



Linking a sea level pressure anomaly dipole over North America to the central Pacific El Niño

Ruiqiang Ding (1), Jianping Li (), Yu-heng Tseng (), Cheng Sun (), and Fei Zheng ()

(1) State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics (LASG), Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China (drq@mail.iap.ac.cn), (2) Plateau Atmosphere and Environment Key Laboratory of Sichuan Province, Chengdu University of Information Technology, Chengdu 610225, China, (3) College of Global Change and Earth System Sciences (GCESS), Beijing Normal University, Beijing 100875, China, (4) Joint Center for Global Change Studies, Beijing 100875, China, (5) Climate and Global Dynamics Division, NCAR, Boulder, Colorado

This study demonstrates the close connection between the north–south dipole pattern of sea level pressure (SLP) anomalies over northeastern North America to the western tropical North Atlantic, referred to as the North American dipole (NAD), and the central Pacific (CP)-type El Niño a year later. In contrast to other ENSO precursors, such as the North Pacific Oscillation (NPO) and Pacific–North America (PNA) pattern, the NAD appears more closely related to the CP-type El Niño than to the eastern Pacific (EP)-type El Niño, indicating that the NAD may serve as a unique precursor for the CP El Niño. The wintertime NAD induces sea surface temperature (SST) anomalies in the northern tropical Atlantic (NTA), which subsequently play an important role in developing the CP El Niño-like pattern in the tropical Pacific over the course of the following year. It appears that the NAD influence on CP El Niño involves air–sea interaction over several major basins, including the subtropical/tropical Pacific and the NTA. Additional analysis indicates that the correlation of either the NAD index or the NPO index with the CP El Niño state a year later depends on the status of the other index. When the wintertime NAD index is of the opposite sign to the simultaneous NPO index, the correlation of the NAD or NPO index with the Niño4 index becomes much weaker.