (Gironde and Landes) and burnt 750 ha is included in this total, although it remained confined in the military compound. As it developed in a polluted area, it could not be handled by the intervention means.

1 620 ha were burnt in the Pyrenees, especially during winter and spring (which is usually the highest risk period because of frequent recourse to the practice of agricultural burning); this is slightly more than average (on average 1 500 ha are affected by fire). The biggest fire was 500 ha in Mérens-les-Vals (Ariège).

The yearly trends in terms of numbers of fires and burnt areas in France since 1980 are shown in Figure 13.



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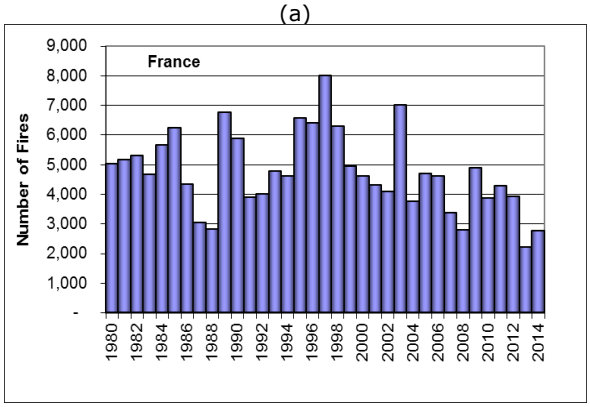

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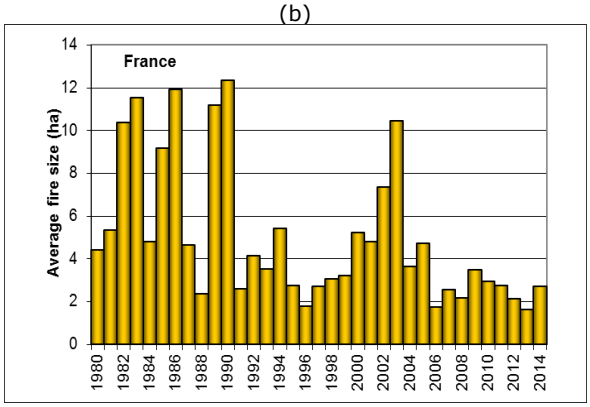

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Figure 13. Burnt areas (a), number of fires (b) and average fire size (c) in France from 1980 to 2014.

Actions carried out in Réunion (Indian Ocean)

The *Direction Générale de la Sécurité Civile et de la Gestion des Crises* (DGSCGC) also mobilized reinforcements in the overseas region of La Réunion in the Indian Ocean. After sending air and ground reinforcements to this area during major fires in 2010 and 2011, it prepositioned a Dash water bomber during the sensitive period in 2014 (end of September to mid-December) as it did in 2012 and 2013.

Damage during the sensitive period in Reunion was limited, and a total of 245 ha of various vegetation was burned, of which 75 ha were forests, although this year there was an marked drought.

Once in place, the Dash was engaged to reinforce the local fire brigade in 16 fires.

The total burnt areas in France (mainland + overseas) is 7 698 ha for 2 797 fires.

Fire prevention activities

2014 is characterized by a continuation of thought about the evolution of State strategy and preventive policy of forest fires in the South of France. Outputs of these thoughts will be new governance and priorities in terms of preventive actions.

The plans for protection of forests against fire (PPFCI) that have expired have been progressively renewed.

The overall budget for prevention is around 150 million euros in subsidies from local authorities and state together.

In the southern zone, the state contributes about 20M€ including 11.3M€ for the general interest role assigned to the ONF. Of this, € 2.3 million was spent on patrols.

Preventive actions were most numerous in the Mediterranean region:

- The 116 meteorological zones are equipped with a network of stations, of which 72 are dedicated to the prediction of forest fire danger;

- The forecasts were supplemented by monitoring the dryness of the vegetation at 30 sites (Figure 14);

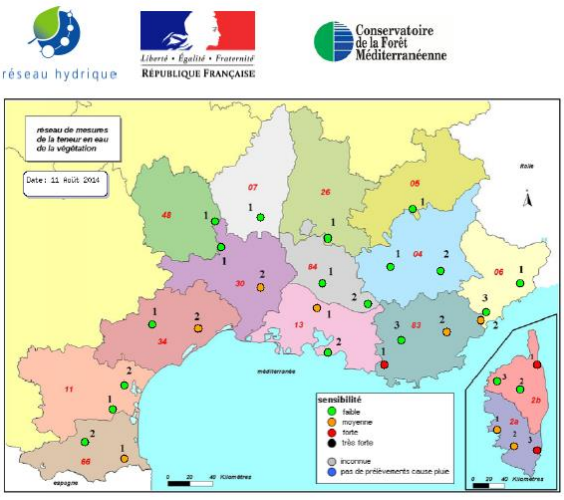


Figure 14. Example of state of vegetation monitoring August 2014.

- During the summer, around a thousand foresters participated in surveillance and alert (lookouts, 6 495 man-days of patrols, deterrence and first response);

- ground facilities were continued, with the financial support of the European Union (maintenance operations included 404 water points, 10 lookout posts, 311 km maintenance of DFCI tracks, 935 ha cleared of undergrowth to maintain safety belts, and 546 controlled burns);

- Information campaigns were conducted at departmental level (NUTS 3) and across the whole area (NUTS 1), to publicize the preventive regulations (limiting or banning the use of fire, movements in the massifs, clearing obligations ...) and dissemination of safety recommendations;

- Interdisciplinary teams (foresters, firefighters, policemen) worked together in most departments to search for the causes of fires, in order to guide preventive actions and improve the criminal justice response.

- In terms of communication, the *Délégation à la Protection de la Forêt Méditerranéenne* (DPFM) has published a bimonthly newsletter since April 2013. The letter describes the main events and articles about the DFCI.

Fire fighting means

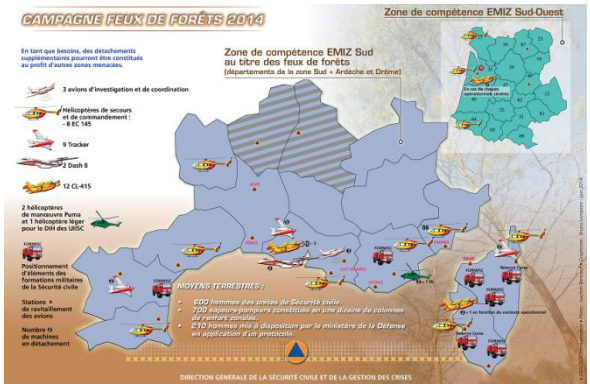


Figure 15. Fire-fighting means deployed in 2014.

To support firefighters funded by local authorities (numbering 37 000 in the Mediterranean departments, 7 700 in the Landes massif), the Ministry of the Interior deployed reinforcing means which included:

- 600 military personnel of investigation and intervention of the civil protection units (UIISC);
- 23 water bombers;
- reconnaissance and coordination aircraft, and 35 rescue and command helicopters.

Under a protocol signed with the Ministry of Defence, with funding from the Ministry of Interior, 250 men, 80 vehicles and three helicopters were assigned to the work of protecting forests.

Finally, around ten reserve firefighters from departmental fire and rescue services outside the Mediterranean area (strictly respecting the required qualifications) coming from different areas of defence were positioned. They could thus supplement the *Centre Oopérationnel de Gestion Interministérielle des Crises* (COGIC) of the Directorate General of Civil Security and crisis management on demand, providing resources in areas especially threatened by the risk of fire. They were not required, given the conditions.

The effectiveness of the intervention mechanism depends on its ability to act without delay by applying a strategy of fast attack for incipient fires based on the forecast mobilization of resources to combat during periods of high risk. Ongoing cooperation with Météo France and the *Office National des Forêts* (ONF) makes it possible to have specifics on the level of foreseeable danger to anticipate the danger and to be more reactive in operational response in the case of incipient fires.

Thus, in times of high risk, both national and local resources are mobilized proactively according to the hazard to act promptly while the fire is still manageable: the elements of UIISC are deployed in the most sensitive forests alongside the local fire fighters. Water bombers provide aerial reconnaissance missions, the military provide patrols alongside local actors (foresters, firefighters, members of community committees for forest fires).

The activity of the national means, compared to previous years, was not limited either for operational prevention (since the measures within this framework are set in motion, especially with regard to air assets, when the risk is high) or for supporting local resources committed to declared fires.

Thus, in the Mediterranean region the national means were only requested 90 times during the summer (all requests for assistance having been met), or 20% of fire starts, whereas they usually intervene in one third of fires.

During the summer, the water bombers were intervened in only 70 fires and the sections of the military formations of civil security intervened 80 times, mostly in Corsica, on small-scale fires solved during ground preventive actions.

Also, despite around sixty additional interventions made during the late part of the season, the number of operations made by the water bombers was reduced: over the year, 1 670 flight hours were made in an operational framework; 1 335 in intervention and 335 in GAAr (preventive aerial surveys) compared with an average of 3 200 in the last 10 years. The number of worked hours during only the summer months (976) has never been so low (average: 2 640, previous minimum: 1 119 in 2013).

Given the operational environment, the Southwest Zone did not request pre-positioning of air power in the summer under a jointly defined protocol providing for the establishment of a detachment of 2 CL415 to Bordeaux-Merignac in case of severe operational risks in the Landes massif.

Loss of human lives

The measures taken to prevent and fight against forest fires were effective in protecting the population, since there were no casualties among its members, and damage to infrastructure (residential buildings...) was limited.

Operations of mutual assistance

The favourable conditions made it possible to respond positively to the request for assistance submitted by the Swedish authorities who had to face a major fire (around 10 000 ha) at the beginning of August.

1 reconnaissance aircraft and 2 Canadair were made available from 5 to 12 August. The water bombers conducted 55 hours of flight, carrying out close 700 drops.

Another smaller scale operation was conducted for the benefit of Greece at the end of August.

(Source: Ministère de l'Intérieur – DGSCGC / SDPGC / BERR; Ministère de l'Agriculture et de l'Agroalimentaire : DGPAAT / SFRC / SDFB / BFTC, France).

2.2.9 The former Yugoslav Republic of Macedonia

The Republic of Macedonia covers a total area of 25 713 km^2, with 997 000 ha of forest land and 1 244 000 ha of agricultural land. As a result of very specific natural and geographical features there are two climatic types that collide in Republic of Macedonia: Mediterranean and Continental, which results in cold and severe winters and hot and dry summers. The annual average air temperature is 11.3 degrees Celsius with average precipitation of 983.7 mm/m^2 and average sunshine period of 2450 hours per year.

Fire danger in the 2014 fire season

The fire danger in the 2014 season in Macedonia was at a minimum level. The majority of fires occurred in the late spring and during the summer months.

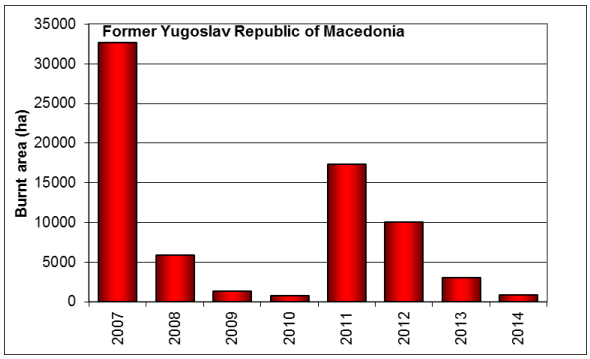
Fire occurrence and affected surfaces

During the year 2014 there were 657 fires, of which 62 were forest fires, affecting a total area of 846 ha. The forest land affected was 412.4 ha and 9.44 % of the total numbers of fires were forest fires. The comparative charts for burnt area, number of fires and average fire size for the years 2007-2014 are shown in Figure 16. The number of fires and burnt area according to types of fires for the year 2014 are shown in Figure 17.

Fire fighting means and information campaigns

The National Protection and Rescue Directorate have made a National Plan for Engagement of Fire Fighting Forces. The Plan establishes firefighting commands and standard operating procedures used in firefighting. Standard operating procedures also govern the engagement of aircraft in fighting forest fires.

The Aerial Firefighting Forces consist of three AirTractors AT-802A FireBoss. The tank has a 3 100 litre capacity, and depth of the water filling the tanks in flight is half a metre.



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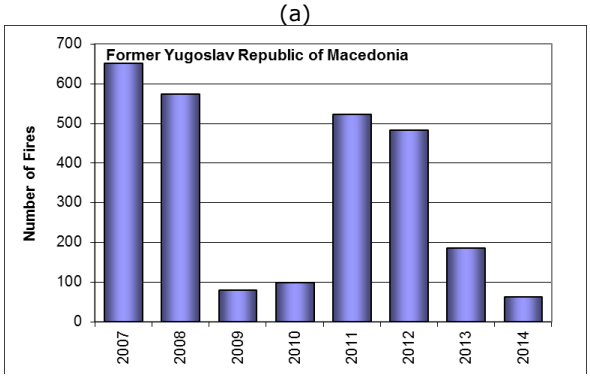

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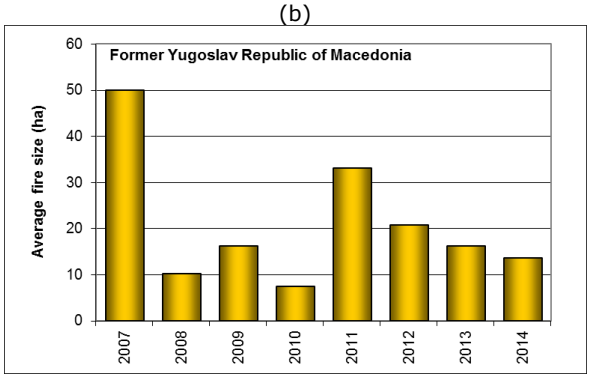

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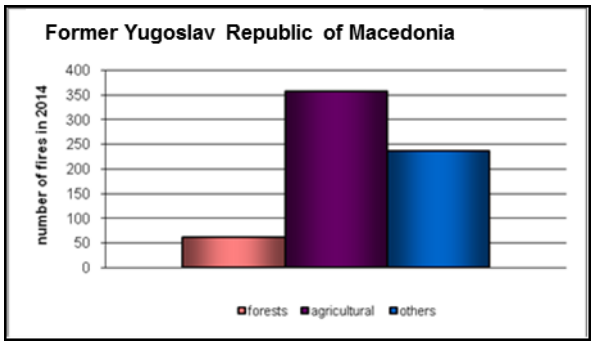
Figure 16. Burnt areas (a), number of fires (b) and average fire size (c) in the former Yugoslav Republic of Macedonia from 2007 to 2014.



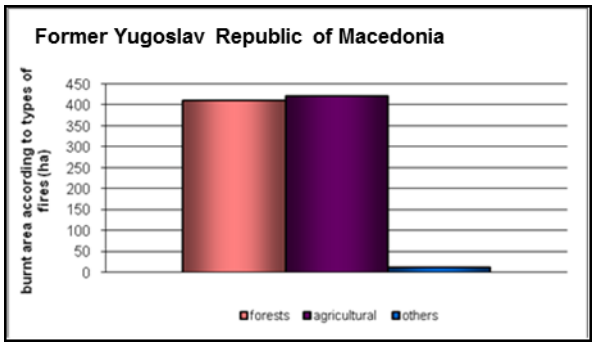


Figure 17. Number of fires (a) and burnt area (b) according to the type of fires in 2014

(*Source: Protection and rescue Directorate, Sector for analysis and research, the former Yugoslav Republic of Macedonia)*

2.2.10 **Germany**

Fire occurrence and affected surfaces

A total of 429 forest fires were reported in Germany in 2014, corresponding to a burnt area of 120 ha (32.9 ha in deciduous forests and 87.1 ha in coniferous forests).

This represents the lowest number of fires and corresponding burnt area for over 20 years.

In 2014, the most affected province (Land) in terms of burnt area was Bayern, although Brandenburg recorded more fires. (Table 6). In 2014, 3 Länder (Berlin, Bremen and Hamburg) did not record any fires.

Table 6. Burnt area in total and by forest type, and total number of fires, Federal Republic of Germany, 2014

	Burnt area (ha)			*Number of fires*
	Coniferous forest	*Broadleaves forest*	*Total*	
Baden-Württemberg	0.5	2.0	2.6	25
Bayern	29.7	13.6	43.3	51
Berlin	0.0	0.0	0.0	0
Brandenburg	24.7	3.3	27.9	123
Bremen	0.0	0.0	0.0	0
Hamburg	0.0	0.0	0.0	0
Hessen	5.7	3.6	9.4	34
Mecklenburg-Vorpommern	2.2	0.0	2.2	16
Niedersachsen	9.9	0.5	10.4	53
Nordrhein-Westfalen	3.2	3.8	7.0	22
Rheinland-Pfalz	2.7	0.4	3.1	15
Saarland	0.0	0.4	0.4	2
Sachsen	3.2	3.9	7.0	49
Sachsen-Anhalt	4.7	1.2	5.9	25
Schleswig-Holstein	0.3	0.0	0.3	2
Thüringen	0.4	0.1	0.5	12
Germany	87.1	32.9	120.0	429

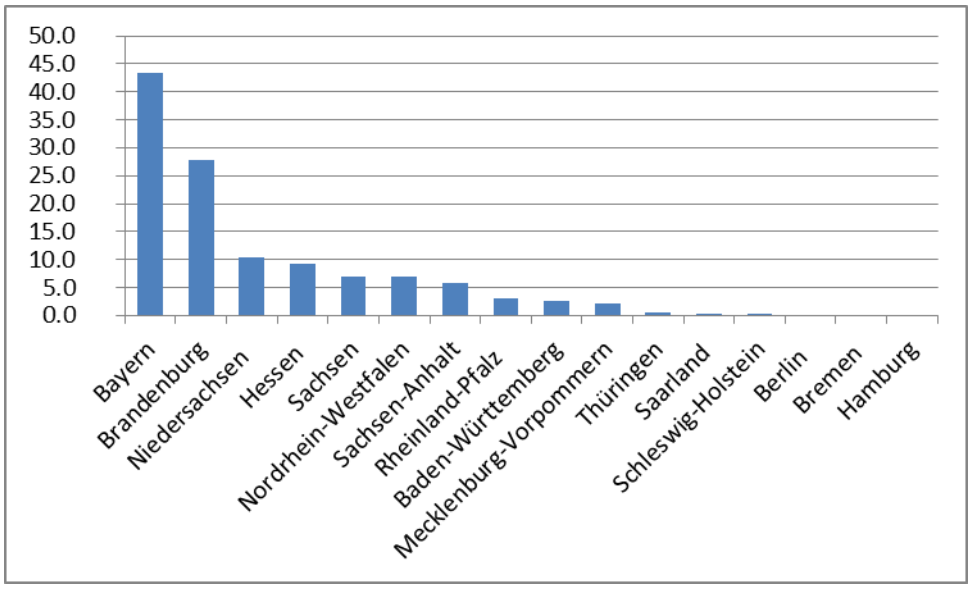


Figure 18. Burnt area in Germany in 2014 by Land.

In 2014 the majority of fires occurred in June and July (Figure 19).

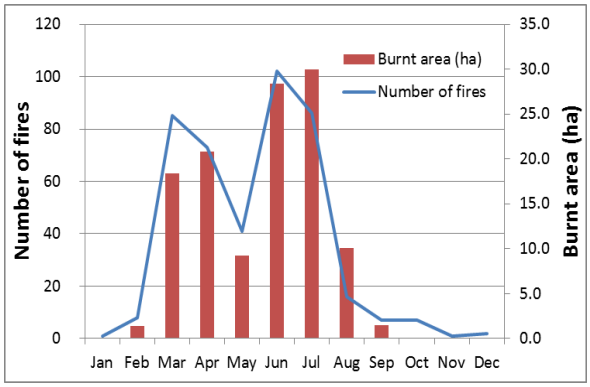


Figure 19. Number of fires and burnt area by month in Germany in 2014

The trend of the burnt areas, number of fires and average fire size in Germany for the years 1991-2014 are shown in Figure 21.

Fire causes and impacts

The main causes of forest fires during 2014 are shown in Figure 20. Within the category of negligence fires, the majority (61) were caused by the general public (campers, visitors, children etc.). This is similar to the proportions recorded in previous years, although the total numbers are lower.

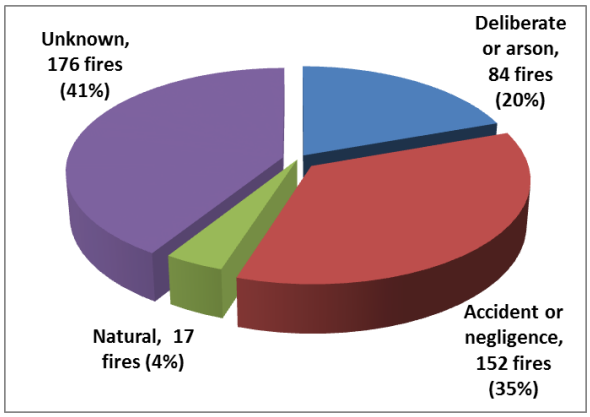
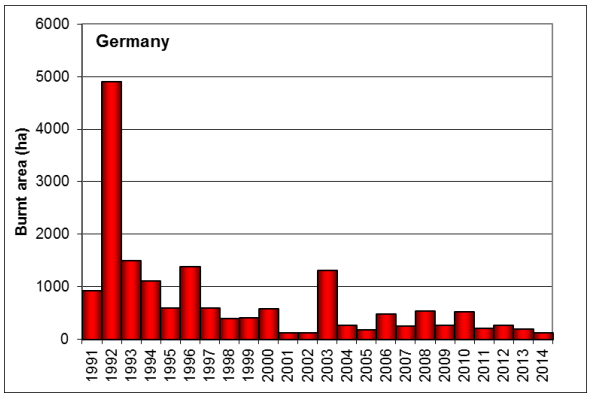


Figure 20. Causes of forest fires in 2014

The economic damage caused by forest fires in 2014 is estimated to be 0.2 million Euro, significantly lower than that recorded in previous years. The yearly average from 1991 to 2019 is 1.9 million Euro. In 2014, approximately 2.58 million Euro were spent on prevention and control measures.



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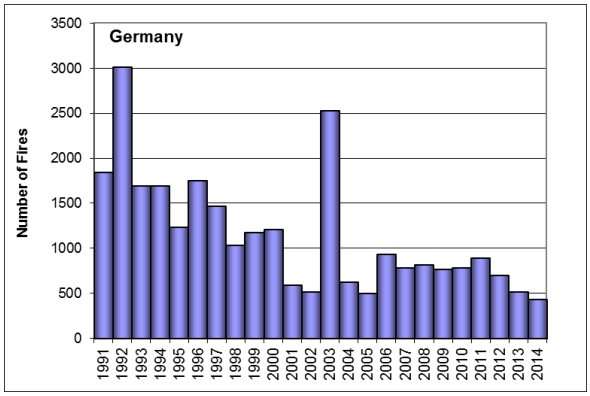

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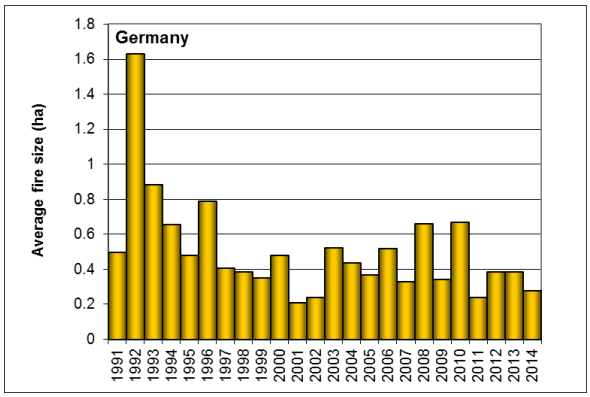

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Figure 21. Burnt areas (a), number of fires (b) and average fire size (c) in Germany from 1991 to 2014.

(Source: Federal Agency for Agriculture and Food, Germany)

2.2.11 **Greece**

Fire danger in the 2014 fire season

Fire danger during the 2014 fire season was at a low level throughout the year and the burned area level remained low as well, compared to the respective figures of the previous years. Overall, 2014 was a mild year in terms of fire danger conditions for Greece and fire weather conditions contributed in avoiding forest fire incidents, although during January and February 2014 the temperature was above the average in the whole country. However, during the period May-September 2014 there were many events of large sized hail-storms, mainly at the northern and central parts of mainland Greece. During 26-27 June 2014, a 2-day warm event affected the eastern part of the Greek mainland and was combined with dust from Africa. During 22-24 August 2014, a 3-day warm event affected mainly Crete and the Peloponnese.

Fire occurrence and affected surfaces

The number of forest fires and burnt area in Greece during 2014 are shown in Table 7. The data below have resulted from the integration of data available by the local Forest Service Units and the maps of burnt areas for 2014 based on 10 TM satellite images with spatial resolution of 30m.

During 2014, a number of around 552 forest fires were recorded. Compared to the previous year, the burned area was significantly less (25 846.11 ha), of which approximately 82% occurred in wooded areas.

The yearly trends in terms of numbers of fires and burnt areas in Greece since 1980 are shown in Figure 22 below.

Table 7. Number of fires and burned area in 2014 by regional forest administration

FOREST ADMINISTRATION AUTHORITIES	*Total number of fires*	*fires <1 ha*	*fires 1-5 ha*	*Fires 5-100 ha*	*Fires 100-500 ha*	*fires >500 ha*	*Total Burned area (ha)*	*Wooded Burned area (ha)*	*Non wooded Burned area (ha)*
Macedonia-Thrace	91	68	17	2	2	2	12190.67	9297.08	2893.59
Epirus & Western Macedonia	73	41	19	13	0	0	229.54	137.45	92.09
Thessaly and Central Greece	158	111	21	15	7	4	5643.56	5630.93	12.63
Peloponnese, Western Greece & Ionian	164	76	32	45	8	3	6166.27	5274.53	891.74
Attica	7	4	2	0	1	0	285.90	226.40	59.50
Aegean (Northern & Southern Aegean)	5	4	0	0	1	0	147.81	0.26	147.55
Crete	54	33	15	3	2	1	1182.36	745.30	437.06
TOTAL	**552**	**337**	**106**	**78**	**21**	**10**	**25846.11**	**21311.95**	**4534.16**

Fire fighting means and information campaigns

The personnel involved in fire suppression was 15 594 persons, of which 8 436 are permanent personnel of the Fire Brigade which deals also with the structural fires, 3 914 personnel employed with five year contracts, 1 500 personnel hired seasonally just for forest fire suppression and 1 744 are volunteer fire fighters.

The Fire Brigade of Greece owns about 1 609 engines which are used in both structural fire and forest fire suppression. A few more small engines owned by Municipalities in high risk areas were involved occasionally in some incidents. Suppression efforts were also supported by volunteers assisting in different ways (e.g., filling trucks with water etc.).

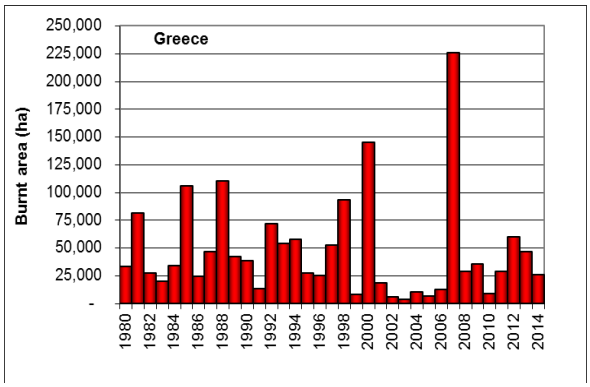
The aerial means used during the 2014 campaign are indicated in Table 8.

Table 8. Aerial means participating in the 2014 campaign

STATE OWNED MEANS			
AIRCRAFT	*LARGE*	CL-215	10
		CL-415	5
	SMALL	PEZETEL	18
HELICOPTERS		CHINOOK	2
		BK 117 CL	3
		AS 332 L1 SUPER PUMA	2
		TOTAL	**38**
HIRED MEANS			
HELICOPTERS		H/P SIKORSKY 64	3
		H/P KA-32	9
		TOTAL	**12**

Table 9. Mutual assistance in 2014 in Greece

Aircraft No	Type	EU State	Date	Region of incident	No of Drops
PELICAN 38	CL-415	FR	27/08/2014	Pelasgia Stylidas/Perfecture of Fthiotida/Central Greece	10
PELICAN 32	CL-415	FR	27/08/2014	Pelasgia Stylidas/Perfecture of Fthiotida/Central Greece	10
97 FZBMB	BEECH CRAFT 200	FR	27/08/2014	Pelasgia Stylidas/Perfecture of Fthiotida/Central Greece	Coordination
97 FZBMB	BEECH CRAFT 200	FR	27/08/2014	Zerbisia Oichalias/Perfecture of Messinia/Peloponnesus	Coordination
97 FZBMB	BEECH CRAFT 200	FR	27/08/2014	Kalochori Kalabakas /Perfecture of Trikala/Thessaly	Coordination



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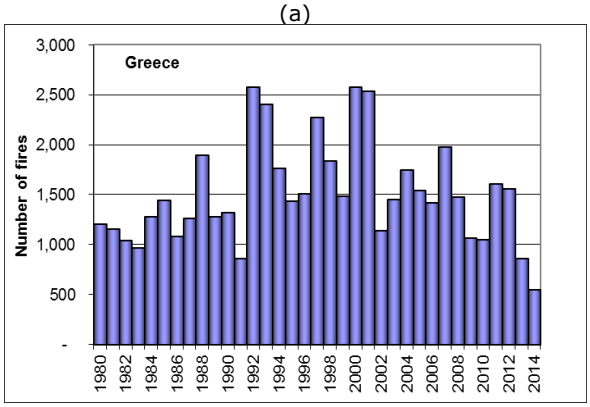

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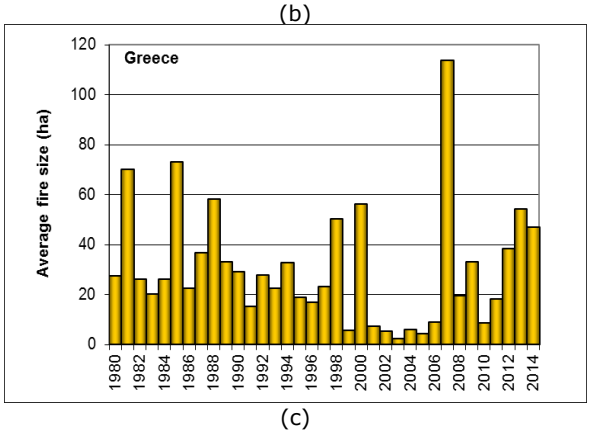

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Figure 22. Burnt areas (a), number of fires (b) and average fire size (c) in Greece from 1980 to 2014.

Operations of mutual assistance

During the fire campaign, the international mechanism was activated as shown in the following Table 9 above.

Injuries and loss of human lives

During the fire campaign of 2014, three (3) persons suffered from burns (1 citizen and 2 firefighters), and fourteen (14) persons (fire fighters) were injured. Furthermore, two CL-415 from Italy and two CL-415 from Croatia participated with three drops each, in a drill at the beginning of June (02/06/2014), that took place in the Stefani/Perfecture of Viotia/Central Greece.

(Source: Ministry of Reconstruction of Production, Environment and Energy; Directorate General for the Protection and Development of Forests and the Rural Environment, Greece)

2.2.12 **Hungary**

Fire danger in the 2014 fire season

FWI derived data and values were reported throughout the whole fire season by the Forestry Directorate (FD). FD has been using JRC's data service to monitor the daily fire danger situation.

Forest fire hazard strongly depends on weather conditions. There were no extreme weather situations in 2014. We may characterize the whole year with lots of rain. A short drought period occurred in mid-March which lasted for three weeks only.

There were some short periods (days) when the FWI values reached the "extreme" level in summer, but there were no fire bans ordered by the Forestry Directorate.

Fire occurrence and affected surfaces

Forest fire data are collected in cooperation with the disaster management authority. Data collected on the spot by fire fighters are uploaded to the database weekly, and if needed it can be done day-to-day. Forest fire data are prepared and analysed with an automated GIS method and checked on the spot by the forest authority.

The gathered fire data are processed and evaluated by size, date, cause, duration of fires, and they are then compared with traditions in forest management processes and the behaviour of visitors and hikers in the forest land area. Data from 2007 are shown in Table 10.

Table 10. Number of fires and burnt areas

Year	*Total number of wildfires*	*Forest fires*		*Other land types*
		Number	*Burned area (ha)*	*Number*
2007	6691	603	4636	6088
2008	6639	502	2404	6137
2009	8658	608	6463	8050
2010	3120	109	878	3011
2011*	8436	2021	8055	6415
2012*	21581	2657	13978	18924
2013*	4602	761	1955	3841
2014*	5783	1042	4454	4741
**From 2011 Fire Database linking between Forestry Directorate and Fire Service*				

A total of 1 042 forest fires were reported with a total burnt area of 4 454 ha in 2014. The number of fires and the total burnt area were lower compared to previous years, which can be seen in Table 10. The reasons can be found in climate extremes, agricultural and forest management methods and especially socio-economic circumstances.

The worst affected regions were the north part of Hungary close to agricultural areas and in the Great Plain in the centre of the country, where more than 30% of the forest fires occurred. Figure 23 shows the locations of forest fires in Hungary in endangered periods of the year.

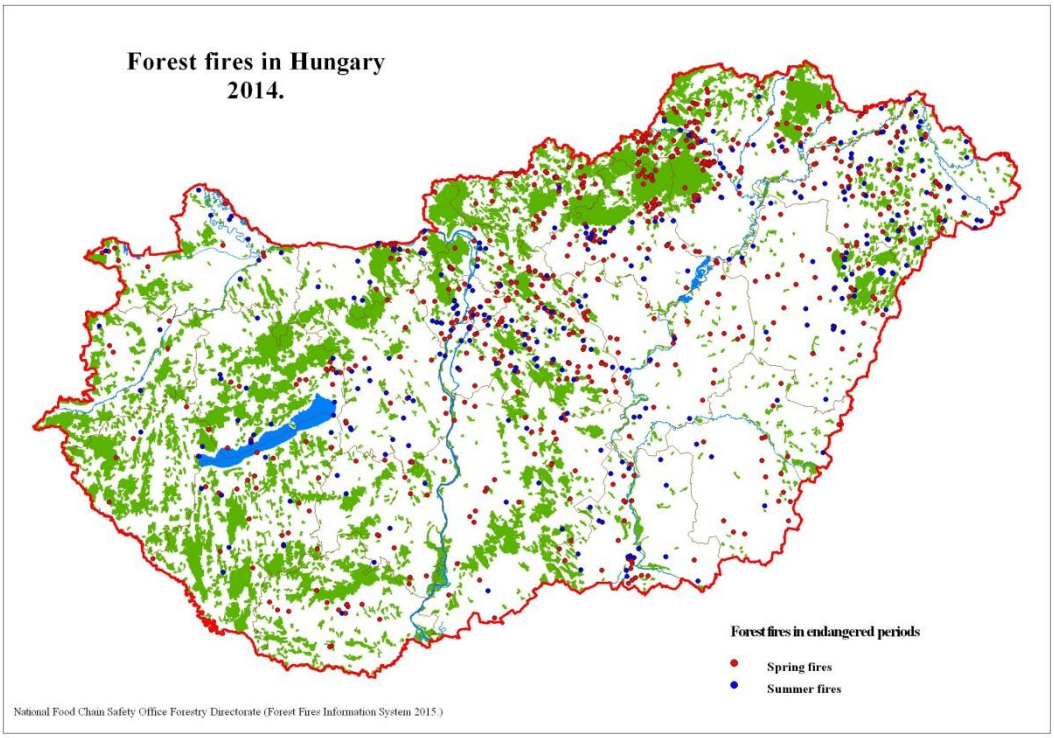


Figure 23. Locations of forest fires in Hungary in 2014

98% of forest fires are surface fires, as shown in Table 11. Surface fires, when surface litter and other dead vegetal parts and smaller shrubs burn, have been common in Hungarian forests. They can develop at any time over the whole fire season. Canopy fires mostly develop in coniferous forests in the summer period. Ground fires are not significant in Hungary.

Table 11. Fires in Hungary 2014 by fire type

Type of forest fire	Number of fires	Total burnt area (ha)
Ground fires	4	1
Surface fires	1034	4440
Crown fires	4	13
Total	1042	4454

The average proportion of fires smaller than 1 hectare is almost 47%. The average total burnt area was 4.2 hectares in 2014, which is similar to previous years. In 2014 there were only 9 fire events when more than 50 hectares were burnt. In most cases about 20% of the total burnt area is forest stands.

Small fires are usually low intensity surface fires where dry grass and small twigs are burning. In 2014 there were five fire events where more than 100 hectares were burnt. The yearly trends in terms of number of fires and burnt area during the last 15 years in Hungary are shown in Figure 25 below.

Fire Causes

99 % of forest fires are human induced (negligence or arson). Most fires are induced by negligence (adults and infants) and only a small proportion of fires are caused by arsonists. Typical forest fire causes are the incorrectly extinguished fires of hikers, and illicit agricultural fires.

Figure 24 represents the tendencies experienced in recent years that there are two most endangered forest fire periods during the year.

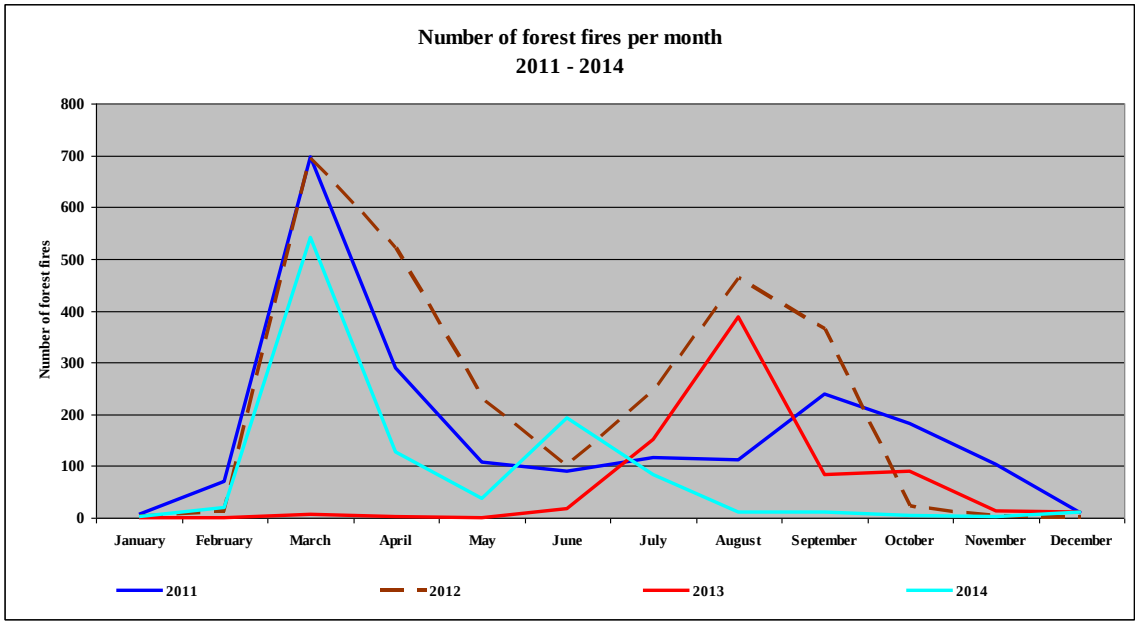


Figure 24. Number of fires per month in Hungary 2011-2014

"Traditional" grassland use includes burning methods in early spring, which can accidentally spread to nearby forest. These fires usually burn between February and April, after snow-break. Though burning has lost its importance these days, it prevails as a traditional early spring grassland management method. Negligently lit and unattended grassland fire may spread to forest lands nearby. Vegetation is not green yet in this period of the year, and in addition a large amount of dry leaves and dry herbs is located on the ground, that can easily go up in flames.

Although the total burnt area reached high values in the past few years, we can say that they were only surface fires which did not cause serious damage in forests stands.

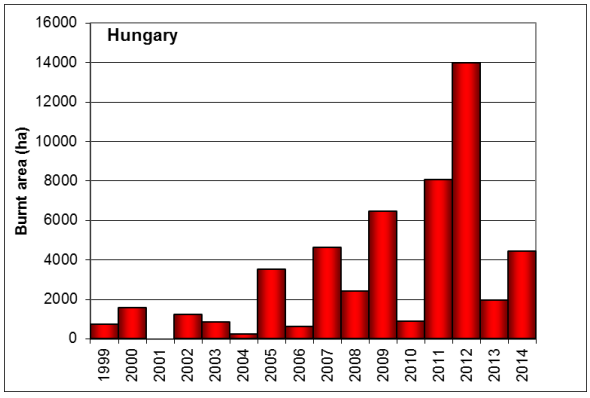
Spring vegetation fires usually burn with low or medium intensity in broadleaf forests, juvenile growth, shrubs and grasslands. Fire totally or partially consumes forests and causes serious harm. 40-45 % of spring fires burn in northern areas (Borsod-Abaúj-Zemplén County, Heves County, Nógrád County) which indicates these areas as high forest fire danger zones. In these areas not only traditional grassland management methods, but other social-economic factors add to forest fire danger.

Unlike spring fires, summer fires usually burn in the Great Hungarian Plain.

Studying the statistics we can see that a total of 756 hectares of forest were burned or affected by fire during 2014. In addition, more than 2 813 hectares of grass vegetation and 885 hectares of bush vegetation were destroyed in forest fires.

Table 12. Fires by forest type

Forest type	Total burnt area (ha)
Forested land	**756**
Other wooded land	**885**
Other land	**2813**
Total	**4454**



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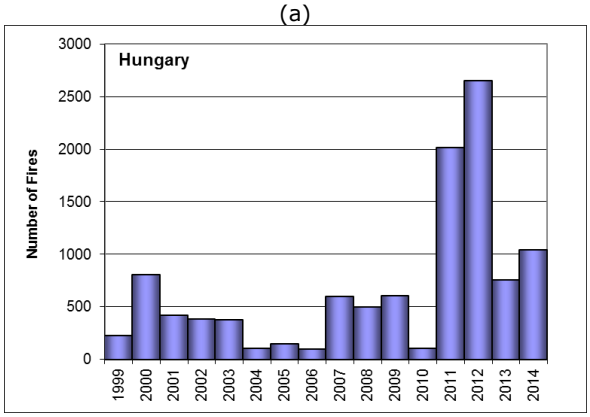

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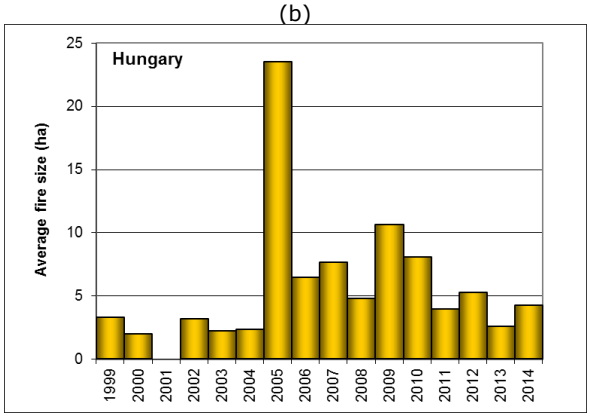

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Figure 25. Burnt areas (a), number of fires (b) and average fire size (c) in Hungary from 1999 to 2014.

Fire fighting means

Fires were usually extinguished in less than an hour after the alarm. The fire service arrived at the fire in 30 minutes on average. Small fires are extinguished within half an hour.

Fire prevention activities and fire information campaigns

There is a cooperation agreement between the Fire Service and the Forest Authority. National Fire Prevention Committee established by the government has been monitoring all fire prevention activities and the implementation of fire awareness raising campaign.

We are now starting a new fire prevention project in Hungary. A FIRELIFE project started in 2014 (the first one in Hungary), which won the support of the LIFE "information and communication" programme. Project duration is 2014-2018.

In the frame of the project we wish to reach all the specified target groups who may cause wildfires negligently or intentionally. Our project is aiming to enhance effective, proactive and continuous forest fire prevention activity in Hungary. In the first axis we wish to elaborate and provide targeted information and messages on the basis of an up-to-date communication framework-plan. Some target groups will be contacted personally.

In order to extend the range of available communication channels and better reach the specified target groups, in the second axis we are planning training courses for teachers, social workers and farm-stead caretakers. Training will also be provided for forest fire prevention experts – foresters, conservationists, fire fighters – through practical indoor and outdoor studies. The courses promote building relationships and better inter-agency cooperation on forest fire prevention.

Operations of mutual assistance and loss of human lives

There were no casualties among fire fighters or civilian people during fire fighting in 2014. Fire service equipment was not heavily damaged. No death or personal injury occurred during fire fighting in 2014. Neither Fire Service nor Forest Authority served mutual assistance last year.

(Source: National Food Chain Safety Office; Forestry Directorate).

2.2.13 **Ireland**

Introduction

2014 saw a very low level of fire activity in Ireland, largely as a consequence of wet weather conditions in Early Spring (March/April). Usually vegetation conditions are most problematic regarding fire around this time. In Ireland, most if not all fires are thought to be started by humans, either intentionally or accidentally, and ignition pattern and general fire risk are greatly influenced by prevailing weather conditions.

