

PRECIP Daily Science Report

0000 UTC 10 Aug 2022 - 0000 UTC 11 Aug 2022

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Summary:

Today was the final day of operations in Taiwan—what a milestone! We are closing this phase of the field project with a synoptic configuration that is unfavorable for heavy rain over Taiwan and Yonaguni. A monsoon gyre continues to march westward, while the subtropical high dominates over Taiwan (Figs. 2,4,5,6). Taiwan and Yonaguni are located in a region of minimal water vapor transport (Fig. 2). Rainfall accumulations were limited to afternoon thunderstorms over the mountains of Taiwan (Fig. 1), and this was well predicted by most numerical guidance (Figs. 2, 3, 7). MPAS also accurately predicted rainfall activity over and off Hsinchu during the overnight to early morning hours of August 11. We operated S-Pol in IOP mode with the RHI angles corresponding to the same angles used on August 5–9 (our modified “INITIATION” strategy) until 10 pm local. S-Pol operated in UNATTENDED mode until 0Z August 11.

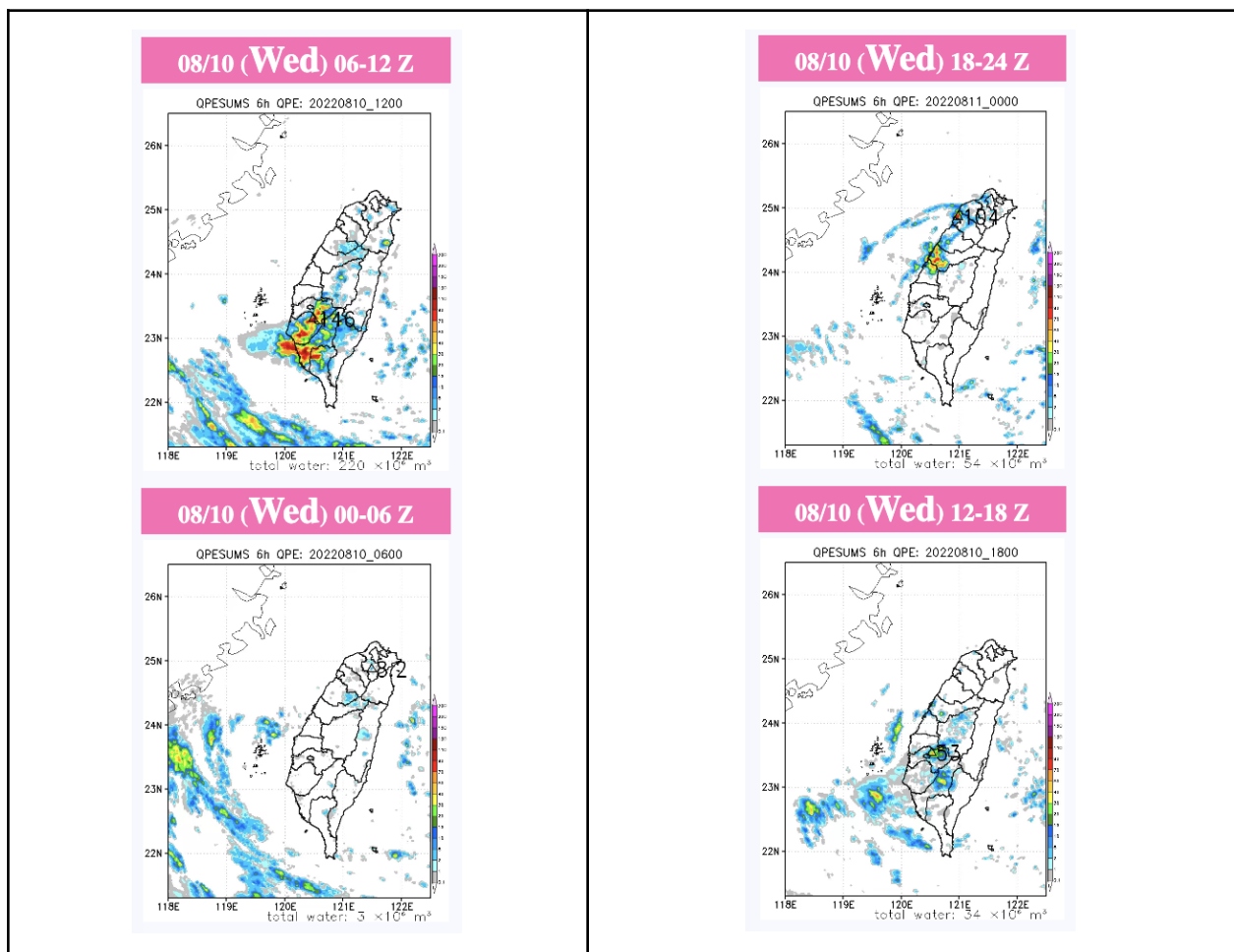


Figure 1: 6-hourly rainfall on 8/10.

