

Summary:

Today was much more active than expected. While the rainfall totals don't show it as well as we would've thought, there were exciting active thunderstorms very near the Hsinchu S-Pol radar, that then shifted toward the south later in the day. A broad region of stratiform precipitation moved over S-Pol during the afternoon, and this offered an opportunity to do a polarimetric calibration. Besides the afternoon thunderstorms, most of the rainfall is to the south, associated with the monsoon gyre.

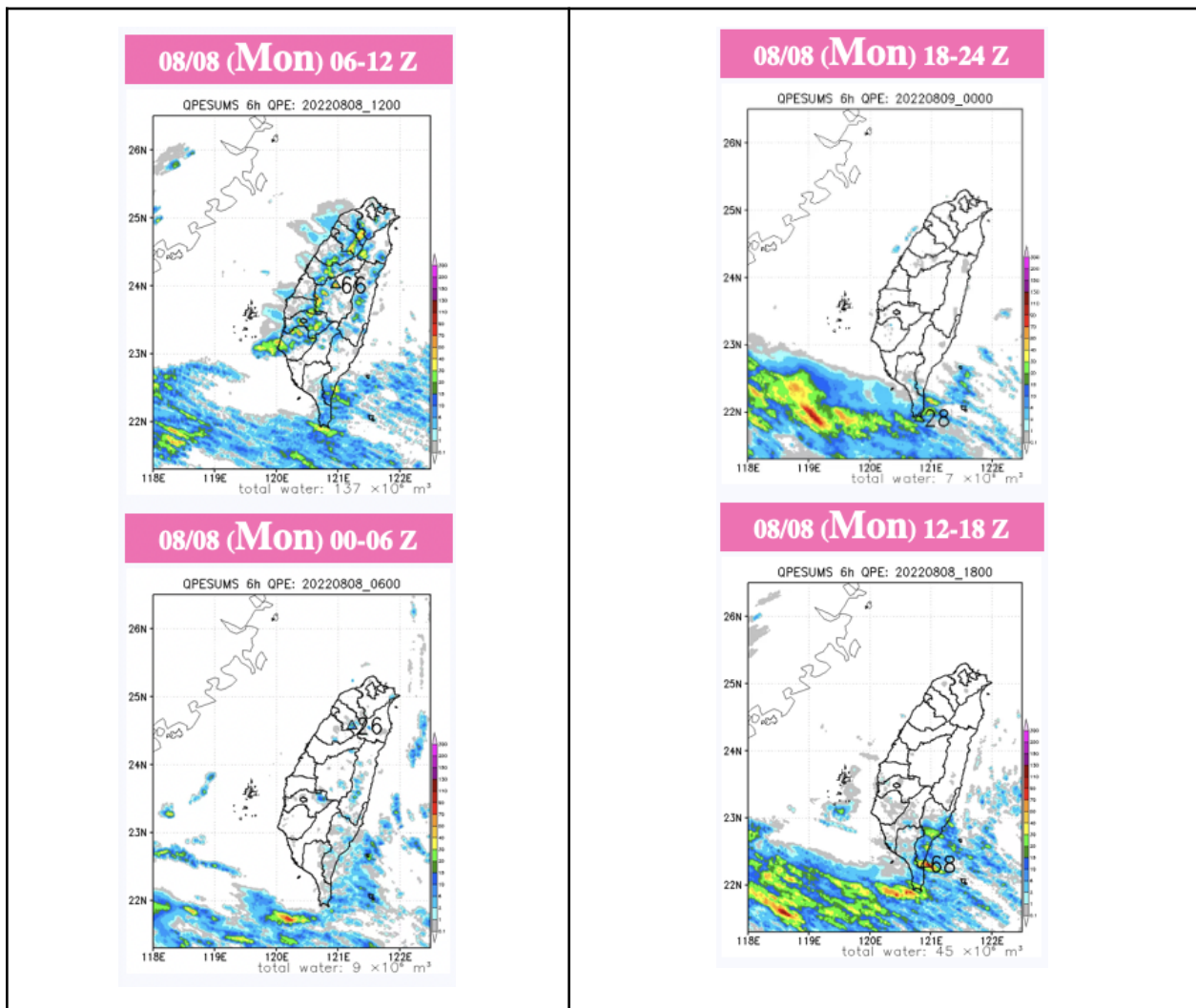


Figure 1: 6-hourly rainfall on 8/8.

Day Zero Forecast (0-24 h; 00 UTC 8 Aug - 00 UTC 9 Aug)

Today's forecast looks really similar to the last few days. 97W developing to the south is driving southeasterly winds. Some of the outer "rainband"-like features are bringing oceanic convection toward Yonaguni and the east coast of Taiwan. This "monsoon gyre" or "monsoonal low" to the south is also driving the high precipitation accumulation on the southern point of Taiwan.

Over Taiwan, it looks like an afternoon thunderstorm day, especially over the mountains, and to the south of S-Pol.

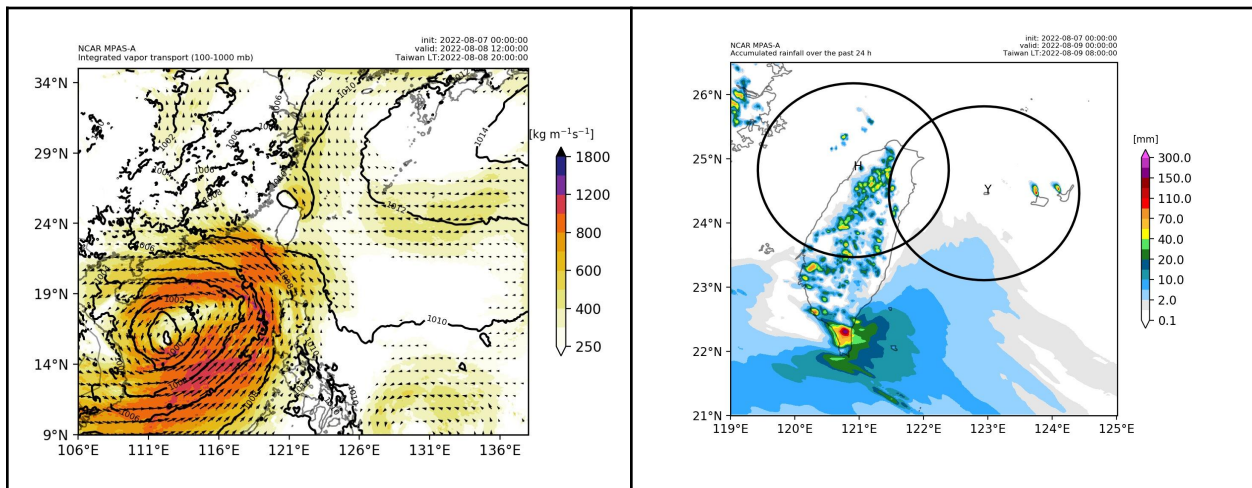


Figure 2: MPAS initialized 0z Aug 7 showing 24-hr accumulated rainfall at the end of Day 0, and IVT at 12z.

