



Mekong River Commission

Weekly Wet Season Situation Report in the Lower Mekong River Basin 20 – 26 August 2024

Prepared by
The Regional Flood and Drought Management Centre
27 August 2024

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Key Messages

Key messages for this weekly report are presented below.

Rainfall monitoring and forecast

- In the period of 20 – 26 August 2024, light to very heavy rainfall has been observed over the LMB. Especially in the period from August 20 - 22, due to the monsoon trough laying across the upper part of Laos into the low-pressure cell over upper Viet Nam, heavy to very heavy rain occurred in the Northern part of Laos and Thai land, including Chiang Rai, Chiang Saen, Nong Khai, Thoeng, Pklay, Vang Vieng, Vientiane, Muong Mai, Muong Kao.
- From 27 August - 31 September 2024, the accumulated rainfall over the entire Lower Mekong Basin is distributed with light to heavy rain and thunderstorms. Heavy rainfall is expected to occur in the upper parts of the 3S Basin of Sekong, Sesan, and Srepok.

Water level monitoring and forecast

- At 22 key monitoring stations along the Mekong mainstream from 20 – 26 August 2024, water level at Nongkhai station has reached alarm level since 24 August 2024. the water levels at other stations are in normal conditions, which do not reach alarm and flood levels. The total accumulated volume of the reverse flow to Tonle Sap Lake remains 16.25 Km³ since 17 August 2024.
- In the period of 27 – 31 August 2024, water levels at stations along Mekong mainstream from are likely expected to rise except for upper stations including Chaing Saen, Luang Prabang and Chiang Khan stations. However, at Nongkhai station, water level is expected to continue at alarm level till 31 August 2024. Other stations are expected in normal conditions, which do not neither reach alarm nor flood levels.

Drought condition and forecast

- During 20-26 August 2024, the LMB was experiencing moderate and severe droughts over the southern part. Severe drought was taking place in Kampong Cham, Kampong Thom, Kratie, and Preah Vihear of Cambodia. The observed drought was caused primarily by meteorological indicator.
- August is expected to be abnormally dry over the central and lower parts. Eastern Cambodia and 3S area are likely the driest area of the region. The forecast also indicates that central and eastern Cambodia is likely at moderately dry during September. While no drought is anticipated for October. More rain is expected to come during October before the end of the rainy season.

1 Introduction

This Weekly Wet Season Situation Report presents a preliminary analysis of the weekly hydrological situation in the Lower Mekong River Basin (LMB) for **20 – 26 August 2024**. 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 water level indicated in this report refers to an above zero gauge of each station.

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 Lake.
- 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.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

During 20 – 26 August 2024, light to very heavy rainfall has been observed over the LMB. Especially in the period from August 20 - 22, due to the monsoon trough laying across the upper part of Laos into the low-pressure cell over upper Viet Nam, heavy to very heavy rain occurred in the Northern part of Laos and Thai land, including Chiang Rai, Chiang Saen, Nong Khai, Thoeng, Pklay, Vang Vieng, Vientiane, Muong Mai, Muong Kao.

Figure 1 presents the mean sea level pressure over the region. It is forecasted that the moderate southwest monsoon and the low pressure will be impacted on the Lower Mekong Basin from 27 August - 02 September 2024. Therefore, in the upcoming seven days, the Lower Mekong Basin is expected with light to heavy rain and thunderstorms. Heavy rainfall is expected to occur in the upper parts of the 3S Basin of Sekong, Sesan, and Srepok.