Fire incidence levels

During 2014, the area of open land affected by fire is thought to be less than 5 000 ha. Most weather systems during the 2014 fire season were westerly, and humid by nature, and this is thought to have greatly helped to moderate ignition patterns by farmers, and also moderate fire incidence and behaviour.

Less than 100 ha of forest is known to have been lost to fire during 2014, although over 7 000 ha was lost to wind damage during severe storms in February 2014. Unusually, forests are known to have been damaged by fire during September 2014, which is a significant development, indicating a strong shift away from spring burning by farmers, to autumn burning, when suitable conditions became available in September.

Most fires take place in upland types habitats, with typical fuels being upland grasses, Calluna Heather and Gorse (Ulex).

Total losses	**Forest**	**Non-Forest land**
	100 ha (approx)	< 5000 ha (estimated)

Fire prevention activities

Following from 2013, fire prevention activities by DAFM and partner agencies continued, with a major emphasis being placed on landowner behaviour and attitudes in relation to fire. Changes in key farmer behaviour arising from this were visible during 2014, including an increase in uncharacteristic autumn burning by farmers, and a marked increase in prescribed burning notification calls to emergency services by farmers reporting legitimate burning operations. This increase was up to 600% in some regions, notably in the South west.

Fire warning system

A revised fire warning system was developed based on standard weather warnings in January 2014, and was in operation by late February. This system is operated by a designated Fire Liaison Officer during the fire season by the Department of Agriculture, food and the Marine, and is designed to complement existing international systems such as EFFIS and FWI. Risk assessment is carried out daily by Forest Service Personnel and incorporates key elements such as Fine fuel Moisture Code condition, general meteorological analysis, recent fire response and prescribed fire notification activity.

During 2014, Forest Service issued five Fire Warning circulars to the Irish Forestry Sector. These specify the level of risk projected (Green, Yellow, Orange, Red) and the types of action required by forest owners and managers to mitigate this risk. A number of circulars were issued to the Forest industry during 2014 fire season, specifying the prevailing fire risk, and outlining the measures to be taken by landowners and managers. The fire warning colour status is displayed daily on the Teagasc (Agriculture Advisory Service) Website. Four Condition Orange (High risk) fire warning circulars were issued during 2014. No Condition Red warnings were issued. This system has been developed further during 2015.

Prescribed Fire Development

During 2014 one Forest Service Staff member undertook training on Technical Fire Management with the Catalan Fire Service, including training on prescribed fire management and suppression fire use that can be used to reduce the outcomes of wildfires. Techniques and doctrines leaned in Catalonia are now being incorporated into practice and guidance in Ireland. Forest Service Staff have since been involved in developing and delivering prescribed fire training and awareness measures on a pilot basis in the Southwest, and in delivering training support of the GLAS scheme a new agri-environment measure.

The Department coordinates and facilitates wildfire prevention planning and awareness measures, and issues guidance to the relevant sectors affected. DAFM produced the Prescribed Burning Code of Practice – Ireland in 2011, to guide the use of fire in agriculture and related sectors, and this guidance is now being reviewed and updated, arising from the training and techniques adapted from Catalonia.

Interagency Co-operation and mutual assistance

A number of agencies have been heavily involved in the development of wildfire interagency groups in fire prone counties, with pilot groups operating in Cork, Kerry and Laois. These groups permit coordination and the sharing of data and information for fire prevention and mitigation activities at local level, and to permit better targeted fire prevention and enforcement measures on the ground.

DAFM facilitated a seminar in Portlaoise in February 2014, designed to highlight the operation of Wildfire Partnership groups, and to demonstrate the effectiveness of these groups in reducing fire incidence, and encouraging adoption of safe fire use practice by landowners in upland areas.

In 2014 DAFM staff also participated in a European fire risk modelling and networking exercise (FRISK-GO), and provided one staff member to a European Forest Institute advisory exchange to Norway in November 2014. Irish Authorities continue to maintain strong links and networks with fire management agencies in the UK.

International exchange and contact is critical to the rapid development of appropriate measures for Ireland, based on lessons learned and examples in other European regions.

Given ongoing changes in land management practice, demographics and climate change projections, wildfire is likely to remain a significant issue into the future in Ireland. A major emphasis is therefore placed on the land management aspects of wildfire mitigation and policies and relevant schemes will hopefully take account of these requirements. Significant work remains in developing a wildfire management culture in Ireland appropriate to the scale and cyclical nature of the problem.

Injuries and loss of human lives

No lives or structures were lost as a consequence of wildfire in 2014.

(Source: Forest Service, Department of Agriculture, Food and the Marine, Ireland).

2.2.15 **Italy**

Fire occurrence and affected surfaces

In 2014 throughout the country there were 3 257 forest fires that burnt a total area of 36 125 hectares, of which 17 320 were wooded.

Compared with the period 2000-2013, both the number of forest fires (-53%) and the total burnt area (-55%) were lower than average. Wooded areas affected represent about half of the total burnt area for the year.

Similar to the previous year 2013, 2014 is among those less affected by fire, well below the long-term averages. This is in a large part due to the weather-climatic trends which were characterised by several periods of precipitation throughout the year.

Compared to 2013, the total number of forest fires increased by 11%, and the total burnt areas increased by 24%.

The total number of fires is lower (-63%) than the long-term average in the forty-year time series, which is almost 9 000 fires per year.

The total area affected by fire was at historically low levels (-66%), well below the long-term average, which stands at around 105 000 hectares.

The average size for an individual fire is about 11 hectares and is the only figure in line with the long-term values, a little lower (-8%) than the average of 12 ha.

The proportion of woodland affected was 48%, firmly in line with the long-term average of 47%.

Overall, the regional and national organization of AIB (Anti Incendio Boschivo) has demonstrated a proven and consistent organizational efficiency especially during periods of highest risk; to this we must add also the deterrent effect determined by the introduction of stricter legislation against agricultural burning of plant residues, which complements positively the usual activities of prevention and repression put in place to limit the impact of forest fires.

About 77% of fires and 93% of the total burnt area was concentrated in the southern regions. Sicily, Sardinia and Calabria were the most affected regions, together totalling about 58% of the number of fires, with about 85% of the total area and over 80% of the woodland burnt by fire.

The total area affected by fire in the region of Sicily accounted for 57% of the national total and 52% of the wooded area: here the aerial national fleet concentrates most of its efforts, with 478 out of a total of 749 missions made during the year.

Table 13. Number of fires and burnt area in Italy by region in 2014

Year 2014	Num. fires	Burnt area (ha)			
		Forest	Non-forest	Total	Av. fire size
PIEMONTE	109	57	109	166	1.5
VALLE D'AOSTA	6	3	4	7	1.2
LOMBARDIA	93	147	309	456	4.9
TRENTINO - A.ADIGE	10	2	0	2	0.2
VENETO	15	10	1	11	0.7
FRIULI V.GIULIA	12	11	7	18	1.5
LIGURIA	97	124	99	223	2.3
EMILIA ROMAGNA	26	10	26	36	1.4
TOSCANA	113	33	46	79	0.7
UMBRIA	7	1	2	3	0.4
MARCHE	4	30	32	62	15.5
LAZIO	211	953	186	1139	5.4
ABRUZZO	21	31	19	50	2.4
MOLISE	32	18	127	145	4.5
CAMPANIA	307	835	193	1028	3.3
PUGLIA	217	635	536	1171	5.4
BASILICATA	68	271	247	518	7.6
CALABRIA	492	2400	1137	3537	7.2
SICILIA	938	9079	11476	20555	21.9
SARDEGNA	479	2670	4249	6919	14.4
TOTAL	**3257**	**17320**	**18805**	**36125**	**11.1**
NORTH	368	364	555	919	2.5
CENTRE	388	1066	412	1478	3.8
SUD+ISOLE	2501	15890	17838	33728	13.5
ITALIA	**3257**	**17320**	**18805**	**36125**	**11.1**

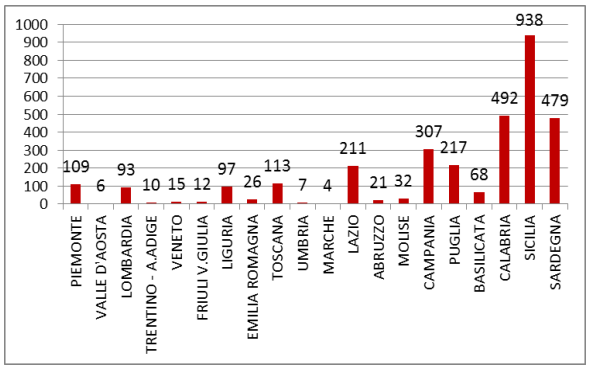


Figure 26. Number of fires by region in Italy in 2014.

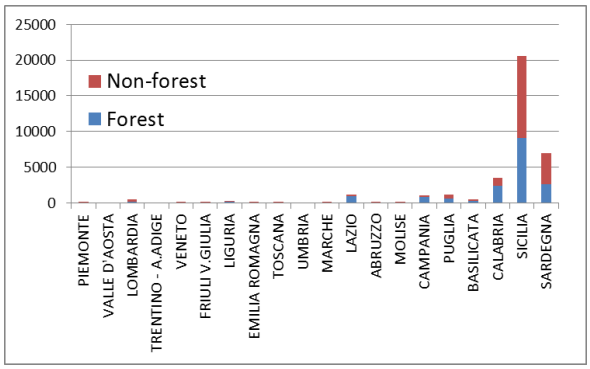
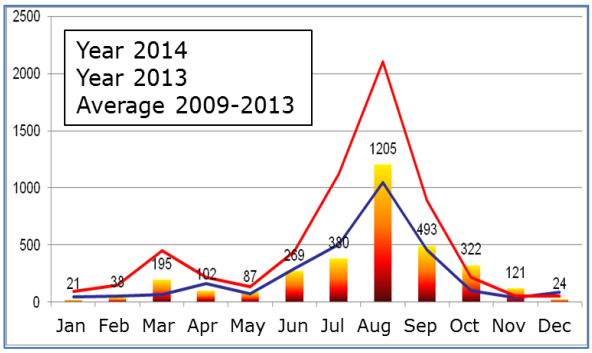


Figure 27. Burnt area by region in Italy in 2014

Table 14. Number of fires and burnt area by month

Year 2014	Num. fires	Burnt area (ha)			
		Forest	Non-forest	Total	Av. fire size
January	21	13	2	15	0.7
February	38	51	76	127	3.3
March	195	294	305	599	3.1
April	102	167	118	285	2.8
May	87	104	134	238	2.7
June	269	2092	2243	4335	16.1
July	380	3020	3956	6976	18.4
August	1205	6221	5857	12078	10.0
September	493	2322	3494	5816	11.8
October	322	2076	2325	4401	13.7
November	121	912	273	1185	9.8
December	24	48	22	70	2.9
TOTAL	**3257**	**17320**	**18805**	**36125**	**11.1**



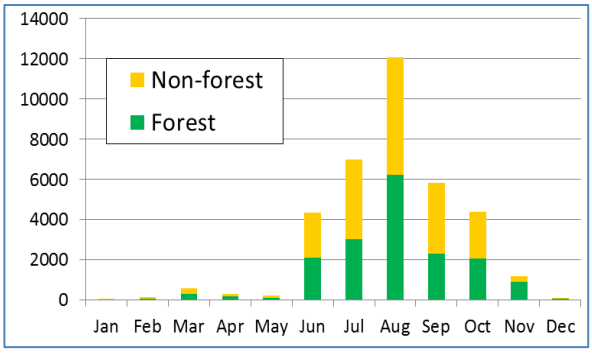
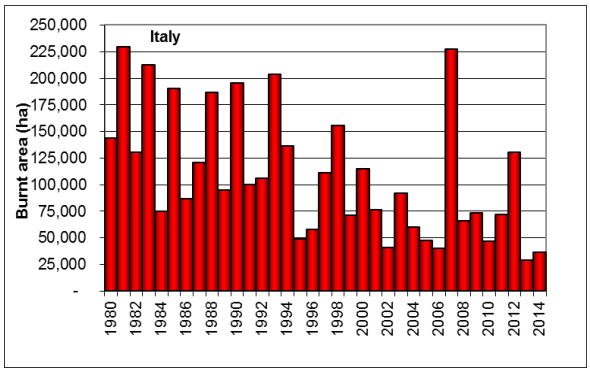


Figure 28. Number of fires and burnt area per month in 2014.

The yearly trends in terms of numbers of fires and burnt areas in Italy since 1980 are shown in Figure 29.



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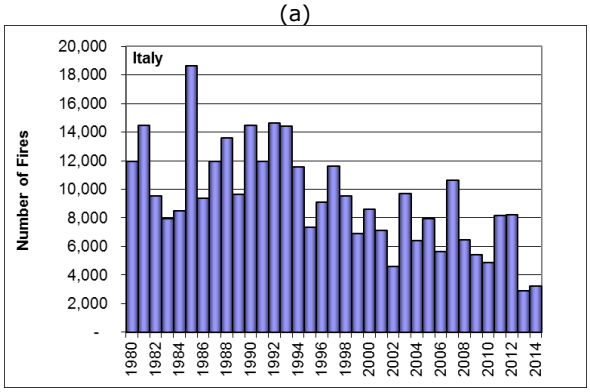

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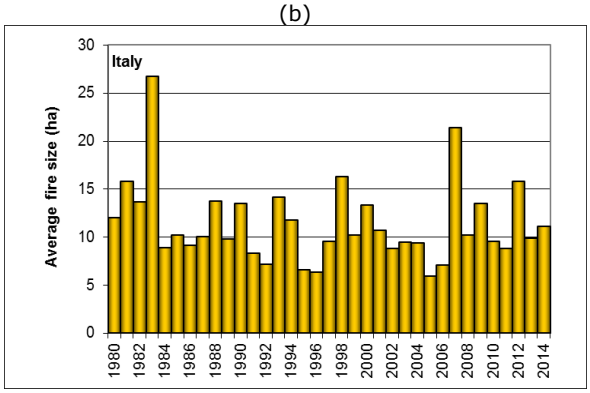

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Figure 29. Burnt areas (a), number of fires (b) and average fire size (c) in Italy from 1980 to 2014.

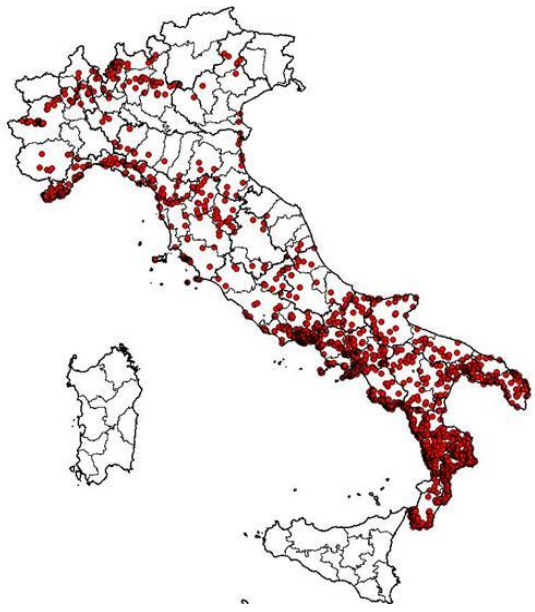
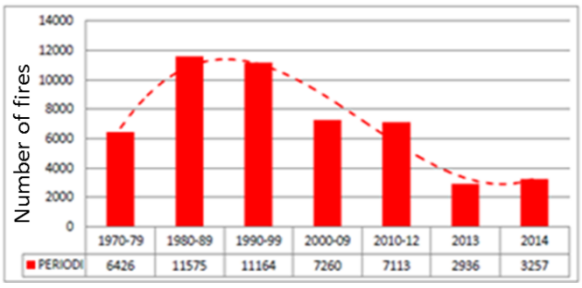
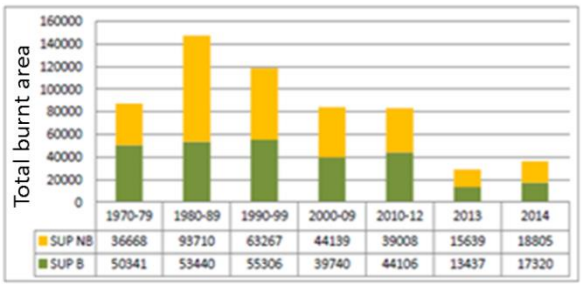


Figure 30. Map of fires in mainland Italy in 2014.

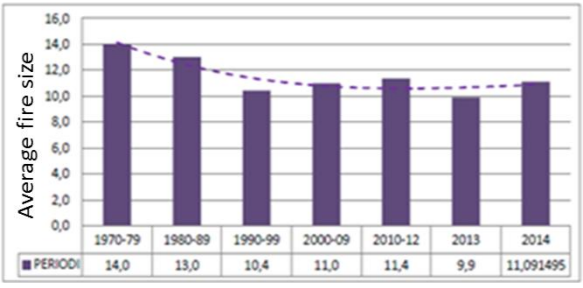
The complete archive of data on forest fires collected by the *Corpo Forestale dello Stato* (Italian forest Corps) is available from 1970 to present. The number of fires increased in the 1970s, then remained less than 10 000 per year until 1978, when there were over 11 000 fires, to remain consistently high in the 1980s and 1990s. Between 2000 and 2007 the average number of fires has dropped by one-third compared to the previous two decades.



The burnt wooded area has been consistent since the early 1970s and has remained above the 50 000 hectare mark as an average value over the last three decades, dropping below 40 000 ha only in recent years since 2000. The burnt non-wooded area was relatively low in the first decade, with an average of 36 000 hectares per year; it reached its maximum in the period 1980-89 with over 93 000 hectares per year and decreased in the third decade, with an average of over 63 000 hectares, falling further to around 44 000 ha in recent years from 2000 and finally to around 30 000 ha from 2010 onwards.



The average burnt area per fire has decreased progressively over the decades, from around 14.0 ha in the 1970s, to 13.0 in the 1980s, and 10.4 for the period 1990-1999, with a slight rise in the years 2000-2009 and from 2010 to 11 hectares.



The most critical situations were recorded in 1985 for the number of fires (18 664), in 2007 for forest area affected by fire (116 602 hectares) and in 1981 for total burnt area (229 850 ha).

Fire prevention activities

The Italian forest Corps, on the activity of prevention and suppression of arson crimes, has given impetus to both the central organization and outstations, through the *Nucleo Investigativo Antincendi Boschivi* (NIAB). This was established in 2000 by the Inspectorate general, which operates throughout the national territory, with the exception of special administrative regions and the autonomous provinces.

The *Nucleo* is responsible for coordination and direction of information-investigation and analysis in relation to forest fires and provides operational, investigative and logistical support to the territorial offices of the Italian forest Corps, also through the research of evidence collected at the scene of fires and the analysis of residues of explosives and triggers.

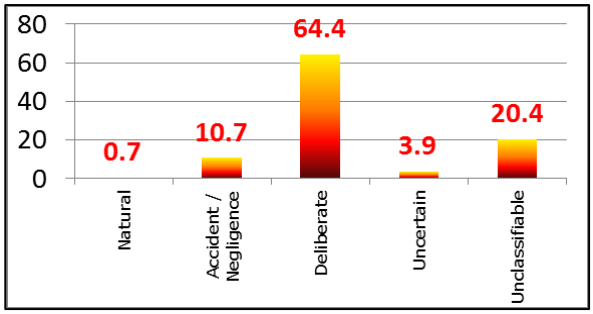


Figure 31. Fire causes in Italy in 2014

Actions against forest fire offences made by the territorial Italian forest Corps in 2014, made it possible to report 133 people to the Judicial Authority, including 117 for negligence fires and 16 for arson. Of these, 3 people were arrested.

In total, over the period 2000-2014, 5 606 people have been reported to the Judicial Authority for forest fire offences, of which 174 were arrested in the act or were subjected to custodial measures.

Innovative technologies of CFS in the field of AIB: The Method of Geometric Evidence

The CFS (*Corpo forestale dello Stato*: Italian forest Corps) has set up a pilot project financed with EU funds related to the National Operational Programme PON-Security 2007-2013, through which it intends to adopt an innovative method for automatic detection of the onset of a forest fire, called

for brevity: MEG - Acronym for "*Metodo delle evidenze geometriche*" (Method of geometrical evidence).

The Italian forest Corps Investigative Unit of the prevention of forest fires (*Nucleo Investigativo Antincendi Boschivi*: NIAB), was formed in 2000 to trial, introduce and disseminate to the territorial units of the Corps, innovative solutions to address the problem of forest fires, in order to understand the causes and motivations, aimed at identification of the perpetrators of forest fires, as contemplated by the Italian penal Code.

The project was born from an empirical, but effective experiment, carried out by the CFS staff of the Basilicata Region, using aerial photos taken by a reconnaissance plane made during the fire, superimposed by hand on the geometric profiles of the theoretical propagation of the flame front available in the literature and in use for some time in the Administration, to identify the most likely area of onset of the event on which to focus the activities of finding the possible triggers or materials used.

The project, at an advanced stage of implementation, provides for the formulation of a numerical algorithm based on mapping software and a procedure for automatic detection of the point of onset of a bushfire starting from the perimeter of the area covered by fire, usually performed by personnel of the Command Station in charge of the task. To this end the calculation model, called TIGER, will be made available. This was developed by the Department of Arboriculture University Federico II di Napoli for the simulation of the propagation of a forest fire, with reference to environmental factors and parameters which characterise the particular context of the fire, thanks to a special agreement/contract between CFS and the university itself, as part of the Project. In practice, with the help of this tool it is possible to make a kind of "reverse-engineering" of the dynamics of the fire, through the analysis of the environmental parameters (wind orography and state of vegetation) and of the interventions against it that have determined the evolutionary dynamics of the fire, used to identify the area of origin.

The model allows users to simulate a situation (or "scenario") of a forest fire in reverse, starting from a set of appropriate available data. The minimum information required are a map of the values of terrain elevation of type matrix ("grid") designed to represent the area affected by fire and immediately surrounding areas, as well as other information useful to determine the different conditions of propensity to fire (degree of flammability), for example, a map of the vegetation.

The MEG system will be appropriately calibrated and tested on some of the main types of ecosystems such as:

- coastal area with maquis/macchia shrubland
- coastal area with mixed pine forest and macchia
- hilly area with vegetation typical of the Apennines

In order to operate the model TIGER needs the input of a series of spatial data relating to:

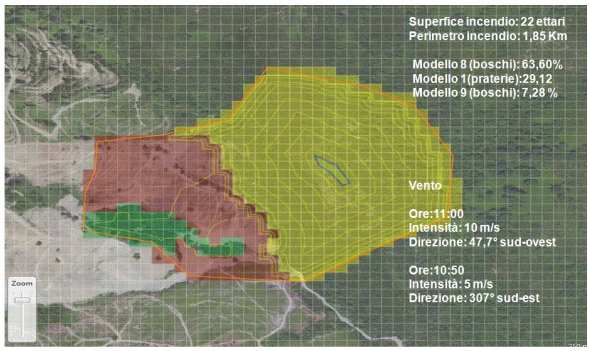
- a DEM (digital elevation map) with a of at least 20 m
- a map of classification of the fuel at an appropriate level of spatial detail

In order to identify the point of onset of the forest fire, the following information is then integrated:

- geographic data at appropriate local scale, particularly concerning the road and technological networks, buildings and the main vegetation types;
- georeferenced orthophotographs of the area for the purpose of photo-interpretation

The output of the pattern constitutes polygons of geographical coordinates in georeferenced KML format, representing the perimeters of the fire front propagated backwards in time for each simulation.

The software procedure can be made available in the first instance to the territorial offices located in the *regioni obiettivo convergenza* of PON (Campania, Puglia and Calabria) on Desktop PC or laptop or tablet used by operators of the Corpo, after necessary training.



(Source: Italian Ministry of Agriculture, Food and Forest Policies, Italian Forest Corps, Italy).

2.2.16 **Latvia**

Fire danger in the 2014 fire season

In 2014 the forest flammable period was set from 17th of April and continued until September 15.

Fire occurrence and affected surfaces

In total, 698 forest fires were discovered and extinguished in 2014 during which 591 hectares were burnt. Of these, 276 hectares of forest, 208 hectares of young stands and 107 hectares of other wooded land were affected. Table 15 shows the distribution of numbers of fires and burnt areas by month during the fire season, and Figure 32 shows the locations of the fires in 2014.

In 77 % of cases the fires were detected and put out before the burned area had reached 1 hectare.

Traditionally, the highest number of forest fires was in the vicinity of two of Latvia's biggest cities – Riga and Daugavpils (227 fires, 146.66 hectares affected area, and 147 fires, 95.13 hectares, respectively).

In 2014 the State fire and rescue service extinguished 4187 wildfires. The total burnt area is nearly 6 818 hectares.

Table 15. Number of fires and burnt areas by month

Month	*Number of forest fires*	*Burnt area (ha)*
February	1	0.01
March	100	123.60
April	332	316.48
May	82	45.62
June	24	5.55
July	100	78.01
August	32	9.08
September	14	6.47
October	9	6.31
November	1	0.01
December	3	0.05
Total	**698**	**591.19**

The yearly trends in terms of number of fires and burnt area during the last 21 years in Latvia are shown in Figure 33.

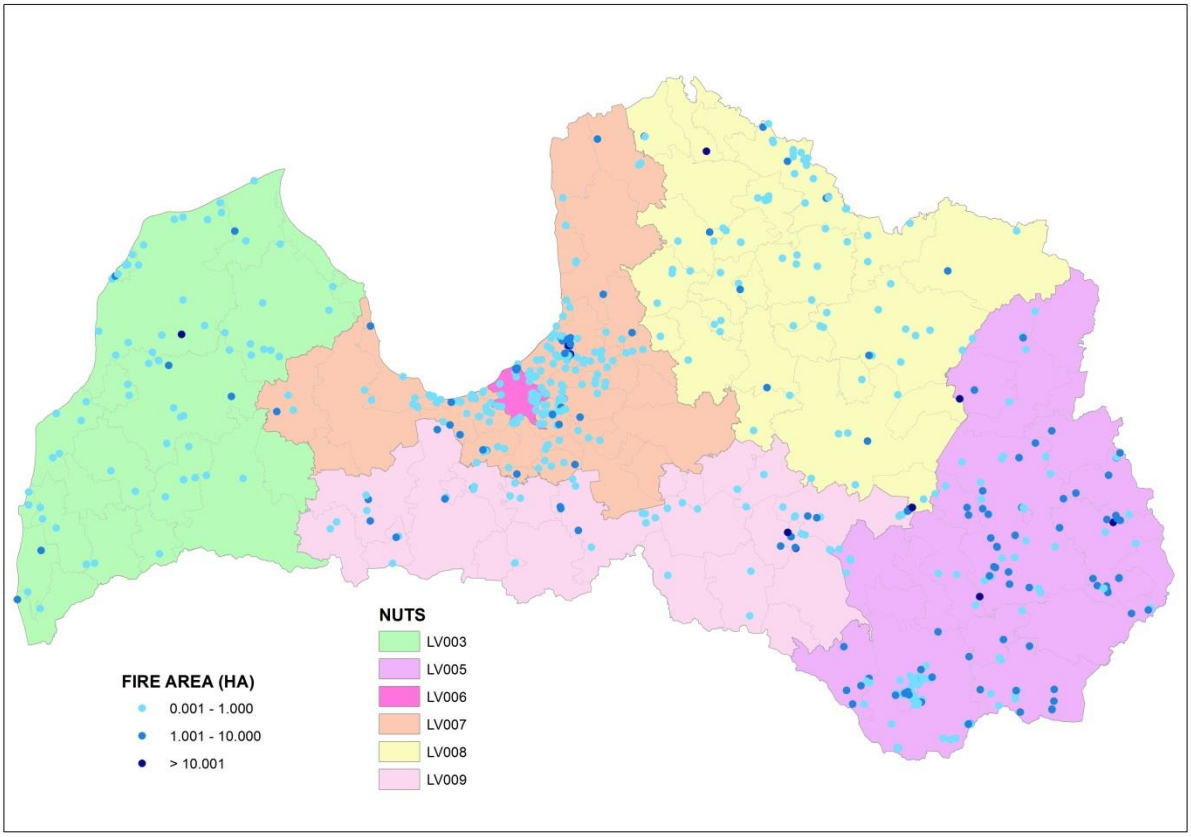
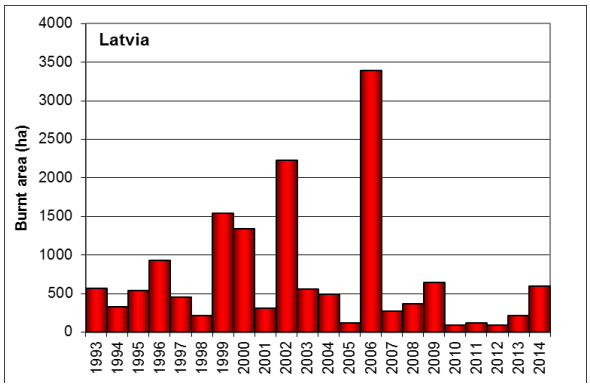


Figure 32. Map of forest fire locations in Latvia in 2014



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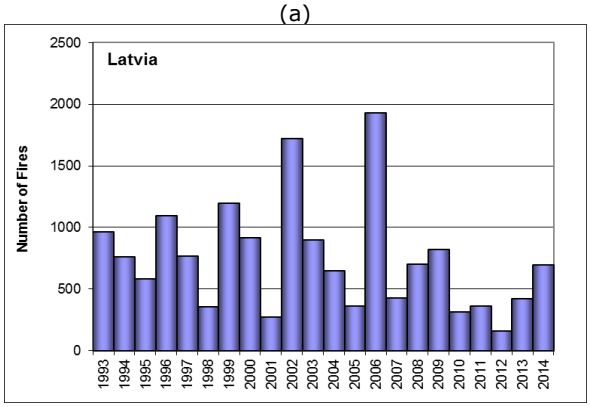

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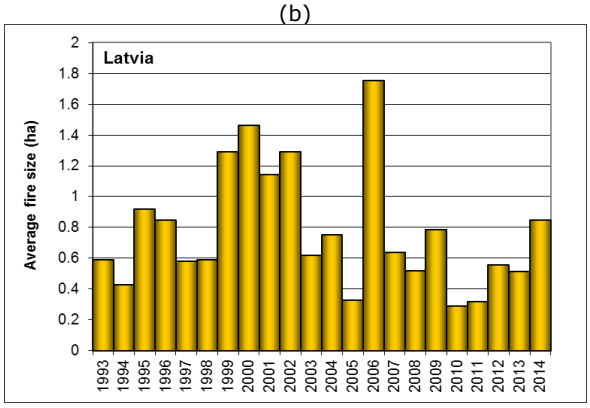


(c)

Figure 33. Burnt areas (a), number of fires (b) and average fire size (c) in Latvia from 1993 to 2014.

Preventive measures

Under the acts of law, fire prevention measures are imposed on forest owners (managers). In 2014 joint stock Company "Latvian state forests" which manages state-owned forests (1.59 million hectares) spent 77 300 Euro on fire preventive measures, and Ltd. company "Riga city forest" which manages forests belonging to Riga municipality (66.5 thousand hectares) spent 2 300 Euro (Table 16).

Table 16: Expenditure on fire prevention measures in Latvia in 2014

Title	*Costs, EUR*
Latvian State forest	
Creating new fire breaks, 0 km	0
Existing fire break cultivation, 3630km	73484
Water point, warning sign renovation	3816
Total	**77300**
Riga City Forest	
Creating new fire breaks, 28km	2300
Existing fire break cultivation, 520km	
Total	**79600**

New equipment

In 2014 State forest service bought 3 new MB Unimog U4000 forest fire trucks. The fire trucks were equipped in Lithuania, by company JSC "Iskada". At the moment each of the State Forest service heads of forestry (10) have at least one new fire truck.

(Source: State Forest Service, Forest Fire Control Unit, Latvia)

2.2.17 **Lithuania**

Fire danger in the 2014 fire season

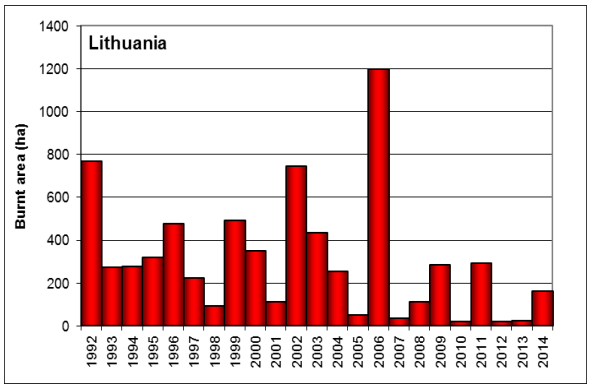
Forest fires during the year 2014 in Lithuania settled at a low level. The amount of wildfires and the total burnt area was low. The number of fires was influenced substantially by the weather conditions in spring and summer.

Fire occurrence and affected surfaces

In 2014, according to the data of the Directorate General of State Forests, 155 forest fires occurred and damaged 162 ha of forest. The highest number of forest fires occurred in April (28 %). The average fire area in 2014 increased dramatically because of 1 forest fire in the Curonian Spit National Park on 25/04/2014 in which 188 ha of forest land was burnt. All other fires were less than 2 ha. The total damage was estimated to be 13 million euro. The yearly trends in terms of number of fires and burnt area during the last 25 years in Lithuania are shown in Figure 34 below.

Fire prevention activities

The Directorate General of State Forests under the Ministry of Environment organizes the establishment of the uniform system of state fire prevention protection measures. Annual contracts between Lithuanian Hydrometeorological Service and Directorate General of State Forests are signed concerning calculations of complex forest fire figures and pronouncements of classes of fire rates in each territory of state forest enterprise. A Forest Fire Danger Map is updated daily (at 12 a.m.) from April to September and can be found at the site http://www.meteo.lt/misku_gaisr_mu.php.
Every year state forest enterprises, together with the Fire and Rescue Services and Armed Forces, organize educational training in the forest in order to check how organizations are able to organize forest fire extinction, manage difficult situations, control the actions, collaborate with each other and keep the connection. In order to sustain the system of general state fire protection measures, state forest enterprises budgeted 2 000 thousand EUR from their own funds in 2014, and 13.1 thousand km of firebreaks were mineralized. Automatic early warning systems for forest fire prevention "FireWatch" are used in 25 state forest enterprises having forests with high fire risk (total 25 central stands and 84 detectors). Forest fire detection systems help to detect forest fire focus coordinates with better precision, so that fire brigades can arrive at the fire faster, and extinguish the fire more efficiently.



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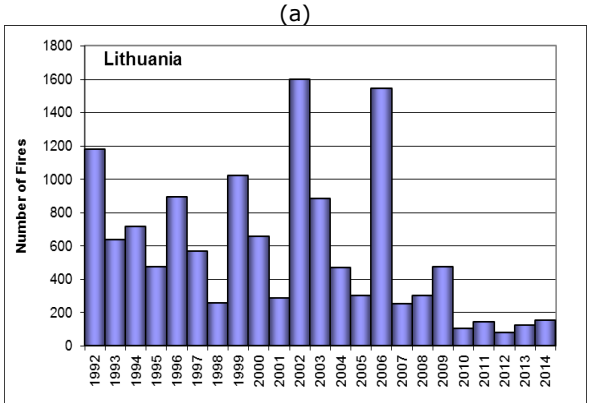

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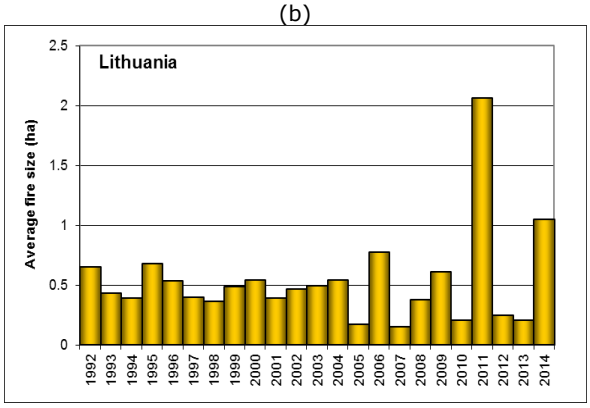


(c)

Figure 34. Burnt areas (a), number of fires (b) and average fire size (c) in Lithuania from 1992 to 2014.

Operations of mutual assistance and loss of human lives

No casualties were reported in Lithuania during the fire season of 2014. One operation of mutual assistance was taken during the suppression of the big forest fire on the Curonian Spit: Latvia was asked to send one helicopter with a water bucket to help to put out the fire.

(Source: Directorate General of State Forests of Lithuania, Forest department, Ministry of Environment of Lithuania).

2.2.18 **Norway**

Fire danger in the 2014 fire season

The fire index WBKZ is used in Norway. The fire season is normally from March to September. Fire danger in Norway varies from north to south since the country is 1 750 km long and there may be high forest fire index in one area and little or no fire risk in other areas in the same time.

Normally the fire season starts in the south-west in March-April. In the western part there are mainly brush-fires. In the southern part it is pines on poor soil that dries up quickly which are most commonly affected. The largest areas with forest are in the eastern part of Norway.

2014 was an abnormal year when there was a dry winter and no snow on the ground in parts of January and February. This combined with strong winds led to some major wildland fires which together took over 60 buildings in Flatanger and Froya (close to Trondheim).

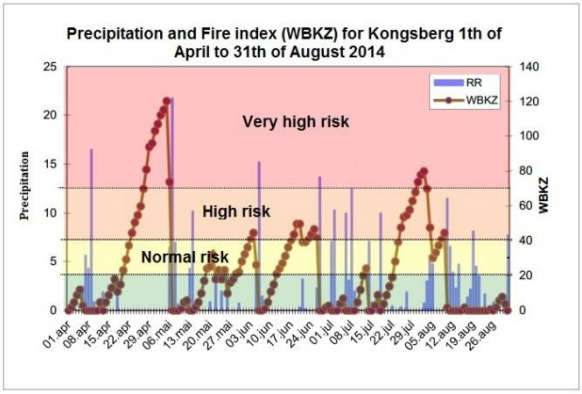


Figure 35 Fire Index in the southern part of Norway in 2014

Temperature

The average temperature was 1.7°C above the average for the Forest Fire season. July was 4.3°C above the normal.

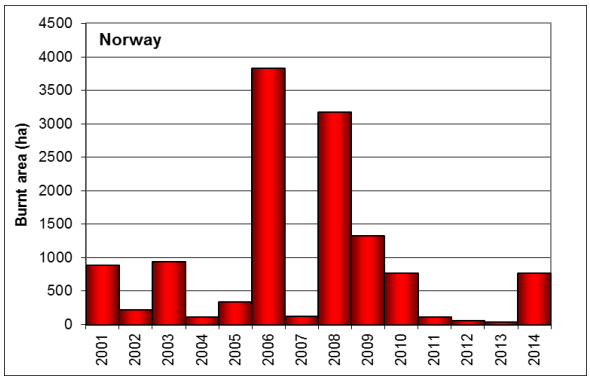
Precipitation

For the Forest Fire Season the precipitation was above the normal and April was very rainy with 125% above the normal. There were dry periods in June and July. There were large variations depending where you were in the country.

Fire in Nes 27–31 July 2014 (*Photo: Dag Botnen*)

Fire occurrence and affected surfaces

In 2014 there were 133 forest fires recorded in Norway; 88 ha of productive forest and 682 ha of other wooded land (wildland). There were 1103 fires recorded in brushes and grass (non-forest).



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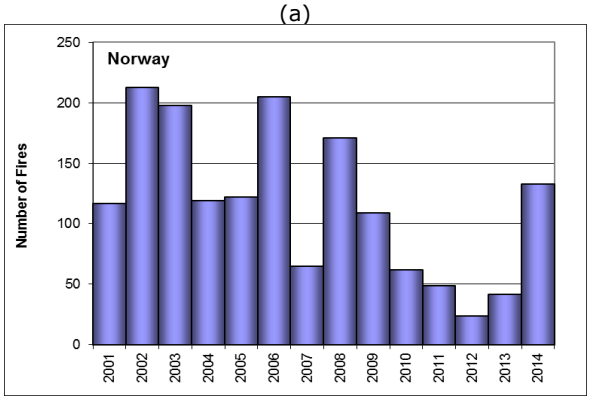

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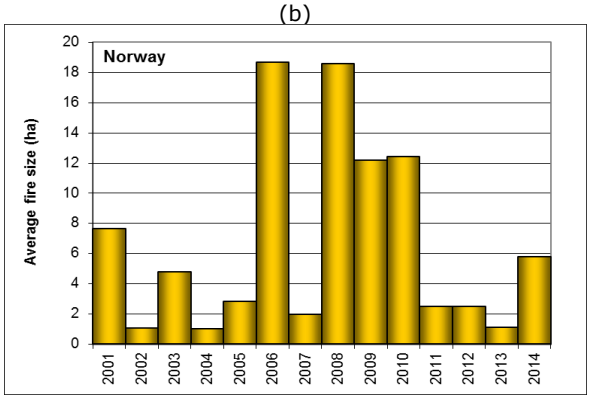


(c)

Figure 36. Burnt areas (a), number of fires (b) and average fire size (c) in Norway from 2001 to 2014

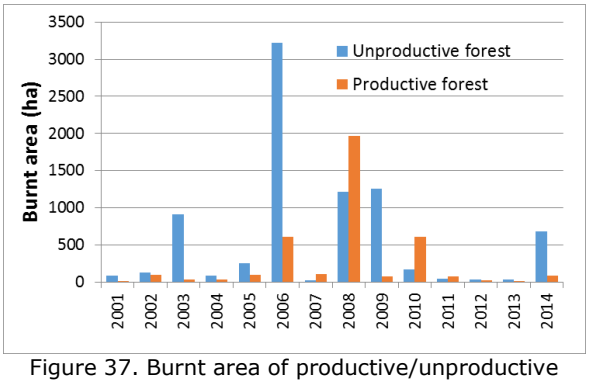


Figure 37. Burnt area of productive/unproductive forest in Norway 2001-2014

Fire prevention activities

The municipalities are responsible for the Fire Services in Norway and the Fire Service is responsible for prevention and action regarding forest fires. Some activities are assigned to Governmental Authorities.

The Fire Services are responsible for the following activities:

a. Monitoring the forest by air (plane);

b. Information campaigns;

c. Prohibit fire dangerous activity in periods with high Fire Index.

The Governmental Authorities are responsible for the following activities:

a. Provide information on the forest fire index through the internet (The Norwegian Meteorological Institute);

b. Provide information through television (Forecast) when the forest fire index is high (The Norwegian Meteorological Institute);

c. General prohibition on lighting fires in the forest or wildland in the period from 15 April to 15 September, regulated by law. (Directorate for Civil Protection).

Loss of human lives

No human lives were lost in fires related to Forest Fires in 2014.

Norway fire season 2014 (*Photo: John Arne Helleso*)

Fire fighting means and information campaigns

The Directorate for Civil Protection and Emergency Planning has an agreement with a private helicopter company for a Bell 214 with a 3000 litres bucket. This helicopter is available for Fire Services in the period from 15 April to 15 September (24/7).

In 2014, the helicopter(s) were used in 52 fires with around 200 hours in the air. The total use of helicopters came to 350 hours flying time (including exercises, etc.).

The Directorate for Civil Protection has established an expert team that supports the local fire chief officer when they have large forest fires and when the helicopter is used.

The Norwegian fire service consists of 4 000 full-time and 8 000 part-time firefighters where the fire department is an all-risk service. For those municipalities that have significant forest fire risk, there are groups established only for fighting forest fires. These groups are managed by the fire services.

Operations of mutual assistance

The agreement that Norway has with a private helicopter company was temporarily not applicable while the helicopters were in use for the forest fire in Sweden in the beginning of August 2014.

Norway fire season 2014 (*Photo: John Arne Helleso*)

(Source: Directorate for Civil Protection and Emergency Planning (DSB), Norway).

2.2.19 **Poland**

Fire danger in the 2014 fire season

The seasonal nature of the occurrence of fires is strictly related to the weather conditions. The diagrams (Figure 38-Figure 42) show the variations of air temperatures, precipitation, pine (*Pinus sylvestris* L.) litter moisture, relative air humidity and the national degree of forest fire danger risk (NDFFDR) in the 2014 fire season. They also present the number of fire outbreaks.

The mean monthly air temperatures were close to the long-term mean values in the entire country (2001-2010) and at 9 a.m. reached 16.6°C (the long-term mean is 16.0°C) and 21.4°C at 1 p.m. (the long-term mean is 21.0°C). In April air temperatures were higher (by about 1.6°C) than the long-term mean values for this month, and reached 10.7°C at 9 a.m. and 16.2°C at 1 p.m. May and June were a little cooler in comparison to the long-term mean values. In May the air temperature was on average 15.1ºC at 9 a.m. and 18.7ºC at 1 p.m., whereas in June it was 18.3°C and 21.9°C. The highest air temperatures were observed in July, and reached 23.0°C at 9 a.m. and as high as 27.8ºC at 1 p.m. These temperatures were higher by about 2.0°C than the decade average. In August the air temperature significantly decreased in comparison to July by over 4.5ºC in both of the observation times. A further decrease of air temperature took place in September, and the mean monthly reached 14.2ºC at 9 a.m. and 20.6ºC at 1 p.m. These temperatures were about 1.3°C higher than the long-term mean values for this month.