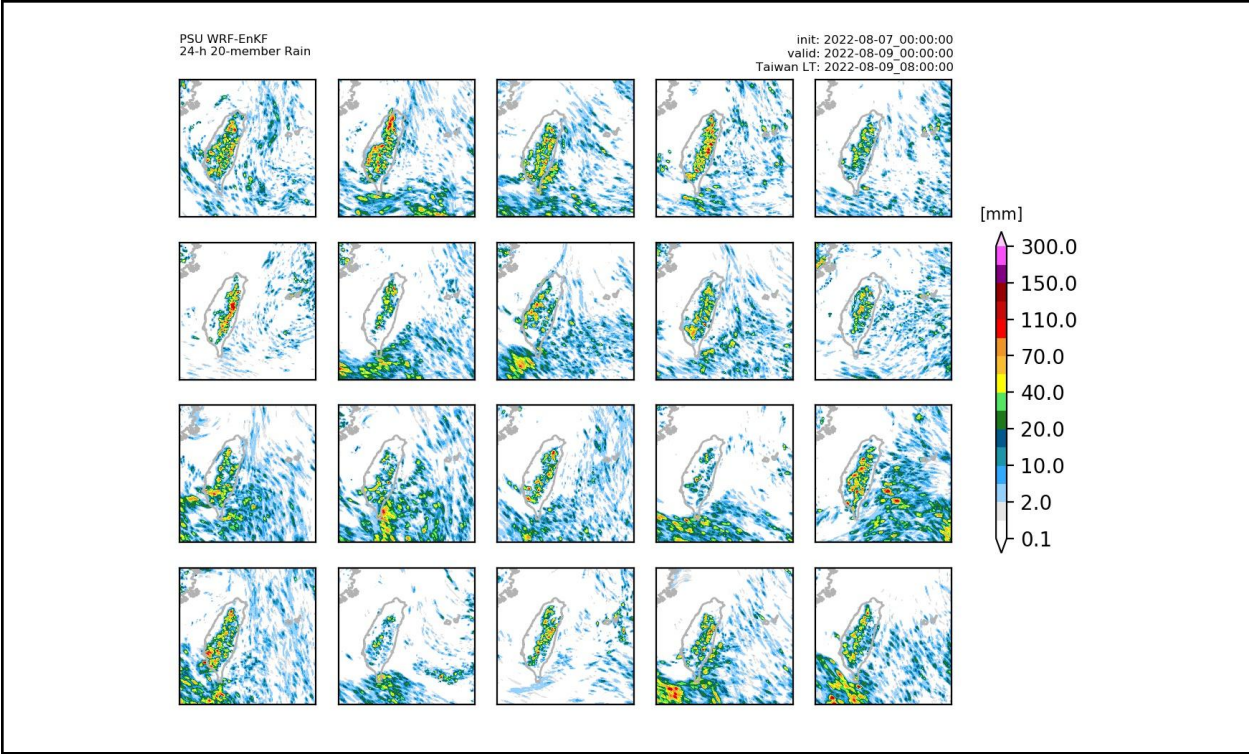


Figure 3: PSU WRF ensemble initialized 0z Aug 7, valid at the end of Day 0 at 0z Aug 9.

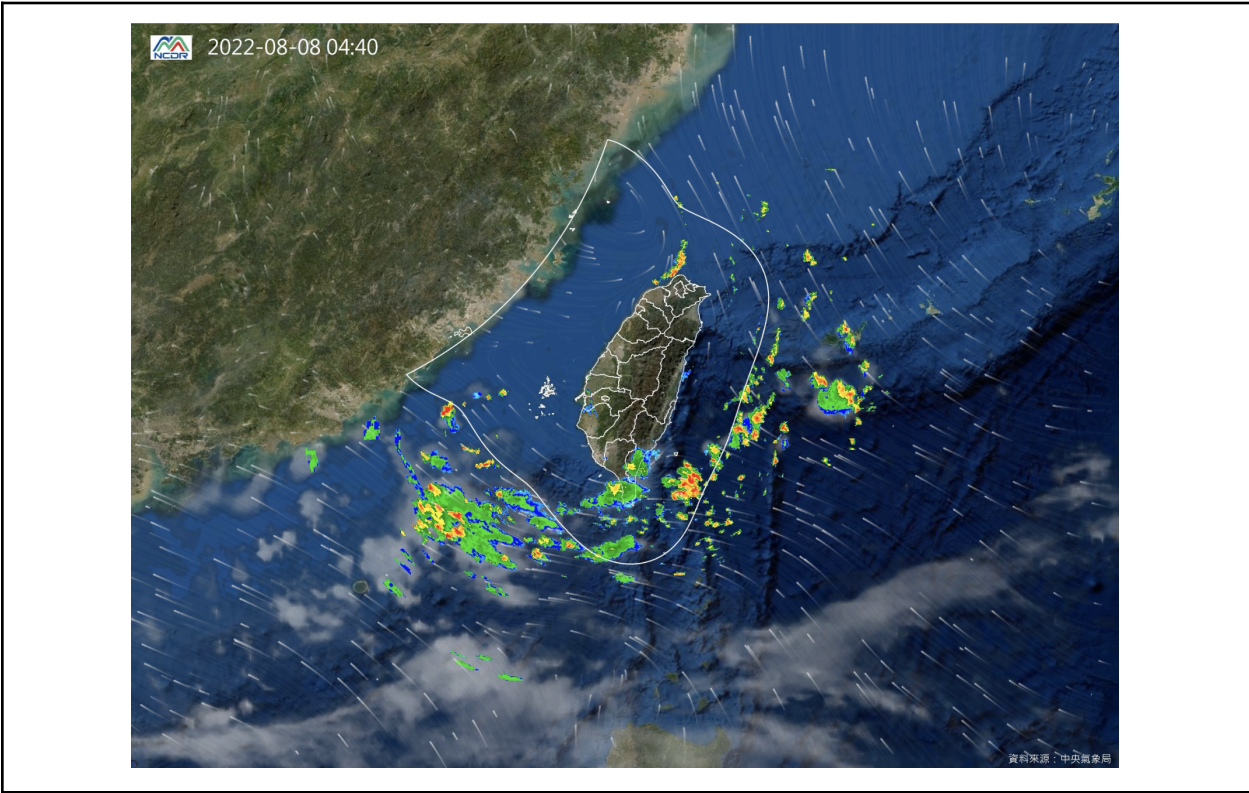


Figure 4: Satellite and radar image from 4:40 am LT on Aug 8.