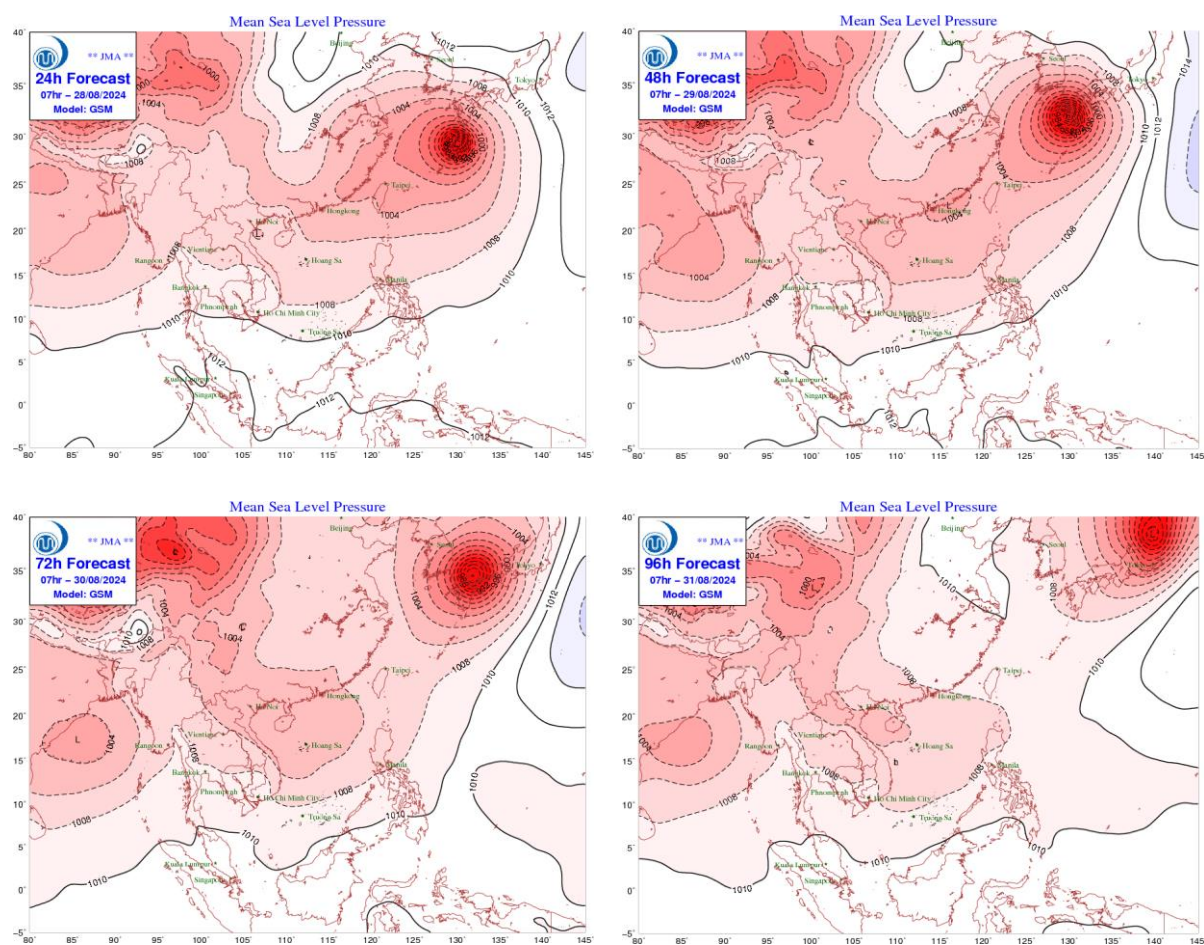


Figure 1: Weather conditions over the LMB

According to the ASEAN Specialised Meteorological Centre (ASMC, <http://asmc.asean.org/home/>), the subseasonal weather outlook (19 August – 01 September 2024) indicates that wetter and warmer conditions are predicted from lower to central parts of Lower Mekong. **Figure 2** shows the outlook of weather condition from 19 August – 01 September 2024 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

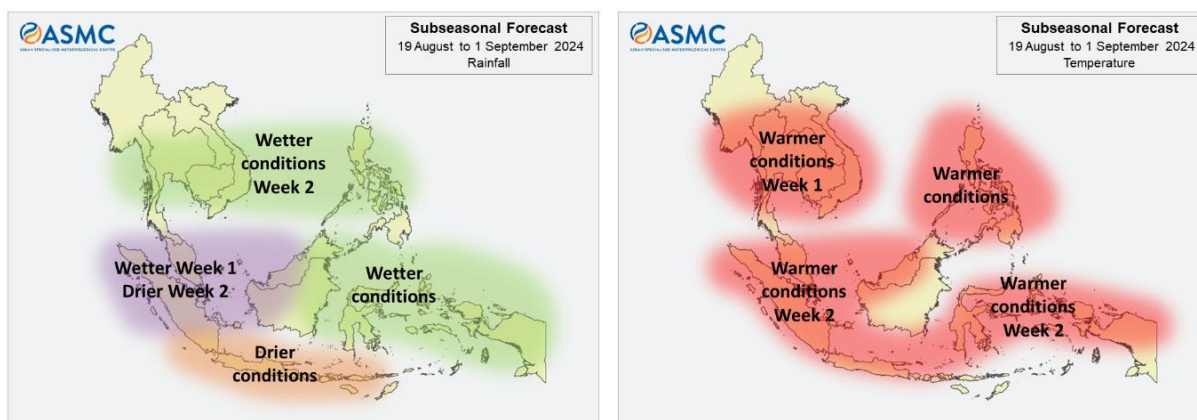


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

Based on the tropical storm risk (TS) (<https://www.tropicalstormrisk.com/>), there is one active NW pacific system as of 26 August 2024 as displayed in **Figure 3**. However, this tropical storm may not affect the LMB.

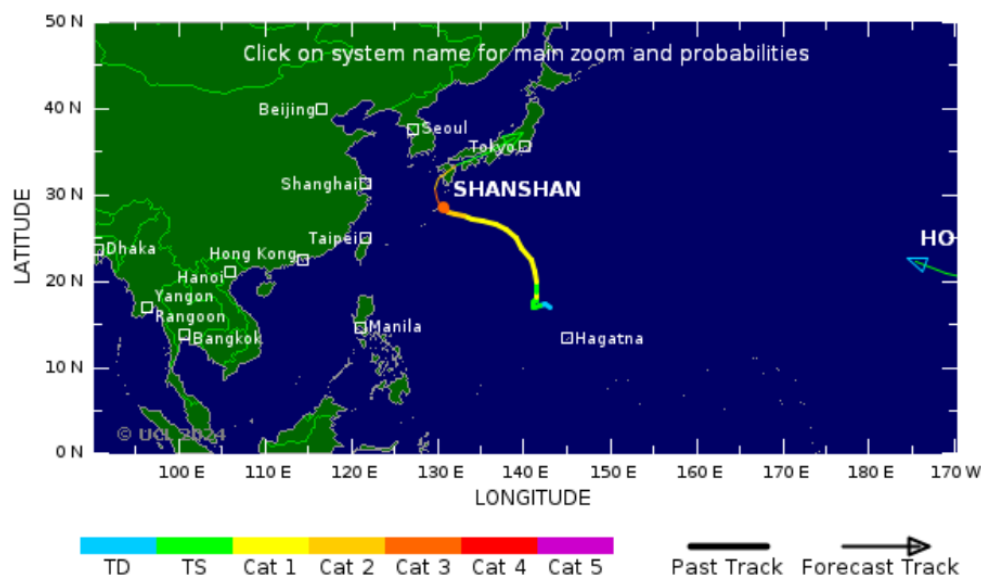


Figure 3: One tropical storm risk observed on 26 August 2024

3. Rainfall and Water Level Monitoring

3.1. Rainfall monitoring

The weekly accumulated rainfall is based on the observed data provided by the MRC Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – from 20 – 26 August 2024 (**Figure 4**). Light to very heavy rainfall has been observed over the LMB. Especially in the period from August 20 - 22, due to the monsoon trough laying across the upper part of Laos into the low-pressure cell over upper Viet Nam, heavy to very heavy rain occurred in the Northern part of Laos and Thai land, including Chiang Rai, Chiang Saen, Nong Khai, Thoeng, Pklay, Vang Vieng, Vientiane, Muong Mai, Muong Kao.

