Geophysical Research Abstracts, Vol. 9, 11072, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-11072

Climate variability in the European region associated with global processes in the ocean-atmosphere system

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The aim of presentation is to study the principles of climate anomalies generation in the European region associated with large-scale processes in the coupled ocean-atmosphere system. Using data sets on standard long-term hydrometeorological observations, COADS, NCEP and river's discharge it was found that about 70% of climate anomalies including extreme events in the European region are associated with joint influence of North Atlantic oscillation - Southern oscillation and Pacific Decadal oscillation (NAO - SO – PDO). Extreme events were identified if absolute value of anomalies of SST, air temperature, sea level pressure, wind speed, precipitation, waves high, river's discharge exceeded 2.5 – 3 r.m.s. The strong hydrometeorological disastrous phenomena registered at the hydrometeorological stations in Crimea were considered too.

It was shown that SO and PDO influence the European climate anomalies indirectly, through NAO. It is most significant in winter-spring. And at the same time all the ENSO events were classified into three types using two criteria: the Pacific sea surface temperature (SST) anomaly beginning and the event duration. The features of their manifestation were described. Positive (negative) PDO phase is accompanied both by increase (decrease) of ENSO events number and intensity and by NAO intensification (weakening). It was shown that frequency of the extreme events alternates for Black Sea and Mediterranean regions and it is associated with responsibility of opposite PDO phase.

As a result, it was found that hydrometeorological extremes in the European region including Black Sea and Southern Ukraine occur if associated signs of NAO, SO and PDO indices are coincided. It was shown that catastrophic events which occur 1-3 times per 50 years are accompanied by extremal NAO and SO phase during mature

PDO phase.