

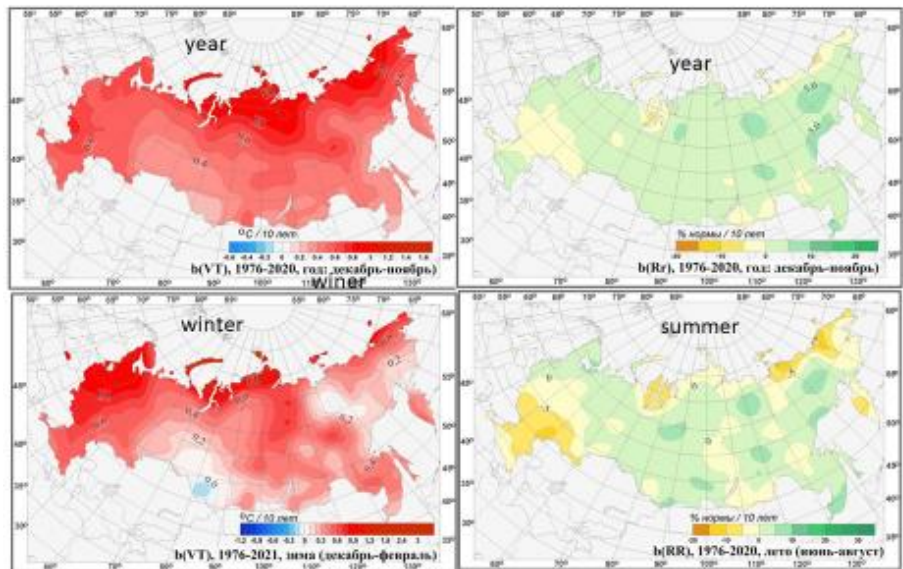
Russian marine protected areas in the climate crisis: National policy responses

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OBSERVED CLIMATE TRENDS IN MEAN TEMPERATURE AND PRECIPITATION FIELDS.
PERIOD: 1976-2021.

Geographic distribution of linear trend coefficients for mean
temperature [°C/10 years] precipitation [%/10 years]



Changes in various environmental factors as a result of climatic fluctuations and anthropogenic impact lead to serious changes in microalgae communities, including a sharp change in their productivity, an increase in abundance, and the development of harmful blooms (HABs). The phenomenon of mass development of microalgae in coastal waters is becoming epidemic in the Far Eastern seas of the Russian Federation. Over the past decades, the frequency and intensity of harmful microalgae blooms in the Russian Far East have increased by more than 5 times.



Due to climate change the task of preserving species and ecosystems in protected areas is becoming more difficult. There was a need to take additional adaptation measures. To develop them, studies are carried out to assess the degree of vulnerability of the territory: what and to what extent is subject to adverse climatic influences, which ones, with what frequency? Under these conditions, in the waters of specially protected natural areas, species appear that are of little character for this geographical zone.



Another new serious environmental problem, associated with global warming of sea waters, for marine ecosystems has become the rapid disintegration of bottom gas hydrates. This process has been recorded on the shelf of Sakhalin Island and the Kuril Islands. This led to methane emissions into sea water.



Due to the increase in precipitation in the south of the Far East of the Russian Federation, the number of powerful cyclones has increased, which has led to an increased removal of flood waters into bays and bays. This leads to severe desalination of coastal sea waters, transformation of coastal ecosystems and, due to this, the death of a number of populations of coastal hydrobionts, such as sea cucumbers, scallops and others

