TAHOPE Weather Summary (08/08~08/12)

Date(UTC): 2022/08/08
Author (in alphabetical order): Chung-Yen Cheng, Jun-Yu Chen, Liang-Yi Kuo
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Analysis of current weather (0808 morning)

From true-color satellite imagery we can see that some conventions coming from the southeast, due to the environmental southeasterly flow and the moisture coming from the south of subtropical high and tropical disturbance 97W (Figure 1). On radar imagery we can see that some of the convections has already influenced our landmass, such as Hengchun Peninsula and Taitung (Figure 2).

From the skew-T diagram in Banqiao (Figure 3), we can see a relatively stable atmosphere at about 950hPa and 750hPa because of the subtropical high to the north. Environmental southeasterly flow is not really favorable for afternoon thunderstorms in Taipei basin. In comparison, the skew-T diagram in Pingtung (Figure 4) shows a more unstable condition with no inversion and more moist air throughout the troposphere. This indicates that the atmosphere is much more unstable in the south and near the mountainous region in the west. Therefore, the afternoon thunderstorms activities today would happen mainly in the mountains and western plains in Taiwan.

For tropical system updates, 97W is still merging itself together (Figure 5). Strong convictions is popping up far from the center, which is the characteristic of a monsoonal low. From ASCAT (Figure 6) we can also see stronger wind in the outer region of the cyclonic flow, which indicates that 97W needs more consolidation for development.

8/7 18Z Synoptic Forecast: (Figure 7)

8/8-9 Subtropical high is located south of Japan,Tropical disturbance 97W is in the South China sea and moves northeastward to north westward toward south China. The wind around Taiwan is southeasterly , bringing the outer rainband of 97W into southeastern Taiwan.There are another two weak tropical disturbances at northeast of Guam island and east of Philippines, both of them follow the steering flow moving northwestward and then quickly dissipate.

8/10 Subtropical high retreats to the east of Japan, the wind around Taiwan is still southeasterly. The tropical disturbance 97W is making landfall at Hainan island in the afternoon.

8/11-12 Subtropical high holds its position at east of Japan, the wind around Taiwan shifts from southeasterly to southerly.Tropical disturbance 97W weakens and finally disappears.

8/4 12Z EC Ensemble forecast for tropical system: (Figure 8)

Most ensemble members forecast the track of monsoon depression in the South China sea, and the trend of heading toward southern China.About the disturbance at the east of Philippines, members also show the trend that it will move northwestward, then enter the region ranging from the ryukyu islands to Bashi channel, with the central pressure around 1000hPa or even weaker intensity for the tropical disturbance.

QPF verification (Figure 9):
Initial at 8/6 18Z, forecast time 8/7 00Z-12Z

The four models (EC,NCEP,WRFD,TWRF) captured the rainfall areas well, which were distributed in the central mountainous region and the southwestern plain areas. NCEP, WRFD, TWRF models capture the rainfall hotspots well. WRFD slightly overestimated the amount of maximum rainfall. Most ensemble members captured the rainfall distribution well, though they slightly overestimated the amount of maximum rainfall.

QPF forecast (Figure 10, 11):

From August 8 to 10, due to the circulation of 97W in the South China Sea, the prevailing wind over Taiwan is southeasterly. This could bring rainfall to the windward side such as the southeastern areas and the southern tip of Taiwan. As for Taipei basin, because it is in the leeward side, the southeasterly wind could cause subsidence after crossing the mountain range. Therefore, the forecasts show that the afternoon thunderstorm signal is weaker there. Afternoon thunderstorms will happen in the central mountainous region and the southwestern plain of Taiwan.

From August 11 to 12, because 97W moves further west and even dissipates, there would be less moisture near the southeastern part of Taiwan, and the afternoon thunderstorm signal is weaker than previous days all over Taiwan. The wind direction will slightly turn south, so there might be afternoon thunderstorms over Taipei Basin.

Figure 1. Himawari Satellite Imagery for Taiwan (true-colored) on 08/08, 01:00 UTC.

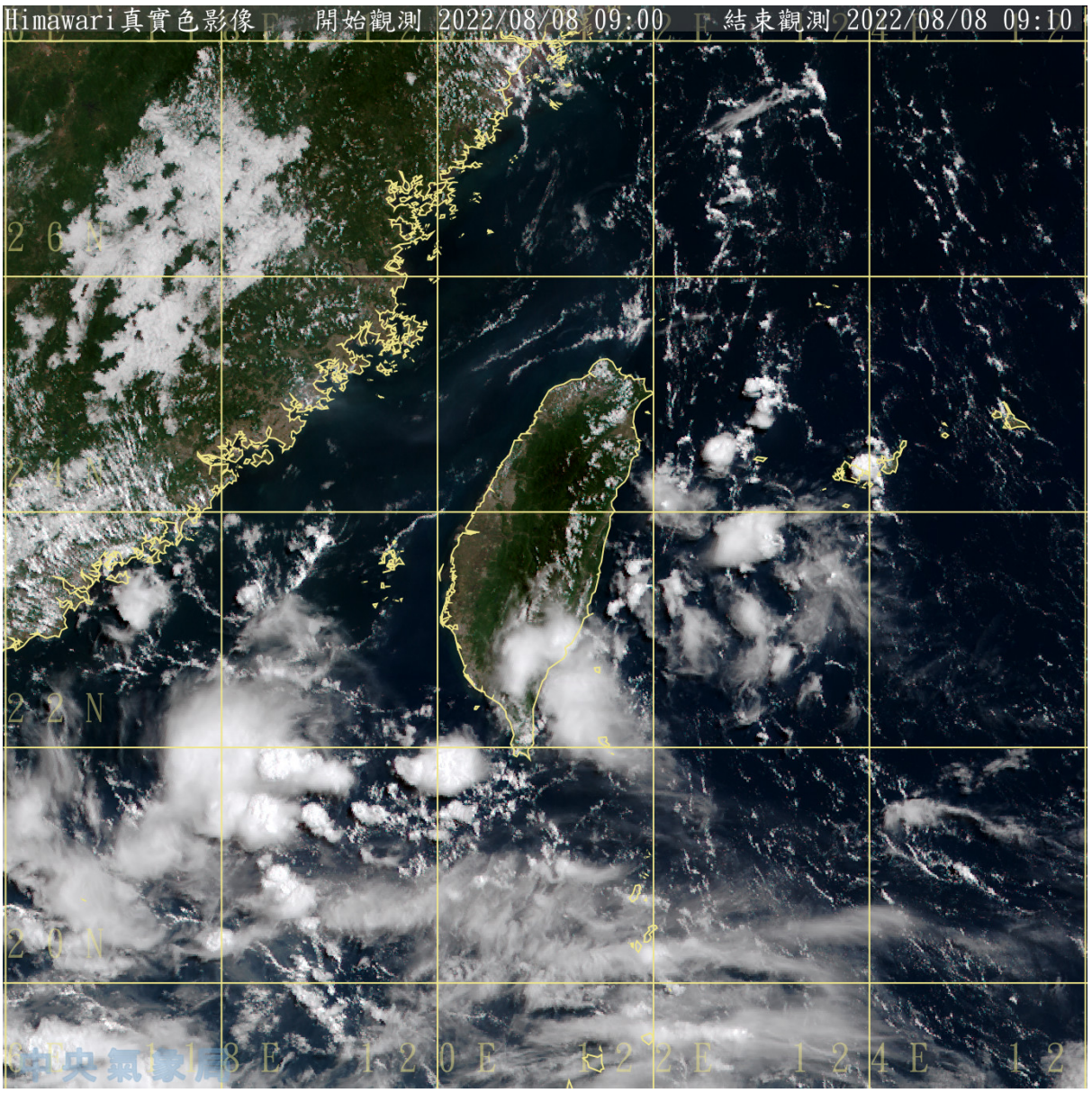

Himawari真實色影像 開始觀測 2022/08/08 09:00 結束觀測 2022/08/08 09:10
26 N
24 N
22 N
20 N
118 E
120 E
122 E
124 E
中央氣象局

Figure 2. Radar Imagery at 01:00 UTC 08/08.

