

# Simulation of Oceanic Mixed-layer Response to a Typhoon

Jun Suwa\*

Satoko Nomura\*\* Yasuhiro Sugimori\*\*, \*\*\* Chaofang Zhao\*\*, \*\*\*\*

## Abstract

The oceanic mixed-layer response to a typhoon was studied using a three-dimensional model in which the entrainment velocity was parameterized using only the vertical velocity shear entrainment mechanism (DIM: Dynamic Instability Model). We simulated the response to Typhoon #9019 in the area around the former Ocean Weather Station T (OWS-T) located south of Japan (29°N, 135°E) during the period starting from September 15 through September 21, 1990. The temperature, velocity and surface meteorological data were collected by both the ocean weather buoy at OWS-T and the three surface buoy systems surrounding OWS-T. The best agreements between the simulated and observed mixed-layer depths and temperatures occurred when Richardson number  $R_v = 0.65 \sim 0.70$ . The simulation suggests that the horizontal advection process was as important as the vertical one-dimensional process in the variation of the mixed-layer thickness, while it was less important than the vertical one-dimensional process in the variation of the mixed-layer temperature in the area during the week surrounding the passage of Typhoon #9019.