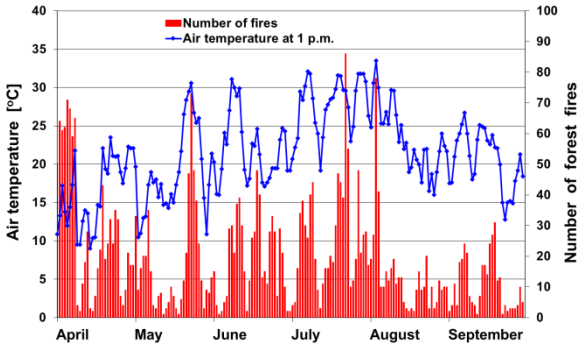


Figure 38. Air temperatures and numbers of forest fires in fire season 2014

The average precipitation level in the fire season was 2.1 mm (similar to the two last years) and was 0.6 mm lower in comparison to the period 2001-2010. It rained almost every day throughout the fire season, but the amounts of rainfall were not large. The average daily precipitation in April was at the level of the last year's (1.4 mm), but in May increased twice to the highest in the fire season (2.8 mm). The highest rainfall in May was on 18th (10.7 mm). In June the average daily precipitation decreased to 1.9 mm and was the lowest of the years 2012-2013 (3.2-3.4 mm daily). In rainy July and August the average precipitation level increased to 2.5 mm, but the highest rainfall was on 14th of August (11.4 mm daily). In September the average rainfall drew on the April level and reached 1.7 mm daily.

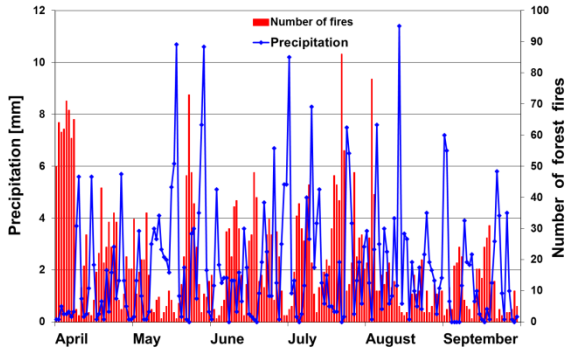


Figure 39. Precipitation and numbers of forest fires in fire season 2014

In some prognostic zones the first measurement of litter moisture began already on the 3rd of March, but in all only from the 17th of March. Mean litter moisture values in the 2014 fire season, just as in the last years, were similar to long-term mean values: 33% at 9 a.m. and 27% at 1 p.m. The lowest mean litter moisture values were in June and July, with values of 29-30% at 9 a.m. and 20-25% at 1 p.m. The highest monthly mean litter moisture values were in August and September, with values of 36% at 9 a.m. and 29-31% at 1 p.m.

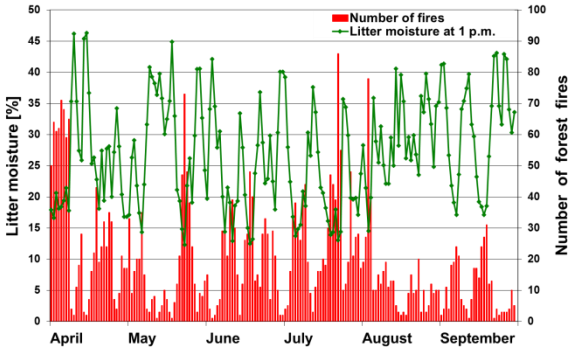


Figure 40. Litter moisture and numbers of forest fires in fire season 2014

The mean relative air humidity for the fire season 2014 was also similar to the long-term values and reached 77% at 9 a.m. and 57% at 1 p.m. Relative air humidity was also close to the yearly average in both times of observation in April, May and June; i.e. from 70-77% at 9 a.m. and 55-58% at 1 p.m. In

July relative air humidity decreased to the lowest level and reached 69% at 9 a.m. and 50% at 1 p.m. In the next two months relative air humidity increased and reached the highest monthly mean values in September: 89% at 9 a.m. and 63% at 1 p.m.

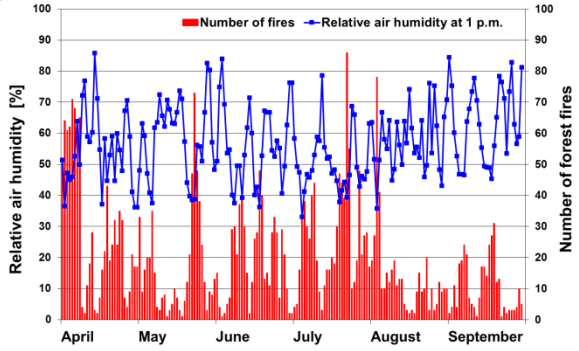


Figure 41. Relative air humidity and numbers of forest fires in fire season 2014

The 2014 fire season was characterized by undistinguished forest fire risk, because the average national degree of forest fire danger (NDFFDR) was 1.5 for all areas of the country, while the long-term value was 1.6. Only in two months was the forest fire danger risk higher than the average for the fire season; i.e. in June 1.8 at 9 a.m. and 1.6 at 1 p.m. and in July 2.0 at 9 a.m. and 1.9 at 1 p.m. The lowest forest fire danger was in September: 0.8 at 9 a.m. and 1.2 at 1 p.m.

The share of occurrence in the third level of forest fire danger for the fire season was 21% on average, which was low compared with the long-term. In July it reached its maximum value of 38% in both times of observation, but the lowest was in September: 4% at 9 a.m. and 8% at 1 p.m.

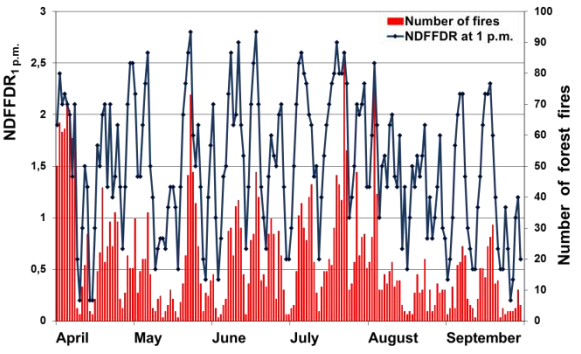


Figure 42. The National Degree of Forest Fire Danger Risk and numbers of forest fires in fire season 2014

Fire occurrence and affected surfaces

In 2014 in Poland, a total of 5 245 fires broke out (3 603 forest and 1 642 other non-wooded natural land), over 322 more than in 2013 (4 883 fires), with a surface area of 2 690 ha (1 957 forest and 734 ha other non-wooded natural land), over two times more than in 2013 (1 289 ha) - Table 17 and Figure 45.

The greatest proportion of fires occurred in March (20.7%; i.e. 1 088) - Figure 43. March was followed by April (16.8%), July (15.9%) and June (11.2%). The lowest number of fires in the fire season (April - September) occurred in September (6%) and August (8.1%). 67.8% of fires occurred in the fire season.

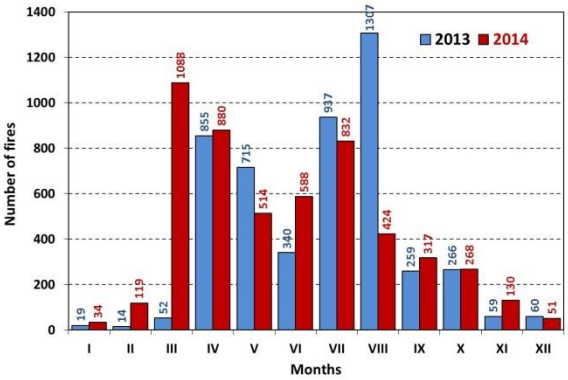


Figure 43. Distribution of number of forest fires by months in 2013 and 2014 in Poland

The largest number of fires in 2014, similar to last year, occurred in Mazowieckie Province (22%; i.e. 1 169 fires).

The lowest number of forest fires occurred in Małopolskie Province (120) and Opolskie Province (155).

The largest burnt forest areas were recorded in:

- Mazowieckie Province (450 ha),
- Dolnośląskie Province (415 ha),
- Warmińsko-Mazurskie Province (320 ha).

The smallest area was in Lubuskie Province (31 ha) and Zachodniopomorskie Province (43 ha). These data are illustrated in Figure 46 - Figure 48.

Small forest fires; i.e. with a surface area of less than 1 ha, represented 93% of all the forest fires in 2014 (Figure 44), with the burnt area amounting to 26.2%. The fires with a surface area of between 1 ha and 10 ha represented 37.8% of the burnt area, with their number representing only 6.6%.

In addition there were 19 large fires representing 23.8% of the burnt area, and 2 very large fires represented 12.2% of the burnt area.

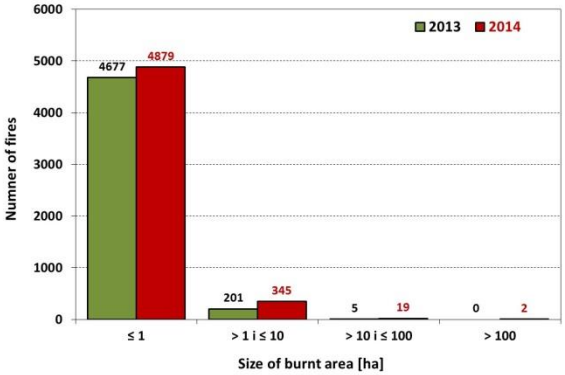


Figure 44. Distribution of the number of forest fires by size of burnt area in the years 2013 and 2014 in Poland

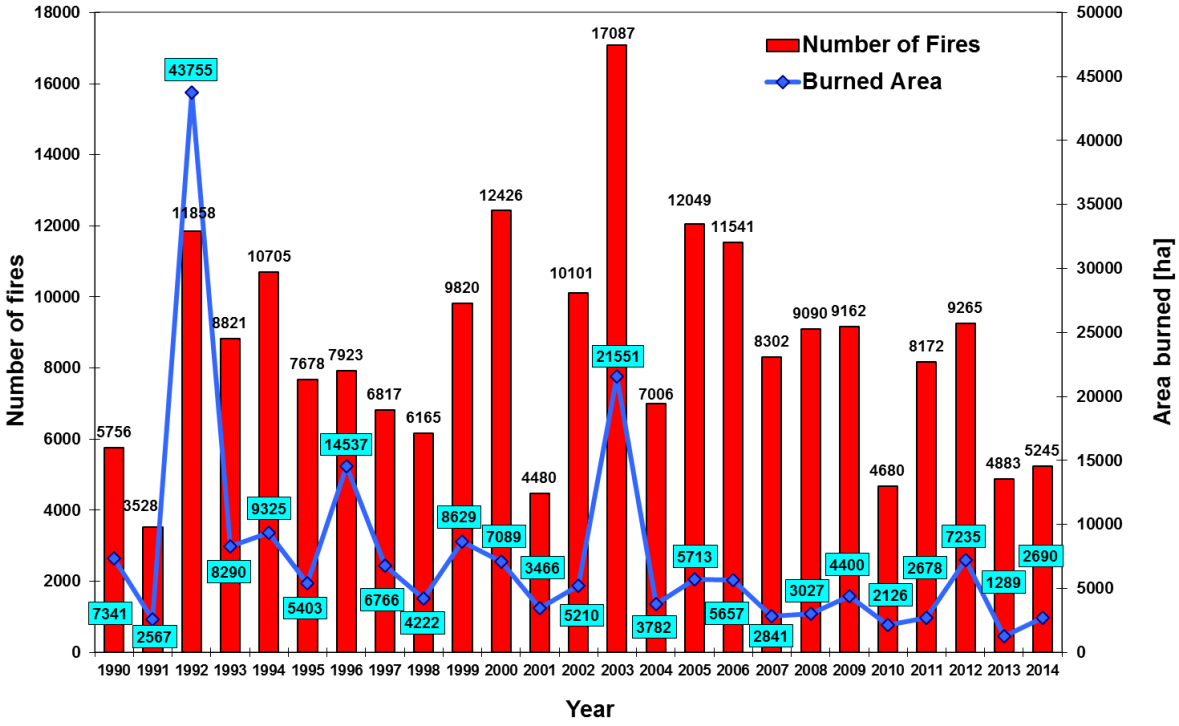


Figure 45. Total number of fires on high forest and area burned in Poland in the period 1990-2014

Table 17. Forest fires in Poland in the period 2007-2014

Year	Number of fires			Burnt area (ha)		
	Forest	Non wooded	Total	Forest	Non wooded	Total
2007	5 086	3 216	8 302	1 642.64	1 198.24	2 840.88
2008	5 568	3 522	9 090	1 810.74	1 216.39	3 027.13
2009	5 633	3 529	9 162	2 524.58	1 875.90	4 400.48
2010	2 975	1 705	4 680	1 358.26	767.98	2 126.24
2011	5 126	3 046	8 172	1 526.11	1 151.66	2 677.77
2012	5 752	3 513	9 265	4 781.65	2 453.62	7 235.27
2013	3 168	1 715	4 883	810.42	478.12	1 288.54
2014	3 603	1 642	5 245	1 956.90	733.55	2 690.45

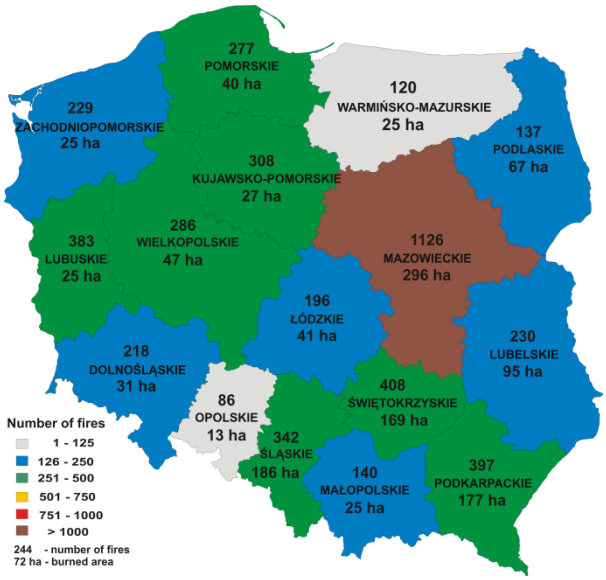


Figure 46. Number of forest fires and burned areas by provinces of Poland in 2013.

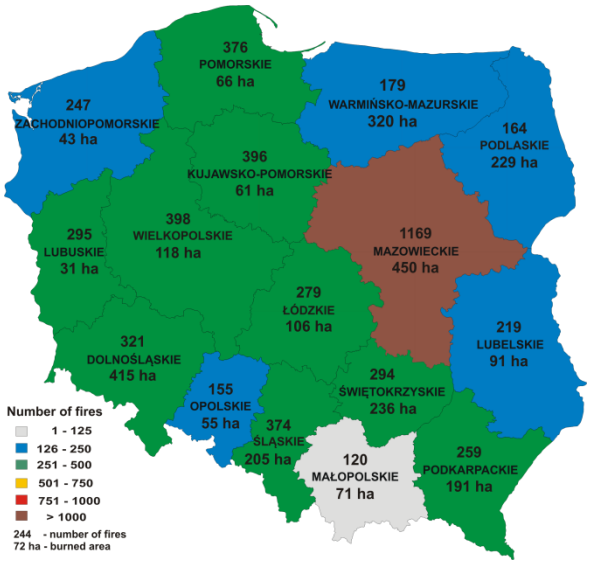


Figure 47. Number of forest fires and burned areas by provinces (NUTS2) in 2014.

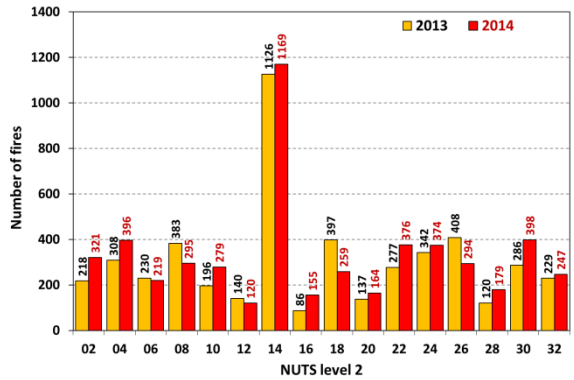
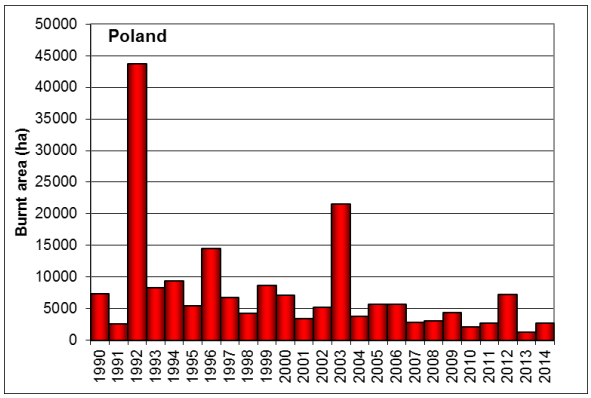


Figure 48. Distribution of the number of forest fires by province (NUTS2) in 2013 and 2014 in Poland.

The burnt area, number of fires and average fire size for the years 1990-2014 are shown in Figure 49.



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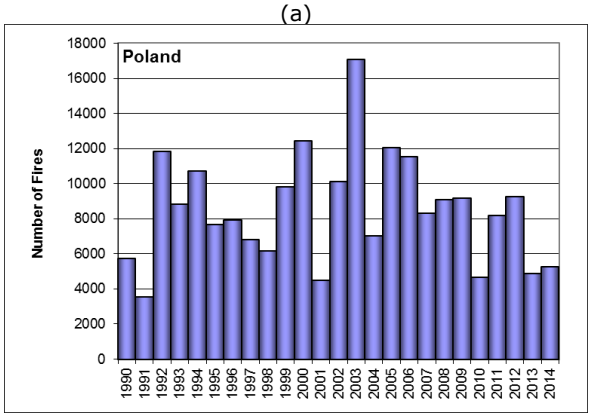

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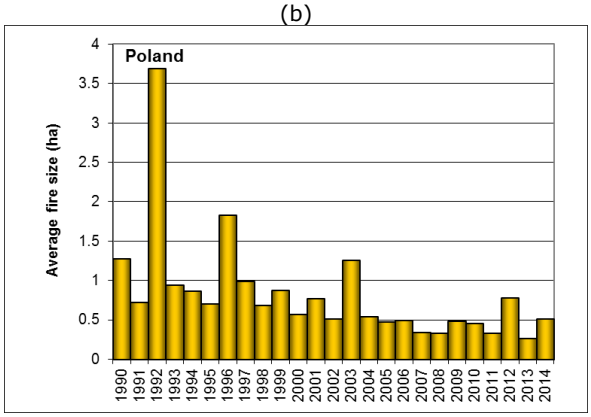

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Figure 49. Burnt areas (a), number of fires (b) and average fire size (c) in Poland from 1990 to 2014.

Fire causes

Human activity was the main cause of forest fires; specifically arson represented almost half of the fires (40.25%), followed by negligence (29.49%) and accident (7.11%), whereas unknown causes accounted for 22.12% (Figure 50).

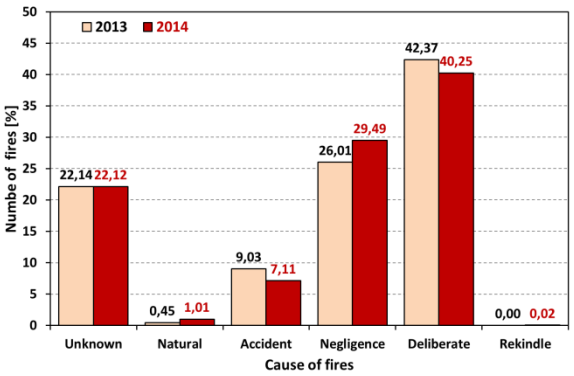


Figure 50. Distribution of the number of forest fires by causes in 2013 and 2014 in Poland.

Fire fighting means and information campaigns

The State Forests NFH had at its disposal equipment, consisting of:

27 fire suppression airplanes and 7 helicopters,
365 patrol and fire suppression vehicles,
13 medium and heavy vehicles,
253 portable pumps.

These means were used to extinguish 5% of all the fires in the areas managed by the State Forests NFH, whereas the other fires were suppressed by units of the State Fire Service and voluntary fire brigades.

In 2014, as part of their information and promotion activities, the following measures in the State Forests NFH were taken:

- more than 10 thousand lectures in schools and youth camps;
- 332 competitions devoted to the forest fire protection were organized;
- more than 700 communications were provided in the mass media on fire danger and the principles of safe behaviour in forests;
- more than 122 thousand posters, information leaflets and calendars related to forest fires were disseminated;
- more than 5 thousand information boards were erected.

Fire prevention activities

In forest areas managed by the State Forests Holding (State Forests NFH), works were carried out to prevent the conditions for fire outbreaks and to reduce their spread, by repairing 5.6 thousand km of fuel breaks and building 35.3 km of new fuel breaks; in addition, forests were cleaned over a surface area of 21.8 thousand ha, by reducing the quantity of flammable biomass.

The observation system of the State Forests NFH consisted of:

- 664 fire protection lookout points, including 242 (36.4%) equipped with a system of TV cameras;
- 6 patrol airplanes,
- 369 ground patrols.

The effectiveness rate of fire detection by fire protection lookout points was 30.5%, airplanes detected 1.2% of fires and civilians notified of 60.8%. The other 7.5% of fires were detected by fire protection patrols.

The communication and alarm network in the State Forests NFH consisted of: 7 311 radio-telephones, including 1 194 base sets, 2 704 mobile sets and 3 368 hand held sets, as well as 113 converters to the frequency band used by the State Fire Service.

Water supply for fire suppression purposes was provided by 11 987 water supply points, including over 4.5 thousand natural points and 2.7 thousand artificial ones. Moreover, water was supplied by more than 4.7 thousand hydrants located in the vicinity of forests.

In 2014, the fire protection costs incurred by the State Forests NFH amounted to 78.5 million PLN.

Information on Poland's National Forest Fire Information System can be found on: *http://bazapozarow.ibles.pl/ibl_ppoz/faces/index.jsp*.
Poland's Forest Fire Danger Map, which is updated daily from March to September (at 9 a.m. and at 1 p.m.), is shown on *http://bazapozarow.ibles.pl/zagrozenie/*

(Source: Forest Research Institute, Forest Fire Protection Department, Poland)

2.2.20 **Portugal**

Fire danger in the 2014 fire season

In 2014 the burnt area has decreased to 19 929 ha. The burnt area represents 17% of the average of the previous decennium which was 115 268 ha. Regarding forest fire numbers, there was a decrease in 2014, to a total of 7 067 fires which represents a decrease of 70% when compared to the average of fires in the last decennium and a decrease of 63% with respect to 2013.

These outcomes had high impact mostly on shrubland (56%), rather than woodland (44%).

Because of the decrease in burnt area, Portugal was able to meet the targets set on the National Fire Plan[1], in regards to the total burnt area per year (100 000 ha annual burned area and less than 0.8% of the national forest area).

Accordingly to the information provided by the National Meteorological Institute, the meteorological daily severity index (DSR), derived from the Fire Weather Index, shows the evolution of the fire risk in an operational perspective for the year 2014 (Figure 51).

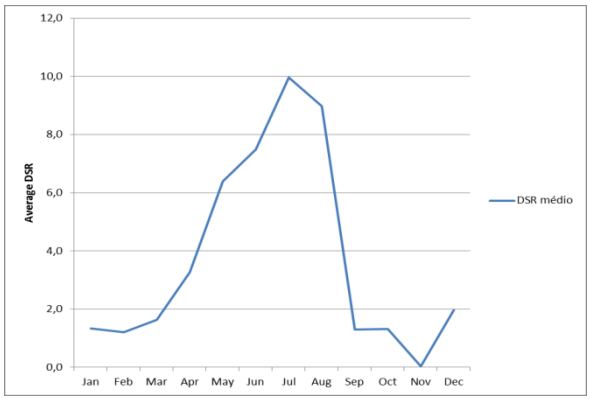


Figure 51. DSR variation in 2014

Fire occurrence and affected surfaces

In 2014 Portugal registered a total of 7 067 forest fires (85%<1ha; 15%>=1ha), responsible for the burning of 19 929 ha (Figure 52). Forest fires affected mainly shrubland (56%). Pinus pinaster, Eucalyptus globulus plantations and Quercus sp. stands were the forest cover most affected by fires.

41.7% of the occurrences (2 950) were reported between January and June; they burned about 5 801 ha (29% of the total burned area);

3 696 forest fires (52.3% total forest fires) occurred in the summer period (July-September), which consumed approximately 13 720ha (68.8% total burnt area).

In 2014, the most critical month was August, with 1 767 forest fires (25% total forest fires) and 7 469ha (37.5% total burnt area): Table 18.

Figure 52. Burned areas in 2014, provisory data (Portugal).

Source: EFFIS/JRC, 2014)

[1] In 2005 the Government, after the fire season, settled a reform on the national system for forest fire prevention and suppression, including the adoption of the National Fire Plan in May 2006, with the goal of 100 000ha burnt/annually by 2012.

Table 18. Monthly distribution of forest fires in Portugal.

Month	*Number of Fires*	*Burnt Area (ha)*		
		Wooded land	*Shrub land*	*Total*
January	4	0	1	1
February	4	0	0	0
March	613	597	1238	1835
April	348	131	207	338
May	1096	465	1109	1574
June	885	1259	794	2053
July	1215	836	938	1774
August	1767	4198	3271	7469
September	714	1170	3307	4477
October	367	71	327	398
November	26	0	4	4
December	28	1	5	6
TOTAL	**7067**	**8728**	**11201**	**19929**

Fire occurrence prevailed mostly in the urban districts, such as Porto (Northern region), Lisbon and Viseu (Centre Region), which registered 40% of the total number of fires (mainly very small fires). The Northern and Central regions of Portugal were the most affected by forest fires (14 938ha – 75% total), Table 19. In these regions are concentrated the main area of Eucalyptus and Pine stands and mountainous areas.

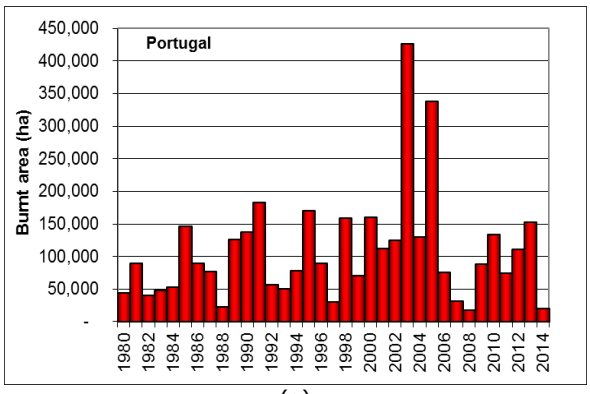
Table 19. Number of fires and burned area in Portugal (NUTSII - 2014).

NUTS II Region	*Number of fires*			*Burned Area (ha)*		
	≥ 1ha	*< 1ha*	*Total*	*Shrub land*	*Wooded land*	*Total*
Norte	598	3162	3760	4450	2694	7144
Centro	301	1589	1890	4802	2992	7794
Lisboa e Vale do Tejo	41	858	899	338	119	457
Alentejo	102	242	344	1054	2724	3778
Algarve	27	147	174	557	199	756
TOTAL	**1069**	**5998**	**7067**	**11201**	**8728**	**19929**

Portugal registered 29 large fires (>=100ha), which corresponded to 58% of the total burned area.

There were 4 fires larger than 500 ha, which burned 6 507 ha. The largest fire of 2014 occurred in Portalegre district, burning 2 268 ha on 25th August.

The analysis of the yearly trends in the number of fires and burnt areas in Portugal is shown in Figure 53.



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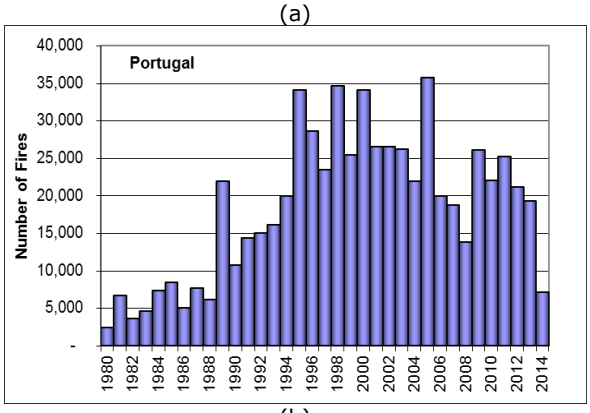

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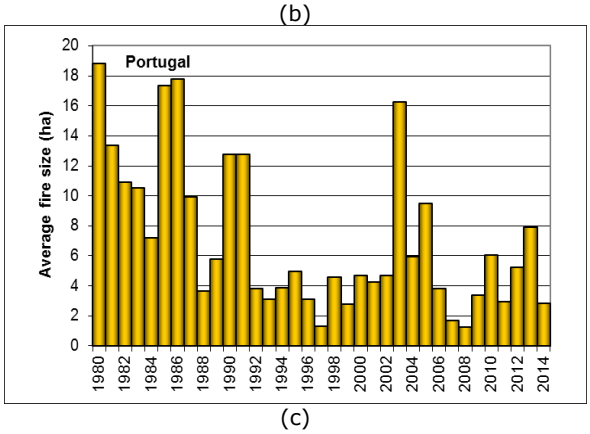

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Figure 53. Burnt areas (a), number of fires (b) and average fire size (c) in Portugal 1980-2014.

Fire causes

Of 7 067 occurrences registered in 2014, the National Guard proceeded with the criminal investigation in 4 406 forest fires (62%) of which 1 682 with unknown cause (Figure 54).

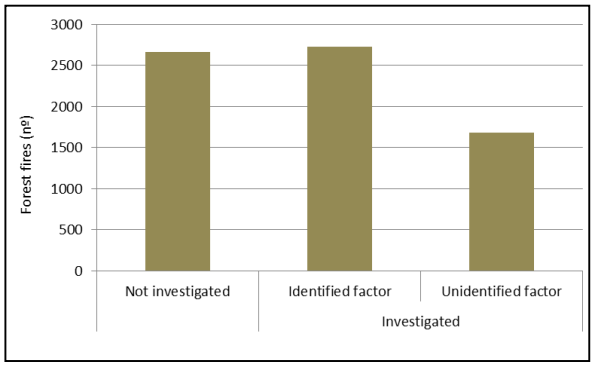


Figure 54. Criminal forest fires 2014 investigation.

Amongst those fires with determined cause, intentional acts corresponded to 32% and accidents or negligence were present in the ignition of 56% (Figure 55). The usage of fire for pasture renewal of shrubs pastures still has a strong impact on the burnt areas.

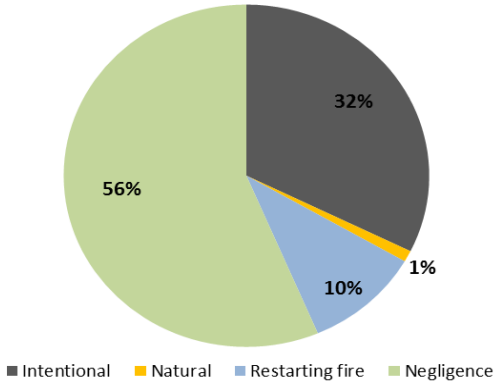


Figure 55. Main causes of forest fires in 2014

Fire fighting means

In order to cope with forest fires and to define an integrated fire-fighting strategy, the Portuguese National Authority for Civil Protection (ANPC), as is customary, established an Operational Directive for the forest fire season of 2014, with the following main purposes:

- Define a unique structure for Direction, Command and Control, and a Special Structure to Fight Forest Fires (DECIF);
- Regulate institutional coordination and the cooperation and involvement of the organizations belonging to the Portuguese Integrated System for Relief Operations (SIOPS).

The Operational Directive applies to all organizations and institutions which play a role in this field and is used as a base to elaborate both district and municipal emergency plans. It is also used as a reference to elaborate all directives, plans and orders that are applied to organizations involved in the Special Structure to Fight Forest Fires (DECIF).

The Directive defines an operational concept based on the following principles:

- Unique command structure;
- Anticipation ability;
- Integrated response;
- Permanent safety;
- Dissuasive surveillance;
- Well-timed detection;
- Immediate dispatch;
- Strong initial attack;
- Unity of command;
- Operation maintenance;
- Unified public information management.

Under the scope of the Operational Directive, the distribution of the available means for surveillance, detection and fire-fighting operations, was made into engagement phases during 2014. The number of means applied in each phase depended, amongst other factors, on the forest fire hazard and territory vulnerability expected for a given period. For example, during the most critical period, Charlie Phase (1JUL-30SEP), there were 9 617 human resources, 2 029 vehicles and 49 aircraft (fixed and rotary wing) available.

Moreover, in order to improve and assure the firefighting operations outside the critical period, terrestrial and aerial means were made permanently available during the Alfa and Echo phases.

In Table 20, a resume of all the fire-fighting resources distributed by engagement phases can be seen:

Table 20. Fire-fighting means available per phase

Phases	Elements	Vehicles	Aerial Means
Alfa (< 15MAY)	Means available on demand		2 - 7
Bravo (15MAY-30JUN)	6 563	1 496	34
Charlie (1JUL-30SEP)	9 617	2 029	49
Delta (1OCT-31OCT)	5 474	1 284	24
Echo (> 31OCT)	Means available on demand		2 - 7

With respect to the aerial means they were of the following types:

- 36 Helis for initial attack;
- 5 Heavy Helibombers for enlarged attack;
- 8 Amphibious aircrafts for enlarged attack.

Under the scope of the same Operational Directive, the Portuguese National Authority for Civil Protection also established an operational order aiming the improvement of the Special Structure to Fight Forest Fires (DECIF) organization and readiness. Briefly, the main purpose of this operational order was the reorganization of the structure addressing the forest fire fighting, grouping it into five main regions, in order to achieve a better management of the available resources overpassing possible constraints resulting from the territorial administrative division. Each one of these operational regions, covering several districts, became responsible for managing all forest fire fighting operations happening in their respective region.

Forest fires planning

The Forestry and Nature Conservation Institute (ICNF) kept its efforts in the forest fire planning at the local, municipal and regional (district) levels.

The municipal planning objective is pursued by the technical support to the municipalities forest offices, based in the Municipal Plans for Forest Fire Prevention (5 years planning) and the Municipal Operational Plans, which are part of the previous plans and are updated on a yearly basis.

The municipal forestry technical offices provided technical support to the Municipal Commission for Forest Defence. By the end of 2014 there were 271 municipal forestry technical offices established and 272 Municipal Plans for Forest Fire Prevention (213 under review and 59 already approved) and 245 Municipal Operational Plans approved.

The regional level planning is assured by 18 Regional Forest Plans (for the entire continental land) and by regional maps of fire pre-suppression, updated each summer in cooperation with municipalities and District Commands for Relief Operations, at the district level.

Forest fuels management

Forest fuels management is one of the key-actions in the forest fire prevention domain. A total area of 38 003 ha was managed, of which 872 ha were with prescribed burning.

Water points

During 2014, 669 water points were renovated.

Forest roads

In 2014, 9 865 kilometres of forest roads were built.

Policy measures

In 2014, the publishing of Regulation n.º 110/2014, established the period between 1st July and 30th September, as the critical period, where special preventive measures prevailed.

There was also an amendment of legislation made in the instruction the responsibility of infringement proceedings.

Bilateral Commission on Forest Fires Prevention and Suppression (Portugal/ Spain).

There was no follow-up progress in the Commission works.

Loss of human lives in the 2014 fire campaign.

No loss of Human lives during 2014 Fire Season, only 123 fire fighters and 23 civilian injured.

Some fire fighting vehicles were also destroyed after being caught by forest fires.

Operations of mutual assistance

No assistance was required during the 2014 Fire Season.

(Sources: Ministry of Agriculture, Rural Development and Fisheries - National Forest Authority and National Authority for Civil Protection, Portugal)

2.2.21 **Romania**

Meteorological characteristics of Romania during 2014

In Romania, the summer of 2014 was warmer than the reference period (1961-1990) [2] . The annual average temperature (10.2°C), was 1.3 °C higher than the standard climatological norm for 1961-1990 (Figure 57). The increased values of high temperatures, with daily values of ΣTmax 32°C, led to periodic exceeding of the temperature-humidity comfort index ITU critical value, which resulted in tropical nights (ΣTmin 17°C) for several days in a row during July and August. The absolute maximum recorded value of temperature was not exceeded at any of the meteorological stations during the summer months, so the drought effect in the country did not increase, also due to the relatively high annual precipitation.

The year 2014 was much rainier than previous years, when there was much less rain and drier soil, so there were fewer fires and less burnt areas in Romania compared with previous years.

The precipitation recorded an excess in most of the country. The recorded annual mean average value of precipitation (807.8 mm), surpassed the standard value by 26.6%. High rainfall in the months of January, March, April, May, July, September, October and December compensated the precipitation deficit from the other remaining months, mostly during summer (Figure 58).

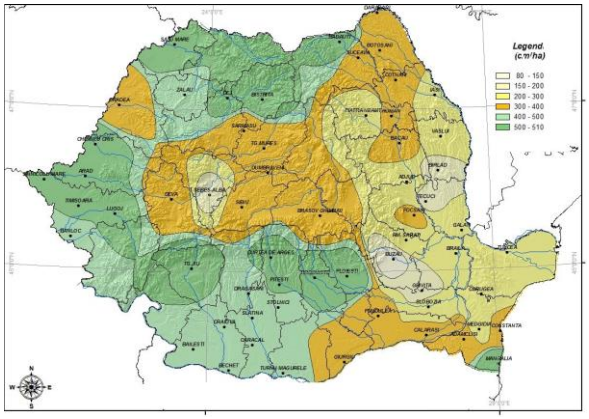


Figure 56. Water soil reserve at the beginning of November 2014 in the depth layer of 0-20 cm.

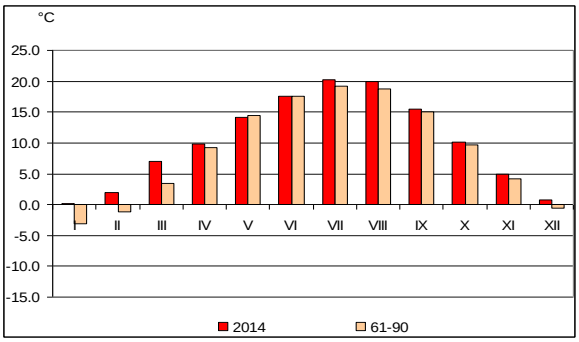


Figure 57. Average monthly temperature in Romania during 2014, compared with the climatological norm (1961-1990).

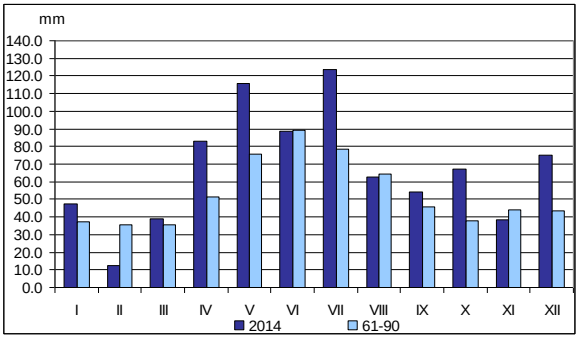


Figure 58. The monthly average precipitations recorded during 2014, compared with normal climatological values (1961-1990).

The soil humidity was satisfactory in most of the country, because of the increased precipitation input as in the previous year. An isolated humidity deficit occurred, especially in the eastern part of the country, locally quite strongly (Figure 56).

Fire occurrence and affected surfaces

The year 2014 had long rainy periods and was "quiet" regarding forest fires. At the national level, a total number of 83 forest vegetation fires were recorded, which affected an area of 217.09 ha, of which:

- 79 fires occurred in the national forest, burning 203.39 ha.

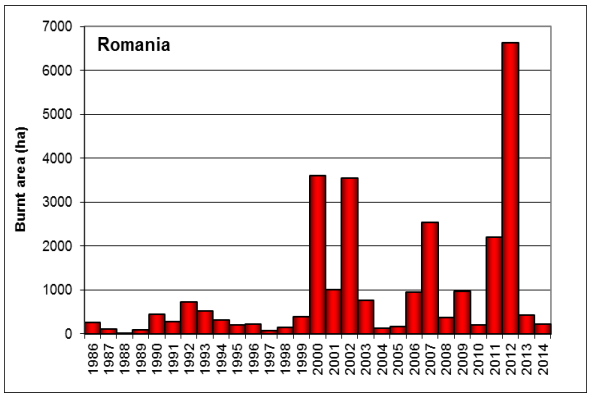
- 4 fires occurred in forest vegetation, located on land outside the forest, burning 13.7 ha.

Following these fires, an estimated damage of 15 500 Euros was produced by the burning of 31 500 seedlings in plantations and natural regenerations and a quantity of 11 cubic meters of standing timber or under operation.

In 2014 there were no important forest fires recorded; only 2 forest fires lasted longer than 24 hours, but none were longer than 48 hours.

[2] *(all meteorological data provided by National Meteorological Institute)*

A comparison for the period 1986-2014 of the affected area, number of fires, average fire size and economical losses is presented in Figure 59 and Figure 60 below.



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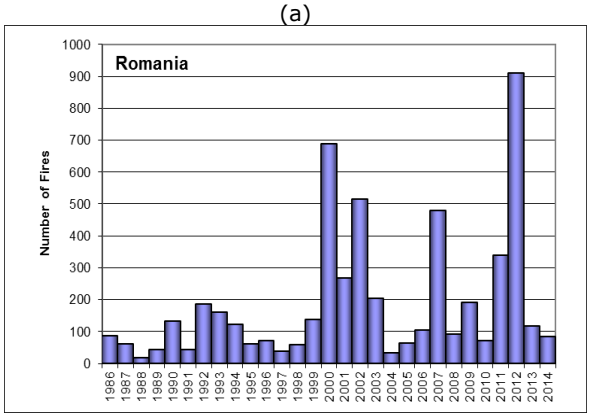

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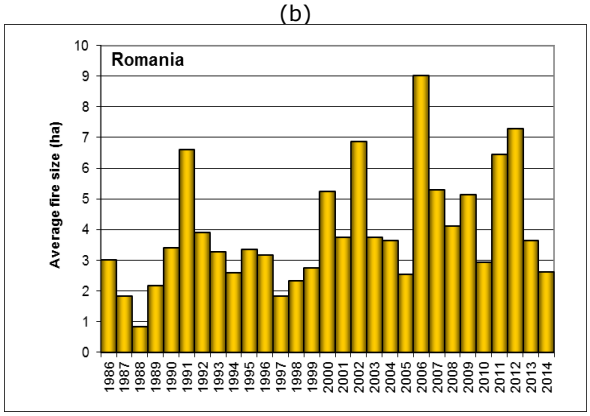

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Figure 59. Burnt area (a), number of fires (b) and average fire size (c) in Romania from 1986 to 2014

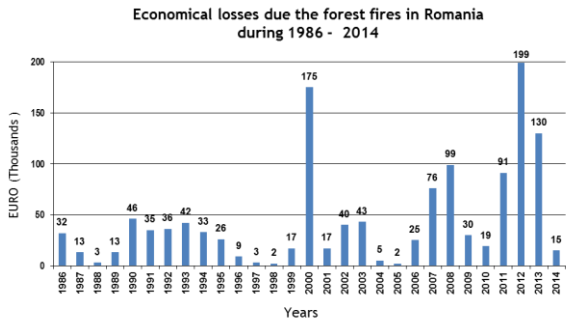


Figure 60. Economic losses due to forest fires in Romania from 1986 to 2014

Fire fighting means

Fire fighting actions involved a total of 2 618 people, of which:

- Forest rangers - 681 persons
- Military and civilian fire-fighters - 756 persons
- Policemen and gendarmes - 92 people
- Citizens – 1 091 persons

Causes of forest fires

1. Unknown (EFFIS code 100) - 27 fires burning 47.76 ha

2. Negligence - 56 fires burning 169.33 ha, of which:

- open fires (EFFIS code 410) - 37 fires (103.97 ha)
- Propagation from fires on agricultural land (EFFIS code 411) - 15 fires (63.86 ha)
- Cigarettes (EFFIS code 422) - 4 fires (1.5 ha)

Land type affected:

1. State public land - 43 fires (126.85 ha)
2. UAT public land - 8 fires (18.53 ha)
3. Private land - 32 fires (71.71 ha)

Type of fire:

1. Litter fires - 78 fires (200.09 ha)
2. Mixed fires (litter, canopy) - 5 fires (17 ha).

(Source: Ministry of Environment and Forests, Romania).

2.2.22 **Russian Federation**

Fire danger in the 2014 fire season

Forest Fire Danger Rating based on weather conditions in the Russian Federation is determined by Nesterov's technique and is characterized by the corresponding class of fire danger (KPO) on a scale from 1 to 5 (the main criteria: quantity of rainless days, humidity of air, temperature).

The fire season started on 4 January in Primrski krai, Far East, following with several large fires, but most extended days with extreme fire danger rating during fire season were recorded in the mid and late summer periods in the Siberian Federal District.

