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Classification of KMA GDAPS systematic errors in near surface temperature forecasts

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Accurate and timely weather forecast could decrease damage resulting from hazard weather events. Numerical prediction provides valuable information for weather forecast and its importance is getting bigger as extreme weather events being more frequent. In August 2016, extreme heat wave frequently approached to Korea. However, Korea Meteorological Administration's (KMA) Global Data Assimilation Prediction System (GDAPS) turned out to have cold bias in medium range weather forecast. Thus, it is essential to analyze characteristics of GDAPS systematic errors for near surface temperature, which will contribute to improving model performance.
We used Self-Organizing Map (SOM) to analyze and summarize spatio-temporal errors. SOM, broadly applied to atmospheric science, reduces dimension of input datasets and organizes them into a two dimensional space where similarity between clusters are in inverse proportion to distance. The data used in this study came from GDAPS forecast such as temperature at 1.5 m level, cloud amount, heat flux in Northern hemisphere during boreal summer from 2016 to 2017.
Medium range forecast errors for summer season temperature in the Northern hemisphere were divided into four clusters to reduce spatial dimension. First cluster shows cold bias below -1[U+2103] and is located in the surrounding area of the Arctic region. Second cluster also depicts cold bias in the ocean. Errors of third cluster shows no significant trend. Finally, fifth cluster represents large warm bias in the middle latitude continent. Further analysis for other variables related to temperature such as cloud amount, heat flux will be presented in the meeting.