The increase in the SAT and the intensification in the surface winds is a single manifestation of climate change in the region, which reflects changes in atmospheric circulation, primarily the strengthening of the zonal flow and the cyclogenesis in the Antarctic. Another important indicator of the climate change is the evolution of glaciers and its surface mass balance strongly depending on local weather settings.

According to the SAT and snow depth series at Faraday-Vernadsky, conditions for annual accumulation existed before 1970s, and subsequently ablation dominated in connection with the warming in the lower troposphere. By the data polygon measurements, restored by prof. L.S. Govorukha, the maximum ablation at the Galindez ice cap was noted in the mid-1990s, caused mainly by the increase in the duration of the ablation period due to the prevalence of positive temperatures in the summer season. Later on, in 2001-2012 annual ablation rate has been decreased, with predominating accumulation in most years, along with significant interannual variability. The leading role of summer ablation in the total annual balance has been revealed: it makes the main contribution to the total annual snow accumulation anomaly, depending on the sign of the SAT anomaly in the months of the warm period. Latest years showed insignificant snow accumulation at the Galindez ice cap due to individual cold seasons and years, e.g 2015, 2016, and predominance of snow accumulation. The given data on the mass balance of the Galindez island glacier may not be representative for the cover and shelf glaciation of the Graham Land. To clarify the state of the glaciers at the AP, further research is needed with field work inside the peninsula and the installation of automatic weather stations.

Peculiarities of the atmospheric circulation responsible for the state of the glacial objects have been studied. The increase in cyclonicity in the months of the warm half of the year leads to significant ablation due to precipitation of mainly mixed and liquid phases, at the same time, cyclogenesis in the months of the cold half of the year with prevailing negative temperatures leads to snow accumulation. The higher temporal stability of the anticyclonic circulation typical for the recent years leads to a longer preservation of cold weather (up to seasonal time scale), which in turn leads to accumulation at the Galindez ice cap.

Glacio-climatic conditions in the study area, including those at Akademik Vernadsky station, are highly dependent on the phase of the El Niño phenomenon, which is associated with the development of certain forms of atmospheric circulation in the south-west Pacific sector of . However, due to the variety of atmospheric responses to each El Niño event, only the large-scale atmospheric process can be indicated. In addition, the Antarctic Peninsula is located at the border of the Pacific-Atlantic influence, so state of the glaciation at the east AP coast can be different. Further research is needed to find more reliable links between regional climate and El Niño.

THE COMPONENTS OF SEASONAL VARIABILITY OF THE SNOW DEPTH IN THE AREA OF THE UKRAINIAN ANTARCTIC AKADEMIK VERNADSKY STATION

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Snow cover is an extremely important integral part of the difficult weather conditions in the Polar Regions, which is due to a number of physical and other characteristics: density, thermal conductivity, albedo, etc. Since the duration of the snow cover period in the polar regions is higher, compared to other territories (usually the period without snow for Ukrainian Antarctic Akademik Vernadsky station (UAS) lasts for days, and sometimes is not observed), its

influence on certain weather characteristics and the formation of weather conditions in general, certainly significant than anywhere else. The snow layer is characterized by significant temporal and spatial variability, which indicates the relevance and importance of conducting continuous observations of its characteristics and necessary of their detailed study.

The purpose of the work is to determine the individual seasonal characteristics of the snow cover in the study area.

In the work, using physical and statistical methods, we analyzed the data of daily observations of the snow cover height at the meteorological playground of the UAS for the period 1997-2020, made with 2 stationary snow depth gauges. The analysis revealed the main trends and the temporal dynamics of the snow mass at the UAS the formation of which is observed from April to August. Analysis of main dates discovered displacement of the boundaries of the beginning and end of the snow period, as well as maximum snow accumulation to later dates. At the same time, the duration of the period itself practically remained unchanged. Analysis of the snow accumulation curve showed that during the period from April to August there are formed 6-8 stable layers, the total height of which is about 250-260 cm. Because the layers are built by certain atmospheric processes, the dates of their formation from year to year are quite close. It is interesting to note that since 2006 the structure of snow cover formation has changed: the process has become slower, however, by the end of the season, the snow depth is even slightly higher.

Formation of snow thickness in the area of UAS occurs by compaction of falling snow under the influence of thermodynamic factors, as well as precipitation in the liquid phase, which are quite often recorded at the station in winter. The most powerful layers are formed in the month of July − the period of maximum snow growth. It should be noted that the curve of dynamics of the snow mass according to observations in the area of UAS against the background of the seasonal component demonstrates the presence of slower quasiperiodic component, the period of which is about 12 years.

MAIN RESULTS OF OCEANOGRAPHIC RESEARCH IN THE SOUTH ATLANTIC AND THE ATLANTIC SECTOR OF THE SOUTHERN OCEAN ACCORDING TO THE SEASON DATA 2018-2020

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The region of Antarctica is one of the regions of the Earth where the most significant climatic changes in the environment are taking place, the dynamics of which have increased significantly in recent decades.

Antarctica is strongly influenced by the Southern Ocean and therefore hydro physical changes in the Southern Ocean have consequences on a planetary scale. More than half of the World Ocean waters contact with the atmosphere in the surface layer of the Southern Ocean. We can say that the Southern Ocean is "lungs" of the Ocean.

Improving of the environmental marine monitoring including the Southern Ocean is one of the main tasks of oceanography. For this purpose, modern science uses satellite information extensively, but the creation of models also requires '*in situ*' measurement data to produce the global analyses. Expeditions on research ships are quite costly activities. One of the successful solutions to this problem is the Ferry Box (FB) approach. It combines commercial and scientific interests. The measuring FB complex provides continuous registration of the basic physical,