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NATURAL DISCHARGE OF THE GALINDEZ ISLAND FRESH LAKE (ANTARCTIC PENINSULAR) AS A REGIONAL CLIMATE CHANGES RESULT

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Природное опустошение пресного озера на о. Галиндез как результат глобальных изменений климата. В.В. Скрыпник, С.Б. Коваленок.
Реферат. Анализ метеорологических данных, погодных условий и ледовой обстановки указывает, что в районе Антарктического полуострова отчетливо прослеживается тенденция к потеплению климата. Климатические изменения, возможно, являются причиной гидрометеорологических аномалий, наблюдаемых в районе архипелага Аргентинские острова. Одним из аномальных гидрометеорологических проявлений является полное опустошение в феврале 1999 года пресноводного озера вблизи станции Академик Вернадский (65^0 15'ю.ш., 64^0 15'з.д.) на мысе Марина.

Keywords: fresh lake, climate change, ice cover.

The results of long-term climate monitoring at Faraday/Vernadsky Antarctic Station shows the fast positive annual mean temperature trend 2.5°C in Antarctic Peninsula region (King, 1994). The regional climate changes are the possible reason of hydrometeorology anomalies in the Argentina Island archipelago area. The frequency of the anomalies increased last years (Popov, 2003). One of the anomalies was the total discharge of the fresh water lake situated in front of Vernadsky Antarctic Station (65°15′S, 64°15′W) main building at Marina Point of Galindez Island in February 1999. Island's relief resembles typical rolling plain. Ice cover occupies approximately 70% of the Galindez Island. The highest hill of the island is the Woozle Hill (54 m height), which situates in the northeast of the island cap. The freshwater lakes that appeared as the result of accumulation snow melting water often occupied small typical erosive hollows of the glaciological derivation. One of the biggest lakes was situated in the plain hollow near the main station building. Lake's hollow extends from the northeast to the sought-west along the main wind direction. Lake's bottom is flat with depth increasing to 2,5 meters at the sought-west end. Approximate like's volume is 1000 m^3 of water. The lake has the weakly indented coastline. The overall length of the lake is 100 m the width is 30 m. During winter seasons the lake is not freezing completely. Consequently, the lake has to have the positive temperature of the near-bottom layer.

The average air temperature was +1,1°C at February 1999. The maximum air temperature +7,1°C was registered in February 22. On this month the cyclone activity was accompanied of the strong north winds, which were noticed in the Bellingshausen Sea region. The intensive cyclonic circulation activity was observing within February. During 20 days the rainfall was registered on the island territory. The 32,6 mm-atmospheric precipitation was observed. The seawater temperature was up to 0,8°C in February 28.

The ice caps of the Argentine Islands have decreased below usual height. The cover of the icecaps became darken which increase the. The predominant warm north wind during of the month was the reason of the strong snow and ice cover melting. The altitude of the snow cover has decreased to 24 cm. As a result, the lake has overfilled by water from melted ice cover. The minimum ice cover was measured at February 14. Its the most thickness was approximately 2m. The southwestern part of the ice was washed out by warm lake's water that created the ice cave under the ice barrier.

After this event, the intensive water flowing began from the lake to the ice cave and than to the ocean. This process last twenty hours and as a result the Galindez Island fresh lake has disappeared. Obviously, siphon event was observed due to the support northwestern wind. The lake water

discharged with the speed approximately 50 m^3/hour. The thickness mud layer on the bottom of lake was 15 cm thick, which it smelled by the fuel products.

The lake discharge event corresponds to the relict Galindez Island ice cap geodesic survey results and the long-period meteorological investigations. According this measurement the ice cover could disappear in the nearest century.

Literature

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