UDC 332.14(470.12) DOI: 10.17238/issn2221-2698.2016.23.80

An integrated approach to tourism development in protected natural areas



© Victor S. Kuznetsov, Candidate of Geographical Sciences, a specialist in the field of system ecology and applied scientific research of wildlife and environmen in the North and in the Arctic zone of Russia. One of the founders of the National Park "Russian Arctic", author of a number of scientific and educational books on history of the discovery and development of the Arctic archipelago of Franz Josef Land and Novaya Zemlya, active member of the Russian Geographical

Society. E-mail: kvs1947@mail.ru

Abstract. The article presents the assessment of tourist activity in terms of development of economy and a result of increased interest of people to rest and travel in the Arctic. Development of the ecotourism in the protected areas is in focus of the article. A draft concept of tourism development in the National park "Russian Arctic" and the state nature reserve of federal importance "Franz Josef Land" are discussed in the context of the most promising approaches to the their development.

Keywords: Arctic, tourist activity, tourist resources, tourist product, ecotourism, protected areas, natural and cultural heritage, development prospects.

Currently, tourism is an integral part of human activity, forming an independent socioeconomic development of certain areas that deserve attention. Outdoor sports is the basic concept in tourism. Financial life involves considerable resources, creates the management structure and promotes circulation of money in large quantities. Interest in travel is enormous, and it is the interest of the people to the knowledge about the nature, our planet and the lives of people on different continents. It resulted in the network of tourist companies, offices, tourist infrastructure, hotel complexes, comfortable liners, means of transport, etc. Tourism formed a well-established competition for business. Strategy for tourism development in the Russian Federation for the period untill 2020 considers tourism a source of financial revenue for the the budget system of the Russian Federation; a means of increasing employment and quality of life; a way of maintaining the health of the citizens; the basis for the development of social and cultural environment and patriotism, as well as a powerful tool for education and development of civil society"¹. This article aims at analysing the practice of tourism in the Arctic and it is largely based on the personal experiences of the author in the organization and planning of tourism in the National Park "Russian Arctic".

Tourist products at the SPNTs

Tourism activity is many-sided, but its basis is the business contacts between tourists, consumers of services offered, and travel companies that offer these services. The range of services is quite extensive. The Russian Federal Law "about bases of tourist activity in the Russian Federation", November 24, 1996 No. 132-FZ²:

"tourism product — range of services on transportation and accommodation provided for the total price (regardless of the value of excursion services and (or) other services) by the contract for tourist products;

promotion of tourist product — complex of measures aimed at the realization of the tourism product (advertising, participation in specialized exhibitions, fairs, organisation of tourist information centres, publishing catalogues, booklets, etc.);

realization of tourist product — activity of a tour operator or travel agent contract on realization of a tourist product, as well as the activities of the tour operator and/or third parties providing tourist services in accordance with this legal act"³.

Today, everyone can choose the type of tourism he likes, can afford. Brochures are full of suggestions on visiting those or other places that you can explore and enjoy communing with nature, culture and lifestyle of the local population. A special place in the classifications of tourism is occupied by eco-tourism including the one in specially protected natural territories (SPNTs). One can say that the types of tourism is rather conditional. Classic tourism is practiced rarely. However, to seek the nomination of the tourism in its classic form is necessary because the tourism industry is not at a standstill and remains active.

Ecological tourism in the Arctic directs tourists to commune with nature. Theorists of ecological tourism discuss this type of tourism and say it should provide not just a passive communication with nature but also the acquaintance and communication with the local population, living in harmony with local natural conditions.

¹ Strategiya razvitiya turizma v Rossijskoj Federacii na period do 2020 goda. 31 maya 2014 g. URL: http://government.ru/docs/12933/; http://www.consultant.ru/document/cons_doc_LAW_164146/ (Accessed: 19 March 2016).

² URL: http://www.consultant.ru/document/cons_doc_LAW_12462/ (Accessed: 19 March 2016).

³ FZ ot 24 noyabrya 1996 №132-FZ «Ob osnovah turistskoj deyatelnosti v Rossijskoj Federacii». URL: http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=181793;fld=134;dst=1000000001,0;rnd=0.140609990613 2281 (Accessed: 19 March 2016).

