



## Heavy Rainfall Related Weather Patterns during the Baiu Season and their Future Changes

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Anomalous weather patterns (WP) in relation to precipitation events during boreal summer season have been investigated by using a neural network algorithm, so-called "Self-Organizing Maps" (SOM). The SOM analysis is a nonlinear classification technique which extracts patterns in high-dimensional data onto a two-dimensional map, which visualizes those nonlinear relationships. We analyzed atmospheric variables around Japan by the SOM. As observational data, we use JRA55 reanalysis for past 54 years (1958-2011). The analysis well captured the feature of the WP in relation to the extreme high-precipitation events in Japan and enable us to easily understand the dependence of the each WP on the extreme precipitation events in the hydrologically separated regions. Comparison of the SOM frequency between the first and second half of past 54 years exhibits the significant change in the frequency of the precipitation-related WP. The future change of the relationship between the WP and precipitation in Japan is investigated by using "d4PDF", the huge ensembles of the 60-km MRI-AGCM and 20-km MRI-RCM. We find changes in the WP-dependency of the extreme rainfall.