ARCTIC TOURISM IN RUSSIA

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The natural tourist potential of the islands in the western sector of the Russian Arctic

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Abstract. The islands of the archipelago of Franz Josef Land and Novaya Zemlya of the western sector of the Russian Arctic are very promising for the organization of the Arctic sea cruises. They have the unique natural landscapes and diverse flora and fauna. The Arctic holds half of the species of shore birds in the world. In summer, the Novaya Zemlya is full of Branta leucopsis and Branta bernicla and occasionally there are tundra swans, white-fronted goose, eider ducks and loons. The archipelago has spherulites — one of the mysterious formations in the Arctic, they are perfectly round stone balls from a few centimeters to several meters in diameter.

Keywords: *tourism, Franz Josef Land, Novaya Zemlya, landscapes, flora, fauna*

The Arctic is one of the remote regions of the Earth with the unique natural landscapes. The attractiveness of the Arctic is in vast ice fields, icebergs, incredible silence, and ability to observe marine animals in their natural habitat. Fans of extreme sports come here to relive the unforgettable and exciting adventures, get new knowledge about the unique natural phenomena and processes. The attractiveness of the Arctic holds a great promise for the development of Arctic tourism. The Arctic islands are the main attractions, especially the archipelagos of Franz Josef Land and Novaya Zemlya in the western sector of the Russian Arctic. Since ancient times this areas hve been attended by fishers in search of fish and marine animals and sailors in search of a Northeast passage, Russian and foreign scientific expeditions to study the natural resource potential of the Arctic lands. Currently, the Arctic islands have become attractive to tourists.

The coast of the islands in the western sector of the Russian Arctic have unique natural formations, cultural and historical objects are very promising for maritime Arctic cruises. Geological and geomorphological features are one of the leading characteristics of their natural complexes. Relief is regarded as a condition and as a resource when exploring tourism potential. It makes the territory attractive for tourism. Untypical landform are especially interesting for tourists [1].

Islands in the western sector of the Russian Arctic are the result of a long and complex geological development. The complexity of their structure is explained by their location in the marginal part of the young and actively developing Arctic Ocean. Franz Josef land is situated within the polar shelf-margin orogenic belt on the border the Barents-Kara plate and the ocean. The archipelago and its 192 islands are located in the Barents Sea. It is the northernmost land of Russia and Eurasia. On the Island of Rudolf there is the northernmost island point of Russia — Cape Fligeli. The height of most of the islands does not exceed 500 m above sea level and the highest point is on the Wiener-Neishtadt Island (620 m), the glacier surface — on Zemlya Viltcheka (735 m). Plate surface of the islands experienced the devastating effects of glaciers that lead to the establishment of the glacial relief forms. More than 85% of the surface of the Franz Josef Land Archipelago is covered with ice of a mainland origin. Shores of the islands are very steep, sometimes they represent glacial cliffs [2, p. 185—186].

Novaya Zemlya is the northern part of the Urals-Novayazemlya fold system. It is the largest Arctic Archipelago between the Barents and the Kars seas. It consists of two large islands Severnyi and Yuzhnyi and dozents of smaller islands. In the South, the strait Karskie Vorota separates them from the Vaigatch Island. The relief of the Severnyi Island is not heterogeneous, with average high mountains, almost completely buried under Noveozemelsky Glacier. Mountains stretch along the island, close to the coast. On the Yuzhnyi Island you will see Sedov's Peak rising (1 115 m). North from it, the height of the mountains increases up to 1 590 m. Near the northern part of the island mountains decrease to 1000m and even up to 500 m.

The lower part of the steep slopes is covered with talus. Mountain valleys are filled with glaciers. High ridges and sharp peaks separate them from each other. The areas with weaker plots have less height and surface platopodibna. Coastal glacial and abrasion plains ledge down to the terraced flat coastal plain, folded by marine sediments with sloping, small dismembered coast. Ice coasts are quite variable. In the south of the Severnyi Island, you can see fjords and steep marginal coasts with a height up to 100 meters [2, p. 353—354].

