

Impact of the Japan/East Sea on the heavy rain event of July 2018 in Japan

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A role of the neighboring waters in the torrential rainfalls in mid-latitudes during a warm season is debatable and under active research. A torrential rainfall that occurred from 28 June to 8 July 2018 caused widespread and devastating floods, landslides, and mudflows and they led to severe damages over wide areas in Japan, especially in its western part. Approximately 9,000 houses were inundated above the floor level and more than 6,000 buildings were destroyed. From the beginning of the July 2018, the Okhotsk high pressure system intensified, bringing the cold air mass southward to the Japan/East Sea (JES). The southward migration of this cold air-mass and high sea surface temperature in JES caused anomalous upward latent heat flux. We examine the impact of this anomalous latent heat flux on the torrential rainfall, through the numerical simulations with a regional atmospheric model. A simulated rainfall has drastically decreased in the western part of Japan when the latent heat flux is artificially reduced in the JES, indicating that the latent heat flux in the JES plays a role in the torrential rainfall event. A reduced latent heat flux intensifies the static stability of the air-mass flowing into the rainfall areas and modifies the structure of meso-scale fronts, leading to the decrease in rainfall in the western part of Japan. The detailed discussion on the role of the latent heat fluxes in the JES in the rainfall event will be given in this presentation.

Keywords: torrential rain, sea surface temperature, Japan/East Sea