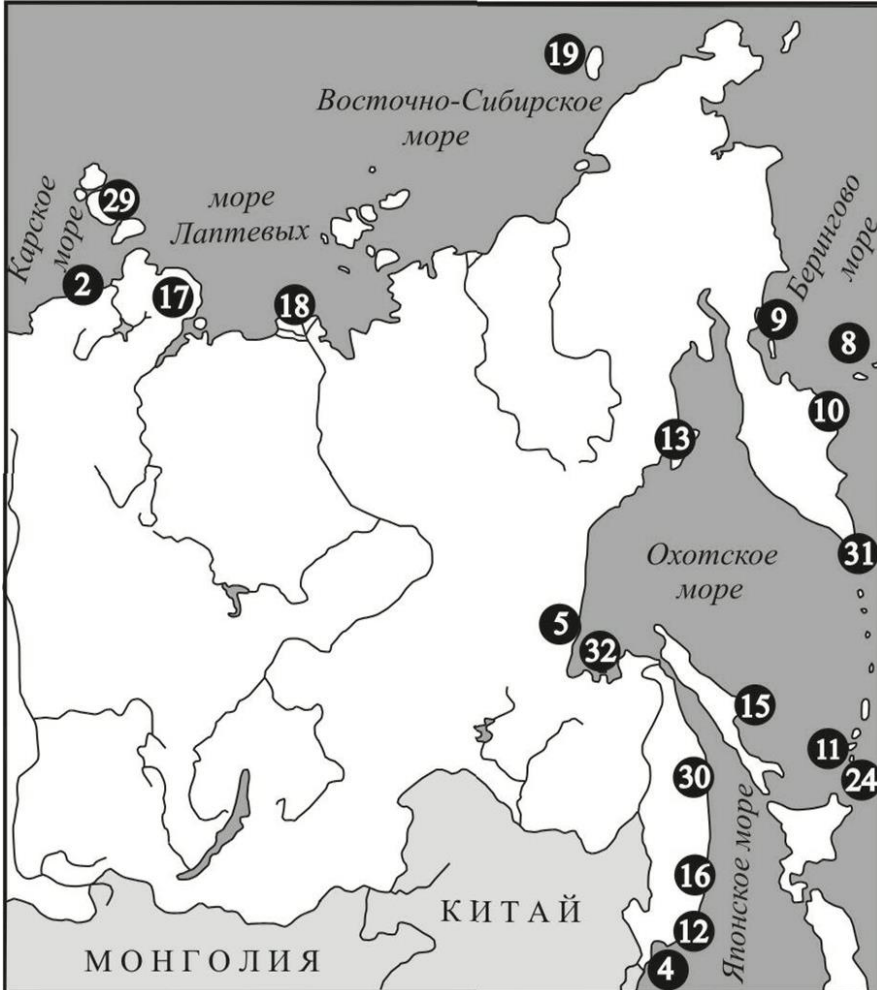
Within the framework of **the Climate Doctrine of the Russian Federation**, the main objectives of climate policy are:

- Strengthening and developing the information and scientific basis of climate policy, ensuring the maximum completeness and reliability of information on the state of the climate system, impacts on the climate, its ongoing and future changes and their consequences;
- Development and implementation of operational and long-term measures to adapt to climate change;
- Development and implementation of operational and long-term measures to mitigate the anthropogenic impact on the climate.

The priority areas of scientific support for the development of measures to adapt and mitigate the anthropogenic impact on the climate include:

- Development and maintenance of climate observation systems in the Russian Federation, including factors that shape the climate and climate change indicators;
- Research and assessment of ongoing and possible future changes in the global and regional climate, as well as their consequences;

Within these areas, the role of the network of protected areas is important, which allows monitoring ecosystem changes.



The most significant changes in ecosystems due to climate change occur in the north of the Russian Far East. First of all, species whose life is associated with ice and permafrost suffer. The decrease in the ice content of the northern seas has a negative impact on the populations of polar bears, walrus and other animals.



The Wrangel Island State Nature Reserve occupies the northernmost position on the map of Russia of all nature conservation areas. The reserve is located at the junction of the eastern and western hemispheres between the East Siberian and Chukchi Seas. The territory includes two islands - Wrangel and Herald, as well as the adjacent water area. The total area of the Wrangel Island Nature Reserve is 2,225,650 hectares, of which 1,430,000 hectares are marine waters. The protected area occupies 3,435,950 hectares.



This reserve serves as a good object for monitoring polar ecosystems in connection with climate change.



