

Impact of SST on heavy precipitation events over Japan during summer

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The previous studies have pointed out the role of sea surface temperature (SST) over the Japan Sea on winter precipitation on the downwind side under the northwesterly East Asian winter monsoon. However, the role of SST over the Japan Sea on precipitation during summer is not well understood. The heavy precipitation event occurred over the northern main island of Japan in early-August, 2013. The unusual precipitation seems to be associated with the significant moisture flux over the Japan Sea where the sea surface temperature was warmer than the normal. Here, the impact of SST warming over the Japan Sea on the heavy precipitation event is examined using a regional atmospheric model. In one experiment, the actual SST is prescribed as a lower boundary condition, while the climatological mean SST is given in another experiment. The simulated precipitation amount associated with the heavy rainfall event in the former experiment is more than that in the latter experiment, associated with the increased moisture flux. In addition, it is found that the heavy rainfall tends to occur near the coast when the SST is higher than the normal. The results suggest a potential impact of SST on severe precipitation events even during summer. The role of SST on other precipitation events are also discussed.

Keywords: Sea Surface Temperature, Precipitation, Japan Sea