

## SYSTEM MONITORING AND COMPLEX EVALUATION OF FOREST LANDS IN INDUSTRIAL REGIONS (ON THE EXAMPLE OF THE URALS AND WESTERN SIBERIA)

*Tatyana A. Lebedeva*

Ural State Mining University, 30, Kuibyshev St., Yekaterinburg, 620144, Russia, Ph. D., Senior Lecturer, e-mail: taranova.ekb@bk.ru

The need for systematic monitoring and complex evaluation of forest lands in industrial regions (on the example of the Urals and Western Siberia) is considered. The methodology of system monitoring and complex evaluation of forest lands on the basis of the concept of sustainable development of territories and biotic regulation of the environment, taking into account the widespread and long-term consequences of nature-land-forest management, modeling of natural objects, phenomena and processes, combining data collection and processing procedures with models of structural elements of forest lands with algorithms of forecasting and decision-making is presented. The scientific and technological principles of system monitoring and information support of complex evaluation of forest lands in industrial regions are considered. The results of using a sound methodology and the proposed principles of system monitoring and complex evaluation of forest land in industrial regions in solving practical problems are presented: substantiation of the concept of environmental safety of the development of the Middle Urals, the role of the natural potential of forest lands in the national accounts structure, the formation of sustainable subsoil use.

**Key words:** forest lands, system monitoring, complex evaluation, industrial regions, sustainable development, biotic regulation, modeling of natural objects, phenomena, processes, forecasting algorithms, decision-making algorithms.

### REFERENCES

1. Belov, S. V. (2016). Paradoxes of the living. *Prirodno-resursnyye vedomosti [Natural Resource Statements]*, 12, P. 8 [in Russian].
2. Neyshtadt M. I. (1957). *Istoriya lesov i paleogeografiya SSSR v golotsene [Forest history and paleogeography of the USSR in Holocene]*. Moscow: AN SSSR Publ., 404 p. [in Russian].
3. Tolmachev, A. I. (1954). *K istorii vozniknoveniya i razvitiya temnokhvoynoy taygi [On the history of the origin and development of the dark coniferous taiga]*. Moscow-Leningrad: AN SSSR Publ., 282 p. [in Russian].
4. Khotinskiy, N. A. (1967). Forests of the past. *Lesnoe khozyaystvo [Forestry]*, 6, 13–18 [in Russian].
5. Savinykh, V. P., Krapivin V. F., & Potapov I. I. (2007). *Informatsionnye tekhnologii v sistemakh ekologicheskogo monitoring [Information technology in environmental monitoring systems]*. Moscow: Geodezkartizdat Publ., 308 p. [in Russian].
6. Terinov, N. I., & Turkov, V. G. (1983). Anthropogenic dynamics of the mountain forests of the Middle Urals. In *Sbornik statey: Ekologo-geograficheskie i geneticheskie printsipy izucheniya lesov [Collection of Paper: Ecological-Geographical and Genetic Principles of Forest Study]* (pp. 158–163). Sverdlovsk: UNTs AN SSSR Publ. [in Russian].
7. Smolonogov, E. P. (1996). Forest formation process and problems of forest typology. In *Sbornik: Lesoobrazovatel'nyy protsess na Urale i v Zaural'e [Forest formation process in the Urals and beyond the Urals]* (pp. 4–25). Ekaterinburg [in Russian].
8. Sedykh, V. N. (2009). *Lesoobrazovatel'nyy protsess [Forest formation process]*. Novosibirsk: Nauka Publ., 164 p. [in Russian].