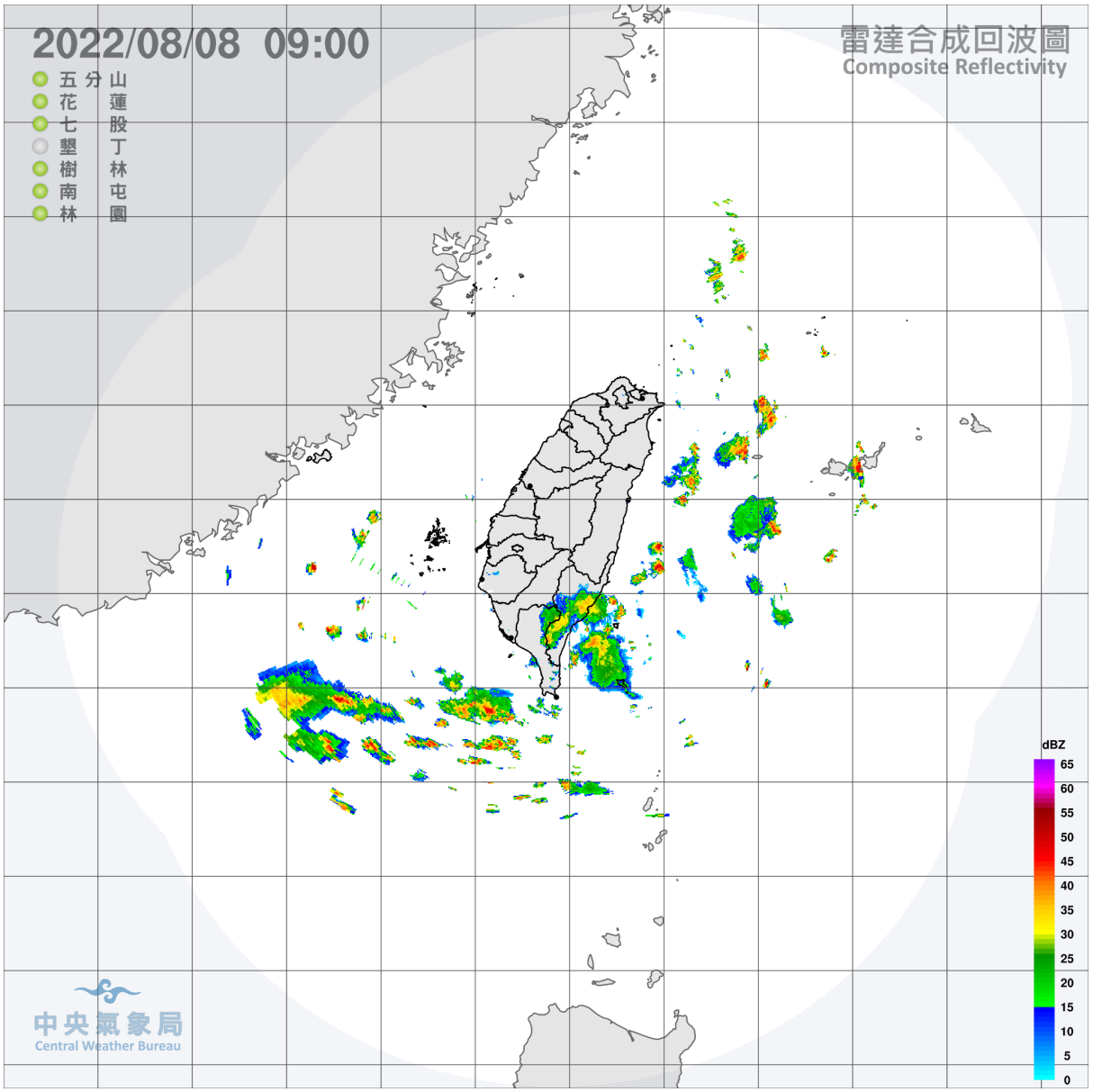


Figure 3. Skew-T diagram in Banqiao on 08/08, 00:00 UTC

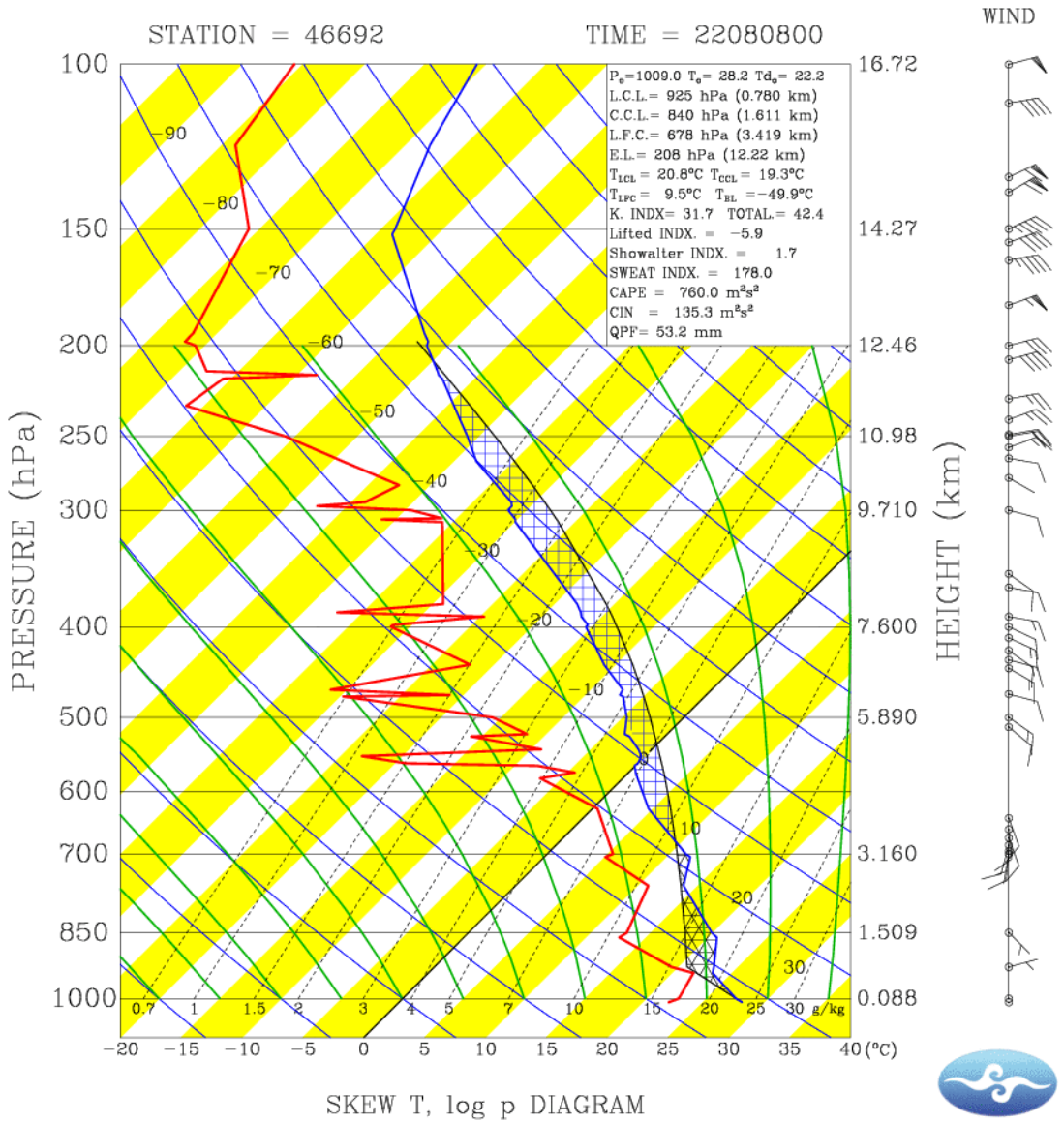


Figure 4. Skew-T diagram in Pingtung on 08/08, 00:00 UTC

