



Mekong River Commission

Weekly Wet Season Situation Report in the Lower Mekong River Basin 25 – 31 August 2020

Prepared by
The Regional Flood and Drought Management Centre
01 September 2020

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1 Introduction

This Weekly Wet Season Situation Report presents a preliminary analysis of the weekly hydrological situation in the Lower Mekong River Basin (LMB) from **25 to 31 August 2020**. The trend and outlook for water levels are also presented.

This analysis is based on the daily hydro-meteorological data provided by the Mekong River Commission (MRC) Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – and on satellite data.

The report covers the following topics that are updated weekly:

- General weather patterns, including rainfall patterns over the LMB
- Water levels in the LMB, including in the Tonle Sap
- Flash flood and drought situation in the LMB
- Weather, water level and flash flood forecast, and
- Possible implications.

Mekong River water levels are updated daily and can be accessed from:
http://ffw.mrcmekong.org/bulletin_wet.php.

Drought monitoring and forecasting information is available at:
<http://droughtforecast.mrcmekong.org>

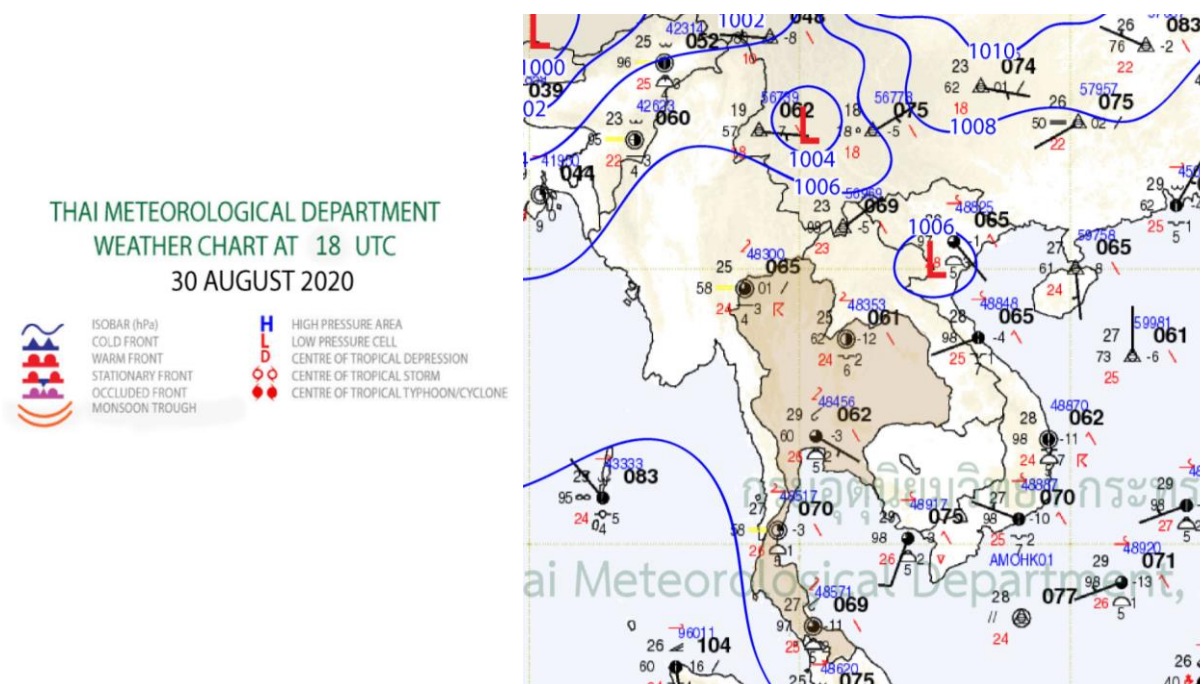
Flash flood information is accessible at: <http://ffw.mrcmekong.org/ffg.php>

2 General Weather Patterns

The weather outlook bulletins for three months (August, September and October) and the weather maps issued by the Thailand Meteorology Department (TMD) were used to verify weather conditions in the LMB.

Since early August 2020, moderate and above-normal rainfall has been observed in the LMB. However, the rainfall in the LMB has gradually decreased from the fourth week of August. The data from the TMD predict that instances of low pressure and tropical cyclones may continue move closer to the Mekong region in September, when heavy rainfall often occurs in the Mekong region. The TMD also predicts that scattered thundershowers throughout September will continue in the north-eastern part of Thailand (within the Mekong region).

[Figure 1](#) presents the weather map of 30 August 2020, showing no lines of any low pressure of the Monsoon Trough crossing the Mekong region. This means a below normal rainfall may happen in the region during these coming days.



predicted rainfall in September and October in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

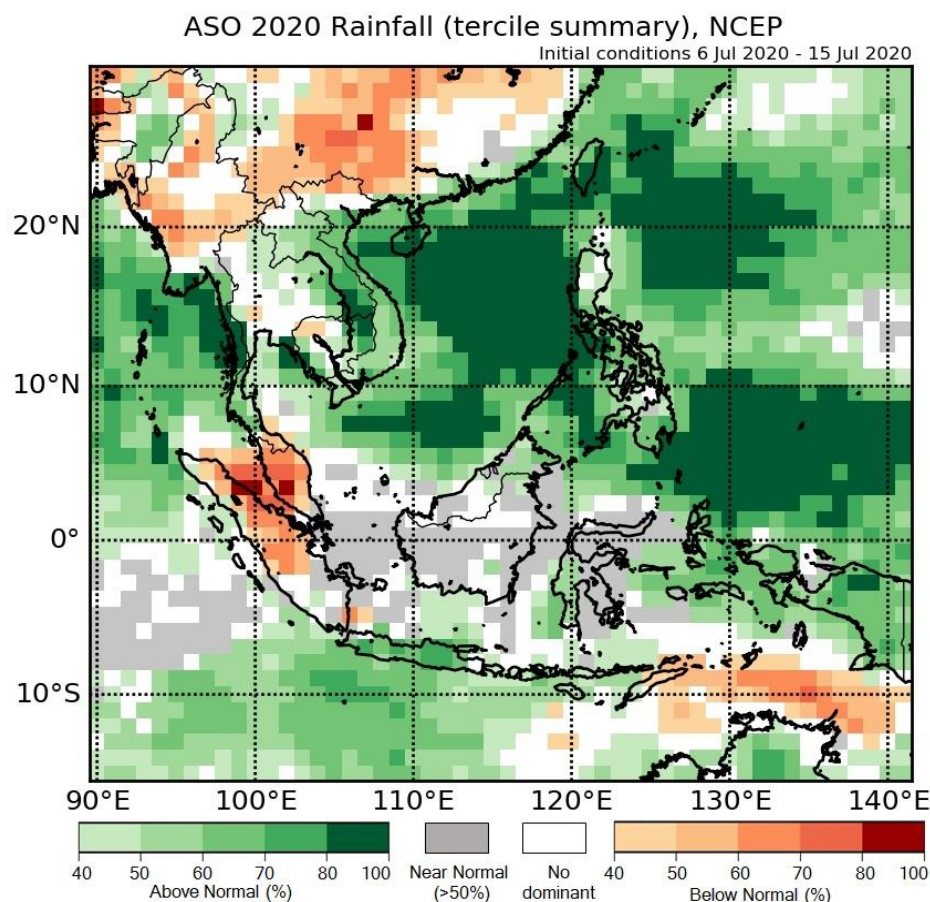


Figure 2. Predicted rainfall over Asian Countries by ASMC

Tropical depressions (TD), tropical storms (TS) and typhoons (TY)

There were neither tropical depressions nor tropical storms in the LMB during this reporting week. However, there were some low pressures movement in the upper part of the Mekong Region which could bring some rainfall in the northern part of the LMB.

Rainfall patterns over the LMB

This week's rainfall is considered below average, varying from 0.4 mm to 42 mm at different stations along the LMB from Chiang Saen in Thailand to Tan Chau and Chau Doc in Viet Nam. The highest rainfall during this week was accumulated in the middle part of the LMB from Vientiane to Khong Chiam area (rainfall from 25 mm to 42 mm), much smaller compared to last week's. The total weekly observed rainfall at these selected stations is shown in Figure 3.

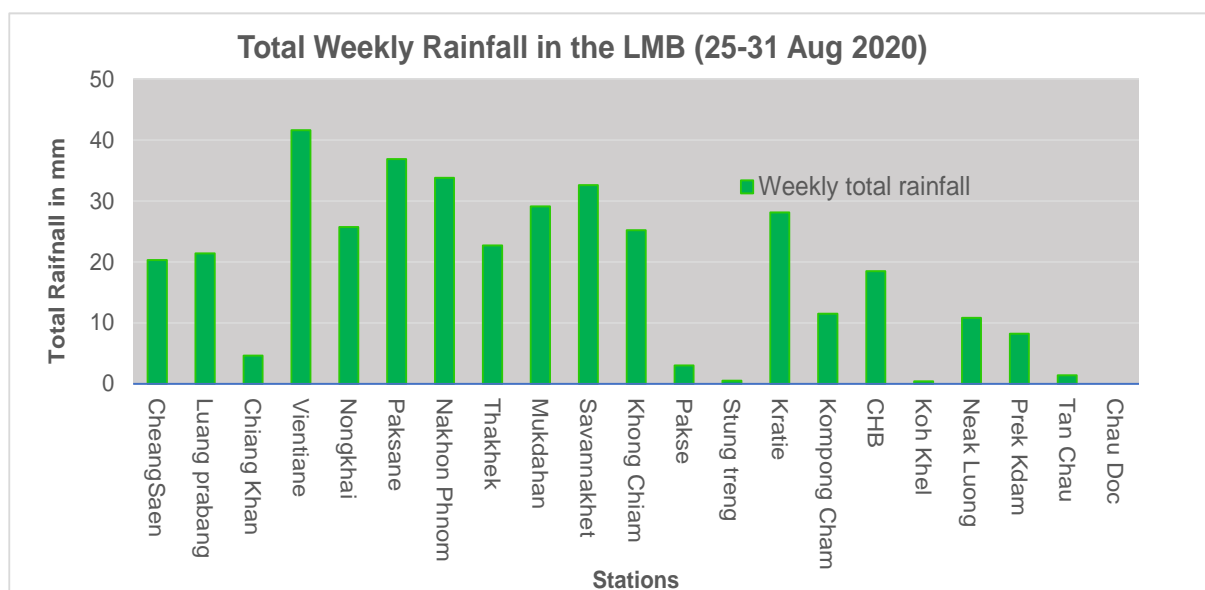


Figure 3. The weekly total rainfall over the LMB

To verify area rainfall distribution, Figure 4 shows a map of the weekly accumulated rainfall based on observed data provided by the MRC Member Countries – Cambodia, Lao PDR, Thailand and Viet Nam – from 25 to 31 August.

