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1920s tropical Pacific climate shift revisited

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This study revisits the mid-1920s Pacific climate shift using a wide variety of historical climate data sets including sea surface temperature (SST), nighttime marine air temperature, sea level pressure, and cloudiness. Overall the 1920s Pacific climate shift is similar to the 1976/77 Pacific Decadal Oscillation shift from cold-to-warm phase, characterized by SST cooling over the North Pacific and deepening of the Aleutian Low. On the other hand, patterns of the tropical Pacific SST change during the 1920s largely depend on SST data sets. HadISST1 shows no significant SST change in the equatorial Pacific. In contrast, COBE-SST2 exhibits a local maximum of SST warming in the central-to-eastern equatorial Pacific, resulting in a weakening of zonal SST gradient. The latter pattern of SST change is more consistent with an observed weakening of the Walker circulation obtained from SLP observations. This result suggests that the 1920s climate shift actually happened not only over the North Pacific but also over the tropical Pacific, a feature not captured by conventional SST data sets. Simulated patterns of surface air temperature and SLP changes from AGCM experiments forced with COBE-SST2 and HadISST1 will also be discussed.