The most suitable areas for ecotourism are territories with special environmental status and, above all, the territory of national parks. National parks, including the Arctic NP "Russkaya", as a form of management of especially protected natural territories, are the most promising form of environmental management and environmental protection. Those territories are suitable to practice techniques for the conservation of the natural and cultural heritage and for limited tourism, which has classical ecological direction.

It should also be borne in mind that tourism in national parks is just at an initial stage of development. Historically a conservative approach to nature protection provids priority to restraining functions, limiting the ability to improve various kinds of tourism. The exception is ecological tourism, definitely suitable for areas with environmental status. In each case, therefore, we should have an individual approach to the development of tourism on specially protected natural territories, taking into account the balance of the economy and ecology. On the basis of a preliminary comprehensive analysis of regional natural and cultural-historical features of each national park needs to build their own local policies in the field of development of ecological tourism.

In modern literature, the problems of tourism development in the Russian Arctic is investigated but is still clearly insufficient, especially when it comes to existing national parks that have been established in the 21st century. E.B. Grushenko discusses the strategy for the development of marine tourism in the Arctci in his article. He analyzed the Arctic icebreaker cruises to high latitudes, mentioned flights from Murmansk on Franz Josef Land with a stop at a Novaya Zemlya [1]. The activities of the Arctic NP "Russkaya" the author does not mention for one simple reason the park simply has not started its work at the time of publication. Materials of inter-regional scientific-practical conference (Apatity, 14-16 November, 2012.) "The development of the North and the Arctic: problems and perspectives": E. B. Grushenko [2] only concerned marine tourism development issues in the Arctic in one report. The author emphasizes that for Russians the Arctic remain unknown and unattractive tourist region. However, in the Murmansk and Arkhangelsk regions, marine cruise tourism is popular and the number of people wishing to visit the North Pole and the Russian Arctic is constantly growing. The main conditions for tourism development in the Arctic seas — the creation of a special cruise fleet and coastal tourism infrastructure. Currently, Russian tour operators are poorly represented in the segment of expeditionary cruises to the Arctic. Financial strength and experience of foreign cruise lines practically exclude opportunity for Russian companies to organize and sell tours to the Russian Arctic on the world market [2, p. 24]. In the collective monograph "Geoeconomic processes in the Arctic and marine communications development" (2014), it was noted that it was unlikely to have an appropriate social otptimizm

concerning tourism cluster in the economy of the Arctic. "It is pointless to deny its role as momentum for creating new segments of regional complexes. Anticipate the need to not only a positive impact of commercial tourist industry, but also the inevitable socio-cultural costs", noted N. P. Zalyvskij [3, p. 48].

In this article, the first is an example of the project "concept of tourism development in the National Park "Russian Arctic" and the state nature reserve of federal significance "Franz Josef Land" (Arkhangelsk, 2016). This experience has both theoretical and practical importance. It may be useful to other protected areas in the Russian Arctic.

General provisions, aims and objectives of the concept

This concept was developed in accordance with the requirements of the Federal State budget-funded agency NP "Russian Arctic", approved by the order of the Minister of Natural Resources of the Russian Federation No. 209, April 13, 2011. The National Park "Russian Arctic" was approved by order of the Minister of Natural resources of the Russian Federation № 806; the provisions on the state federal natural reserve "Franz Josef Land" are approved by the order of the Minister of Natural Resources of the Russian Federation No. 679. The main provisions on tourism are in the federal law No. 132-FZ November 24, 1996. The bases of tourist activity in the Russian Federation mentioned in the law "about specially protected natural territories" No. 33-FZ March, 14, 1995 and a law No. 7-FZ "On environmental protection" points to the need to develop instruments which determine the development of tourism in protected areas. The place and role of tourism as a component of economic development in the AZRF, defined in the framework of the state policy in the Arctic for the period untill the year 2020 and beyond, signed by the President of Russia D.A. Medvedev in 2008. In addition, one more document is important and it is the development strategy of the Russian Federation Arctic and national security strategy for the period until 2020, approved in 2013 by Russian President Vladimir Putin.

The aim of this concept is the creation of conditions for the development of tourism and recreation regulated within the territory of the national parks and state natural reserves of federal significance "Franz Josef Land" through high-quality visitor services, outreach escort cruise flights, conducting excursions, printing and advertising, information and scientific nature.