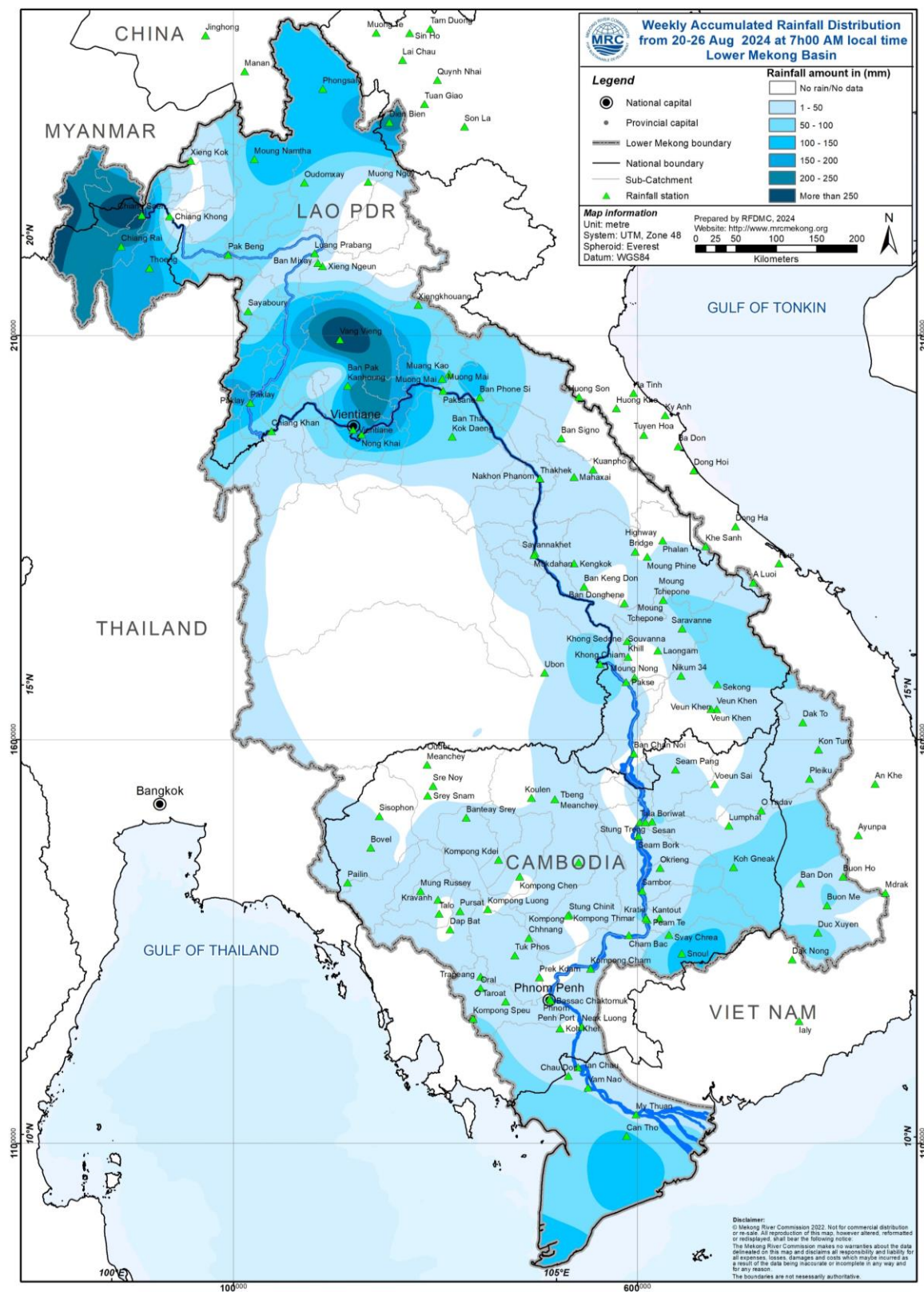


Figure 4: Weekly rainfall distribution over the LMB during 20 – 26 August 2024

3.2. Water level monitoring

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 Upper Mekong Basin (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 in Cambodia to capture overall flows of the Mekong Basin; and at Viet Nam's 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>.

During 20– 26 August 2024, the observed water level (WL) at Jinghong hydrological station¹, was almost constant and ranges between 535.96 m and 536.94 m, which are corresponding to the outflow between 1,340.00 m³/s to 2,100.00 m³/s (recorded on 7:00 am), respectively (**Figure 6**). The water level in Chiang Saen station also indicated a fluctuation ranging from 5.71 m to 7.85 m. At the same period, the water level in Luang Prabang station also increased with an approximate value of 1.86 m from 14.12 m to 15.98 m as compared to the previous week.

During the same period, the water levels observed at all stations have been increasing due to heavy rainfall in the upper parts of the basin. At Chiang Khan, Vientiane, Nongkhai, Paksane, Nakhon Phanom, Thakhek, Mukdahan, Savannakhet, Kong Chiam and Pakse stations, the water levels have increased from 9.55 m to 11.01 m, 10.2 m to 11.73 m, 10.71 m to 12.06 m, 9.19 m to 10.17 m, 10.26 m to 11.12 m, 8.61 m to 9.37 m, 7.02 m to 7.77 m, 9.51 m to 10.1 m and 7.58 m to 8.12 m, respectively. Moreover, moving downstream at Stung Treng, Kratie, Kampong Cham, Phnom Penh Port, Phnom Penh Bassac, Neak Luong, Koh Khel and Prek kdam, the water levels have also increased from 6.84 m to 7.16 m, 15.69 m to 16.30 m, 9.48 m to 9.9 m, 6.1 m to 6.3 m, 5.0 m to 5.22 m, 5.64 m to 5.76 m, 4.22 m, 4.22 m to 4.48 m, and 5.23 m to 5.38 m, respectively.