87 % of total area burned was observed in six regions of the Far East and Siberia (3 123 700 ha):

- Republic of Saha (Yakutia) (1 269 500 ha, 35.2%)
- Irkutskaya oblast (770 800 ha, 21.4%)
- Zabaikalski krai (555,400 ha, 15.4%)
- Amurskaya oblast (343 400 ha, 9.5%)
- Republic of Tyva (104 200 ha, 2.9%)
- Primorski krai (80 500 ha, 2.2%).

Figure 61. Fire danger rating on 1st July, 2014

Fire occurrence and affected surfaces

There were 17 058 forest fires in total in the Russian Federation in 2014, and the area burned is 3 738 207 ha.

There were 1 722 large forest fires which burned a total area of over 3 million ha, compared with 649 large fires burning 1.2 million ha in 2014 (Figure 62).

(A forest fire is indicated as a large fire if the area burned is over 200 ha in the extended territories (aerial fire monitoring zone) and if over 25 ha in the ground monitoring zone).

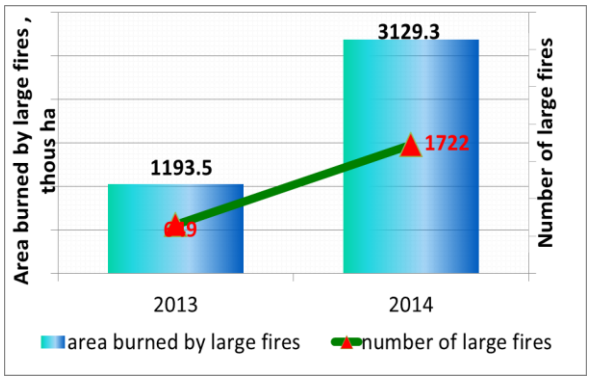


Figure 62. Comparison data of large forest fires 2013-2014.

Fire causes

Fire causes in 2014 are shown in Figure 63.

Carelessness was the cause of 46.1% of the total number of fires, compared with 36.7% in 2013.

Lightning caused 17.2% of total forest fires compared with 25.4 in 2013.

Agriculture burning was the cause of 8.1% of fires; in comparison with 4.2% in 2013.

28.6% of fire causes were unknown (compared with 33.7% in 2013), but it is most likely that the majority of them were also caused out of carelessness.

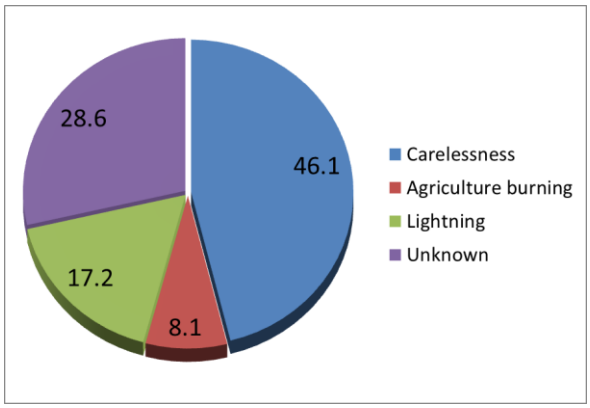


Figure 63. Forest fires causes in the Russian Federation in 2014

Fire prevention activities

The most important activities on fire prevention and preparation include:

- Fire-prevention activities in the forests (construction and reconstruction of forest roads, maintenance of observation towers, prevention fire lines; creation of fire-prevention water reservoirs, etc.);
- providing acquisitions of fire-prevention equipment and engines, communication systems, etc.);
- Training for firefighters and other personnel;
- providing fire management publicity for use of mass media.

In the Russian Federation, the following fire prevention activities were undertaken as preparation for the fire season of 2014:

- Construction of forest roads for fire prevention: 4 400 km;
- Reconstruction and maintenance of roads for fire prevention: over 6 000 km;
- Construction of fire breaks and mineralised barriers: over 203 000 km;
- Care of the fire breaks and barriers: over 600 000 km;
- Prescribed burning: 0.8 million ha.

(Source: Aerial Forest Fire Centre, Russian Federation).

2.2.23 **Slovak Republic**

Fire danger in the 2014 fire season

Forest fires during the year 2014 in Slovakia settled at a low level. The amount of wildfires was low and the total burnt area was almost the same as the long term average. The number of fires was influenced substantially by the weather conditions in spring and summer.

Fire occurrence and affected surfaces

A total number of 153 forest fires were reported in Slovakia in 2014, corresponding to a total burnt area of 191.73 ha. The average burned area per fire was 1.25 ha.

Figure 64 and Figure 65 show the pattern of fire occurrence and burnt area by month during the year. The burnt areas, number of fires and average fire size for the years 1999-2014 are shown in Figure 66.

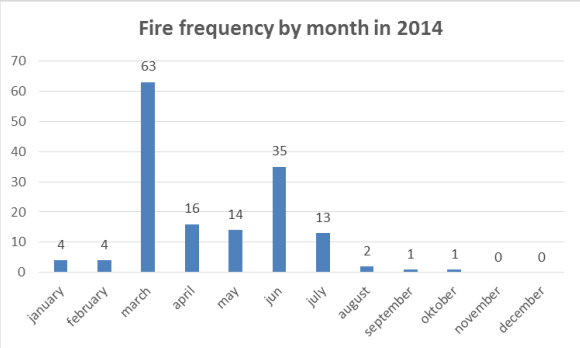


Figure 64. Fire frequency by month in 2014.

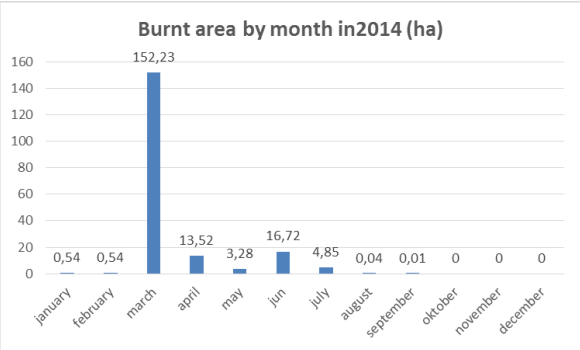
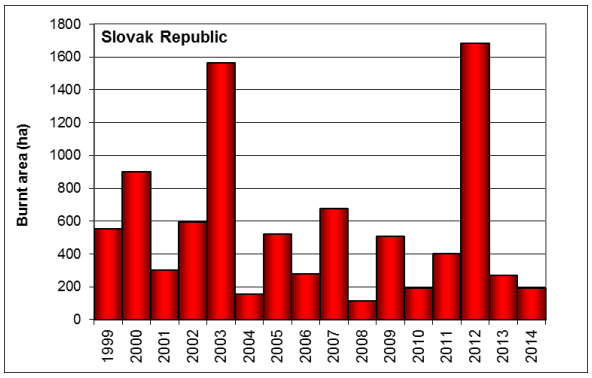


Figure 65. Burnt area by month in 2014.



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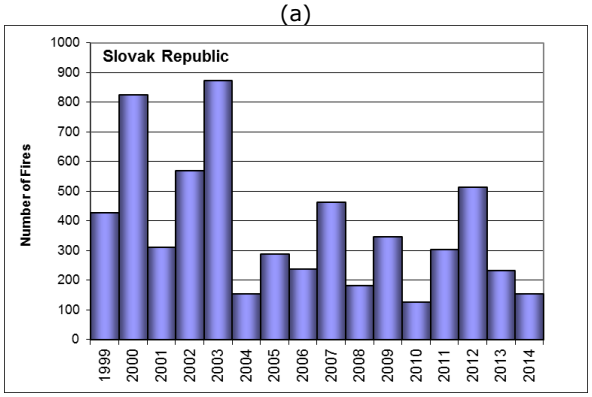

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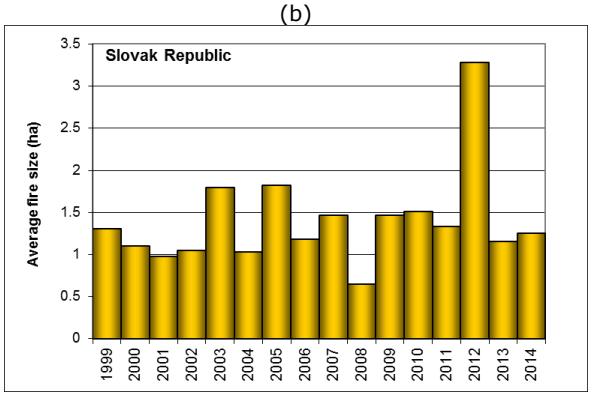


(c)

Figure 66. Burnt areas (a), number of fires (b) and average fire size (c) in the Slovak Republic from 1999 to 2014.

Injuries and loss of human lives

One injury and one loss of a life was reported in Slovakia during the fire season of 2014.

Fire causes

Forest fire causes in 2014 are shown in Figure 67, and causes for the years 2004–2014 are shown in Table 21.

Table 21 Fire causes in Slovak Republic in 2004 – 2014 (number of forest fires).

	Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Basic information	Total fires	155	286	237	463	182	347	123	303	517	233	153
Known causes (Human)	Arson	8	7	8	11	7	18	6	8	42	33	26
	Negligence (see also B below)	138	261	201	416	154	286	94	244	409	177	112
Known causes (Natural)	Lightning	1	2	3	6	1	3	2	1	8	4	2
Unknown causes	Unknown	8	16	25	26	20	40	21	50	58	19	13
B: Supplementary information: Total negligence	Agricultural operations	38	91	22	110	25	51	25	59	135	26	24
	Logging and forest operations	2		10	23	19	52	25	21	56	15	18
	Other industrial activities	0	1	3	2	20	12	5	0	1	7	1
	Communications (railways, electricity lines, etc.)	1	2	2	3	3	7	2	1	7	3	1
	General public (campers, other visitors, children)	96	163	163	278	81	161	66	222	208	125	67
	Other (military, etc.)	1	4	1	0	6	3	0	0	2	1	1

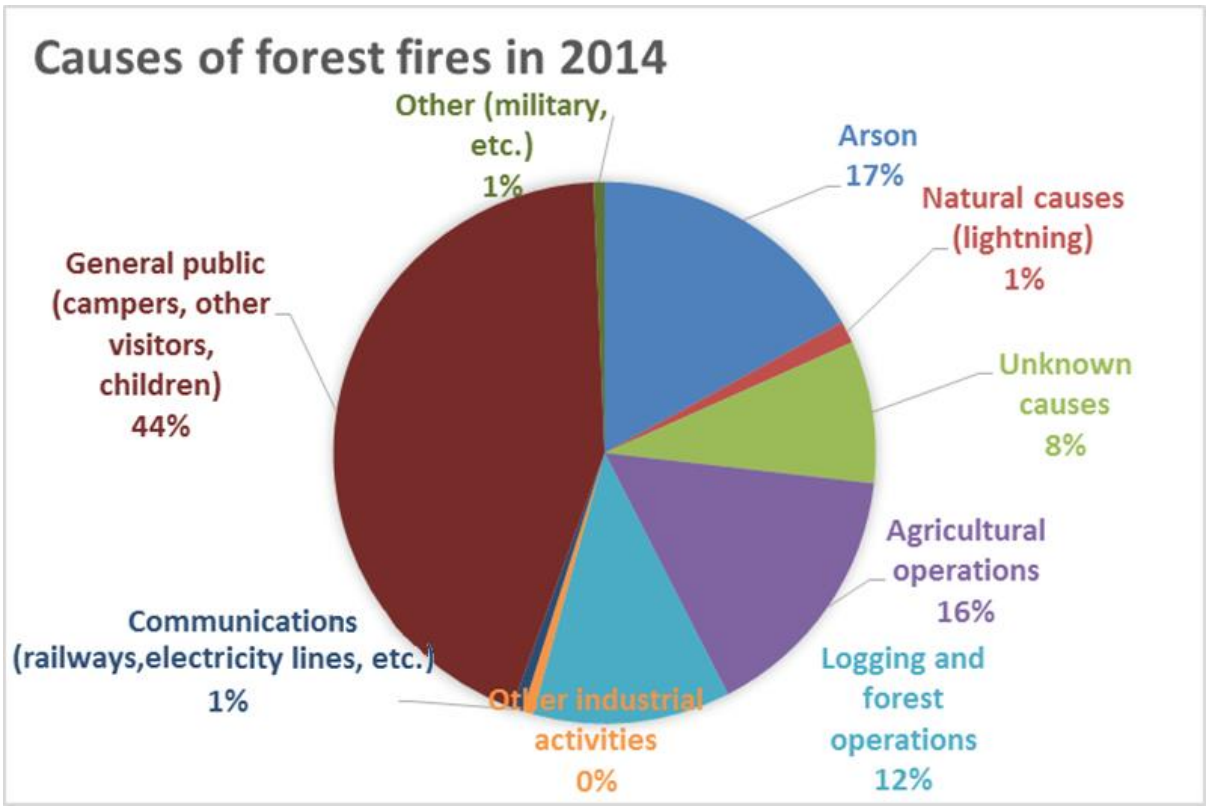


Figure 67. Causes of forest fires in 2014

(Processed: National Forest Centre - Forest Research Institute Zvolen, Slovakia; Source: Institute for Fires and Expertise of the Ministry of Interior of the Slovak Republic).

2.2.24 **Slovenia**

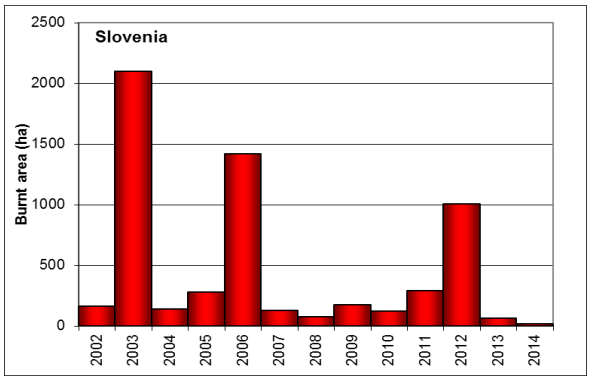
In 2014, according to the data of the Forest Service, 35 forest fires were reported, with a total burnt area of 17.94 ha, of which 12.7 ha were in forest land (Table 22). The burnt area is lower than has been reported in the last 10 years. There were only 6 fires over 1 ha during the year, and the average fire size was 0.5 ha. Figure 68 shows the trends in terms of number of fires and burnt area during the last 11 years in Slovenia.

Table 22. Number of fires and burnt area in Slovenia in 2014

Number of fires	< 1 ha	29
	>= 1 ha	6
	>= 100 ha	0
	>= 500 ha	0
	Total	**35**
Burnt area	Woodland	12.70
	Bushes	0.33
	Non woodland	4.91
	Total	**17.94**

As was the case in previous years, the worst affected region was Sežana, in which 55% of the fires (42% of burnt area) occurred (Table 23).

Most of the known causes (15 fires) were reported as negligent (agricultural operation, train lines, etc.). 4 were reported as natural causes and 4 were deliberately started. The remaining 12 fires were of unknown cause.



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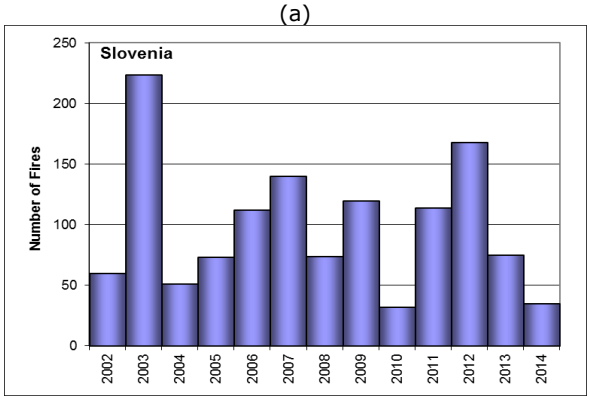

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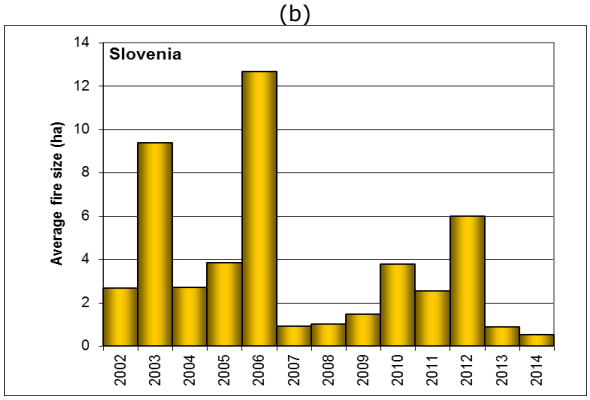


(c)

Figure 68. Burnt areas (a), number of fires (b) and average fire size (c) in Slovenia from 2002 to 2014.

Table 23. Number of fires and burnt area by forest management unit in Slovenia in 2014.

	Number of fires			**Burnt area (ha)**			
Region	**<1 ha**	**≥1 ha**	**Total**	**Forest**	**Scrub**	**Non wooded**	**Total**
Tolmin	1	0	1	0.00	0.00	0.01	0.01
Bled	0	0	0	0.00	0.00	0.00	0.00
Kranj	1	0	1	0.10	0.00	0.00	0.10
Ljubljana	8	2	10	5.22	0.00	0.75	5.97
Postojna	0	0	0	0.00	0.00	0.00	0.00
Kočevje	0	0	0	0.00	0.00	0.00	0.00
Novo mesto	1	2	3	0.16	0.33	2.85	3.34
Brežice	1	0	1	0.00	0.00	0.00	0.00
Celje	0	1	1	1.00	0.00	0.00	1.00
Nazarje	1	0	1	0.00	0.00	0.00	0.00
Slovenj Gradec	0	0	0	0.00	0.00	0.00	0.00
Maribor	0	0	0	0.00	0.00	0.00	0.00
Murska Sobota	0	0	0	0.00	0.00	0.00	0.00
Sežana	16	1	17	6.22	0.00	1.30	7.52
Total	**29**	**6**	**35**	**47.92**	**0.33**	**4.91**	**17.94**

(Source: Ministry of Agriculture and the Environment, Slovenia).

2.2.25 **Spain**

Number of fires and affected surfaces

In 2014, both the total number of fires and the burnt area was far below the average for the previous decade and the lowest of the series. The total number of fires was 37% less than the decade average, with small fires (≤1 ha) down by 34% and fires of >1 ha down by 44%.

Table 24. Number of fires in 2014 compared with 10 year average

	Average 2004-2013	*2014*
Number of fires <1ha	10 244	6 754
Number of fires ≥1ha	5 394	3 013
Total	15 638	9 771

There was a 75% reduction in forest burnt area and a 60% reduction in total burnt area with respect to the mean.

Table 25. Burnt area in 2014 compared with the 10 year average

	Average 2004-2013	*2014*
Burnt area other wooded land (ha)	39 932.53	9 904.84
Burnt area forest (ha)	117 034.22	46 721.16

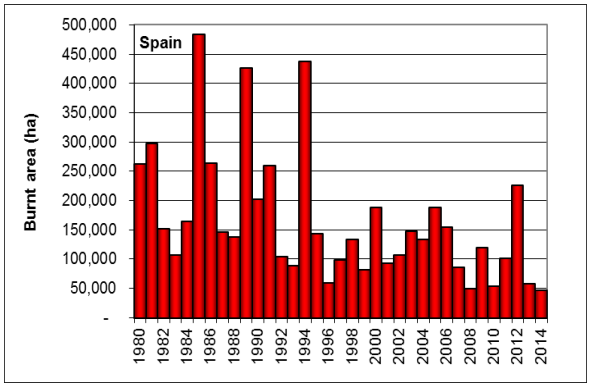
Large fires

According to the provisional statistics compiled by the relevant departments, there were 7 Large Fires (GIF: defined as burnt area ≥500 ha) in 2014. They were spread out over the spring and summer seasons. These fires account for 21% of the total area affected and 0.07% of the number of fires. The Mediterranean region was the hardest hit in terms of area affected by large fires, accounting for 42% of large fires and 57% of the area burnt by them. Table 26 gives the location, date and burnt area of large fires.

Table 26. Large fires in 2014

Province	*Municipality of origin*	*Start date*	*Burnt area (ha)*
Cantabria	Arredondo	09-03	533.6
Almería	Alhama de Almería	25-03	3212.65
Almería	Lucainena de las Torres	20-04	1543.11
Tarragona	Tivissa	15-06	810.89
Guadalajara	Cogolludo	17-07	1735.51
Guadalajara	Bustares	18-07	1221.61
Burgos	Mercerreyes	01-09	626.65
Total burnt area			**9684.02**

The yearly trends in terms of numbers of fires and burnt areas during the last 35 years in Spain are shown in Figure 69.



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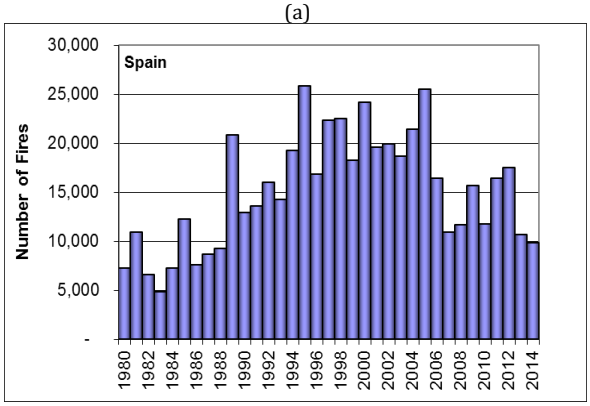

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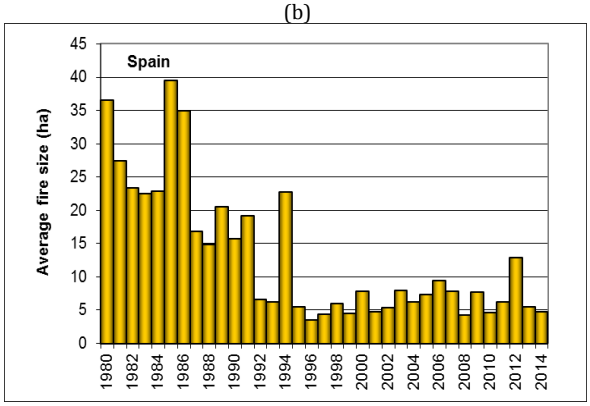


(c)

Figure 69. Burnt areas (a), number of fires (b) and average fire size (c) in Spain for the last 35 years.

The distribution of the total number of fires by geographical area is shown in Figure 70. The largest number of fires occurred in the Northwest Peninsula (Galicia, Asturias, Cantabria, Basque Country, Zamora and León), with 42.8% of the number of fires, followed by the Inner regions with 36.2%. Regarding burnt area, the northwest region accounts for 46.2% of the total, followed by the interior communities, the Mediterranean, and, with much lower values, the Canary Islands (Figure 70).

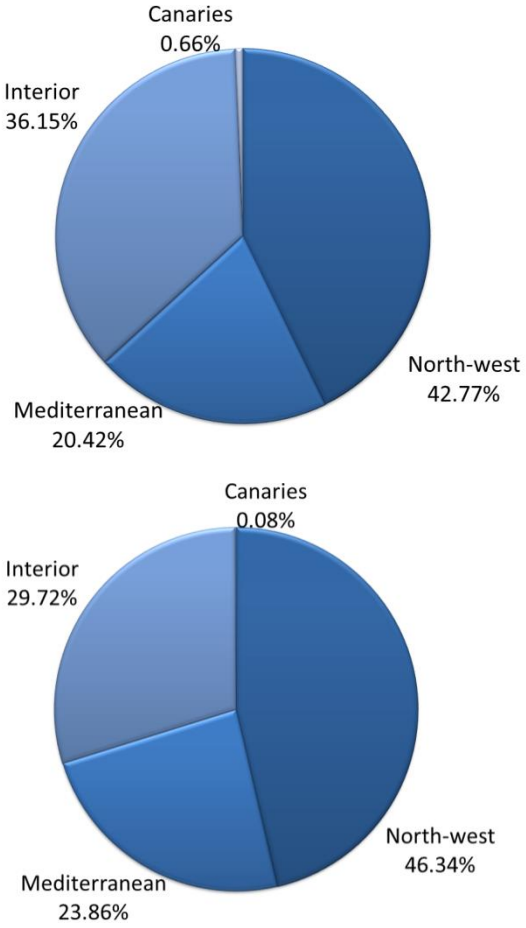


Figure 70 Number of fires and burnt area in 2014 by geographic region

Prevention measures

Training in fire management

During 2014 MAGRAMA carried out the following courses:

- ICS 300 and ICS 400 courses under the Memorandum of Understanding signed with the United States Forest Service in 2012;

- Advanced Course on Safety and Accident Investigation.

Integral Prevention Teams (*Equipos de Prevención Integral*: EPRIF)

In 2013 the EPRIF were operational from 13 January to 30 May and then resumed work from November to the end of the month, completing a maximum of 6 months of work by the end of the year.

In the first quarter of 2014, EPRIF treated 1 891 hectares of land and conducted 272 controlled burns, helping to reduce the risk of wildfires by reducing fuel and creating discontinuities in vegetation while also achieving other objectives such as improved pastures, favouring the habitat of various species, improving accessibility, etc.

They also ran training activities and meetings with various groups such as ranchers, farmers, hunters, municipalities, neighbourhood associations and teachers, to raise awareness on the prevention of forest fires.

On occasions, for the implementation of controlled burning, the EPRIF located in Huesca, Tabuyo (Leon), Cangas del Narcea (Asturias), Pola de Lena (Asturias) and Gredos (Ávila) received support from the Preventive Work Brigades MAGRAMA close to the operation sites.

Preventive Work Brigades (*Brigadas de Labores Preventivas*)

The Preventive Work Brigades (*Brigadas de Labores Preventivas)* acted in collaboration with the regional administrations from the beginning of the year until the beginning of the summer campaign, performing fire prevention work in over 1 760 hectares of forest land. After the summer campaign preventive work resumed, which ended in mid-December, extending the work period to 11 months.

In total over 400 employees distributed in 10 Preventive Work Brigades carry out preventive silvicultural work in the mountains close to the BRIF bases. As has already been noted, they occasionally work together with EPRIF in the implementation of prescribed burning.

Figure 71. BLP performing firewall maintenance in Tineo.

Human resources: Reinforcement Brigades against Forest Fire (*Brigadas de Refuerzo contra Incendios Forestales*: BRIF)

The MAGRAMA deploys five BRIF teams during the winter-spring campaign in the north and west of the Peninsula and ten during the summer campaign across the country.

In the summer season BRIF consists of three teams each formed by two supervisors and 14 specialists under the command of 1 technician. For transport and support for fire extinction they have two helicopters with 1 500 litre capacity. The BRIF-B brigade, located in the Puerto Pico (Ávila) region, is smaller and its composition the same as that of the winter campaign brigades (BRIF-i), consisting of teams of 7 specialists, 1 foreman and 1 technician with a 1 500 litre capacity helicopter.

These highly specialised helicopter transport personnel units can operate anywhere in the country where they are needed. The BRIF personnel receive continuing education and training to enable them to perform in the most demanding situations and the most complicated fires. The use of all fighting techniques including back-burning is essential in its operation.

In the 2014 campaign, BRIF teams worked for a total of 1 124 hours in fire interventions and extinguished a front length of 156 678 metres.

The BRIF teams with the highest activity during this campaign were in Tineo (Asturias) with 43 interventions, and Laza (Ourense) and Ruente (Cantabria) both with a total of 25 interventions.

Aerial means

During 2014, the MAGRAMA air assets were involved in 662 interventions in extinguishing 273 forest fires. They flew for a total of 2 001 hours, making 9 767 discharges.

Figure 72. BRIF helicopter working on a fire in Carrucedo (León).

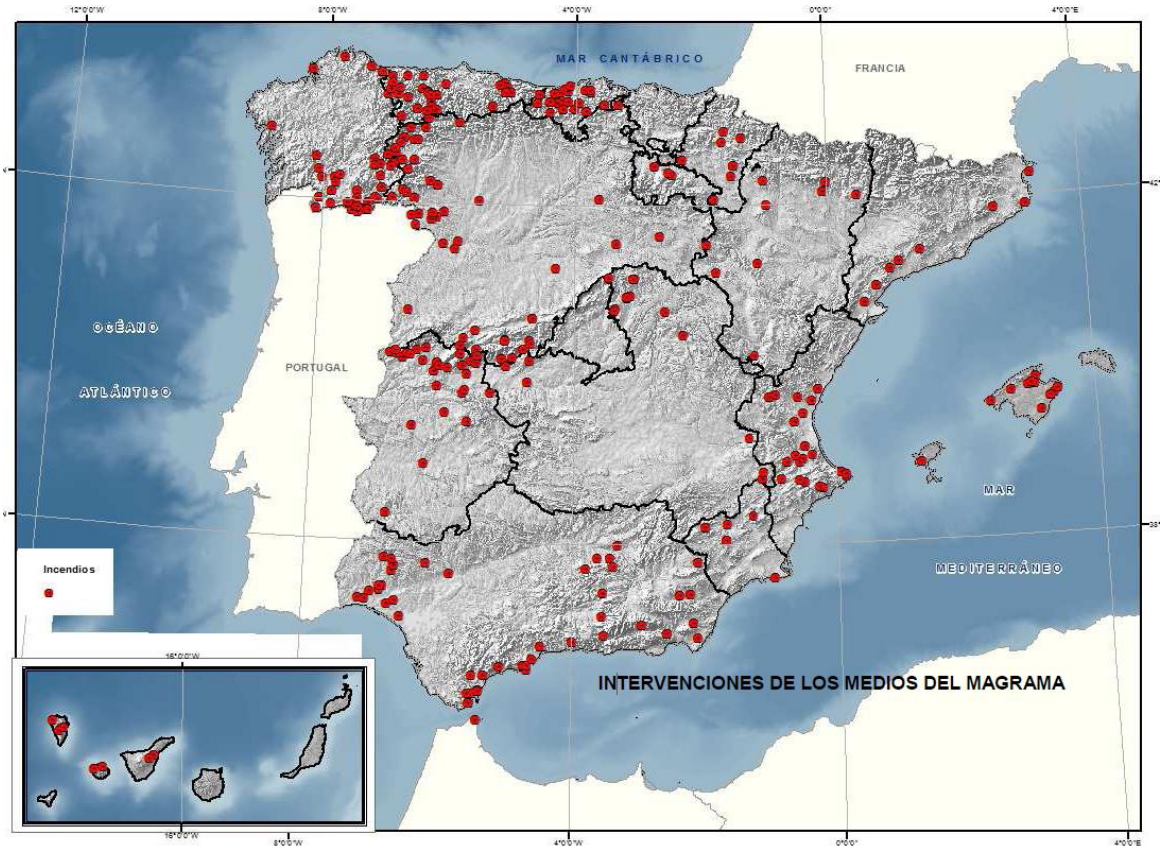


Figure 73 Location of air intervention actions made in 2014

(*Source: Ministerio de Medio Ambiente y Medio Rural y Marino, Área de Defensa Contra Incendios Forestales, Spain*).

2.2.26 **Sweden**

Fire danger in the 2014 fire season

The grass fire risk started in southern Sweden in March and continued until the end of June in northern Sweden. The risk level for forest fires varied throughout the season with noticeable differences depending on the geographic region. A heat wave in Sweden occurred at the end of July. Under this period of very warm weather and low precipitation, some areas were affected by several forest fires.

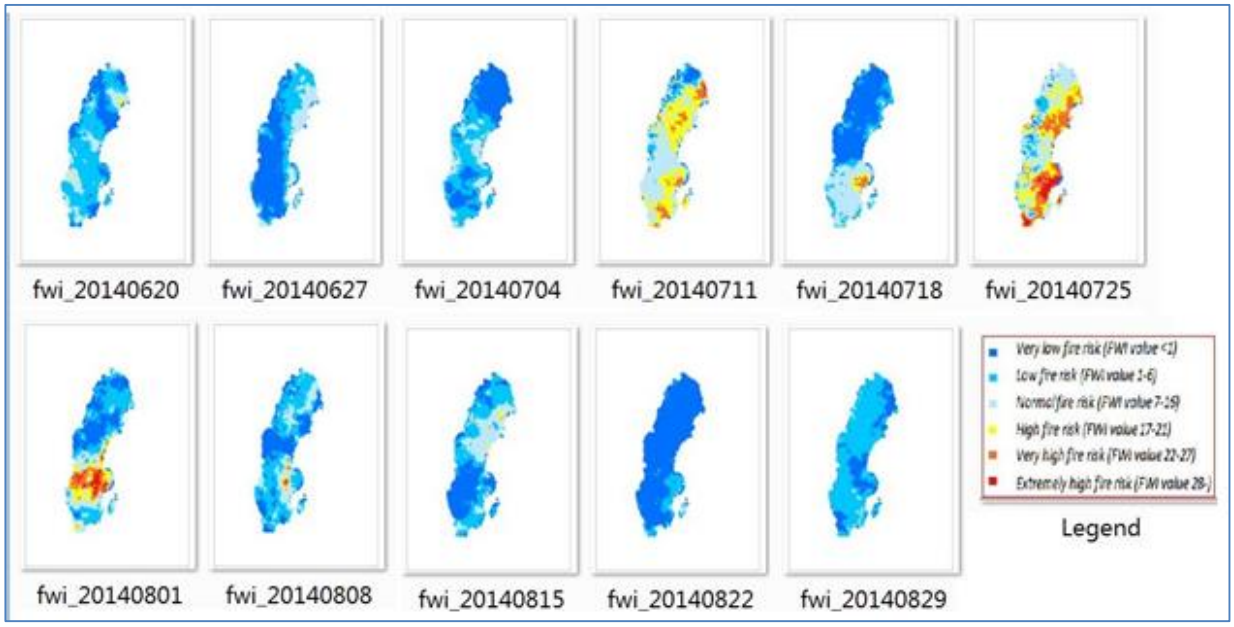


Figure 74. Maps of Forest fire danger shows how the extreme fire danger varied over time and area season 2014 for short periods.

Figure 75. Devastation caused by the fire in Västmanland County in July 2014. (*Photo owned by MSB*)

Fire occurrence and affected surfaces

Europe's largest forest fire in 2014 (12 807 ha) started on the 31th of July and on the 4th of August the most dramatic fire expansion took place. Nine thousand hectares burned that afternoon, the front reaching a maximum speed of 5 km/hour. The fire was extinguished and the rescue operation ended on the 11th of September. The fire was caused by forestry work with a vehicle that was used to prepare the ground before planting in a clear cut area. A spark from the vehicle ignited the ground vegetation.

During 2014 the number of fires recorded in Sweden was 4 374 which burned a total of 10 499 ha of forest, 2 124 ha of other wooded land and 2 043 ha other non-wooded natural land.

The fire in Västmanland County was the largest fire recorded in Sweden. It started on the 31th of July and was extinguished 6 weeks later. During this fire, about 12 807 ha burned. A full account of this fire can be found (in Swedish) in the report https://www.msb.se/RibData/Filer/pdf/27530.pdf

The second and third largest fires in the country started on the 29th of July and affected about 99 ha and 90 ha of forest respectively and both of them were probably caused by lightning. The burnt area, number of fires and average fire size for the years 1998-2014 are shown in Figure 77.

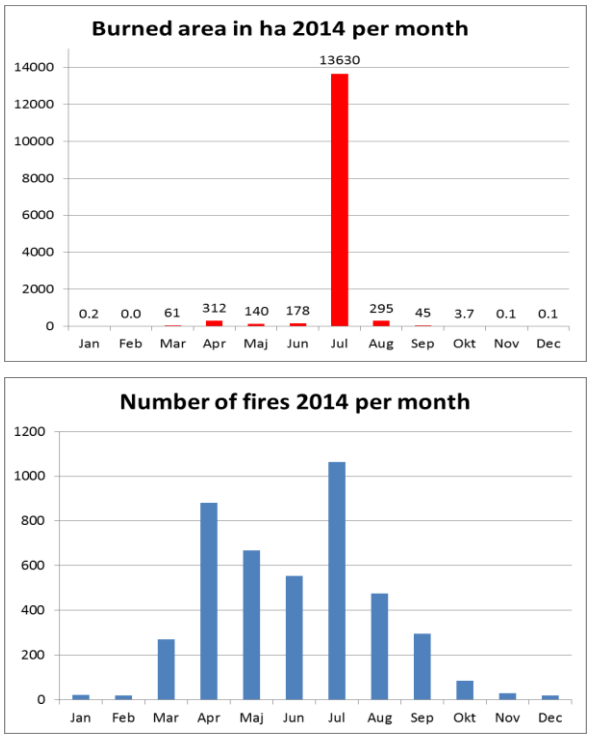
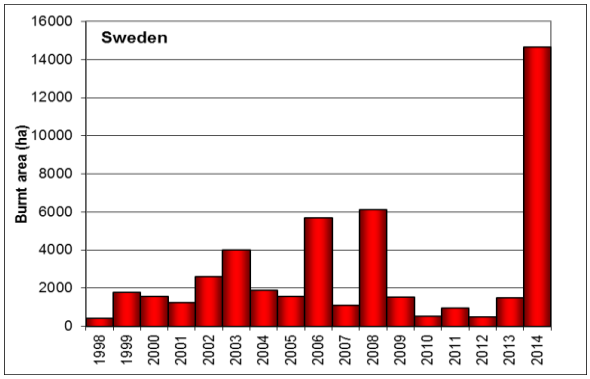


Figure 76. Total burnt area (ha) and number of fires by month in 2014.

Operations of mutual assistance and loss of human lives

On the afternoon of 4th of August, one person was killed by the Västmanland fire and one person was severely burned but survived. They were going to take out timber from the forest using a lorry.

International support for the fire was provided by three countries: Norway, Italy, and France. Norway flew two helicopters with a water bucket in the burn site while Italy and France each used their own water-bombing aeroplane. France also assisted with one surveillance aeroplane.



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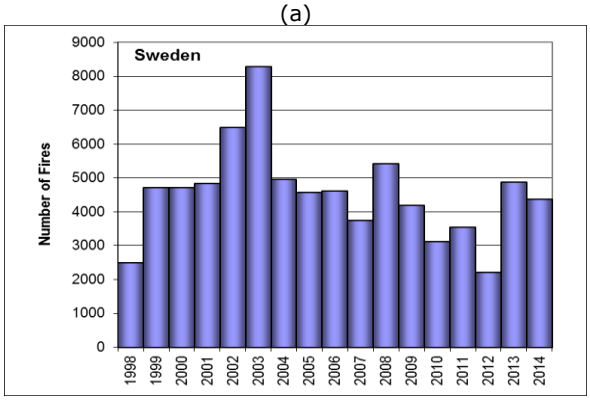

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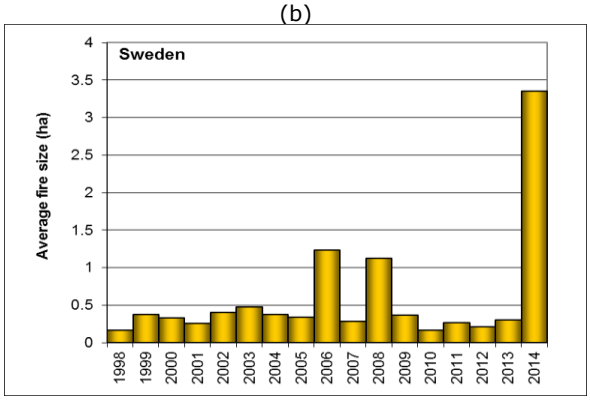


(c)

Figure 77. Burnt areas (a), number of fires (b) and average fire size (c) in Sweden from 1998 to 2014.

(Source: Swedish Civil Contingencies Agency (MSB); Risk & Vulnerability Reduction Department, Natural Hazards & Critical Infrastructure Section, Sweden).

2.2.27 **Switzerland**

Weather conditions and state of the forests 2014

The year 2014 was, along with 2011, one of the warmest years since the beginning of the temperature measurements in Switzerland about 150 years ago. Overall, temperatures were about 1.0 to 1.4 degrees Celsius above the 1981-2010 average in 2014.

Despite the impression of a poor summer 2014, precipitation was normal to slightly below the average in Northern Alpine Areas. Conversely, in southern Alpine Areas, precipitation was exceptionally abundant rising up to 150-160% of the 1981-2010 norm. Overall, sunshine duration was in the 1981-2010 norm, with slightly high values in the Zurich, Lucerne and Neuchatel Areas (about 110%), but clearly below average in the South, in Ticino and Grisons (80-90%).

The variability of atmospheric conditions in 2014 shaped the state of the forests. In southern Switzerland, local extreme snowfall damaged trees that broke. For example, at an elevation of about 1 500m, the Bosco Gurin weather station in Ticino measured about 9m of cumulated snow.

In February strong winds occurred, causing damage to trees. In March, a sudden warm and dry period occurred with temperatures rising up to 20-25°C, before winter came back and snow fell at low elevations. April was very mild and dry, and strong thunderstorms occurred at the end of the month.

May was rather cool, but as from the 7th of June, one week with temperatures up to 35°C occurred and ended with extreme thunderstorms and hail. That week of summer was about the only real summer episode in 2014.

July and August were wetter and cooler than average. September was successively milder and cooler that average, but rather dry. Mild south-westerly winds occurred in October and November bringing moisture and rising temperatures again. Especially in southern areas extreme precipitation occurred in October.

While record-like precipitation occurred in Ticino (about 1 080mm precipitation in Camedo within 10 days), strong Föhn winds (warm and dry) episodes occurred on the northern slopes with peaks at about 160-190km/h.

October and November were the warmest since the beginning of measures in Switzerland. The only exception during that period was a cold front on the 21st of October with very strong winds that again affected trees.

December was very mild at the beginning and cold temperatures with snowfall at low elevations characterized the period after Christmas, as from the 26th of December 2014.

Fire occurrence and affected surfaces

For 2014, fires from Canton Appenzell-Ausserrhoden, Baselland, Berne, Jura, Graubünden, Sankt-Gallen, Solothurn, Ticino, Valais and Zurich were recorded in the database.

A total of 56 forest fires were registered in 2014 (as reported by June 2015), burning 45 hectares, which corresponds to a low occurrence compared to the yearly average since 1980. Average fire size was 1 ha.

63% of the fires happened during the winter season (November to April), when 93% of the burned surface occurred.

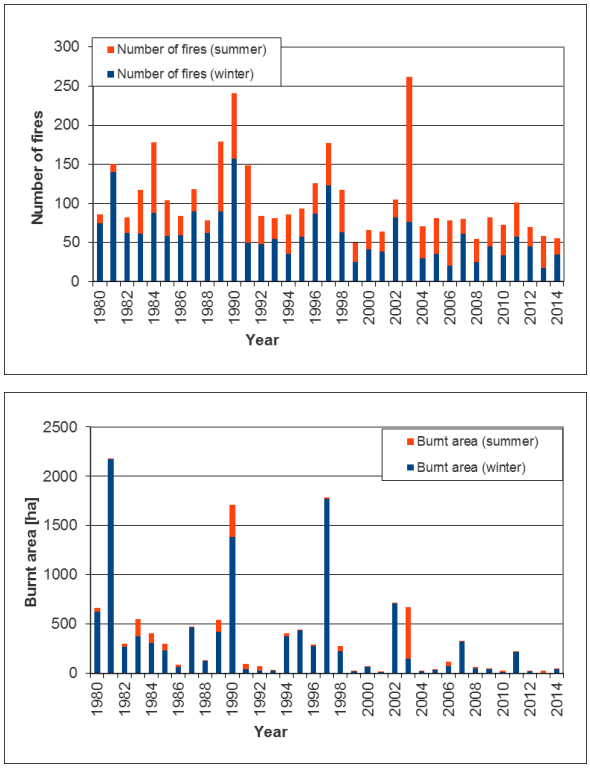
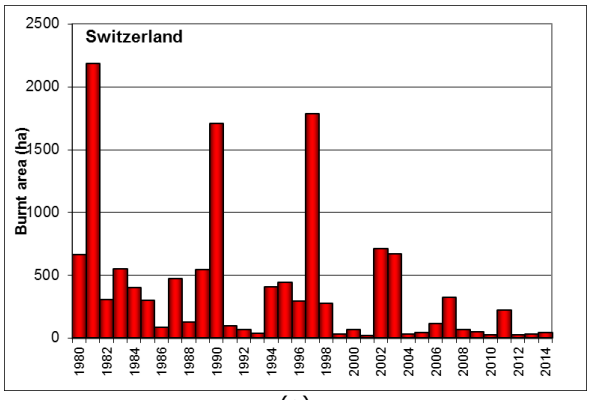


Figure 78. Number of fires and burnt area for winter and summer fires.

The yearly trends in terms of number of fires and burnt area during the last 35 years in Switzerland are shown in Figure 7 below.