To achieve this goal, you will accomplish the following tasks:

a) Inventory of natural, historical and cultural values and a list of geographic locations relevant to tourism development;

b) A set of studies on the natural characteristics of the territory; identify rare and endangered species of animals and plants in order to avoid, or limit, tourists can visit the habitats of rare animals and plants; c) Work on recreational arrangement and accomplishment of the territory of the national park and wildlife reserve of federal importance; the creation and arrangement of nature trails and hiking trails;

d) The establishment a federal reserve head office, museum on the territories of the national park, and ensuring their functioning in the interests of the tourism development;

e) The constant release of outreach booklets, brochures and other printed products, aimed at informing the population and potential tourists on sightseeing in the Russian Arctic;

f) Qualitative Internet-support information on the state of tourism in natural areas of the Russian Arctic;

g) Business contacts with tourism companies, developing cruise tourism in the Arctic;

h) Commissioning application and reporting forms for the visit, cruise ships and yachts.

Legal acts and the Arctic tourism

Laws and governing principles usually regulate any activity, especially activities in a specific subject area. Tourism today is not a narrow subject area with a holiday function, travel and entertainment. It turns into a large segment of the economy, involving significant amounts of financial resources and actively influencing the economy of territories. Tourism is an independent, steadily growing industry. Tourist companies are actively introduced in hospitality, the sphere of public catering, transportation, advertising and printing, local authorities and of course the administration of specially protected natural territories. Each institution or company is looking for its place in the tourism industry.

The Federal law "About fundamentals of tourist activity in the Russian Federation (No. 132-FZ, November, 24 1996) determined that "tourism — a tour operator and travel agency activities, as well as other travel activities. Tourism resources — natural, historical, socio-cultural objects, including objects of tourism, as well as other display objects, able to satisfy the spiritual needs of tourists and others, to help to maintain their livelihoods, to rehabilitate and develop their physical strength.

The Charter of the National Park "Russian Arctic" says: "the objective of the institution is conservation of natural complexes and objects of ecologic, historic, aesthetic value, intended to use for environmental, educational, scientific and cultural purposes and for the development of controlled tourism. The institution carries out activities, including activities in the area of organization and development of tourism and recreation on the territory of the National Park, visitor services and excursions". For the development of controlled tourism, organization of excursions on the territory of the Franz Josef Land Archipelago and the northern tip of the Severniy Island of Novaya Zemlya: the first priority is to identify the most significant natural, cultural and historical sites. The objects established and approved as priorities for tourism development should be assessed for their prospects for tourism. To show the natural and historical sights of objects. There should be a general description, prepared booklets, brochures and other information materials for tourist companies and their agents, as well as potential tourists.

It should be borne in mind that tourism in the Arctic has its regional specificities related to the particular climatic conditions and the need to ensure reliable security. In addition, the issue of accessibility of the SPNTs in the Arctic is very important. Maritime or air travel in the Arctic plays a great role for the tourists. All this complicates the raise economic efficiency of the Arctic tourism.

Currently, there is considerable political support for tourism development in the Arctic. When you define the main objectives of the policy of the Russian Federation in the Arctic in the sphere of socio-economic development (2008), it is indicated the need for environmental management and development of environmentally friendly forms of tourism. The program, approved in 2013 by the President of Russia Vladimir Putin, "Arctic development strategy of the Russian Federation and national security for the period up to the year 2020" provides "... Arctic tourism development and expansion of environmentally friendly tourism activity in the Arctic. Arctic tourism promotion at the national and international markets" in order to improve the system of public administration, socio-economic development of the AZRF.

Therefore, forable conditions for the determination of tourism within the territory of the National Park "Russian Arctic" and the State nature reserve of federal significance "Franz Josef Land" have been established. Those territories are an integral part of the system of the state management of social and economic development of the Russian Arctic.

Evaluation of natural conditions, the status of the territory and cultural-historical heritage of the NP "Russian Arctic" and GPZFZ "Franz Josef Land"

The National Park "Russian Arctic" includes two separate archipelagoes — Franz Josef Land and the north of the Severniy Island of the Novaya Zemlya Archipelago. Despite the proximity of these protected areas, the similarity of geographical conditions and climatic characteristics, there are significant differences, as the natural environment, and the history of their discovery.

