SCORE PETROCHEMICAL POLLUTION TERRITORY COMPLEX OF THE CHECHEN REPUBLIC

Malika Kitieva[1], Idris Bayrakov[2]

[1]Ingush State University
366700 Republic of Ingushetia, Magas, I.B. Zyazikov Ave., 7
[2]Chechen State University named after A.A. Kadyrov
364024, Grozny, A. Sheripov str., 32,
idris-54@mail.ru

Abstract

In the article the results of research of the ecological status of water bodies of the Chechen Republic podvergshie petrochemical pollution of long-period. In this period as a whole in the water bodies of the Chechen Republic is folded the tense ecological situation caused by natural pollution Wednesday, and especially petroleum, biogenic organic and other substances. One of the main sources of water pollution in the basin of the Terek are surface watercourses in the Chechen Republic, pollution made with objects extraction, refining and transportation of oil, sludge, many of which have been destroyed or subjected to destruction presently. Map of petrochemical pollution scheme, is a table of content of petroleum hydrocarbons in soil samples collected in rivers Terek and Sunzha rivers, Neftjanka. Which shows that water resources are in a State of medium and high degree of pollution and in urgent need of organizing activities to optimize their management. The data obtained suggest that there is a gradual decrease in sediment contamination r. Terek and Sunzha r. oil hydrocarbons. The results of the last 5 years show that the largest number of well falls on 2012 year-more than 567 mg/kg.

Keywords: Chechen Republic, petrochemical pollution, air, water resources, environmental condition.

I. Introduction

The Chechen Republic among the subjects of the Russian Federation in terms of the degree of technogenic impact, including military impact, on the environment is among the heavily polluted areas. Atmospheric air, soil, groundwater and surface water are particularly heavily polluted by enterprises of oil production and transportation, energy and agriculture [1].

II. Materials and Methods

The main sources of atmospheric pollution are natural, industrial and household processes. They are grouped into the following groups: - pollutants of natural origin (mineral, plant and microbiological); - pollutants formed during the combustion of fuel for the needs of industry, heating of homes, during the operation of transport; - pollutants formed during the combustion and processing of household and industrial waste. This indicates that water resources are in a state of medium and high pollution and are in urgent need of organizing measures to optimize their management. The data obtained indicate a gradual decrease in pollution of the sediments of the Terek River and the Sunzha River with petroleum hydrocarbons. Enterprises of petrochemical and fuel and energy complexes, production of building materials, motor transport and others are significant sources of air pollution of the Chechen Republic, a specific feature of

these industries is a large set of ingredients, including inorganic and organic compounds (salts, acids, oxides) a number of the emission ingredients are potent substances. The bottom sediments selected from the Sunzha and Terek rivers were used for the study. Sampling stations are shown in Table 1.

The analysis was carried out by the fluorometric method on the analyzer "Fluorat-02-2M" according to a metrologically certified method. According to the data obtained, the most polluted petroleum hydrocarbons are the soils of the Nefyanka river in the alignment, the Grozny - Chervlennaya - 14.7 mg/kg, the Terek river in the area of the Chervlennaya station - 14.4 mg/kg and the Sunzha river in the area of Grozny (Zhukovsky Street bridge) - 10.2 mg/kg. Soil pollution is uneven in nature. So, other samples taken in the Sunzha river in the area of art.

Petropavlovsk, already contained 4.2 mg/kg of petroleum hydrocarbons. The Terek soils taken at the site of the Kargalinsky hydroelectric complex, as well as in the Sunzha River near the village of Braguna, were characterized by relatively low concentrations of NU - 2.5 and 2.9 mg/kg, respectively (Table 1).

Table 1: *Content of NU in soil samples in the rivers Terek, Sunzha and Neftyanka*

№ site	River	Sampling site	Petroleum products mg/kg
2	Terek river	st. Chervlennaya	14,4
3	-*-	st. Grebenskaya	6,4
4	-*-	Kargaly hydroelectric complex	2,5
6	Sunzha River	Alkhan-Kala	1,8
2	-*-	Grozny, Zhukovsky str.	10,2
10	-*-	Grozny, Sheripova str.	3,8
15	-*-	s.Braguni	2,9
14	-*-	st. Petropavlovskaya	4,2
50	Neftyanka river	Route Grozny-Chervlennaya	14,7

III. Results and discussions

In recent years, there has been a clear downward trend in hydrocarbon pollution, and in 2017 the average annual concentration of petroleum carbons was about 50 mg / kg. Thus, it can be assumed that both water and bottom sediments are gradually cleared of oil pollution (Fig. 1). As a result of economic activity, industrial and motor transport enterprises of the Chechen Republic in 2017, 643 thousand tons of harmful substances were emitted into the atmosphere, including 511 thousand tons in Grozny.

The main air pollutants in the territory of the Chechen Republic are still enterprises of the oil and petrochemical industries, road transport, a cement plant and artisanal oil refining. Of all emissions of 84% of harmful substances into the atmosphere by industry (504 thousand tons / year) accounted for enterprises of petrochemistry, oil refining, energy, building materials. The main reasons for the high level of air pollution include: - unsatisfactory implementation of the state plan for environmental protection - weak departmental control over the state of atmospheric pollution and the efficiency of treatment facilities [1; 2].