9. Lebedev, Yu. V. (2011). *Otsenka lesnykh ekosistem v sisteme prirodopol'zovaniya [Forest ecosystem assessment in the environmental management system]*. Ekaterinburg: UrO RAN Publ., 574 p. [in Russian].
10. Isaev, A. S. (2002). *Monitoring biologicheskogo raznoobraziya lesov Rossii: metodologiya i metody. RAN [Monitoring of the biodiversity of the Forests in Russia: methodology and methods. RAN]*. Moscow: Nauka Publ., 453 p. [in Russian].
11. Giniyatov, I. A., & Zharnikov, V. B. (2000). *On the structure and content of the land monitoring in modern and contemporary history. Vestnik SGUGiT [Vestnik SSUGT]*, 5, 25–27 [in Russian].
12. Zamolodchikov, D. G. (2013). Anthropogenic and natural components of temperature dynamics in the territory of Russia. *Ispol'zovanie i okhrana prirodnnykh resursov Rossii [Use and Protection of Natural Resources of Russia]*, 1, 36–42 [in Russian].
13. Kaevitser, V. I., Krapivin, V. F., & Potapov, I. I. (2015). Economically efficient information-modeling technology of the forest ecosystems monitoring and assessment of their role in the climate change. *Ekonomika prirodopol'zovaniya [Environmental Economics]* 4, 57–61 [in Russian].
14. Kondrat'ev, K. Ya., & Krapivin, V. F. (2004). *Modelirovanie global'nogo krugovorota ugleroda [Modeling the global carbon cycle]*. Moscow: Fizmatlit Publ., 336 p. [in Russian].
15. Lebedeva, T. A., & Shipilova, E. V. (2015). Methodology and scientific and technical principles of monitoring and integrated assessment of forest lands in the intensively developed territories. In *Sbornik materialov Interexpo GEO-Sibir'-2015: T. 2. Distantionnye metody zondirovaniya Zemli i fotogrammetriya, monitoring okruzhayushchey sredy, geoekologiya [Proceedings of Interexpo GEO-Siberia-2015: International Scientific Conference: Vol. 2. Remote Sensing Methods of the Earth and Photogrammetry, Environmental Monitoring, Geoecology]* (pp. 153–156). Novosibirsk: SSUGT Publ. [in Russian].
16. Kolesnikov, B. P., Zubareva, R. S., & Smolonogov E. P. (1973). *Lesobrazovatel'nye usloviya i tipy lesov Sverdlovskoy oblasti (prakticheskoye rukovodstvo) [Forest conditions and types of forests in the Sverdlovsk Region]*. Sverdlovsk: USC of the USSR Academy of Sciences Publ., 176 p. [in Russian].
17. Lebedev, Yu. V., Kopylova, Yu. Yu., Potravnyy I. M. (2003). *Given time factor for assessment of the impact of the environment-forming forest's function. Ekonomika prirodopol'zovaniya [Environmental Economics]* 1, 32–43 [in Russian].
18. Lebedeva, T. A., Trubina, L. K. (2017). The models of forests lands as a basic units of GIS monitoring in land use. *Vestnik SGUGiT [Vestnik SSUGT]*, 22(1), 178–186 [in Russian].
19. Chumachenko, S. I. (2006). *Imitatsionnoe modelirovanie mnogovidovykh raznovozrastnykh lesnykh nasazhdeniy [Simulation modeling of the multiple uneven-aged forest plantations]. Doctor's thesis. Moscow, 287 p. [in Russian]*.
20. Krapivin, V. F., Burkov, V. D., Potapov, I. I., & Shalaev, V. S. (2009). Production process modeling in forest ecosystems. *Problemy okruzhayushchey sredy i prirodnnykh resursov [The problems of Environment and Natural Resources]*, 3, 32–45 [in Russian].
21. Anufriev, V. P., Lebedeva T. A., & Ivanova N. S. (2017). Steady land use: accounting of the modern calls and risks. In *Materialy VI Mezhdunarodnoi nauchno-prakticheskoi konferentsii: Innovatsionnye geotekhnologii pri razrabotke rudnykh i nerudnykh mestorozhdeniy [Proceedings of 6nd International Scientific and Practical Conference: The Innovative Geotechnology in the Development of Ore and Nonmetallic Deposits]* (pp. 184–188). Ekaterinburg [in Russian].
22. Lebedeva, T. A., & Maksimova, N. A. (2015). The scientific principles of formation of the database for estimated works on forest lands. In *Materialy XIII Mezhdunarodnoi nauchno-prakticheskoi konferentsii: Teoriya i praktika ekonomicheskogo regulirovaniya prirodopol'zovaniya i okhrany okruzhayushchey sredy [Proceedings of 13nd International Scientific and Practical Conference: Natural Resource Management and Environmental Protection: Theory and Practice of Economic Regulation]* (pp. 342–348). Kazan' [in Russian].

Received 25.04.2019

© *T. A. Lebedeva, 2019*