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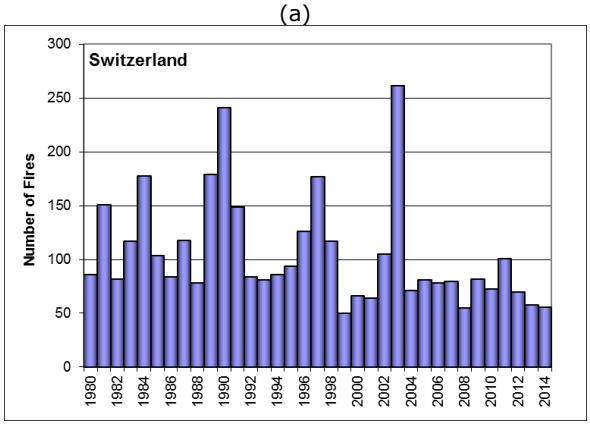

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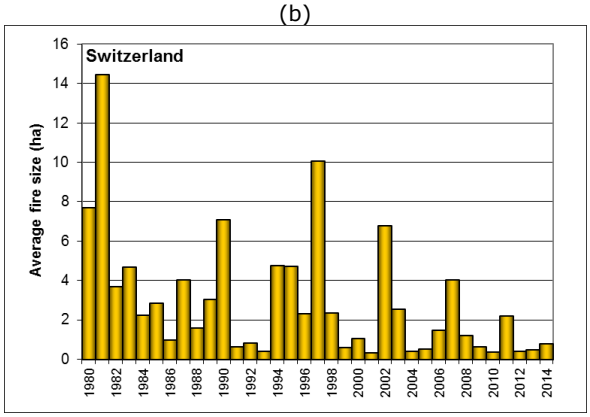


(c)

Figure 79. Burnt areas (a), number of fires (b) and average fire size (c) in Switzerland from 1980 to 2014.

Fire prevention activities

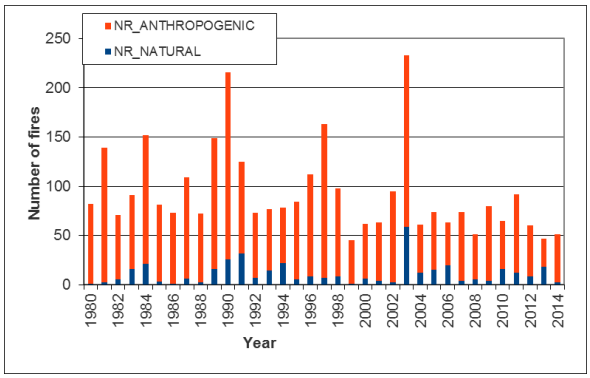
In accordance with the weather conditions, 2014 was a rather "quiet" year for fire prevention. Only the mild and dry April and the episodes at the beginning of June characterize the prevention campaigns. Warnings were issued over short periods and mostly in the southern territory. There were fire bans in Ticino and in Grisons' southern valleys at Eastertime (08/04/2014-27/04/2014). Several Cantons reminded their population of the fire risk in relation to the dry and hot conditions in June and asked to be cautious with fires in the open air. Then the moist conditions throughout the summer and autumn kept the fire danger at low levels up to mid to end of the year.

Prevention and information are in the focus of the federal forest fire prevention strategy. The Federal Office for the Environment website has an updated table with an overview of fire danger and measures decreed in the regions:

www.forest-fire-danger.ch

Fire causes

The main cause of fires in Switzerland remains neglect (Figure 80).



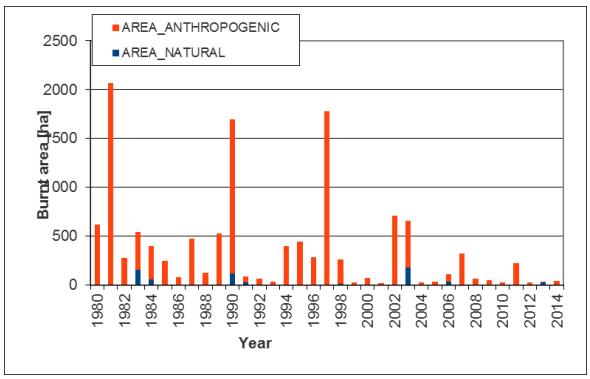


Figure 80. Number of fires and burnt area by cause.

Loss of human lives

No losses of life or major damage to buildings were reported in 2014.

(Sources: Federal Office for the Environment, MeteoSwiss, WSL Federal Research Institute).

2.3 Comparison of Southern EU Countries with longer time series (1980–2014)

The long time series of forest fire data available for these 5 large southern countries (Portugal, Spain, France, Italy, and Greece) justifies a separate analysis as has been the case in previous reports.

Figure 81a shows the total burnt area per year in the five large Southern Member States since 1980. The statistics vary considerably from one year to the next, which clearly indicates how much the burnt area depends on seasonal meteorological conditions.

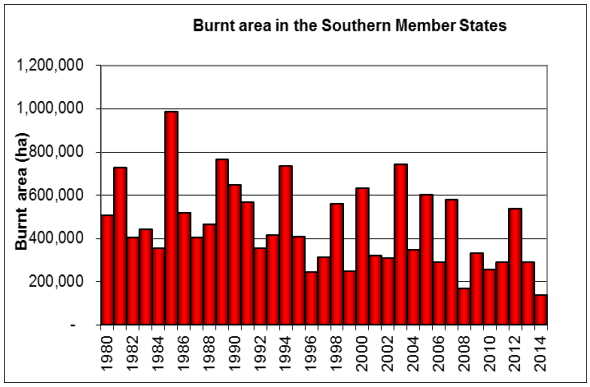
In 2014, forest fires burned a total area of 136 114 ha. This is the lowest burnt area recorded in these 5 countries since the time series began in 1980, and compares with an average of about 450 000 ha. In particular, Portugal saw less than 20% of the average amount of forest burnt. Spain, France and Italy all experienced around a third of their average burnt area, and for Greece it was around one half.

Figure 81b shows the yearly number of fires in the five southern Member States since 1980. After the increasing trend during the 1990s, which was also partly due to the improvement in recording procedures, the number of fires was stable for around one decade, and in the last decade a decrease was observed. In 2014 the number of fires (23 425) is the second lowest recorded since 1980 (see Table 27 and Annex 1 for details).

Figure 81c shows the yearly average fire size in the 5 countries since 1980. There is a clear difference in average fire size before and after 1990.

This is a similar trend to that observed in the number of fires and is also partly due to the same reasons (the additional fires that are recorded thanks to the improvements in the statistical systems are the smallest ones). However, it is also largely due to the improvements of the fire protection services of the countries.

In 2014 the average fire size was lower than in 2012 or 2013, and comparable to the values of the previous 4 years. The value is slightly below the average of the last 2 decades.



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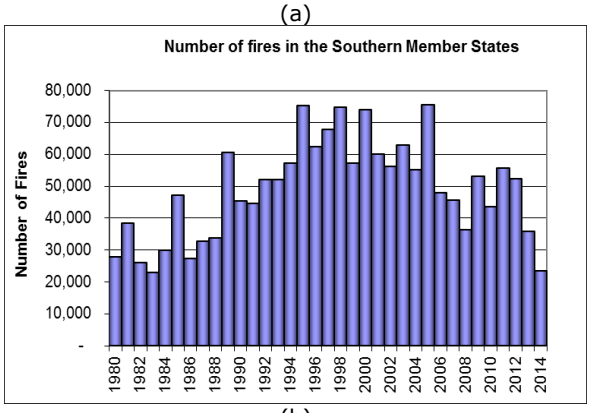

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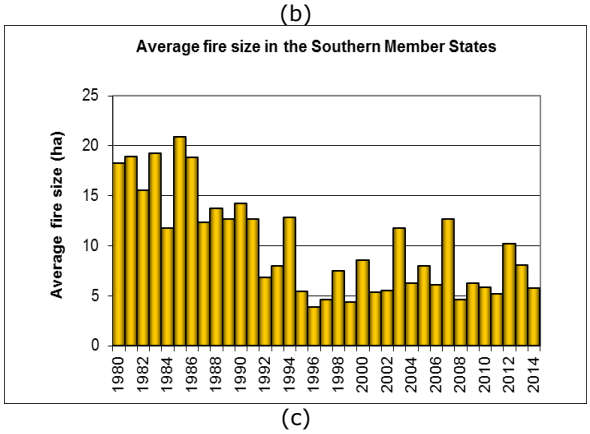


(c)

Figure 81. Burnt area (a) number of fires (b) and average fire size (c) in the five Southern Member States for the last 35 years.

Figure 82 compares the yearly averages of burnt areas, number of fires and average fire size for the periods 1980-89; 1990-1999, 2000-9 and 2010-2014 with the figures for 2014. It shows each of the 5 countries separately and also their total. It shows that 2014 was an extremely low year for fires for all 5 of the countries.

Table 27 gives a summary of the burnt areas and number of fires for the last 35 years, the average for the 1980s, the 1990s and the 2000s, and the average for the last 4 years, together with the figures for 2014 alone.

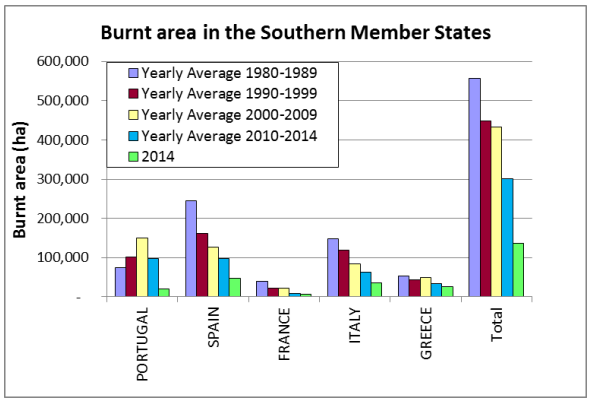
The total of 136 114 ha burnt over the 5 countries is half that burnt in 2013 and around one quarter of the average values from previous decades (1990-1999 and 2000-2009). Looking at the individual countries, Portugal had particularly good year, while Spain, Italy and France) had seasons similar to 2013 (Figure 82b).

The number of fires was also significantly lower than the average values for previous decades for all 5 countries (around half the long-term average).

Figure 83 shows the contribution of each of the five Member States in terms of burnt areas and number of fires to the overall figures for all five countries in 2014.

Since the area of each country is different, and the area at risk within each country is also different, the comparisons among countries cannot be absolute. It should also be borne in mind that since 2009 the figures for numbers of fires in Greece are incomplete and are therefore an under-representation of the true figure. This also affects the figures for average fire size and leads to an inflated figure for average fire size in Greece.

During 2014 Spain was the most affected country by a modest margin, and Portugal with 15% of the burnt area had a smaller share than usual.



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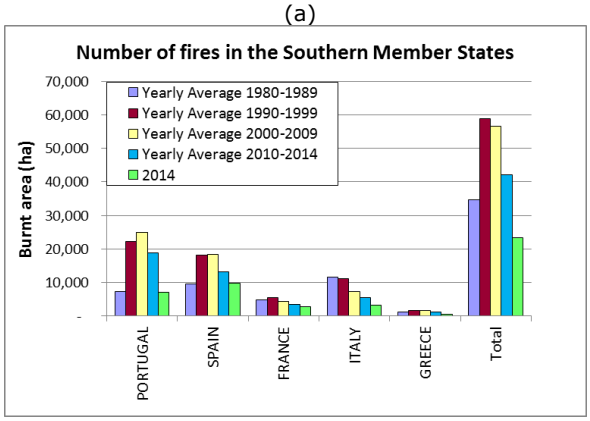

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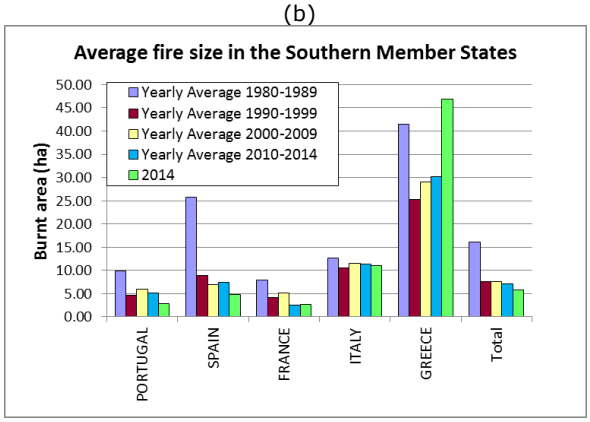
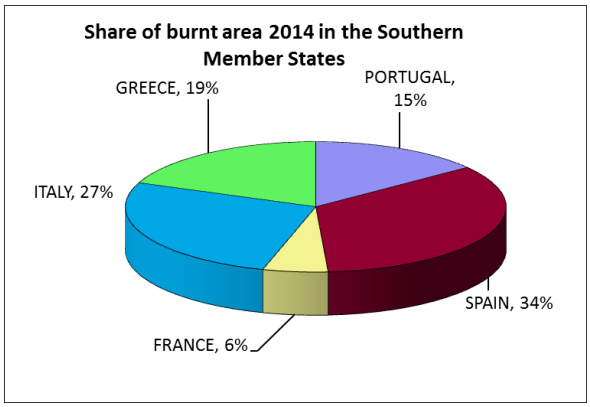
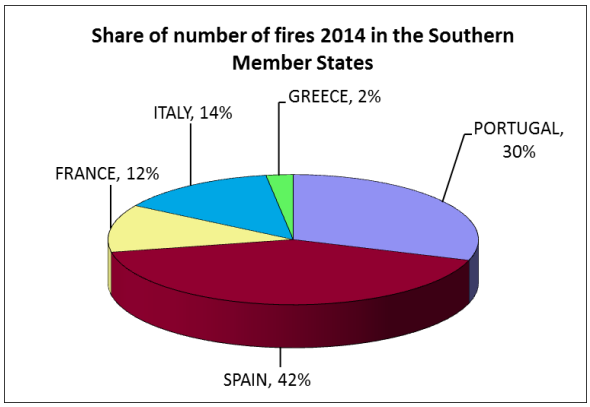


(c)

Figure 82. Burnt areas (a), number of fires (b) and average fire size (c) in the five Southern Member States in the year 2014 as compared with average values for previous decades.



(a)



(b)

Figure 83. Share of the total burnt area (a) and the total number of fires (b) in each of the Southern Member State for 2014.

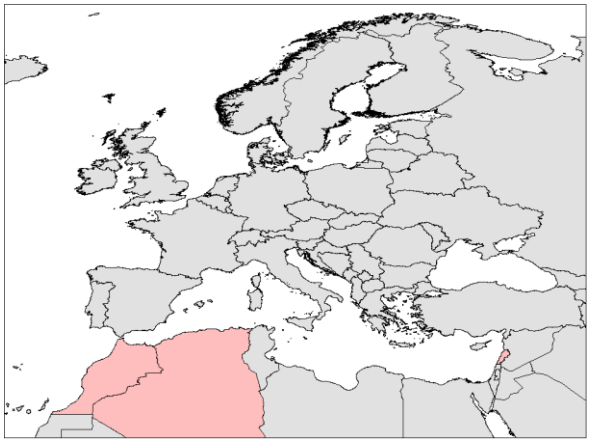
Table 27. Number of fires and burnt area in the five Southern Member States in the last 35 years.

Number of fires	PORTUGAL	SPAIN	FRANCE	ITALY	GREECE(*)	TOTAL
2014	**7 067**	**9 771**	**2 778**	**3 257**	**552**	**23 425**
% of total in 2014	30%	42%	12%	14%	2%	100%
Average 1980-1989	7 381	9 515	4 910	11 575	1 264	34 645
Average 1990-1999	22 250	18 152	5 538	11 164	1 748	58 851
Average 2000-2009	24 949	18 369	4 418	7 259	1 695	56 690
Average 2010-2014	18 956	13 207	3 416	5 502	1 128	42 209
Average 1980-2014	18 302	15 040	4 735	9 357	1 506	48 940
TOTAL (1980-2014)	640 586	526 390	165 737	327 487	52 696	1 712 896

Burnt areas (ha)	PORTUGAL	SPAIN	FRANCE	ITALY	GREECE	TOTAL
2014	**19 929**	**46 721**	**7 493**	**36 125**	**25 846**	**136 114**
% of total in 2014	15%	34%	6%	27%	19%	100%
Average 1980-1989	73 484	244 788	39 157	147 150	52 417	556 995
Average 1990-1999	102 203	161 319	22 735	118 573	44 108	448 938
Average 2000-2009	150 101	127 229	22 362	83 878	49 238	432 809
Average 2010-2014	97 964	97 752	8 504	62 911	34 111	301 243
Average 1980-2014	107 077	166 346	25 287	108 873	46 519	454 104
TOTAL (1980-2014)	3 747 705	5 822 123	885 056	3 810 561	1 628 181	15 893 626

(*) Numbers of fires are incomplete since 2009

2.4 *Middle East and North Africa Countries*



2.4.1 **Algeria**

Introduction

Algeria covers an area of 2 388 000 km^2, of which the Sahara occupies an area of over 2 million km^2, or 84% of the territory, making it the one of the largest deserts in the world.

The regions of northern Algeria where conditions of climate and environment are conducive to the development of forest formations occupy 250 000 km^2, or about 11% of the total area.

Forests and maquis cover 4.1 million hectares or an afforestation rate of 16.4% for northern Algeria and 1.7% only if the arid Saharan regions are also considered.

The actual forests, including reforestation, cover 1 702 8018 ha, or 42% of the total forest land area; however the maquis cover 2 413 090 ha or 58%.

The predominant species in the forests is the Aleppo pine which occupies 880 000 ha and which is found primarily in semi-arid areas; cork oak with 230 000 ha is in the north of the country and zeen oak with 48 000 ha occupies the cooler environments.

Other forest formations are less dominant and are scattered discontinuously: cedar, maritime pine and eucalyptus are encountered especially in the north of the country, and the holm oak, thuja and juniper in semi-arid areas.

Fire danger in the 2014 fire season

During the hot season of 2014, the climatic conditions were very close to the seasonal average and temperatures were mild enough for much of the summer.

"Sirocco" periods, which are characterized by hot and dry Saharan winds that quickly dry the vegetation and raise the risk of fire, were less frequent in summer 2014. Only four short heat waves were felt at the end of July and early August, and these were linked to the most serious fires recorded during this campaign.

In summary, the season of 2014 was fairly quiet and very similar to the previous season of the year, particularly in terms of maximum temperatures and low rainfall recorded between June and October.

Forest fire prevention

During 2014 there was a massive preparation campaign against forest fires, particularly in preventive work, awareness of citizens and the implementation of organizational systems to deal with forest fires.

Below, a quantitative listing of the main actions carried out:

Preventive work

Prevention Actions	Amount
Maintenance of firewall trenches	655 ha
New firewall trenches	214 ha
Maintenance of road verges	5 670 km
Buffer zones around farms	2 292 ha
Maintenance of clearings under high voltage lines	72 ha
Maintenance of railway verges	98 km
Maintenance of forest trails	1 000 km
New forest trails	679 km
Maintenance of water points	54 units
Construction of new water points	106 units
Silvicultural activities	23 805 ha

Awareness campaigns

Awareness raising activity	Number
Promotion of conferences and debates	345
Organisation of exhibitions and open days	320
Television broadcasts	75
Radio broadcasts	613
Sermons and religious lectures	632
Written articles	424
Organisation of local meetings	5 785
Distribution of young plants	599 905
Distribution of posters and leaflets	41377

Operational Organisation

- Updated "Forest Fire" plans for the 40 wilayas affected by this risk: the plan lays down procedures for the implementation of preventive measures and the mobilization of resources in the fight against forest fires.
- Enabling operational committees, to coordinate control operations at national level, and at the level of wilayas, daïras and communes.
- Set up local committees composed of farmers and citizens, which play an important role in fire prevention and first intervention in remote and isolated communities.
- Implementation of numerous simulation exercises "fight against wildfire" in coordination with the different sectors involved in the operations against forest fires.
- Organization of a development cycle of simulated forest fires for the benefit of civil protection officers, responsible for the command of forest fire response operations. in order to upgrade their knowledge in this area.

Monitor, alert, and response reinforcement

According to the Algerian regulations on forest fires, the system put in place for monitoring, alert and first intervention were provided by the Forest Service. However, the numerous interventions on reported fires were performed by means of civil protection units, reinforced if necessary by mobile columns, located in high fire risk wilayas.

In addition, supplementary team resources comprising civil protection means, were installed in sensitive areas, especially at large plots about to be harvested during the harvest season, and inside forest regions that are heavily frequented by citizens for recreation.

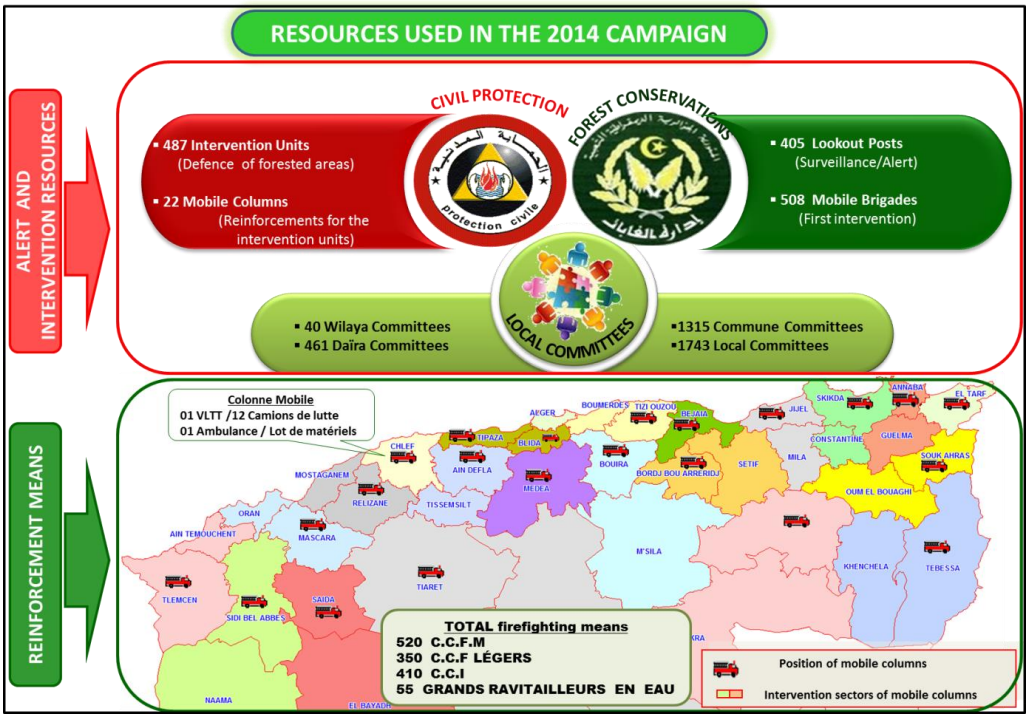


Figure 84. Resources used in the 2014 campaign in Algeria

Fire occurrence and affected surfaces

The total area burnt by fire during the 2014 season is estimated at 43 125 hectares, caused by a total of 4 629 fires. This area is significantly higher than that recorded during the campaign of 2013.

The distribution of burnt area by vegetation type (Figure 85) shows that 60% of this area was composed of forests and maquis. The rest of this area consists of scrub (brush, dry grass and alfa).

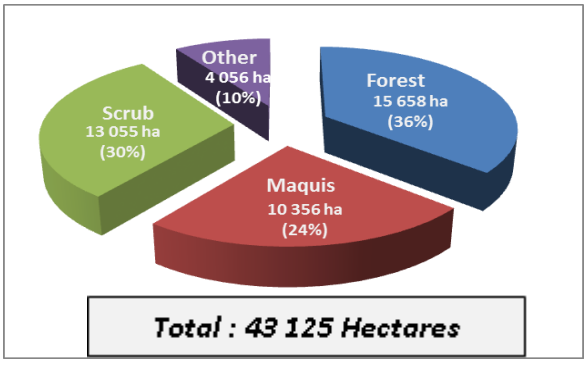


Figure 85. Burnt area classified by vegetation type

Figure 86. Number of fires in Algeria in 2014 classified by fire size

The distribution of area burned by region of the country (East/Centre/West) (Figure 87) shows that, during the 2014 campaign the Western region (12 wilayas) was the most affected by fires, with a burnt area of 22 471 ha representing 52% of the national total.

Although they are the most wooded, the other two regions: East (15 wilayas) and Centre (13 wilayas) had fewer fires in 2014. A total of 26% and 22% was recorded respectively in each of these two regions.

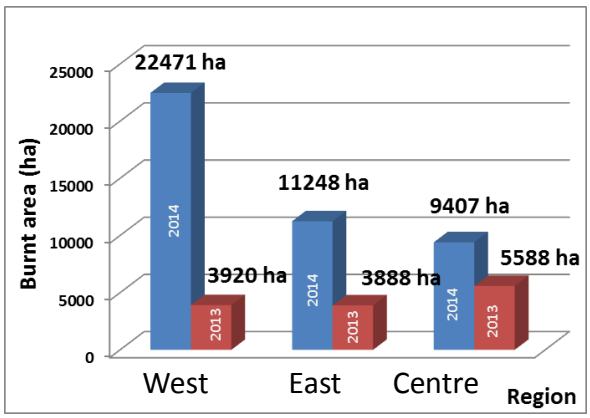


Figure 87. Burnt area classified by regions of the country

The monthly distribution of the burnt area (Figure 88) shows that the largest area burned was during the month of August when an average of 12ha/fire was recorded. This can be explained by the short heat-waves that were recorded during that month. It should also be noted that during the 2014 campaign, not many fires were recorded with very large burnt areas (Figure 86). In fact, over 79% of fires were less than 5 hectares in size, demonstrating the effectiveness of the teams deployed nearby for rapid detection and intervention.

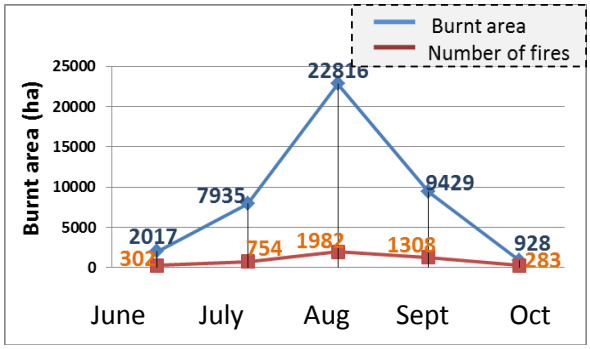


Figure 88. Number of fires and burnt area by month

Loss of life

There were no recorded deaths either among citizens or firefighters during the 2014 season forest fires. However, some less serious accidents occurred among members of the Civil Protection intervention teams during control operations. These consisted of fractures, respiratory problems, and minor injuries.

Mutual assistance operations between states

Algeria did not request any international assistance in the fight against forest fires in the 2014 campaign; nor did the General Directorate of Civil Defence participate in any operation in response to forest fires outside Algerian territory.

(Source: Direction Générale de la Protection Civile; Direction Générale des Forêts, Algeria).

2.4.2 **Lebanon**

Number of fires and affected surfaces – analysis of past seasons 2008-2010

The state of Lebanon's forest fires for 2008, 2009, and 2010 were completed by the year 2014 within the framework of a collaborative work between the Ministry of Environment (MOE) and the Biodiversity Program, Institute of the Environment, University of Balamand (BP-IOE-UOB). The 2010 forest fires report showed a comparison of fire occurrence and burned areas in addition to fire inter-annual seasonality between 2008, 2009, and 2010 (Figure 89 and Figure 90). Currently, there are ongoing efforts to complete the fire reports for the years 2011 through 2014.

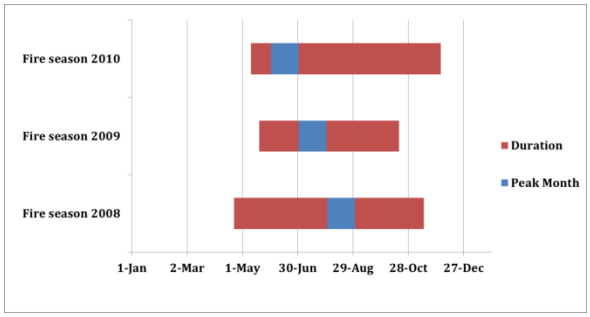
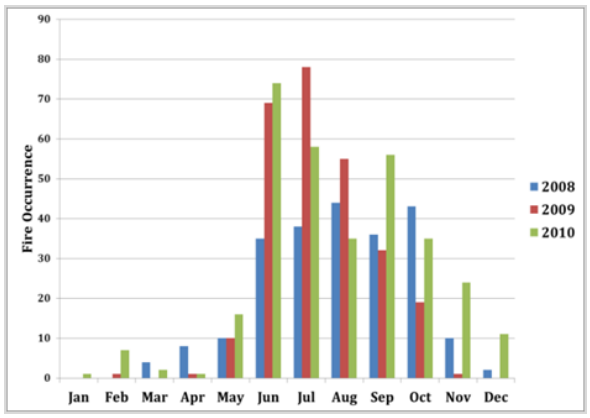
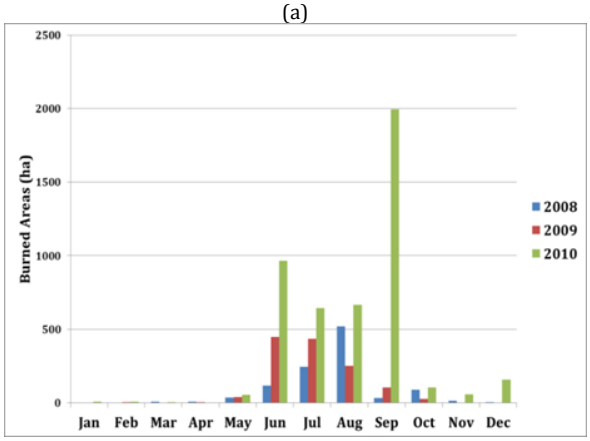


Figure 89. Comparison in fire inter-annual seasonality.



(a)



(b)

Figure 90. Comparison of fire occurrence (a) and burned areas (b) between 2008, 2009 and 2010.

Fire preventive activities

National fire prevention measures were only limited to a few initiatives including the publication by the Directorate of Civil Defense of a daily bulletin for prediction and prevention of forest and rural fires.

The United Nations Development Program (UNDP) in Lebanon, and through its Disaster Risk Management Unit (DRM) at the Presidency of the Council of Ministers, organized a national conference in October 2014 aiming at presenting and discussing initiatives that have been implemented at the national level by all the agencies concerned with forest fire fighting since the adoption of the National Strategy for Forest Fire management (Resolution No 52, 2009) in addition to offering suggestions for activating its implementation.

Fire danger

The year 2014 was exceptional in terms of precipitation with a total annual rainfall of 640.25 millimetres. The highest temperature recorded was 38°C on 4 June 2014, and the maximum wind speed recorded was 70.6 km/h on May 6. This contributed to having a relatively long fire season which roughly started in March and ended in the beginning of November. Negligence continues to be reported as the main cause of fires.

BP-IOE-UOB organized in August a closing conference of the project "Towards a better assessment and management of wildfire risk in the Wildland-Urban Interface in Lebanon: gaining from the US experience" funded by the US Agency for International Development (USAID) and supported by the Partnerships for Enhanced Engagement in Research (PEER) in agreement with the US National Academies of Science (NAS). The main results presented in the conference showed that 33% of the Lebanese territory (including forests, shrublands, and grasslands) is characterized by moderate to very high risk of fires, while the average length of the fire season is 147 days knowing that the season can extend up to 200 days in some years. In addition, Lebanon's climate proved to have increasing trends of drought promoting recurrent, larger, and more intense and severe wildfires in the near future, especially with the continuous lack of efficient forest management plans. The project's results and findings are expected to pave the way towards a better assessment and management of wildfire risk in Lebanon, and to contribute to better legislative measures in the forestry sector.

Around 50 individuals participated in August 2014 in a training session conducted within the USAID-PEER project. Participants from different ministries, public agencies, union of municipalities, Non-Governmental Organizations, universities and research centres, and committees of Nature Reserves among others, expressed interest in the main outputs of the project and highlighted different possibilities for use of the project's results within ongoing local and national initiatives. Also, they discussed how the ongoing wildfire research is one of the necessary steps to help in developing the capacity of stakeholders in assessing and adaptively managing wildfire risk in Lebanon.

Fire occurrence and affected areas

Until present, no official reports have been published on the number and extent of burned areas for 2014 in Lebanon. However, based on a desk study conducted by the BP-IOE-UOB, it was found that an approximate total vegetated area of 450 ha was affected by fire. In general, fire-affected type of forests consisted of conifer forests (e.g. Pinus sp.), mixed forests, grassland, mixed forest/agricultural land, and mixed grassland/agricultural land.

The Betshai/Baabda forest fire in May 2014 was considered as one of the biggest fires burning in the Wildland-Urban Interface in Lebanon. Firefighters struggled to put out a fire that was threatening hundreds of nearby homes. The fire forced many residents to flee the area, while nearby schools were evacuated (Figure 91).

Figure 91. Citizens check a charred car in a fire affected area in Betshai (May 5, 2014) near the Capital Beirut (*source: The Daily Star/Mohammad Azakir*).

Firefighting means and information campaigns

Fire control in 2014 mainly involved the use of Lebanese Army helicopters, fire engines of the Directorate of Civil Defense, small fire trucks owned by Non-Governmental Organizations, and local residents.

An awareness campaign was launched in June 2014 by the Ministry of Agriculture in collaboration with the Ministries of Environment, National Defense, and Interior and Municipalities, with the participation of local and National NGOs. During the launching of the campaign, the Minister of Agriculture announced that a new warning service has been put in place by the Lebanese Agriculture Research Institute (LARI) to communicate to farmers SMS messages comprising information about wind speed, temperature, relative humidity, and possible risks on planted vegetation. Also, the Directorate of the Civil Defense at the Ministry of Interior and Municipalities issued circular appealing citizens not to set fire during the fire season and to immediately report any possible risk.

In June 2014, two reports namely the "*status of wildfire warning systems in Lebanon*" and "*needs assessment of fire equipment for protected areas in Lebanon-2014*" were published within the framework of the EU funded project entitled "**Support to Reforms – Environmental Governance**" (EuropeAid/134306/D/SER/LB). The former report described the current situation in wildfire risk assessment, evaluated the existing and potential systems for fire danger rating, and provided recommendations and directions for improvements in fire danger assessment and forecasting. The other report 1) assessed the current situation of fire management in specific Protected Areas across Lebanon, and 2) identified needs in terms of firefighting equipment, fire management plans, and training activities.

Loss of human lives

In 2014, one firefighter from the Directorate of the Civil Defense was killed during forest firefighting in South of Lebanon, and at least 4 individuals were injured from activities associated with controlling forest fires.

(Source: Biodiversity Program, Institute of the Environment, University of Balamand, Lebanon).

2.4.3 **Morocco**

Background

In over 9 million hectares of forest domain representing more than 20% of the national area, forest formations in Morocco cover an area of 5 814 000 ha (broadleaves, conifers…) and 3 318 260 ha of *stipa tenacissima* (Figure 92), and are distributed among the different bioclimatic zones, from semi-arid to humid.

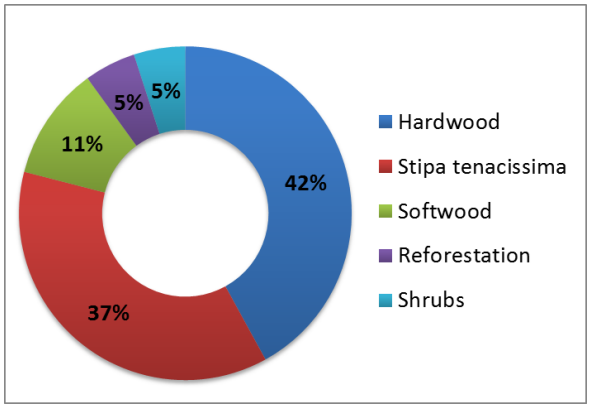


Figure 92. Composition of forest land in Morocco

As in Mediterranean countries, forested areas in Morocco are subject to a recurrent risk of fires that is favoured by the extreme flammability of forest species during the summer. The consequences of this risk are prejudicial in terms of social, economic and environmental components. Indeed, the forest land is an open space where access (except rare situations) is free. Riparian forest populations live in a subsistence economy (using forests for their needs of construction wood and firewood, various non-timber forest products, and pasture). Consequently, forests are under a very strong human pressure.

Through the analysis of annual reports of forest fires during the years 1960 to 2014, an average of 282 fires per year is calculated for an annual average area affected of 3 068 ha (HCEFLCD, 2014).

Although limited compared to the average area burned in other countries with similar conditions, especially the Mediterranean, this area is important in view of the major roles played by forests and the difficulties of their reconstruction and regeneration with regard to the national socio economic and environmental context.

To face the recurring and imponderable phenomenon of fire, a **National Plan of Prevention and Fight against forest fires** (in French: *Plan Directeur de Prévention et de Lutte Contre les Incendies "PDCI"*) was adopted with the participation of all institutional partners concerned by this issue: Ministry of the Interior (MI), High Commission of Forests, Water and combating Desertification (HCEFLCD), Ministry of Equipment and Transport (MET), Royal Gendarmerie (GR), Civil Protection (PC), Agency for Economic and Social Development for Northern Provinces and Prefectures (ADPN) and the Administration of Land Conservation, Cadastre and Mapping (ACFCC). The plan focuses on the actions of equipment and forest management for fire prevention, risk prediction, monitoring and warning and also on the coordinated operations to fight against forest fires.

Despite the efforts made at different levels by all institutions involved in forest fire management in Morocco, **the system calls for continuous improvements**, not only in terms of prevention and prediction, but also in terms of operational and organizational interventions.

Fire occurrence and affected surfaces

<u>From 1960 to 2014</u>

Through the analysis of the available data on forest fires in Morocco during the period 1960s to 2014, a total of 14 205 outbreaks of fire (Figure 93) and a total area damaged (but not lost) of 158 338 ha are reported, giving an average of 273 fires per year for an annual average area of 3 045 ha affected, with maxima of 11 000 ha in 1983 and 8 660 ha in 2004 (Figure 94). The absolute minimum is recorded in 2002 with 593 ha (Figure 94).

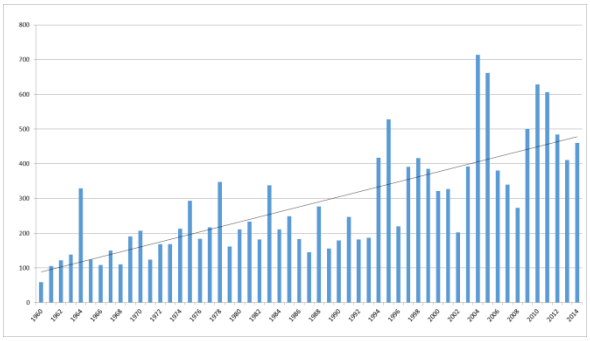


Figure 93. Evolution of forest fire numbers from 1960 to 2014 (HCEFLCD, 2014)

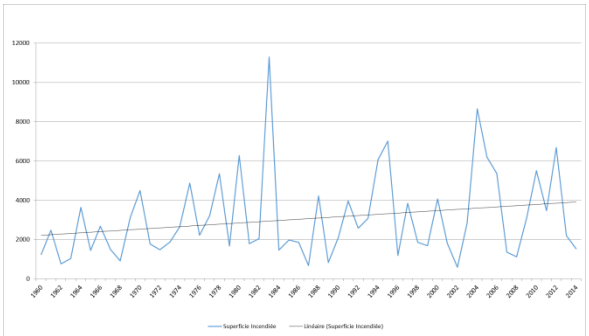


Figure 94. Evolution of the areas burned from 1960 to 2014 (HCEFLCD, 2014)

It should also be noted that, globally and since 1960, the trend of fire numbers and area affected by forest fires has never stopped increasing; but the shapes of the increases are not similar. Indeed, the increase in fire number has been continuous from an average of 242 between 1990-1994, to 498 forest fires in the last decade (2004-2013) (Figure 93).

The period from 1960 to 1974 represents the portion where fire number and area burned are at the lowest levels (154 fires and 2 073 ha) compared to the averages for the period covering 1975 to 2014 (331 fires and 3 442 ha). We note that the area affected per fire, which reached the value of 7.5 ha during the period 2005-2014, has decreased by 37% compared to the national average recorded since 1960, which is 12 ha per fire (Figure 94).

Over the past decade, the years 2004, 2005, 2010, 2011, 2012 and 2014 were exceptional both in forest fire numbers declared and in affected areas. Indeed, it is mainly the Rif and Pre-Rif provinces which were most affected because of the high sensitivity to fire of pine, cork oak and shrub formations and the strong pressure on land resulting from the use of fire as a cleaning land practice for cultivation.

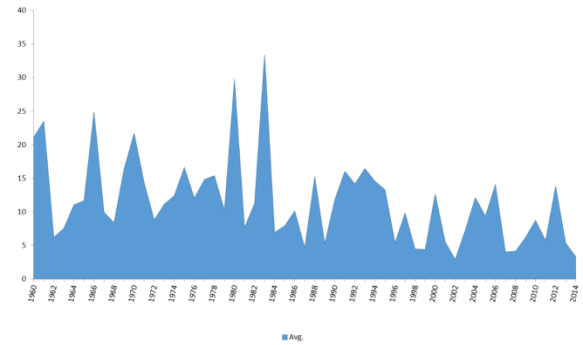


Figure 95. Evolution of the area affected per fire from 1960 to 2014

2014 fire season

During 2014, there was recorded a total of 460 fires affecting an area of 1 539 ha, an average of 3.3 ha per fire.

Both the number of fires and the total burnt area have decreased in comparison to the average for the last decade 2004-2013, by 8% and 65% respectively (Figure 96, Figure 97).

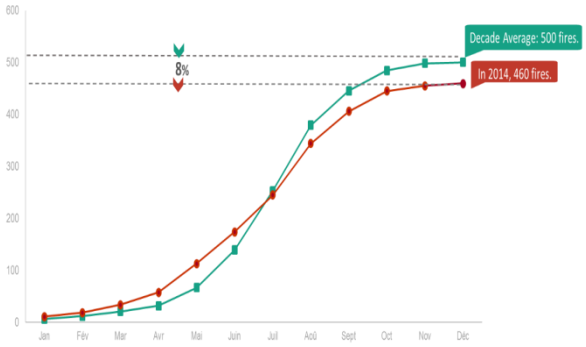


Figure 96. Evolution of the number of fires in 2014 compared to the last decade

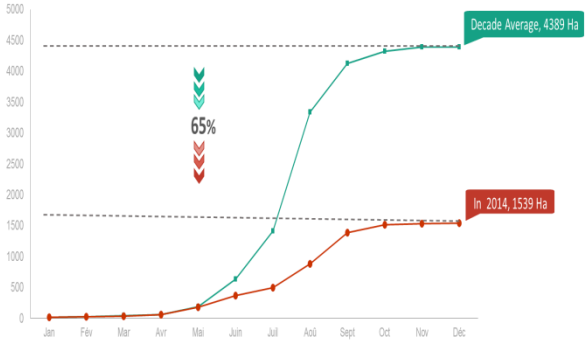


Figure 97. Evolution of burnt area in 2014 compared to the last decade

The distribution of fires recorded in 2014 (Figure 98), based on the type of vegetation affected, is as follows:

- For wooded land, an area of 869 ha (55% of the total area burned) was affected by 232 fires (40% of the total number of fires);
- The shrub and herbaceous covers were affected by 337 fires that covered an area of 670 ha, equivalent to 60% respectively of the total number of reported fires and 43% of the total area burned.
- For wooded stands, *Pinus halapensis* is in first place with an area of 165 ha affected, equivalent to 19% of the total area burned in this category, followed closely by *Pinus pinaster* trees with an area of 164 ha affected (19%).