From to the previous week, the water levels from 20 to 26 August 2024 at Viet Nam's Tan Chau and Chau Doc, water levels have decrease from 1.87 m to 1.72 m and from 1.64 m to 1.65 m, respectively.

¹ Near-real time data of hydro-meteorological monitoring at the Jinghong hydrological station is available at <https://portal.mrcmekong.org/monitoring/river-monitoring-telemetry>.

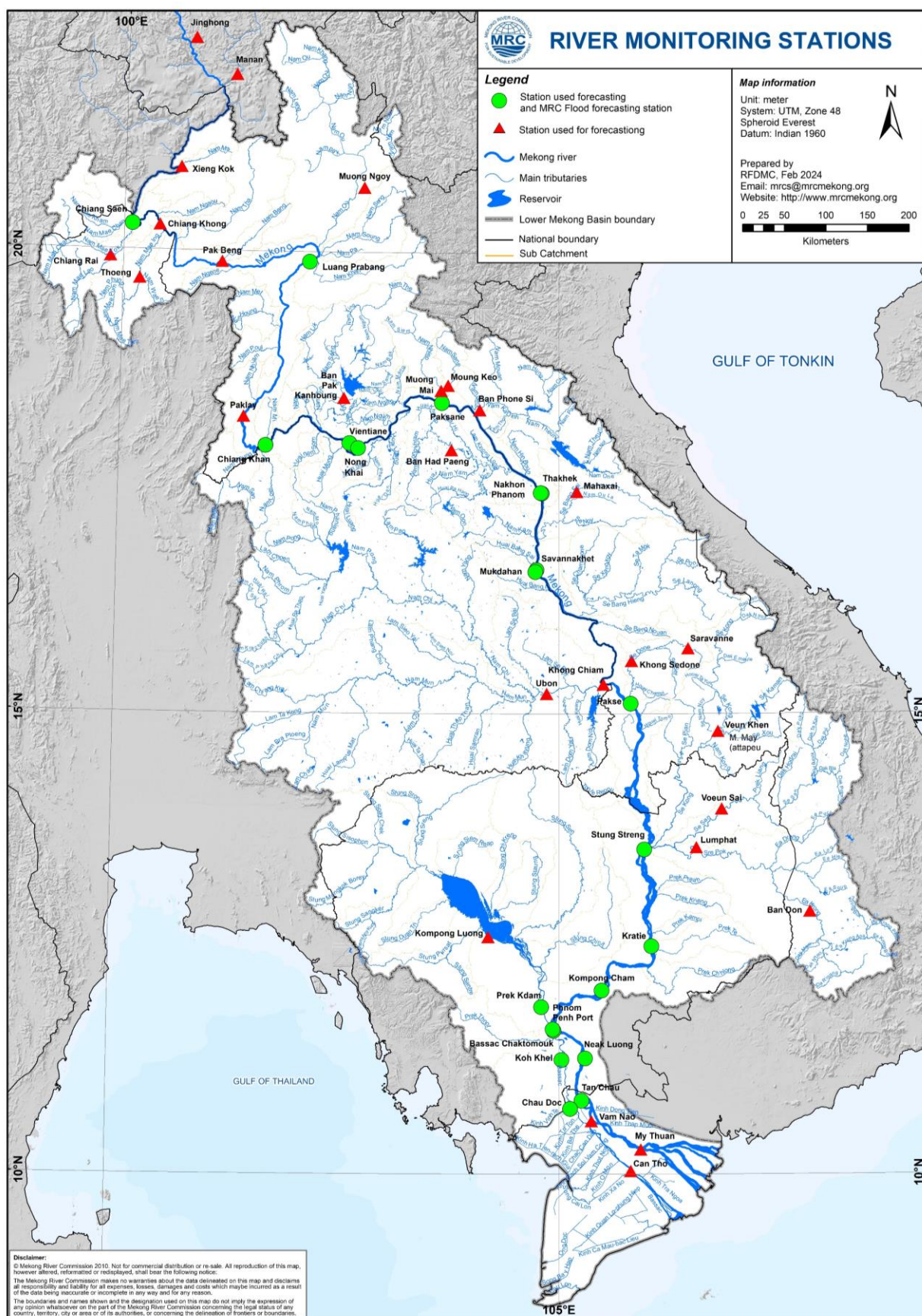


Figure 5: The key stations along LMB for river flood forecasting

The water levels in key monitoring stations on 26 August, water level at Nongkhai has reached alarm level since 24 August 2024. However, at other stations, the water levels are in normal conditions, which do not reach alarm and flood levels. Moreover, all stations with available PMFM (Article 6C) thresholds are in normal conditions. The graphics of water level monitoring in all key stations are presented in **Annex A** and the weekly water levels and rainfall at each key station are summarised in **Annex B**.

