Aerial Protection of Boreal Forest in Russia

Andrey Eritsov
Deputy Director
Aerial Forest Fire Center Avialesookhrana
Wildfire Dynamics on a Global Scale
Smoke transporting episodes to Northern territories
Deposits darken snow / ice surface in the Arctic region and reduce reflectivity.

Climate change resulting in increase of recurrence and severity of extreme droughts and wildfire episodes (Russia: 2001-2005, 2010)
International Bor Forest Island Experiment, 1993
Recent International Events on Fire Management in Russia

International Conference on Transboundary Forest Fires (Irkutsk 2010)

International Fire Management Weeks (Krasnoyarsk 2012, 2013)

International Congress & Exhibition on Forest Fires (Novosibirsk November 11-13, 2013)
Observations of post fire development
Zones of Fire Management in Russia

- **Forrests of Russian Federation**
  - **Ground based management Zone** 72.7 mln. ha
  - **Aerial Management Zone** 477.3 mln. ha
  - **Control Zone** 590.2 mln. ha
  - **Fire Suppression by Ground Forces**
  - **Fire Suppression by Aerial Means**
Development of Aerial Firefighting

300 aircraft
4000 aerial firefighters
It was predicted fire behavior according to known amount of fuel and other forest-growing conditions, as well as the class of fire danger rating using mathematical models.
Development of use of detonating cord for building of firelines in extended territories

An analysis of the results of the conducted studies showed that the detonating cord has a sufficient explosion power for construction of fire barriers. The barrier building time is 7.5 min per 100 m.
There were comparative experiments in Khanti-Mansisk region with soft helibacket and various foams

According to experiments the dosage of a liquid on a wetted strip in a forest is closely related to the helicopter flight mode when draining a liquid and external conditions.
As a result of the studies carried out, it has been proved that it is possible to create a fire-proof barrier strip up to 500 m long and about 8 m wide with an average foam dosage on a strip of about 0.5 l / m2. The fire barrier created by fire-resistant fast-hardening foam has a long-term effect.
Development of Rain Seeding Operations

In 2017, 2018 rain seeding operations managed on firefighting missions in the extended areas of Siberia and Far East with the use of An-26 aircraft and special equipment.
Forest Fire Monitoring System Based on Remote Sensing

- Data of the Earth Monitoring
  - Resurs DK, Meteor
  - NOAA, (AVHRR) TERRA, AQUA c (MODIS)
  - SPOT (VEGETATION)
  - SPOT, LANDSAT

- Reports From the Regions
  - Forest Fire Information including fire management operations

- Weather information
  - Information from the 1500 weather stations;
  - Lightning detection information.

- Thematic archive
  - Vegetation map
  - Borders of forest districts

INFORMATION SYSTEM

- The interface of operative monitoring
- Statistical and analytical reports
- Thematic maps
- Integration with external systems
The practical significance of the research is the improvement and development of new technologies for creation of fire protection barriers (strips) in the remote areas for fire management as well as rain seeding for fire control. This allows to solve an important problem of increasing the effectiveness of fire management in remote areas.

Use of modern instruments and technologies of firefighting provides in time control of wildfires.

- It is important to develop decision making program for fire management in extended territories with the use of Information system based on fire history, vegetation map, fire danger rating, weather forecast, etc.
- It is required the development of regulations on fire management zoning procedures in extended territories based on International experience.
- It is important to continue researches on development of modern technologies on fire management.
Thank you for attention!