Day Zero Forecast (0-24 h; 00 UTC 10 Aug - 00 UTC 11 Aug)

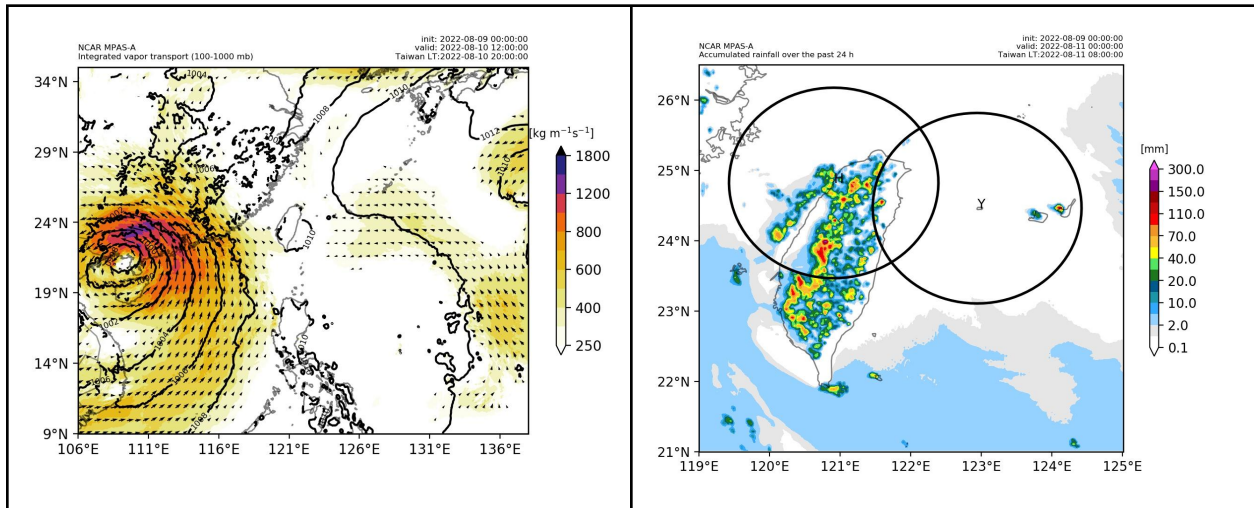


Figure 2: MPAS initialized 0z Aug 9 showing 24-hr accumulated rainfall at the end of Day 0, and IVT at 12z.

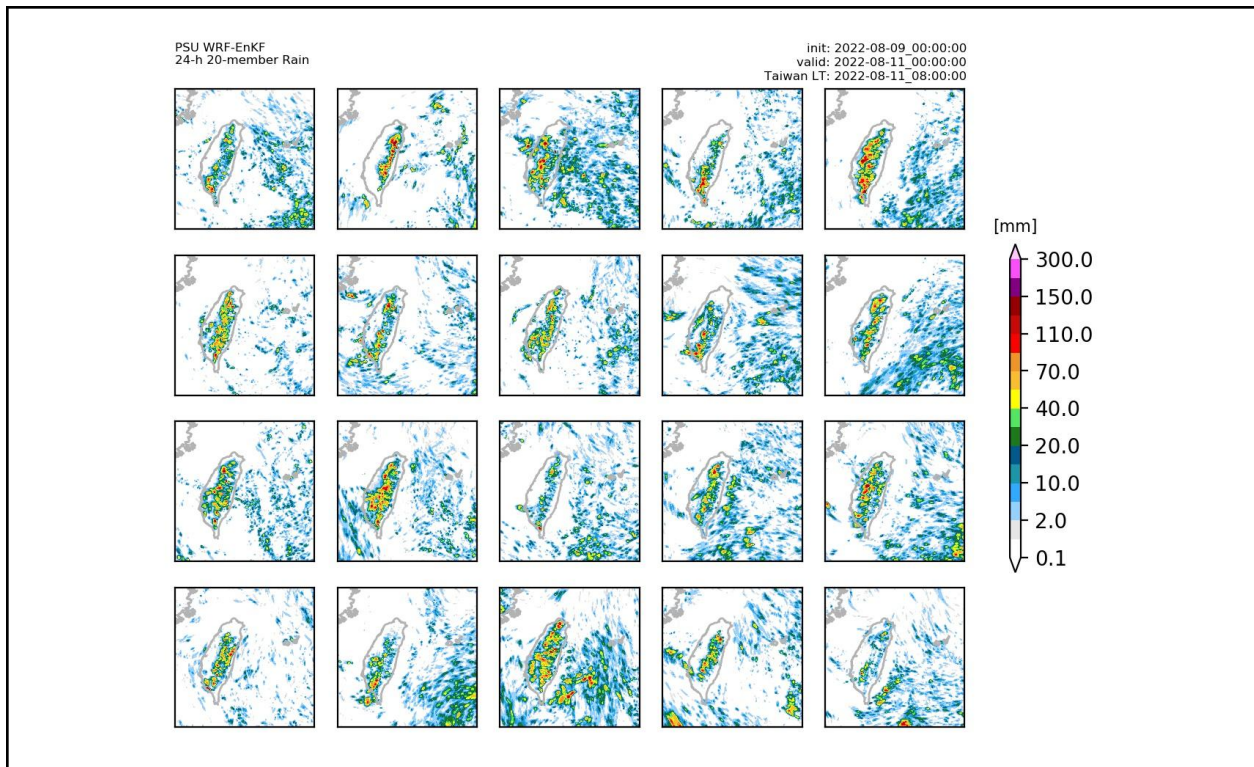


Figure 3: PSU WRF ensemble initialized 0z Aug 9, valid at the end of Day 0 at 0z Aug 11.