In respect of both the Arctic archipelagos, constitute the most sublime sites of the continental shelf, stretching to the Arctic periphery Eurasia. Franz Josef Land Archipelago represents an ensemble of 192-194 islands located within the Barents-Kars platform. The best studied part of the Barents-Kars platform is also situated there [4, p. 18]. Active geological processes took place there when land-based species of reptiles, dinosaurs reigned and, apparently, those landforms rise a talk about the volcanic origin of the islands of the archipelago. In the midst of the Quaternary period, characterized by the extinction of large mammals and the emergence of modern man, there was a powerful glaciation on the territory of the archipelago and the Barents Sea shelf. Processes of glaciation had also left traces on the islands and they may be of interest for estimates of the geological past. Their neotectonic and geomorphological characteristics of Franz Josef Land are represented by a strong fragmentation, and nowhere else this fragmentation does not occur in the Arctic.

Novaya Zemlya along with the island Vaygach are a continuation of Uralo-Pajhojskoj mountainous country. The northern half of the Severnyi Island is a one-piece massif, 80% covered with ice shield. In the ice, it is possible to see some separate nunataks — mountain tops with a height from 800 to 1000 metres. The area between the capes of Sakharov and Varnek has nunataks form the coastal mountain range, known as the mountains of Mendeleev. Magmatic Mesozoic rocks are noted in the Inostrancev Bay area and near the Cape Zhelaniya. Thus, external notable landforms at the northern tip of the Severniy Island of Novaya Zemlya are also confined to the era of dinosaurs.

Harsh Arctic Polar climate is a feature of especially protected natural territories of the Russian Arctic. For this zone, the main factors are the climate, the atmospheric circulation, the hydrological regime of the sea and islands covered with glaciers.

History of the discovery of the Arctic archipelago of Franz Josef Land is a subject of particular attention. In 1873, the Austro-Hungarian polar expedition opened new, previously unknown land. Expeditions after it started the research of the area and made a general description of the islands of the archipelago [5, p. 1021]. Many expeditions were individual, of a private nature and, as a rule, included representatives of different states. The data shows that only a small part of the expeditions had scientific and educational objectives. The rest were caused by fishing and business objectives like hunting the local sea animals. Now, the islands stil have the ruins and separate buildings. The people who tried themselves in the Polar conditions used these buildings not only for wintering but also as storages for fluel and food warehouses. At the beginning of the 20th century, interest in the North Pole was extremely high.

Great interest has the history of the archipelago during the Soviet period. Before 1929, Franz Josef Land archipelago had not been a part of any state. This territory had been claimed by several states involved in the discovery of the archipelago. Yes, in fact, the name Franz Josef gave reason to believe that this was the territory of the Austro-Hungarian Empire. Its assosiation with Russia was approved in 1929 after the creation of the permanent Russian polar station there. Some people believe that in 1929 Russia annexed the archipelago and it had to have a status similar to Antarctica. Therefore, it is important to continue the work on objective coverage of Russian organizations in the Arctic during the Soviet Union. The history of the Severniy Island of Novaya Zemlya is also of great interest because of the Ice Harbor, place of a forced wintering for the Dutch expedition of Willem Barents⁴. In addition, here have been researching Russian pioneers, starting from the 17th century, historical events of the WWII and Soviet polar stations, providing transportation along the Northern sea route.

Thus, the territory of Franz Josef Land and the northern tip of Novaya Zemlya, in terms of nature, cultural and historical heritage, is of great interest for the development of cognitive, ecological and extreme tourism.

Tourism in the Arctic and the international organizations and travel agencies

The National Park "Russian Arctic" and the federal reserve "Franz Josef Land" should be understood, on the one hand, as part of the Arctic lands, and on the other hand, as part of the Russian Arctic. This misinterpretation is necessary in order to assess the condition and prospect of the development of tourist activity, in terms of not only national economic interests, but also taking into account global trends, strengthen attention to the Arctic.

After the recognition of the Arctic archipelago of Franz Josef Land a territory of Russia, significant increase of Russian companies and scientific polar stations occured. In the pre-war period, the work of the specialized meteorological stations allowed participation of foreign experts and the expeditionary groups. Unfortunately, in the post-war period, the Arctic had intensified activities aimed at strengthening the country's defense. The work and the results of the state were closed, limiting the possibility of international cooperation. However, interest in the Arctic territories, grw up by 1970s. The first group of Soviet skiing tourists began to visit Arctic territory. Of course, these sports tourists were well prepared for ski crossings and received permission from authorities and guarantees of security of the Arctic campaign. The Arctic treks skiers were widely covered by the mass media, but these hikes did not have further development.

