

2026年熱帶擾動91W引發的暴洪災害 多重情境分析與預警

Analysis on the Multiscale Situations of Flood Disaster Involved in the Tropical Disturbance of 91W in 2026 for Early Warning

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Abstract

The heavy rainfall event on 4-6 June 2026 due to the influence of tropical disturbance (91W) brought severe flash flood with landslides, damage of roads, houses and crops in Taiwan areas. The objective of this research is to realize the large-scale dynamic conditions, and furthermore, the physical mechanisms from the mesoscale point of views to find out the approximate approaches for disaster prevention and early warning.

The primary findings suggest that under the influence of Pacific High and 91W, a convergent effect of Pacific high (1014hPa) and southeasterly steering flow was located off the east and southeast area of Taiwan in an intensely unstable environment, and this weather pattern made 91W landfall at Donggang, Pingtung at 0830L, 5 June 2026, propagate northeastward in slow speed (~25km/h), and move to the waters off Hualien at night, staying over land more than 12 hours. Furthermore, the sustained surface winds could reach 23 to 28 knots (13-14m/s) just before the landfall at Donggang, Pingtung. Its vertical structure analyzed by WISSDOM was in a northward tilting appearance, and its primary vortex could reach 5km in height, obviously blocked by the southern part of Central Mountain Range, Mount Beidawu in peak of 3092m. The well-organized vortex resulted in heavy rainfall over the southmost part of Taiwan with maximum hourly rainfall rate of 66.5mm (屏東南州) and 48h accumulated rainfall rate of 392.0mm (屏東大漢山), respectively.

The forecasts of tropical disturbance track, duration of stay, amount of accumulated rainfall and intensity of wind field are the key factors for disaster preparation, and more information input for nowcasting is quite significant for well preparation, including observed and simulated products. Also, well-organized concept models based on multiscale weather scenario for the early warning and prevention of disaster are necessary.

【Key words】: tropical disturbance, flash flood, WISSDOM, disaster prevention

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