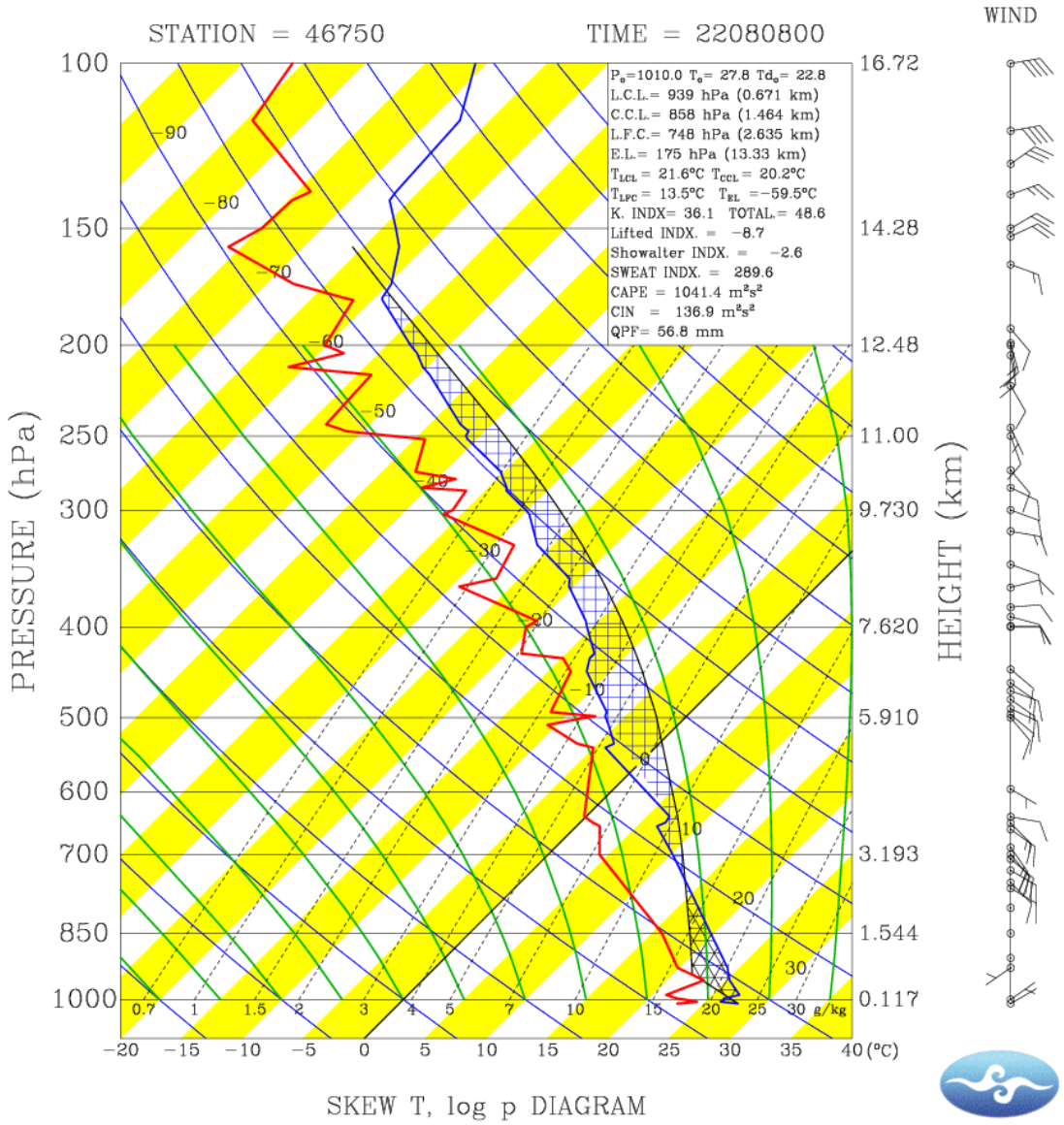


Figure 5. Himawari Satellite Imagery for 97W (IR, color-enhanced) on 08/08, 02:50 UTC.

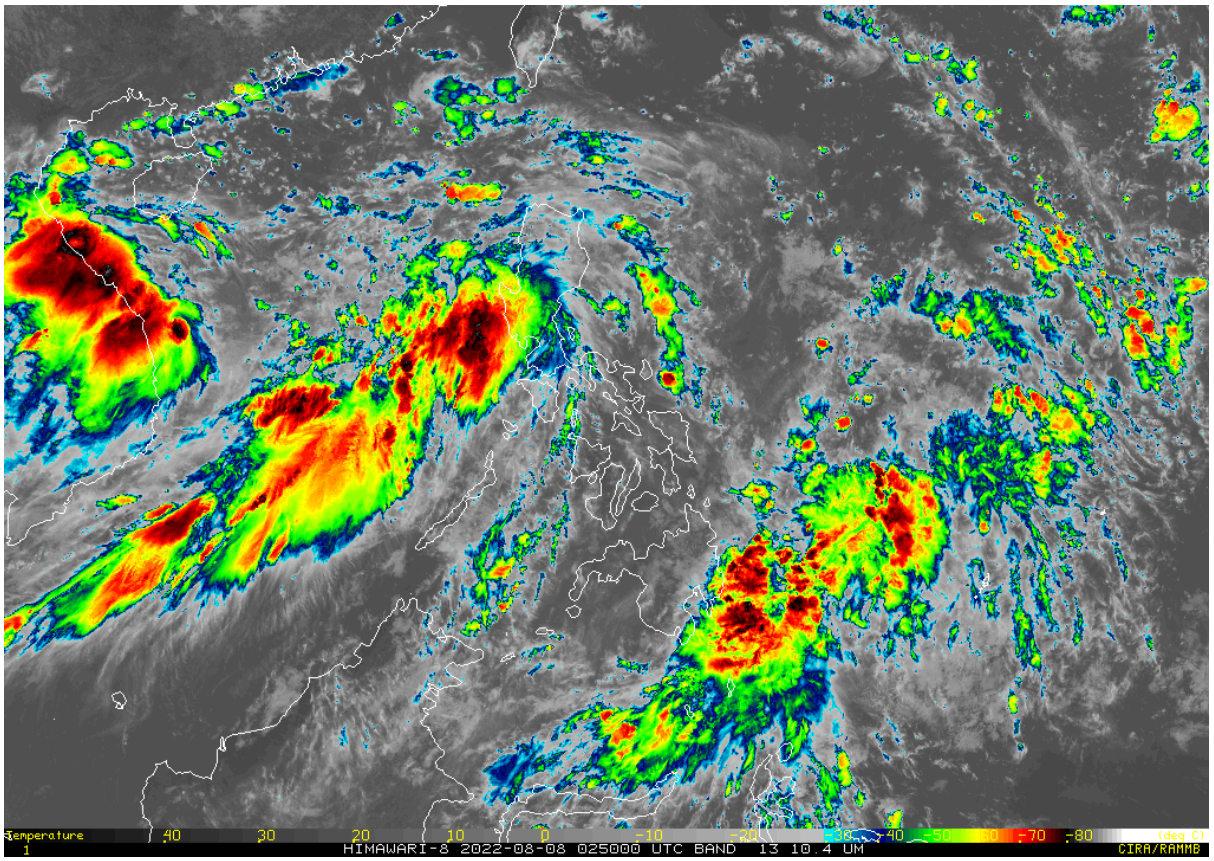


Figure 6. ASCAT-derived surface wind on 08/07, 13:05 UTC.