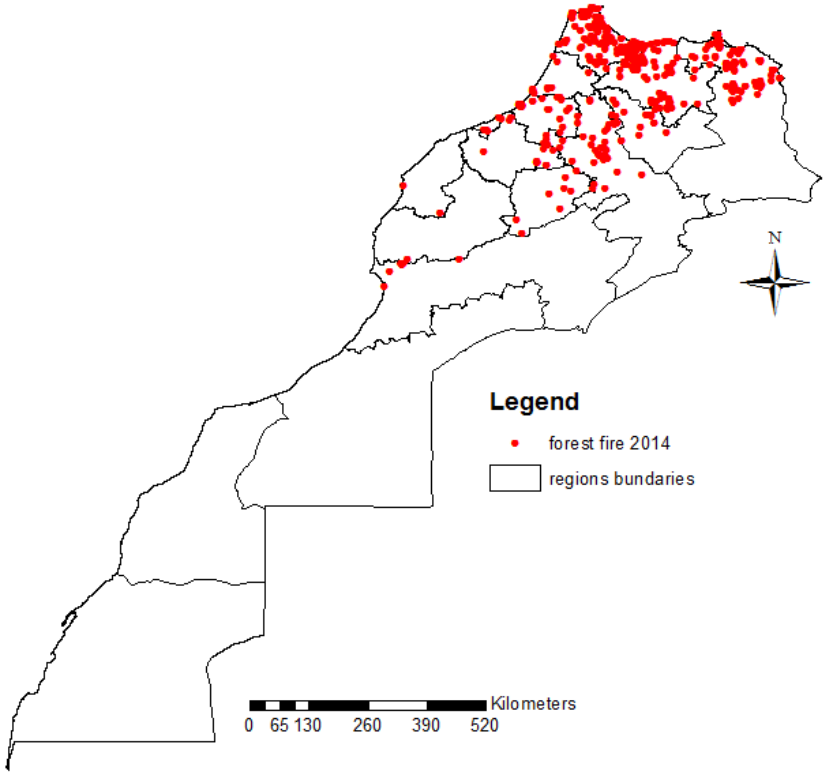


Figure 98. Location the forest fires recorded in 2014 in Morocco

Table 28. Distribution of fires based on the type of vegetation affected in 2014

Category	Species	Area (ha)	% Area	Number	% Nbr
broadleaves	carob tree	0.20	0.01	0.35	0.08
	eucalyptus camaldulensis	1.84	0.12	3.75	0.81
	eucalyptus gomphocephalla	5.81	0.38	4.00	0.87
	eucalyptus sideroxylon	0.50	0.03	0.17	0.04
	olive	0.23	0.01	0.47	0.10
	Pistachio of Atlas	1.00	0.06	0.50	0.11
	Oak Zeen	6.36	0.41	1.19	0.26
	Oak Tauzin	21.00	1.36	1.44	0.31
	holm oak	137.57	8.93	19.46	4.23
	cork oak	45.52	2.96	20.03	4.35
	pepper	0.80	0.05	0.40	0.09
S/ **Total**		**220.83**	**14.34**	**51.76**	**11.25**
Coniferous	Fir tree	80.00	5.20	1.00	0.22
	Atlas cedar	3.16	0.21	18.54	4.03
	cypress	0.00	0.00	1.00	0.22
	oxycèdre	1.51	0.10	1.42	0.31
	red cedar	22.38	1.45	1.93	0.42
	juniper thunifère	0.24	0.02	1.23	0.27
	Aleppo pine	164.45	10.68	46.44	10.10
	maritime Pine	163.63	10.63	17.65	3.83
	Pine pignon	148.95	9.67	4.56	0.99
	thuja	62.94	4.09	8.96	1.95
S/**Total**		**647**	**42.03**	**102.72**	**22.33**
Others	Alfa	206.73	13.43	47.26	10.27
	arbutus	0.12	0.01	0.20	0.04
	chamerops	2.00	0.13	1.00	0.22
	Secondary species	293.98	19.09	117.70	25.59
	pistacia	1.31	0.09	0.89	0.19
	rosemary	48.48	3.15	2.17	0.47
	grass cover	119.12	7.74	136.31	29.63
S/Total		**671.74**	**43.62**	**305.52**	**66.42**
Total		**1539.83**	**100.00**	**460.00**	**100.00**

The data relating to the distribution of fires according to size classes of affected areas are represented in the table below (Table 29). Indeed, 93% of reported fires were under control with the speed and efficiency required, since the area affected has not exceeded 5 ha for each fire. It is also noted that only 2 fires (0.5% of the total number of fires) affected an area of over 100 hectares, representing over 28% of the total area burned.

Table 29. Distribution of fires according to size classes of affected areas

Size Class (ha)	***Number***		***Area (ha)***	
	Count	***%***	***Area***	***%***
0-5 ha	427	93%	310	20%
5-10 ha	13	3%	99	6%
10-20 h	5	1%	77	5%
20-50 ha	8	2%	259	17%
50-100 ha	5	1%	369	24%
>100 ha	2	0.5%	426	28%
Total	**460**	**100%**	**1540**	**100%**

The data showing the distribution of fires by forest region are reported, below, in Table 30.

Table 30. Fire numbers and area affected by forest region

Region	***Number***		***Area (Ha)***	
	Count	***%***	***Area***	***%***
RIF	143	31.1%	703.45	45.7%
Oriental	100	21.7%	357.97	23.2%
Fes-Boulmane	19	4.1%	130.55	8.5%
Nord-Est	73	15.9%	106.17	6.9%
Haut-Atlas	3	0.7%	78.58	5.1%
Centre	23	5.0%	75.87	4.9%
Moyen-Atlas	38	8.3%	47.59	3.1%
Rabat-Sale-Zemmour-Zaer	34	7.4%	24.97	1.6%
Sud-Ouest	6	1.3%	5.92	0.4%
Tadla-Azilal	7	1.5%	5.19	0.3%
Nord-Ouest	14	3.0%	3.56	0.2%
Total	**460**	**100%**	**1539.8**	**100%**

The Rif region (Tanger, Tetouan...) ranks first in terms of area affected with 703 ha (45% of the total area recorded nationally) (Figure 99 and Table 30). Therefore, despite the large number of fires (143 fires), the average area affected by each fire was only 4.9 ha.

The occurrence of fires is concentrated in the provinces of Rif and Pre-Rif (including Tangier and Tetouan); this situation is favored by the terrain, the high sensitivity of forest stand types (pine, cork oak matorral...) and the intense human pressure on land resulting from the use of fire as a practice of cleaning land for their cultivation.

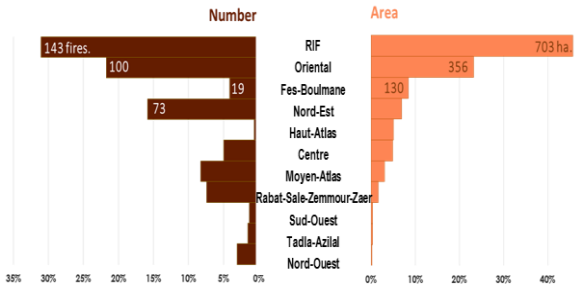


Figure 99. Number of fires and area affected by forest region.

Fire Causes

Forest fires of unknown origin represent a dominant share (96%). Almost all forest fires result from human action, either intentionally or by negligence (Table 31).

Table 31. Causes of fires

Origin	***Cause***	***Number***		***Area***	
		Count	***%***	***Area***	***%***
Accidental	Landfill, Honey extraction, High tension line	13	2.8%	143.7	9.3%
unknown	Unknown	441	95.9%	1394.5	90.6%
Intentional	Land clearing, Vandalism	6	1.3%	1.6	0.1%
Total		460	100%	1539.8	100%

Forest fire risk mapping in Morocco

In 2014, the mapping of static and dynamic risk of ignition and fire spread was completed for the whole of the kingdom. This mapping is a Decision Support System to help managers in all operations related to anticipation, prevention and intervention effectiveness.

- The static risk maps (see Figure 100 and Figure 101) are used to guide and optimize investment means, in the short and medium terms (10 years), especially as regards infrastructure, equipment and fire management in forest areas.

- Dynamic risk maps (see Figure 102), is an interactive map published on the web (www.sysfeu.com); these maps, updated twice a day, offer trigger process alerts and pre-positioning of the intervention means of the departments involved (HCEFLCD, PC, GR and FRA) depending on the scale of the danger of forest fires.

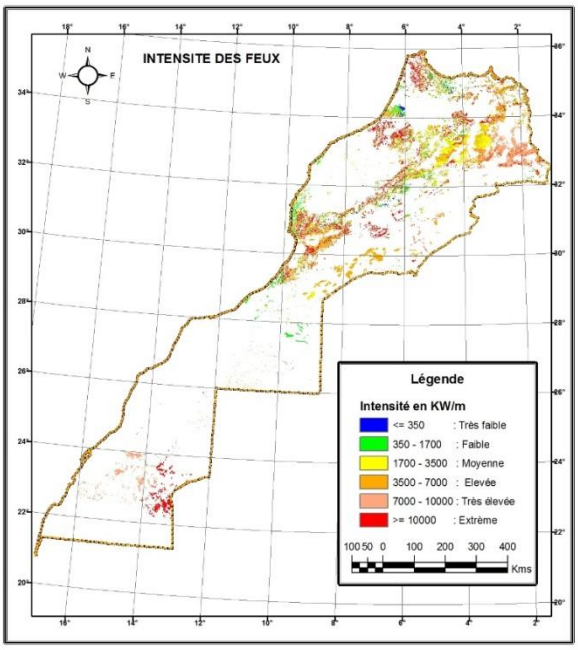


Figure 100. Risk of fire spread (fire intensity) in Morocco

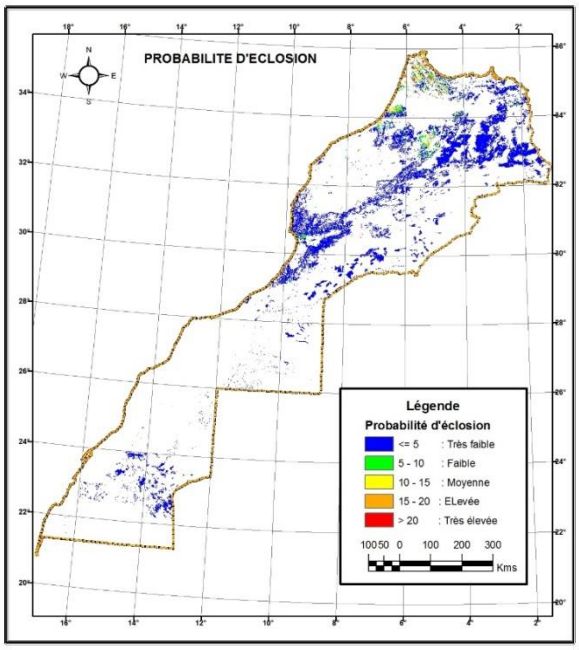


Figure 101. Ignition risk in Morocco

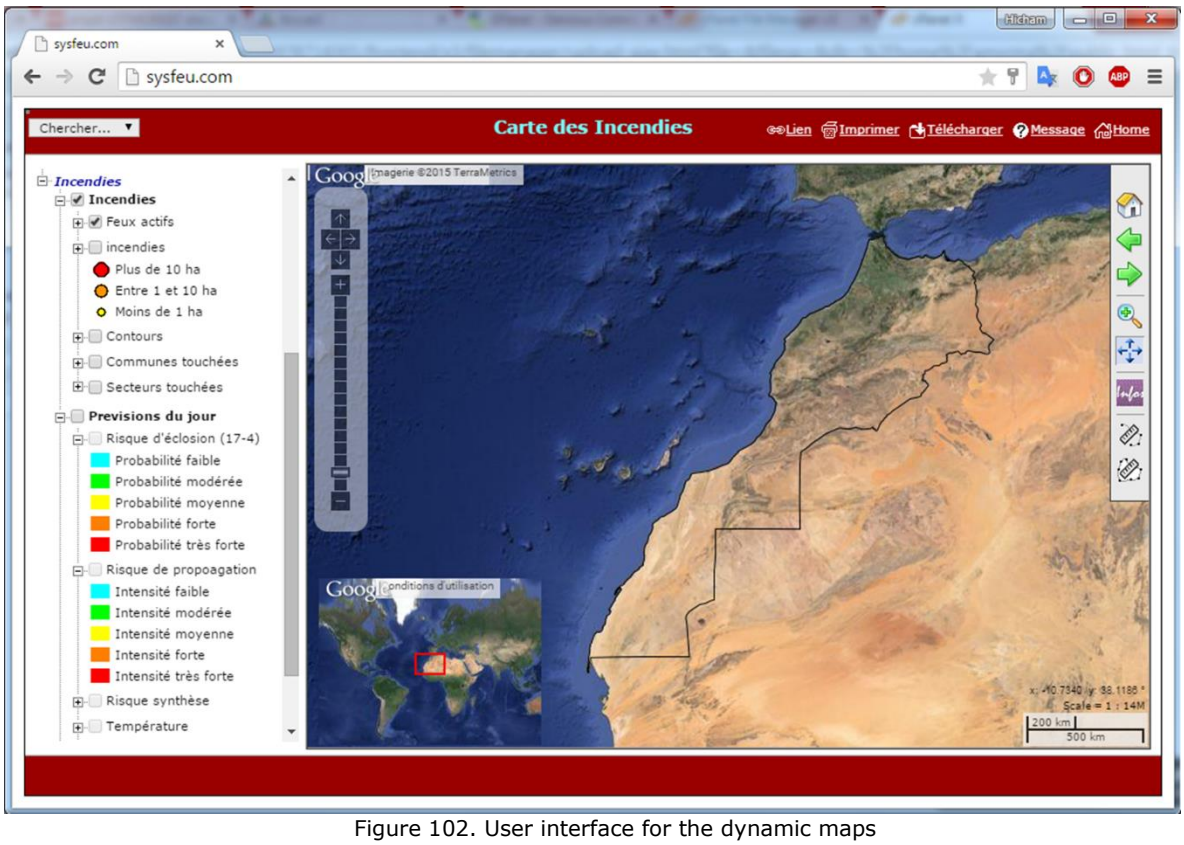


Figure 102. User interface for the dynamic maps

Table 32. Fire fighting means in 2014.

Activities	*Department*	*Quantity*
Monitoring and alerts	High Commission of Forests, Water and combating Desertification	**1200** watchers
	Ministry of the Interior	**NC** [Estimated at **1000** watchers]
Ground intervention	High Commission of Forests, Water and combating Desertification	**410** forest fighters with **96** vehicles for the first intervention
	Civil Protection	**NC**
	Auxiliary Forces	**NC** [Estimated at 300 persons]
	Royal Armed Forces	**NC** [Estimated at 300 persons]
Aerial control	Royal Gendarmerie	Twelve **(12)** Turbo Trush aircraft
	Royal Air Forces	Five **(5)** Canadairs

***NC** : Not Communicated*

Fire fighting means

The means mobilized by the different departments in 2014 in Morocco for the operations against forest fires, are shown in Table 32 above.

Information campaigns

In Morocco and before 2005, the program of public awareness conducted by the HCEFLCD and its partners did not have a national scope, but was limited mainly to setting up of panels of awareness along the roads, distributing posters and organizing meetings of provincial committees around the issues of forest fires.

Up to 2014, the HCEFLCD has gradually accumulated experience in designing and disseminating educational materials to raise awareness, and has succeeded in building a real communication device that drives the public to realize that a simple act, of negligence or innocent, may cause natural, environmental, or economic damage and even sometimes dramatic loss of human lives. Thus, during this period the following activities were undertaken:

- the design and broadcasting in different languages, during prime time during the risk season, of 10 television spots and 7 radio messages, specific and generic, with a consistent and diversified content aimed at attracting attention and curiosity, showing the problem of forest fires and the revealing solutions.
- the distribution of posters, leaflets and brochures written in Arabic and French in public places: schools, government offices, roads, highways, bazaars, villages, etc;
- posting signs of awareness in the vicinity of major roads and highways, especially at the exit of large cities, and those leading to the most sensitive forest areas.
- The organization of press briefings to raise awareness of print and audiovisual media on progress of the campaign of prevention and fight against forest fires.

Loss of human lives

No lives were lost in the 2014 season.

(Source: Service de la Protection des Forêts, Haut-Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification, Morocco)

3 THE EUROPEAN FOREST FIRE INFORMATION SYSTEM (EFFIS)

The European Forest Fire Information System (EFFIS) has been established jointly by the European Commission services (DG ENV and JRC) and the relevant fires services in the EU Member States and European countries (Forest Services and Civil Protection services).

EFFIS is the EC focal point of information on forest fires aiming to support the national services in charge of the protection of forests against fires in the EU and neighbouring countries, and also to provide the EC services such as the Emergency Response Centre (ERC), formerly Monitoring and Information Centre (MIC), of Civil Protection and the European Parliament with up to date and harmonized information on forest fires in Europe.

Research activities for the development of the system initiated in 1998 and the first EFFIS operations were in the year 2000. In 2003, EFFIS was officially established in the context of Regulation (EC) No 2152/2003 (Forest Focus) of the European Council and Parliament on monitoring of forests and environmental interactions.

The purpose of EFFIS is to provide information for the protection of forests against fire in Europe addressing both pre-fire and post-fire conditions. It also centralises the national fire data that the Member States collect through their national forest fire programmes. A web mapping interface has been set up on the EFFIS website [1] which allows users to access EU wide information about forest fires and other related environmental data.

EFFIS monitors the fire situation in Europe and the Mediterranean area, and regularly sends updates to EC services during the main fire season. The information about the on-going fire season is daily updated on the EFFIS web site, which can be interactively queried[2]. EFFIS provides daily meteorological fire danger maps and forecasts of fire danger up to 6 days in advance, updated maps of the latest hotspots (active fires) and fire perimeters. The damage caused by forest fires in the European and Mediterranean region is also estimated from the burned area maps of EFFIS.

The EFFIS module for the assessment of meteorological forest fire danger is the EFFIS Danger Forecast. This module forecasts forest fire danger in Europe, part of North Africa and the Middle East, on the basis of the Canadian Fire Weather Index (FWI) System, allowing a harmonized evaluation of the forest fire danger situation throughout Europe and neighbouring countries.

The damage caused by forest fires in Europe and neighbouring countries is estimated using the EFFIS Rapid Damage Assessment module. Since 2000, cartography of the burned areas is produced every year through the processing of satellite imagery. In the year 2003, due to the availability of daily satellite imagery from the MODIS sensor on board of the TERRA and AQUA satellites, the RDA provided frequent updates of the total burnt area in Europe. Since 2007 the RDA is updated up to two times every day. Further to the mapping of burnt areas, the analysis of which types of land cover classes are affected by fires is performed. This module uses MODIS satellite imagery with a ground spatial resolution of about 250 metres, which permits the mapping of fires of 40 ha or larger. The burned area mapped by EFFIS corresponds, on average, to 75% to 80% of the total area burnt in Europe each year.

Other EFFIS modules have been developed and are currently in a final validation stage. Such modules are aimed to provide an assessment of atmospheric emissions from forest fires and of the socio-economic impact of forest fires in Europe.

[1] http://effis.jrc.ec.europa.eu
[2] see http://effis.jrc.ec.europa.eu/current-situation

3.1 EFFIS Danger Forecast: 2014 results

The EFFIS Danger Forecast was developed to support the Commission's Directorate-General for the Environment and the forest fire-fighting services in the EU Member States. From 2002, at the request of the Member States, operation of the EFFIS Danger Forecast was extended to six months starting on 1 May and ending on 31 October, and in 2006 to nine months, from 1 February to 31 October.

In this chapter the fire danger trends assessed by EFFIS in the different countries during the 2014 fire season are presented, comparing them with previous years.

2014 was noteworthy for being the lowest season for fires for decades in many of the southern countries normally most affected by fire. Temperatures were lower and rainfall rates were frequently higher than normal during spring and summer, leading to a relatively low fire danger.

The exception was in the more northern countries, which experienced warmer and drier conditions than average. The largest fire of the year occurred in Sweden, and there were two major fires (over 500 ha) in Norway in January.

The end of the season was quiet, with a low fire danger level in all regions from September onwards.

Through the Danger Forecast module of EFFIS the situation has been continuously monitored and the risk level analysed and mapped.

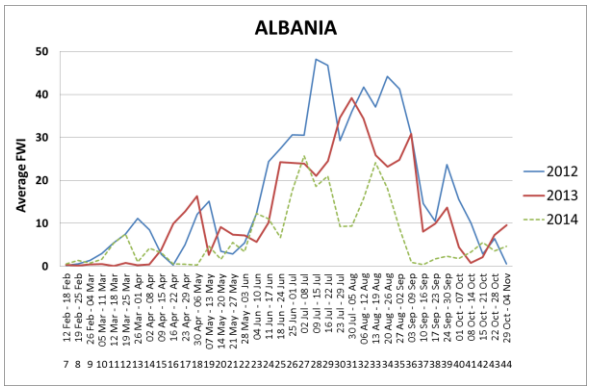
The following figures show fire danger through 2014 as determined by the average FWI values assessed during the fire season in the individual countries.

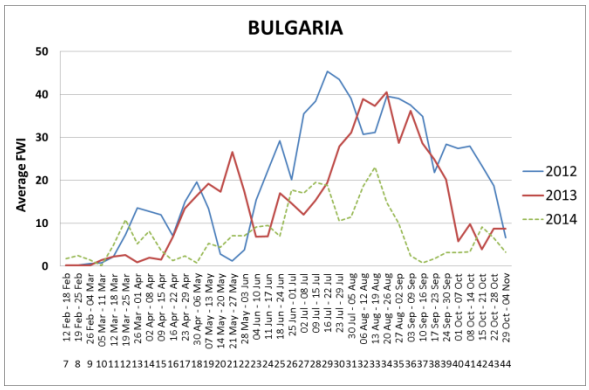
The graphs show the weekly averages of FWI over entire countries; therefore local peaks might have been flattened, especially in those countries such as France or Italy, where there are strong differences in fire danger level with changing latitudes; nevertheless the general trend is depicted providing relevant information about the fire danger level and trends of the year.

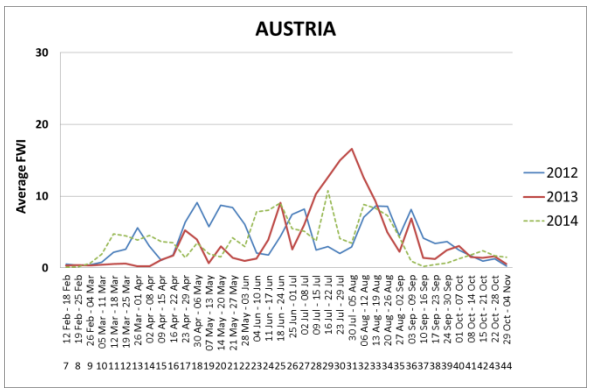
To allow a better comparison with past seasons, the curves of 2012 and 2013 are presented in conjunction with 2014 for all countries.

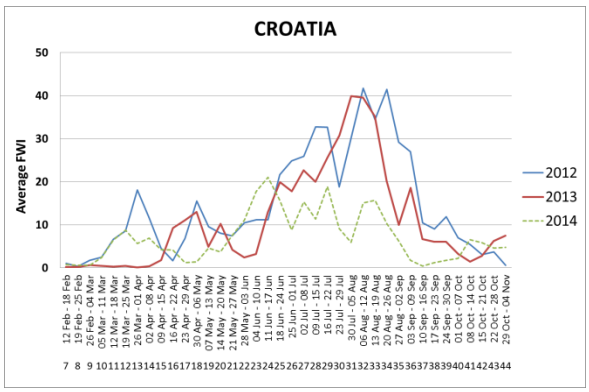
The countries analysed are those participating in the EFFIS network for which data are available, and are presented in alphabetic order within the two groups (European countries and MENA countries) in the graphs that follow.

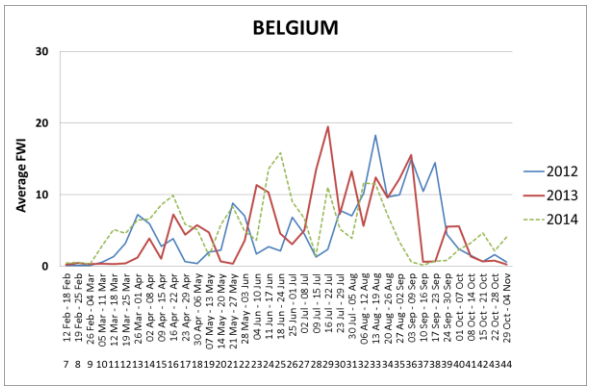
NOTE: In order to make the graphs more readable, 3 scales have been used to present the FWI: 0-30 for the most northern countries where fire danger rarely reaches high levels; 0-50 for most other countries including those in the Mediterranean; and 0-70 for the MENA countries and Turkey.

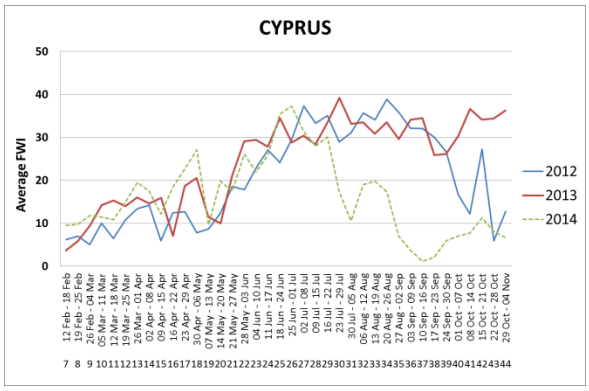

ALBANIA
Average FWI
2012
2013
2014

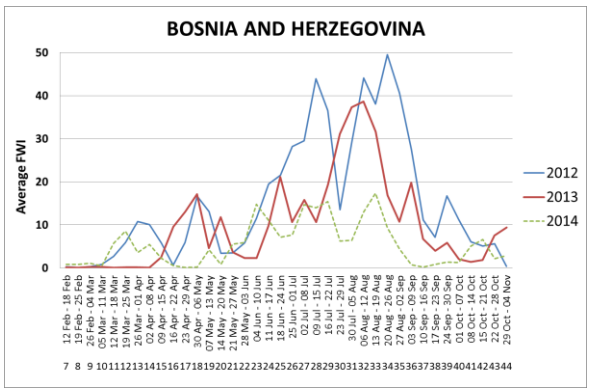

BULGARIA
Average FWI
2012
2013
2014

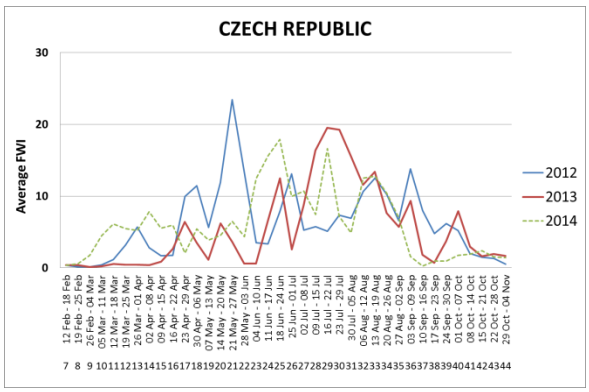

AUSTRIA
Average FWI
2012
2013
2014

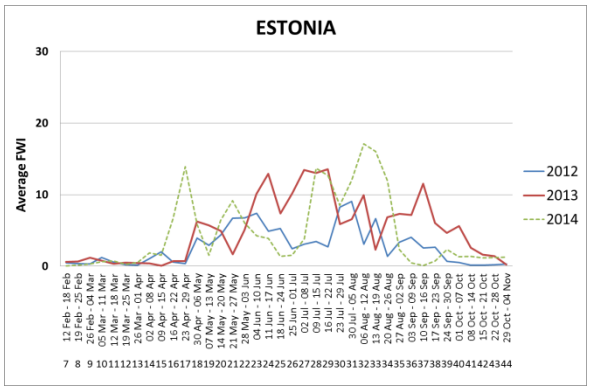

CROATIA
Average FWI
2012
2013
2014

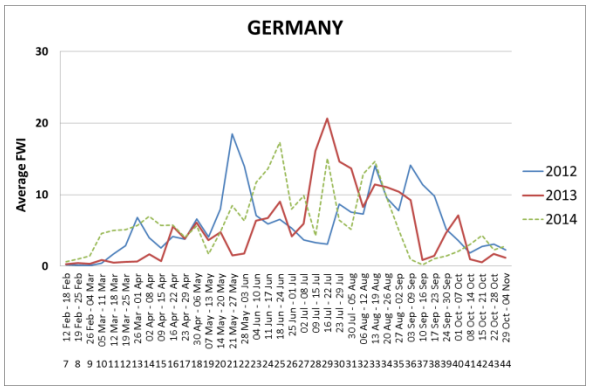

BELGIUM
Average FWI
2012
2013
2014

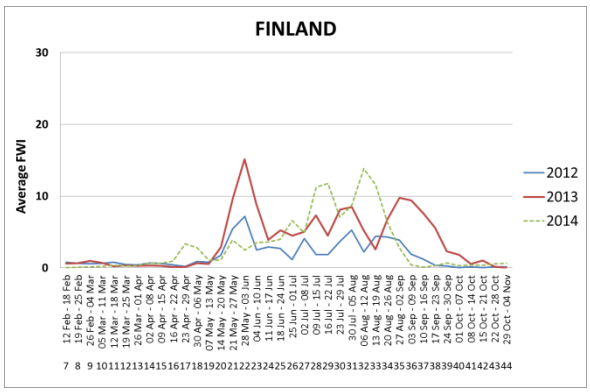

CYPRUS
Average FWI
2012
2013
2014

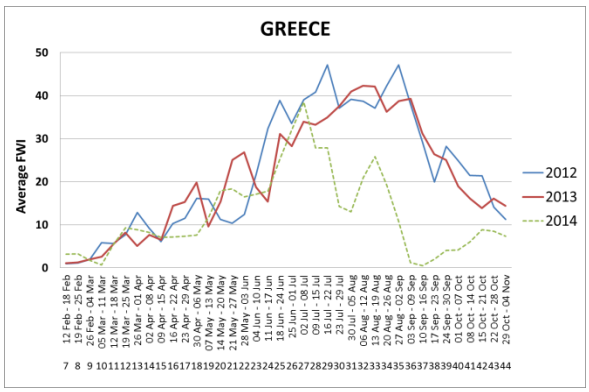

BOSNIA AND HERZEGOVINA
Average FWI
2012
2013
2014

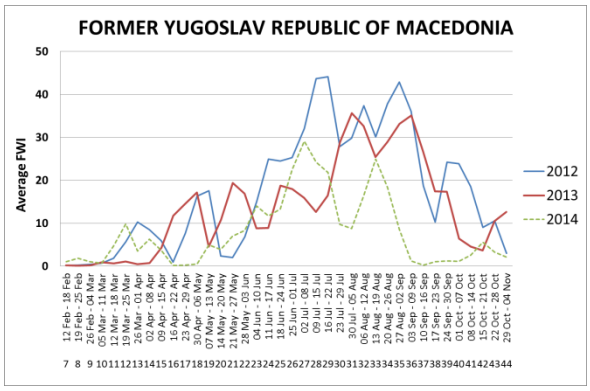

CZECH REPUBLIC
Average FWI
2012
2013
2014

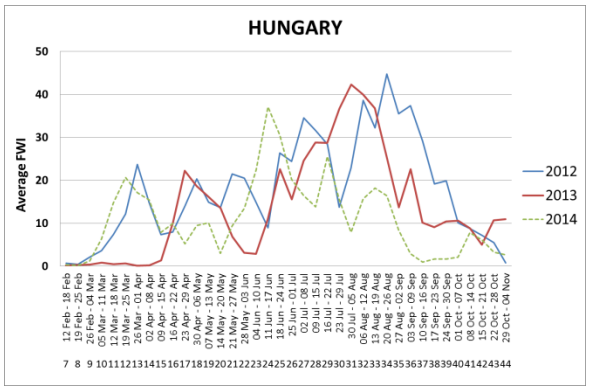

ESTONIA
Average FWI
2012
2013
2014

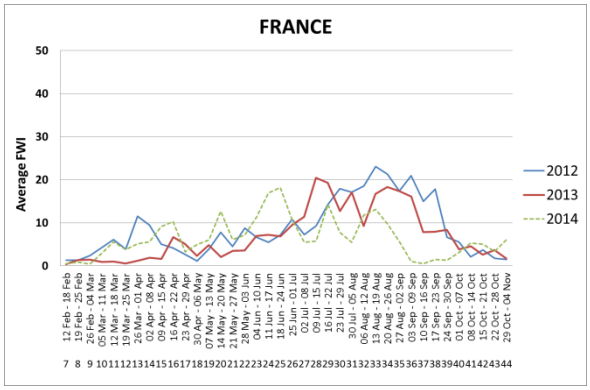

GERMANY
Average FWI
2012
2013
2014

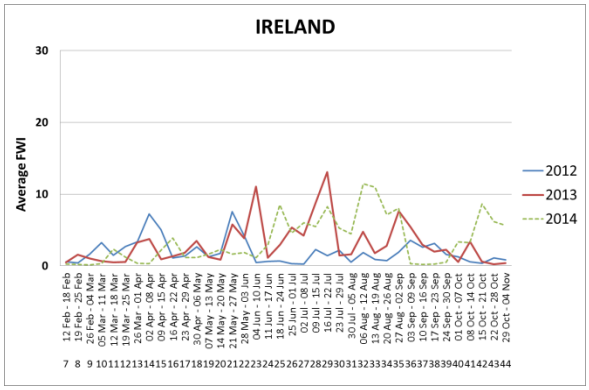

FINLAND
Average FWI
2012
2013
2014

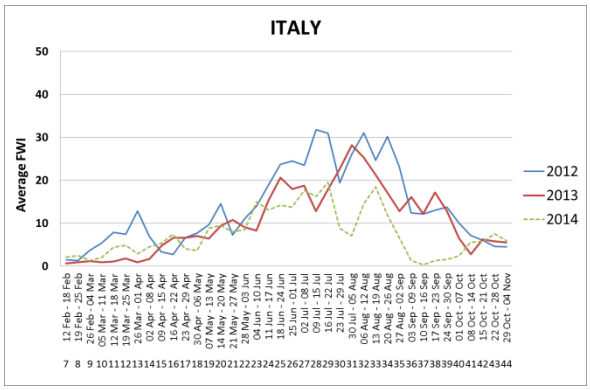

GREECE
Average FWI
2012
2013
2014

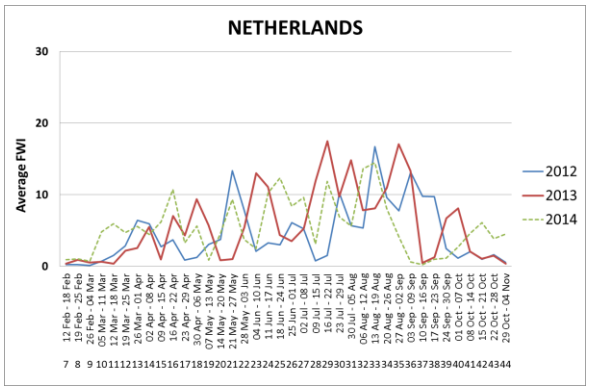

FORMER YUGOSLAV REPUBLIC OF MACEDONIA
Average FWI
2012
2013
2014

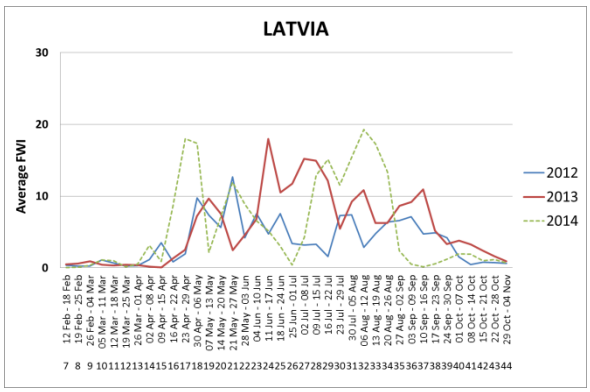

HUNGARY
Average FWI
2012
2013
2014

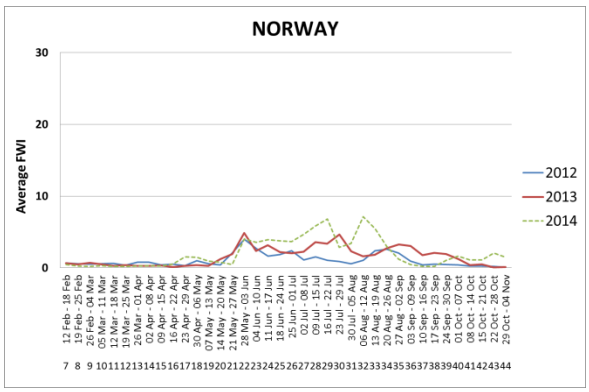

FRANCE
Average FWI
2012
2013
2014

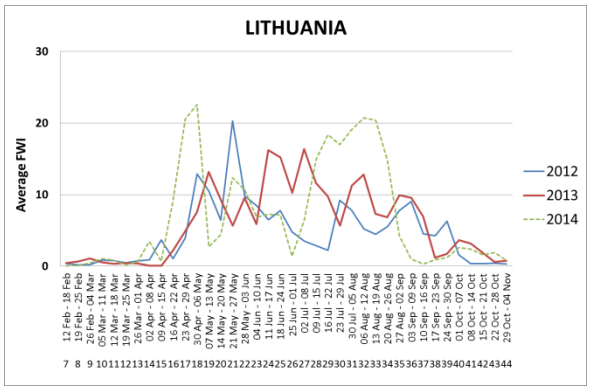

IRELAND
Average FWI
2012
2013
2014

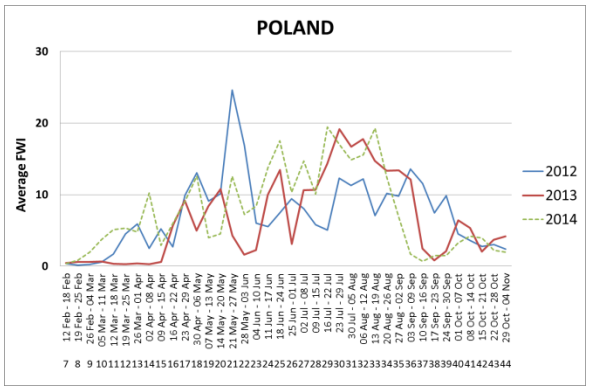

ITALY
Average FWI
2012
2013
2014

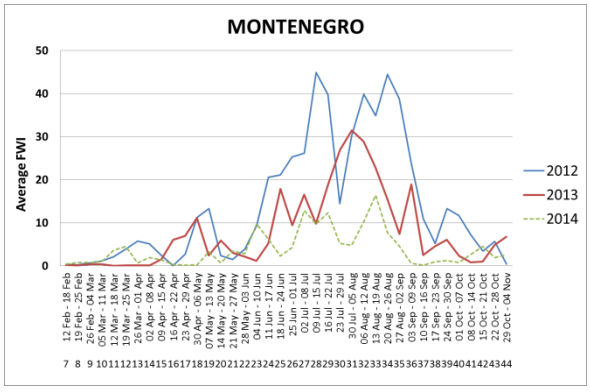

NETHERLANDS
Average FWI
2012
2013
2014

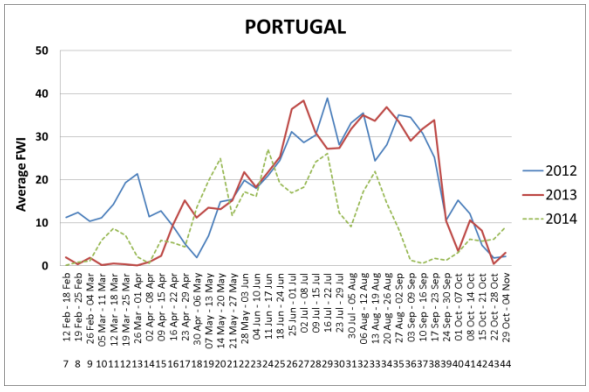

LATVIA
Average FWI
2012
2013
2014

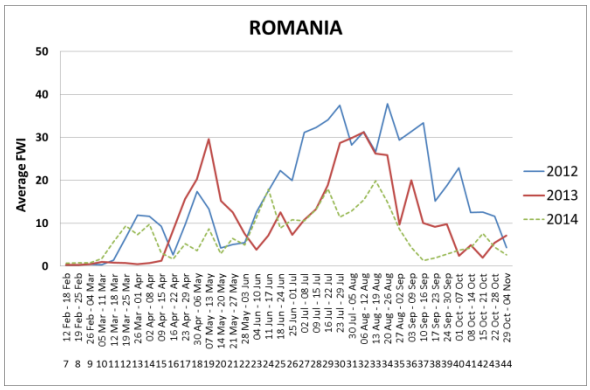

NORWAY
Average FWI
2012
2013
2014

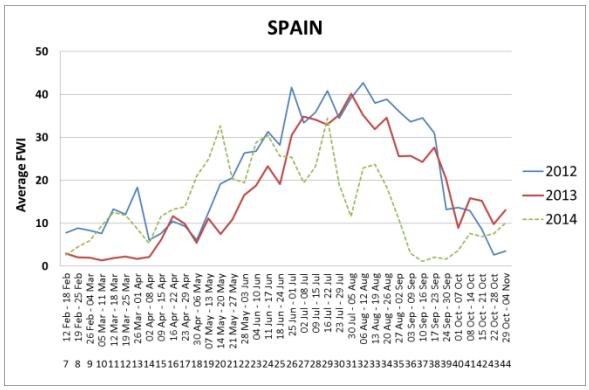

LITHUANIA
Average FWI
2012
2013
2014

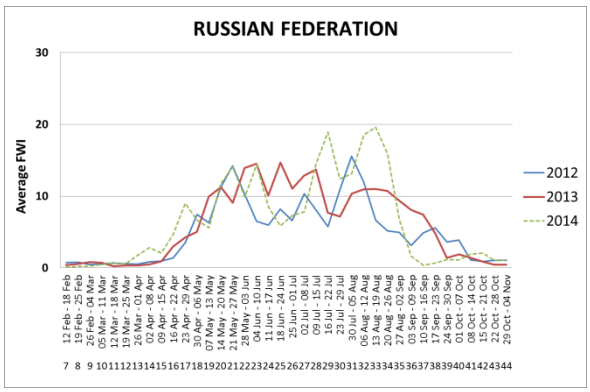

POLAND
Average FWI
2012
2013
2014

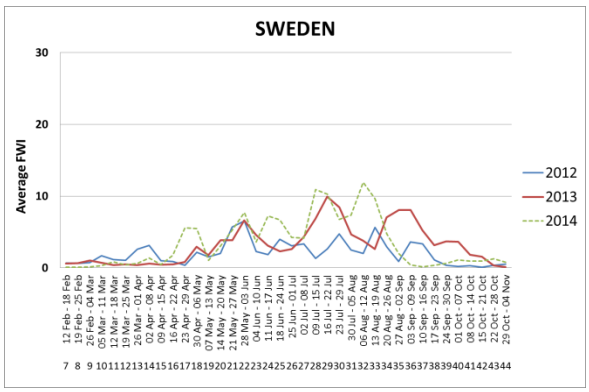

MONTENEGRO
Average FWI
2012
2013
2014

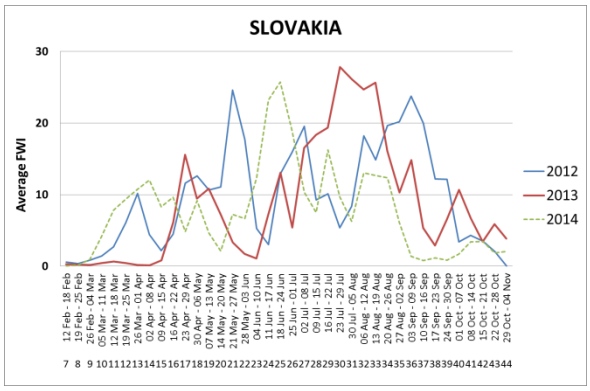

PORTUGAL
Average FWI
2012
2013
2014

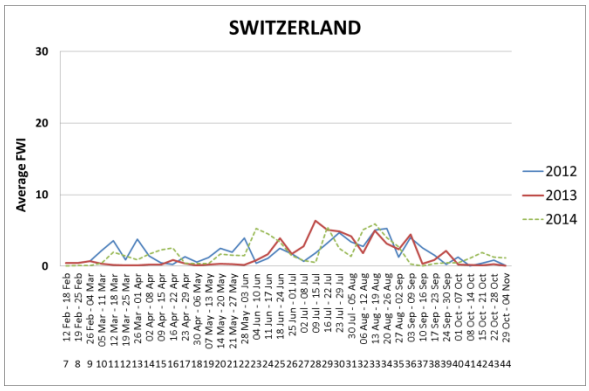

ROMANIA
Average FWI
2012
2013
2014

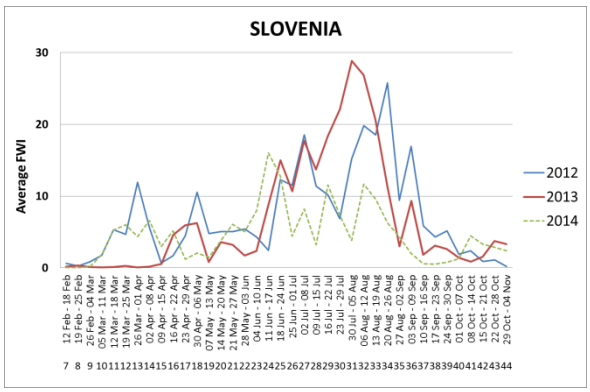

SPAIN
Average FWI
2012
2013
2014

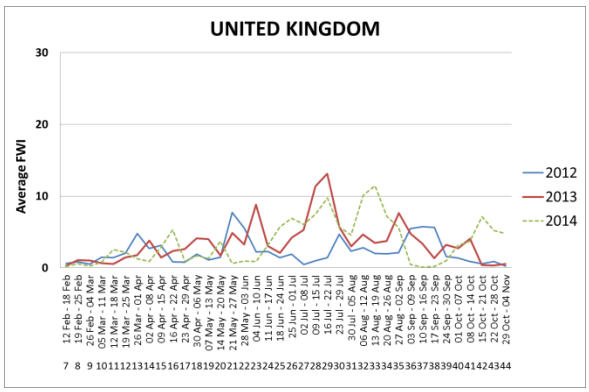

RUSSIAN FEDERATION
Average FWI
2012
2013
2014

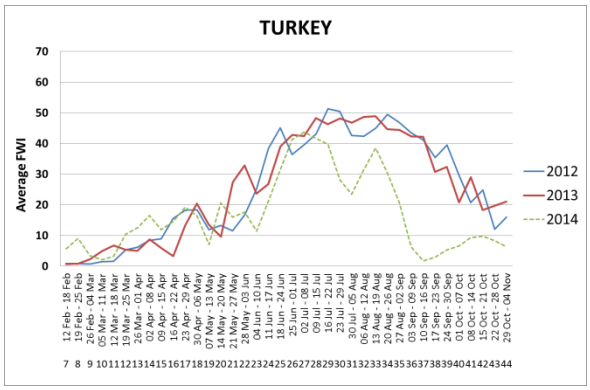

SWEDEN
Average FWI
2012
2013
2014


SLOVAKIA
Average FWI
2012
2013
2014

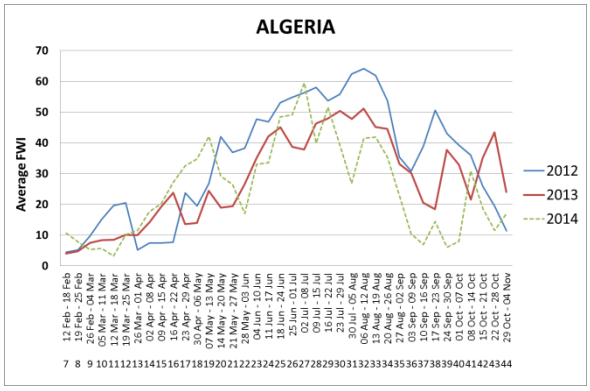

SWITZERLAND
Average FWI
2012
2013
2014

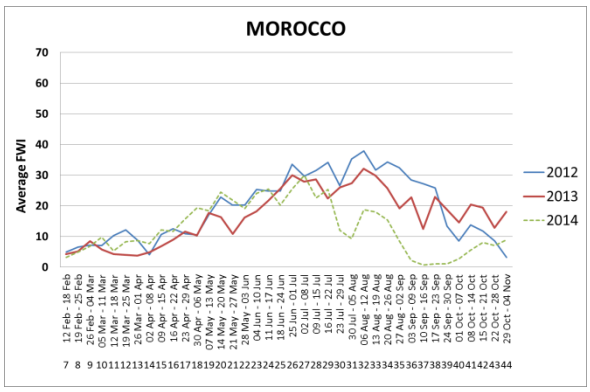

SLOVENIA
Average FWI
2012
2013
2014

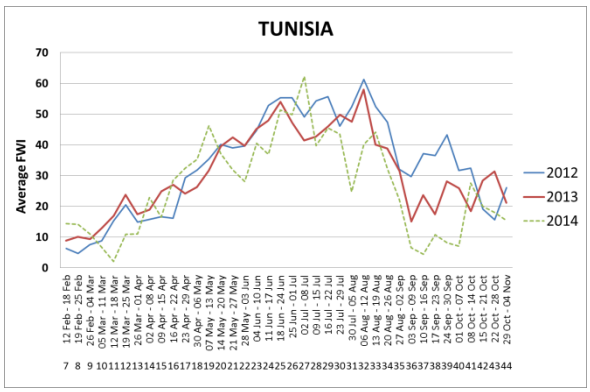

UNITED KINGDOM
Average FWI
2012
2013
2014



MENA Countries







As mentioned previously, weekly country averages tend to flatten local fire danger peaks, which as a consequence become less evident, especially in those countries such as France or Italy, where there are strong differences in fire danger level with changing latitudes.