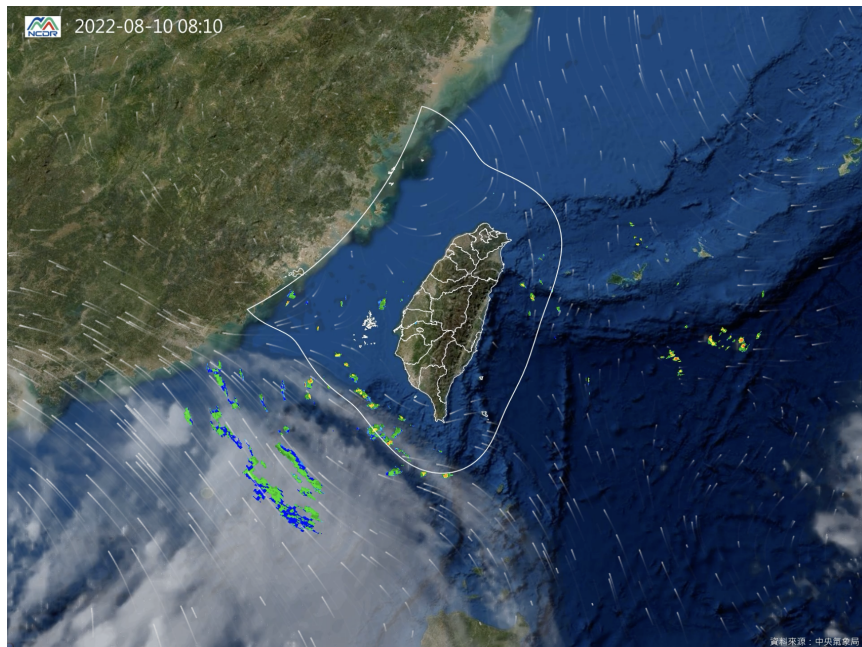


Figure 4: Satellite and radar image from 8:10 am LT on Aug 10.

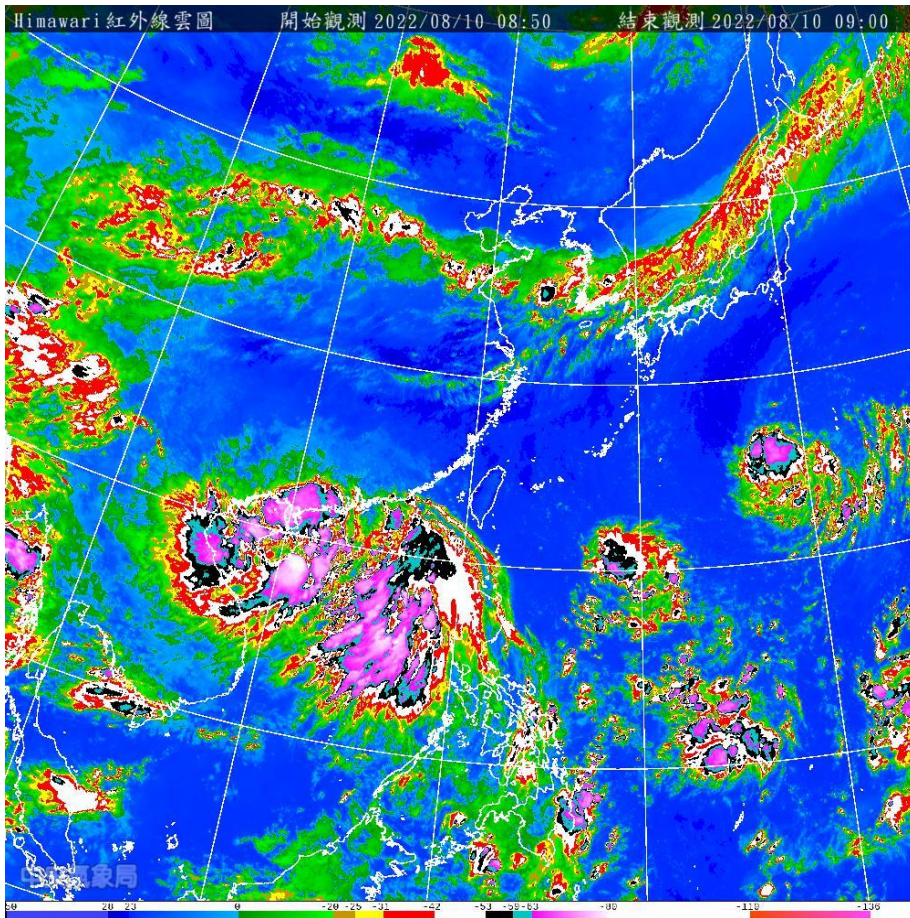
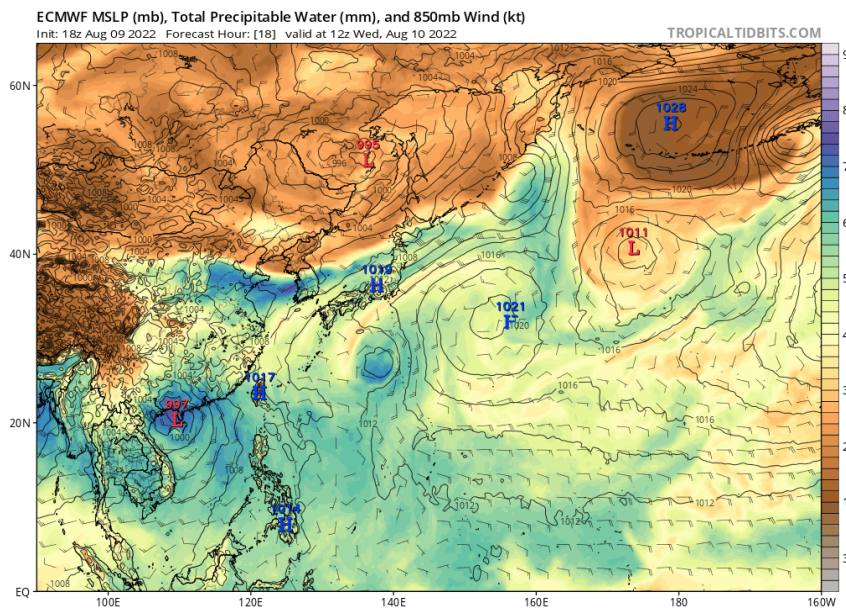