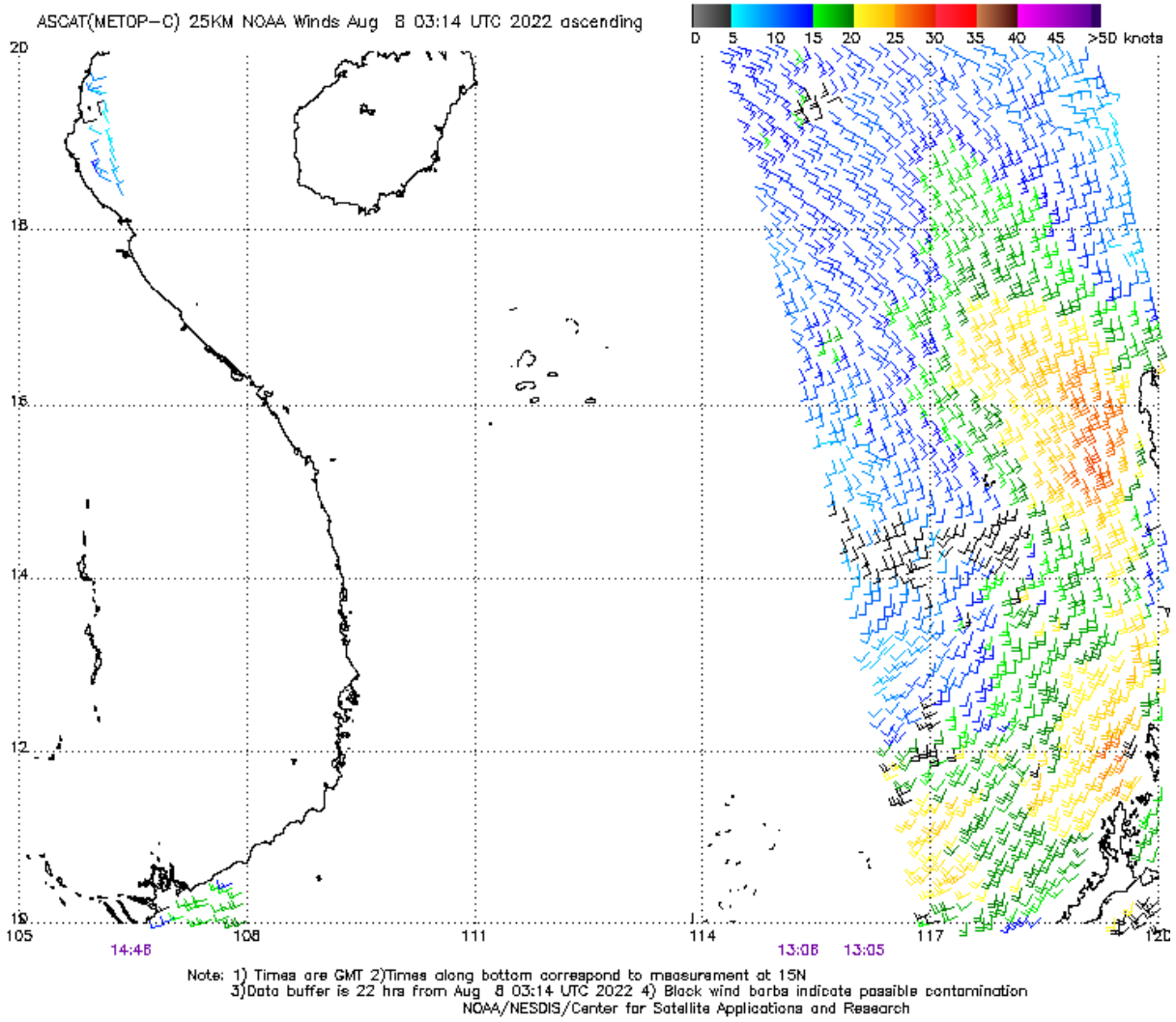
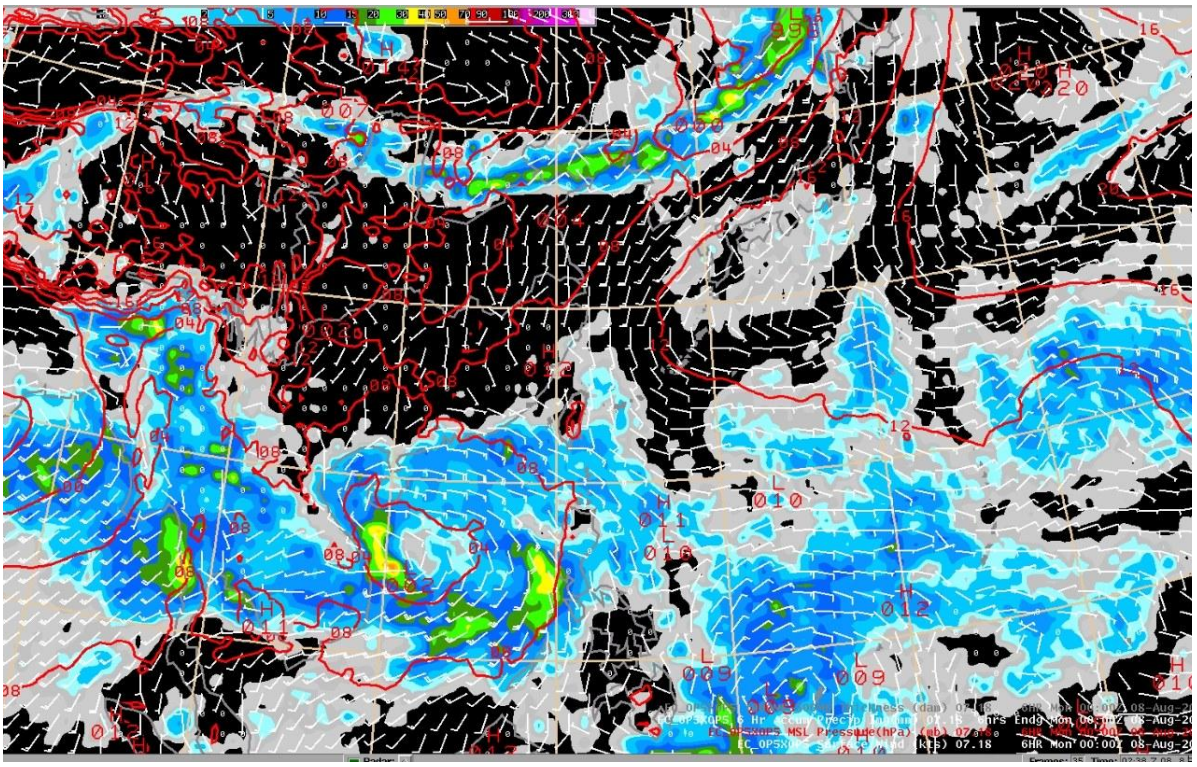
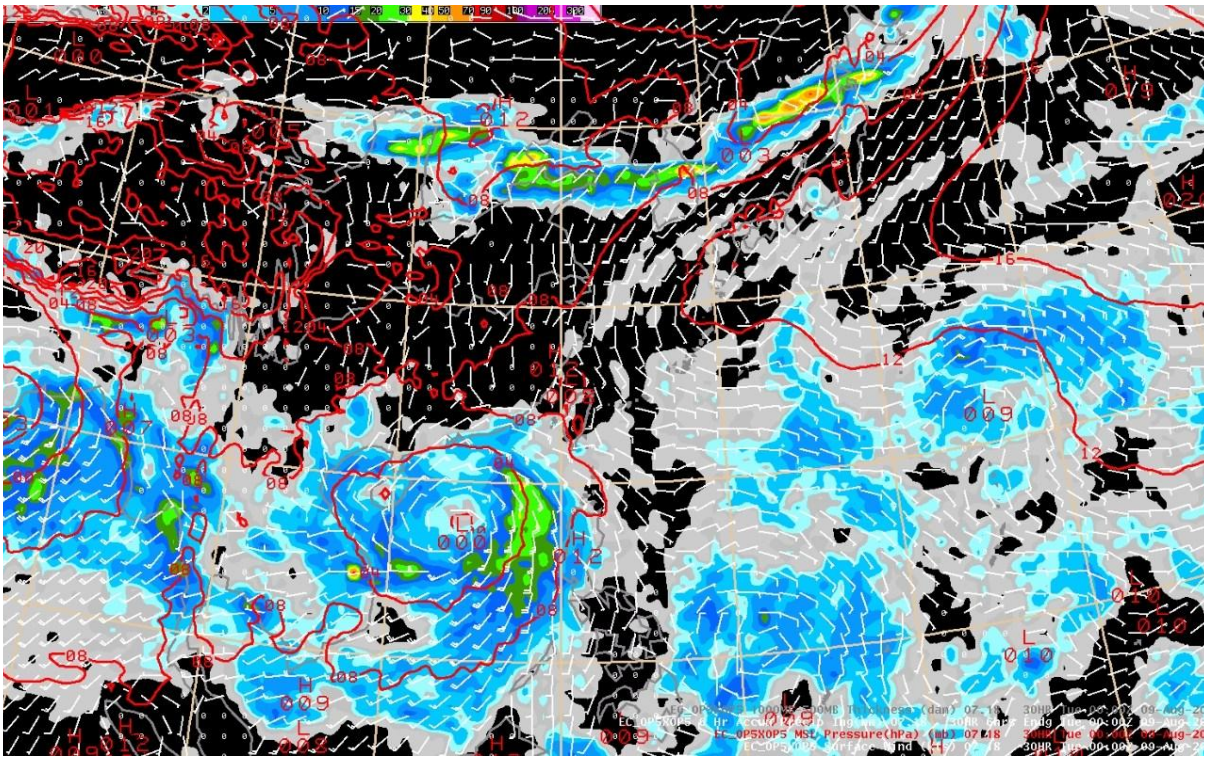


Figure 7. 8/8-8/12 Synoptic field forecast(Init: 8/7 18 UTC)