The situation during this reporting week is comparable to that of last week, except that the amount of rainfall this week (25 – 42 mm) was below average and lower than last week's quantity (250 – 380 mm).

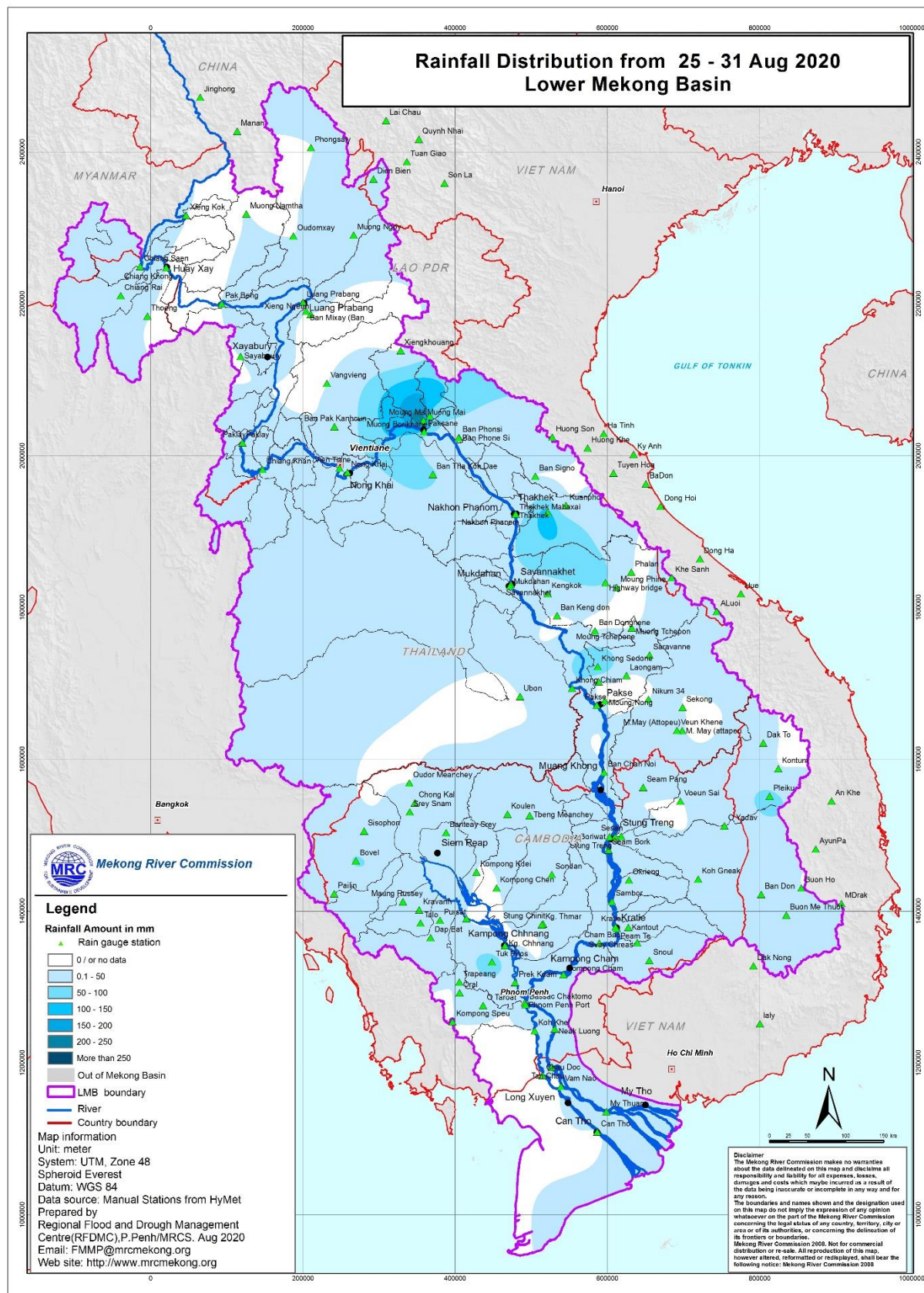


Figure 4. The weekly rainfall distribution over the LMB

3 Water Levels in the Lower Mekong River

The hydrological regimes of the Mekong mainstream are illustrated by recorded water levels and flows at key mainstream stations: at Chiang Saen to capture mainstream flows entering from the UMB; at Vientiane to present flows generated by climate conditions in the upper part of the LMB; at Pakse to investigate flows influenced by inflows from the larger Mekong tributaries; at Kratie to capture overall flows of the Mekong Basin; and at Tan Chau and Chau Doc to monitor flows to the Delta.

The key stations along the LMB and their respective model application for River Flood Forecasting during the wet season from June to October and River Monitoring during the dry season from November to May are presented in Figure 5. The hydrograph for each key station is available from the MRC's River Flood Forecasting: <http://ffw.mrcmekong.org/overview.php>.

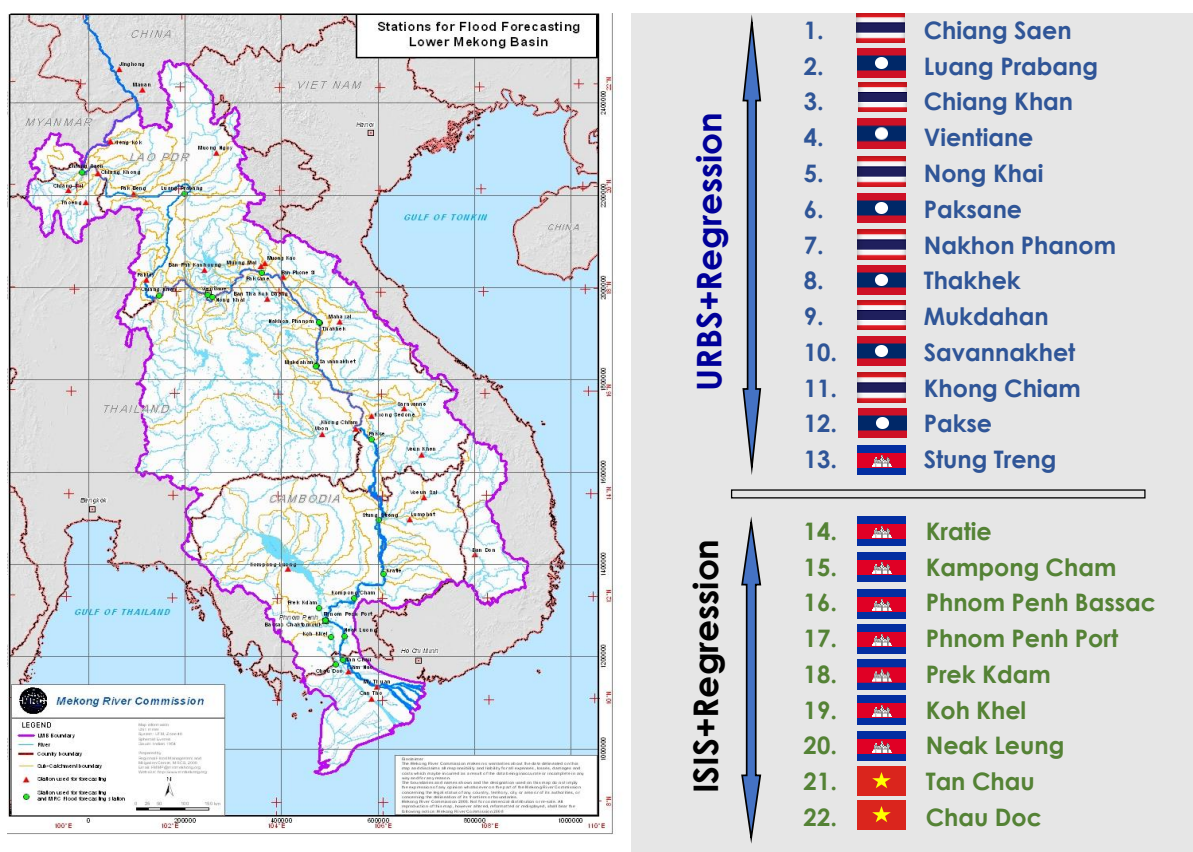


Figure 5. Key stations and model application for River Monitoring and Flood Forecasting

Chiang Saen and Luang Prabang

Water levels during August 25-31 at Chiang Saen station in Thailand were fluctuating, ranging between -0.39 and 0.15 metres during this reporting week. Main possible causes of such a phenomenon are believed to be a less quantity of inflow volume from the upstream, stemming from Lao PDR, Myanmar and Lancang (Mekong) in China, and last week's lower rainfall contributed by catchment inflows. When comparing to last week, this week's water levels are very much similar.

Water levels at Luang Prabang monitoring station in Lao PDR rapidly decreased from 11.87 metres to 10.09 metres during the reporting period. Compared to last week, the figure shows a decreasing number, ranging from -0.52 to -0.19 metres. However, this level is higher than that of 2019 but remains lower than its long-term average (LTA).

Being caught up between the upstream (Nam Beng, Nam Ou, Nam Suong, and Nam Khan) and downstream (Xayaburi) hydropower dams, Luang Prabang station has a unique characteristic as it is influenced by the operations of all surrounding dams. Thus, the water levels at this station can change very rapidly during the wet season.

Chiang Khan, Vientiane-Nong Khai and Paksane

Water levels at Chiang Khan decreased from 10.62 metres last week to 8.50 metres this week, dropping far below their LTAs values. Such a situation is believed to have been contributed by the Xayaburi dam at the upstream. Compared to this time last year, the water level at Chiang Khan is about 1 metre higher.