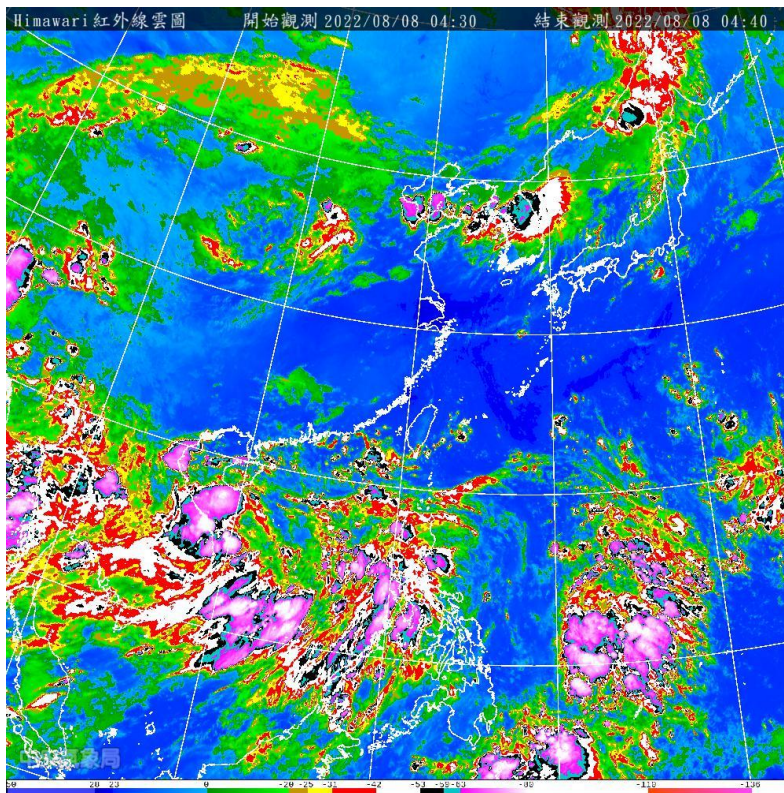
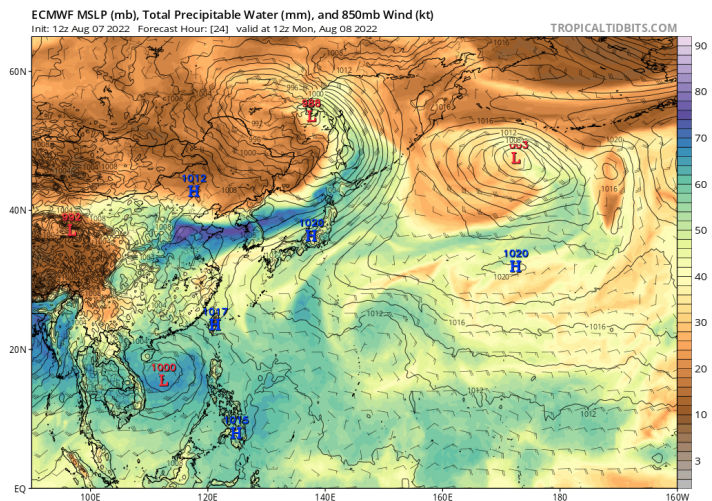


Figure 5: Himawari satellite Color IR image from 4:30 am LT on Aug 8.



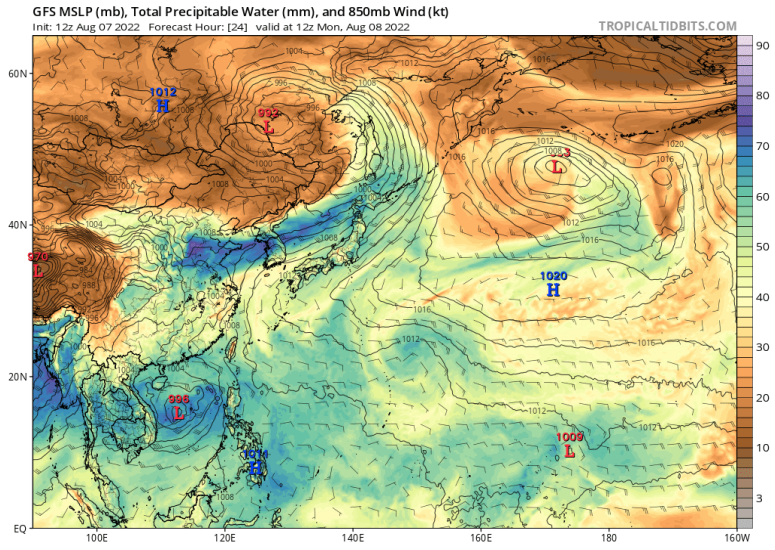


Figure 6: EC & GFS, initialized 12z Aug 7, showing PWAT and 850 mb Wind for the whole Pacific at 12z Aug 8.

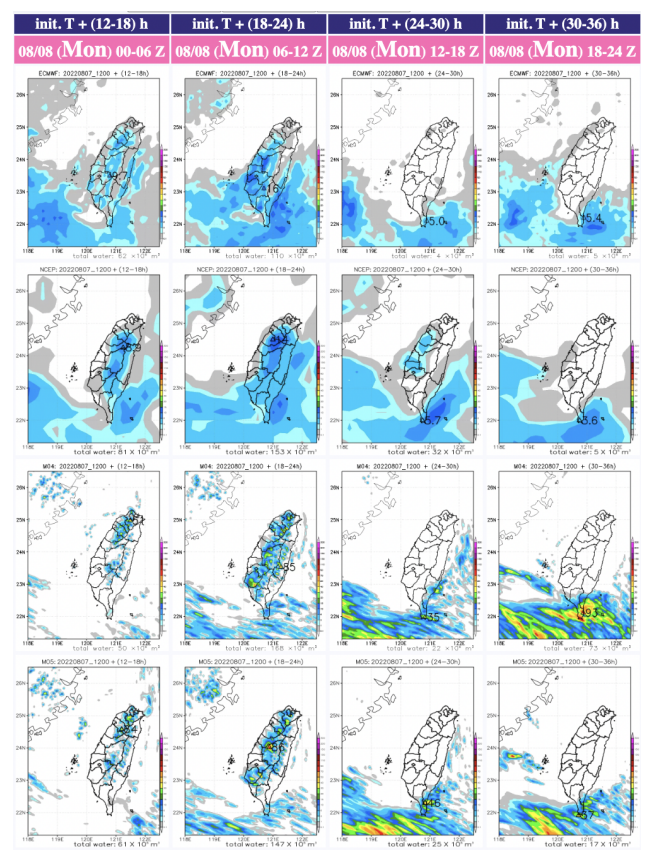


Figure 7: 6-hourly QPF on Day 0 from (top to bottom) EC, NCEP, WRFD and TWRF initialized 12z August 7th.

Discussion

Below are a number of RHIs, scanning strategy, and IR loops showing the convection from today. They provide a sense of the rainfall observed.