Therefore, to show more clearly the seasonal changes in FWI in the larger EU Mediterranean countries, i.e. Portugal, Spain, France, Italy and Greece, their territory has been further divided for fire danger reporting, according to the map shown in Figure 103. The division criteria are mainly administrative and should be taken as provisional, since other fire risk reporting sub-regions, with a specific focus on environmental criteria, might be proposed in the future.

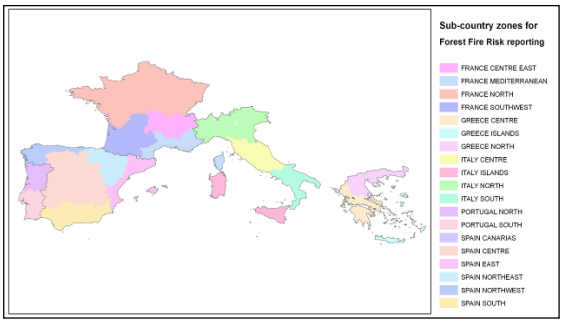


Figure 103. Sub-country regions identified for fire danger trend reporting in the five largest Mediterranean Member States.

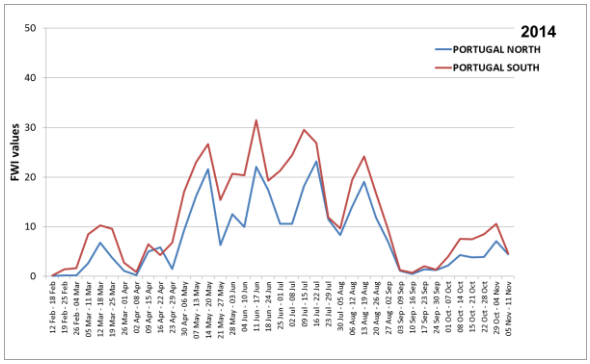


Figure 104. Fire danger trends in 2014 as determined by the Fire Weather Index (FWI) in the regions identified for Portugal.

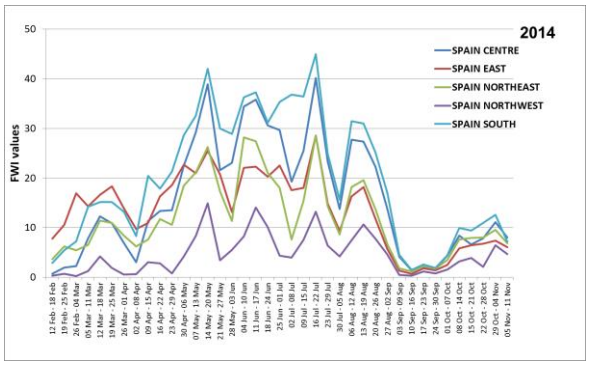


Figure 105. Fire danger trends in 2014 as determined by the Fire Weather Index (FWI) in the regions identified for Spain.

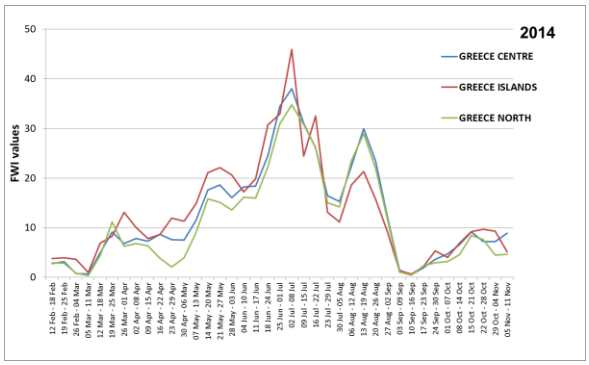


Figure 106. Fire danger trends in 2014 as determined by the Fire Weather Index (FWI) in the regions identified for Greece.

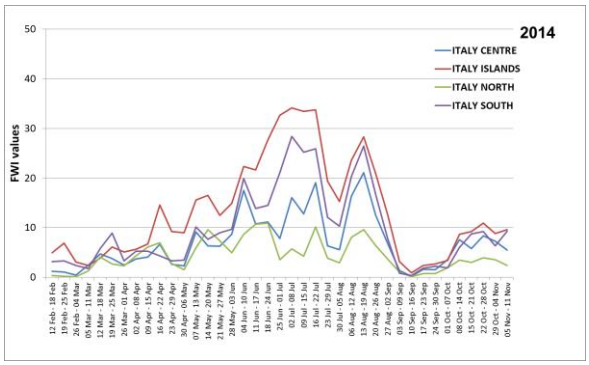


Figure 107. Fire danger trends in 2014 as determined by the Fire Weather Index (FWI) in the regions identified for Italy.

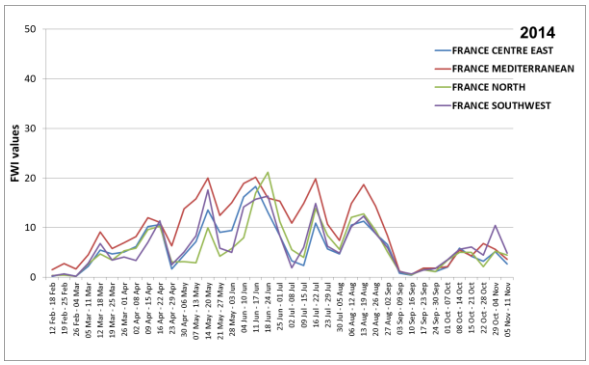
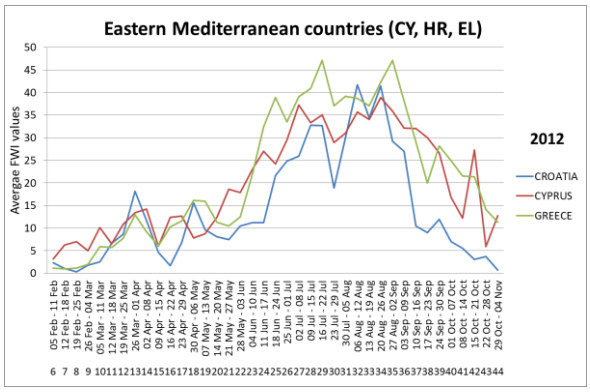
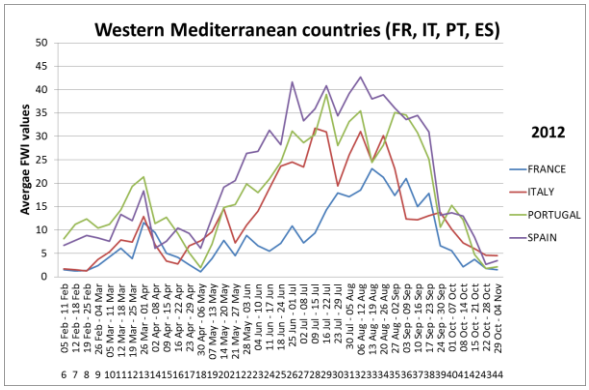
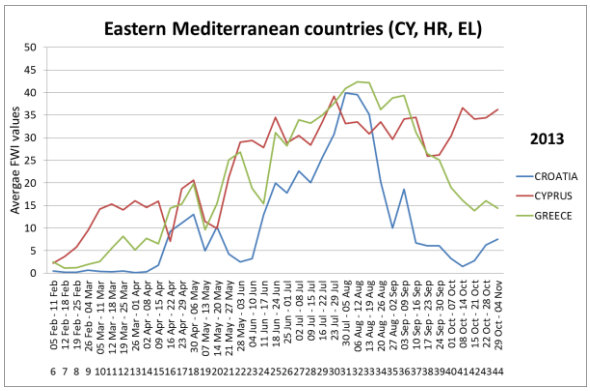


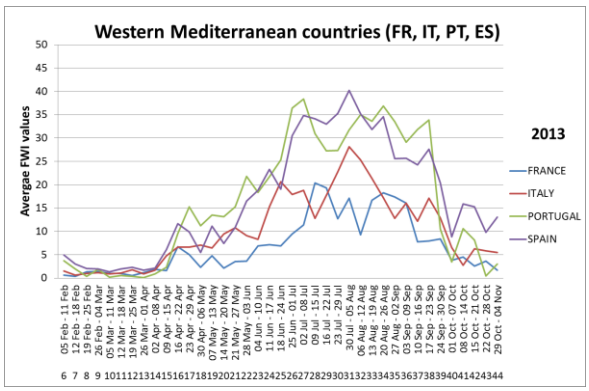
Figure 108. Fire danger trends in 2014 as determined by the Fire Weather Index (FWI) in the regions identified for France.

To facilitate the comparison among the different countries in EU, in the next graphs (Figure 109 to Figure 115), the fire danger trends as determined by FWI are shown for countries grouped by main bioclimatic type (e.g. Mediterranean, temperate or boreal). Data are given for 2012 to 2014.









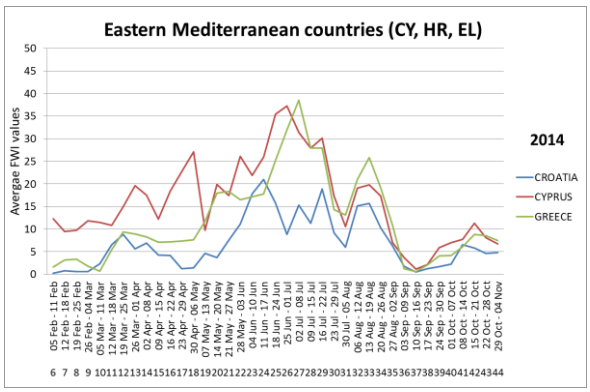


Figure 109. Fire danger trends 2012-2014 in eastern EU Mediterranean countries (CY, HR, GR).

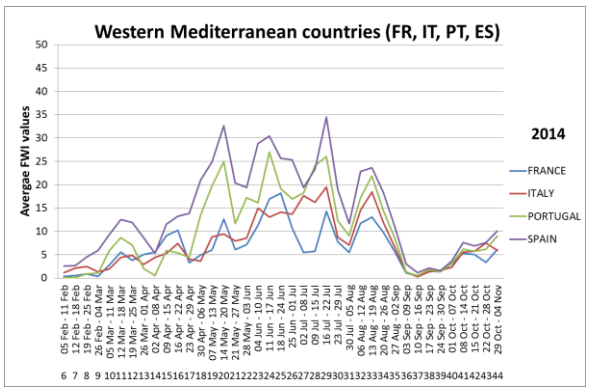
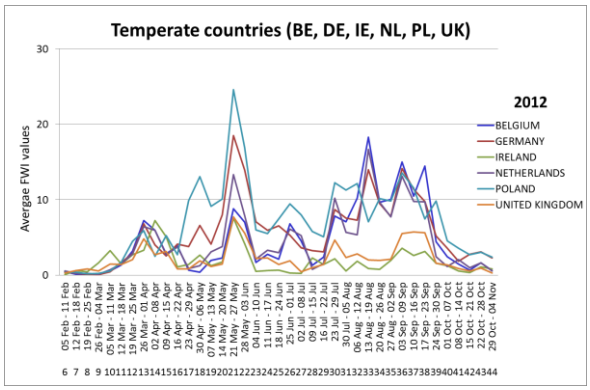
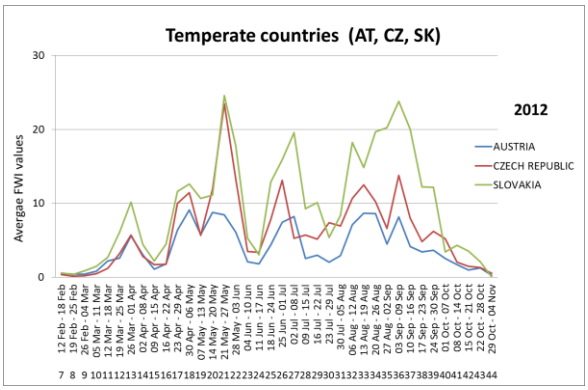
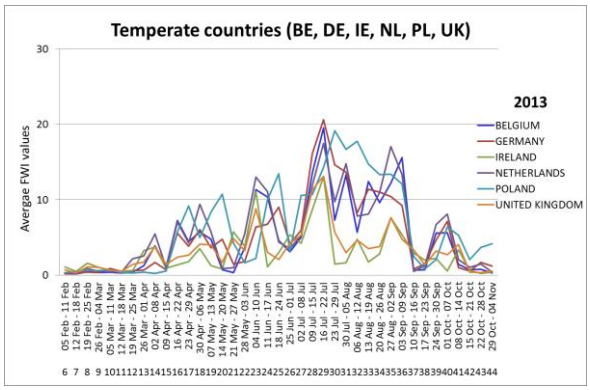
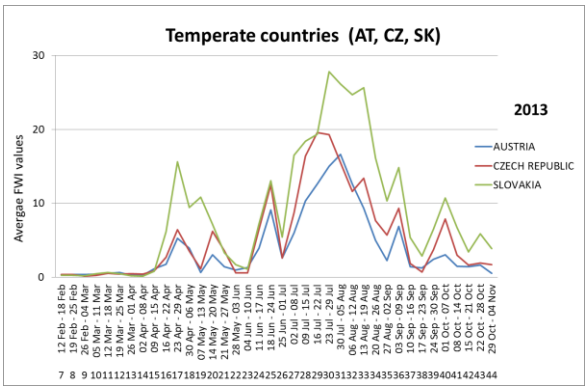


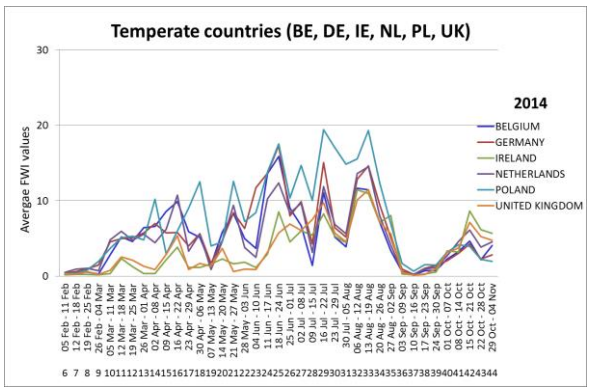
Figure 110. Fire danger trends 2012-2014 in western EU Mediterranean countries (FR, IT, PT, ES).











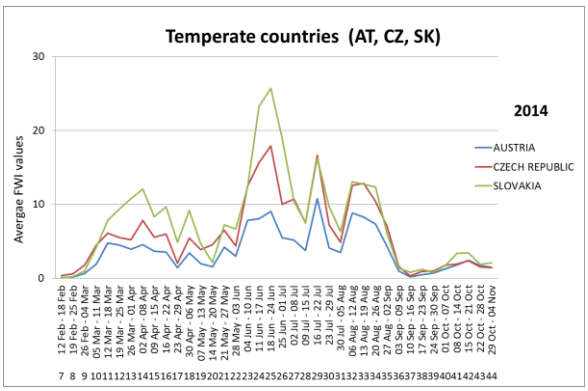
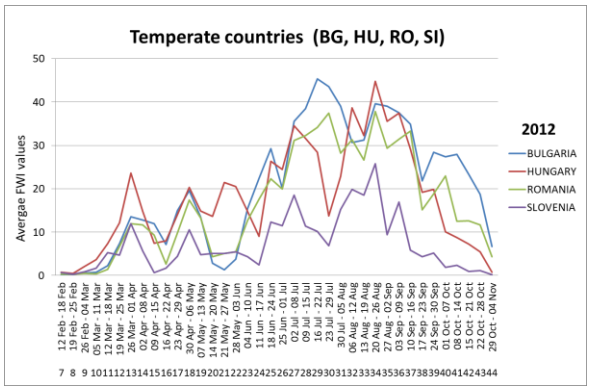
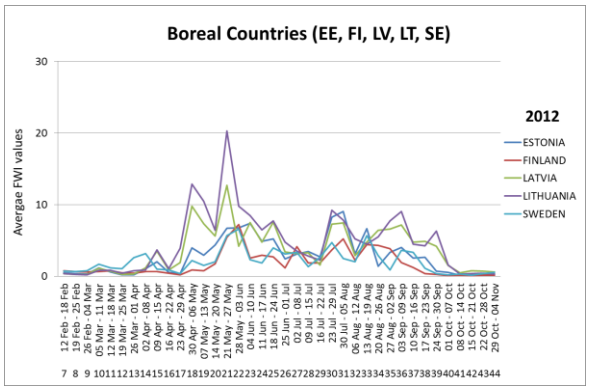
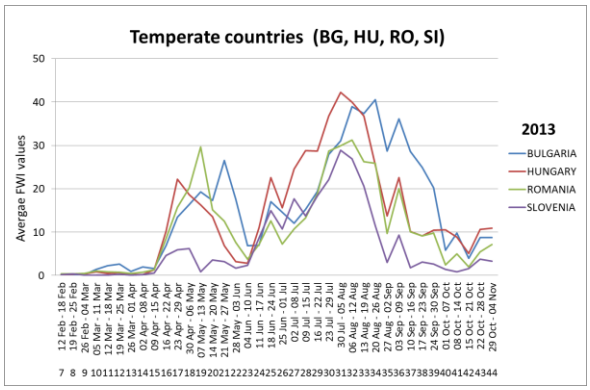


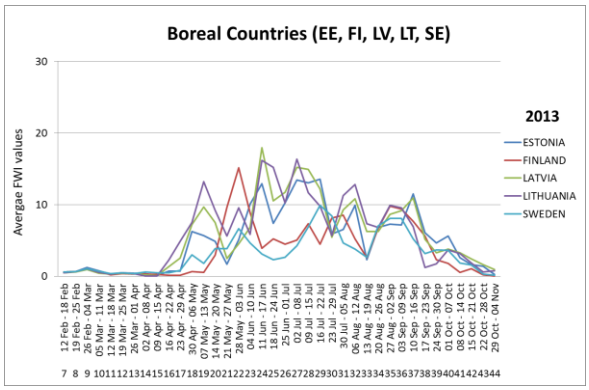
Figure 111. Fire danger trends 2012-2014 in some northern EU temperate countries (BE, DE, IE, NL, PL, UK).

Figure 112. Fire danger trends 2012-20143 in some central EU temperate countries (AT, CZ, SK).









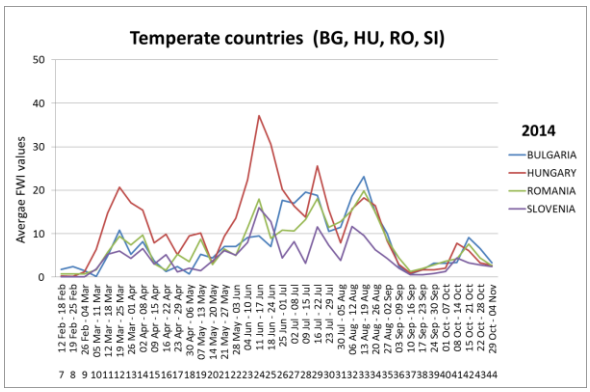


Figure 113. Fire danger trends 2012-2014 in some eastern EU temperate countries (BG, HU, RO, SI).

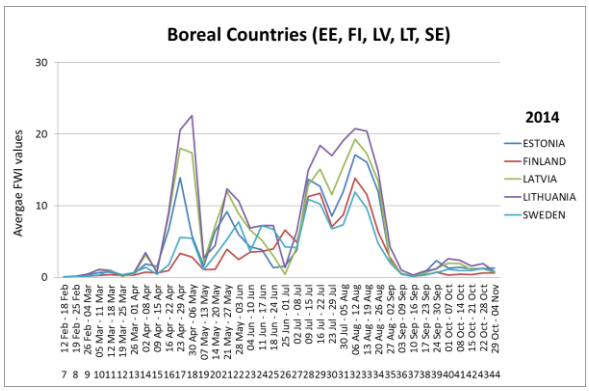
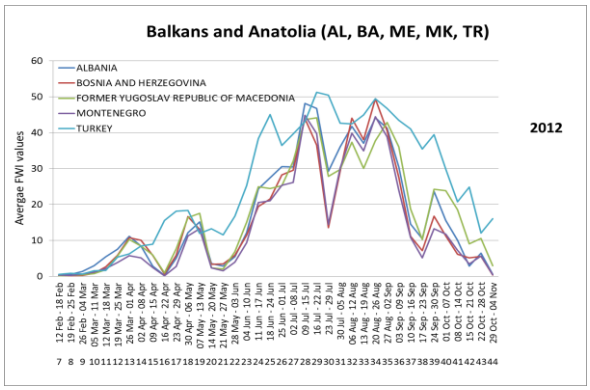
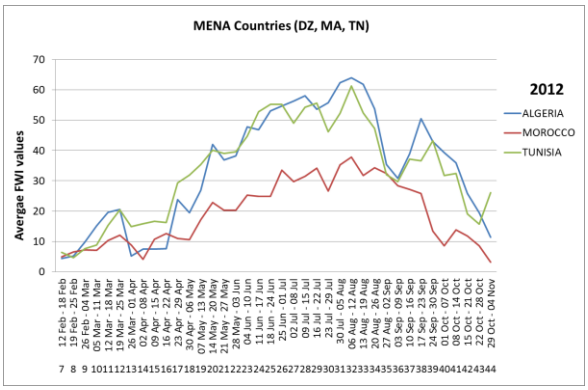
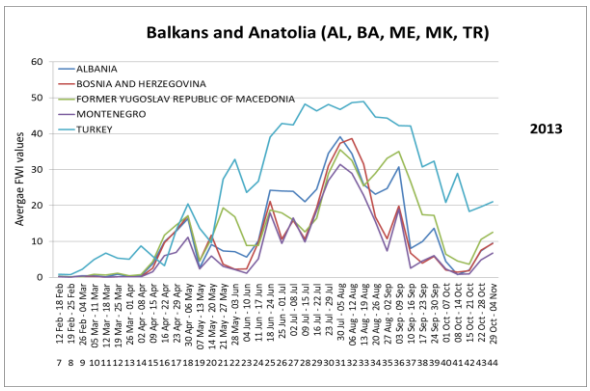
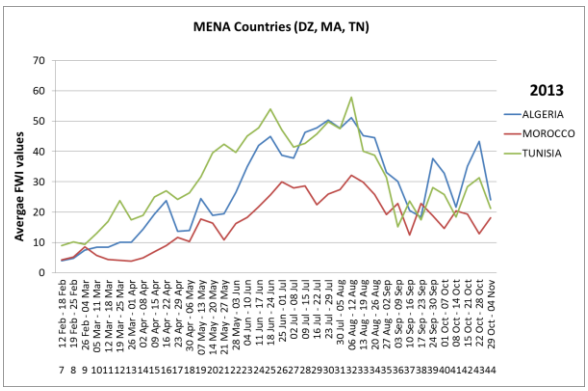


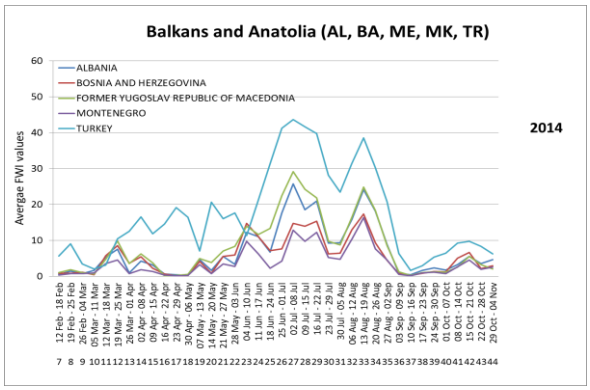
Figure 114. Fire danger trends 2012-2014 in some EU boreal countries (EE, FI, LV, LT, SE).











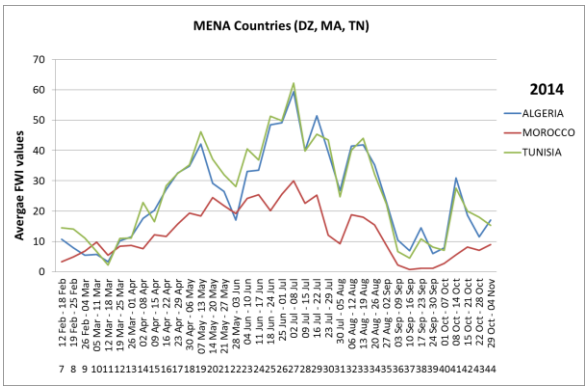


Figure 115. Fire danger trends 2012-2014) in the Balkans and Anatolia (AL, BA, ME, MK, TR).

Figure 116. Fire danger trends 2012-2014 in MENA countries (DZ, MA, TN).

As in previous years, the Member States gave very positive feedback on the danger assessment activity, urging that the EFFIS Danger Forecast should be continued and improved as part of the European Forest Fire Information System. This dialogue with users and other stakeholders is bound to result in an improved civil protection and forest fire service across Europe, and helps meet the EU's aim of providing environmental information and services that can be combined with other global environmental information products, in support of the Copernicus (formerly Global Monitoring for Environment and Security - GMES) initiative.

EFFIS RAPID DAMAGE ASSESSMENT: 2014 RESULTS

The Rapid Damage Assessment module of EFFIS was set up to provide reliable and harmonized estimates of the areas affected by forest fires during the fire season. The methodology and the spatial resolution of the satellite sensor data used for this purpose allows the mapping of all fires of about 40 ha or larger. In order to obtain the statistics of the burnt area by land cover type the data from the European CORINE Land Cover 2000 (CLC) database were used. Therefore the mapped burned areas were overlaid to the CLC data, allowing the derivation of damage assessment results comparable for all the EU Countries.

EFFIS Rapid Damage Assessment is based on the analysis of MODIS satellite imagery. The MODIS instrument is on board both the TERRA (morning pass) and AQUA (afternoon pass) satellites. MODIS data has 2 bands with spatial resolution of 250 meters (red and near-infrared bands) and 5 bands with spatial resolution of 500 meters (blue, green, and three short-wave infrared bands). Mapping of burnt areas is based mainly on the 250 meters bands, although the MODIS bands at 500 meters resolution are also used, as they provide complementary information that is used for improved burnt area discrimination. This type of satellite imagery allows detailed mapping of fires of about 40 ha or larger. Although only a fraction of the total number of fires is mapped (fires smaller than 40 ha are not mapped), the analysis of historical fire data has determined that the area burned by wildfires of this size represents in most cases the large majority of the total area burned. On average, the area burned by fires of at least 40 ha accounts for about 75% of the total area burnt every year in the Southern EU.

Since 2008, EFFIS has included Northern African countries in the mapping of burned area, following the agreement with FAO *Silva Mediterranea*, the FAO statutory body that covers the Mediterranean region. This is intended to be a first step towards the enlargement of EFFIS to the non-European countries of the Mediterranean basin.

The results for each of the European countries affected by forest fires of over 40 ha are given in the following paragraphs in alphabetical order, followed by a section on the MENA countries.

Overall, 2014 was a very light year for large fires and the lowest total burnt area was recorded since 2008. Fires of greater than 40 ha were observed in 21 countries and the mapped burnt area was half of that registered in 2013 and less than one fifth of the 2012 total. However, there were some unusual patterns, with some northern countries being worse affected than usual: the largest fire of the year was recorded in Sweden in August. Algeria was the worst affected country in 2014, accounting for around one third of the total burnt area registered.

The total area burned in 2014 by fires larger than 40 ha, as shown by the analysis of satellite imagery, was 176 116 ha (Table 33). These figures may also include agricultural and urban areas that were burned during the forest fires.

Table 33. Areas burned by fires of at least 40 ha in 2014 estimated from satellite imagery.

Country	***Area (Ha)***	***Number of Fires***
Albania	457.45	4
Algeria	63483.18	147
Bosnia and Herzegovina	3204.03	5
Croatia	304.73	2
Cyprus	435.85	2
France	4665.69	26
Greece	14813.97	31
Ireland	141.16	1
Italy	13250.53	78
Morocco	998.74	8
Norway	3335.85	6
Poland	54.43	1
Portugal	11573.71	35
Romania	2403.34	8
Spain	22053.32	62
Sweden	13630.76	12
Syria	2081.5	4
The Netherlands	395.95	1
Tunisia	11556.79	31
Turkey	7190.31	24
United Kingdom	85.17	1
TOTAL	***176116.45***	***489***

Figure 118 below shows the scars caused by forest fires during the 2014 season.

Of particular interest is the analysis of the damage caused by fires to the areas protected within the Natura2000 network, as they include habitats of especial interest which are home for endangered plant and animal species.

However, the category of Natura2000 areas only exists in the countries of the European Union. Information on other protected areas outside the EU is presented for those countries for which the information is available. The area burnt within the Natura2000 and other protected sites is presented in Table 34 and Figure 117. The area affected in 2014 was less than half that recorded in the previous year. The country most affected was Spain, accounting for over one third of the total.

Summary	Total Area (Ha)
EU28	**83808.6**
Other European countries	**14187.7**
Middle East and North Africa	**78120.2**
Natura2000 and protected sites	**29747.6**

Country	*Area (Ha)*	*% of Natura2000 Area*	*Number of Fires*
Cyprus	306.27	0.188	1
France	2546.64	0.037	16
Greece	4718.17	0.132	11
Ireland	141.16	0.016	1
Italy	2773	0.048	20
Portugal	4739.78	0.248	18
Romania	2403.34	0.056	8
Spain	10473.7	0.076	27
Sweden	111.18	0.002	4
The Netherlands	353.71	0.062	1
EU28 total	**28566.95**		**107**
Algeria	951.67	0.572	4
Morocco	228.94	0.03	1
Other total	**1180.61**		**5**
TOTAL	**29747.57**		**112**

Table 34. Area burnt in 2014 within Natura 2000 and other protected sites.

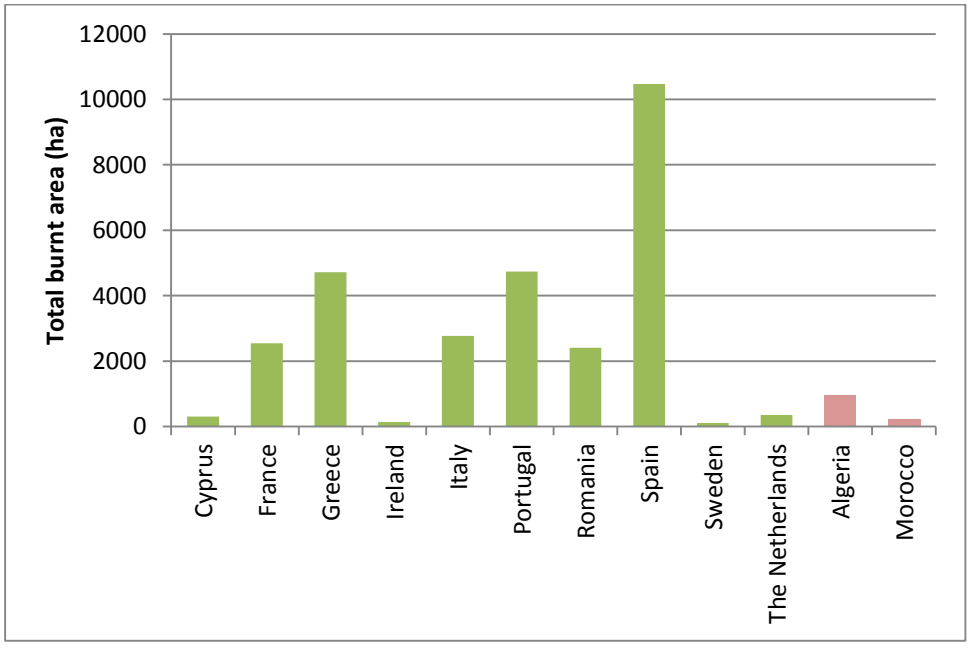


Figure 117. Burnt area in Natura2000 sites and other protected areas in 2014.

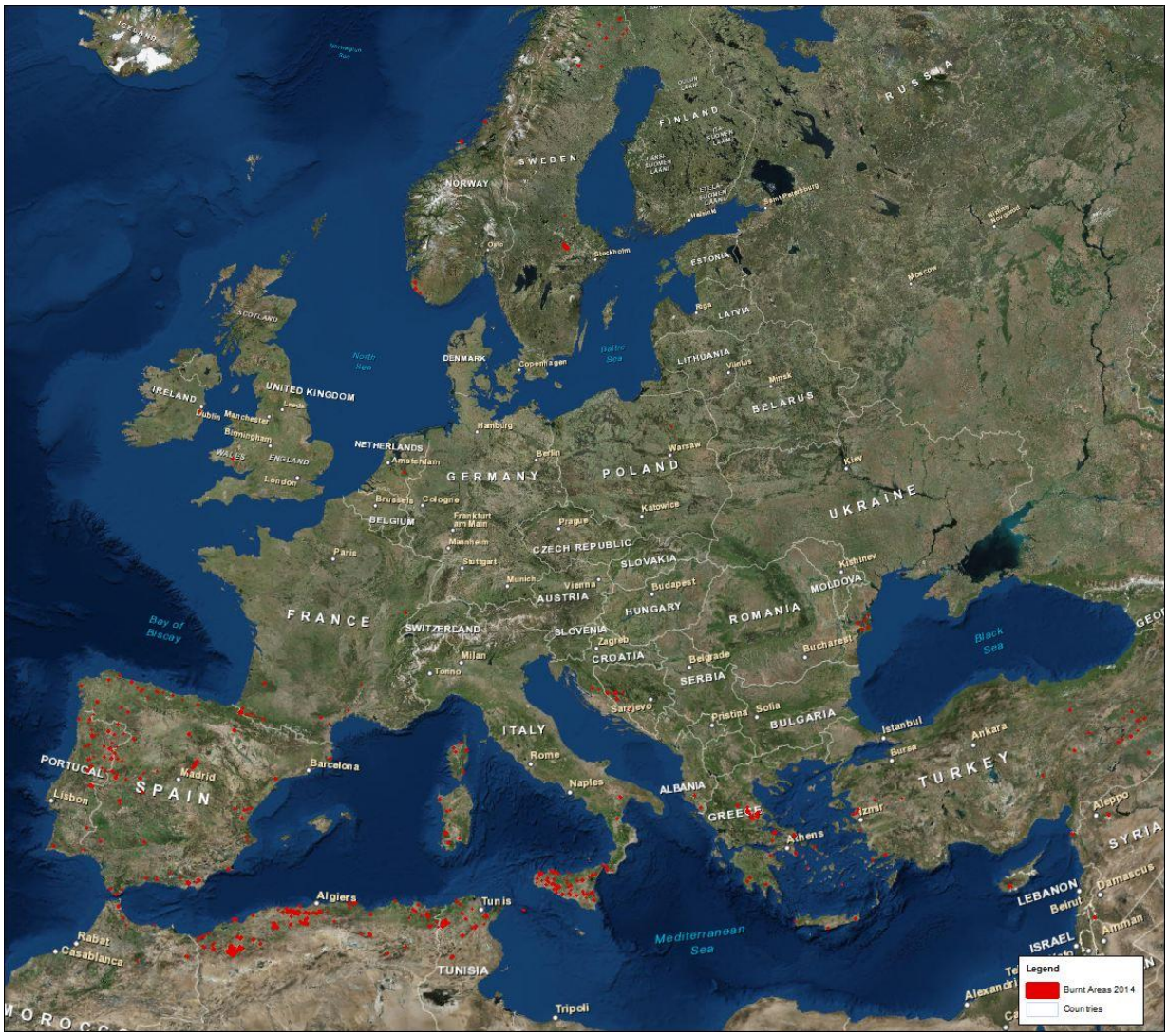


Figure 118. Burnt scars produced by forest fires during the 2014 fire season.

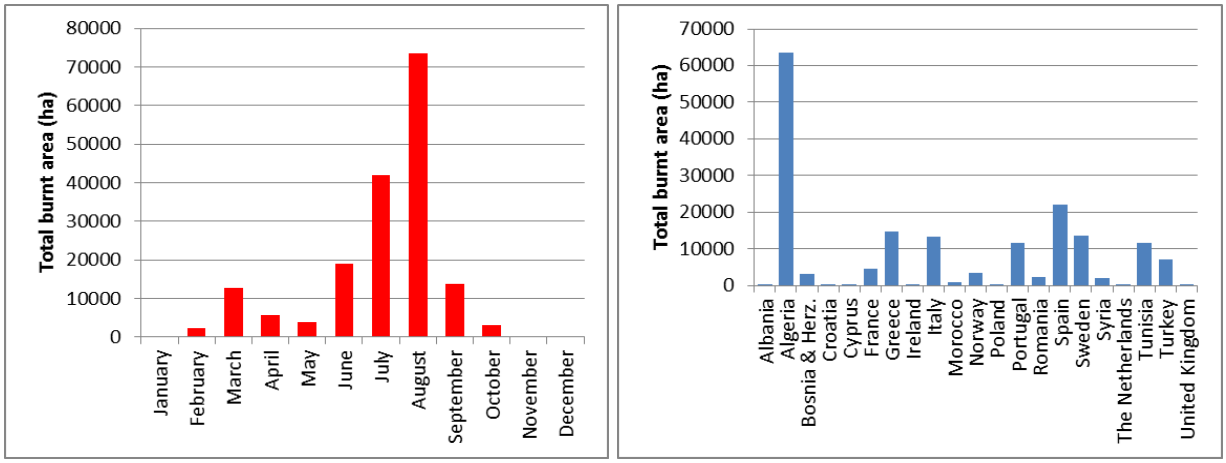


Figure 119. Total burnt area of fires >40 ha by month and by country in 2014

In 2014, 13 of the EU28 countries were affected by fires of over 40 ha: (Croatia, Cyprus, France, Greece, Ireland, Italy, Poland, Portugal, Romania, Spain, Sweden, The Netherlands, United Kingdom), burning a total of 83 809 ha. Of this total, 28 567 ha (34%) were on Natura2000 sites.

European countries

In 2014 the countries traditionally badly affected by forest fires (Mediterranean regions) had a quiet year, while some more northern regions experienced unusually heavy amounts of damage.

3.1.1 Albania

The 2014 fire season in Albania was the lowest recorded since 2007. There were only 4 fires of over 50 ha burning a total of 457 ha, all in August. Table 35 presents the distribution of the mapped burned area by land cover type using the CLC 2000 database.

Table 35. Distribution of burnt area (ha) in Albania by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	164.55	35.97
Other Natural Land	260.32	56.91
Agriculture	32.29	7.06
Artificial Surfaces	0.3	0.06
Total:	***457.45***	***100***

3.1.2 Bosnia-Herzegovina

Bosnia-Herzegovina had a very light year for forest fires, with a similar amount of damage to that recorded in 2013. The annual total was 3 204 ha from 5 fires, all occurring early in the season in March.

Table 36 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 database. Most of the damage occurred in Other Natural Land. Visible fire scars caused by forest fires in Bosnia-Herzegovina can be seen in Figure 120.

Table 36. Distribution of burnt area (ha) in Bosnia-Herzegovina by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest /Other Wooded Land	507.65	15.84
Other Natural Land	2648.07	82.65
Agriculture	48.31	1.51
Total:	***3204.03***	***100***

3.1.3 Croatia

In 2014 there were only 2 fires of over 40 ha in Croatia, both in March, burning 305 ha and making this the lowest amount of damage since 2006. None of the burnt area was recorded in protected areas. Table 37 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 database. The visible scars left by fires in Croatia can be seen in Figure 120 below.

Table 37. Distribution of burnt area (ha) in Croatia by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest /Other Wooded Land	76.95	25.25
Other Natural Land	68.36	22.43
Agriculture	159.42	52.32
Total:	***304.73***	***100***

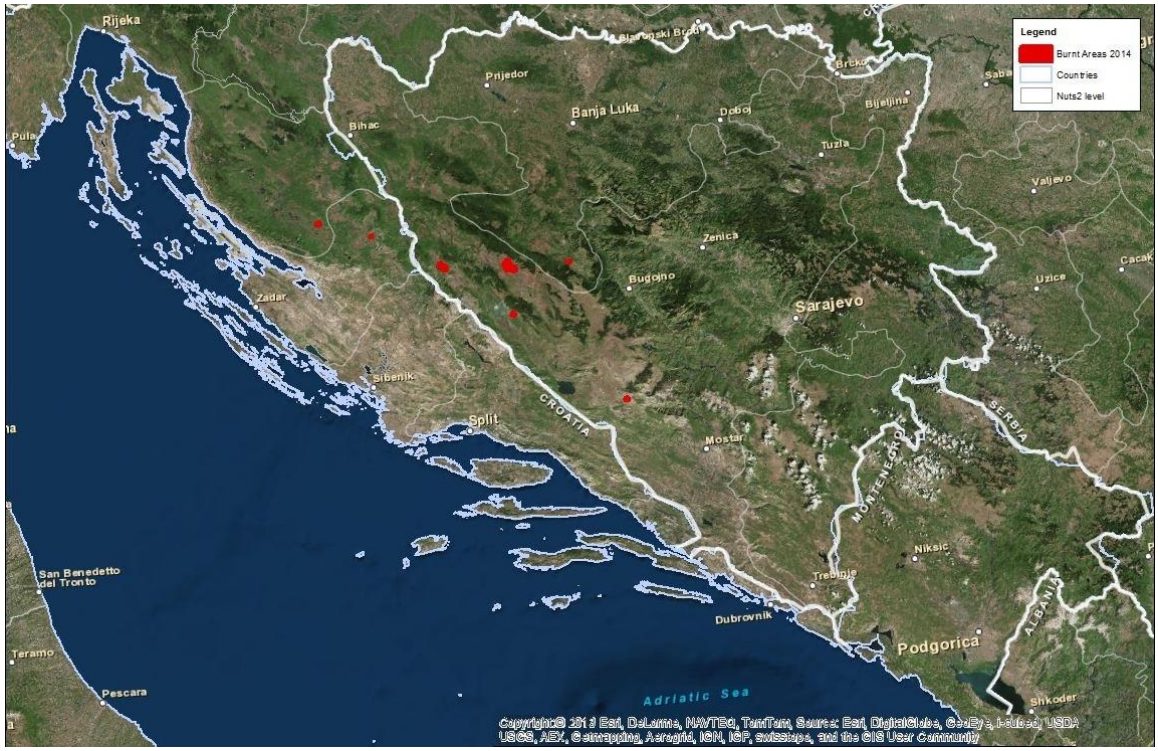


Figure 120. Satellite image showing impact of forest fires across the Balkans in 2014.

3.1.4 **Cyprus**

After two fairly severe fire seasons in 2012 and 2013, Cyprus had a very light year in 2014. There were two fires of over 40 ha recorded in June, which burnt a total of 436 ha (as a comparison the total in 2013 was 2 856 ha: six times more). In 2014, 306 ha of Natura2000 areas were burnt, corresponding to 70% of the total area burned, and 0.18% of the total Natura2000 areas in the country. Table 38 presents the distribution of the mapped burned area by land cover type using the CLC 2000 database.

