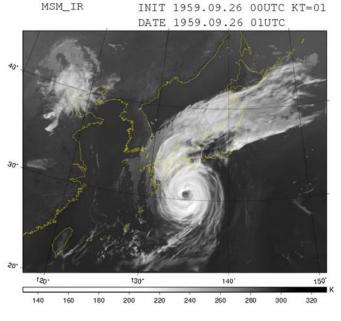# Re-forecast of Typhoon Vera (5915) with the JMA Operational Meso-Analysis System

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50 years ago, Typhoon Vera (1959) made landfall in Kii peninsula in Japan around 0900 UTC on 26 September in 1959. It brought tremendous disasters to Japan islands, especially around the Ise Bay area. It was the most tragic meteorological disaster in Japan after the World War II. Indeed, total amount of death toll was more than 5,000. Because of its massive damage for the Japanese society, Vera is one of memorable typhoons in Japan, called as 'Isewan (Ise Bay) Typhoon'.

The JMA starts the project associated with the long-term re-analysis during the period from 1958 to 2012, called as the 'JRA-55' project. Using the re-analyzed dataset, we performed numerical predictions for validating the Vera's predictability. We used an interim version of JRA-55 as initial conditions for the track, intensity and storm surge predictions of Vera.

JNoVA (JMA Non-hydrostatic model Variational data Assimilation system) was used for implementing the mesoscale analysis for 24 hours from 0900 JST on 25 September in 1959 with a 3-hour assimilation window. We performed 36 hours forecast experiment using this analysis result and the JMA non-hydrostatic model with a grid spacing of 5 km from 0900 JST on 26 September in 1959.

Figure 1 shows a pseudo-satellite image calculated by the output of the numerical simulation. This image is almost similar to an actual infrared satellite image. After conducting the numerical simulation by the mesoscale model, storm surge predictions were performed using the Princeton Ocean Model and the result of numerical simulation as an atmospheric forcing. The predicted sea-level height at the port of Nagoya was very close to the observation.

From these above-mentioned experimental results, we can obtain highly accurate prediction for Vera using the latest forecast technique. One of the important points is that the numerical model used in the present numerical simulations is almost similar to the operational one in JMA. This suggests that we have high potential capability to predict intense typhoons like Vera using the JMA operational prediction system.

Keywords: assimilation, VERA