

February 1, 2021

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Who breathes well in Russia?

ACRA's ecological ranking of Russian regions

ACRA has compiled an ecological ranking of the regions of the Russian Federation¹ as part of its assessment of sustainable development in the country. To put the rating together, ACRA developed a comprehensive indicator of the environmental situation in the regions, which includes six factors: level of emissions of harmful substances, discharge of contaminated wastewater, production and consumption of waste, water consumption, energy consumption, and expenses on protecting the environment. To perform a comparative analysis of the regions, ACRA used the specific values of the above indicators calculated per unit of gross regional product (GRP) when calculating the comprehensive indicator, and in the case of expenses on protecting the environment — per unit of budget expenditures.

ACRA's ranking is based solely on official information: data from the government reports "On the state and the protection of the environment of the Russian Federation" dated 2016–2018 was used for the ecological factors and data provided by the Federal State Statistics Service and the Federal Treasury was used for the economic factors. Unfortunately, official reports and statistical data are released with rather a large delay in Russia. For example, the state environmental report for 2019 was published at the end of December 2020, and GRP data for 2019 will only be made available in March 2021. Due to this, ACRA will publish an updated ecological ranking for 2019 at the end of Q1 2021.

This analytical commentary pays the most attention to the ranking's leaders and outsiders. The final table with the ranking results is given in *Appendix 1*, where the scores for each analyzed indicator is also presented to reflect the constraining factors. The final values of the complex indicator of the environmental situation are displayed on a map of Russia in *Appendix 2*, and the description of the method for calculating the indicator is given in *Appendix 3*.

In general, the distribution of the complex indicator among the regions is quite even: 68 regions received an assessment in the middle range, which indicates a satisfactory level of environmental friendliness of GRP. 11 regions received the highest score, which was either due to the rather good ecological situation in these regions (according to the method employed) or extremely high GRP. The regions that occupy the last five slots in the ranking are a cause for concern (*Table 1*). These regions either have a high level of environmental pollution or a low GRP due to the absence of major industrial facilities or other types of economic activity.

The transfer of profit to the trading divisions of major companies leads to the formation of an overestimated GRP in the regions where trade divisions are registered and an underestimation of the GRP of the regions where production is based, which distorts the ranking. This emphasizes the validity of the idea that tax optimization — one of the main reasons of inter-holding profit flows — does the most damage to specific socio-ecological indicators that largely determine the quality of life in Russian regions where production and extraction assets are based. Tax optimization leads to a shortfall in GRP in mining and industrial regions and does not compensate for the environmental and economic harm done to the population of these regions (through the improvement of the social component).

¹ As of the end of 2018.

ACRA believes that increased attention of the government, public activists and industrial associations to sustainable development issues will encourage companies to be more active in the development of the regions of their presence and the environmental situation in them, which in turn will improve the attitude to large Russian business not only among the population of these regions, but also responsible investors.

Table 1. Leaders and outsiders of ACRA's ecological ranking

Region	Indicator score
Nenets Autonomous Okrug	1
Moscow	1
Moscow Region	1
Astrakhan Region	1
Yamalo-Nenets Autonomous Okrug	1.17
Kaliningrad Region	1.17
Khanty-Mansiysk Autonomous Okrug	1.33
Tyva Republic	1.5
Saint Petersburg	1.83
Nizhny Novgorod Region	1.83
Vladimir Region	1.83
Republic of North Ossetia – Alania	4.17
Ryazan Region	4.17
Kemerovo Region	4.5
Murmansk Region	4.67
Republic of Karelia	4.83

1 — maximum score; 5 — minimum score.

Source: ACRA

Ranking leaders

Four regions share first place in ACRA's ranking: the Nenets Autonomous Okrug (NAO), Moscow, the Moscow Region, and the Arkhangelsk Region. Moscow secured first place thanks to its enormous GRP by Russian standards and significant expenses on protecting the environment, which negate the negative impact of the emissions produced by the city's industrial enterprises. The NAO, on the other hand, received a high score thanks to its substantial GRP generated by the oil and gas assets in the region. The NAO's high GRP offsets the environmental damage incurred by the oil and gas industry, and puts it at the top of the ranking.