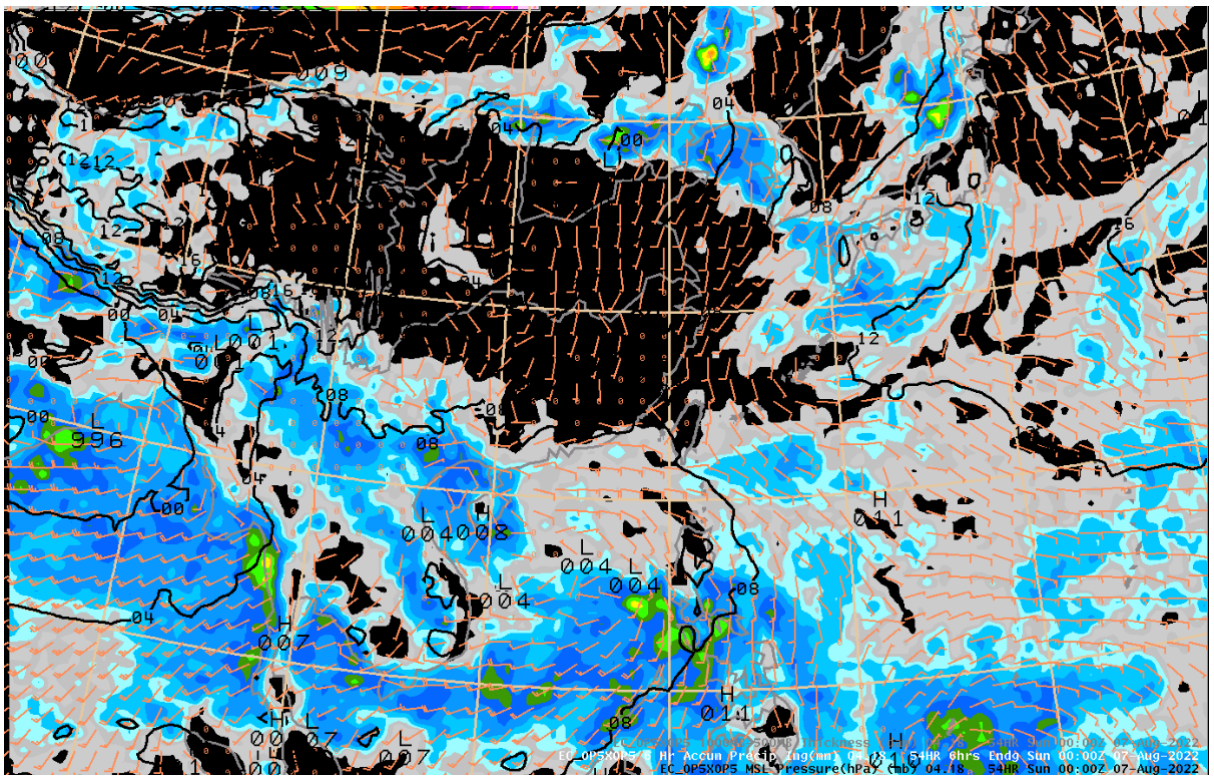
(a) 8/8 00 UTC



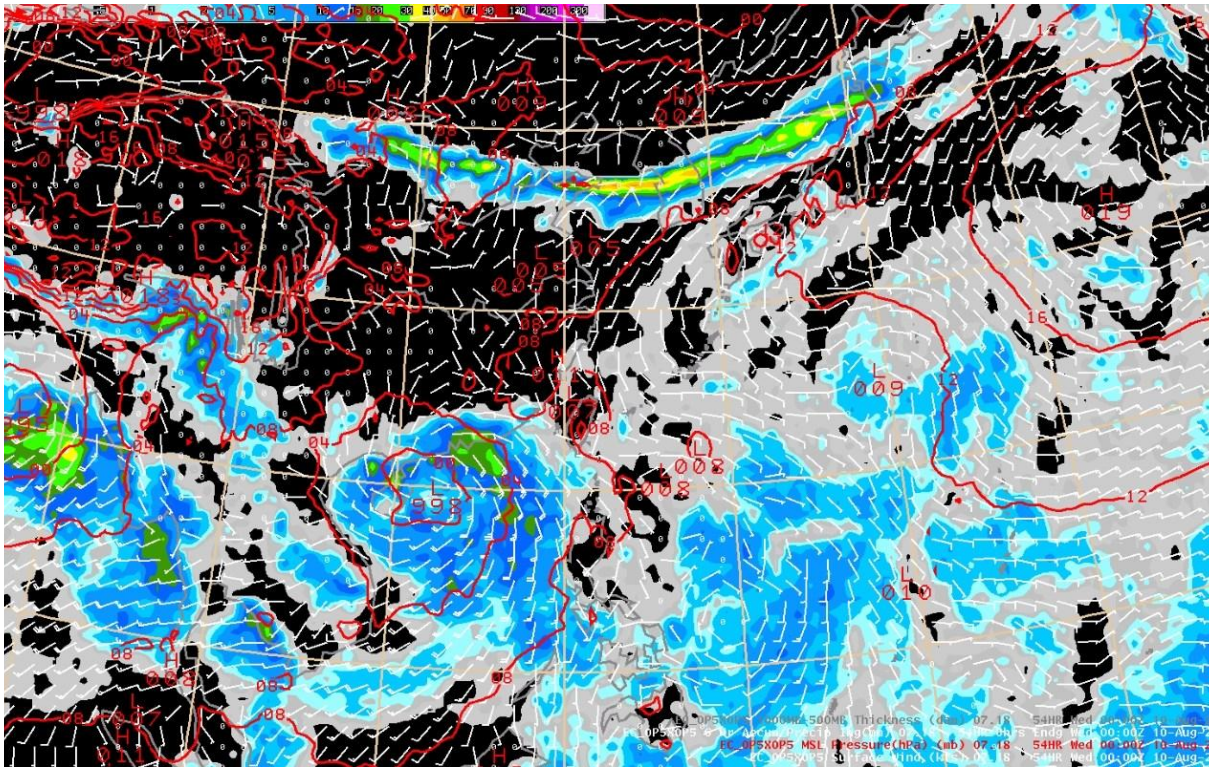
(b) 8/9 00 UTC



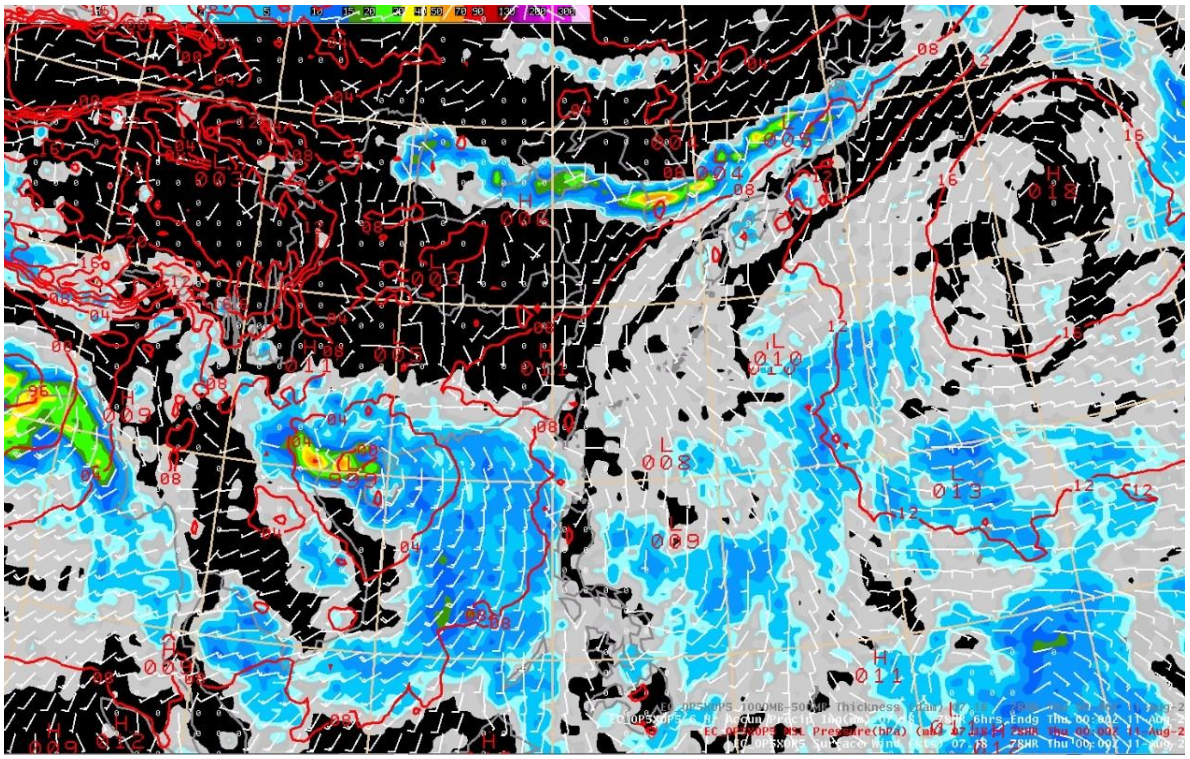
(c) 8/7 00 UTC


EC-OPSX0P5 MSL Pressure(hPa) (mb) 07.18 54HR Sun 00:00Z 07-Aug-2022

(d)8/10 00 UTC



(e)8/11 00 UTC



(f)8/12 00 UTC

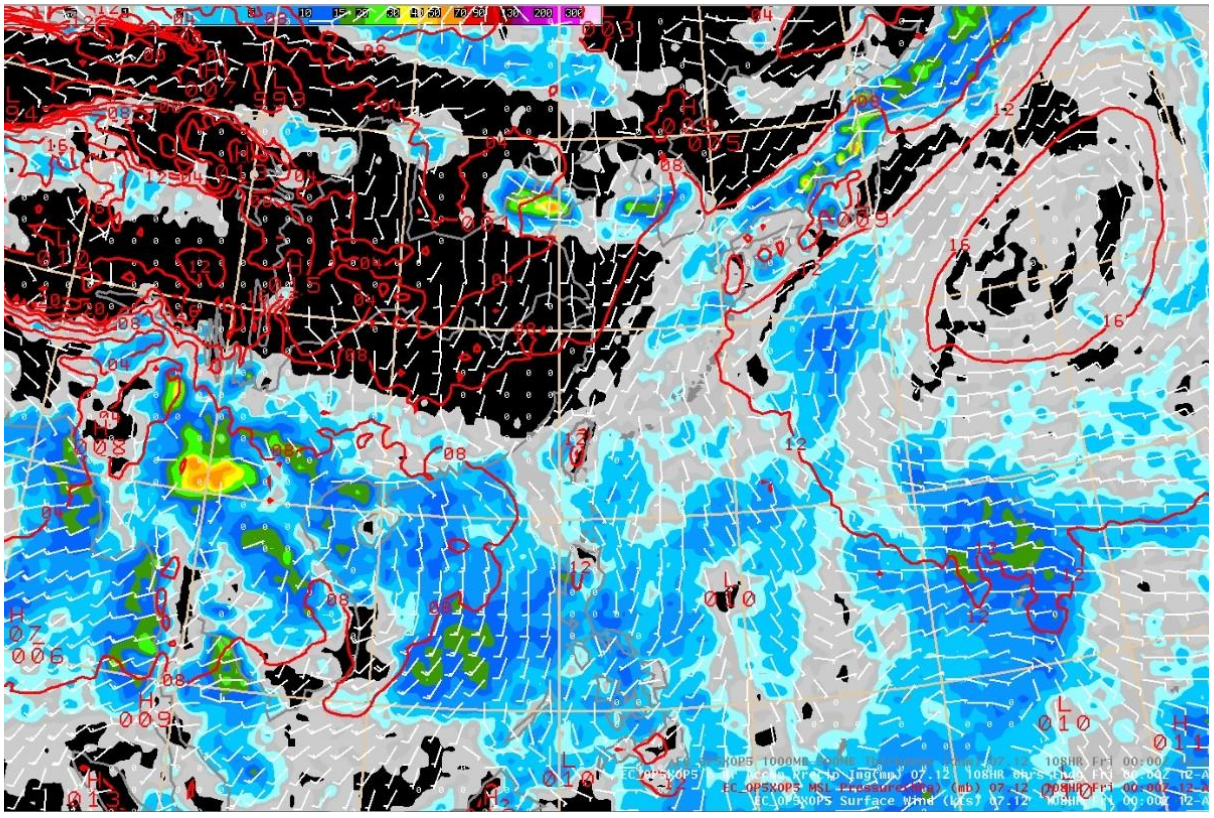


Figure 8.EC model ensemble for TC forecast.(Init:8/7 1200Z)

