

Ecological and economic balance evaluation of Peter the Great Gulf basin (Sea of Japan)

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Abstract. This work analyzes the indicators of ecological and economic balance within the basin of Peter the Great Gulf. The need for this study is due to the fact, that environmental conditions in the basin are greatly affected by the ongoing process of infrastructural and economic development. The aforementioned processes are characterized by unevenness in their spatial distribution. A map that demonstrates the spatial distribution of 10 land use classes (built-up areas, quarries, rice/paddy fields, agricultural lands, unutilized agricultural lands, unutilized rice/paddy fields, grasslands, shrublands, forests and water bodies) of the area of interest has been compiled using satellite imagery as of 2022. The ecological and economic balance of the basin, which was subdivided into 20 smaller river basins, has been evaluated. Each land use class was assigned to a category representing the intensity of anthropogenic impact. Ecological and economic balance indicators – absolute tension, relative tension, natural protectiveness indices and total area of land with resource-stabilizing properties – were calculated. The balance between the natural potential and economic development was found to be maintained in the study area as a whole, albeit with a few exceptions such as the Pervaya Rechka and Bogataya river basins which host the most intense human impact in the basin. Minimum human influence on the natural potential can be observed in the southwest of the basin (basins of the Bolotnaya, Tesnaya, Tsukanovka, Gladkaya, Ryazanovka, Poyma, Brusya, Narva, Barabashevka, Amba rivers).

Keywords:

Peter the Great Gulf, basin approach, ecological and economic balance, anthropogenic impact, absolute and relative tension indices, natural protectiveness index

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