Séminaire vendredi le 2 février 2018 11:00 / Seminar Friday Feb 2nd 2018 11:00h

Sujet/Subject: Eastern Canada flooding 2017 and its subseasonal predictions

Langue/language   : Anglais/English

Conférenciers/Lecturers: Hai Lin (RPN-A)

Résumé/Abstract:

Severe damages were made by the flooding event across Eastern Canada in the first week of May 2017, when thousands of residences were affected and many people were evacuated from their homes in Southern Quebec and Eastern Ontario. This event was mainly caused by the persistent heavy rainfall during that week. In this study, the ability of making a useful prediction of this heavy rainfall event about two weeks in advance is assessed for 11 Subseasonal-to-Seasonal (S2S) prediction models. It is found that the above normal precipitation in Eastern Canada during the week of May 1 to 7 was predicted by most of the models, although the forecast anomaly was in general too weak comparing to the observations. These models also predicted high probability of extreme precipitation. Analysis of atmospheric circulation pattern associated with the flooding event reveals a wave train of 500-hPa geopotential height anomaly along the middle latitudes from the North Pacific across North America to the North Atlantic, which sets up a favorable environment for strong water vapor transport from the Gulf of Mexico and the western Atlantic to Eastern Canada. Most models were able to predict this wave train. This flooding event is found to be likely connected to the tropical Madden-Julian Oscillation (MJO) through atmospheric teleconnections. It is observed that during the week of April 24-30 the MJO was in phase 7 with enhanced convection in the western-central Pacific. A numerical experiment is conducted using a linear model with a specified tropical diabatic heating similar to MJO phase 7. The resulting 500-hPa geopotential height response has many similarities to the observed wave train which was responsible for this flooding event.