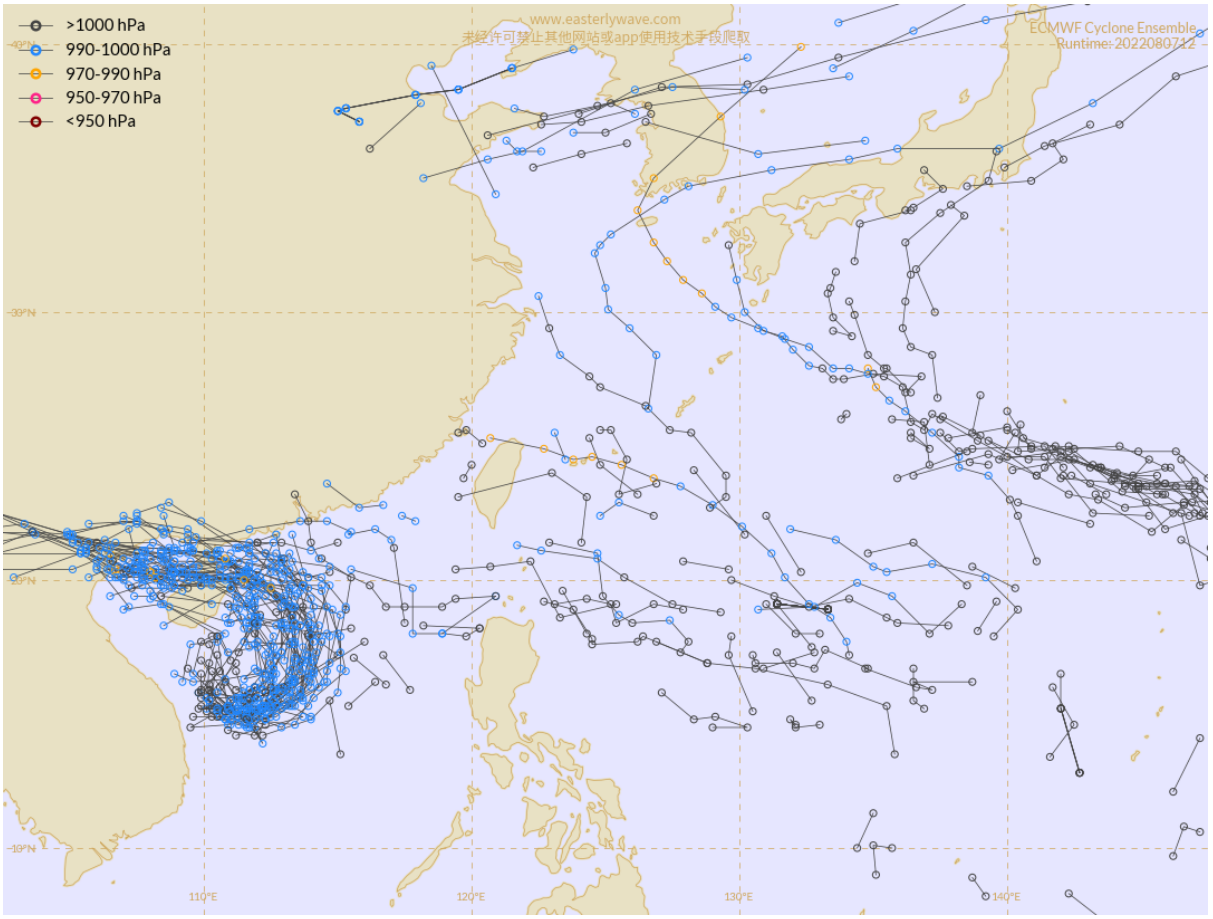
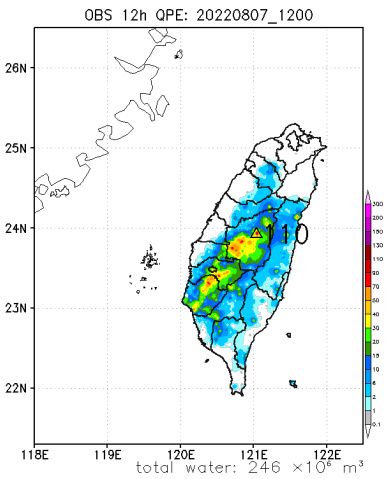
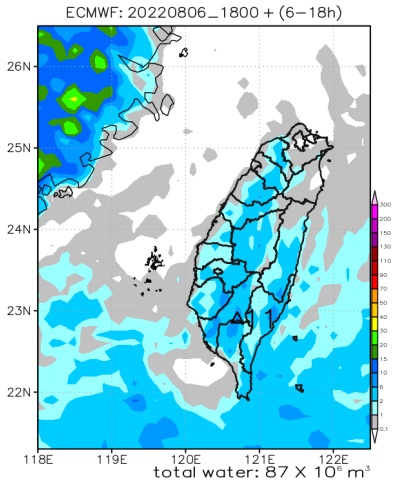


Figure 9. QPF Verification (initial on 8/6, at 18 UTC, forecast time: 8/7 00-12 UTC)

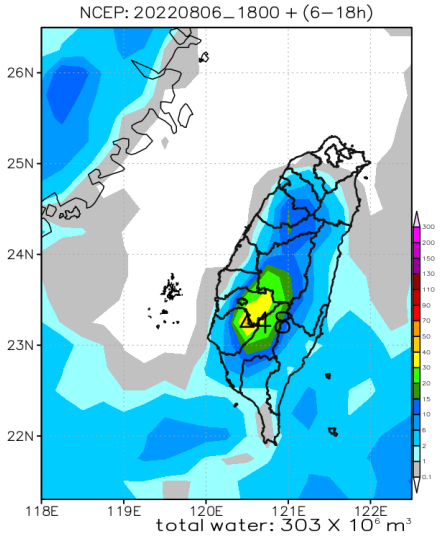
OBS



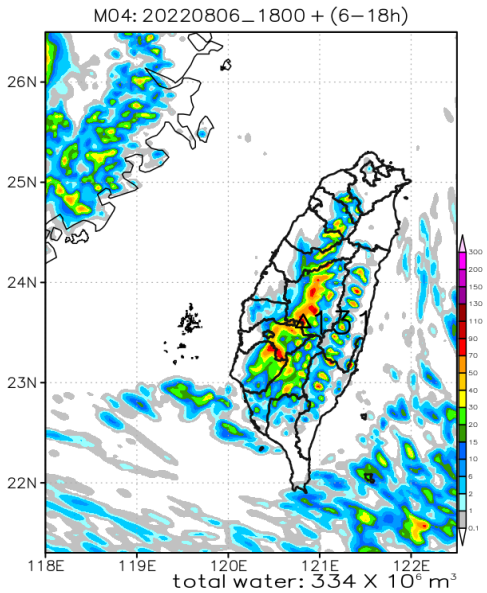
EC


ECMWF: 20220806_1800 + (6–18h)
26N
25N
24N
23N
22N
118E
119E
120E
121E
122E
total water: 87 X 10⁶ m³

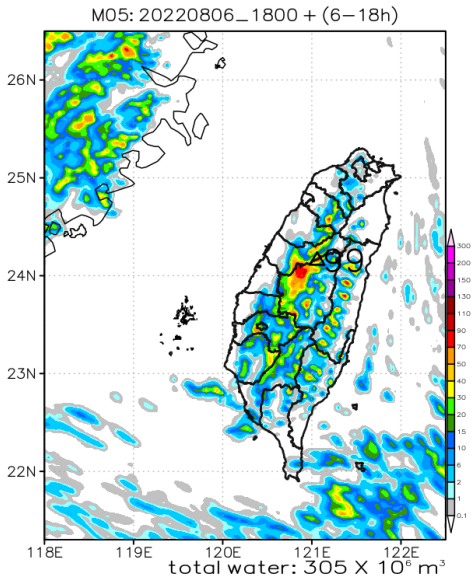
NCEP


NCEP: 20220806_1800 + (6–18h)
26N
25N
24N
23N
22N
118E
119E
120E
121E
122E
total water: 303 X 10⁶ m³