Table 38. Distribution of burnt area (fires of at least 40 ha) by land cover class in Cyprus in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	366.79	84.16
Other Natural Land	0.62	0.14
Agricultural Areas	68.43	15.7
Total:	***435.85***	***100***

3.1.5 **France**

France reversed the downward trend that it has experienced in recent years and reverted to a more typical season. 26 fires of more than 40 ha were recorded throughout the year, resulting in a total burnt area of 4 666 ha: very close to the 10 year average. The largest of these occurred in the Landes province in late April, when 896 ha burnt. Of the 2014 total, 2 547 ha were on Natura2000 sites, corresponding to 54.5% of the total area burned, and 0.037% of the total Natura2000 areas in the country. Table 39 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 database. The burnt scars left by the large fires occurring in the southern region of the country and in Corsica are shown in Figure 121.

Table 39. Distribution of burnt areas (fires of at least 40 ha) by land cover type in France in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	1249.23	26.77
Other Natural Land	2832.35	60.71
Agriculture	552.35	11.84
Artificial Surfaces	0.34	0.01
Other Land Cover	31.43	0.67
Total:	***4665.69***	***100***

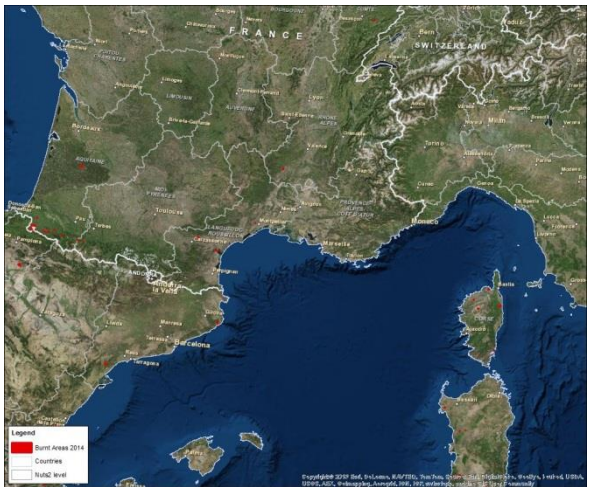


Figure 121. Impact of forest fires in southern France and Corsica in 2014.

3.1.6 **Greece**

Greece had a very light season for fires: the lowest since 2010. There were 31 fires of over 40 ha burning a total of 14 814 ha. Much of the damage occurred early in the season in June, including some of the largest fires of the year, the worst of which burnt 2 583 ha in Fthiotida. Of the total burnt area in 2014, 4 718 ha were on Natura2000 sites, corresponding to 31.8% of the total area burned and to 0.132% of the Natura2000 areas in the country. Table 40 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 map. Figure 122 shows the damage caused by forest fires in Greece.

Table 40. Distribution of burnt areas (fires of at least 40 ha) by land cover class in Greece in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	6675.57	45.06
Other Natural Land	2311.52	15.6
Agriculture	5773.67	38.97
Artificial Surfaces	53.21	0.36
Total:	***14813.97***	***100***

Figure 122. Burnt area scars in Greece in 2014.

3.1.7 **Ireland**

In Ireland a single large fire burnt 141 ha of a Natura2000 site. The area was categorised as 100% Other Natural Land.

3.1.8 **Italy**

In 2014 Italy had a second light year for forest fires, with an amount burnt slightly less than the previous year, and the lowest amount of damage recorded since 2006. 78 fires of over 40 ha burnt a total of 13 251 ha between June and October. The largest of these was one in Arbus (Sardinia) in July that burnt 1 903 ha. Of the year's total, 2 773 ha of damage occurred on Natura2000 sites, corresponding to 21% of the total area burned, and 0.048% of the total Natura2000 area in the country. Table 41 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 database. Figure 123 shows the distribution of major forest fires in southern Italy, Sardinia and Sicily.

Table 41. Distribution of burnt areas (fires of at least 40 ha) by land cover type in Italy in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	4748.26	35.83
Other Natural Land	3699.25	27.92
Agriculture	4738.09	35.76
Artificial Surfaces	64.94	0.49
Total:	***13250.53***	***100***

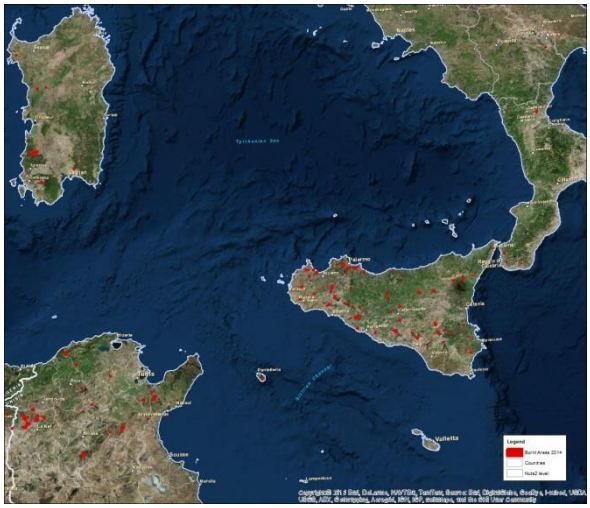


Figure 123. impact of forest fires in Sicily and Sardinia in 2014.

3.1.9 **The Netherlands**

The Netherlands does not usually suffer large fires, but in 2014 a single fire burnt 396 ha in April. 354 ha of this was Natura2000 sites, amounting to 90% of the total and 0.062% of the Natura2000 land in the country. Table 42 shows the classification of the burnt area by land type.

Table 42. Distribution of burnt area (ha) by land cover class in the Netherlands in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	4.06	1.02
Other Natural Land	341.57	86.27
Agriculture	50.32	12.71
Total:	***395.95***	***100***

3.1.10 **Norway**

In common with several of the northern regions, Norway had an unusually bad year for forest fires. There were 6 fires of over 40 ha mapped in February and April. The two recorded in February were each around 1 000 ha in size. Most of the damage was in Other wooded Land, as shown in Table 43.

Table 43. Distribution of burnt area (ha) in Norway by land cover types in 2014

Land cover	*Area burned*	*% of total*
Other Natural Land	2922.21	87.6
Agriculture	293.62	8.8
Other Land Cover	120.02	3.6
Total:	***3335.85***	***100***

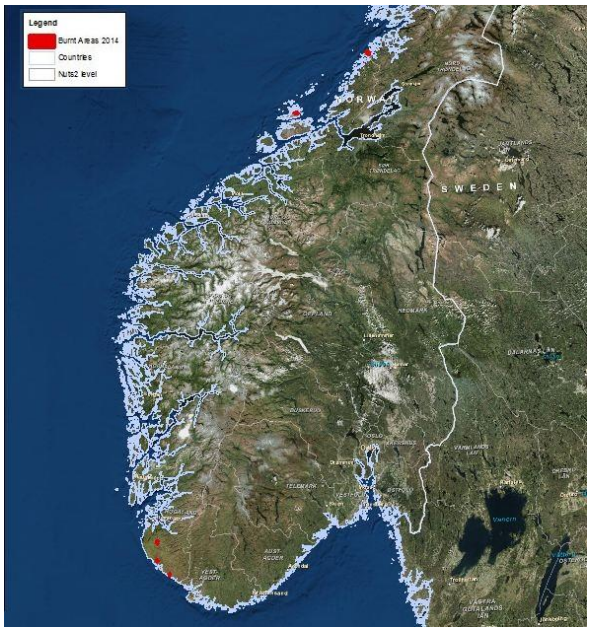


Figure 124. Forest fires in Norway 2014.

3.1.11 **Poland**

In Poland a single large fire in May burnt 54 ha of Forest and Other Wooded Land.

3.1.12 **Portugal**

After an exceptionally hard season in 2013 (when 154 174 ha burnt), Portugal experienced the lightest year for fires since 2008. A total of 11 574 ha burnt, less than 10% of the previous year. There were however still some large fires: one in Montalvao in August burnt 2 869 ha and was one of the largest fires of the season. Of the total burnt area mapped in 2014, 4 740 ha occurred on Natura2000 sites, corresponding to 40.9 % of the total area burnt, and 0.248 % of the total Natura2000 areas in Portugal. Table 44 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 map. The mapped burnt areas are shown in Figure 125.

Table 44. Distribution of burnt areas (fires of at least 40 ha) by land cover class in Portugal in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	6807.23	58.82
Other Natural Land	2719.08	23.49
Agriculture	2007.32	17.34
Artificial Surfaces	10.59	0.09
Other Land Cover	29.5	0.25
Total:	***11573.71***	***100***

3.1.13 **Romania**

In Romania, 8 fires caused 2 403 ha of damage, slightly less than the amount recorded in either of the previous two years. Fires occurred throughout the season, from March to September, although the two largest fires (over 500 ha) both occurred relatively early in the season. The entire burnt area in 2014 was on Natura2000 sites, representing 0.056% of the total Natura2000 area of Romania. Table 44 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 database.

Table 45. Distribution of burnt area (ha) in Romania by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Other Natural Land	1777.3	73.95
Other land cover	626.04	26.05
Total:	***2403.34***	***100***

Figure 125. Impact of forest fires in Spain and Portugal in 2014

3.1.14 **Spain**

Although Spain was the European country most affected by fire in 2014, the total mapped burnt area was the lowest since 2010. In total, 62 fires of over 40 ha were mapped. The fire damage was spread throughout the season with one early peak occurring in March, including one of the largest fires of the year in Almeria (4 127 ha), followed by a second wave of damage in July. Of the 22 053 ha burnt in 2014, 10 473 ha were on Natura2000 sites, corresponding to 47% of the total area burned, and 0.076% of the Natura2000 areas in Spain. Table 46 presents the distribution of the mapped burnt area by land cover type using the CLC 2000 database. The most noticeable fires in Spain during 2014 are shown in Figure 125 above.

Table 46. Distribution of burnt area (ha) in Spain by land cover type in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	10881.09	49.34
Other Natural Land	8225.3	37.3
Agriculture	2828.75	12.83
Artificial Surfaces	77.07	0.35
Other Land Cover	41.11	0.19
Total:	***22053.32***	***100***

3.1.15 **Sweden**

In Sweden there were 12 fires of over 40 ha, including one in August that burned 12 484 ha, making it by a significant margin the largest fire of the year (approximately the same size as the next 3 largest fires put together, and accounting for around 7% of the entire burnt area recorded in 2014: Figure 126). As a result of this fire, the season was the worst that Sweden had experienced for decades and only Algeria, Spain and Greece recorded a larger total burnt area in 2014. Of the total burnt area, a relatively small proportion (111 ha) occurred on Natura2000 sites: 0.8% of the total burnt area and 0.002% of the Natura2000 area of Sweden. Table 47 shows the breakdown of the burnt area with respect to different land cover types.

Figure 126. Burnt area scars in Sweden in 2014, and the perimeter of the large fire of August 2014

Table 47. Distribution of burnt area (ha) in Sweden by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	12325.11	90.42
Other Natural Land	1108.27	8.13
Agriculture	28.96	0.21
Other Land Cover	168.42	1.24
Total:	***13630.76***	***100***

3.1.16 **Turkey**

After a severe fire season last year, Turkey experienced much less damage in 2014. The amount burnt from 24 fires of over 40 ha was 7 190 ha, the lowest amount since 2010. Half of the damage occurred in August, including one fire of over 1000 ha in Mugla province. Table 48 presents the distribution of the mapped burned area by land cover type using the CLC 2000 database. The visible scars from forest fires in the country are shown in Figure 127. The fires were generally concentrated around the west coast and in the south-eastern regions.

Table 48. Distribution of burnt area (ha) in Turkey by land cover types.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	1840.92	25.6
Other Natural Land	3426.8	47.66
Agriculture	1910.15	26.57
Artificial Surfaces	8.59	0.12
Other Land Cover	3.85	0.05
Total:	***7190.31***	***100***

Figure 127. Impact of forest fires in Turkey in 2014.

3.1.17 **United Kingdom**

In the UK a single fire burnt 85 ha. 77 ha (90%) was on Other Natural Land and the rest was on agricultural land. No Natura2000 sites were affected.

Middle East and North Africa

Taken as a whole the fire season in North Africa and the Middle East was not a particularly damaging one; the total burnt area in 2014 was below the 5-year average. Of the countries affected, Algeria had the worst year and accounted for over 80% of the total damage recorded in the region.

3.1.18 **Algeria**

In 2014, Algeria was the country most affected by large forest fires. 147 fires of over 40 ha burnt a total of 63 483 ha: one third of the amount recorded over the entire region covered by EFFIS. This should, however, be taken in context as 2014 generally was a very low year compared to long term averages. The total burnt in Algeria in 2014 is below the 5-year average for this country (Figure 129).

57% of the damage occurred in August, including one very large fire of 4 559 ha that occurred in Sidi-Bel-Abbes (the second largest of the season, after the one in Sweden). There was one other fire of over 4000 ha, and 74 fires in total over 500 ha in size. Four fires occurred in Protected Areas, totalling 952 ha and representing around 1.5% of the total burnt area. The burnt scars left by these fires can be seen in Figure 128. The Globcover land cover map from ESA was used to split the burnt area into different land type categories, and the distribution of burnt area by land cover types is given in Table 49.

Table 49. Distribution of burnt area (ha) in Algeria by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest /Other Wooded Land	17232.11	27.14
Other Natural Land	14295.45	22.52
Agriculture	31349.75	49.38
Artificial Surfaces	586.64	0.92
Other Land Cover	19.24	0.03
Total:	***63483.18***	***100***

Figure 128: Impact of forest fires in Northern Africa in 2014

3.1.19 **Morocco**

Morocco had the lightest year for forest fires for at least 5 years. The total burnt area recorded by large fires was 999 ha from 8 fires, occurring mostly relatively late in the season, in September and October. Of this total, 229 ha occurred in Protected Areas, representing 23% of the total and 0.03% of the total protected area of the country. The burnt scars left by these fires can be seen in Figure 128 above. The distribution of burnt area by land cover types, using Morocco's own land cover map but with terminology harmonised with CLC, is given in Table 50.

Table 50. Distribution of burnt area (ha) in Morocco by land cover types in 2014.

Land cover	*Area*	*% of total*
Forest /Other Wooded Land	835.52	83.66
Agriculture	163.22	16.34
Total:	***998.74***	***100***

3.1.20 **Syria**

In Syria, 4 fires of over 40 ha burnt a total of 2 082 ha, significantly lower than the amount burnt in the previous two years. Nearly half of this total came from a single fire in August in Aleppo province, which burnt 971 ha. The CORINE Land Cover database has not yet been developed in Syria, so the Globcover land cover map from ESA was used to split the burnt area into different land type categories. Table 51 shows the distribution of burnt area by land type.

Table 51. Distribution of burnt area (ha) in Syria by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest/Other Wooded Land	748.96	35.98
Other Natural Land	300.37	14.43
Agriculture	1009.8	48.51
Other Land Cover	22.37	1.07
Total:	***2081.5***	***100***

3.1.21 **Tunisia**

The 2014 fire season in Tunisia was similar to that of 2013, and worse than in previous years 2009-2012. A total of 31 fires were recorded, burning 11 557 ha. All the fires occurred between July and September and included 8 fires of over 500 ha. The largest burnt 1659 ha in July in Le Kef province. Figure 128 above shows the burnt scars left by these fires, and the distribution of burnt area by land cover types using Tunisia's own land cover map but with terminology harmonised with CLC, is given in Table 52.

Table 52. Distribution of burnt area (ha) in Tunisia by land cover types in 2014.

Land cover	*Area burned*	*% of total*
Forest /Other Wooded Land	10673.21	92.35
Other Natural Land	48.75	0.42
Agriculture	809.6	7.01
Artificial Surfaces	1.61	0.01
Other Land Cover	23.62	0.2
Total:	***11556.79***	***100***

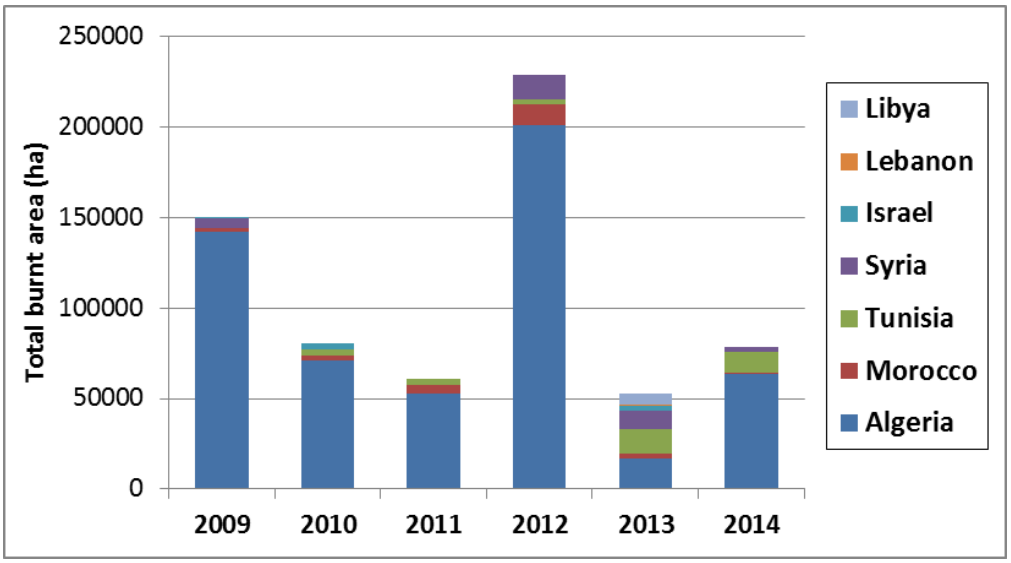


Figure 129. Comparison of burnt area recorded in the MENA countries from 2009-2014

3.2 European Fire Database

Background

The European Fire Database is an important component of EFFIS containing forest fire information compiled by EU Member States and the other countries members of the EFFIS network.

The first steps to create a forest fire database were taken under the **Regulation EEC No 2158/92** (now expired), which set up an action framework focussing mainly on measures for the prevention of forest fires. Under the regulation, a first forest fire information system, referred to as the Common Core Database, was established in order to collect information on forest fires, their causes and to improve the understanding of forest fires and their prevention.

Detailed rules for the application of this forest fire information system were given in the subsequent **Regulation EEC No 804/94** which made the systematic collection of a minimum set of data on each fire event a matter of routine for the Member States participating in the system. The Common Core Database covered six Member States of the Union: Germany, Portugal, Spain, France, Italy and Greece. Regulation 2158/92 was renewed for five years in 1997 and expired on 31 December 2002.

The **Forest Focus Regulation (EC) No 2152/2003** was built on the achievements of the two previous Council Regulations on the protection of Community's forests against atmospheric pollution and forest fires. According to the implementing rules of the Regulation, monitoring of forest fires in Europe continued to be recorded in order to collect comparable information on forest fires at Community level.

The forest fire data provided each year by individual EU Member States through the above-mentioned EU regulations, and additional data coming from other European countries have been checked, stored and managed by JRC within EFFIS. The database is now known as the ***European Fire Database***.

More detailed information about the database can be found in the technical report "*The European Fire Database: Technical specifications and data submission*" EUR26546 EN, which can be downloaded from http://forest.jrc.ec.europa.eu/effis/reports/effis-related-publications/

Structure and collected information

The database contains four types of information: about the time, location, size and cause of the fire (Table 53).

Before being accepted into the database, the submitted data pass through a validation phase. The checks include the following:

Time of fire

- Is the date valid?
- Does the date given in the file match the year given in the filename?
- Does the date/time of intervention/extinction occur after the initial date/time of alert?
- Is the duration of the fire reasonable given its size?

Location of fire

- Do the place names exist and are they correctly spelt?
- Are the commune name/code/NUTS codes consistent with each other?
- Is the correct (up to date) code used?
- If information is missing, is it possible to obtain it from cross-referring other data?
- If North/East values are given, are they plausible?

Size of fire

- Are the values plausible (e.g. correct units)?
- Have the categories (Forest, Non-forest, etc.) been assigned correctly?

Cause of fire

- Is the mapping between the country cause code and EU code consistent/correct?

Data stored in the database

In 2012 the 4 MENA countries submitted data for entry into the database, bringing the number of countries now contributing to 26 (Algeria, Bulgaria, Croatia, Cyprus, Czech, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Lebanon, Morocco, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tunisia and Turkey). The database currently contains almost 2.5 million individual fire event records (1.88 million forest fires). See Table 53 for a summary.

Access to the information

Access to summarised information from the database is provided through the EFFIS web interface

http://effis.jrc.ec.europa.eu/fire-history, which allows the users to retrieve general information such as maps of the number of fires, burnt area and average fire size for a selected year and for the countries for which data are available (Figure 130). The data can be displayed at country, NUTS1, NUTS2 or NUTS3 level and may be filtered to exclude fires below a certain size, while an interactive graphical facility allows the user to display the same fire statistics over time. Further analysis possibilities are planned for the future.

Table 53. Information collected for each fire event

ID	Unique Fire identifier	FIREID
TIME OF FIRE	Date of first alert [YYYYMMDD]	DATEAL
	Time of first alert [HHMM]	TIMEAL
	Date of first intervention [YYYYMMDD]	DATEIN
	Time of first intervention [HHMM]	TIMEIN
	Date of fire extinction [YYYYMMDD]	DATEEX
	Time of fire extinction [HHMM]	TIMEEX
LOCATION OF FIRE	Province Code (national nomenclature)	PROVCODE
	NUTS3 code	NUTS3
	Commune Code (national nomenclature)	CODECOM
	Commune Name (national nomenclature)	NAMECOM
	Latitude [decimal degrees]	NORTH
	Longitude [decimal degrees]	EAST
SIZE OF FIRE (Ha)	Burnt Area FOREST	BAFOR
	Burnt Area OTHER WOODED LAND	BAOW
	Burnt Area OTHER NON WOODED NATURAL LAND	BAONW
	Burnt Area AGRICULTURE AND OTHER ARTIFICIAL LAND	BAAGR
CAUSE OF FIRE	Certainty of knowledge of Presumed Cause (New EU code)	CAUSE_KNOWN
	Presumed Cause (New EU categories code)	CAUSE_EU
	Presumed Cause (Country detailed categories code)	CAUSE_CO

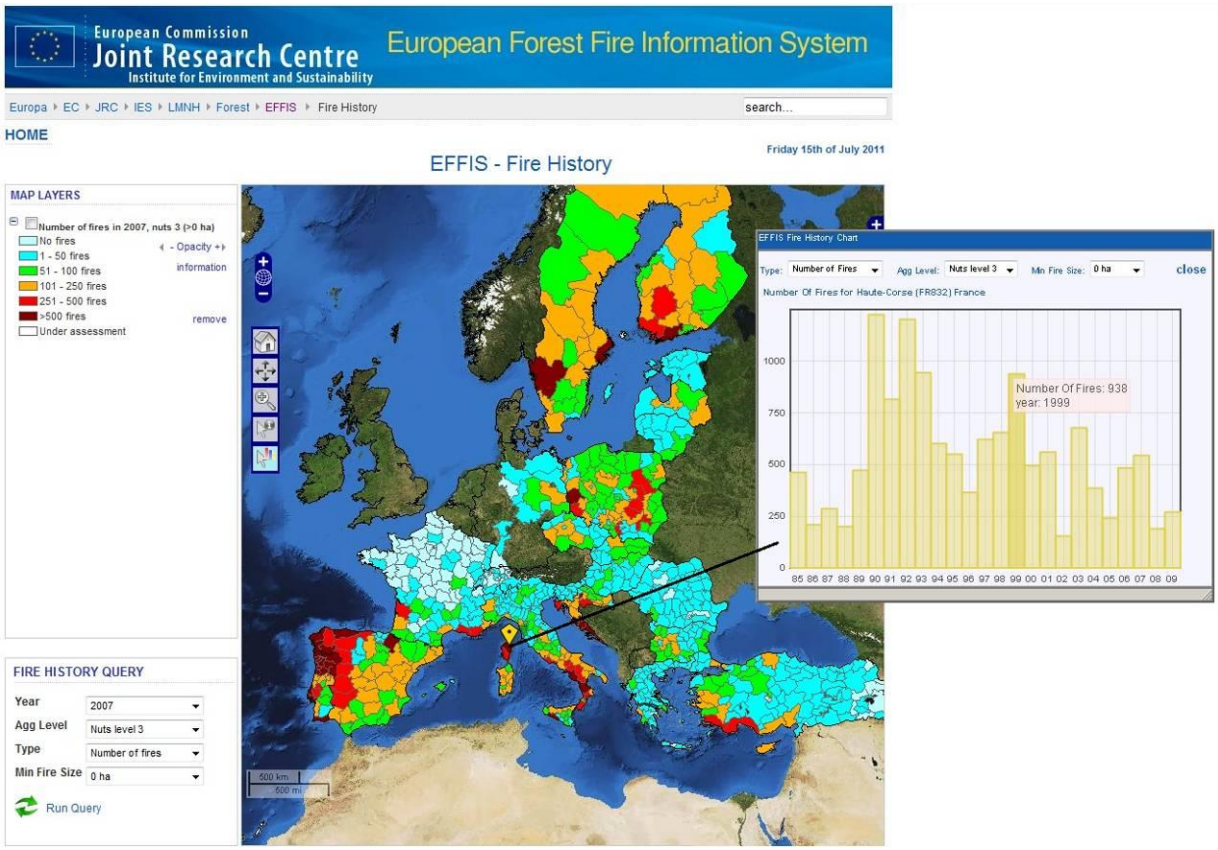


Figure 130. Access to the information stored in the European Fire Database from EFFIS web interface

Table 54. Summary of data records stored in the European Fire Database

	BG	CH	CY	CZ	DE	EE	ES	FI	FR	GR	HR	HU	IT	LT	LV	PL	PT	RO	SE	SI	SK	TR	DZ	LB	MA	TN
1980		79															2349									
1981		147															6730									
1982		71															3626									
1983		107								945							4542									
1984		166								1184							7356									
1985		96					12235		3732	1417			12931				8441									75
1986		76					7514		2657	1088			6115				5036									89
1987		109					8816		2116	1234			8506				7705									207
1988		76					9440		2240	1798			9785				6131									158
1989		168					20250		3321	1203			8328				21896									70
1990		235					12914		3297	1283			11560				10745									118
1991		148					13529		2372	1036			7580				14327									97
1992		70					15956		2708	2008			10044				14954									182
1993		76					14253		4766	2707			14317				16101									183
1994		74			706		19249		4728	1955			7153			24361	19983									131
1995		87			525		25557		6539	1494			5505			23816	34116			44						13
1996		108			822		16586		6401	1527	3147		6064			23582	28626		4854	47						13
1997		135			276		22320		8001	2271	3795		11608			25068	23497		7057	55						98
1998		91			592		22003		6289	605	5485		9565			21342	34676		2503	143						
1999		45			794		17943		4881	513	3856		6956			32646	25477		4707	55						
2000		49	285		930		23574		4343	1469	7897		8609			31809	34109		4708	100						
2001		48	299		373		19099		4259	1313	4045		7227			24511	27982		4831	60						
2002		67	243		278		19929		4097	572	4713	429	4607			38154	28738		6490	64						
2003		155	427		1238		18616		7023	622	6937	373	9716			79013	26941		8282	227						
2004		49	221	957	300		21396	2285	3767	739	2859	104	6341	430	647	36315	26945	34	4955	50	153					
2005	251	63	185	653	299	65	25492	2631	4698	718	3372	150	7918	267	365	46542	40965	64	4573	74	287	1530				
2006	393	46	172	697	717	248	16334	6314	4608	764	3580	97	5651	1444	1929	35630	23647	105	4618	106	238	2227			347	216
2007	1479	65	111	809	435	64	10932	2813	3382	1226	5177	603	10736	245	426	31303	23956	478	3787	129	463	2706			304	292
2008	582	46	114	470	560	71	11656	3161	2781	1071	228	502	6648	272	716	35786	18619	91	5420	68	182	2135			267	259
2009	314	52	91		575	47	15642	2746	4808	354	181	608	5423	471	890	30912	29218	190	4180	122	347				487	199
2010	222	57	133		525	30	11722	3100	3828	540	131	109	4884	106	319	24443	25013	70	3120	33	123	1861			597	264
2011	635	88	85		515	24	16417	2871	4283	953	279	2021	8181	137	373	39011	38118	340	3534	114	303				568	262
2012	876	58	78		451	5	15978	1050	3713		570	2657	10345	81	162	53907	30740	911	2213	168	517	2449	5036	99	484	493
2013	408		135			15	10797	2864	2061		137	761		119	420	25652	27372	118	4907	75		3755			411	

General notes on Table 54:

- 2014 data are still undergoing validation checks and are not presented
- The totals given in this table do not always match the published number of fires for a number of reasons:
    1. Purely agricultural fires are stored in the database if submitted by the country, but are excluded from forest fire calculations
    2. Some countries do not report detailed records for the whole of their territory and this information is only available in summary form

3.3 EFFIS goes mobile

The information provided in the web site of EFFIS can now by viewed on the move in a new app. The app is not only oriented to fire managers and operational staff: it is also a very useful tool for anybody who is affected by fires and who requires information in real time about the ongoing fire or fire danger risk that is accessible on a mobile device.

The fire community has made it clear that they require mobile applications that provide information relevant to the individual's current location and their regions of interest, as well as real-time access to vital fire information. Therefore, feedback and control are key factors in the system.

The EFFIS mobile application allows you to:

- view fire danger forecasting for the next three days;
- detect hot spots in real time;
- get fire-related news;
- receive alerts.

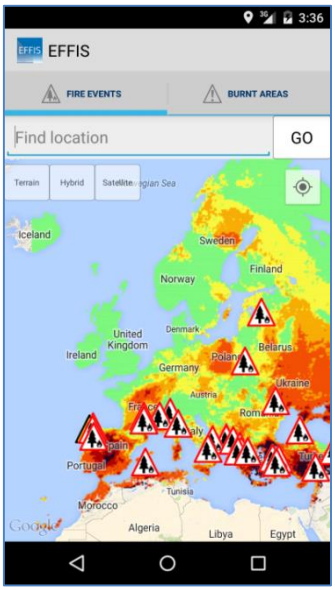
You can also:

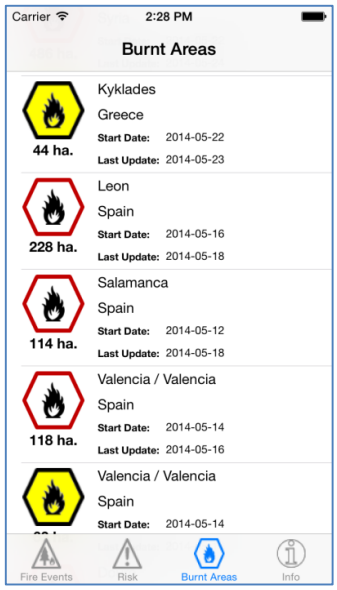
- notify of fire hazards and help to mitigate risks;
- calculate the fire rate of spread (ROS) via your mobile device;
- get mapping and fire reports on the burnt area.

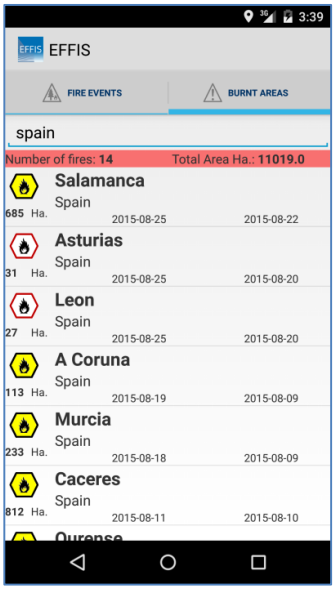
The app is currently available for Apple devices. A version for Android is under development and will be released shortly.

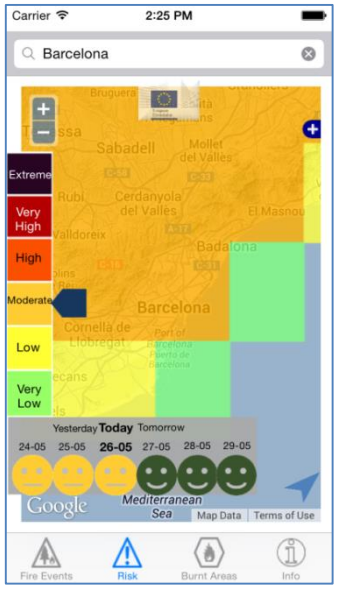
Information on how to download the app and the technical specifications required for it can be found on the EFFIS web page:

http://forest.jrc.ec.europa.eu/effis/









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ANNEX I – Summary Tables of Fire Statistics

Statistics on burnt area divided into forest and non-forest area are supplied in the individual country reports, where available.

NOTE

Every effort is made to ensure that the published figures are correct. However, at the time of printing some data are provisional and may be changed in the future. Where there is a discrepancy between figures published in different reports, the later report should be taken as the definitive version.

Table 55. Number of forest fires in five Southern Member States (1980-2014)

Year	*PORTUGAL*	*SPAIN*	*FRANCE*	*ITALY*	*GREECE*	*TOTAL*
1980	2 349	7 190	5 040	11 963	1 207	27 749
1981	6 730	10 878	5 173	14 503	1 159	38 443
1982	3 626	6 545	5 308	9 557	1 045	26 081
1983	4 539	4 791	4 659	7 956	968	22 913
1984	7 356	7 203	5 672	8 482	1 284	29 997
1985	8 441	12 238	6 249	18 664	1 442	47 034
1986	5 036	7 570	4 353	9 398	1 082	27 439
1987	7 705	8 679	3 043	11 972	1 266	32 665
1988	6 131	9 247	2 837	13 588	1 898	33 701
1989	21 896	20 811	6 763	9 669	1 284	60 423
1990	10 745	12 913	5 881	14 477	1 322	45 338
1991	14 327	13 531	3 888	11 965	858	44 569
1992	14 954	15 955	4 002	14 641	2 582	52 134
1993	16 101	14 254	4 769	14 412	2 406	51 942
1994	19 983	19 263	4 618	11 588	1 763	57 215
1995	34 116	25 827	6 563	7 378	1 438	75 322
1996	28 626	16 771	6 401	9 093	1 508	62 399
1997	23 497	22 320	8 005	11 612	2 273	67 707
1998	34 676	22 446	6 289	9 540	1 842	74 793
1999	25 477	18 237	4 960	6 932	1 486	57 092
2000	34 109	24 118	4 603	8 595	2 581	74 006
2001	26 533	19 547	4 309	7 134	2 535	60 058
2002	26 488	19 929	4 097	4 601	1 141	56 256
2003	26 195	18 616	7 023	9 697	1 452	62 983
2004	21 870	21 396	3 775	6 428	1 748	55 217
2005	35 697	25 492	4 698	7 951	1 544	75 382
2006	19 929	16 354	4 608	5 634	1 417	47 942
2007	18 722	10 936	3 364	10 639	1 983	45 644
2008	13 832	11 655	2 781	6 486	1 481	36 235
2009	26 119	15 643	4 800	5 422	1 063*	53 047
2010	22 026	11 721	3 900	4 884	1 052*	43 583
2011	25 221	16 414	4 500	8 181	1 653*	55 929
2012	21 176	17 503	4 105	8 252	1 559*	52 595
2013	19 291	10 626	2 223	2 936	862*	35 938
2014	**7 067**	**9 771**	**2 778**	**3 257**	**552***	**23 425**
% of total in 2014	**30%**	**42%**	**12%**	**14%**	**2%**	**100%**
Average 1980-1989	7 381	9 515	4 910	11 575	1 264	34 645
Average 1990-1999	22 250	18 152	5 538	11 164	1 748	58 851
Average 2000-2009	24 949	18 369	4 418	7 259	1 695	56 690
Average 2010-2014	18 956	13 207	3 416	5 502	1 128	42 209
Average 1980-2014	18 302	15 040	4 735	9 357	1 506	48 940
TOTAL (1980-2014)	640 586	526 390	165 737	327 487	52 696	1 712 895

* Incomplete data

Table 56. Burnt area (hectares) in five Southern Member States (1980 – 2014)

Year	*PORTUGAL*	*SPAIN*	*FRANCE*	*ITALY*	*GREECE*	*TOTAL*
1980	44 251	263 017	22 176	143 919	32 965	506 328
1981	89 798	298 288	27 711	229 850	81 417	727 064
1982	39 556	152 903	55 145	130 456	27 372	405 432
1983	47 811	108 100	53 729	212 678	19 613	441 931
1984	52 710	165 119	27 202	75 272	33 655	353 958
1985	146 254	484 476	57 368	190 640	105 450	984 188
1986	89 522	264 887	51 860	86 420	24 514	517 203
1987	76 269	146 662	14 108	120 697	46 315	404 051
1988	22 434	137 734	6 701	186 405	110 501	463 775
1989	126 237	426 693	75 566	95 161	42 363	766 020
1990	137 252	203 032	72 625	195 319	38 594	646 822
1991	182 486	260 318	10 130	99 860	13 046	565 840
1992	57 011	105 277	16 593	105 692	71 410	355 983
1993	49 963	89 267	16 698	203 749	54 049	413 726
1994	77 323	437 635	24 995	136 334	57 908	734 195
1995	169 612	143 484	18 137	48 884	27 202	407 319
1996	88 867	59 814	11 400	57 988	25 310	243 379
1997	30 535	98 503	21 581	111 230	52 373	314 222
1998	158 369	133 643	19 282	155 553	92 901	559 748
1999	70 613	82 217	15 906	71 117	8 289	248 142
2000	159 605	188 586	24 078	114 648	145 033	631 950
2001	111 850	93 297	20 642	76 427	18 221	320 437
2002	124 411	107 464	30 160	40 791	6 013	308 839
2003	425 726	148 172	73 278	91 805	3 517	742 498
2004	129 539	134 193	13 711	60 176	10 267	347 886
2005	338 262	188 697	22 135	47 575	6 437	603 106
2006	75 510	155 345	7 844	39 946	12 661	291 306
2007	31 450	86 122	8 570	227 729	225 734	579 605
2008	17 244	50 322	6 001	66 329	29 152	169 048
2009	87 416	120 094	17 000	73 355	35 342	333 207
2010	133 090	54 770	10 300	46 537	8 967	253 664
2011	73 813	102 161	9 400	72 004	29 144	286 522
2012	110 231	226 125	8 600	130 814	59 924	535 694
2013	152 756	58 985	3 608	29 076	46 676	291 101
2014	**19 929**	**46 721**	**7 493**	**36 125**	**25 846**	**136 114**
% of total in 2014	**15%**	**34%**	**6%**	**27%**	**19%**	**100%**
Average 1980-1989	73 484	244 788	39 157	147 150	52 417	556 995
Average 1990-1999	102 203	161 319	22 735	118 573	44 108	448 938
Average 2000-2009	150 101	127 229	22 362	83 878	49 238	432 809
Average 2010-2014	97 964	97 752	8 504	62 911	34 111	301 243
Average 1980-2014	107 077	166 346	25 287	108 873	46 509	454 104
TOTAL (1980-2014)	3 747 705	5 822 123	885 056	3 810 561	1 628 181	15 893 626

Table 57. Number of forest fires in other European countries (1990-2014)

Country	Austria	Bulgaria	Croatia	Cyprus	Czech Rep.	Estonia	Finland	former Yugoslav Republic of Macedonia	Germany	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia	Sweden	Switzerland	Turkey
1990	-		-	-	-	-	-	-	-	-	604	-	5756	131	-	-	-	241	1750
1991	-	73	-	-	-	-	-	-	1846	-	225	-	3528	42	-	-	-	149	1481
1992	-	602	325	-	-	-	-	-	3012	-	1510	1180	11858	187	-	-	-	84	2117
1993	-	1196	372	-	-	-	-	-	1694	-	965	634	8821	159	-	-	-	81	2545
1994	-	667	181	-	-	-	-	-	1696	-	763	715	10705	121	366	-	-	86	3239
1995	-	114	109	-	1331	-	-	-	1237	-	582	472	7678	62	254	-	-	94	1770
1996	-	246	305	-	1421	-	1475	-	1748	-	1095	894	7923	72	662	-	4854	126	1645
1997	-	200	305	-	1398	-	1585	-	1467	-	768	565	6817	37	535	-	7057	177	1339
1998	-	578	441	-	2563	-	370	-	1032	-	357	258	6165	59	1056	-	2503	117	1932
1999	-	320	223	-	1402	-	1528	-	1178	229	1196	1022	9820	138	426	-	4707	50	2075
2000	-	1710	706	285	1499	-	826	-	1210	811	915	654	12426	688	824	-	4708	66	2353
2001	-	825	299	299	483	-	822	-	587	419	272	287	4480	268	311	-	4831	64	2631
2002	-	402	176	243	604	356	2546	-	513	382	1720	1596	10101	516	570	60	6490	105	1471
2003	-	452	532	427	1754	111	1734	-	2524	375	900	885	17087	203	872	224	8282	262	2177
2004	-	294	204	221	873	89	816	-	626	104	647	468	7006	34	153	51	4955	71	1762
2005	954	241	147	185	619	65	1069	-	496	150	365	301	12049	64	287	73	4573	81	1530
2006	912	393	181	172	697	248	3046	-	930	97	1929	1545	11541	105	237	112	4618	78	2227
2007	750	1479	345	111	-	64	1204	652	779	603	425	251	8302	478	463	140	3737	80	2829
2008	-	582	275	114	-	71	1456	573	818	502	700	301	9090	91	182	74	5420	55	2135
2009	218	314	181	91	-	47	1242	80	858	608	823	471	9162	190	347	120	4180	82	1793
2010	192	222	131	133	-	30	1412	99	780	109	316	104	4680	70	127	32	3120	73	1861
2011	356	635	280	85	-	24	1215	523	888	2021	360	142	8172	340	303	114	3534	101	1954
2012	312	876	569	78	-	5	417	483	701	2657	162	81	9265	882	517	168	2213	70	2450
2013	357	408	137	135	-	15	1452	186	515	761	422	123	4883	116	233	75	4878	58	3755
2014	369	151	43	68	-	91	1660	62	429	1042	698	155	5245	83	153	35	4374	56	-

Table 58. Burnt area (hectares) in other European countries (1990 – 2014)

Country	Austria	Bulgaria	Croatia	Cyprus	Czech Rep.	Estonia	Finland	former Yugoslav Republic of Macedonia	Germany	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia	Sweden	Switzerland	Turkey
1990	-	-	-	-	-	-	-	-	-	-	258	-	7341	444	-	-	-	1708	13742
1991	-	511	-	-	-	-	-	-	920	-	69	-	2567	277	-	-	-	96	8081
1992	-	5243	11131	-	-	-	-	-	4908	-	8412	769	43755	729	-	-	-	69	12232
1993	-	18164	20157	-	-	-	-	-	1493	-	570	274	8290	518	-	-	-	35	15393
1994	-	18100	7936	-	-	-	-	-	1114	-	326	279	9325	312	-	-	-	408	38128
1995	-	550	4651	-	403	-	-	-	592	-	535	321	5403	208	-	-	-	446	7676
1996	-	906	11214	-	2043	-	433	-	1381	-	927	478	14537	227	-	-	1588	292	14922
1997	-	595	11122	-	359	-	1146	-	599	-	448	226	6766	68	-	-	5873	1785	6316
1998	-	6967	32056	-	1132	-	131	-	397	-	211	93	4222	137	-	-	422	274	6764
1999	-	8291	6053	-	336	-	609	-	415	756	1544	494	8629	379	557	-	1771	30	5804
2000	-	57406	68171	8034	375	-	266	-	581	1595	1341	352	7089	3607	904	-	1552	70	26353
2001	-	20152	16169	4830	87	-	187	-	122	-	311	113	3466	1001	305	-	1254	20	7394
2002	-	6513	4853	2196	178	2082	590	-	122	1227	2222	746	5210	3536	595	161	2626	713	8514
2003	-	5000	27091	2349	1236	207	666	-	1315	845	559	436	28551	762	1567	2100	4002	671	6644
2004	-	1137	3378	1218	335	379	358	-	274	247	486	253	3782	124	157	138	1883	30	4876
2005	71	1456	3135	1838	227	87	495	-	183	3531	120	51	5713	162	524	280	1562	43	2821
2006	75	3540	4575	1160	53	2638	1617	-	482	625	3387	1199	5657	946	280	1420	5710	117	7762
2007	48	42999	20209	4483	-	292	576	32665	256	4636	272	38	2841	2529	679	128	1090	322	11664
2008	-	5289	7343	2392	-	1280	830	5915	538	2404	364	112	3027	373	118	75	6113	67	29749
2009	22	2271	2900	885	-	59	576	1307	757	6463	646	287	4400	974	510	177	1537	51	4679
2010	37	6526	1121	2000	-	25	520	737	522	878	92	22	2126	206	192	121	540	27	3317
2011	78	6883	15555	1599	-	19	580	17308	214	8055	115	293	2678	2195	403	288	945	224	3612
2012	69	12730	24804	2531	-	3	86	10021	269	13978	90	20	7235	6299	1683	1006	483	28	10455
2013	165	3314	1999	2835	-	79	461	3027	199	1955	217	25	1289	421	270	66	1508	29	11456
2014	192	916	188	669	-	78	881	846	120	4454	591	162	2690	217	192	18	14666	45	-

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