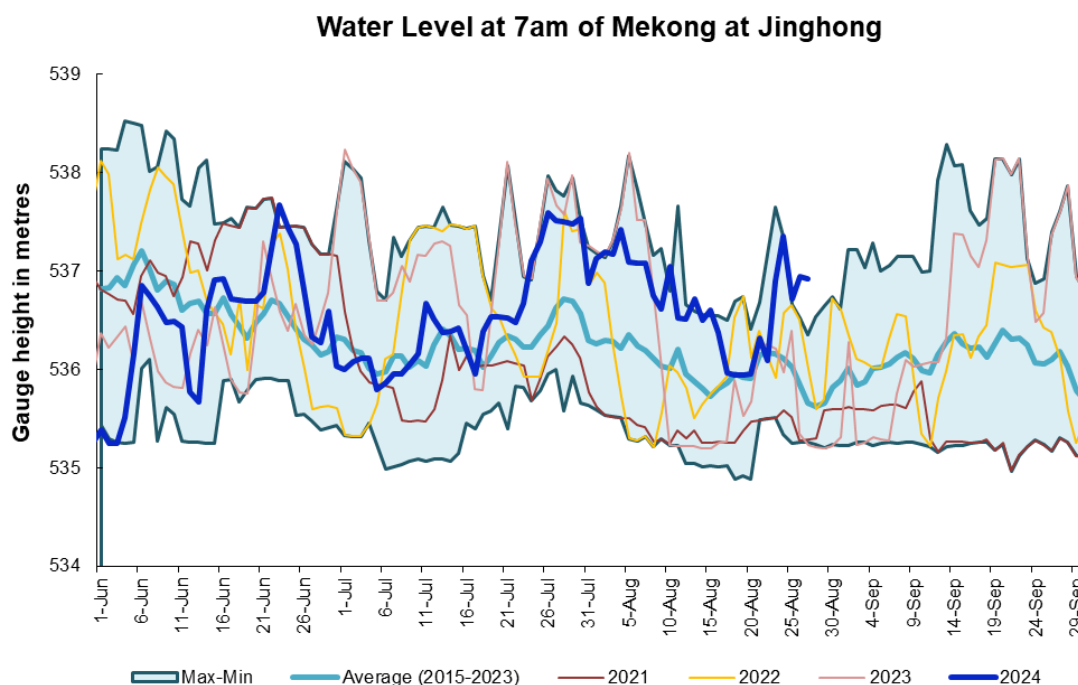


Figure 6. Water level at the Jinghong hydrological station up to 26 August 2024.

At the end of the wet season, when water levels along the Mekong River subside, the outflow of the Tonle Sap Lake (TSL) returns to the Mekong River and then to the Delta. This phenomenon normally takes place between September and October. Based on flow observation at Prek Kdam monitoring station, the inflow/reverse of the Tonle Sap Lake took place since 29 June 2024.

The outflow flow is calculated based on a formula of rating-curves using by difference of water levels at Kompong Luong and Phnom Penh Port stations for slop and Prek Kdam as cross-section of the Lake. The formula of flow is as follows:

$$Flow = WL_{Prek\ Kdam}^{1.2} \times \sqrt{|WL_{Phnom\ Penh\ Port} - WL_{Kompong\ Luong}|}$$

Where, WL is water level in m (msl).

The seasonal changes of the inflow/reverse flow and the outflow of the TSL at Prek Kdam in comparison with the flows of 2020, 2021 and 2022, 2023 and their LTA level (1997-2023) are illustrated in **Figure 7**. The reversed flow to the lake has stopped since 17 August 2024. This may be resulted from high water level in the lake caused by significant contribution from its

tributaries. Moreover, it might be contributed from limited flow from the Mekong mainstream.

The seasonal changes in monthly flow volumes up to 26 August 2024 for the TSL compared with that in 2020, 2021, 2022, 2023 and their LTAs, and the fluctuation levels (1997–2023) are presented in **Table 8**. The mean monthly water volume of the Tonle Sap Lake in July 2024 is lower than its LTA (about 72.94 %) and 2022 but higher than that in 2019, 2020, 2021 and 2023 during the same period (**Figure 8 and Table 1**). However, updated until 26 August 2024, the volume of the lake is approximately 65.30% of its LTA in August.

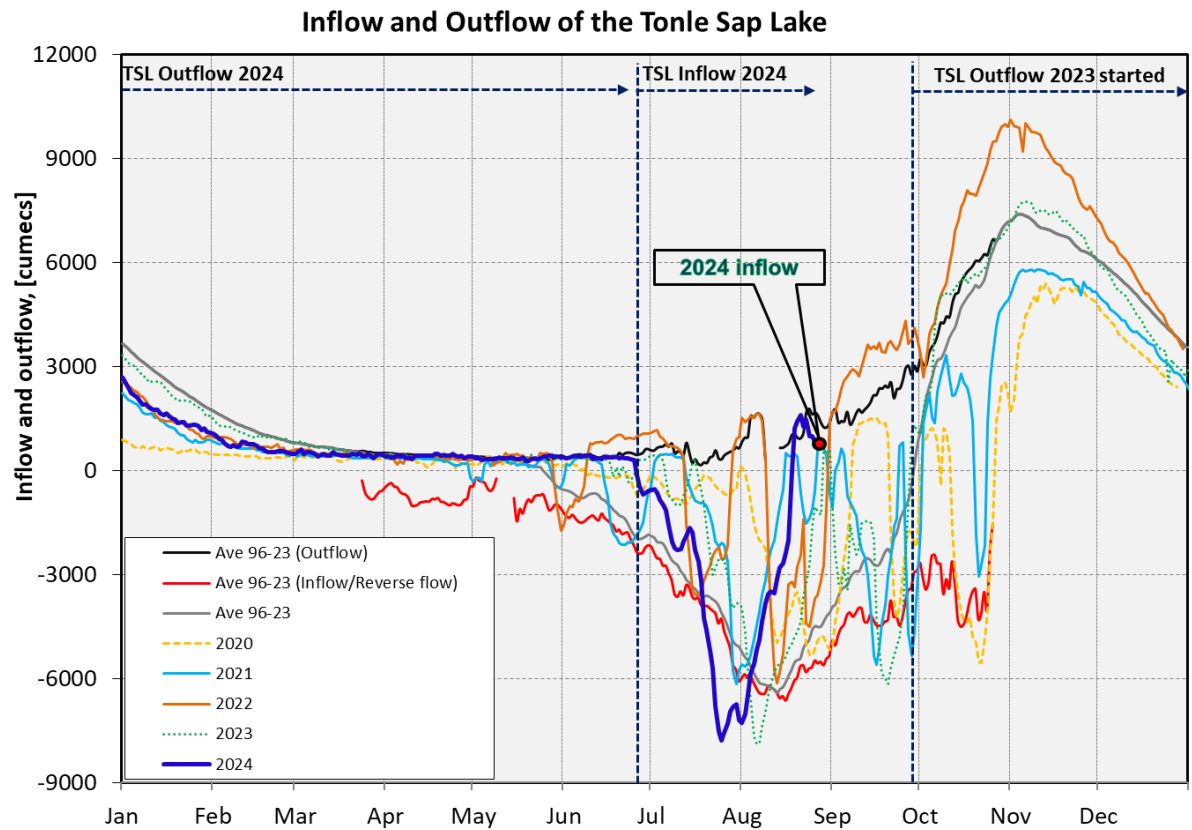


Figure 7: Seasonal change of inflows and outflows of Tonle Sap Lake.