The Moscow and Astrakhan Regions, which have more moderate specific values of indicators compared to Moscow and the NAO, have over the past three years demonstrated positive progress in reducing environmental impact by the majority of analyzed factors, and this has allowed them to climb to the top of the ranking. However, ACRA notes that these regions have specific problems with the level of water consumption and wastewater generation per GRP unit. In the Astrakhan Region this is due to significant water consumption for irrigation and, most likely, insufficient wastewater treatment by enterprises, while in the Moscow Region the main consumers of water are numerous industrial and utilities enterprises, whose wastewater treatment systems are apparently insufficient. The Agency assumes that if the water consumption systems in these regions are not optimized in the near future, then they may slip down in the ranking.

The Yamalo-Nenets Autonomous Okrug (YNAO), Kaliningrad Region, Khanty-Mansiysk Autonomous Okrug (KMAO), Tyva Republic, Saint Petersburg, Nizhny Novgorod Region and the Vladimir Region also made it into the top list of the rating. The YNAO did not make it to the very top of the ranking due to its rather low spending on environmental protection out of total budget expenditures, however, its performance in terms of all other factors of impact on the environment are in line with that of the leaders of the ranking. The Kaliningrad Region's high place in the ranking is due to a good balance between its responsible approach to the environment and its decent economic standing (average GRP and no large polluting enterprises).

The commodity-based KMAO and the non-commodity-based Tyva Republic climbed to the top of the ranking due to the positive dynamics of indicators reflecting the impact on the environment observed in the last three years. However, it should be noted that the level of water consumption is not optimal in these regions, taking into account the size of their economies. The Tyva Republic also has certain problems with the amount of waste it generates.

Saint Petersburg's place among the leaders of the ranking is the result of its high added value that is generated by industry and other sectors of the economy and compensates for the high level of environmental impact of the city and its enterprises.

The Nizhny Novgorod and Vladimir Regions, which are also in the upper part of the ranking, are generally characterized by an average score for most of the analyzed indicators. In the Nizhny Novgorod Region, this is due to the moderate level of industrial impact on the environment and a rather high GRP. In the Vladimir Region, it is due to a low level of economic development and the absence of large industrial enterprises. However, for these two regions, ACRA notes the positive dynamics of the level of environmental friendliness of the GRP in the last three years, which allowed them to rise to higher positions in the ranking.

Ranking outsiders

The group of outsiders (the last five in the ranking) is led by the Republic of North Ossetia – Alania and the Ryazan Region, where operations of the main polluting enterprises (non-ferrous metal plants and oil refineries, respectively) could not compensate for the environmental damage they caused. It should be noted that the two regions also received an adjustment in ACRA's index for the negative dynamics in the environmental friendliness of GRP over the past three years, which worsened their position in the ranking.

The last three positions in the ranking are occupied by the industrial Kemerovo and Murmansk Regions, as well as the Republic of Karelia. Metal and mining assets located in these regions, as well as chemical plants, generate such a significant amount of emissions, wastewater and waste that it is not offset by the positive impact on the regional economy and cannot compensate for environmental damage.

