GIS Support for the Carbon Budget Assessments of the Forest Ecosystems

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Key words: *carbon sequestration by forests, forests ecosystem services, carbon budget, GIS, thematic maps.*

The possibility of using GIS tools to support climate research related to the assessment of the environmental potential of forests to store biogenic carbon is shown by the example of the forest area of coniferous-broadleaved (mixed) forests of the European-Ural region of Russia. GIS tools allowed for identification of carbon budget accounting units of regional and local levels. With the help of ArcGIS software, a map of the division of the Russian territory into forest zones and forest areas with homogeneous site specific conditions in accordance with the regulatory documents of the Ministry of Natural Resources of the Russian Federation has been prepared. Territorial and spatial representation of forest taxation characteristics – input parameters of model calculations of carbon deposition and carbon budget within the forest lands of the research object – is considered. The maps of ecology and resource potential of the forest area's ecosystems were made by ArcGIS software. The indicators of the annual carbon accumulation by ecosystems (NEP) over the forest management units dedicated to the zone of coniferous-broadleaved (mixed) forests of the European-Ural part of Russia and the carbon budget (NBP) were calculated with data of the State Forest Register (SFR) as of 01.01.2016. The results of model calculations of carbon sequestration by coniferous-broadleaved (mixed) forests of the European-Ural part of Russia and carbon balance in the cartographic form are presented.