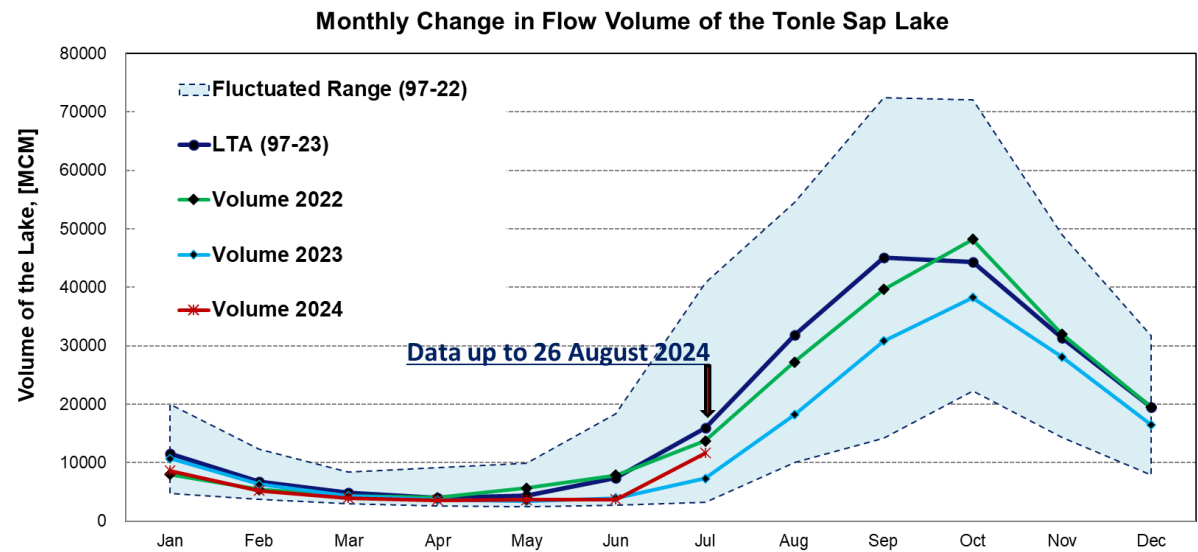


Figure 8. The seasonal change in monthly volume of Tonle Sap Lake.

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

Month	LTA (97-22) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]	Volume 2022 [MCM]	Volume 2023 [MCM]	Volume 2024 [MCM]	Volume in 2024 [%], compared with its LTA
Jan	11487.13	20039.88	4796.69	7998.69	4796.69	7405.81	7998.69	10700.62	8610.88	74.96
Feb	6697.79	12266.87	3757.30	4954.90	3757.30	4671.15	5405.65	6309.00	5211.05	77.80
Mar	4822.51	8340.62	3030.40	3936.30	3259.79	4147.46	4330.50	4299.86	3936.30	81.62
Apr	4033.80	9203.09	2552.38	3317.61	2635.83	3259.79	4026.48	3609.52	3580.11	88.75
May	4376.15	9938.04	2441.69	3317.61	2469.30	3462.96	5668.52	3404.68	3609.52	82.48
Jun	7357.50	18344.65	2775.77	3580.11	2832.04	4765.22	7886.07	3936.30	3698.04	50.26
Jul	16001.18	40825.01	3230.96	4269.27	3230.96	7333.01	13751.91	7260.51	11671.87	72.94
Aug	31847.52	54529.13	10021.39	12266.87	10021.39	12453.19	27226.87	18168.63	20796.07	65.30
Sep	45088.00	72427.44	14251.59	35070.22	14251.59	22430.63	39624.67	30811.08		
Oct	44317.53	72124.19	22296.87	25074.27	28782.41	32331.33	48230.13	38255.90		
Nov	31391.74	49030.83	14302.12	14302.12	23867.31	25218.90	31989.11	28075.12		
Dec	19550.90	31734.10	7886.07	7886.07	13900.73	15599.94	19545.75	16466.19		
	Critical situation: lower than long-term minimum values (LTMIN)									
	Normal condition: within the range of long-term min (LTMIN) and max (LTMAX) values									
	Low volume situation: lower than long-term average (LTA)									
Unit: Million Cubic Meter (1 MCM= 0.001 Km ³)										

Remarks: the monthly volume of Tonle Sap Lake in 2024 is updated until 26 August 2024.

4. Flash Flood in the Lower Mekong Basin

During the weekly monitoring period from 20 – 26 August 2024, the LMB received light to very very heavy rain in some areas in the upper and central parts of the LMB.

According to the Southeast Asian Flash Flood Guidance System (SEAFFGS) and analysis, flash flood guidance was detected high level in the next 1, 3, and 6 hours in some areas of Lao PDR and Thailand during this period, the reporting period as shown in [Figure 14](#) and [Table 2](#).