Downstream water levels from Vientiane to Paksane followed the same direction. The decrease varied between -0.80 and -0.63 metres. Contribution from upstream inflows and sub-catchments is likely the main reason. Compared to this time last year, the water levels at these stations are slightly higher.

Nakhon Phanom to Pakse

Similarly, water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR were fluctuating during the reporting period, ranging between -0.53 and 0.18 metres. Low rainfall from upstream and its adjacent catchments is likely the cause of the fluctuation. Nevertheless, although the levels are higher than those of last year, they are still lower than the LTA value.

Stung Treng to Kampong Cham/Phnom Penh to Koh Khel/Neak Luong

Like many of the upstream stations, water levels at Stung Treng, Kratie, Kampong Cham, Chaktomuk, Koh Khel, Phnom Penh Port and Prek Kdam stations in Cambodia were fluctuating, varying from -0.12 to 0.38 metres. This week's water levels at these stations are between their minimum and LTA levels. At Neak Luong and Prek Kdam stations, the levels are slightly lower than 2019's figures.

Tidal stations at Tan Chau and Chau Doc

Like last week, water levels at the two tidal stations of Tan Chau and Chau Doc were fluctuating below their LTAs due to daily tidal effects from the sea.

The Tonle Sap Flow

At the end of the dry season, when water levels along the Mekong River increase, flows of the Mekong River reverse into the Tonle Sap Lake (TSL). This phenomenon normally takes place from mid-May to mid-October.

Figure 6 shows the seasonal changes of the inflow/reverse flow and the outflow of the TSL at Prek Kdam in comparison with the flows of 2018 and 2019, and their LTA level (1997-2019). Up to 31 August of this reporting period, **it is observed that the main reverse flow into the TSL has started since August 4. There were also two extremely small instances of the reverse flow in July, but they were not significant.** The recorded incident very much matches the record on reverse flow into TSL by the PMFM's (Procedures for the Maintenance of Flows on the Mainstream) tool on Article 6B (monitoring area). The delay of the reverse flow was due to the low water levels on the Mekong mainstream which were caused by deficit rainfall in upper sub-catchment areas, among other factors.

Although the reverse flows have started since August 4, the water volume of the Lake up to this point has been considered critical as it is still lower than its minimum level. Figure 7 shows seasonal changes in monthly flow volume up to August 31 for the TSL compared with the volumes in 2018, 2019, and their LTA and the fluctuating levels (1997-2019). It shows that in July and August water volume of the Lake were at a critical level, compared with last year (2019) figure and historical minimum levels at the same period. Table 1 shows the monthly change in flow volume of the TSL and the critical flow volume of the TLS in July and August 2020 compared to its historical minimum value and volumes of 2018 and 2019. This reveals that the TSL is still affected by low inflows from the Mekong River and insufficient rainfall in the surrounding sub-catchments.

The low inflows (inflows from the Mekong River and from tributaries) in the early wet season of 2020 has resulted in the very critical situation of the TSL. This demonstrates the influence of the relationships between the reverse flows, water levels of the Mekong River, and the flow direction in the complex hydraulic environment of the TSL during this wet season. The data show that more than half of the annual inflow volume into the lake originates from the Mekong mainstream. Thus, flow alterations in the mainstream could have direct impacts on the Tonle Sap Lake water levels and on hydrology.

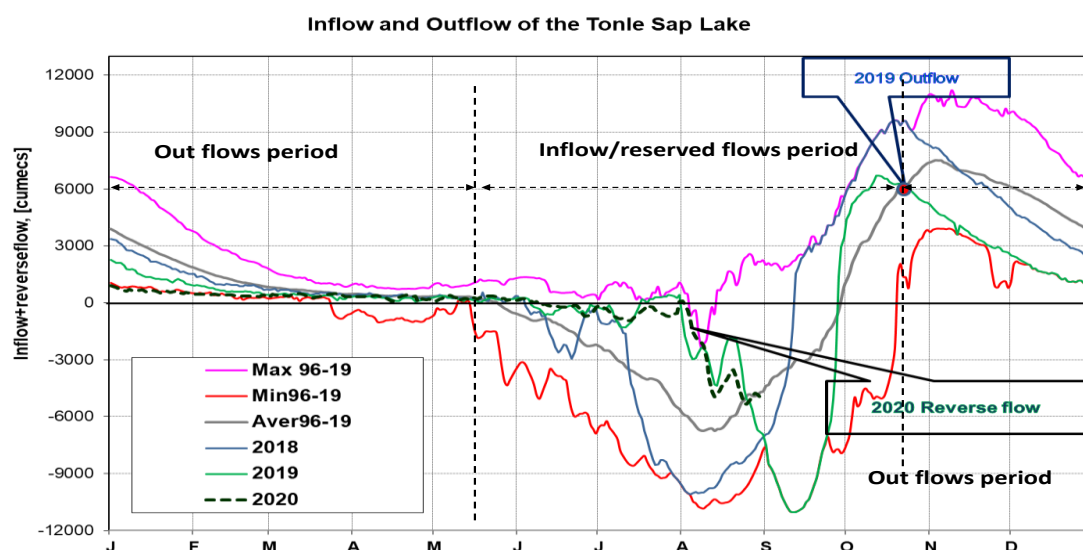


Figure 6. The seasonal change of inflows and outflows of Tonle Sap Lake

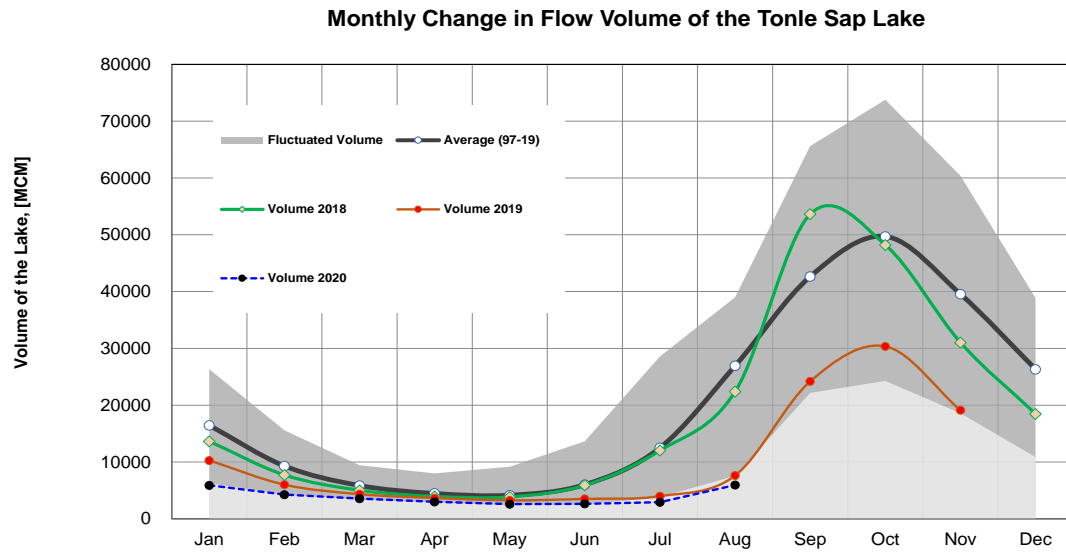


Figure 7. The seasonal change in monthly flow volume of Tonle Sap Lake

Table 1. The monthly change in the flow volume of Tonle Sap Lake

Month	Average Volume (97-19) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2018 [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Percentage of Volume in 2020 [%]
Jan	16452.95	26357.53	6272.01	13633.41	10285.31	5906.80	35.90
Feb	9312.36	15596.22	4281.41	7729.72	6019.30	4264.19	45.79
Mar	5868.92	9438.24	3350.92	5037.06	4354.62	3553.99	60.56
Apr	4474.98	8009.14	2875.42	3956.47	3667.47	2992.61	66.87
May	4166.07	9176.93	2417.81	3864.00	3266.43	2594.92	62.29
Jun	6034.10	13635.01	2470.54	5919.18	3517.06	2641.88	43.78
Jul	12502.58	28599.56	3832.51	12024.96	4001.99	2925.86	23.40
Aug	26934.35	39015.12	7554.93	22399.65	7622.71	5941.07	22.06
Sep	42644.05	65632.35	22180.73	53639.54	24194.19		
Oct	49698.19	73757.23	24276.79	48193.08	30358.38		
Nov	39542.58	60367.33	18576.01	31036.07	19112.65		
Dec	26325.13	38888.95	10869.43	18469.21	10577.29		
	Critical situation, comapred with historical Min values						
	Normal condition, compared with LTA (Long term average)						
	Low volume situation, comapred with LTA values						
Unit: Million Cubic Meter (1 MCM= 0.001 Km ³)							

4 Flash Flood in the Lower Mekong Basin

During 25-31 August, the total recorded daily rainfall was small or moderate in the LMB, leading to a moderate or low Average Soil Moisture (ASM) condition. Therefore, flash floods during this period did not occur in the LMB.

Figure 8 shows the Flash Flood Guidance (FFG) results for the next 03 and 06 hours and the ASM produced by the MRC's Flash Flood Guidance System (MRC-FFGS) on 25 August 2020 at 00:00 UTC (07:00 AM local time).

