

## Consecutive compound extremes of flood and heatwave within East Asia Summer Monsoon Lifecycle

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In recent years, East Asian countries have faced to wet and dry extremes frequently. For example, Japan experienced a catastrophic flood, and it was followed by a record-breaking heatwave in July 2018. The flood caused about 10 billion USD of economic damage which was a record breaking. The casualties by flood and drought exceeded 200 and 1000, respectively. In this study, we suggest that the timing of the consecutive flood and drought would not be coincident, but they are tightly connected with the active, break and revival phases of East Asia Summer Monsoon Lifecycle. Also, we examine the extend to which these back-to-back extreme events changes under the global warming and to which the human-induced warming is attributed to the intensification of the wet and dry swing. Multi-model large-ensemble simulations based on historical (naturalized and all-forcing) and future (+1.5 and +2.0 degree warming above preindustrial period) were adopted from Half a degree Additional warming, Prognosis and Projected Impacts project.

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