



Factors affecting cold waves over the Korean Peninsula using a long-term simulation

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This study explores the characteristics of natural variability influencing cold waves over the Korean Peninsula in unforced 500-year simulation of the Community Climate System Model Version 3 (CCSM3). To represent extreme temperature events, we define the cold wave frequency (CWF) index which is the number of days with the daily minimum temperature being less than 10th percentile calculated based on daily climatology for the cold wave season (December – March) for a given year. Each extreme event is determined by normalized CWF index greater than thresholds of 1.0 standard deviation. Composite analysis shows that the selected cold events are associated with negative barotropic geopotential height anomalies over the Korean Peninsula, accompanying a stronger East Asian trough at 500 hPa. We also notice that negative Arctic Oscillation and positive Siberian High with a strengthened Aleutian Low induce northeasterly over the Korean Peninsula, making favorable condition for extreme cold events. We will discuss the impacts of sea-ice concentration over Arctic region and Rossby wave train induced by sea-surface temperature over the North Atlantic and tropical Pacific on extreme cold events.