

Demographic aspects of forest fire forecasting at the scale in the Russian Federation

-
- A. N. Rzdaivodin** – Russian Research Institute of Silviculture and Mechanization of Forestry, Pushkino, Moscow region, Russian Federation, razdayvodin@roslesrad.ru
- V. V. Kalnin** – Russian Research Institute of Silviculture and Mechanization of Forestry, Candidate of Biological Sciences, Pushkino, Moscow region, Russian Federation, kalnin@vniilm.ru
- I. I. Maradudin** – Russian Research Institute of Silviculture and Mechanization of Forestry, Pushkino, Moscow region, Russian Federation, info@roslesrad.ru
- A. I. Radin** – Russian Research Institute of Silviculture and Mechanization of Forestry (ARRISMF), Doctor of Biological Sciences, Pushkino, Moscow region, Russian Federation, info@roslesrad.ru
- D. Y. Romashkin** – Russian Research Institute of Silviculture and Mechanization of Forestry, Pushkino, Moscow region, Moscow region, Russian Federation, info@roslesrad.ru
- A. P. Ryabinkov** – Russian Research Institute of Silviculture and Mechanization of Forestry, Candidate of Biological Sciences, Pushkino, Moscow region, Russian Federation, info@roslesrad.ru
-

The paper proposed a predictive model of forest fire situation in the 10-year period in the scale of the Russian Federation. Most of the papers addressing the forecasting of forest fire situation is focused on a certain region of the country: Siberia, the far East, region, administrative district, etc. The present work focused on the preparation of forecast in the scale all of the country.

Examples of such generalized figures are the average height above sea level, average annual temperature of the Earth, etc. The purpose of this forecast, unlike the regional ones, is not the design of fire protection measures in the forests of a particular region, and in getting a General idea of trends in forest fire situation at the Federal level for the long term.

The initial data for forecasting are data on forest fires from 1965 to 2016. The main methodological approach in this paper is to find factors having a close relationship and have the greatest impact on outcome measures (the number of forest fires, total area burned), followed by construction of a mathematical model. Based on this model can be made a forecast. A large part of forest fires due to human factors.

Therefore, the search for factors was performed among demographic characteristics on the public data of the Federal state statistics service. This factor was the number of people employed in agriculture, forestry and hunting farms.

The analysis of the relationship of this factor with data on the forest fires and its dynamics in the studied time interval have shown that it can be used as a basis to predict the number and area of forest fires.

The forecast is made for a ten-year period up to 2026. If current trends continue, the number of wildfires will remain at the current level or to decline slightly. The average area of forest fires will slowly increase and by the end of the forecast period will come to a stable level. The total area damaged by fire, will gradually decrease.

The forecast model assumes the parameters of meteorological factors stable over time and fixed at the level of mean annual values. In reality it is not. In years when weather conditions will deviate significantly from the average, the parameters of the forest fire situation may deviate from the forecast. In this case, our forecast sets a basic reference line determined by demographic factors, as observed in particular years the number of fires will deviate from it in one way or another to the greater, the more abnormal will be the weather conditions in a given year. This applies in particular to forecast the number of fires as the parameter most dependent on specific meteorological conditions. The forecast of the average area of a fire is less dependent on weather conditions. This value must less to deviate from the predictable.