

Figure S1. Sea ice volume annual cycles in the Arctic region of (a) LW experiments, (b) SW experiments, and (c) T2m experiments. The sea-ice volume of each experiment averaged from 1991 to 2014. The LW (JJ) is the sea ice volume simulation with JRA55 reanalysis as the main forcing (the first J) and JRA55 reanalysis as the longwave radiation forcing (the second J). The LW (JR) is sea ice volume simulation with JRA55 reanalysis as the main forcing (the first J) and NCEP R2 as the longwave radiation forcing (the second R). The black line (JJ combination) represents the REFERENCE, the red line (JR combination) represents the VARIABLE (NCEP), and the blue line (JE combination) represents the VARIABLE (ERA) in Table 3. Other combinations are in grey.

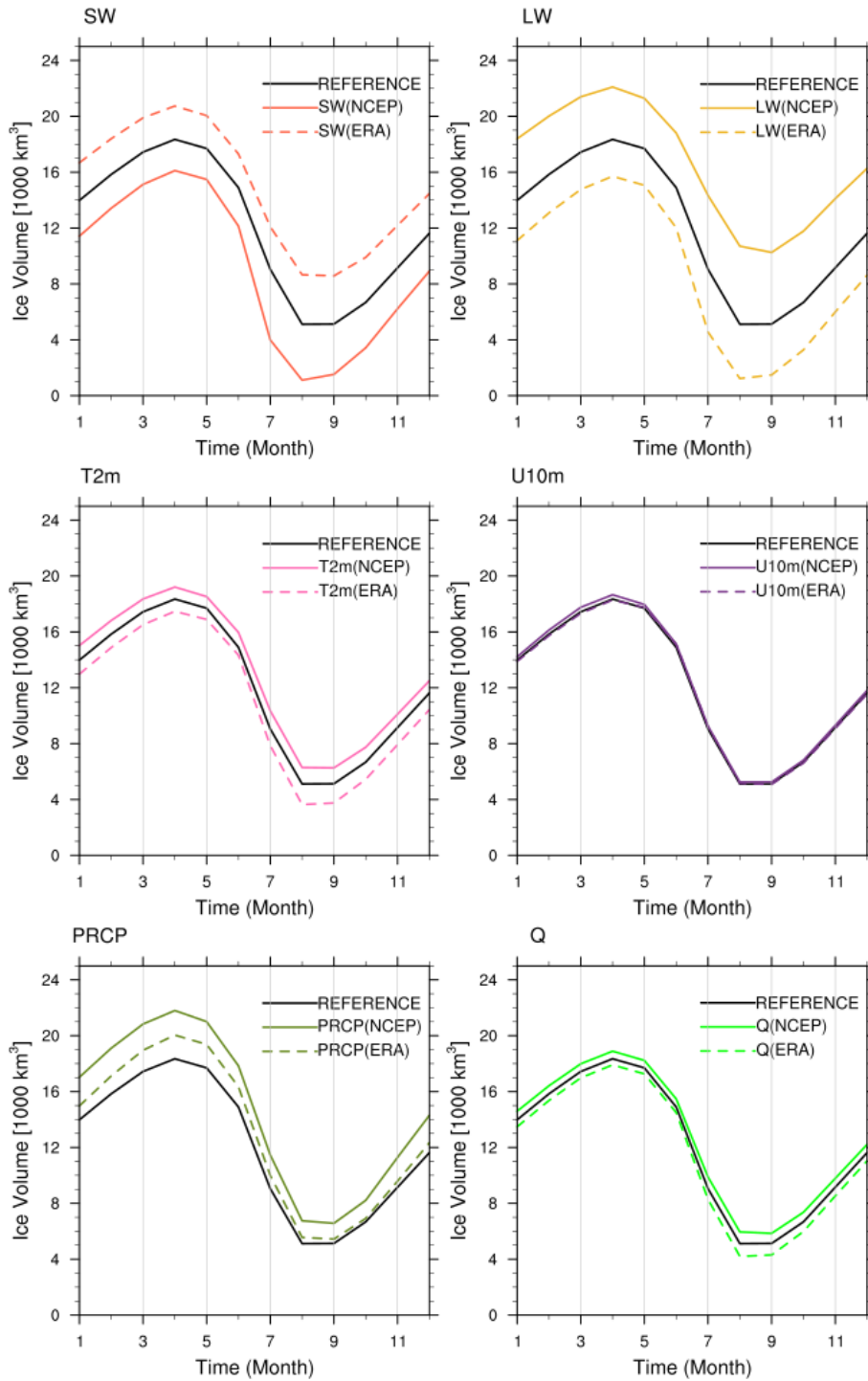


Figure S2. Sea ice volume annual cycles in the Arctic region of replacing experiments. The sea-ice volume of each experiment averaged from 1991 to 2014. The black solid line indicates the REFERENCE experiment and colored-solid and -dashed lines indicate the replacing experiments for each forcing variable, the NCEP and ERA, respectively.