Platopodibna staggered upland of the Franz Josef Land, medium mountains, hilly plateau and the coastal lowlands of the Severnyi Island of the Novaya Zemlya Archipelago are very attractive for tourists. Of particular importance are its unique geological and geomorfolo-environmental objects. The lack of vegetation on the ice-free coast Islands let us see stratitopical, stratigraphical and palaeontological cuts from various periods, which are valuable sources of information about the development of natural processes. They reflect the main stages of geological and tectonic development of the territory and various forms of relief of the island coastlines.

Residual intrusive landforms, stone balls — sferolits are very attractive to tourists. Sferolits are one of the mysterious Arctic entities, perfectly round stone ball with a diameter of few centimeters to several meters. They are found on the islands of Franz Josef Land, but they are especially diverse on the Champ Island.

Great attraction have marginal, cumulative, icy Arctic coast. Coasts folded within loose rocks, easy to wash and termoerosium. Such a coastline rapidly changes its configuration. Coasts with the accumulative type of development are characterized by accumulation of sediments and formation of various terraces, forelands and rerashes.

On the islands of the Franz Josef Land Archipelago, numerous columnar basalt separate outputs could be seen. Often they are located on the tops of the Islands (Champ, Northbrook, Hooker), forming sheets of basalts. On a number of islands, the columnar basalts occur near the water line, forming a unique coastline. For example, the coastline on the Zemlya Aleksandry Island. When going up to the surface, the bedrocks are subjected to destruction with the formation of the block piles, “stone chaos” and moving on to a scattering of stones. They are crushed to rubble and form smooth low-lying coastal plains. In their slides various Arctic plant communities appear.

Lonely standing rock Rubini in the Tihaya Bay of the Hooker Island also represents gigantic logout basalts. In contrast to the coast of the island of Zemlya Aleksandry, here large-, medium-, and small separates of basalts are chaotically spread; they descend to the water line, forming a step-like coastline, actively deconstructed by the sea surf. Unique geological and geographical formations could be regarded as a valuable natural tourism resource. Their number could be counted per unit area or length of coast [3, p. 92—114].

The climatic conditions and the radiation balance that depends on latitude and location play a significant role in the tourist attractiveness of the territory. Franz Josef Land and Novaya Zemlya are situated in the Arctic and subarctic climate zones and have low temperatures even in summer. An icy, snow-covered surfaces and domination of Arctic air masses have a great influence on weather conditions. Cyclones coming from the Atlantic Ocean cause the highest winter temperatures, maximum cloudiness, precipitation, drastic shifts in weather, strong winds and frequent fogs and high relative humidity. For example, Novozemelskaya Bora or a strong wind is able to reach a speed of 60 m /s occupies a special place.

Climatic conditions had a significant impact on the comfort of the Arctic tourism, since the thermal regime affects the thermal sensation of a person. The Arctic islands have unfavourable climatic conditions for tourism not only in winter, but also in summer. Steady change of the average daily air temperature over 0°C to positive values at Novaya Zemlya and Franz Josef Land is

marked in June, and at the end of August. At the beginning of September, the average daily temperature becomes a negative value. Warm period with average temperatures 2-3° C on Franz Josef land lasts only 40-60 days and 80-115 days on the Novaya Zemlya Islands. Stable snow cover is formed by 2nd-3rd decades of September. The duration of snow time is up to 300 days per year [2, p. 9—39]. Only the use of comfortable cruise liners smooths the environmental conditions in the Arctic and landing in such areas get their special extremity.