Appendix 1. Ecological ranking of Russian regions

Region	Indicator value	Factor score						Adjustment for dynamics
		Emissions	Wastewater	Waste	Water consumption	Energy consumption	Environmental protection expenses	
Nenets Autonomous Okrug	1	1	1	1	1	1	1	0
Moscow	1	1	1	1	1	1	1	-0.5
Moscow Region	1	1	4	1	3	2	1	-1
Astrakhan Region	1	1	2	1	4	1	3	-1
Yamalo-Nenets Autonomous Okrug	1.17	1	1	1	1	1	2	0
Kaliningrad Region	1.17	1	3	2	1	1	2	-0.5
Khanty-Mansiysk Autonomous Okrug – Ugra	1.33	2	1	2	4	3	2	-1
Tyva Republic	1.5	1	2	4	4	2	2	-1
Saint Petersburg	1.83	1	4	2	1	1	2	0
Nizhny Novgorod Region	1.83	1	4	2	3	3	1	-0.5
Vladimir Region	1.83	2	4	2	2	3	1	-0.5
Republic of Sakha (Yakutia)	2	2	1	5	1	1	2	0
Novgorod Region	2	3	2	3	2	3	2	-0.5
Chechen Republic	2	4	1	1	5	3	1	-0.5
Yaroslavl Region	2	2	5	2	2	3	1	-0.5
Republic of Tatarstan	2.17	2	2	2	2	2	3	0
Voronezh Region	2.17	2	2	3	2	2	2	0
Altai Republic	2.33	4	1	4	1	2	2	0
Chukotka Autonomous Okrug	2.33	2	1	5	1	1	4	0
Tyumen Region	2.33	1	2	1	2	5	3	0
Kamchatka Krai	2.33	2	2	4	3	1	2	0
Chuvash Republic	2.33	3	4	1	2	3	1	0
Udmurt Republic	2.33	3	3	2	3	3	3	-0.5
Republic of Dagestan	2.5	3	2	1	5	1	3	0
Tambov Region	2.5	3	2	3	2	2	3	0
Sakhalin Region	2.67	1	1	5	1	1	4	0.5
Kabardino-Balkarian Republic	2.67	4	3	1	5	2	1	0
Bryansk Region	2.67	2	3	2	2	2	5	0
Rostov Region	2.67	2	2	2	5	2	3	0
Volgograd Region	2.83	3	2	3	4	4	1	0
Tomsk Region	2.83	4	1	2	4	3	3	0
Kurgan Region	2.83	4	3	3	1	4	2	0
Kaluga Region	2.83	1	3	3	1	4	5	0
Smolensk Region	2.83	3	3	2	3	4	2	0
Kursk Region	2.83	2	1	4	3	4	3	0