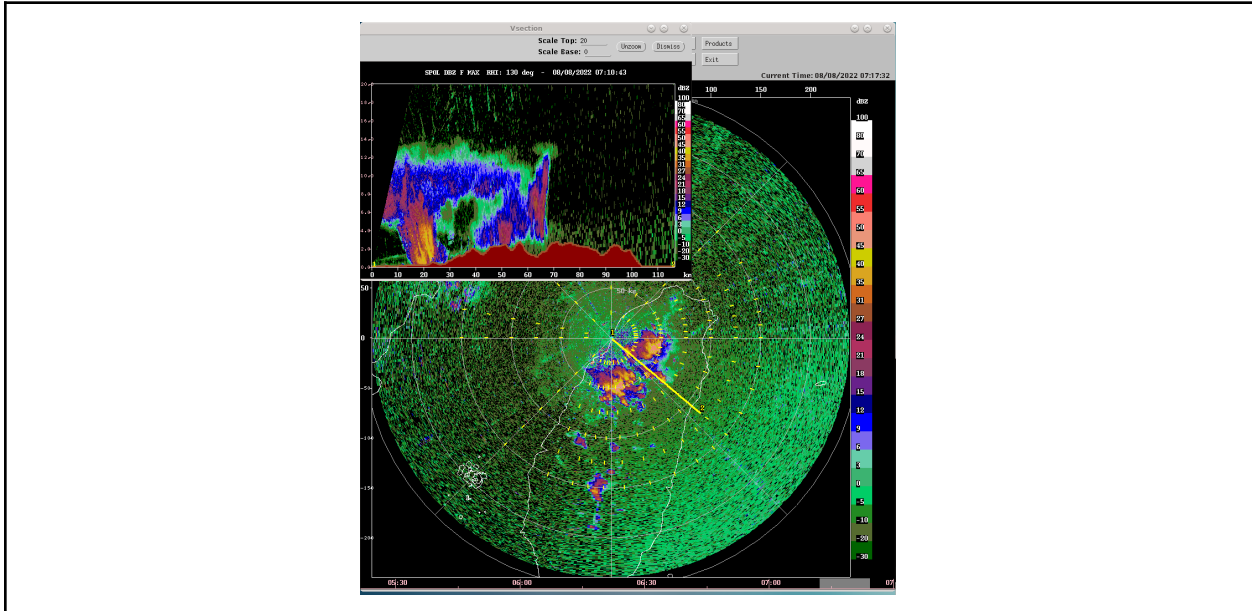


Figure 8: RHI to the ESE of S-Pol.

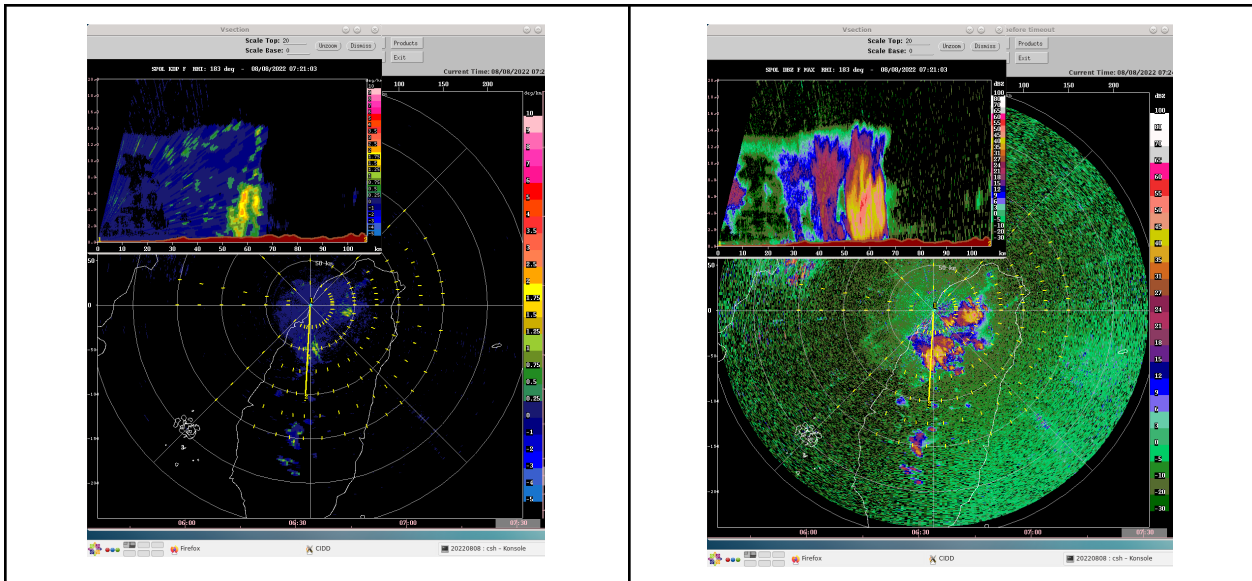


Figure 9: RHIs to the south of S-Pol.