Figure 5: Himawari satellite Color IR image from 8:50 am LT on Aug 10.



GFS MSLP (mb), Total Precipitable Water (mm), and 850mb Wind (kt)
 Init: 18z Aug 09 2022 Forecast Hour: (18) valid at 12z Wed, Aug 10 2022

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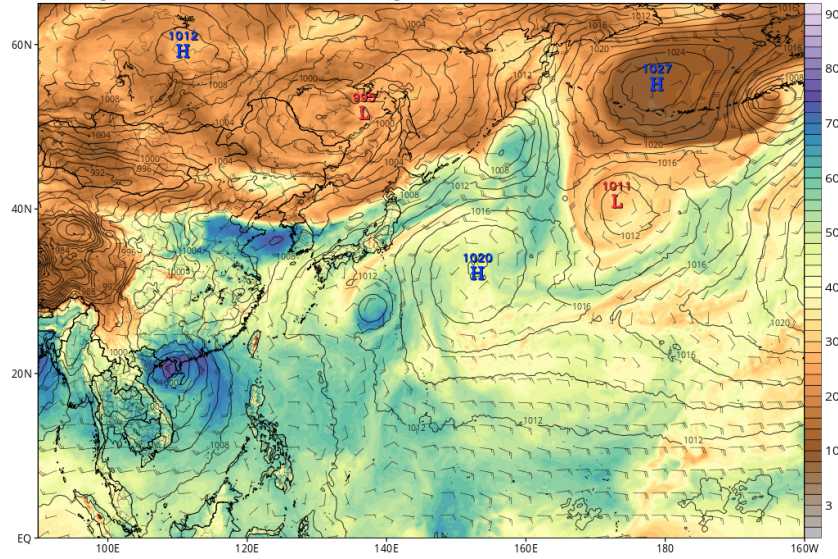


Figure 6: EC & GFS, initialized 18z Aug 9, showing PWAT and 850 mb Wind for the whole Pacific at 12z Aug 10.

