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Editorial for the Special Edition on Tropical cyclones in 2015–2016

The years 2015 and 2016 are characterized by tropical cyclones in the western North Pacific, with unique seasonality, unusual tracks, and record-breaking phenomena. The El Niño event strengthened throughout 2015 and no typhoons generated until early summer in 2016. In August 2016, a monsoon gyre has produced many named TCs in the western North Pacific and they include Typhoon Lionrock (2016) that exhibited the unusual motion in a counterclockwise direction. Many typhoons such as Etau (2015) and Nepartak (2016) caused devastating hazards including strong winds, heavy rainfall and high waves. They are of meteorological and climatological interest, and have drawn a remarkable attention of the public, which have motivated the establishment of the Editorial Committee on the special issue of “Tropical cyclones in 2015–2016” on JMSJ. The Editorial Committee decided to accept eight papers for publication in the Special Edition as a collection online at http://jmsj.metsoc.jp/special_issues_editions/vol96no4.html

The papers in this Special Edition describe important contributions to researches of tropical cyclones and relevant atmospheric phenomena. Cao and Wu (2018) compared contributions of different environmental factors to tropical cyclone genesis over the western North Pacific during 2015 and 2016. Two papers focused on Typhoon Lionrock. Wada and Oyama (2018) revealed the role of convective bursts before Lionrock made landfall in northern Japan. Nayak and Takemi (2019) conducted pseudo global warming downscaling experiments of an extreme rain produced by Lionrock in order to assess the impacts of climate change on resulting hazards. Jin et al. (2019) evaluated the initial large-scale environment of the real-time forecast from the Coupled Ocean/Atmosphere Mesoscale Prediction System –Tropical Cyclone. The distributions of 500 hPa height, upper-level divergence and 850-500 hPa moisture played important roles for intensification of Typhoon Nepartak. Using the nonhydrostatic icosahedral atmospheric model, Jinno et al. (2019) conducted a series of hindcast simulations to reproduce the temporal evolution of the monsoon gyre in August 2016, which yielded the genesis of multiple tropical cyclones. Two papers investigated extremely heavy precipitation affected by two typhoons that occurred around the Kinugawa River, Japan, in September 2015. Fujita et al. (2019) suggested the probability of extreme precipitation occurrence using data from large ensemble forecasts. Wada et al. (2019) investigated the influence of sea surface temperature on the local heavy rainfall event using a regional air-sea strongly coupled data assimilation system based on the local ensemble transform Kalman filter and a nonhydrostatic atmosphere model coupled with ocean-surface wave model and a multilayer ocean model. Fudeyasu and Yoshida (2019) examined the statistical characteristics

of tropical cyclones for which the cyclogenesis process was modulated by upper tropospheric cold lows over the western North Pacific during the 38 years. The extremely hot summer of 2016 was partly enhanced by the intense Tibetan high, when 4 typhoons were defined as having cyclogenesis influenced by upper tropospheric cold lows.

The Special Edition on Tropical cyclones in 2015–2016 provides a valuable opportunity for publishing papers to investigate the unique phenomena associated with tropical cyclones in 2015–2016, and is a vital addition to the body of work on tropical cyclones research. On behalf of the JMSJ Editorial Committee, we cordially thank the authors for their contributions and invite readers to make full use of this collection.

January 2019

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Kosuke Ito: Associate chief editor of the special issue
Masuo Nakano: Editorial manager of the special issue

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