In the beginning of 1990s, individual travel companies began to organize Arctic cruises to the North Pole with a visit to the archipelago of FJL. At this time, cruise tourism development was in not only the Russian Arctic, but also especially in Greenland, Svalbard and Antarctica. Therefore, travel companies that specialize in organizing tours to the Arctic and Antarctic regions formed their organization AESO (Association of Arctic Expedition Cruise Operators). Arctic cruise operators Association has been in operation since 2003 and its headquarters is located in Svalbard. Posting this Association Headquarters in Svalbard is understandable, as the archipelago is the most visited by tourists from all over the world. Organization of tourism in Svalbard could be taken as a model.

⁴ Buhta Ledyanaya gavan. URL: http://wikimapia.org/11364016/ru/Buxta-Ledyanaya-Gavan' (data obrashheniya: 19 March 2016).

Over the past twenty years, interest in the Arctic as a whole has increased and there is no doubt that for the average person this interest is associated with tourism activities. The western part of the Russian Arctic, which includes the territory of Franz Josef Land and the Severniy Island of Novaya Zemlya, is very attractive for tourists because of natural beauty and rich history. In addition, Arctic Cruises to the North Pole are quite popular among the wealthy citizens of economically developed countries. The number of tourists visiting the North Pole with a stop at the FJL is growing. So, if in the 1990s the maximum number of tourists — 400 people — was noted in 1994, then in summer 2012, the number of tourists reached 1 024, and in season, 2015 - 1 225 people. All this says about the great tourist potential of the western sector of the Russian Arctic.

The further developing tourism in the Franz Josef Land and Novaya Zemlya should take into account the positive experience of tourism on similar natural and cultural-historic territory of Svalbard. The territory developed a whole system of tourist conduct, operators of tourist activity, as well as the crews of cruise ships on the shore. Regulations for tourists has developed clear instructions on human behavior in various situations. There are indications for cases of human encounter with a polar bear, and recommendations on conducting observations of other animals and birds for which the Arctic is home. Experience of tourism at Svalbard allowed Cruise Operators Association to develop recommendations for almost all cases. In general, we can say that all the Arctic tourist companies are interested in having humans in the vulnerable nature of the Arctic with a minimal impact on the nature itself. They are interested in preservation of nature. Thus, the specificity of tourist activity on the Arctic islands of the Russian Arctic requires a careful approach to the creation of high-quality tourist product that corresponds to modern international standards.

How to make Novaya Zemlya and Franz Josef Land attractive for tourism

When improving the attractiveness of especially protected natural territories of the Arctic archipelagos, it is necessary to proceed from the characteristics of the geographic location of those territories. First, be aware of the remoteness of the territory, islands marine location, harsh climatic conditions and clearly expressed seasonality, which makes it difficult to talk about the possibility of year-round visit. The remoteness of the area from major transport nodes and priority use of marine transport to reach the island territories define the high cost of tourist cruises that predominate in Arctic tourism business. Therefore, the interests of tourists is ranged by the level of their material status. The most preferred is a visit to the territory of the Arctic archipelagos and their natural and historical objects. However, not every tourist can afford such an opportunity. Less wealthy tourists, provide an opportunity to familiarize themselves with the features of the Arctic especially protected natural territories, without visiting them. In this case, you need to create a network of information centres, visit equipped specialized rendering, giving the opportunity to virtual visit.

Accordingly, all activities should be divided into three separate groups:

1. Organizational and management activities, preparation of booklets, brochures, guidebooks and other materials required.

2. Activities aimed at the construction of tourists' accomodation on the Seveniy Island of Novaya Zemlya and Franz Josef Land.

3. Activities to establish a Visit Centre located in the building of the Head Office of the National Park in Arkhangelsk, expositions, presentations, slideshows, videos and other materials about the Park to show tourists and visitors.

Organizational and management activities

1) Annual issue of information materials covering natural features of the Arctic region, its historical and cultural heritage and the main results of the activities of the national park and specially protected natural territories.

2) Business contacts with tourism companies, agencies and other organizations working in the field of the cruise tourism in the Arctic.

3) Planning and participation in exhibitions, conferences, seminars and other activities related to tourism activities in the Arctic.