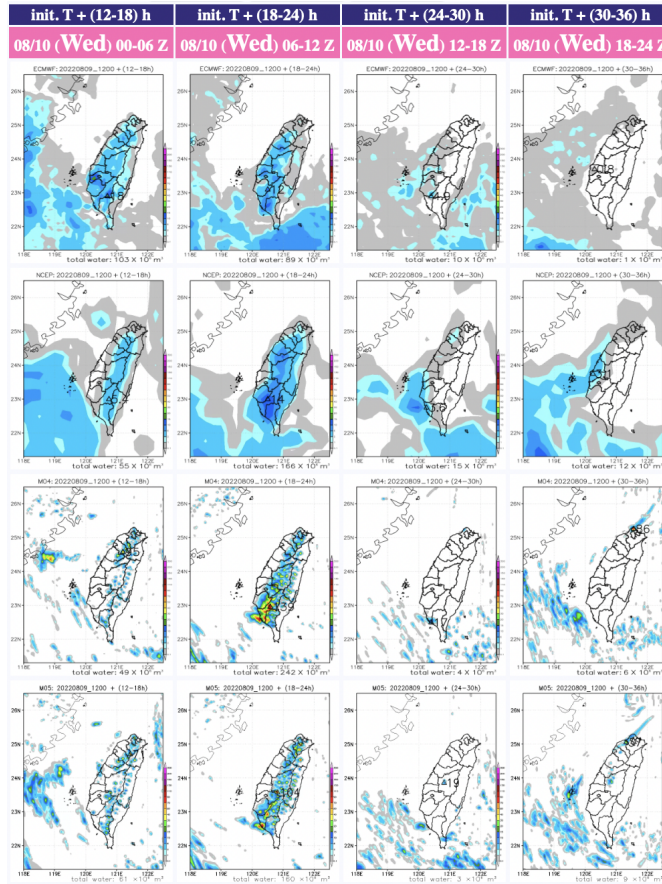


Figure 7: 6-hourly QPF on Day 0 from (top to bottom) EC, NCEP, WRFD and TWRF initialized 12z August 9th.

Discussion

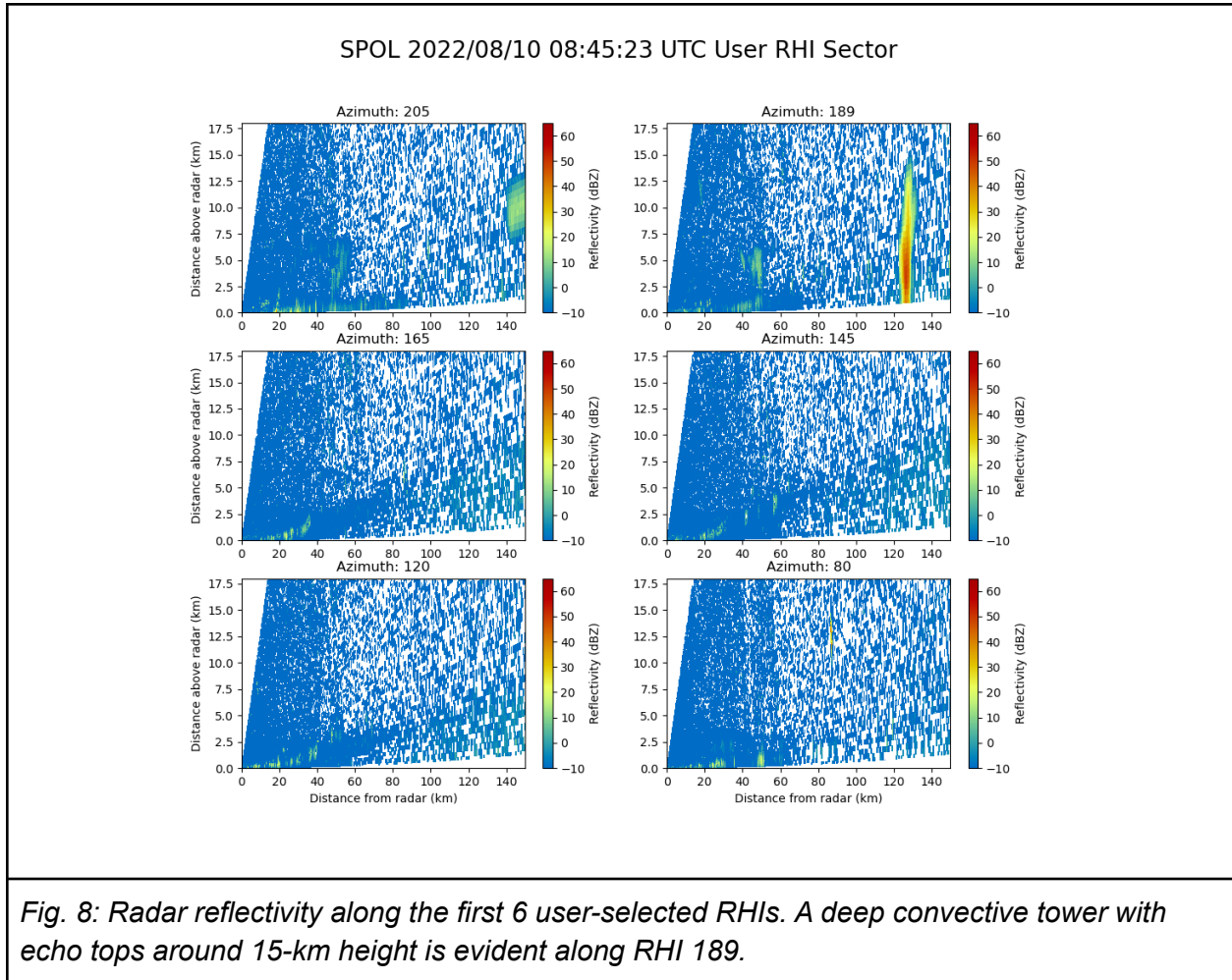


Fig. 8: Radar reflectivity along the first 6 user-selected RHIs. A deep convective tower with echo tops around 15-km height is evident along RHI 189.

