

Chien, F.-C., Y.-C. Chiu, and C.-H. Tsou, 2021: A Climatological study of southwesterly flows and heavy precipitation in Taiwan during Mei-yu seasons from 1979 to 2018. *J. Meteor. Soc. Japan*, **99**, 913-931.

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**Plain Language Summary:** During active years of southwesterly flow events, the Pacific high weakens and moisture is transported from the South China Sea to the Taiwan area in the early mei-yu season. The moisture-laden air results in a large equivalent potential temperature gradient to the north of Taiwan, favoring the formation of mei-yu fronts and low pressure systems. The pressure gradient thus increases and southwesterly flows develop. More moisture is transported toward Taiwan, resulting in heavy rainfall as well as a further increase of equivalent potential temperature.

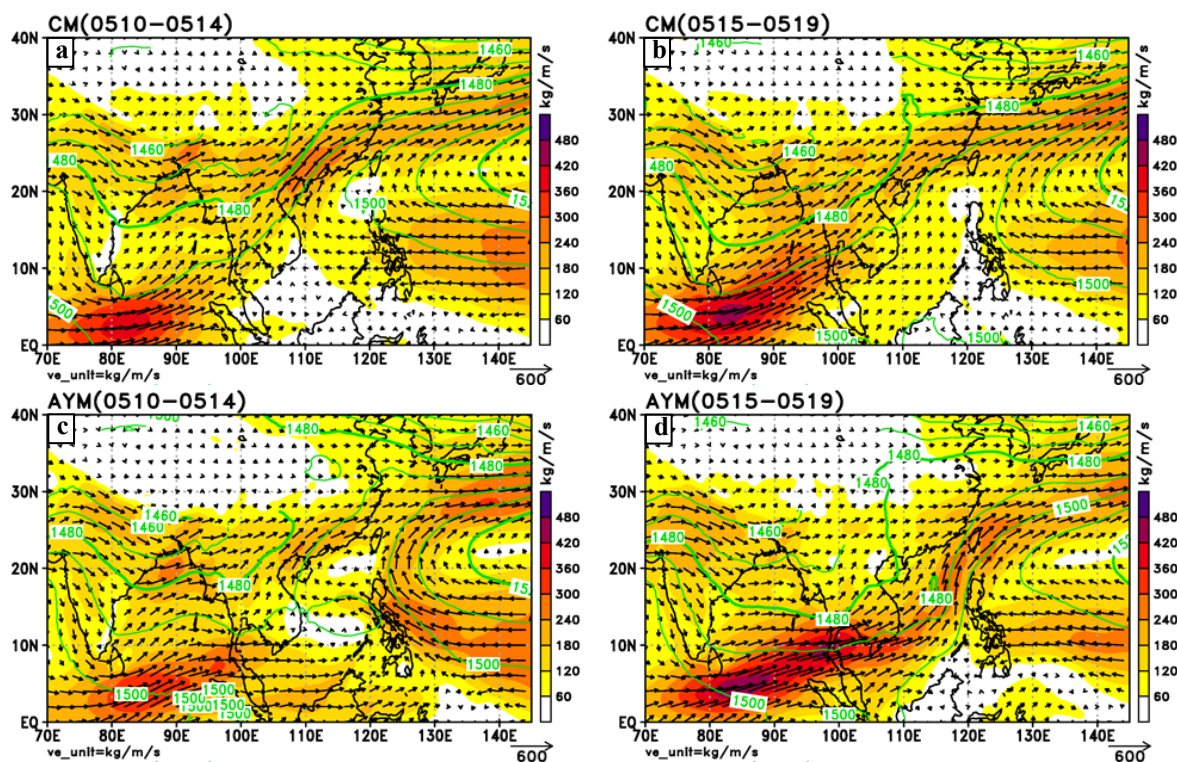


Figure 1. Five-day average (May 10–14) of 1000–200 hPa integrated water vapor transport (IVT, vector), IVT magnitude (color shading), and 850-hPa geopotential height (contour) for (a) CM, climatological mean, and (c) AYM, mean of southwesterly flow active years. (b, d) Same as (a, c), but for 5-d average from May 15 to 19.

- In southwesterly flow active years, the Pacific high weakens and moisture is transported to Taiwan from the Bay of Bengal and from the south of the Pacific high in the early mei-yu season.
- A positive feedback of moisture transport and southwesterly flow produces more fronts, stronger southwesterly flows, and heavier rainfall during the mei-yu season.
- The meridional component of vertically integrated water vapor transport (IVT) over the South China Sea and the Philippines in the early mei-yu season can be used to predict the occurrence of southwesterly flows and heavy rain for the entire mei-yu season.