

Change in global climate regime and increase of extreme events in the ocean and continental areas in the 21 century

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Rapid change in global climate regime at the turn of 20-21 centuries is revealed by using PC analyses of a set of various time series of observation data. We use monthly mean time series of surface heat fluxes, sea level pressure, precipitation, Precipitable Water Content (PWC) in the atmosphere, surface air temperature from NCEP reanalyses, as well as Reynolds/ Hadley SST. With respect to the previous climatic regime, evaporation and a latent heat flux (LH) are increasing in most areas of latitude band from 50°S to 50°N during recent decades of the 21 century. It accompanies the significant rise in PWC being highest in 100°E - 200°E longitude band of the Indo - Pacific Region and in both eastern tropical regions of Pacific and Atlantic Oceans. The PWC also rises in central and western regions of North Pacific and North Atlantic. The changes in LH and PWC correspond to the strengthening of tropical, mid-latitude cyclones, storms and extreme weather events over the ocean and continents. Recent climatic regime in the XXI century is characterized by a significant increase in sum of precipitation mostly in land-ocean marginal zones with wet maritime climate, as well as in adjacent continental regions. During 17 years of the 21st century the number of extreme precipitation and floods has increased in Eurasia and North America. The decrease in rainfall occurs in some continental regions, including South and Central Siberia, where the area of forest fires is increasing during the 21st century.

Keywords: climate, change, extremes, precipitation, floods

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