Extremely Heavy Rain Advisory

1. Tainan City,
Extremely Heavy Rain Advisory or Torrential Rain Advisory in effect from this evening (08/10) through tonight (08/10)
2. Kaohsiung City, Pingtung County, Hengchun Peninsula,
Heavy Rain Advisory or Extremely Heavy Rain Advisory in effect from this evening (08/10) through tonight (08/10)
3. Nantou County Mountain Area, Yunlin County Mountain Area, Chiayi City, Chiayi County,
Heavy Rain Advisory in effect from this evening (08/10) through tonight (08/10)

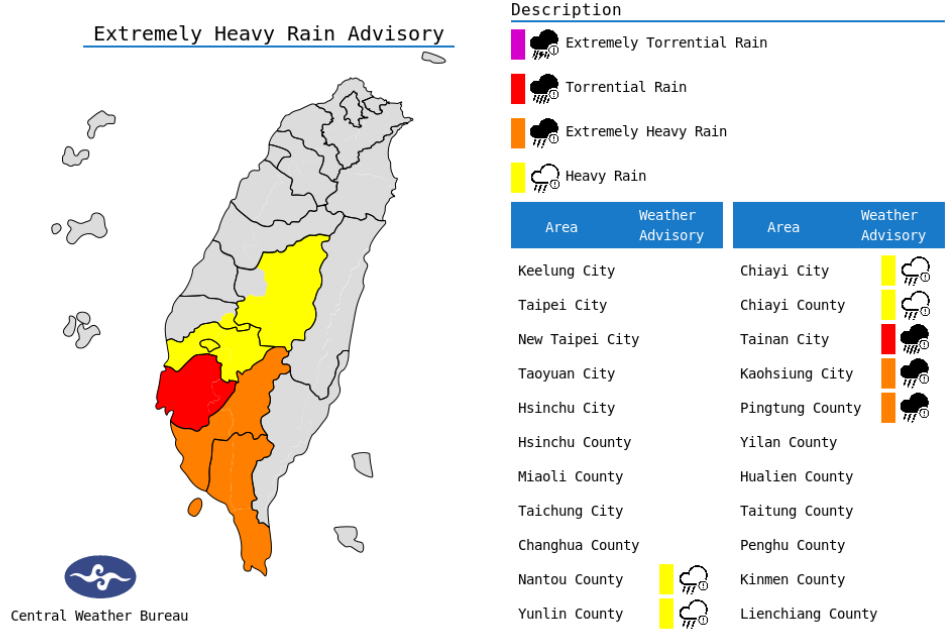


Fig. 9: Torrential rain advisory issued for Tainan county, with heavy rain or extremely heavy rain advisories for the surrounding counties.

SPOL 2022/08/11 00:05:08 UTC PPI 0.5 deg

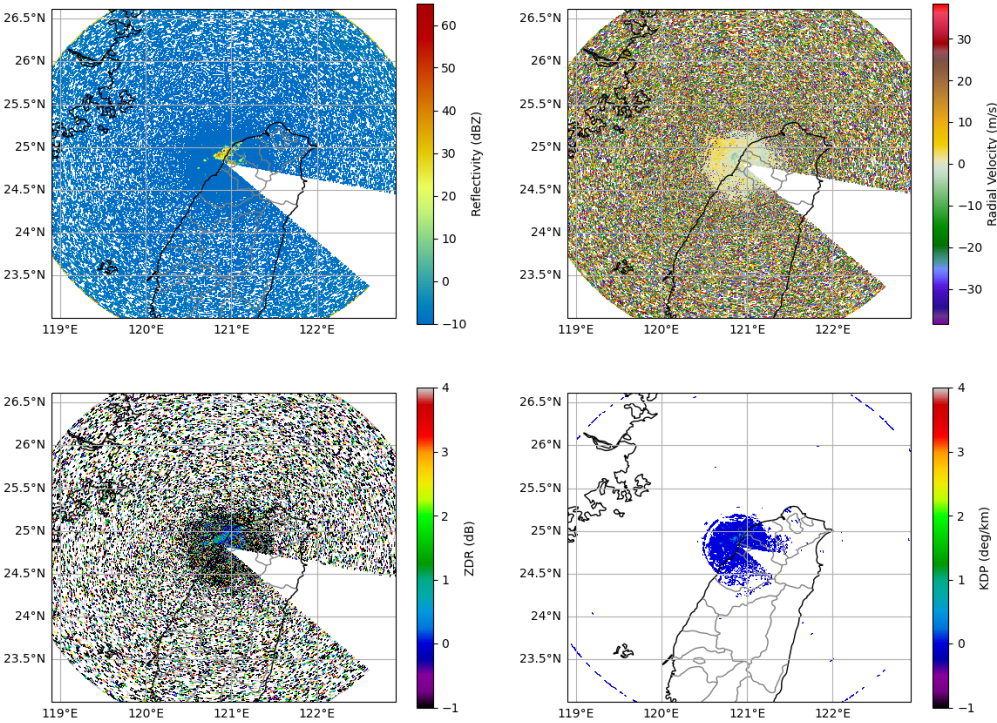


Fig. 10: Last S-Pol images taken at 00:05 UTC on August 11. Localized convection is evident over and west of S-Pol.