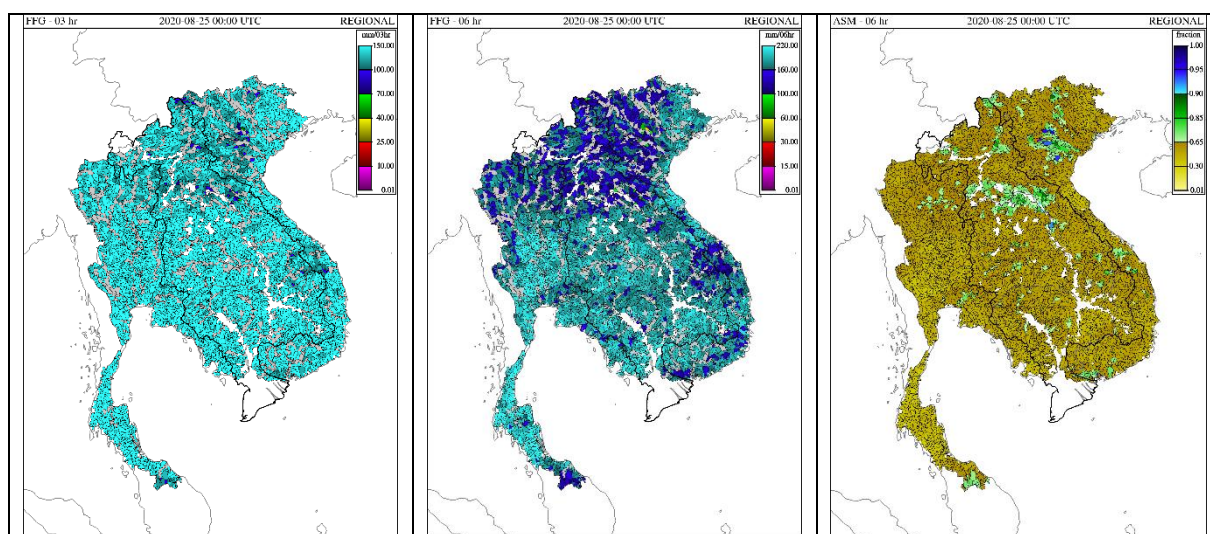


Figure 8. Flash Flood Guidance (FFG) for the next 3 and 6 hours and Average Soil Moisture (ASM) 6 hours produced on Aug 25 at 00:00 UTC

5 Drought Monitoring in the Lower Mekong Basin

Weekly drought monitoring from 20-26 August 2020

• Weekly Standardised Precipitation Index (SPI1)

SPI values in [Figure 09](#) show that the LMB received heavy rain from 20-26 August in the Central part of the region covering the border between Lao PDR and Thailand which include parts of Vientiane, Borikhamxay, and Nong Khai. The driest areas, on the other hand, were found in Northern Phreah Vihear of Cambodia, Southern Champasack of Lao PDR and Ubon Ratchathani of Thailand, and some parts in Cambodia's Ratanakiri, and Thailand's Si Saket and Chaiyaphum. The bordering area between Lao PDR and Thailand is wetter, while between Cambodia and Thailand the condition is drier compared to that of last week from 13-19 August.

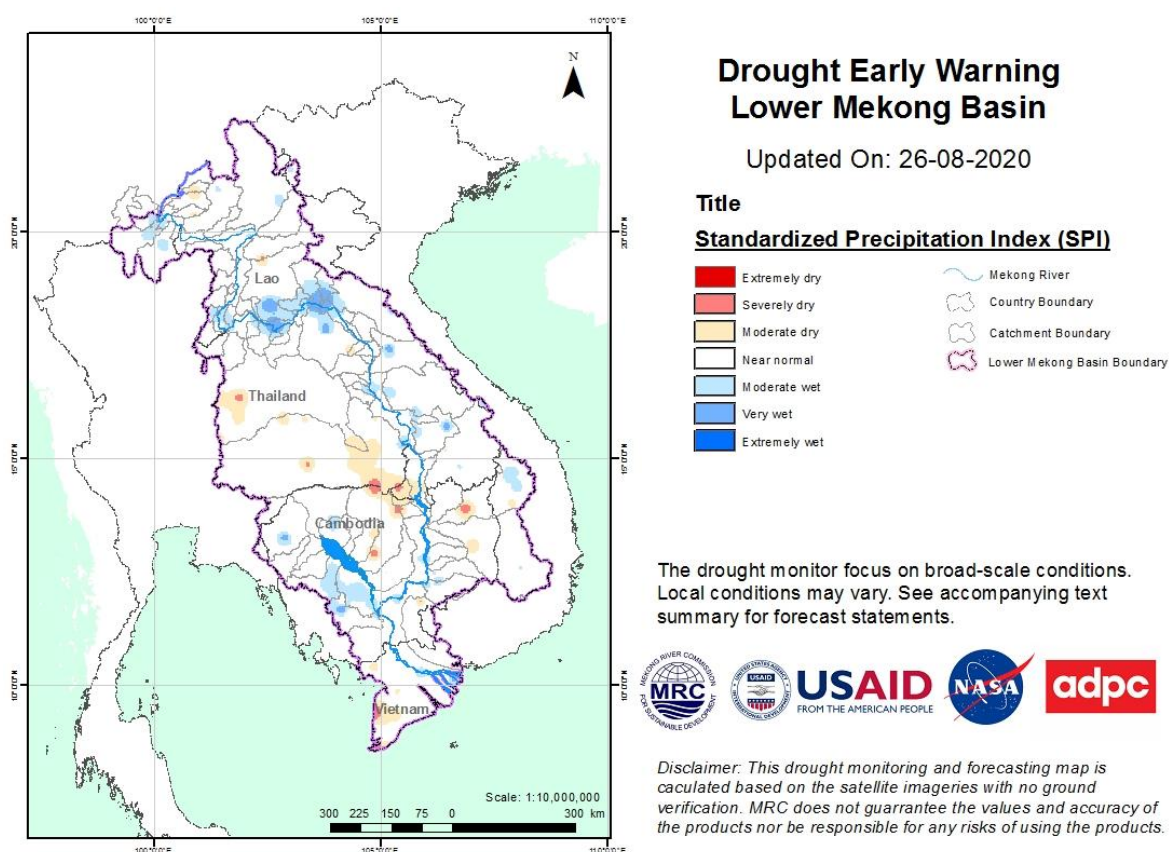


Figure 9. Weekly standardised precipitation index from 20-26 August 2020

• Weekly Soil Moisture Anomaly (SMA)

The agricultural indicator through soil moisture anomaly does not change much from the previous week (13-19 August). As shown in [Figure 10](#), the driest soil moisture condition is found in the east of Savannakhet and Saravane of Lao PDR, and western Chiang Rai, Chiang Rai, and Phayao of Thailand with severely and extremely dry conditions. The situations of

moderately and severely dry are found in Lao PDR's northern Sekong, north-eastern Khammuane, southern and northern Xayabury, and southern Luang Prabang; Thailand's southern Si Saket, some part of Ubon Rachathani, central Nakhon Phanom, western Loei, and northern Kon Tum; and Northern Kon Tum and Gia Lai of Viet Nam.

No dry soil is found in the Cambodian territory during the latest two weeks from 13-26 August.

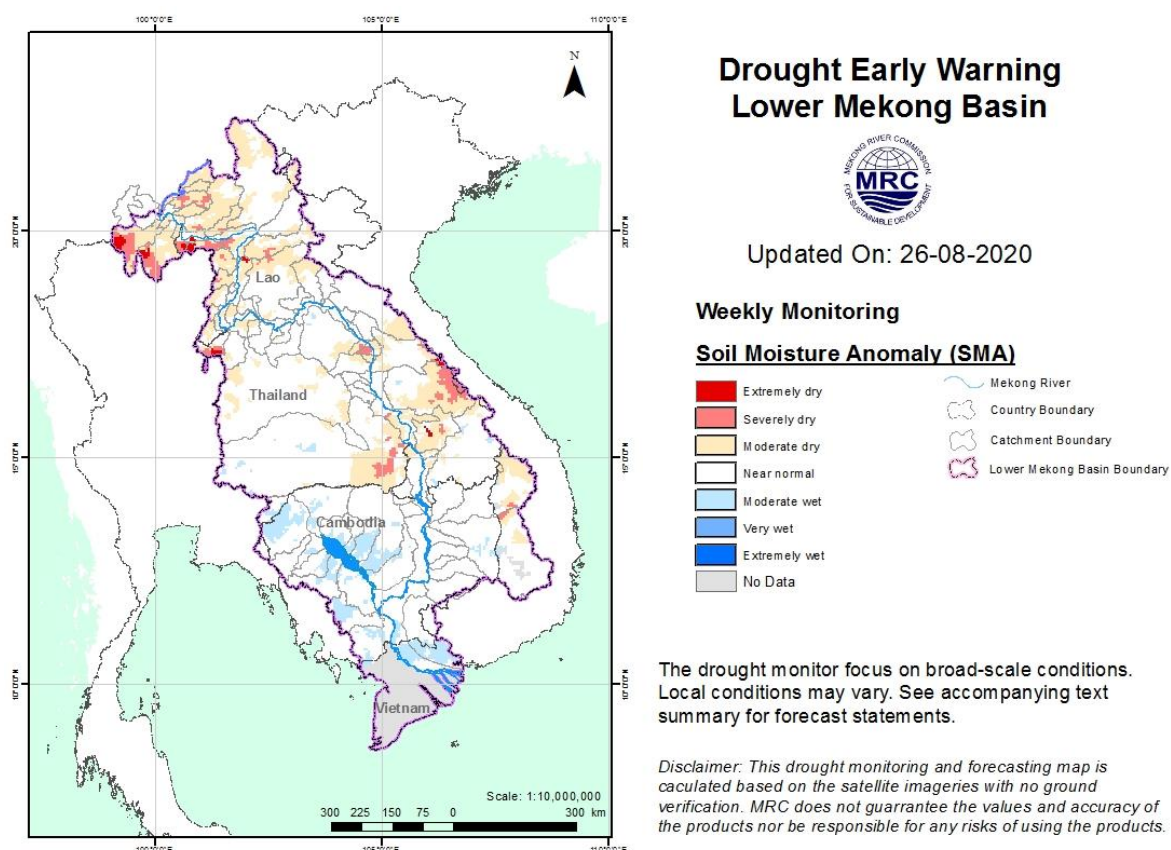


Figure 10. Weekly Soil Moisture Anomaly from 20-26 August 2020

• Weekly Combined Drought Index (CDI)

The overall drought condition through combined drought index shows no significant threats to the LMB during the forecasting week from 20 to 26 August. [Figure 11](#) shows that the CDI for this reporting period looks very much similar to that of last week.

The severe drought condition in Quang Tri of Viet Nam appeared last week from 13-19 Aug has disappeared this week but replaced by slightly moderate dry condition. Only some moderate dry exists this week which are found in Northern and Eastern Ubon Ratchathani and Central part of Nakhon Phanom of Thailand. The situation is not significant for any agricultural impact.

