

Topographic, geodetic and gravimetric works in Antarctica carried out by Federal Service of geodesy and cartography of Russia.

The beginning of mapping in the Antarctic coincides with its discovery. The first Russian expedition was in 1820 when our compatriots Bellingsgauzen and Lazarev reached the coast of shelf glacier in the Antarctic and for the first time made sea description.

During 1928-1955 there were produced maps of Antarctica by foreign specialists but they had observational character. Beginning from 1956 when the stage of intensive and detailed researches started Antarctic expeditions of our country are organizing every year. There were 34 Soviet and 9 Russian Antarctic expeditions. About 30 permanent stations were organized for scientific researches, some of them are layed out today. Specialists of our country brought a vital contribution into realization the complex researches of the Antarctic in the sphere of geography, geology, climatology, geophysics and so on.

In 1966 a new Atlas of the Antarctic was produced. Specialists of Federal Service of geodesy and cartography took part in its preparation. We can say that Atlas is "the cartographic encyclopaedia of the Antarctic".

Specialists of the State Enterprise "Aerogeodezia", where I am working as a general director, took part in Antarctic expeditions beginning from 1970.

The complex of topographic and geodetic works produced at the Antarctic territory includes the following directions:

- Creation of field compilation
- producing the topographical surveyings
- creation the control gravimetrical chain and gravimetrical surveyings

Content of the field compilation works included the following main stages:

- measurement of the space base with length of 1400 km with the help of radiogeodetic system RDS (this work was unique not only for Antarctic conditions but also in the world practice)
- definition of the base for standardization the radiogeodetic system
- definition the coordinates of points of field compilation with the means of creation the linear-angles chain, chain of trilateration, astronomic observations, dopler observations the artificial Earth satellites.

The total square of mapping in the Antarctic by specialists of the State Enterprise "Aerogeodezia" is more than 500 thousand km². The main scales are 1:100 000 and 1:200 000. The map creation of these scales was produced by stereophototopographic method. Aerophotography was produced with synchronous photoregistration the stator's readings, the readings of radar altimeter and radiogeodetic system RDS.

During the period from 1970 there were produced around 80 sheets of the maps of the scale 1:100 000 and around 100 sheets of the maps of the scale 1:200 000.

Beginning from 1985 specialists of the State Enterprise "Aerogeodezia" developed the unique works for creation the special topographic maps of the Antarctic (the scales 1:500 000 and 1:1 000 000) with the help of radiolocational survey. The subglacial continental relief and thickness of ice cover (the maximum thickness was 2,3 km) were shown at those maps.

The most important gravimetric works in the Antarctic were the works making during 1975-1990. 10 basic gravimetric points of the 1st class were marked and defined at the territory of Russian Antarctic stations.

The created basic gravimetric chain was the base for producing the gravimetric survey of the Antarctic in the scale 1: 1 000 000 at the territory of 34,5 thousand km.

It is necessary to notice the intensive using the most perspective and highly effective technical means and methods at the moment of producing topographic, geodetic and gravimetric works.

Unfortunately, but the works for mapping the Antarctic making by the Federal Service of geodesy and cartography of Russia are shortened. With the aim to activate those works State Enterprise "Aerogeodezia" prepared special Program, the principal measures you can see in the following table:

No.	Measures	Doer	Dead- line
1	Map preparation and printing 17 sheets of the Antarctic's map of the scale 1:2500000 with obtaining the information up to 2000 year in Russian language (but index will be not only in Russian but also in Latin).	Cartographic Association "Cartographiya", (Moskow)	2000-2001
2	Map preparation and printing 2 sheets of the Antarctic's map of the scale 1:5 000 000 in Russian language: <ul style="list-style-type: none"> • traditional (paper) version • digital version. 	Cartographic Association, "Cartographiya", (Moskow)	2000-2001
3	Creation the digital maps in the scale 1: 100 000 - 4 sheets, and in the scale 1:200 000 - 10 sheets.	State Enterprise "Aerogeodezia"	2000-2001
4	Elaboration and creation Russian GIS on the Antarctic's territory	RAE, State Enterprise "Aerogeodezia", State Centre "Priroda" (Moskow)	2000-2003
5	Creation and obtaining the topographic plans at Russian Antarctic stations in the scale 1:2000 and 1: 10 000 (station Bellingsauzen): <ul style="list-style-type: none"> • traditional (paper) version • digital version. 	State Enterprise "Aerogeodezia"	From 2000
6	GPS measures according the Program "Epoch SCAR"	State Enterprise "Aerogeodezia"	From 2000
7	Creation the base gravimetric point at Russian station "Progress"	State Enterprise "Aerogeodezia"	2000-2001
8	Production the space survey in the interest of mapping State Centre the Antarctic	State Centre "Priroda" (Moskow)	From 2001

9	Creation the digital maps of the scale 1: 100 000 and 1:200 000 using the materials of space surveying 1981-1989 years.	State Centre "Priroda" (Moskow)	From 2001
10	Making the topographic and space photo maps using the materials of new space surveyings.	State Centre "Priroda" (Moskow)	From 2002
11	Exploration the dynamic of coast line and ice cover of the Antarctic on the base of archive and new surveyings.	State Centre "Priroda" (Moskow)	Regular
12	Preparation the agreement about scientific and technical cooperation in Eastern Antarctic between Federal Service of geodesy and cartography, Ministry of hydrometeorology of Russia and Australian Antarctic Service (with the aim to prepare such agreement it is planning Mr. Manning's visit to Russia).	State Enterprise "Aerogeodezia"	2000

As I promised last our meeting in Poland I prepare three special articles about the achievements of Russian polar explorers in assimilation the Antarctic. They must be published in Russian journal "Geodesy and cartography" to the end of this year and Mr. Berk can confirm this information.