With the beginning of hostilities, the level of emissions of harmful substances into the atmosphere increased sharply, due to their receipt from burning torches. According to our calculations, more than 500 thousand tons of harmful substances are emitted into the atmosphere per year.

If until 1994 the unfavorable situation for the emission of harmful substances into the atmosphere developed in Grozny, chiri-Yurt settlement, then since 1996 artisanal production of petroleum products has led to the fact that in some settlements of the republic - Tsotsan-Yurt, Mesker-Yurt, Kurchaloi, Mayrtup and others, sanitary standards have been exceeded tenfold.

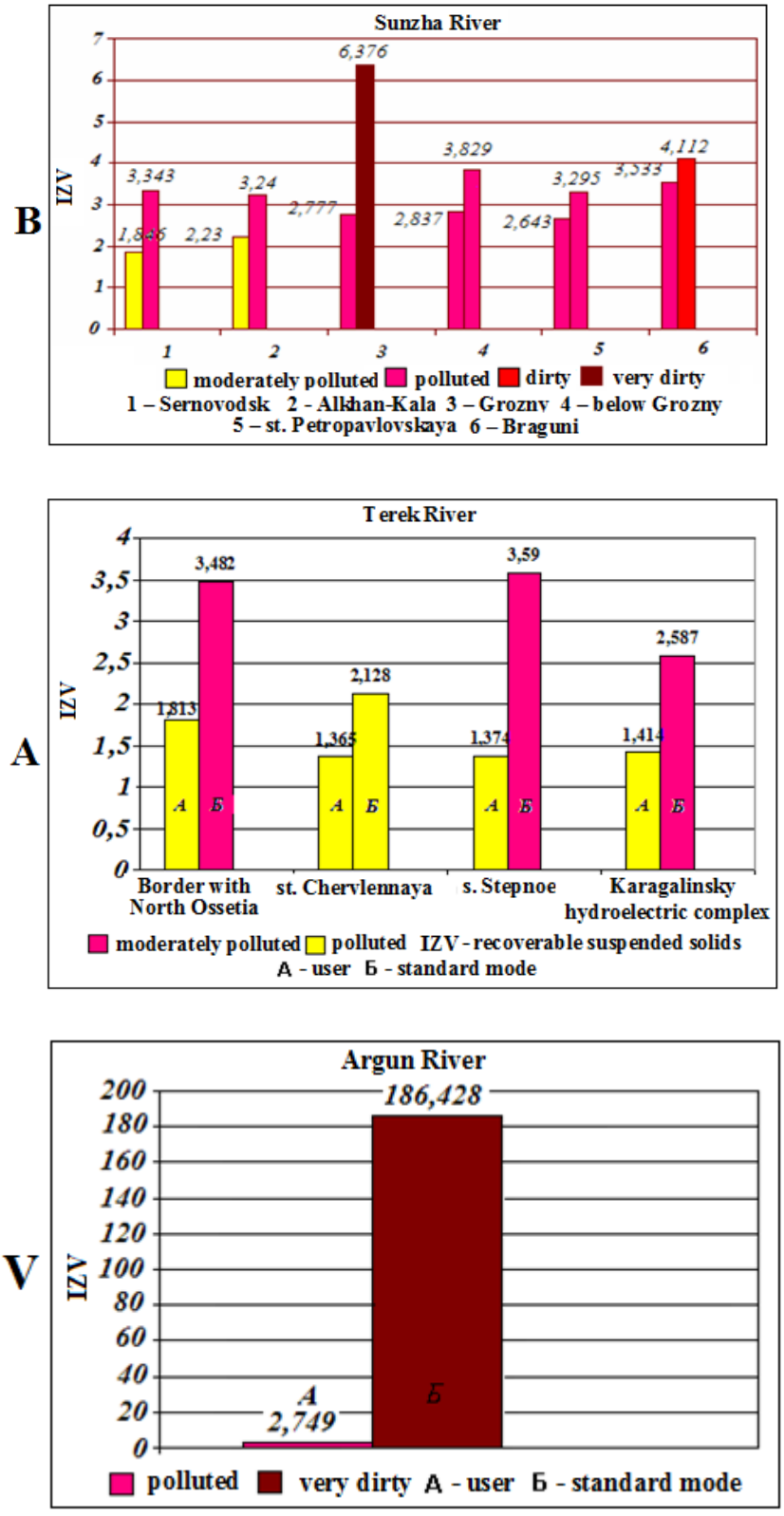
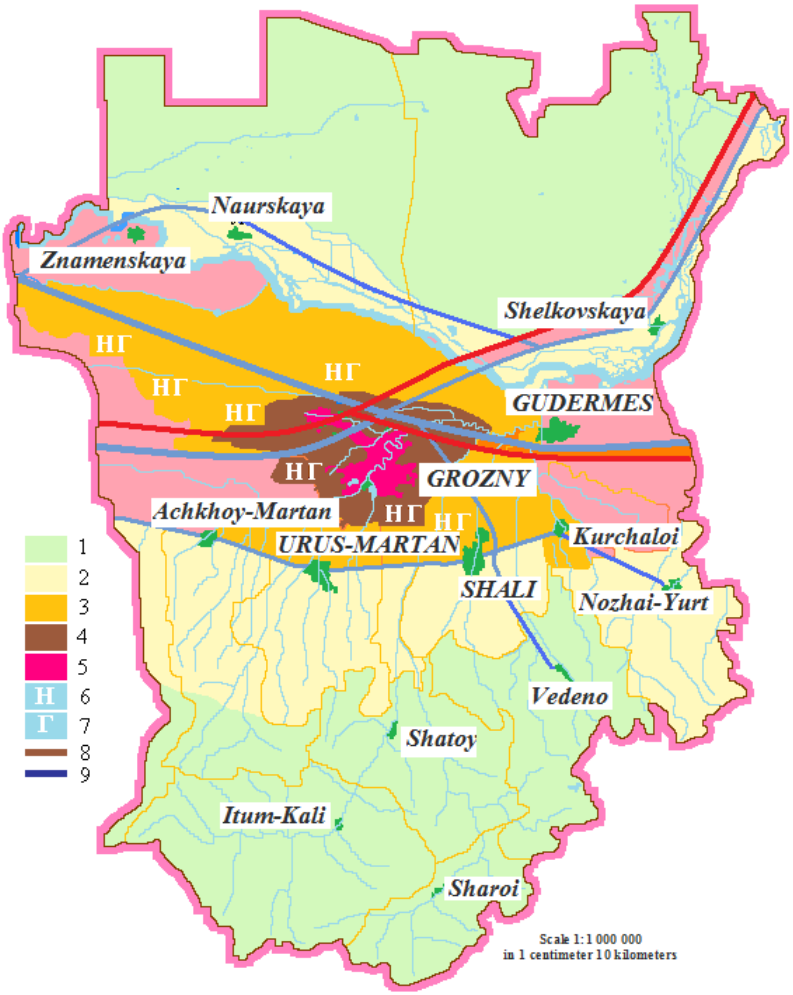