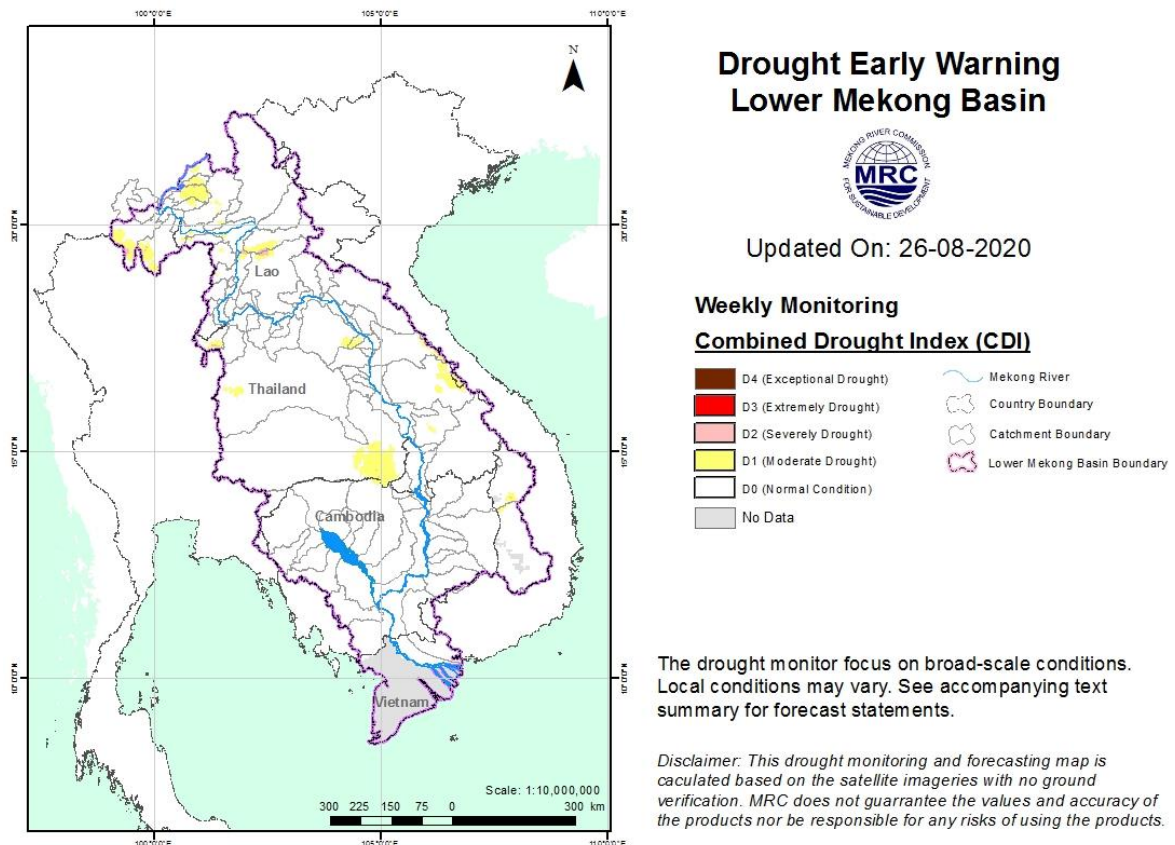


Figure 11. Weekly Combined Drought Index from 20-26 August 2020

Further detail information for Drought Early Warning and Forecasting as well as the explanation are available at the link below:

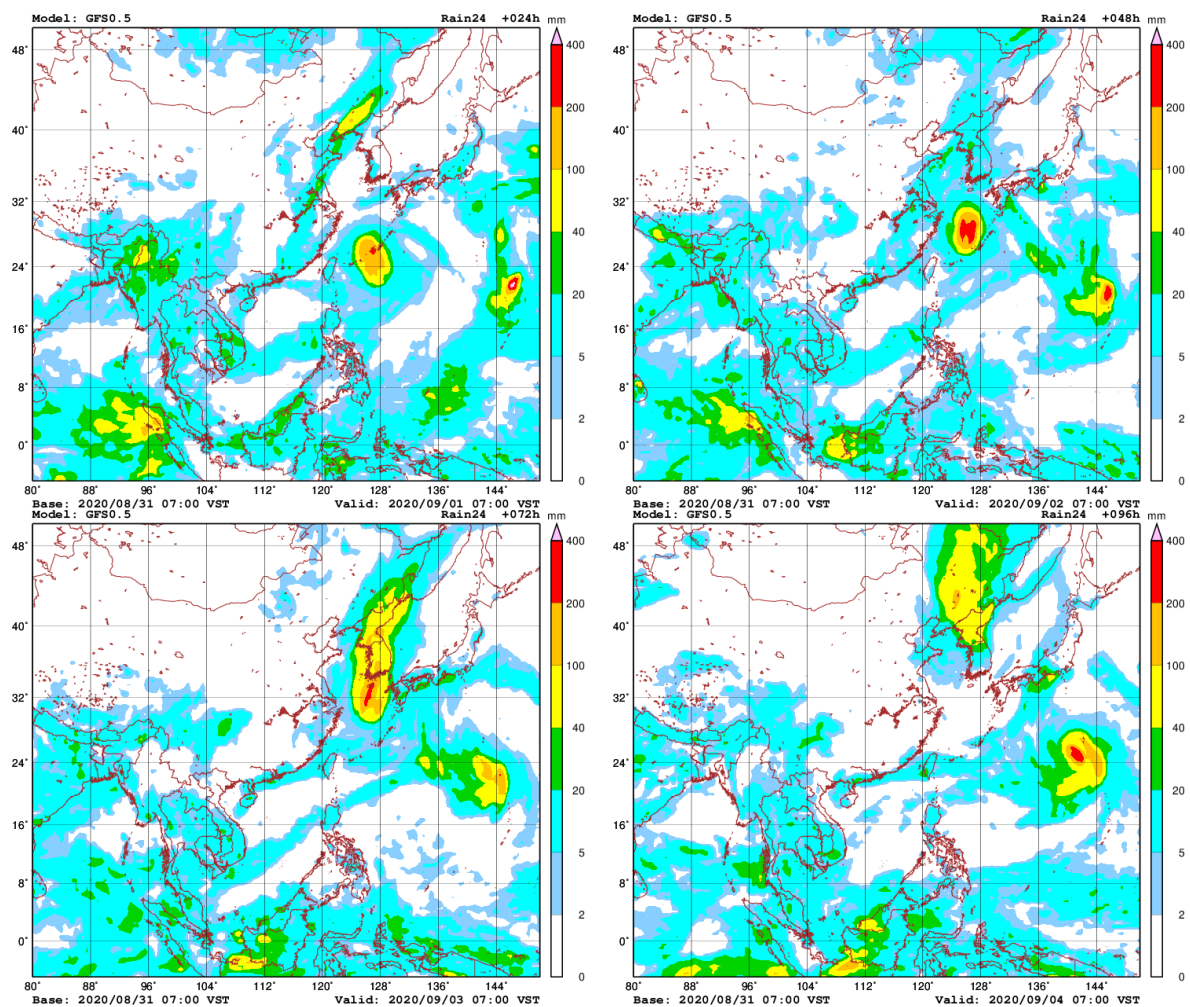
<http://droughtforecast.mrcmekong.org/templates/view/our-product>

6 Weather and Water Level Forecast and Flash Flood Information

6.1 Weather and rainfall forecast

Based on the analysis of synoptic meteorological, in the coming week, there might be two factors affecting the LMB region. They include: (i) Intertropical Convergence Zone (ITCZ) going through from upper to middle part; and (ii) Southwest monsoon phenomena (SW) from middle to lower parts (including Viet Nam and Cambodia). That phenomenon will bring small rainfall of approximately at 10 – 20 mm/24hrs over most parts of the LMB from the middle to lower part during next week.

[Figure 12](#) shows the accumulated rainfall forecast (24hrs) of model GFS (from 1 to 7 September 2020).