Table 2. Detected moderate to high-risk flash flood in Lao PDR on 20 August

FLASH FLOOD GUIDANCE IN THE LOWER MEKONG BASIN IN LAO PDR								
In the next 01 hour			In the next 03 hour			In the next 06 hour		
Province	District	Level of FFG	Province	District	Level of FFG	Province	District	Level of FFG
Bokeo	Meung	moderate	Khammuane	Bualapha	moderate	Khammuane	Bualapha	moderate
Bolikhamxay	Thaphabat	moderate	Khammuane	Nhommalat	high	Khammuane	Nhommalat	high
Bolikhamxay	Viengthon	moderate	Khammuane	Mahaxay	high	Khammuane	Mahaxay	high
Khammuane	Nakai	moderate	Khammuane	Xaybouath	high	Khammuane	Xaybouath	high
Khammuane	Bualapha	moderate	Luangnamtha	Viengphou	moderate	Luangnamtha	Viengphou	moderate
Khammuane	Nhommalat	high	Phongsaly	Bounneua	moderate	Phongsaly	Bounneua	moderate
Khammuane	Mahaxay	high	Phongsaly	Bountay	moderate	Vientiane	Xanakham	moderate
Khammuane	Xaybouath	high	Vientiane	Xanakham	moderate			
Luangnamtha	Long	moderate						
Luangnamtha	Viengphou	moderate						
Luangprabang	Ngoi	moderate						
Luangprabang	Nambak	moderate						
Luangprabang	Viengkham	moderate						
Phongsaly	Samphanh	moderate						

FLASH FLOOD GUIDANCE IN THE LOWER MEKONG BASIN IN LAO PDR								
In the next 01 hour			In the next 03 hour			In the next 06 hour		
Province	District	Level of FFG	Province	District	Level of FFG	Province	District	Level of FFG
Phongsaly	Bounneua	moderate						
Phongsaly	Bountay	moderate						
Vientiane	Xanakham	high						
Xayaboury	Khop	moderate						

FLASH FLOOD GUIDANCE IN THE LOWER MEKONG BASIN IN THAILAND								
In the next 01 hour			In the next 03 hour			In the next 06 hour		
Province	District	Level of FFG	Province	District	Level of FFG	Province	District	Level of FFG
Chiang Rai	King Amphoe Khun Tan	moderate	Bueng Kan	Bung Kan	high	Bueng Kan	Bung Kan	high
Chiang Rai	Thoeng	moderate	Chiang Rai	Thoeng	moderate	Chiang Rai	Thoeng	moderate
Chiang Rai	Phaya Meng Rai	moderate	Sakon Nakhon	Phu Phan	moderate	Sakon Nakhon	Phu Phan	moderate
Bueng Kan	Bung Kan	high	Sakon Nakhon	Kutbak	moderate	Sakon Nakhon	Kutbak	moderate
Sakon Nakhon	Phu Phan	moderate						
Sakon Nakhon	Kutbak	moderate						

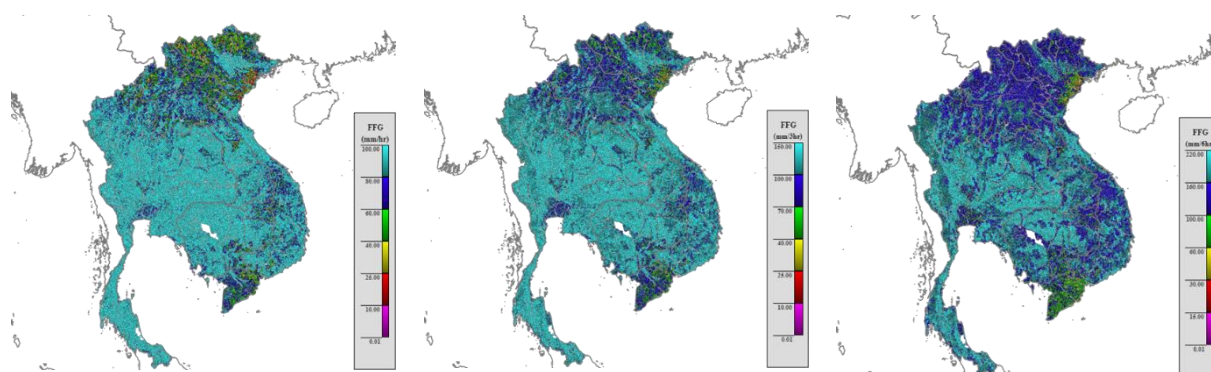


Figure 9. Flash Flood risk for the next 12-hr and 24-hr on 20 August

5. Drought Monitoring in the Lower Mekong Basin

5.2. Weekly drought monitoring from 20-26 August 2024

Drought monitoring data for 2024 are available from Monday to Sunday every week; thus, the reporting period is normally delayed by one day compared to Flood and Flash Flood reports. We adopt the Index of Soil Water Fraction (ISWF) data obtained from FFGS to represent soil moisture of agricultural indicator for both dry and wet seasons.

- **Weekly Standardised Precipitation Index (SPI1)**

As indicated in **Figure 10** below, during 20-26 August, the LMB was facing some moderate and severe meteorological droughts in southern part covering mainly Thailand and Cambodia. Severe drought was taking place over Phailin, Siem Reap, Oudor Meancehy, Preah Vihear,

Kampong Thom, Kampong Cham, Kratie, Kandal, Mondulakiri, Ratanakiri, Ca Mau, Bac Lieu, and Ubon.