4) Development of promising infrastructure projects, sites and objects of natural and historic attractions, including the ecology of environmental trails and observation platforms.

Activities aimed at the construction of visit centers

1) Justification and approval of the list of the places of natural and historical, cultural interest recommended for tourists at the scientific and technical Council (STC).

2) Edition of booklets with history profiles, names, natural, historical and cultural features of the places recommended for tourists.

3) Drafting of settlement for each of the selected sites, including establishing ecological trails, observation points, resting places, objects, museums

4) Develop rules and regulations for visiting, as well as information support for cruise specialists of the National Park.

5) Compiling for places with the presence of objects of historical and cultural heritage of individual project museumification of the place, its approval at the STC.

6) A register of equipment (generators, heat gun, stoves, transport, tools, household equipment, etc.) required for the functioning of the temporary homes.

7) Determine the volume of necessary financial support for arrangement of the territory (project work), as well as the equipment, fuel, tools, vehicles.

Organizing a Vvisit Centre and the head office in Arkhangelsk

1) The project for a Visit Center, exhibition and educational complex, including museum and exhibition space with animations, slideshows, movies.

2) Identifying potential projects and producing movies with elements of flash animation on various subjects, up to 5 minutes. Videos should be designed for different target audiences (children up to 7 years, schoolchildren, students, adults) on historical, ecological and natural themes.

3) Define the scope of the required financial resources to pay for the manufacture and drawing up a work plan.

4) Development of a to build a new Visit Center of the National Park "Russian Arctic" in Arkhangelsk, a Visit Center lab transformer complex and the Oceanarium.

The establishment of the National Park "Russian Arctic" on the uninhabited island territories of high-latitude Arctic and the beginning of tis administration needs an innovative approach to its functioning. Tourism activities, as the new direction of the development of global business, are attracting more financial resources for the SPNTs. On one hand, the National Park Directorate should ensure integrity and protection of natural, historical and cultural values of the territory; on the other hand, it is needed to develop environmental education and tourism for each protected area. Therefore, a new tourism development should be done to establish the proposed tourist product. The concept should also the basic directions of development of tourist activities and the specialty of the Arctic territories, taking into account contemporary trends in the development of tourism.

Conclusion

Communication with nature reflects the degree of development of human society: its dependence on natural forces, the nature of the involvement of natural resources into economic life and recognition by the man himself as indissoluble particle of the complex world of wildlife. Improving the technical means and technologies, people have gradually moved from the natural environment and wildlife by creating comfortable conditions of life. Life in the city has become a role model, and people assumed natural to stay in comfort, warmth and away from the wild living conditions. The remaining corners untouched wildlife on earth began to declare special environmental territories in which either restricted or entirely prohibited any economic activity. This so-called natural reserves, designed for research, limited tourism and educational activities. A person needs to understand the wildlife on Earth and to feel the relationship of life and nature. We should search for optimal environmental conditions, something between the technological development of modern society and preservation of nature.

When improving our lifestyles, it is interesting to know all the secrets of life in other areas of the world, and tourism, as a journey in space and time enriches it with new knowledge. Tourism in areas with special environmental status can help in determining ways of organizing life. This process is not simple, it can be quite long, but it is what people often search for. The proposed concept can be a practical scheme of such a search.

References

- 1. Grushenko E.B. Strategiya razvitiya morskogo turizma v Evroarkticheskoj zone. Ekonomicheskie i socialnye peremeny: fakty, tendencii, prognoz. 2009. № 1 (5). pp. 74—79.
- 2. Grushenko E.B. Razvitie morskogo turizma v Arktike. *Razvitie Severa i Arktiki: problemy i perspektivy*. Materialy mezhregionalnoj nauchno-prakticheskoj konferencii, Apatity, 14—16 noyabrya 2012 g. Apatity, 2012. pp. 23—25.
- 3. *Geoekonomicheskie processy v Arktike i razvitie morskih kommunikacij /* nauch. red. d.e'.n., prof. S.Yu. Koz'menko, d.e'.n., prof. V.S. Selin. Apatity: KNC RAN, 2014. pp. 41–51.
- 4. Gosudarstvennaya geologicheskaya karta RF. Seriya Severo-Karsko-Barencemorskaya. SPb: Kartfabrika VSEGEI, 2011.
- 5. Severnaya enciklopediya. M.: Evropejskie izdaniya, 2004.