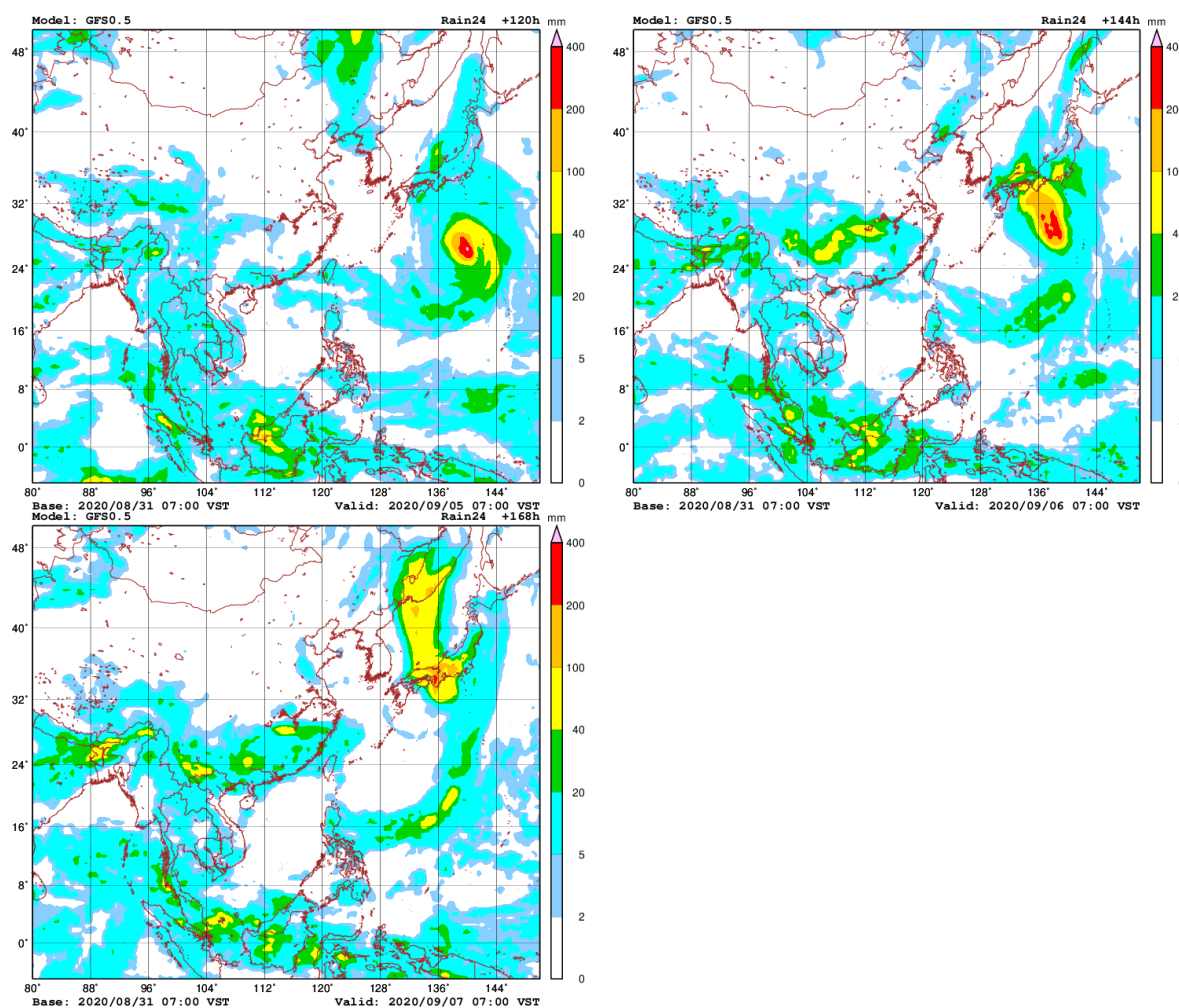


Figure 12. Accumulate rainfall forecast (24hrs) of model GFS

6.2 Water level forecast

Chiang Saen and Luang Prabang

Based on the daily flood bulletin on 31 August, daily forecast water levels at Chiang Saen are expected to decrease from 3.72 to 3.32 metres in the next five days.

For Luang Prabang, the water levels will decrease from about 10.09 to 9.73 metres during the same period.

This decreasing trend will continue to make the water levels at these stations below than their LTA.

Chiang Khan, Vientiane-Nong Khai and Paksane

Water levels at Vientiane station are forecasted to go down from 8.50 to 8.15 metres, while at Paksane water levels will also decrease from 7.80 to 7.53 metres in the next five days. They will still stay below their LTA.

Nakhon Phanom to Pakse

Water levels at these stations are also likely to decrease by about 0.39 metres in the next three days. Water levels at Pakse station are forecasted to decrease from 7.04 to 6.48 metres in the next five days.

Stung Treng to Kampong Cham/Phnom Penh to Koh Khel/Neak Luong

From Stung Treng to Neak Luong along the Mekong River, water levels will decrease between -0.40 and -0.02 metres in the next five days.

Water levels of the Tonle Sap Lake at Prek Kdam and Phnom Penh Port will decrease between -0.16 and -0.07 metres over the next five days. Water levels at Phnom Penh, Chaktomuk, and Koh Khel on the Bassac River will fluctuate, varying from -0.16 to -0.05 metres during the same period.

The water levels at these stations will continue staying around their LTA and minimum levels.

Tidal stations at Tan Chau and Chau Doc

For Viet Nam's Tan Chau on the Mekong River and Chau Doc on the Bassac River, water levels will be moving up and down below their LTAs, following daily tidal effects from the sea.

[Table 2](#) shows the River Flood Forecasting Bulletin issued on 24 August. Results of the daily flood forecasting bulletin are also available at http://ffw.mrcmekong.org/bulletin_wet.php.

The performance of the weekly flood forecast, with an accuracy and data input evaluation from 25 to 31 August is presented in [Annex 1](#).

6.3 Flash Flood Information

Although there is some expected amount of rainfall coming to the region during next week based on the rainfall forecast, the amount may not be much. Therefore, the possibility of flash floods occurrence is low. Nevertheless, local heavy rains in a short period of time is still possible with unexpected flash floods. The information about flash flood guidance for the next 1, 3 and 6 hours is updated twice daily at: <http://ffw.mrcmekong.org/ffg.php>. Further detail information for Flash Flood Information Warnings as well as the explanation are available in excel file of the link below:

http://ffw.mrcmekong.org/ffg/folderxls/1598928638_FFGS_result.xlsx.

6.4 Drought forecast

There are several climate prediction models with different scenarios on the upcoming months until December 2020. The MRC's Drought Forecasting and Early Warning System (DFEWS) adopts an ensemble model, which averages all scenarios called the North America Multi-Model Ensemble (NMME). The system is updating the data resolution from 25 km to 5 km and is expected to be ready by the end of September for the MRC DFEWS.

Temporarily, the global scale of rainfall prediction is used to see how the rain distribution looks like for the coming months. [Figure 13](#) of the monthly anomaly maps shows daily average of each month in mm/day from August to December 2020 produced by the NMME.

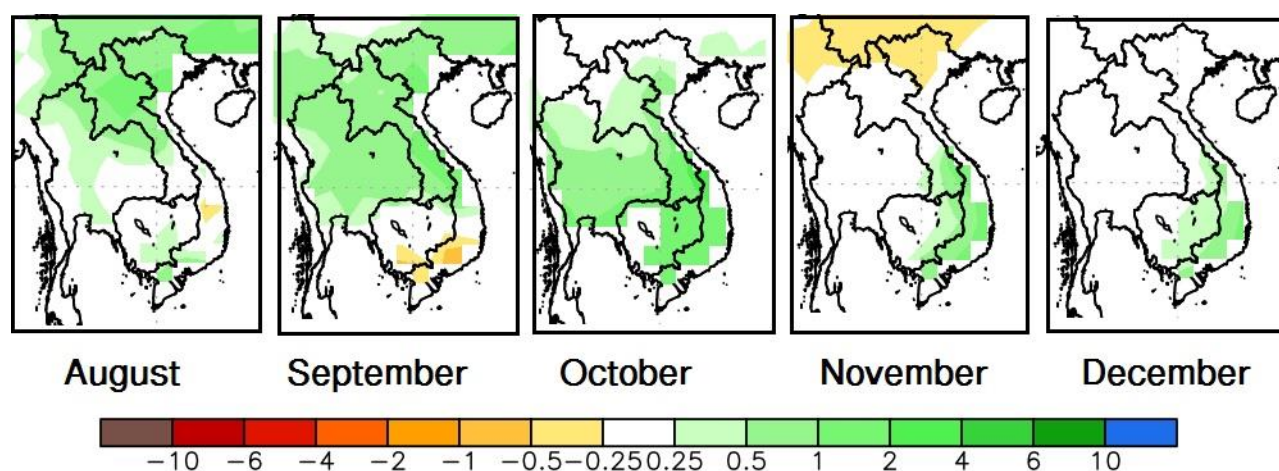


Figure 13. Daily average monthly rainfall forecast from August to December 2020

From the ensemble prediction model, the LMB is likely to receive more rain starting from August until the end of the rainy season in November 2020. Among the upcoming five months, September is likely to receive the least rain especially in southern part of the LMB covering south of Cambodia and the Mekong Delta as well as the Central Highland of Viet Nam. October is predicted to be relatively wet while November to receive average rainfall in Thailand and Lao PDR, and an excessive amount of rainfall in southeast of the LMB.

Table 2. River Flood Forecasting Bulletin



Mekong Bulletin

Mekong River Commission Secretariat (MRCs)

Regional Flood and Drought Management Centre (RFDMC)

P.O. Box 623 #576, National Road #2, Chak Angre Krom, Meanchey, Phnom Penh, Cambodia

Tel: (855-23) 425353, Fax: (855-23) 425363, Email: floodforecast@mrcmekong.org

River Flood Forecast: 31 August-05 September 2020

Date: 31 August 2020

Location	Country	24-hr Observed Rainfall (mm)	Zero gauge above M.S.L. (m)	Flood level (m)	Alarm level (m)	Observed W. level against zero gauge (m)		Forecasted Water Levels (m)					There is currently no flood warning in place at monitoring sites on the Mekong					
		30-Aug				30-Aug	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep						
Jinghong		16.5				536.64	536.13						↓	×	×	×	×	×
Chiang Saen		0.0	357.110	12.80	11.50	3.57	3.72	3.75	3.52	3.42			↑				★	★
Luang Prabang		0.0	267.195	18.00	17.50	10.28	10.09	10.02	9.94	9.87	9.78	9.73	↓					
Chiang Khan		1.0	194.118	16.00	14.50	8.78	8.50	8.37	8.35	8.32			↓	↓			★	★
Vientiane		0.0	158.040	12.50	11.50	6.00	5.85	5.67	5.56	5.53	5.50	5.40	↓	↓	↓			
Nongkhai		0.0	153.648	12.20	11.40	6.40	6.27	6.12	6.02	6.00			↓	↓	↓		★	★
Paksane		0.0	142.125	14.50	13.50	8.24	7.80	7.70	7.62	7.56	7.55	7.53	↓	↓				
Nakhon Phanom		0.0	130.961	12.00	11.50	7.88	7.36	7.15	7.10	7.06			↓	↓			★	★
Thakhek		0.0	129.629	14.00	13.00	8.95	8.44	8.22	8.15	8.09	8.05	8.03	↓	↓				
Mukdahan		0.0	124.219	12.50	12.00	7.79	7.26	6.85	6.74	6.71			↓	↓	↓		★	★
Savannakhet		0.0	125.410	13.00	12.00	6.32	6.01	5.70	5.63	5.60	5.58	5.56	↓	↓				
Khong Chiam		0.0	89.030	14.50	13.50	9.10	8.57	8.19	7.80	7.69			↓	↓	↓	↓	★	★
Pakse		0.0	86.490	12.00	11.00	7.50	7.04	6.83	6.60	6.54	6.50	6.48	↓	↓	↓	↓		
Stung Treng		0.0	36.790	12.00	10.70	7.31	6.85	6.46	6.27	6.08	6.04	6.02	↓	↓	↓	↓		
Kratie		0.0	-0.101	23.00	22.00	16.32	16.20	15.73	15.33	15.13	14.93	14.88	↓	↓	↓	↓	↓	↓
Kompong Cham		0.0	-0.930	16.20	15.20	10.08	10.23	10.09	9.61	9.20	9.00	8.80	↑	↓	↓	↓	↓	↓
Phnom Penh (Bassac)		0.0	-1.020	12.00	10.50	5.71	5.80	5.81	5.65	5.50	5.43	5.36	↑		↓	↓	↓	↓
Phnom Penh Port		nr	0.070	11.00	9.50	4.73	4.82	4.83	4.66	4.50	4.43	4.36	↑		↓	↓	↓	↓
Koh Khel		0.0	-1.000	7.90	7.40	5.14	5.26	5.28	5.17	5.05	5.00	4.95	↑		↓	↓	↓	↓
Neak Luong		0.0	-0.330	8.00	7.50	4.04	4.05	4.12	4.05	3.90	3.73	3.64		↑	↓	↓	↓	↓
Prek Kdam		0.0	0.080	10.00	9.50	4.59	4.72	4.74	4.58	4.42	4.35	4.30	↑		↓	↓	↓	↓
Tan Chau		0.0	0.000	4.50	3.50	1.84	1.87	1.89	1.90	1.89	1.86	1.83	↑				↓	↓
Chau Doc		nr	0.000	4.00	3.00	1.79	1.81	1.85	1.83	1.80	1.76	1.72		↑		↓	↓	↓