Issue Time: 2022/08/11 06:40

Heavy Rain Advisory

1. Hsinchu City, Hsinchu County, Miaoli County, Taichung City, Changhua County,
Heavy Rain Advisory in effect from this morning (08/11) through late this morning (08/11)

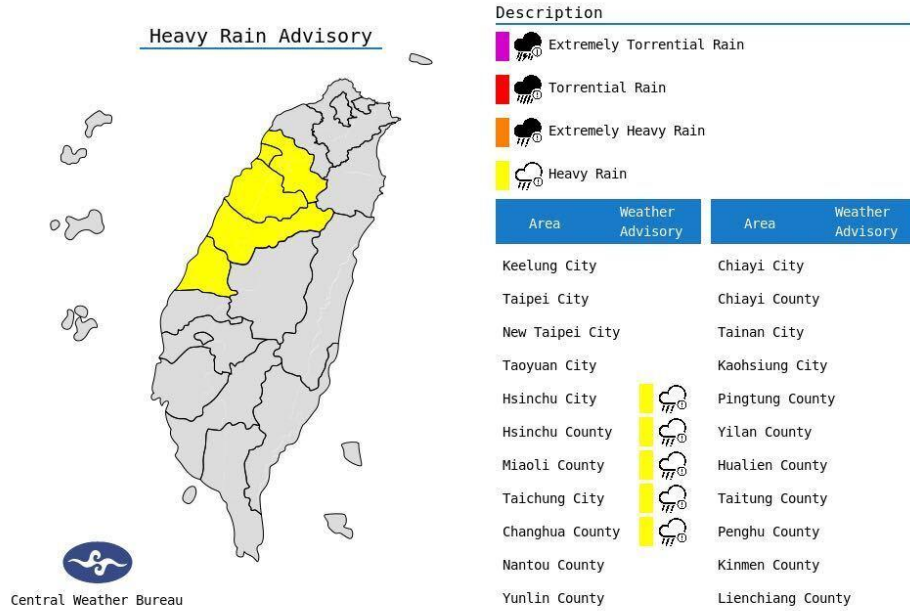
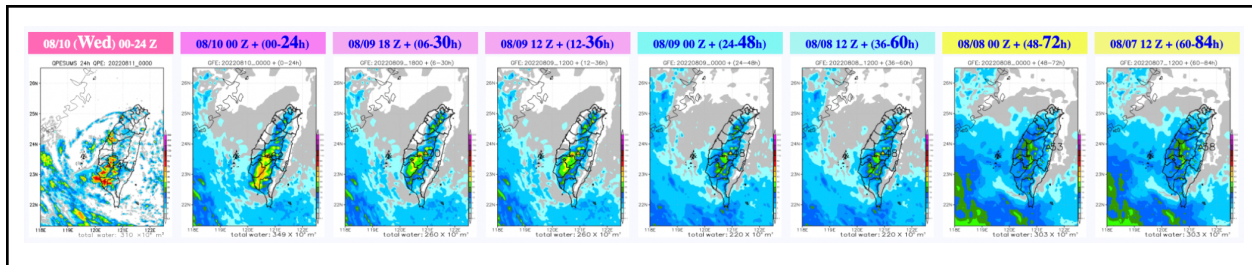


Fig. 11: Heavy rain advisories issued on the morning of August 11 for Hsinchu city, and Hsinchu, Miaoli, Taichung, and Changhua counties.

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



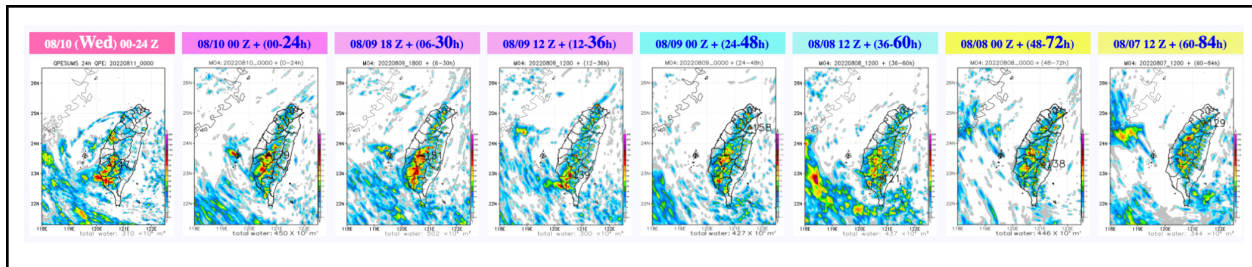


Figure 12: Official (top) and WRFD (bottom) 24-hr verification for August 10th.

