



## The Forest Fire Season in the Russian Federation in 2011

Forests in the Russian Federation occupy 69 % of the total territory and cover 1183.3 million hectares (ha) of forests, including the State Forest Fund (1144.1 million ha), the Special Protected Natural Territories (26.2 million ha), forests of other categories (forests of under the jurisdiction of the Ministry for Agriculture, Ministry for Public Transport, etc.) (6.8 million ha), forests under the jurisdiction of the Ministry of Defense (4.8 million ha), and municipality forests (1.4 million ha).

The Forest Fund of Russia subdivided into the following zones of monitoring (Fig. 1):

- 1) Zone of Ground Monitoring (densely populated territories with a developed road network where detection and suppression is made by mainly ground forces that capable to arrive to a fire within 3 hours from the time of fire detection) – 90.4 million ha;
- 2) Zone of Aviation Monitoring (forests with a low-developed road network, detection is made by aviation means; fire suppression is made mainly by aerial firefighting teams (smokejumpers, helirapellers) firefighting aircraft) – 481.2 million ha;
- 3) Zone of Space Monitoring (remote territories). The zone of space monitoring is subdivided into two levels. In the Sub-zone Level 1 fires are detected and monitored by satellite remote sensing, and suppression is carried out by aerial means. In the Sub-zone Level 2 fires will be suppressed only if settlements, other economic values at risk are threatened or controlling those wildfires that would spread to other Zones or to Sub-zone Level 1 – 571.3 million ha.

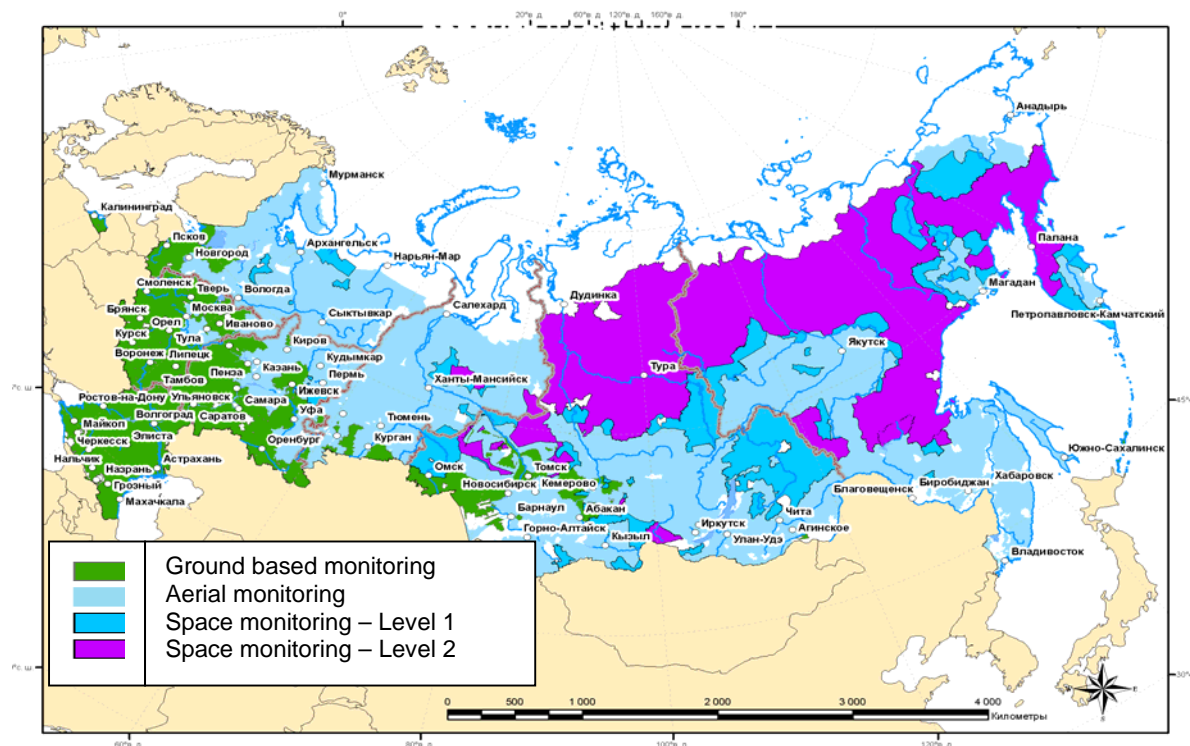


Figure 1. Forest Fire Monitoring Zones. Explanations: See text above.