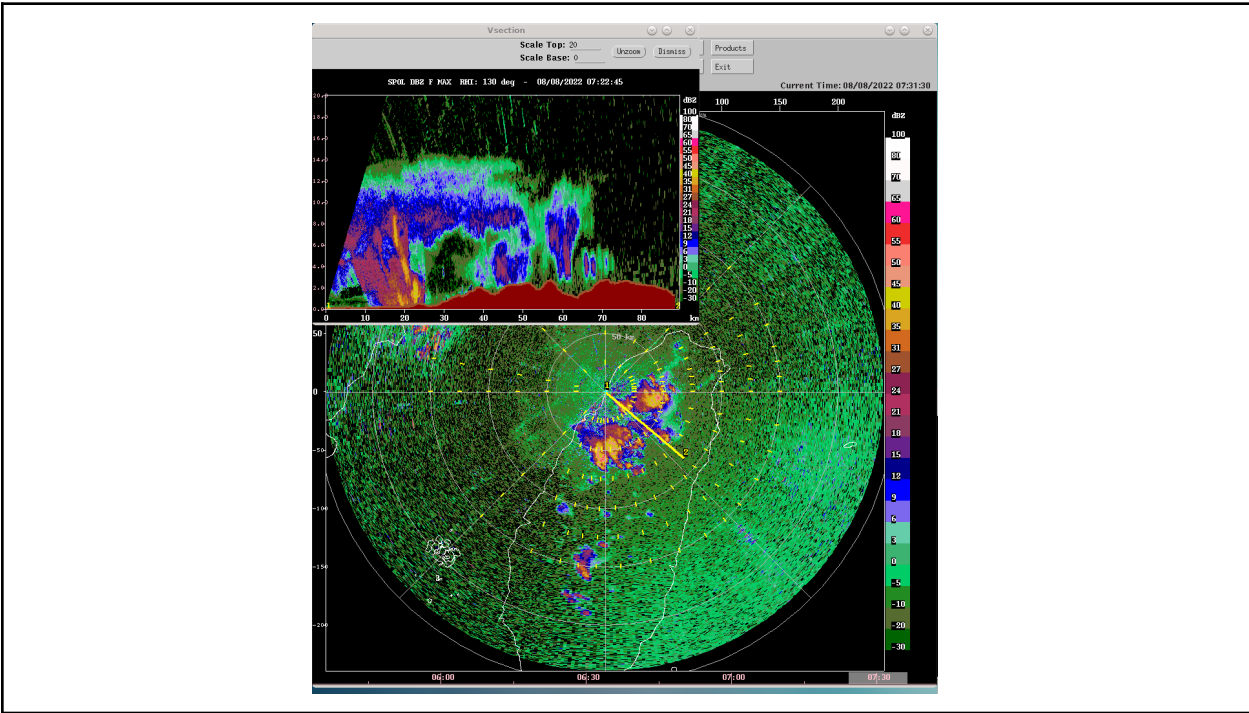
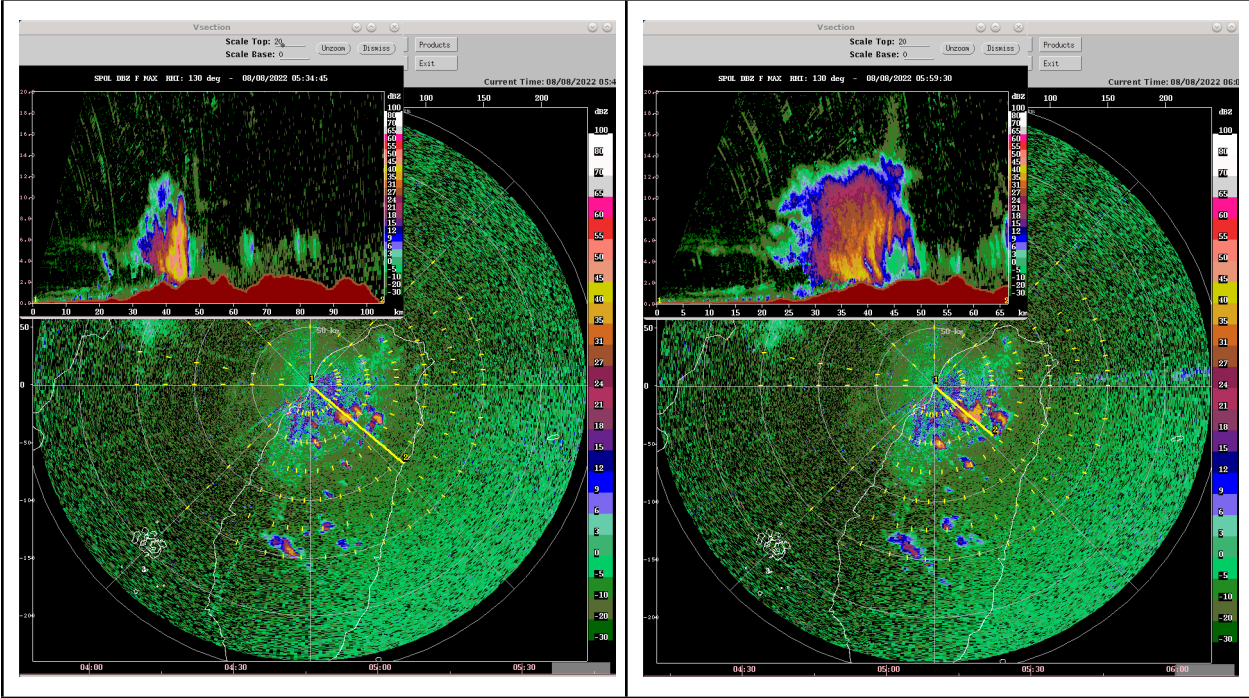


Figure 10: RHI to the ESE of S-Pol.



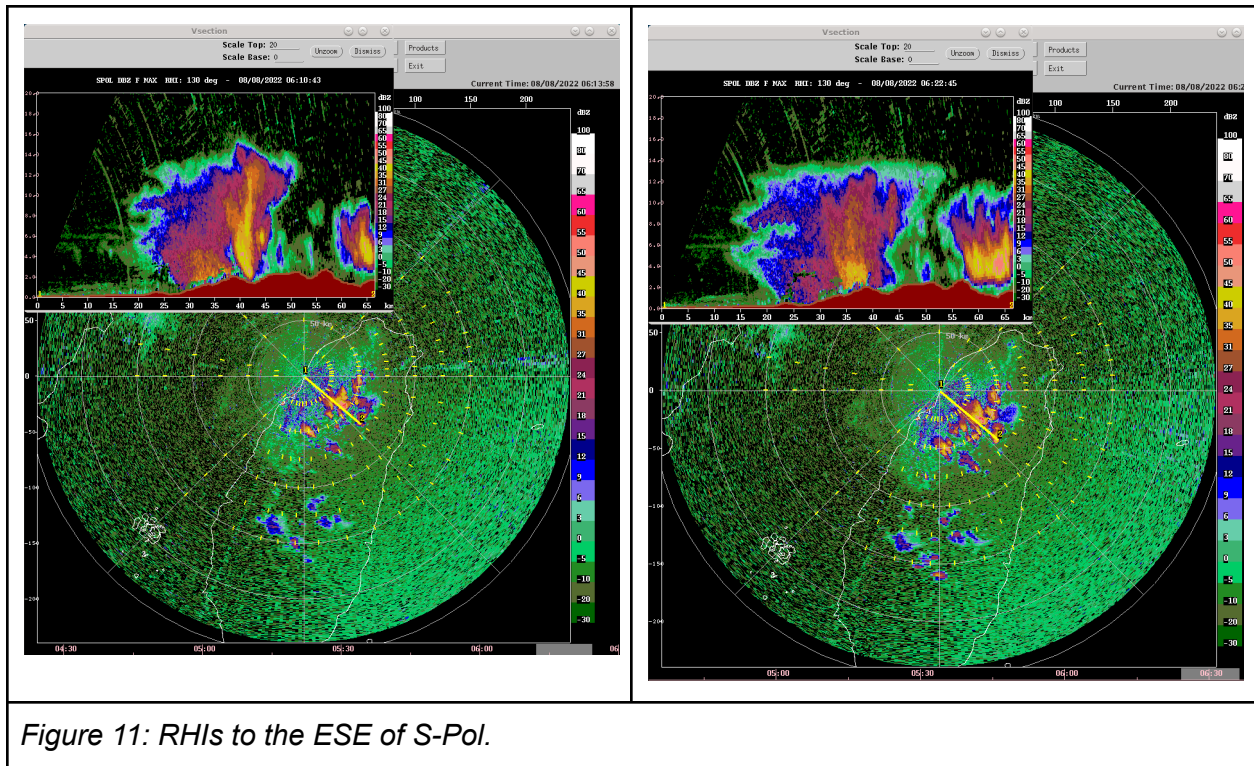


Figure 11: RHIs to the ESE of S-Pol.

CWB issues a heavy rain advisory for several counties due to prolonged rainfall activity over the northern mountains. The infrared satellite image shows the location of the rainfall system during the early afternoon hours preceding the heavy rain advisory.