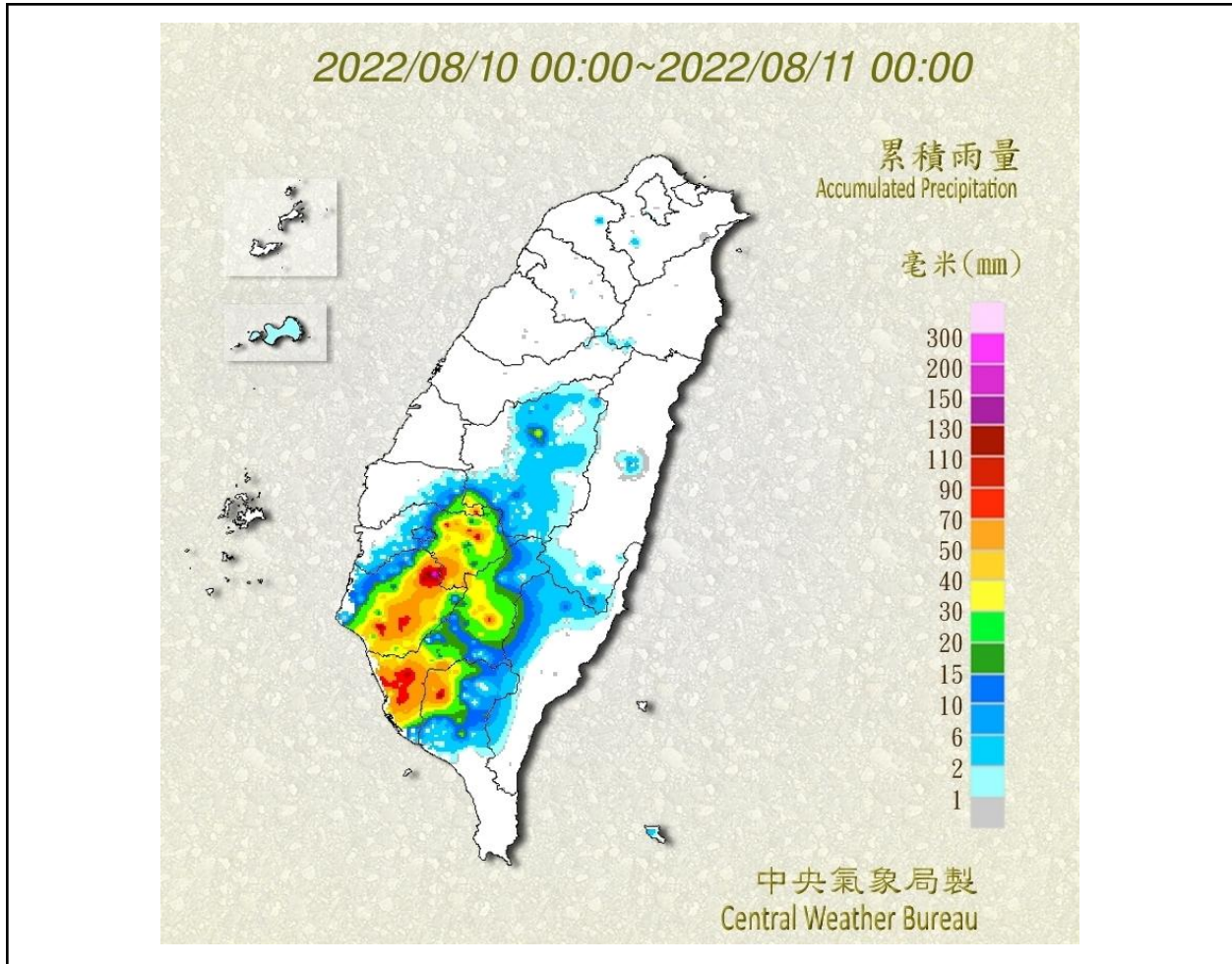


Figure 13: 24-hr rainfall accumulation from CWB. Note that this is LT.

Days One and Two Outlook (24-72 h; 00 UTC 11 Aug - 00 UTC 13 Aug)

We continue to monitor conditions for Yonaguni. The chances of precipitation remain low for the upcoming days.

Extended Outlook (Days 3-5; 00 UTC 13 Aug - 00 UTC 16 Aug)

We focus only on the chances of tropical cyclone activity for the extended outlook, but the chances of a tropical cyclone remain low at this point. The ECMWF and GFS continue to suggest a weak tropical low-pressure system approaching Yonaguni on August 13–14. MPAS also captures that system, which is accompanied by anomalously high precipitable water vapor. While this system may bring increased chances of rainfall to Yonaguni compared to current conditions, it does not meet our criteria for extended operations in Yonaguni (which would be an invest declared by August 11 or model consensus of a significant tropical cyclone).