According to the Forest Code of Russia fire prevention, mitigation and fire management is carried out by:

- Federal Forestry Agency – concerning the forests on which responsibilities are not transferred to public authorities of the regions of the Russian Federation according to a part 2 of Article 83 of the Forest Code of the Russian Federation (Note: Enacted on 1 July 2012 responsibilities on forest management in the Moscow region including fire prevention, mitigation and suppression given to the Moscow Region Government that was before under Federal Forest Agency’s responsibility);
- The Ministry of Natural Resources and Ecology of the Russian Federation – concerning the forests located on lands of Special Protected Natural Territories at Federal level;
- The Authorities of State Defense – concerning the forests located on the lands belonging to the jurisdiction of the Ministry of Defense;
- Public authorities of the regions of the Russian Federation or local governments – concerning the forests located on the lands belonging to the regions and municipalities;
- Public authorities of the regions of the Russian Federation – concerning to the forests located on State forest lands of the regions, implementation of responsibilities on which transferred to Authorities of the Regions of the Russian Federation according to Part 1 of Article 83 of the Forest Code of the Russian Federation.

On the Forest lots provided for a long-term **use & rent for forest users** prevention and mitigation activities carried out by the users based on Forest Use Project, but fire fighting operations carried out by special fire centers and brigades build up in every region.

The most important activities on fire prevention and preparation include:

- Fire prevention arrangement of the forests (construction, reconstruction the forest roads, maintenance of observation towers, prevention fire lines; creation of fire-prevention water reservoirs, etc.);
- Provision of fire suppression equipment and engines, communication systems, etc.;
- Public information and education through mass media.

In preparation of the 2011 fire season in the Russian Federation a total of 3058 plans of suppression of forest fires were prepared and 1,046,200 km of patrol routes approved. Voluntary fire teams are organized and included 67,347 volunteers.

Fire Prevention activities in the Russian Federation:

- Construction of forest roads for fire-prevention, 6,200 km
- Reconstruction and Maintenance of roads of fire-prevention appointment, over 20,000 km
- Construction of the fire-prevention mineralized lines, barriers, over 200,000 km
- Care of the fire-prevention mineralized strips, barriers, over 600,000 km
- Prescribed burning – 1.2 million ha

### **Fire danger rating**

In comparison with 2010 it is noted the increase of monthly average temperatures in the Siberian Federal District – in April – June, in the North West Federal District – in June, in the Ural Federal District in September. For all territory of the Russian Federation October was abnormally warm. High fire danger rating was observed in Southern Siberia and Far East in April (Fig.2).



Figure 2. Fire danger rating as for 30 April 2011

So first fires started in southern regions of Siberia and Far East in April (Buriatia, Altai, Zabaikalie and Primorski regions) where first fires burned thousands of hectares of forests in the beginning of fire season (Fig.3).

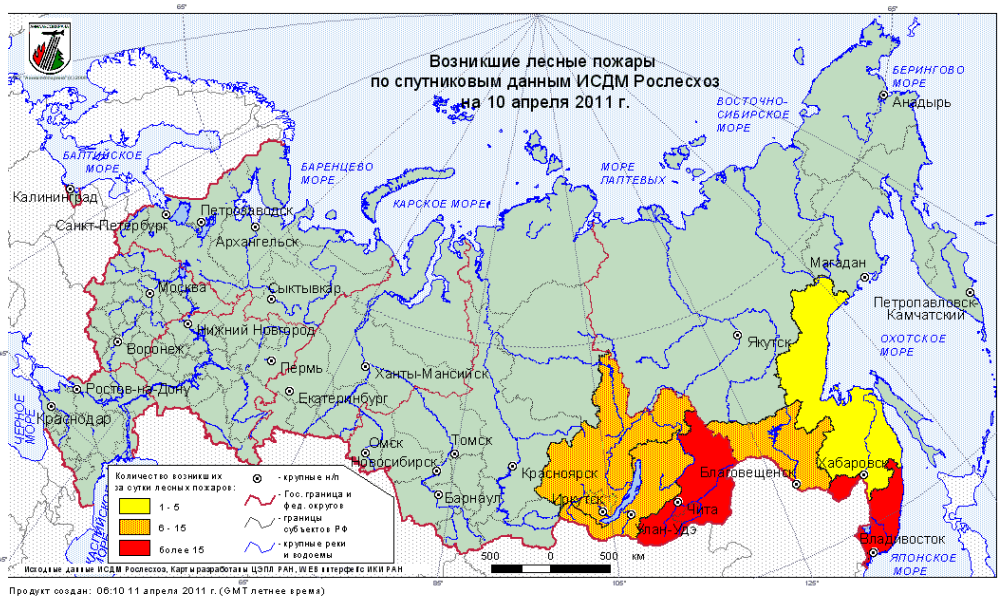


Figure 3. Regions of Russia with major active wildfires between the start of the fire season up for 10 April 2011. (Legend: Number of fire starts during the last day – Yellow 1-5, Ochre 6-15, Red <15)

Decrease of average amount of precipitation in comparison with 2010 is noted: In the Central Federal District – in May, in the Northwest Federal District – in June, in the Far East Federal District – in July. In the majority of other regions the average amount of precipitation increased.