Issue Time: 2022/08/08 14:45

Heavy Rain Advisory

1. Taoyuan City Mountain Area, Hsinchu County Mountain Area, Miaoli County Mountain Area, Yilan County Mountain Area.
Heavy Rain Advisory in effect from early this afternoon (08/08) through tonight (08/08)

Heavy Rain Advisory

Central Weather Bureau

Description

- Extremely Torrential Rain
- Torrential Rain
- Extremely Heavy Rain
- Heavy Rain

Area	Weather Advisory	Area	Weather Advisory
Keelung City		Chiayi City	
Taipei City		Chiayi County	
New Taipei City		Tainan City	
Taoyuan City	■	Kaohsiung City	
Hsinchu City	■	Pingtung County	
Hsinchu County	■	Yilan County	■
Miaoli County	■	Hualien County	
Taichung City		Taitung County	
Changhua County		Penghu County	
Nantou County		Kinmen County	
Yunlin County		Lienchiang County	



Figure 12: Heavy rainfall advisory over Taoyuan, photo from S-Pol looking East.

The infrared satellite loop gives the impression that a convective system was propagating southwestward during the afternoon to evening hours. Was it the same convective system propagating southwestward or was convection being triggered further southwest with time ahead of a boundary or other source of convective forcing?

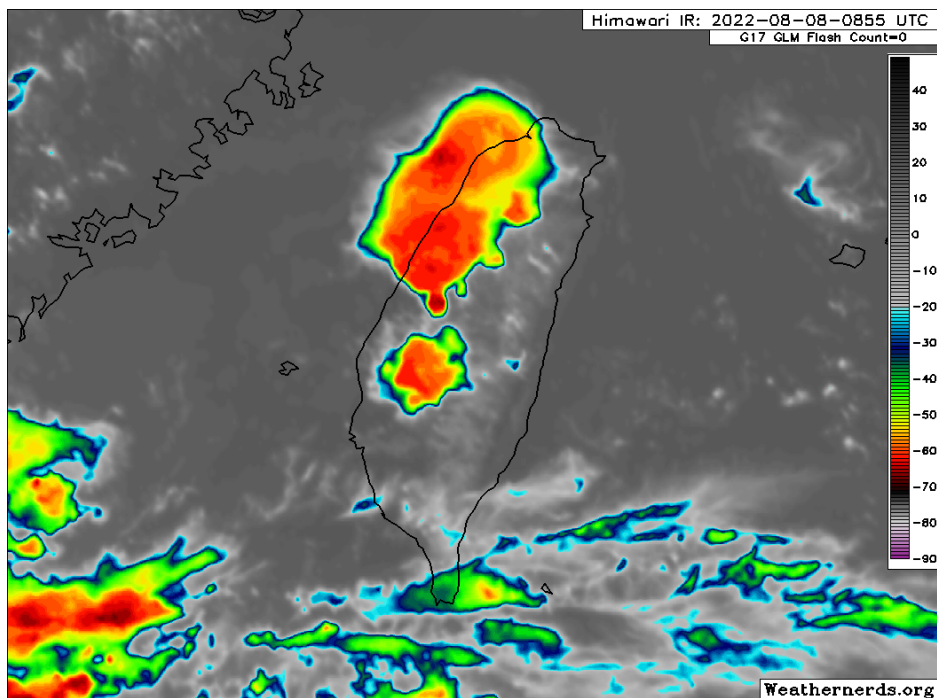


Figure 13: IR Himawari loop

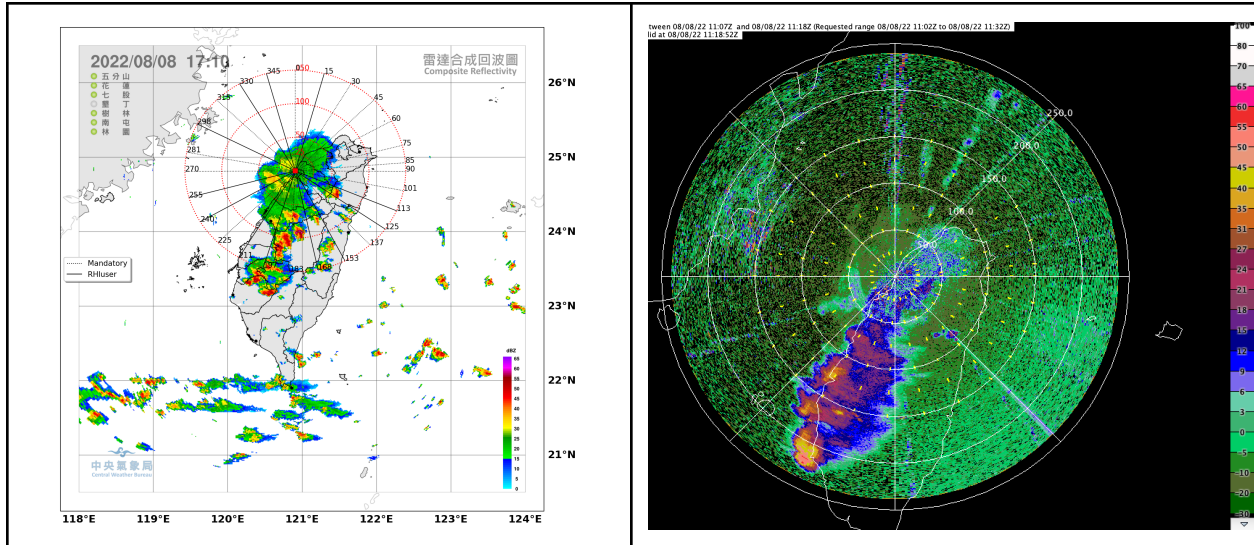


Figure 14: (left) 17:10 LT scanning strategy showing the broad stratiform region over Hsinchu during the early afternoon and (right) S-Pol screenshot showing the active convective region off Chiayi county during the late afternoon.

Verification (how well did the models do for this event?)

None of the models predicted the broad stratiform region over Hsinchu or the apparent southwestward propagating convective system with trailing stratiform. Nonetheless, all numerical guidance correctly pointed at afternoon thunderstorms over the mountains and no afternoon thunderstorms over Taipei basin.

