



A search for robust impacts of Pacific Ocean SST on Asian hydroclimate in the last millennium

Martin Peter King (1), Entao Yu (2), Stefan Sobolowski (1), Odd Helge Otterå (1), and Yongqi Gao (3)

(1) Uni Research Climate and Bjerknes Centre for Climate Research, Bergen, Norway, (2) Nansen-Zhu International Research Centre, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China, (3) Nansen Environmental and Remote Sensing Center and Bjerknes Centre for Climate Research, Bergen, Norway

We investigate for robust hydroclimate impacts in Asia related to major drivers of climate variability in the Pacific Ocean, namely the El Niño-Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO). Composite analyses have been carried out on a tree ring-based Palmer Drought Severity Index as well as on a long coupled global climate model control experiment. El Niño (La Niña) has a robust impact on wet (dry) conditions in West Asia and dry (wet) conditions in South Asia. For the PDO, impacts are found throughout the Asia domain. Results indicate that West Asia (South and Southeast Asia) experiences wet (dry) conditions during periods of positive PDO. For East Asia, there is an indication that positive (negative) PDO is associated with wet (dry) conditions around and southward of 30°N and dry (wet) conditions north of this latitude. This result is consistent with the current understanding of the role of PDO in the “southern-flood northern-drought” phenomenon in China. We also examine the dynamical characteristics of the reported hydroclimatic impacts in the global climate model experiment which indicates moisture transport into (out of) regions that exhibit wet (dry) conditions in a manner consistent with the various ENSO and PDO composites, thereby providing physical explanation of the PDSI-based results.