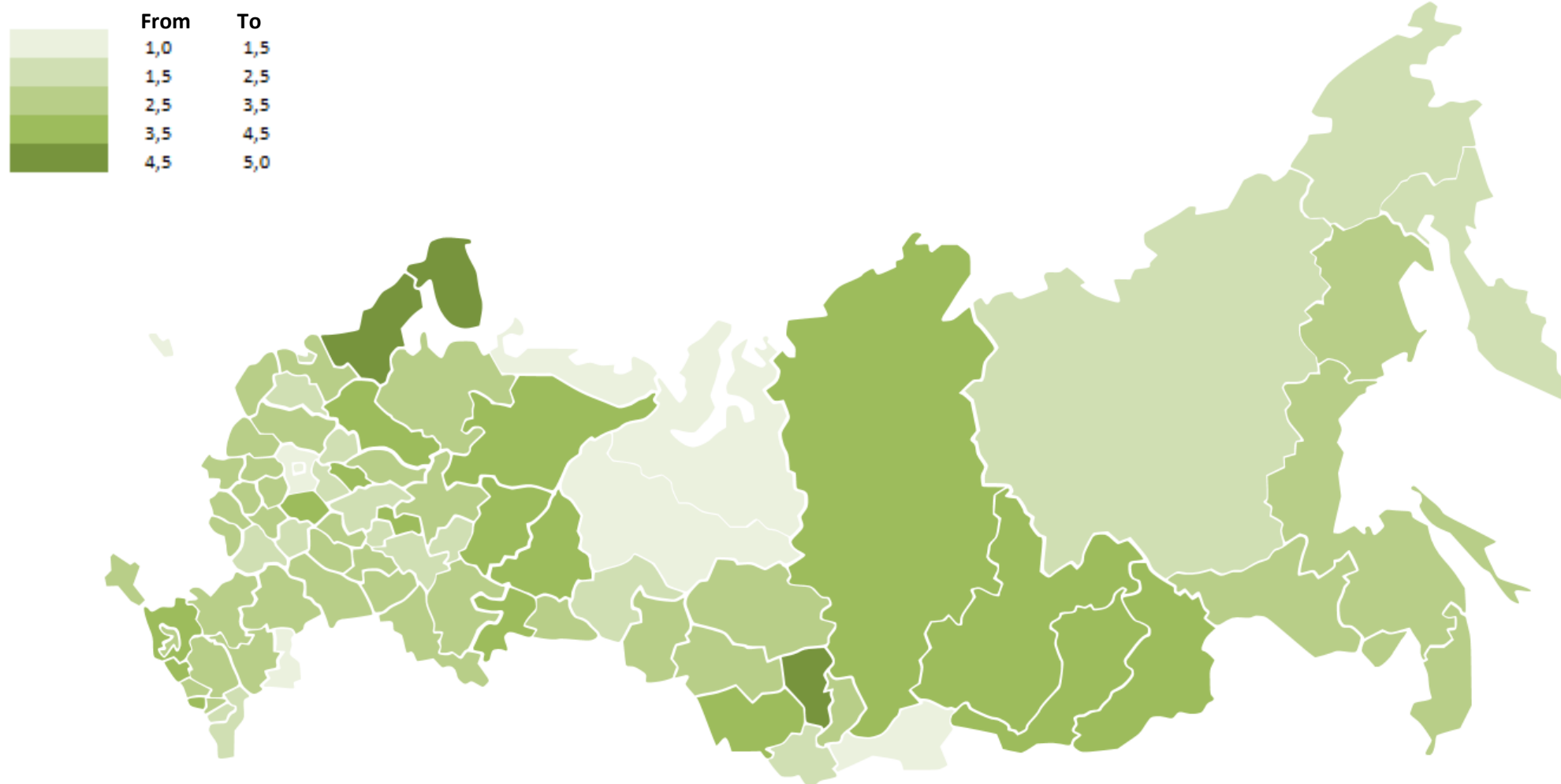
Region	Indicator value	Factor score						Adjustment for dynamics
		Emissions	Wastewater	Waste	Water consumption	Energy consumption	Environmental protection expenses	
Tula Region	2.83	3	4	4	2	3	1	0
Novosibirsk Region	3	2	2	4	3	2	5	0
Republic of Mordovia	3	4	2	3	1	3	5	0
Republic of Ingushetia	3	4	1	1	5	2	5	0
Omsk Region	3	3	3	3	2	3	4	0
Republic of Kalmykia	3	3	3	1	5	1	5	0
Jewish Autonomous Region	3	4	3	2	2	5	2	0
Leningrad Region	3	2	4	3	3	4	2	0
Belgorod Region	3	2	2	5	2	3	4	0
Ulyanovsk Region	3.17	3	4	2	2	3	5	0
Samara Region	3.17	2	4	2	3	4	4	0
Penza Region	3.17	2	4	3	3	2	5	0
Tver Region	3.17	3	3	1	5	4	3	0
Saratov Region	3.17	3	2	3	4	4	3	0
Lipetsk Region	3.17	5	2	3	2	4	3	0
Republic of Bashkortostan	3.17	3	3	4	3	3	3	0
Stavropol Krai	3.33	3	4	2	5	3	3	0
Arkhangelsk Region	3.33	1	5	4	4	2	4	0
Republic of Khakassia	3.33	4	3	5	2	5	1	0
Pskov Region	3.33	5	3	3	3	2	4	0
Amur Region	3.33	4	3	3	1	5	4	0
Kostroma Region	3.33	3	3	2	5	4	3	0
Republic of Crimea	3.5	2	4	4	3	3	2	0.5
Magadan Region	3.5	2	2	5	3	3	3	0.5
Khabarovsk Krai	3.5	2	4	5	3	2	5	0
Oryol Region	3.5	4	4	4	2	2	5	0
Republic of Adygea	3.5	4	4	3	5	2	3	0
Kirov Region	3.5	4	4	2	3	4	4	0
Orenburg Region	3.5	5	2	4	4	3	3	0
Primorsky Krai	3.5	3	5	4	2	3	4	0
Krasnodar Krai	3.67	4	5	3	5	1	4	0
Sverdlov Region	3.67	4	4	4	2	4	4	0
Altai Krai	3.67	5	1	4	4	4	4	0
Vologda Region	3.67	5	3	4	3	5	2	0
Perm Krai	3.67	3	3	4	4	4	4	0
Mari El Republic	3.83	3	4	3	3	3	4	0.5
Krasnoyarsk Krai	3.83	5	2	5	4	4	3	0