REMARKS:

:- not available.

nr: no rain.

LEGEND	
rising water level	↑
stable water level	
falling water level	↓
alarm stage	
alarm situation	
flood stage	
no data available	×
as suggested by Thailand, forecasted values are not displayed pending further improvement of the system	★

Note: Stable water level is defined as a daily change of less than 10cm from Chiang Saen to Savannakhet; less than 5cm at Pakse and Stung Treng; and no more than 3cm cm from Kratie downstream.
Flood stage is when the flood level exceeds. A flood level is determined by each Member Country.
Alarm stage is when the water level ranges between alarm and flood levels.
Alarm situation is when the water level is forecasted to reach the flood stage within the next three days.

River Flood Forecaster

KHEM Sothea

NOTE: Discharge at Luang Prabang may be influenced by hydropower operations (at both upstream and downstream).

For more info, please refer to this link:

<http://www.mrcmekong.org/>; http://ffw.mrcmekong.org/bulletin_wet.php; <http://ffw.mrcmekong.org/reportflood.php>

7 Summary and Possible Implications

7.1 Rainfall and its forecast

Rainfall during this reporting week was considered below average, varying from 0.5 mm to 50 mm at different stations along the LMB from Chiang Saen in Thailand to Tan Chau and Chau Doc in Viet Nam. The highest concentration was in the middle part of the LMB at Vientiane area (up to 50 mm). Compared with last week's amount, it was considered very low.

Neither tropical depressions nor tropical storms in the LMB were detected during this reporting week in the LMB. On 31 August, there were some spots of low pressure of the Monsoon Trough, crossing the northern and eastern parts of the Mekong region. This situation may bring some rainfall to these areas over the next few days.

Based on forecast rainfall from satellite using GFAS data, rainfall is likely to take place in areas between Lao PDR's Luang Prabang and Thailand's Nakhon Phanom, varying from 50 mm to 65 mm in the next five days. This will increase the chance of rainfall concentration over the LMB in the upcoming week (near average rainfall expected).

7.2 Water level and its forecast

Water levels at most of the monitoring locations in the LMB during this reporting week decreased due to low precipitation in the middle part of the LMB, making the water levels drop significantly below their long-term averages (LTA).

In general, this week's water levels at most of the stations were lower than those of last week. And the water levels this week from Phnom Penh Port to Prek Kdam on the Tonle Sap River in Cambodia were very much comparable to the figures last year.

The starting date of the reverse flow from the Mekong River into the Tonle Sap Lake took place on August 4, a bit late compared to a normal event. However, two extremely small and brief instances happened in July. Due to late reverse flows this year, the water volume of the Lake at this reporting point remains extremely small and less than its minimum volume (even than the 2019's) and is considered at critical level.

Over the next few days, water levels across all the stations in the LMB are expected to decrease between -0.5 and -0.02 metres. Thus, all stations' water levels are expected to remain below their LTAs.

The situation in Tan Chau on the Mekong River and Chau Doc on the Bassac River is expected to remain unchanged.

Below average precipitation during the past months is believed to be one of the main factors causing low water levels at most of the stations along the Mekong mainstream.

Since the beginning of this year (2020), water levels in the Lower Mekong River have been lower than their LTAs for all monitoring stations (from upper to lower stretches within the

LMB). Like many parts of the world, the Mekong region has been affected by the prolonged El Nino event, the phenomenon that usually causes extreme heat and insufficient rainfall. This climate change impact has been observed since 2019. Therefore, the main cause of low water levels in the Mekong mainstream from June to July 2020 could be the unusual low rainfall as results of the climate change affecting the Lower Mekong Region.

For a more complete preliminary analysis of the hydrological conditions in the LMB over January – July 2020, please refer to this [Situation Report](#).

The contribution to the Mekong River's flow from the Upper Mekong Basin in China (Yunnan component) is about 16 % by the time the river discharges through the Mekong Delta into the Sea. By far the major contribution comes from the two major 'left-bank' (eastern) tributaries between Vientiane – Nakhon Phanom and Pakse – Stung Treng, which together contribute more than 40% of the flows.

7.3 Flash flood and its trends

Flash floods will most likely not take place in the LMB during next week as only small amount of rainfall is predicted. However, unexpected heavy rain in local communities which could lead to minor flash flood is still possible.

7.4 Drought condition and its forecast

Drought condition of the LMB from 20-26 August was getting much better compared to the condition over past weeks. The severe drought condition in Quang Tri of Viet Nam during last week from 13-19 Aug has disappeared. Only moderate dry conditions are found in Southern and eastern Ubon Ratchathani, South-eastern Si Saket, Southern Chiang Mai and Chiang Rai, Western Phayao, Bokeo and Laungnamtha, and the bordering area of Vientiane with Luangprabang. However, the situation is not significant.

The upcoming three-month (September-November) forecast show that LMB areas are likely to receive more rain compared to the previous months and its three-month long-term average. However, the southern part of the LMB including south of Cambodia, Mekong Delta, as well as Central Highland of Viet Nam are predicted to receive less rain than other areas in September 2020.

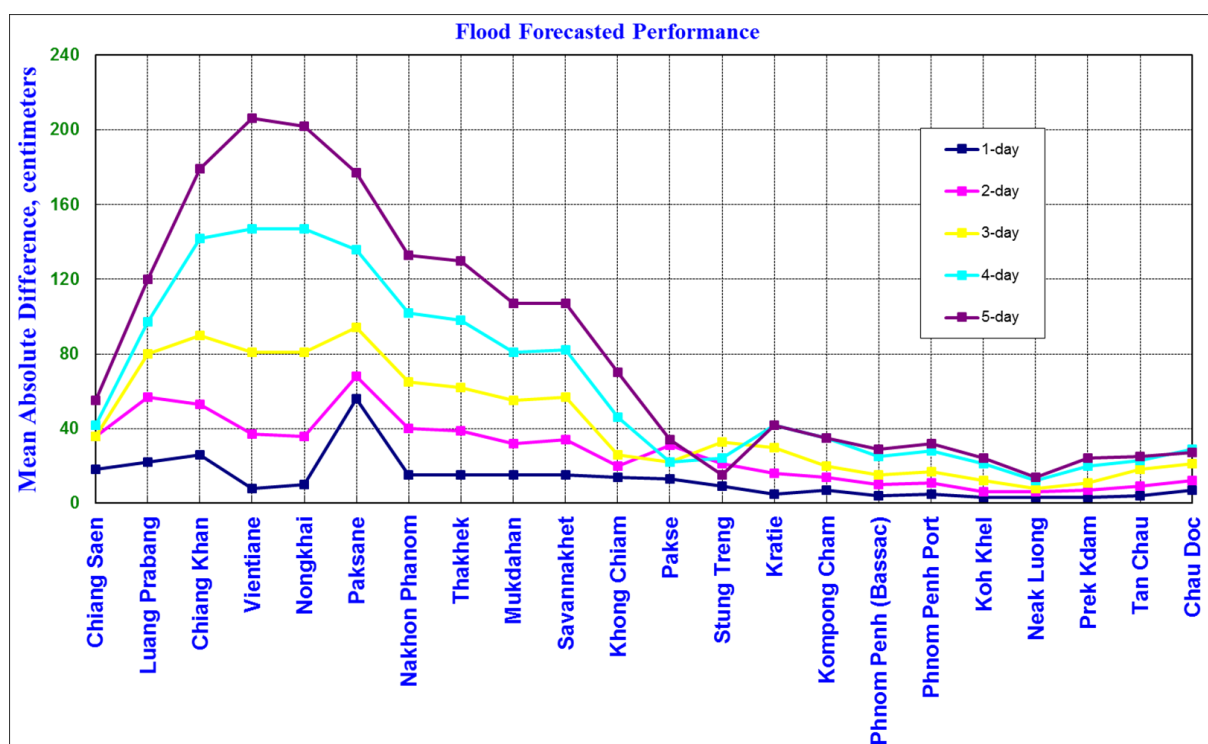
Annex 1: Performance of the weekly flood forecasting

Accuracy

“Accuracy” here refers to the state where data recorded in the MRC’s Mekong River Flood Forecasting System are cleaned and verified to ensure they are correct before releasing.

The adjustment of flood forecasting outcomes from the flood forecasting system requires flood forecasters to have extensive knowledge in hydrology and statistical modelling for estimating the relationships between stations upstream and downstream in the Mekong River Basin. Flood forecasting performance presented in the graph below shows the average flood forecasting accuracy at each key station along the Mekong mainstream from 25 to 31 August 2020.

