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King George Island glacier dynamics (on example of Bellingshausen Dome)

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King George Island (Antarctic) on 95 % is covered by ice. We study dynamics of change of glacial Bellingshausen Dome (SW part of island) from 2007 at support of the Russian Antarctic expedition. Last years works on a glacial dome are spent also in connection with project IAEA INT5153. The dome has the sizes 3,5×4 km, height to 250 m; in northern part the dome is connected with other ice massifs of island. Till 2009 we saw negative ice mass balance of on the dome, and the Equilibrium Line Altitude (ELA) was situated above the top point of the dome (all snow which is accumulated for winter was completely melted), and almost all surface of the dome was lowered. From 2009 there were striking changes: ELA has lowered to a sea level, and the ice mass balance on the dome became positive. It has led to accumulation of snow, firm and ice on big area of the dome. And only in 2011/2012 and 2016/1017 the ice mass balance on the dome was negative. Annual snow surveys have shown that in the upper part of the glacial dome there are some points of snow accumulation still even in common conditions of negative mass balance. It is connected as with decreasing of mean summer air temperature (according to weather station Bellingshausen), and also with the increased vertical air temperature gradients (to 0.9-1.4° on 100 m of height). Since 2009 decreasing of mean summer air temperature was noted. For example, 2013 was the first year during Bellinsgauzen station history when the mean summer air temperature was negative. Now in separate points at the upper part of dome there is more than 6 m of snow and firn. Every year the thickness of this layer increases. It has led to loading of the dome by additional weight of snow. In the summer 2016/2017 it was possible to observe crevasses which penetrate through snow with thickness more than 4-5 m that earlier was not observed. It speaks about the activation of ice movement which has begun in summertime on the dome. Dome edges practically do not change during time except for its east part where edge retreating was observed with a speed about 2 m per year. If process of climate cooling in the area will continued in the future the sizes of the dome will start to increase. Change of the dome dimensions will lead to change of structure of sediment redistribution of in periglacial zone.