



Forest changes at the south-west of Moscow region

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The economical activity of man is one of the significant factors in the formation of modern forest cover. The nature of the Moscow region is used by man for a long period. According to different studies during the last 250 years forest cover increased in different parts of this region [1,2,3]. Using old maps (available since the middle of the XVIII century in Russia) we show that the forest area at the south-west of Moscow region mainly increases since 1870. In some places, it increased twice.

The key site is situated 250km south-west of Moscow city, in the basin of the river Ugra. The amount of forests increased during the study period and now the forest area is 6 times larger than in 1770. The reforestation is continuous and steady

Landsat images interpretation shows that the study area is covered by coniferous 42% (spruce, spruce-pine, and pine forests) and small-leaved forests 38% and small-leaved-coniferous forests 20%. The forests with different tree stand have a well-defined connection with the previous land-use. The coniferous forests grow mainly within the old forest territory. The farmlands abandoned after WWII and later overgrown with the small-leaved forests.

To detail estimate of reforestation, we chose the area with homogeneous natural characteristics. According to archive maps, there are forests with different age. The first site is covered by forest for at least 250 years. Here are mainly mixed communities of spruce, pines, birches, and aspens. The second site is covered by forest for the last 150 years. The spruce-pine and pine forests grow here. The third site is covered by forest for at least 100 years. The birch and pine forests grow here.

Using the satellite images we analyzed the changes of tree stand during the last 40 years. In the 250-year-old forest the number of coniferous trees increased a little but the mixed character of tree stand generally is saved. In the 150-year-old forest the number of coniferous trees increased significantly. In the 100-year-old forest, there are different changes, somewhere the percentage of coniferous species increases, and somewhere decreases due to the loss of old pines.

The forest percentage increases in the south-west part of the Moscow region during the last 150 years. The study of the key sites shows that the small-leaved forest is formed at recently abandoned fields. On the fields abandoned over 100 years ago the mixed birch-pine forests grow. Then the coniferous trees begin to dominate in the tree stand and since a long time under the constant light impact (selective cuttings) the relatively stable mixed communities are formed.

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