North of the Arctic Circle, the change of polar day and polar night is clearly expressed. On the islands of Franz Josef Land and Novaya Zemlya the sun does not set from April to August. The rest of the year here is the long polar night. Light comes only from the moon and auroras. In summer these area has clear weather and weak winds, clear and transparent atmosphere of the high seas. You can observe the refraction of light and mirages. Distant objects become visible from much greater distances than in normal conditions. They can be bigger than in reality or turn to rise above the surface. On the 20th of June 2012 at 10:30 pm, the vessel “Professor Molchanov” was passing along the coast of the Severniy Island of Novaya Zemlya Archipelago, between Bolshie Oranskie Islands and Bay of Anna, when the weather was clear and calm, the participants of the expedition observed the Arctic mirages.

Modern Western Arctic climate contributes to the formation glaciers on the islands of Franz Josef Land and Novaya Zemlya Archipelago. It is natural land ice of atmospheric origin. Franz Josef Land has covering glaciers mostly. On the Severnyi Island, land and mountain ice cover are usually found. Glaciers are unique natural formations and at the same time, they are very attractive for tourists because of their beauty and unusual forms.They create specific glacial landforms and unique glacial landscapes. At the seaside, the edge of the glaciers form icebergs of different colour: from bright green to dark blue. A large concentration of icebergs is observed in the Inostranceva Bay on the Severniy Island, where Pavlov’s Inostranceva glaciers slide. In addition, the water surface of the Arctic seas is covered with various types of sea ice. They are formed by freezing of seawater and are quite different from the river and inland ice. The presence of various species of sea ice significantly increases tourism attraction of marine areas.

The Arctic islands have no big rivers. The eyes of tourists could see only short, but fast flowing rivers or glacial waterfalls breaking away from steep glacial coasts up to 30 m high. Among similar icy Arctic landscapes, they are very attractive for tourists.

Landscape diversity of marine ice, cover glaciers, icebergs and the Arctic rivers form the unique Arctic tourism objects, allowing to treat them as factors influencing the formation of the

tourism potential of the Arctic territories. Their measure in assessing the natural tourism potential is their presence or absence per unit of area or the coast.

In the western sector of the Russian Arctic has two natural zones: the Arctic desert and tundra. Despite the cold Arctic summer, the surface gets a sufficient amount of solar radiation, which stimulates the growth and development of vegetation, especially the polygonal mochowo-lichenous group. The richest flora of bryophytes and lichen communities. For example, within the Franz Josef Land their amount is 120 and 114 species. Flora of vascular plants in this zone comprises with no more than 100 species and different domination grains, cruciferous, and Rosales. The top ten families make up 80% of the total flora [2, p. 9—39]. Diversity of flowering plants make these harsh lands colorful and attractive to tourists in summer.

The Arctic fauna is limited in species composition: polar bears, lemmings, and the Arctic fox. Among marine animals: only species strictly confined to the Arctic latitudes. Since the pre-glacier times, the Arctic fish inhabit the northern seas: polar shark, polar flounder, haddock, meet seals, walruses, beluga whales, narwhals and whales.

The Arctic holds half of the world shorebirds species. In spring, the Arctic islands are attended by many shorebirds typical for high latitudes. In summer on the Novaya Zemlya, you can see brent goose, tundra swan, white-fronted goose, eider and loon. Rocky Arctic islands are full of marine colonial birds. Gulls, guillemots, cepphus form bird's bazaars here. Bolshie Oranskie Islands, located in 4 km north from Cape Carlsen, look like columnars with a common foundation. All eaves and ledges on steep rocky coasts are populated by islands' birds. Similar bird bazaars are also found on the Bogatiy Island in a Russkaya Harbour, at Cape Zhelaniya (Severniy Island of the Novaya Zemlya Archipelago), on a Rubini Rock in the Tihaya Bay on the Island of Hooker (Franz Josef Land). Many birds do not leave the Arctic, even in winter, wandering among the water ice of the Arctic seas. They are an important link between marine and land ecosystems. The Arctic plant communities and species are valuable objects for various tours waimed at teaching and shaping the ecological culture. In addition, they are very attractive objects from an aesthetic point of view.

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