As a whole for Russia in 2011 the average amount of precipitation was for 22% higher than in 2010. Forest Fire Danger Rating is based on weather conditions in the Russian Federation and determined by the Nesterov Index. Fire danger classes (KPO) on a scale from 1 (Low) to 5 (Extreme) are determined by the number of rainless days, relative air humidity and temperature.

The analysis of fire danger shows that in comparison with last year High and Extreme fire danger was observed in Far East Federal District (April, August, October), Siberian Federal District (April, May, October), and also in North West Federal District (June). In the majority of other regions average value of KPO was up to standard or decreased.

In 2011 a total of 20,851 forest fires were recorded in the Russian Federation. The area burned on Special Protected Natural Territories was 1,636,232 ha. According to remote sensing data of the Space Research Institute of Russia the total vegetated area burned is about 5 million ha. Large fires occurred mainly in Siberia, the Far East and the Northwest Federal Districts (90% out of total area burned), with most fires occurring in 11 subjects (regions) of the Russian Federation: Republics of Sakha (Yakutia), Buryatiya, Komi, Zabaykalsky Krai, Krasnoyarsk, Khabarovsk, Amur, Arkhangelsk, Irkutsk, Sverdlovsk and Khanty-Mansi Autonomous Okrug).

The main reason for the raised number of forest fires and area burned in that regions were agricultural burnings that went out of control and abnormal weather conditions.

Over 17,000 fire engines, tractors and other equipment and over 200 aircraft were mobilized during the season nationwide.



**Figures 4 and 5.** Aerial and ground fire suppression forces operating in 2011. Photos: *Avialesookhrana*.

Unfortunately there were several fatalities and injuries during the 2011 fire season. One fire fighter died in Rostov Oblast during a high-intensity crowning fire. One pilot died and one was severely injured in Republic of Tyva after the crash of a Bekas X-32 airplane that was deployed for aerial wildfire monitoring.

