GC33F-07: Northern Hemisphere Polar Moisture Budget and Its Links to the Major Circulation Phenomena over the Northern Eurasia

Olga Zolina[1,2], *Ambroise Dufour*[2] *and Sergey Gulev*[3], (1)IORAS, Moscow, Russia, (2)LGGE, Saint Martin d'Heres, France, (3)Shirshov Institute of Oceanology, Moscow, Russia

We analyze atmospheric moisture budget and its components over the Northern Hemisphere north of 60N using 7 first generation and modern era reanalyses (NCEP-1, NCEP-DOE, NCEP-CFSR, MERRA, JRA-25, JRA-55, ERA-Interim) for the period from 1979 onwards. Estimates of moisture transport were derived using decomposition of the moisture advection into the mean flow and transient eddy transport components. Extensive evaluation demonstrates general qualitative consistency of different products in replication the structure of the transports, however quantitative differences between different reanalyses may be quite pronounced and relate in particular to the fractional contribution of transient eddies to the total transport. Transient eddy transport over the Northern Eurasia and the North European basin was further associated with the cyclone activity diagnosed by different products and it has been found that cyclones may seriously contribute to the northward moisture advection. Importantly, this contribution is associated not only with the area of the main subpolar storm track in the North European basin but also with the area of continental storm tracks over the Northern Eurasia. Analysis of long-term interannual variability in different components of the high-latitude moisture budget demonstrated that the moisture advection tended to decrease over the last several decades while the Arctic hydrological cycle has intensifies with upward changes in both evaporation and precipitation. This is confirmed by all reanalyses analyzed and hints on the importance of local diabatic mechanisms in changing Arctic hydrological cycle in the period of rising Arctic temperatures and declining sea ice extent.