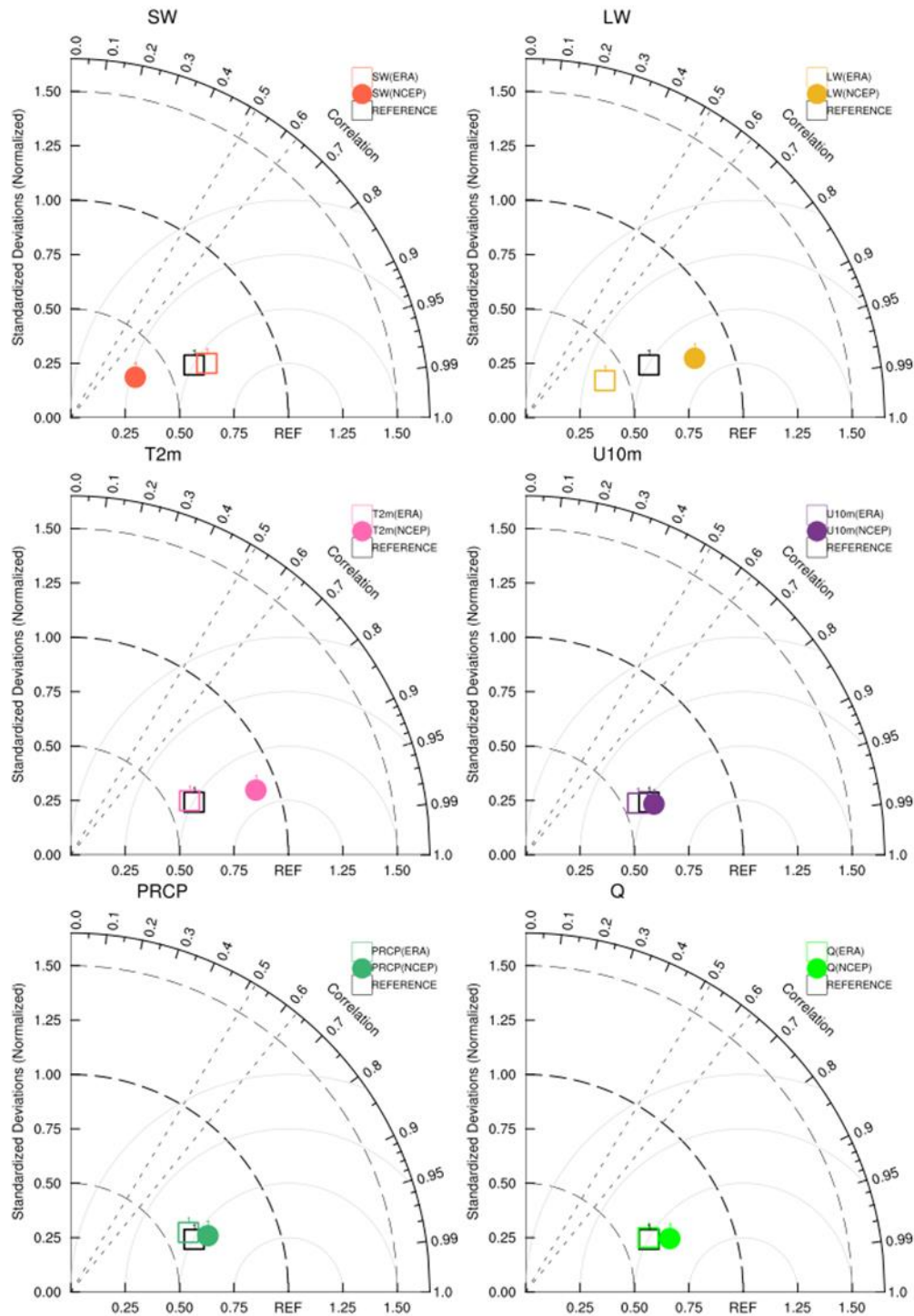


Figure S3. Taylor diagrams of sea ice volumes in the Arctic region. Here, the sea ice volume of the PIOMAS is reference points (REF) for sea ice volume. The open rectangle represents the REFERENCE, and colored-filled circle and -open rectangle indicate the replacing experiments for each forcing variable, the NCEP and ERA, respectively.