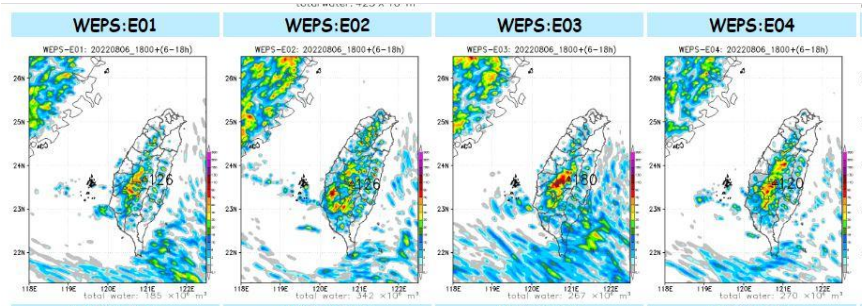
WRFD



TWRF



20 ensemble members



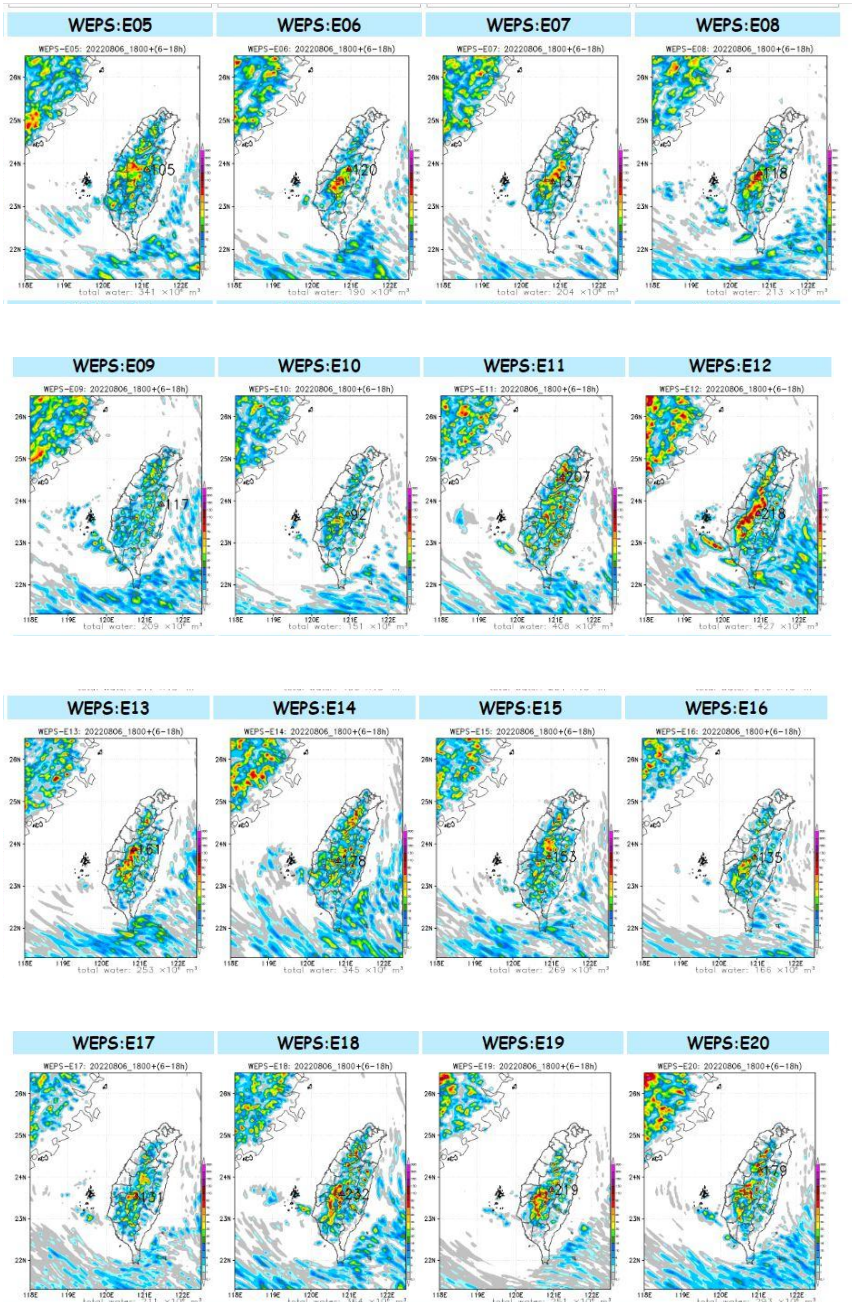
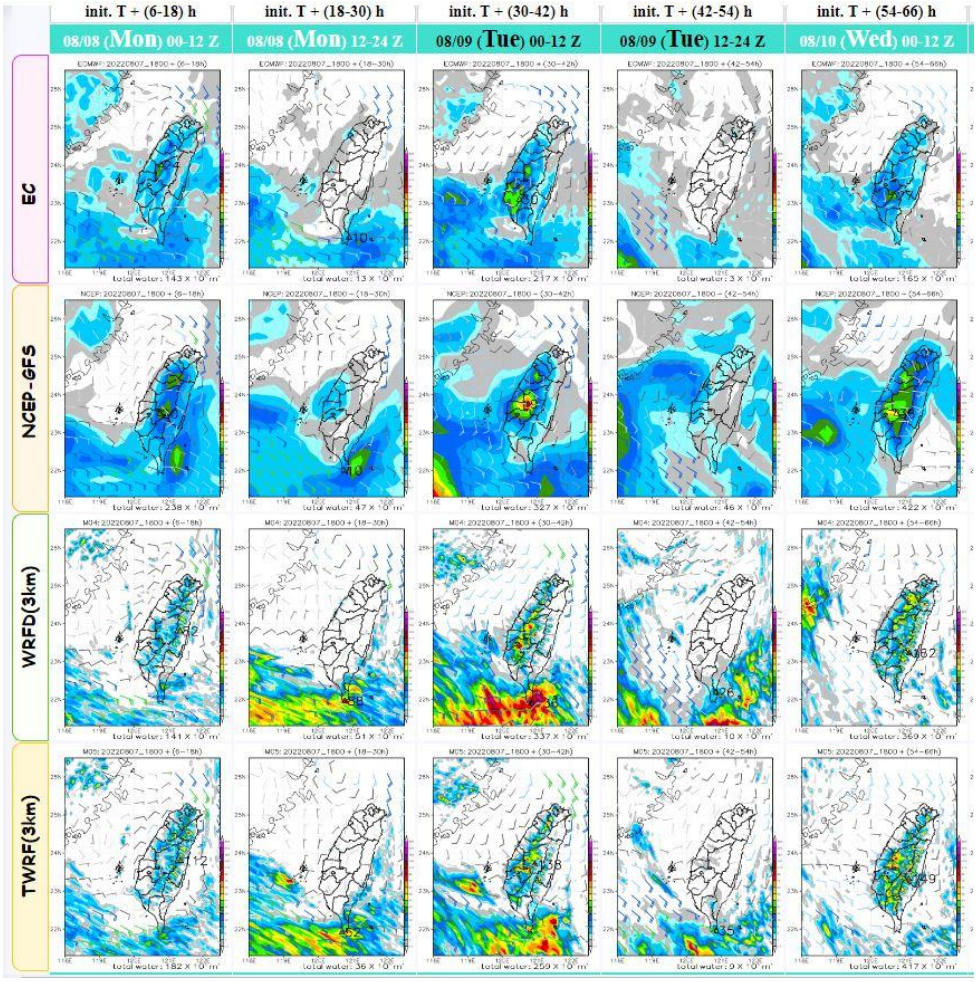


Figure 10. 8/8-8/12 QPF forecast (initial time on 8/7, at 18 UTC)

EC, NCEP, WRFD, TWRF (8/7-8/12)


init. T + (6-18) h
init. T + (18-30) h
init. T + (30-42) h
init. T + (42-54) h
init. T + (54-66) h
08/08 (Mon) 00-12 Z
08/08 (Mon) 12-24 Z
08/09 (Tue) 00-12 Z
08/09 (Tue) 12-24 Z
08/10 (Wed) 00-12 Z
EC
NCEP-GFS
WRFD(3km)
TWRF(3km)