The forecasting values from 25 to 31 August 2020 show that the overall accuracy is fair for 1-day to 3-day forecast lead time at stations in the middle part of the Mekong River from Luang Prabang to Vientiane due to the hydropower operation and heavy rainfall affecting this area.



Note: The higher percentage of flood forecasting accuracy is due to several key factors as follows:

- Missing data and data input are not sufficient to be used for inputting into the flood forecasting model system.
- The influence of heavy rainfall and hydropower operations from upstream (Xayaburi) and tributaries inflows.

- Luang Prabang, Chiang Khan and Paksane stations have been affected by hydropower operations of Xayaburi and Nam Nguem (water retention and release). Rainfall always accumulates at this spot, which could be causing rapid high-water levels.
- Rapid fluctuations of water levels at Tan Chau and Chau Doc stations due to daily tidal effects of the sea in the Mekong Delta.
- Satellite rainfall data was not representative of the actual rainfall at ground stations in some areas of the Mekong region.

Performance based on data from the Member Countries

Flood forecasting performance is based on the hydro-met data received from the Member Countries. The flood forecasting achievement indicated in (%) and (cm) from 1 day to 5 days at each key station, against with Old Benchmark for a successful lead-time are presented in Table B1 and Table B2.

The evaluation of performance indicators, missing data and completion time for flood forecasting are presented in Table B3 and Figures B4, B5 and B6, respectively from 25 to 31 August 2020.

Table B1: The Mean Absolute Difference (Error) of Flood Forecasting base on old defined Benchmark from 25 – 31 Aug 2020 in cm

Lead-time Forecasted	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
1-day	18	<u>22</u>	<u>26</u>	8	10	56	15	15	15	15	14	13	9	5	7	4	5	3	3	3	4	7
2-day	<u>36</u>	57	53	<u>37</u>	<u>36</u>	68	<u>40</u>	<u>39</u>	<u>32</u>	<u>34</u>	<u>20</u>	<u>31</u>	<u>21</u>	16	14	10	11	6	6	7	9	12
3-day	<u>36</u>	80	90	81	81	94	65	62	55	57	<u>26</u>	<u>22</u>	<u>33</u>	<u>30</u>	<u>20</u>	15	17	12	8	11	18	<u>21</u>
4-day	<u>42</u>	97	142	147	147	136	102	98	81	82	<u>46</u>	<u>22</u>	<u>24</u>	<u>42</u>	<u>35</u>	<u>25</u>	<u>28</u>	<u>21</u>	12	<u>20</u>	<u>23</u>	<u>29</u>
5-day	55	120	179	206	202	177	133	130	107	107	70	<u>34</u>	15	<u>42</u>	<u>35</u>	<u>29</u>	<u>32</u>	<u>24</u>	14	<u>24</u>	<u>25</u>	<u>27</u>

Table B2: The Mean Absolute Difference (Error) of Flood Forecasting base on old defined Benchmark from 25 – 31 Aug 2020 in %

Lead-time Forecasted	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc	Average
1-day	57.1	71.4	57.1	57.1	<u>42.9</u>	57.1	57.1	71.4	71.4	71.4	57.1	71.4	71.4	71.4	71.4	57.1	57.1	85.7	57.1	71.4	57.1	85.7	64.9
2-day	66.7	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	66.7	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>33.3</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	83.3	<u>50.0</u>	66.7	<u>50.0</u>	53.0
3-day	<u>40.0</u>	60.0	60.0	<u>40.0</u>	<u>40.0</u>	<u>40.0</u>	60.0	60.0	60.0	60.0	<u>40.0</u>	60.0	60.0	60.0	60.0	60.0	60.0	60.0	<u>40.0</u>	80.0	60.0	60.0	55.5
4-day	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	75.0	75.0	75.0	<u>50.0</u>	75.0	<u>50.0</u>	75.0	<u>50.0</u>	<u>50.0</u>	75.0	75.0	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	75.0	75.0	60.2
5-day	66.7	<u>33.3</u>	66.7	66.7	66.7	66.7	<u>33.3</u>	66.7	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	57.6

Note: Red values are not well matched with the actual values in (%) and (cm)

Table B3: Overview of performance indicators for the past 8 days from 25 to 31 August 2020

	FF time sent				Arrival time of input data								Missing data (number-mainstream and trib.st.)							
2020	FF completed and sent (time)	Stations without forecast	FF2 completed and sent (time)	Weather data available (time)	NOAA data	China	Cambodia - DHRW	Cambodia - DOM	Lao PDR - DMH	Thailand - DWR	Viet Nam - SRHMC	Viet Nam - HMS	NOAA data/2dataset	China/2	Cambodia - DHRW/15	Cambodia - DOM/34	Lao PDR - DMH/32	Thailand - DWR/13	Viet Nam - SRHMC/6	Viet Nam - HMS/39
week	10:18	00:00	-	-	08:15	07:10	06:57	08:04	08:29	08:23	07:09	08:07	0	0	3	0	72	0	1	0
month	10:24	00:00	-	-	08:15	07:10	07:38	08:11	08:39	08:26	07:14	08:06	0	0	37	0	464	0	2	38

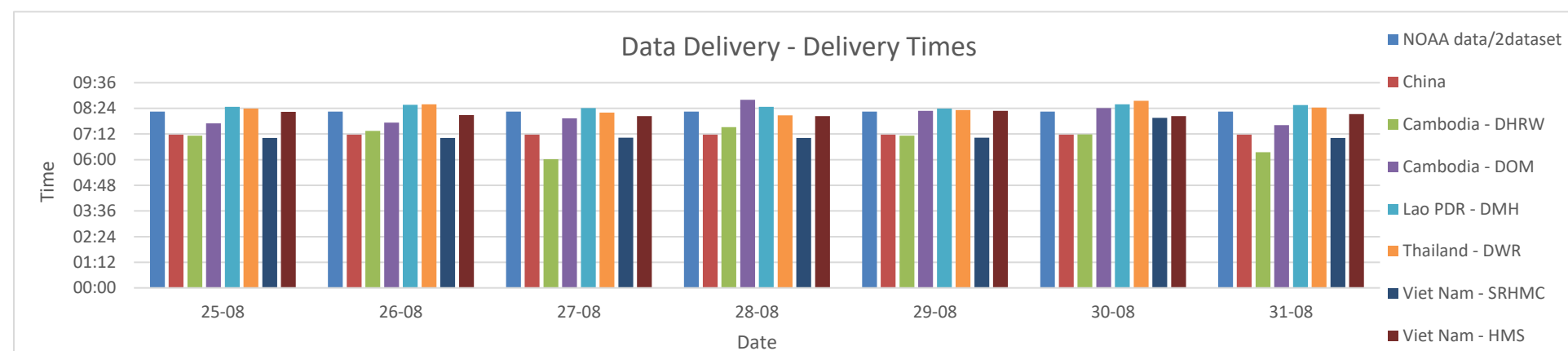


Fig. B4: Data delivery times for the past 8 days from 25 to 31 August 2020

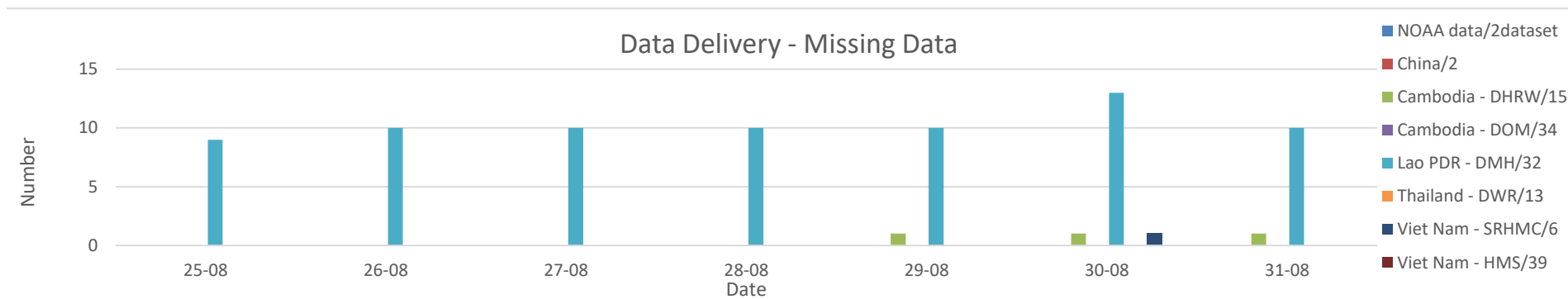


Fig. B5: Missing data for the past 7 days from 25 to 31 August 2020

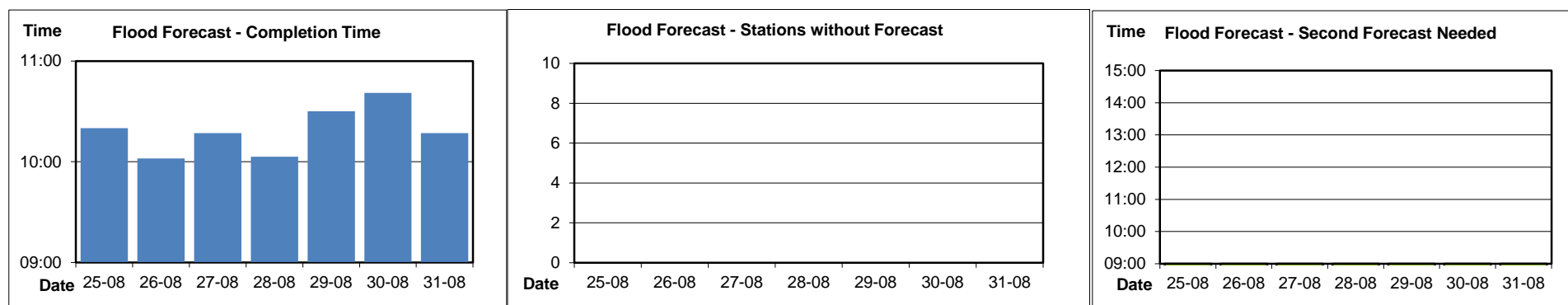


Fig. B6: Flood forecast completion time, stations without forecasts, and second forecasts need from 25 to 31 August 2020



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