



ENSO-related PDO in the PMIP3 mid-Holocene climate state

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We examine El Niño and Southern Oscillation (ENSO)/Pacific Decadal Oscillation (PDO) relationship under the mid-Holocene climate (6,000 years ago) state using Paleoclimate Modeling Intercomparison Project phase 3 (PMIP3) climate models. The temporal structure for the ENSO-PDO relationship changed in the mid-Holocene climate. In particular, the relationship between ENSO and PDO during the boreal winter becomes stronger so that there would be more frequent in phase occurrence of ENSO and PDO (i.e. El Niño-a positive PDO or La Niña-a negative phase of PDO). Since PDO could constructively interfere with the ENSO-related climate when ENSO and PDO are in phase, it would be speculated to strong climate signal to ENSO in the midlatitude in the mid-Holocene. The PMIP3 climate models also shows that ENSO pattern is shifted to the west and reduced but PDO intensity is not changed in the mid-Holocene climate. We also discuss the possible reason on the enhanced linear relationship of ENSO-PDO even though ENSO intensity is reduced in the mid-Holocene climate state.