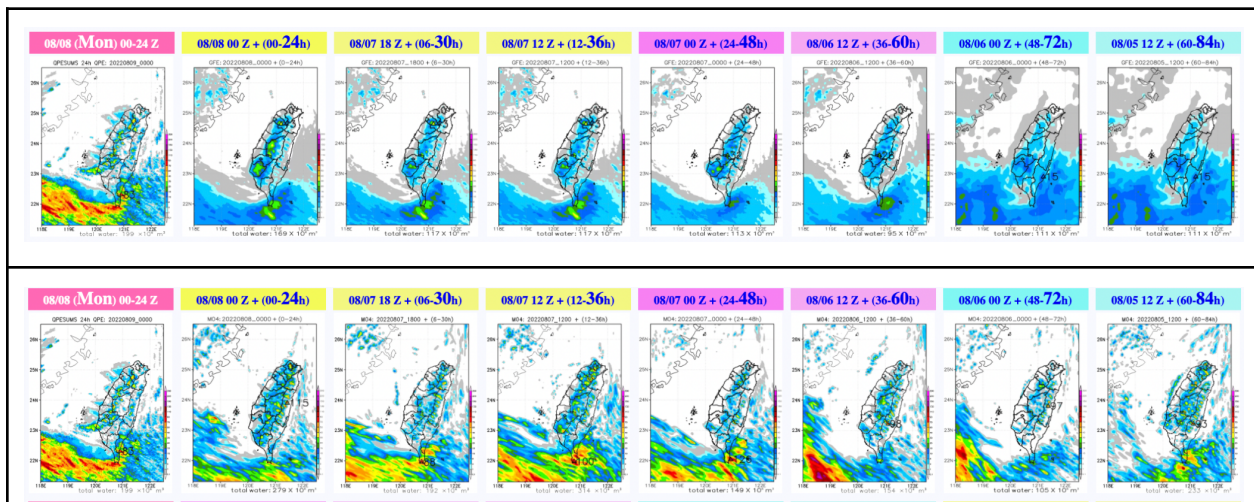


Figure 15: Official (top) and WRFD (bottom) 24-hr verification for August 10th.

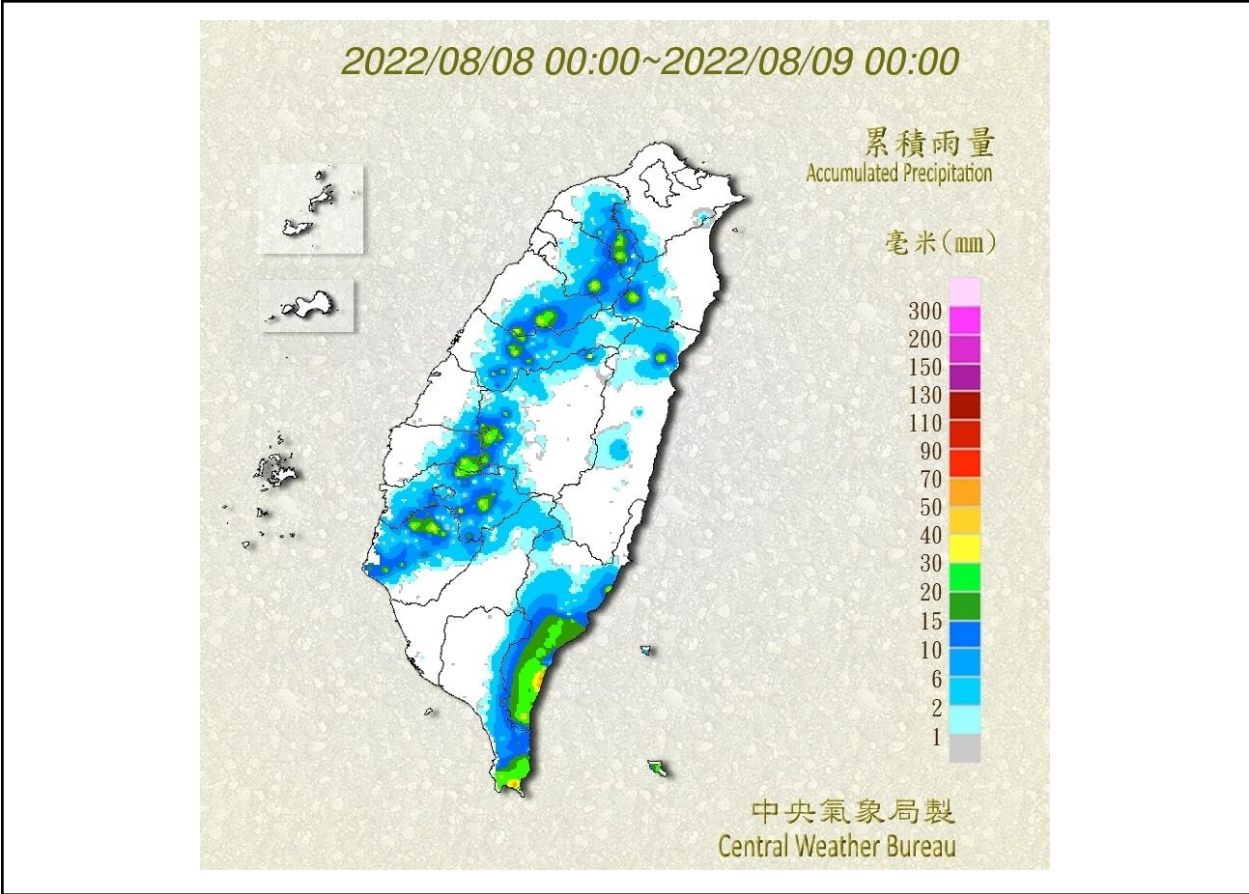
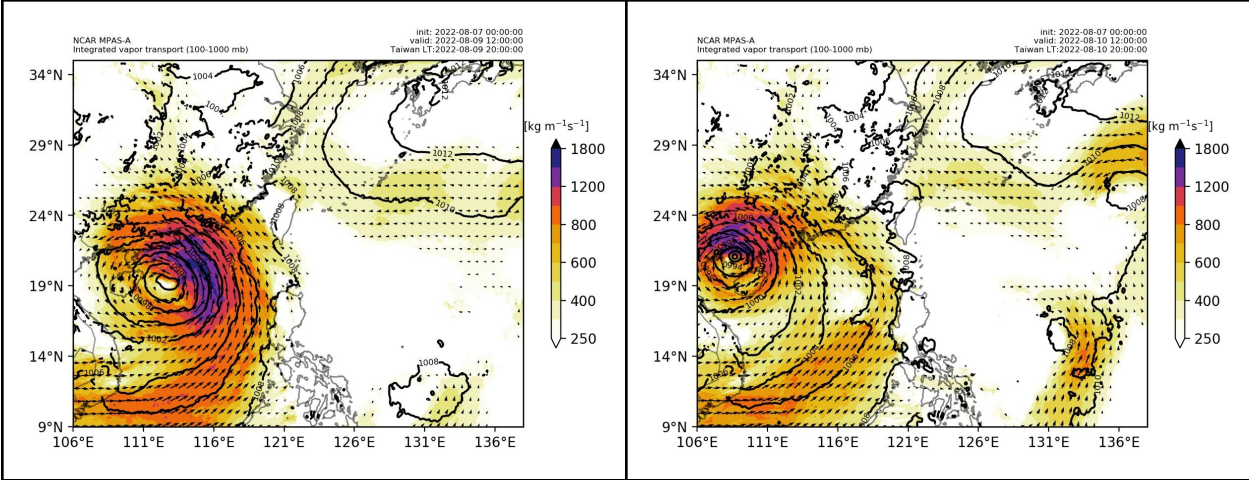


Figure 16: 24-hr rainfall accumulation from CWB. Note that this is LT.

