

# Using WRF and SWAN models in calculating wind and wave conditions for Typhoon Jebi (2018)

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## Abstract:

In 2018, Typhoon Jebi brought significant damages around the Osaka Bay, located in the western areas of Japan. In order to test the accuracy of the WRF and SWAN (Simulating WAVes Nearshore) models, wind speed, direction and wave conditions were calculated using the models for this typhoon.

First, wind conditions were calculated using the WRF model with GSM (Japan Meteorological Agency's Global Spectral Model) as input data. As a result, WRF was able to successfully estimate the strong winds in the Osaka Bay, which had not been well reproduced with GSM. Subsequently, wave conditions were calculated using the SWAN model with WRF and GSM wind data as inputs. The model outputs were compared with the observed data to test the validation.

We believe the advancement in the predictive ability of wind in Japan with such a highly complex coastal structures will be of great use in future wave protection and the development of offshore wind power generation.

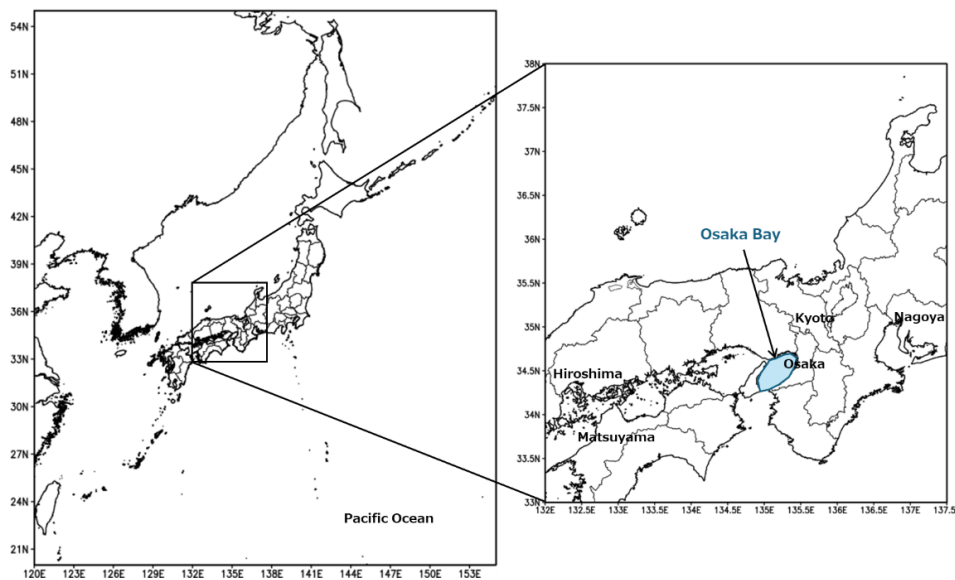


Fig.1 The location of the Osaka Bay

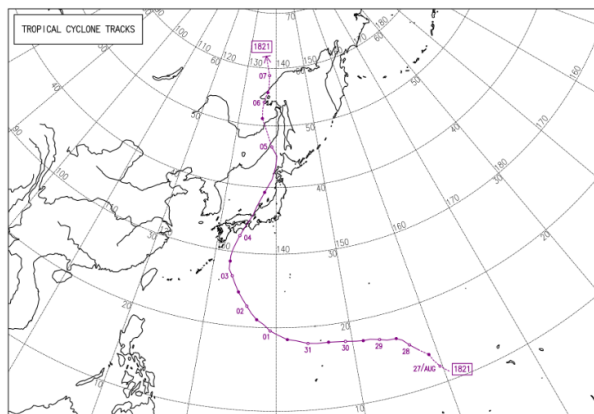


Fig.2 Track chart of Typhoon Jebi (Japan Meteorological Agency)



Fig.3 Fallen utility poles blocking a road in Osaka (<https://www.nikkei.com/article/DGXMZ049287500S9A900C1000000/>)