The Commander Islands State Nature Biosphere Reserve is the largest marine reserve in Russia. The area of its protected marine waters is more than 3 million hectares – the same territory as Belgium, for example. The reserve is located on the Commander Islands and adjacent waters, in the northern part of the Pacific Ocean, not far from the Kamchatka Peninsula.



The reserve is used to monitor the ecosystems of the northern seas of East Asia



The Federal State Budgetary Institution "Kronotsky State Nature Biosphere Reserve" (short name FSBI "Kronotsky State Reserve") manages three specially protected natural areas of federal significance: Kronotsky Reserve, Koryaksky Reserve and South Kamchatka Federal Sanctuary.



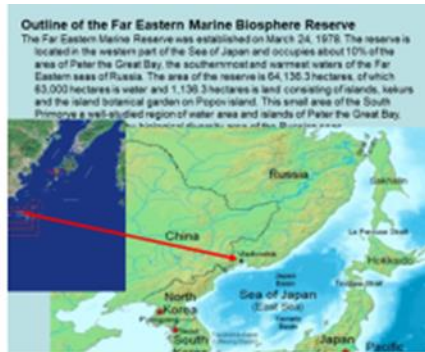
Kronotsky Nature Reserve is home to more than 800 brown bears. This is the largest wild population of individuals in Russia and the world, one of the bright living symbols of the country. Protected areas have become a haven for many species of rare fur animals: sable, marmot, fox, ermine, wolverine. The Valley of Geysers in the reserve is the only geyser field in Eurasia, one of the largest in the world.



Sikhote-Alin State Natural Biosphere Reserve.



The reserve was founded in 1935 to preserve and study coniferous-deciduous forests of the central part of the ridge Sikhote-Alin. For its animal and plant world is characterized by exceptional biodiversity, where a high proportion of rare endemic and relict species. The largest population of the Amur Goral is noted on the reserved coast of the Sea of Japan; this species is located here at the northern limit of its distribution. Reserve has a sea area of the Sea of Japan 1 km wide and an area of 2900 hectares.



Far Eastern State Biosphere Marine Reserve

The Far Eastern State Marine Reserve (FESMR) was established on March 23, 1978.

Aims of the Far East Marine Biosphere Reserve: conservation of natural complexes and valuable natural objects.

Three sites with a total area of 63 thousand hectares were assigned to the reserve, a protection zone was approved around the 3-mile-wide sea borders, as well as a 216-hectare area on Popov Island to create an island botanical garden.

The water surface and the deep sea of the reserve are inhabited by more than 1000 species of multicellular plants and animals, made up of boreal, subtropical, and arctic species, including 200 species of fish, 400 species of crustaceans, 30 species of echinoderms and more than 200 species of mollusks.

Main objects of protection

Animals - Far Eastern trepang, Kamchatka crab, giant octopus, Far Eastern garfish, large-scale rudd, Japanese hairooth, Far Eastern seal (Larga), yellow-billed heron, small spoonbill, island cricket, high biodiversity of birds;

Plants - prickly raspberry, quadrangular kamek, lanceolate lily, dense-flowered pine, pointed jaw, tri-pointed maiden grape, Schöppenbach's rhododendron, toothed oak.





Sikhote-Alin is the last large integral territory in the world where the Amur tiger (*Panthera tigris* L.) lives.



The main objects of the poaching industry (illegally catch) require special protection measures: the Far Eastern trepang, the giant octopus, the Kamchatka crab and scallop.





The reserve is used to monitor terrestrial and coastal ecosystems of the temperate zone of East Asia.

Trepang (*Apostichopus japonicus*)



The reserve is used to monitor marine and coastal ecosystems in the southern part of the temperate zone of East Asia.

A photograph of two tigers in a snowy, wooded environment. One tiger is standing on the left, looking down at a third tiger lying on the snow. The second tiger is sitting on the right, looking towards the camera. The background is filled with snow-covered trees and branches.

Thank You Very Much for your
attention