Seasonal Prediction (Autumn 2008) with Icosahedral-hexagonal Gridpoint Model GME

Jai-Ho Oh[1], Sumin Woo[1], Ara Kok[1]

[1]*Department of Env. Atmos. Sci., Pukyong National University, Korea (jhoh@pknu.ac.kr)*

Predicting the seasonal change is so important to understand the future's weather and climatecondition. There are so many Atmospheric General Circulation Models to simulate the climate change. But, it has the so-called pole problem that exists in conventional latitude-longitude grids. And it is so difficult to simulate regional climate condition due to insufficient temporal/horizontal resolution. So In this study, we have adopted operational global numerical weather prediction model (GME) of German Weather Service (Deutscher Wetterdienst). It is based on uniform icosahedral-hexagonal grid (Majewski et al., 2002). The GME gridpoint approach avoids the so-called pole problem. This model can adjust the resolution, so it is possible to simulate weather and climate change of regional scale. In this study, attempt has been made to perform long-term simulations of GME with mass correction. Mass correction method guarantees the strict conservation of the global meanithrface pressE wiate long-term simulations. So we have performed GME modelsimulation to predict seasonal change. We have used 40km/40layers of horizontal/vertical resolution of GME to predict seasonal simulation in East Asul included Korea. We have conducted 2 types of experiments. In one experiment which is considered as control run using SST dataiate 3riyears period of ERA climatology with SST forcing and we have performed 10members of ensemble simulation using different initial conditions to reduce the uncertainty of the climate model. Another experiment is prediction run using persistent SST anomaly and SST data for 30 years of ERA climatology from SST forcing. In this study, we have used CRAY X1E cluster to simulate the climate change at high resolution and have predicted simulation of this autumn season (SON 2008).

Based on the model simulation for this autumn prediction (SON 2008), we have found that this autumn would be typical weather but it might be slightly warm over East Asia during September and November compared to normal years. And during autumn 2008, it might be similar rainfall compared to normal. From model simulation, 6~7 typhoons may be during this autumn over western pacific, 1 among them may move to Korea. In case of Mongolia region, it might be warm during October and rainfall shows similar compared to normal during autumn.

References:

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