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Role of Western Hemisphere Warm Pool in Rapid Climate Changes over the Western North Pacific

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Oceanic states over the western North Pacific (WNP), which is surrounded by heavily populated countries, are closely tied to the lives of the people in East Asia in regards to both climate and socioeconomics. As global warming continues, remarkable increases in sea surface temperature (SST) and sea surface height (SSH) have been observed in the WNP in recent decades. Here, we show that the SST increase in the western hemisphere warm pool (WHWP), which is the second largest warm pool on the globe, has contributed considerably to the rapid surface warming and sea level rise in the WNP via its remote teleconnection along the Pacific Intertropical Convergence Zone (ITCZ). State-of-the-art climate models strongly support the role of the WHWP not only on interannual time sales but also in long-term climate projections. We expect that understanding the processes initiated by the WHWP–SST could permit better forecasts of western North Pacific climate and the further development of the socioeconomics of East Asia.