Impacts of Geopotential Heights at 500hPa on Droughts of Haihe River Basin

Xiaolin Yan\textsuperscript{1,2}, Yang Yang\textsuperscript{3}, Jiayou Huang\textsuperscript{4}, Zhenxin Bao\textsuperscript{1,2}

\textsuperscript{1}Nanjing Hydraulic Research Institute, Nanjing, China; \textsuperscript{2}Research Center for Climate Change, MWR, Nanjing, China; \textsuperscript{3}Water Resources Information Center, MWR, Beijing, China; \textsuperscript{4}Department of Atmosphere Science, School of Physics, Peking University, Beijing, China

The impacts of the signal field at 500hPa on droughts of Haihe River Basin (HRB) are investigated with 74 10-day precipitation drought events from 1961 to 2009 and their associated spatial patterns of geopotential heights. The results indicate that a drought event of HRB corresponds with three anormal centers in the signal field at 500hPa: 150°E and 30°N, 102.5°E and 45°N, and 122.5°E and 32.5°N. The former two are higher than normal, and last lower than normal. A drought index is then built based on the spatial patterns of the signal field at 500hPa to predict drought events in 2010, and it shows a satisfied result. Since GCMs can provide trustworthy large scale geopotential height information, this index could be used to predict the droughts for a wide range climate change impact applications. And it could be a reference for water resources management in HRB.