Days One and Two Outlook (24-72 h; 00 UTC 9 Aug - 00 UTC 11 Aug)

97W, or a “monsoon low” or “monsoon gyre” depending on your preference, is developing to the south of Taiwan. This is driving the southeasterly winds.



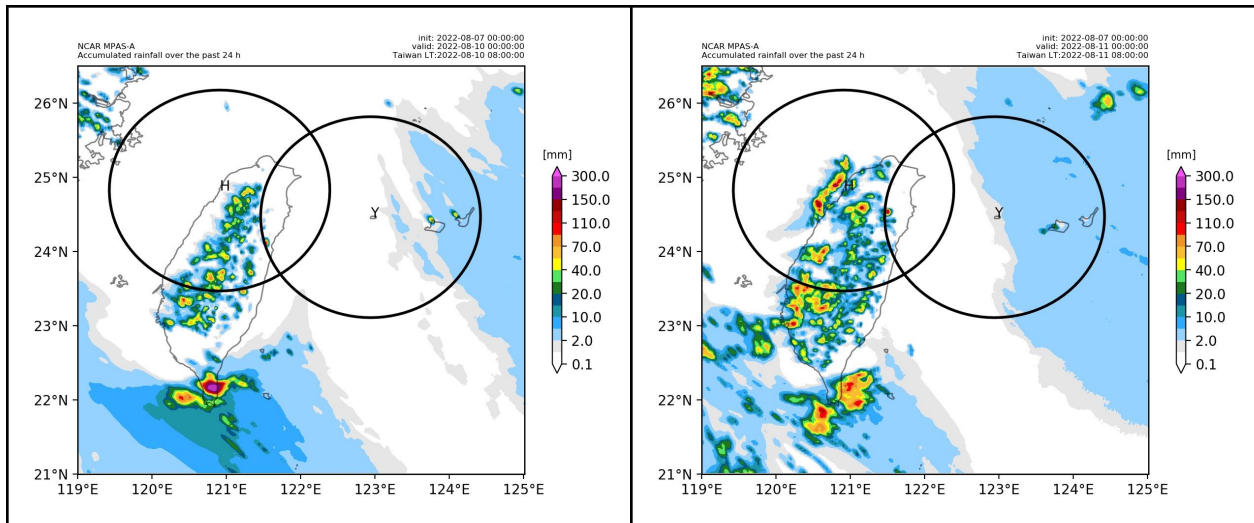


Figure 17: MPAS run initialized 0z on 7 Aug. Left is Day 1, right Day 2. (top) is IVT at the halfway point of the day (12z 9 Aug and 10 Aug) and (bottom) is 24-hr accumulated precipitation at the end of the day (0z 10 and 11 Aug).

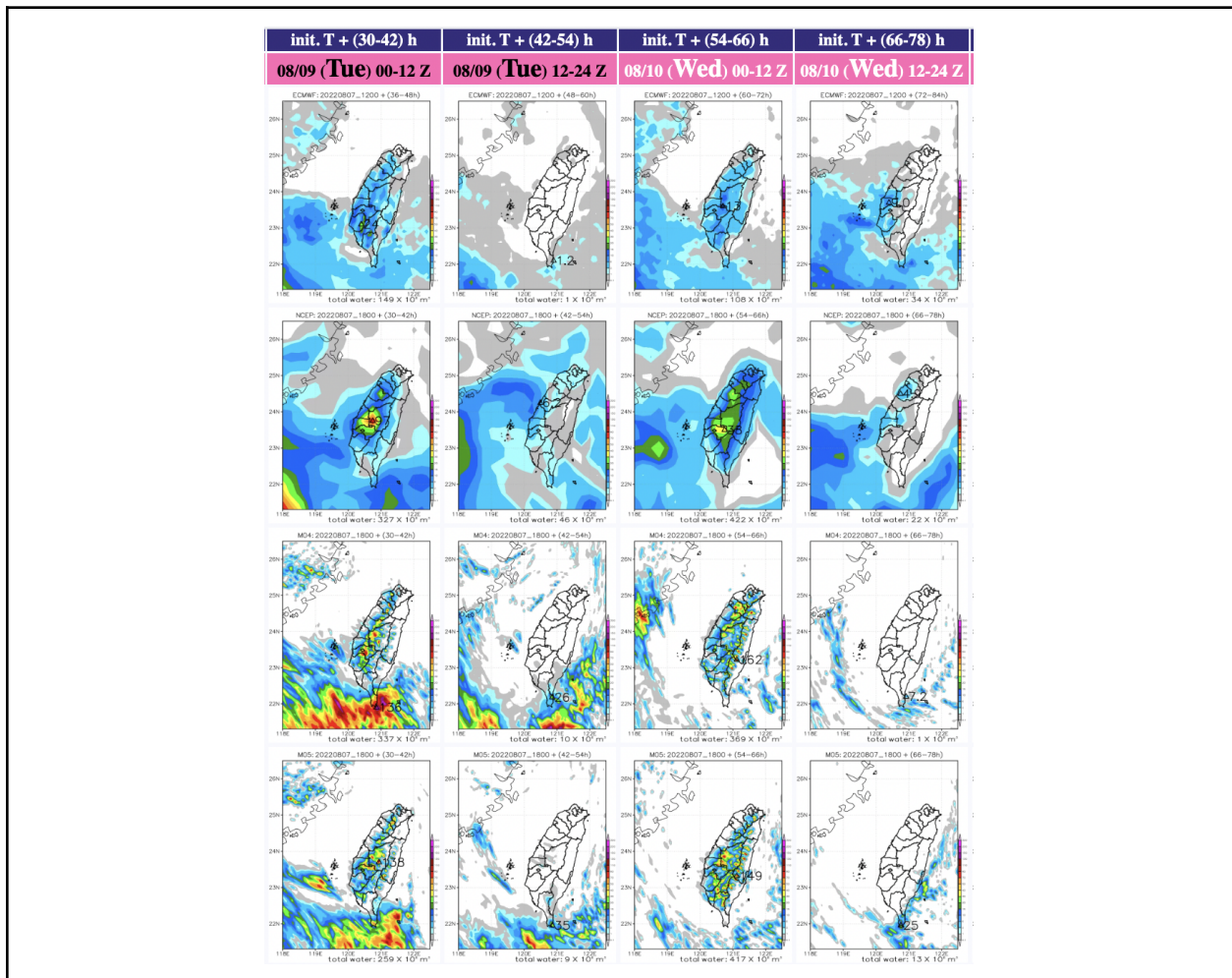


Figure 18: Initialized 18z Aug 7, for Day 1 and 2 in 12-hourly increments.

Extended Outlook (Days 3-5; 00 UTC 11 Aug - 00 UTC 14 Aug)

No extended outlook needed!