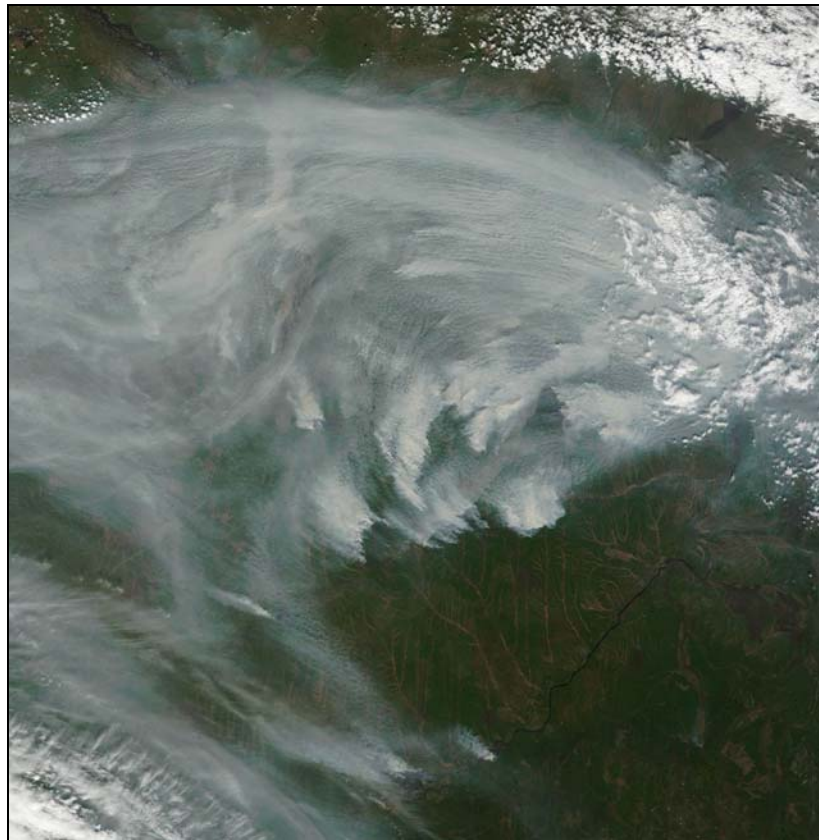
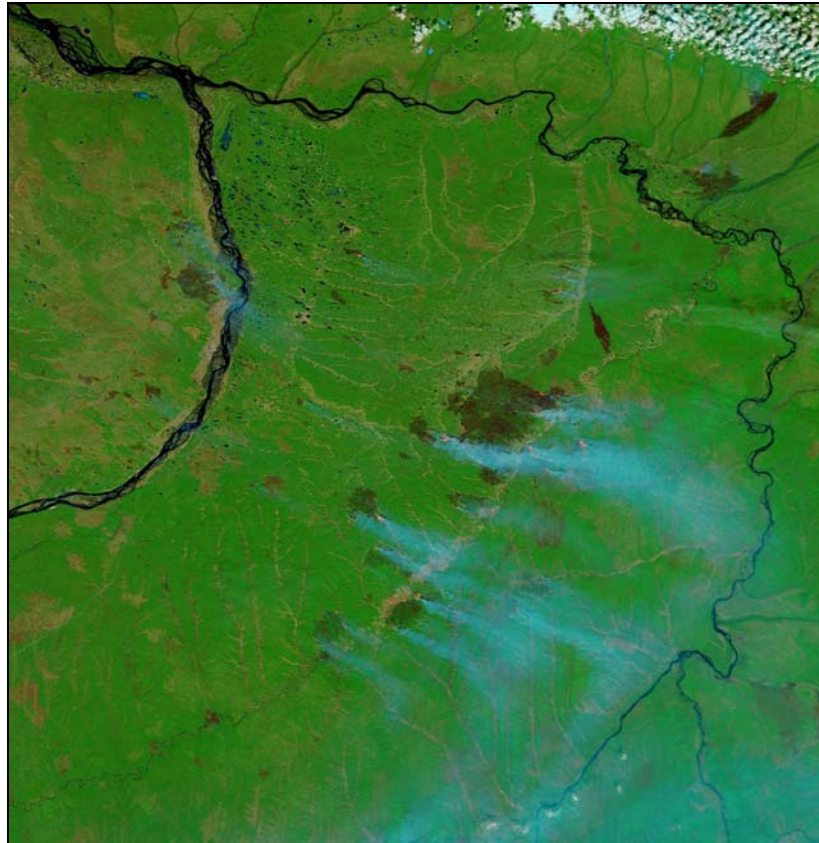
Under the Interagency Agreement fire suppression forces of Avialesookhrana, the Emergency Ministry and other agencies were involved and coordinated during these extreme fire events. Based on interregional agreements 1600 firefighters were exchanged / dispatched between the regions of the Russian Federation.

In comparison with 2010 the number of fires decreased by 1.6 times, the area burned in Special Protected Natural Territories decreased by 471,000 ha. The damage caused by forest fires in 2011 amounted about 20 billion rubles – almost 6 times less in comparison to last year.

In the territory of the Moscow Region the Federal Forest Agency (*Rosleskhoz*) together with the Government of the Moscow region defined sites of peatlands for rehabilitation and wildfire hazard reduction by irrigation. Also *Rosleskhoz* together with the Government of Moscow Region coordinated the irrigation of sites of the Forest Fund in 2012 and 2013. In 2010-2011 the area of irrigated peat lands of the Forest Fund amounted 17,000 ha out of the total area of 20,000 ha.

On the Special Protected Natural Territories 331 wildfires (in 2010 – 732 wildfires) affected 83,000 ha (thereof 32,000 ha forested), i.e. 30% less than in 2010. Most fires were registered in the Far East and the Siberian Federal Districts (95% of all fires occurring in Special Protected Natural Territories).





**Figures 6 and 7.** The wildfires burning in Yakutia were continuously monitored from space. The upper image was captured by the MODIS instrument on NASA's satellite Terra (infrared image, showing active fire fronts and burned area on 22 May 2011). The lower image shows the wildfire smoke covering Yakutia on 27 May 2011 as depicted by MODIS on NASA's satellite Aqua. Source: Courtesy NASA

On the lands under the jurisdiction of the Ministry of Defense 126 forest fires burned 19,600 ha of vegetated land, thereof 19,000 ha forested lands. The number of fire incidents was 1.9 times higher than the in 2010 (67 fires).

Compared to 2010 the budget for forest the protection of forests in the Russian Federation increased by about two times and amounted about 8.0 billion rubles, including 5.0 billion rubles for the acquisition of firefighting engines and tractors.

## References

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