Region	Indicator value	Factor score						Adjustment for dynamics
		Emissions	Wastewater	Waste	Water consumption	Energy consumption	Environmental protection expenses	
Chelyabinsk Region	3.83	3	5	4	3	5	3	0
Komi Republic	3.83	5	5	3	4	2	4	0
Sevastopol	3.83	3	5	3	3	5	4	0
Karachay-Cherkess Republic	4	5	5	4	4	4	2	0
Zabaykalsky Krai	4	5	3	5	4	5	2	0
Ivanovo Region	4	4	5	2	4	4	5	0
Republic of Buryatia	4	5	3	5	5	5	1	0
Irkutsk Region	4	4	5	4	4	5	2	0
Republic of North Ossetia – Alania	4.17	5	5	3	4	2	3	0.5
Ryazan Region	4.17	4	3	3	3	4	5	0.5
Kemerovo Region	4.5	5	4	5	4	5	4	0
Murmansk Region	4.67	4	5	5	5	5	4	0
Republic of Karelia	4.83	5	5	5	4	5	5	0

1 — maximum score; 5 — minimum score.

Source: ACRA

Appendix 2. Ecological map of Russian regions in 2018



Source: ACRA

Appendix 3. ACRA's ranking methodology

To compile the ecological ranking of regions, which serves the basis for the ecological map of Russia², ACRA does not use absolute values, but the specific values of negative impact factors obtained as the ratio of the absolute factor value (for example, the volume of emissions or wastewater) to the GRP in each region. For the environmental protection expenses, ACRA calculated their share in the budgetary expenditures of a region. This makes it possible to determine the most "polluted" GRP and the most environmentally responsible regions. For each negative impact factor and environmental protection expense factor, ACRA makes an assessment based on a quintile analysis. In this approach, the entire set of specific values for each factor is divided into five groups, aka quintiles. For each quintile, the upper and lower limits of the specific value of the factor are determined. The region's score for each of the factors corresponds to the ordinal number of the quintile, within the range of which its specific value falls. That is, "1" is assigned to the best regions, "5" – to the worst. Then, the resulting factor scores are summed up (taking into account the equal weights of each of the six factors used) and form the final complex indicator corresponding to the environmental situation in each region (the "indicator").

In addition to the indicator's value for the last year, ACRA includes in its calculations the indicator's dynamics over the past three years. This results in certain adjustments reflecting the regions' efforts to reduce the negative environmental impact and increase expenses for environmental protection. For example, if the region's indicator is consistently decreasing (i.e., over the past three years, the region has been steadily moving to the upper part of the environmental ranking, and the indicator decreased by at least 5% every year), then the region's score is adjusted one point downward. If over the past two years the indicator's value has improved (i.e. the score has decreased by more than 10%), but inconsistently, then the indicator is adjusted by -0.5 points.

Similar adjustments are applied in the opposite direction. In case of negative dynamics, expressed as an increase in the indicator by 10 percent or more over the past two years, the final score will be adjusted upward by one point. If the indicator deteriorated, but it was due to one-time changes and was not sustainable, the value is adjusted by +0.5 points.

The final indicator is used to determine the rank of each region. Regions with equal indicators stand in the same position in the ranking.

² The Ministry of Natural Resources of Russia publishes the environmental indicators of regions with a substantial time lag after year-end. Therefore, in December 2020, only data for no later than 2018 was available. In view of this, the environmental map was built by ACRA based on the indicators for 2016–2018.

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