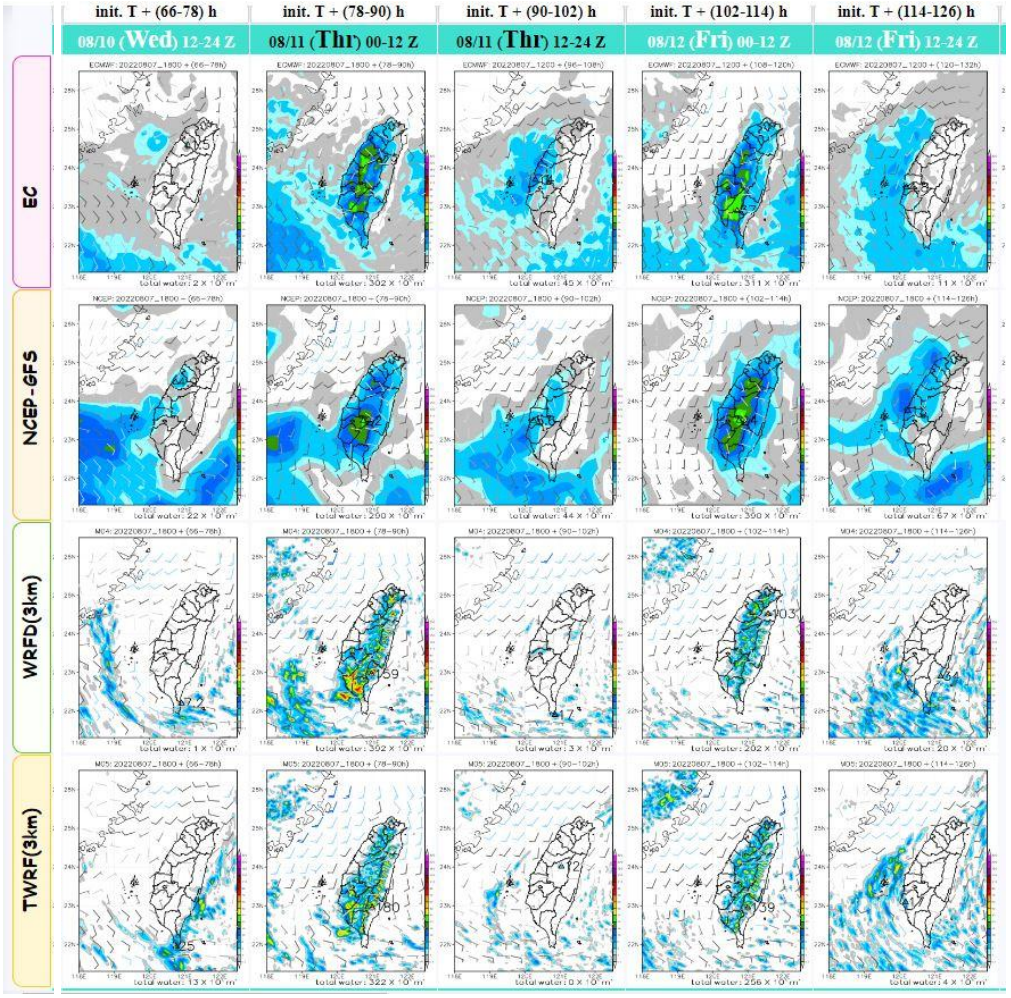
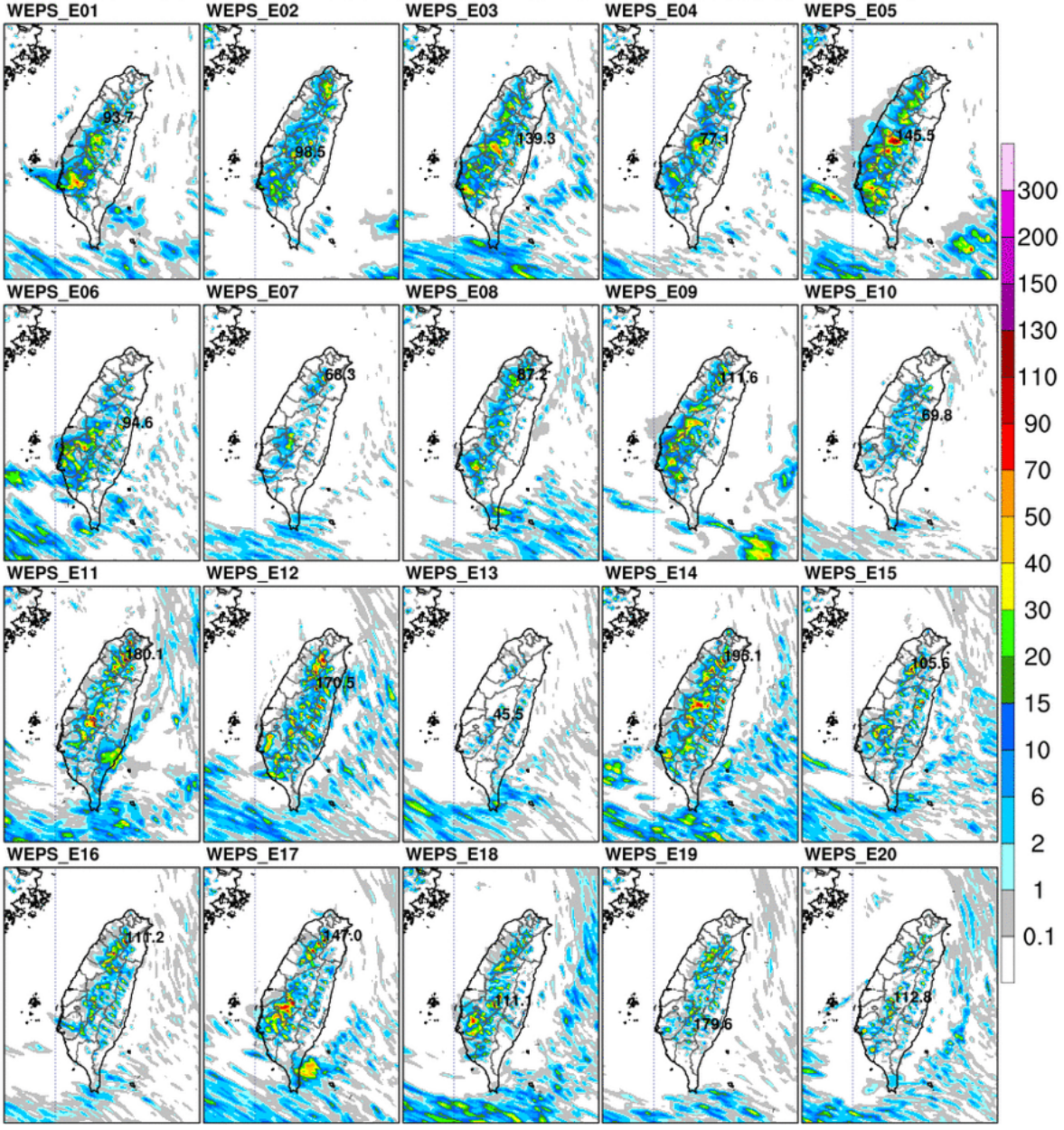


Figure 11: ensemble QPF forecast (8/8~8/10)
Initial time: 8/7 12Z

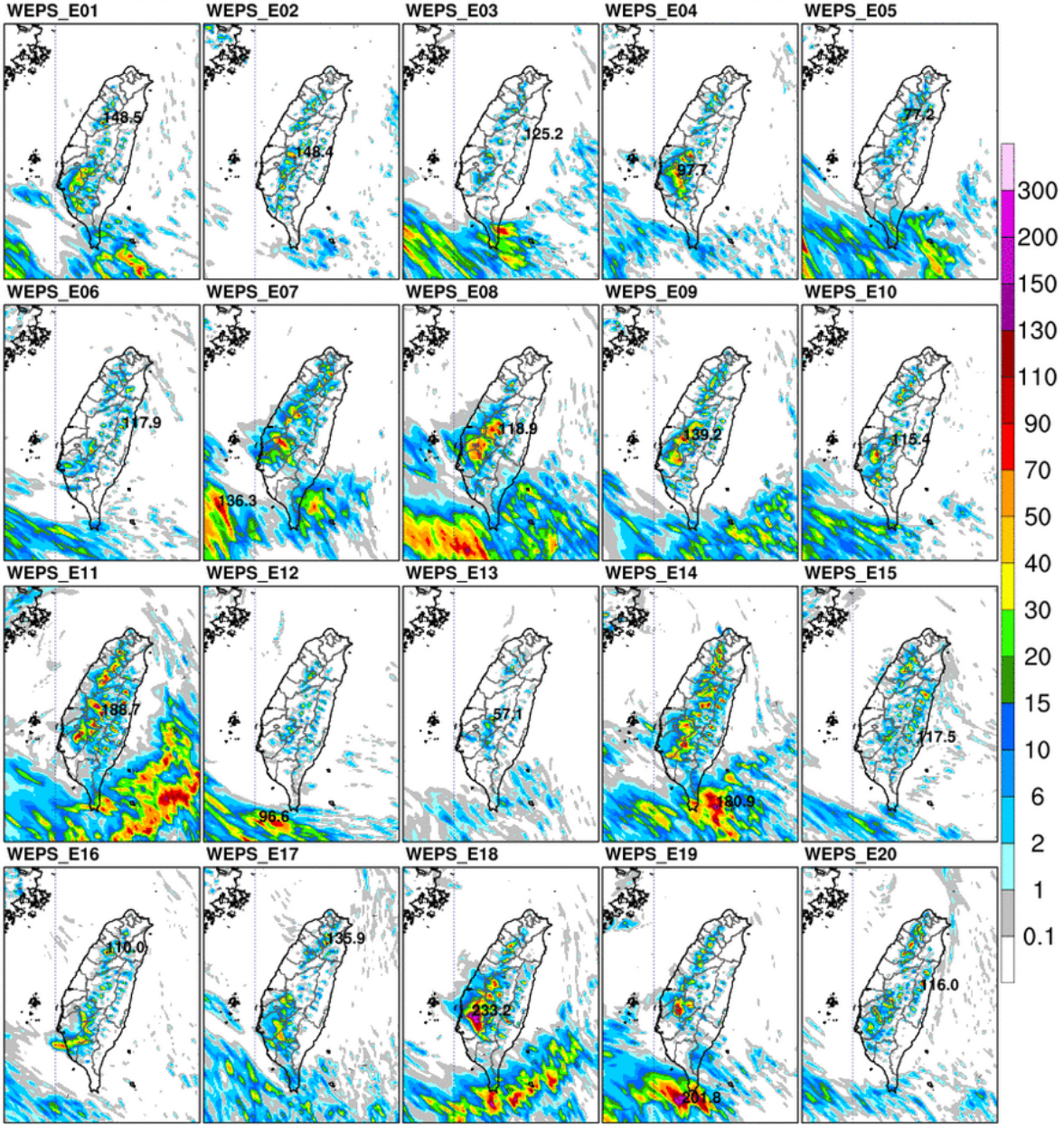
Ensemble QPF Initial at 2022080712

0012-0024 hr fcst ACCumulated rainfall from 2022080800 to 2022080812



Ensemble QPF Initial at 2022080712

0036-0048 hr fcst ACCumulated rainfall from 2022080900 to 2022080912



Ensemble QPF Initial at 2022080712

0060-0072 hr fcst ACCumulated rainfall from 2022081000 to 2022081012