Figure 1. (**A, B, V**). *Assessment of water quality of rivers of the Chechen Republic (**A** - Terek, **B** - Sunzha, **V** - Argun) according to **IZV** in the standard mode (taking into account high concentrations of metals)*

This has a very serious impact on the health of the population. Especially high percentage of childhood and oncological diseases (Fig.2) [3,4].



Legend to the map.Conditional Symbol: 1-no pollution; 2 – moderately polluted; 3 – contaminated; 4 – dirty; 5 – very dirty; 6 – oil production; 7 – gas production; 8 – oil pipelines; 9 – gas pipelines.

Figure 2. *Zoning of the territory of the Chechen Republic on petrochemical pollution The main pollutants are: 1-hydrocarbons (50%), 2-carbon monoxide (32.8%), 3-sulfur dioxide (8.7%), 4-oxides ofn nitrogen (4.3%); 5 - other pollutants.*

VI. Conclusion

Studies have shown that the territory of the Chechen Republic is experiencing, although the levels of the Chechen Republic have decreased slightly in recent years, petrochemical pollution. Water bodies have been subjected to particularly severe impact of oil pollution, where unsweetened untreated industrial effluents have been discharged for many years. The above graphic and cartographic material shows that an even greater part of the territory of the Chechen Republic is under the influence of petrochemical pollution.

Acknowledgments. The research was carried out within the state assignment of Ministry of Science and Higher Education of the Russian Federation (theme No. №075-03-2021-074/4).

References

[1] Bajrakov, I. A., Bolotxanov, E. B., Avtorxanov, A. I., Tajmasxanov, X. E., Shaxmatirov, I. Ya. Chechenskaya Respublika: priroda, e`konomika i e`kologiya. RIO ChGU. Grozny`, 2006. S-369.

[2] Bayrakov, I. A. The current state of landscapes and ecological zoning of the territory of the Chechen Republic. // *Izv. higher. educational. establishments Sev.- Kav. region "Natural Sciences"*. - Izd-vo SKNCVSH. Appendix No. 6. 2005. – P. 44 – 56.

[3] Bayrakov, I. A. Petrochemical pollution of water bodies of the Chechen Republic and measures for their improvement / Modern aspects of ecology and environmental education. / Materials of the I International Interactive Scientific Conference - Moscow - Astrakhan - Nazran: Pilgrim, 2007.

[4] Bayrakov, I. A. Anthropogenic transformation of geosystems of the North-Eastern Caucasus and ways of optimization of nature management. - Nazran, Iz-vo Pilgrim, 2009. – 170 p.

[5] Bayrakov, I. A. Assessment of economic impact and geoecological zoning of the territory of the Chechen Republic. / Interregional Pugoush Symposium "Science and Higher School of the Chechen Republic: Prospects for the Development of Interregional and International Scientific and Technical Cooperation". Abstracts.- Grozny: Academy of Sciences of the Chechen Republic, 2010.. 278-283 s.