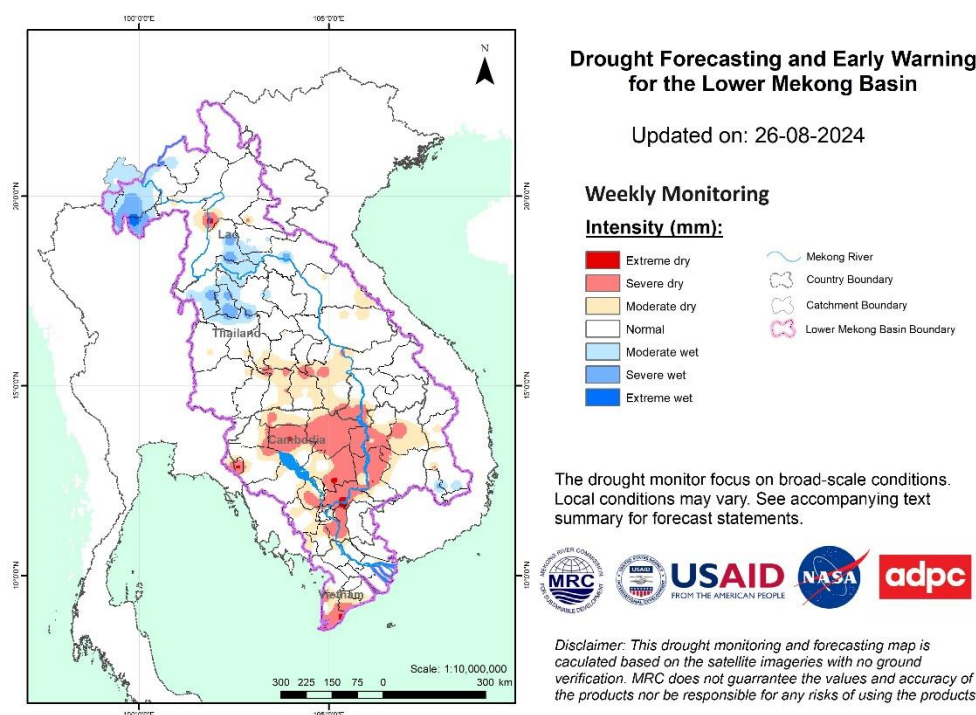


Figure 10: Weekly standardized precipitation index from August 20 to 26.

- **Weekly Index of Soil Water Fraction (ISWF)**

There were some moderate and severe agricultural droughts taking place during the monitoring week from 20 to 26 August 2024 and mainly in southern Lao PDR and eastern Cambodia., see **Figure 10**.

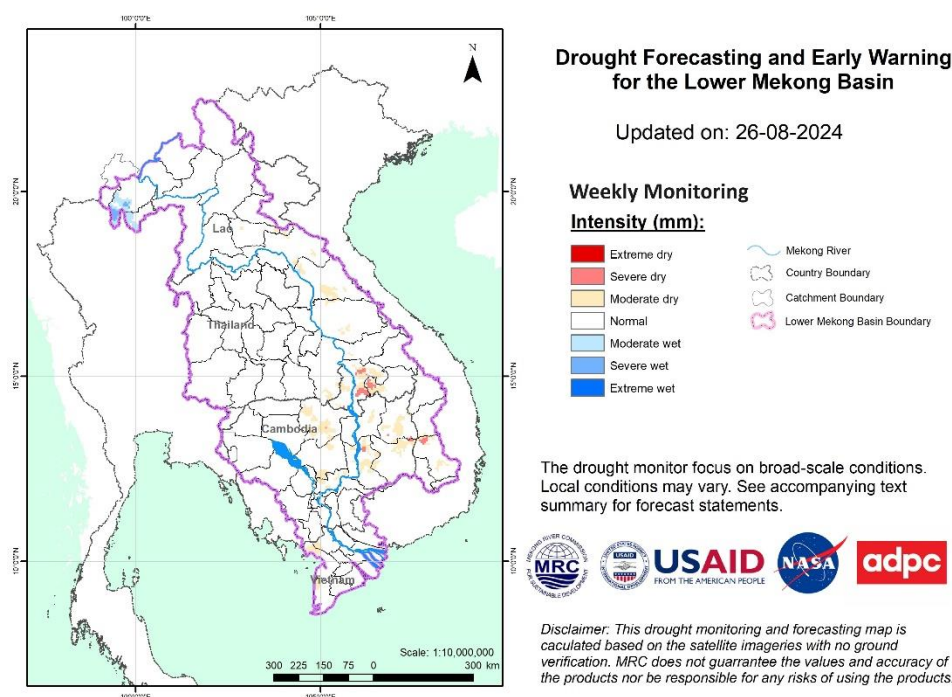


Figure 11: Weekly Index of Soil Water Fraction from August 20 to 26.

- **Weekly Combined Drought Index (CDI)**

The combined drought indicator, **Figure 11**, shows that the LMB was experiencing moderate and severe droughts over the southern part. Severe drought was taking place in Kampong Cham, Kampong Thom, Kratie, and Preah Vihear of Cambodia. The observed drought was caused primarily by meteorological indicator.

The impacted areas are listed below:

Number	Country	Province	Mderate	Severe	Extreme	Exceptional	Number	Country	Province	Moderate	Severe	Extreme	Exceptional	Number	Country	Province	Moderate	Severe	Extreme	Exceptional
1	Cambodia	Battambang					24	Lao PDR	Oudomxai					47	Thailand	Udon Thani				
2	Cambodia	Banteay Meanchey					25	Lao PDR	Loungprabang					48	Thailand	Sakon Nakhon				
3	Cambodia	Kampong Cham		S			26	Lao PDR	Xayaburi					49	Thailand	Bueng Kan				
4	Cambodia	Pursat					27	Lao PDR	Xiangkhouang					50	Thailand	Nakhon Phanom				
5	Cambodia	Kampong Chhnang					28	Lao PDR	Vientiane					51	Thailand	Kalasin				
6	Cambodia	Otdar Meanchey					29	Lao PDR	Vientiane Capital					52	Thailand	Mukdahan				
7	Cambodia	Preah Vihear					30	Lao PDR	Xaisomboun					53	Thailand	Roi Et				
8	Cambodia	Kampong Thom		S			31	Lao PDR	Borikhamxai					54	Thailand	Yasothon				
9	Cambodia	Kratie		S			32	Lao PDR	Khammouan					55	Thailand	Amnat Charoen				
10	Cambodia	Monduliri					33	Lao PDR	Savannakhet					56	Thailand	Ubon Ratchathani				
11	Cambodia	Ratanakiri					34	Lao PDR	Salavan					57	Thailand	Si Sa Ket				
12	Cambodia	Tbong Khmum					35	Lao PDR	Xekong					58	Thailand	Surin				
13	Cambodia	Prey Veng					36	Lao PDR	Attapu					59	Thailand	Buri Ram				
14	Cambodia	Kampot					37	Lao PDR	Champasack		S			60	Thailand	Nakhon Ratchasima				
15	Cambodia	Takeo					38	Thailand	Chiang Mai					61	Viet Nam	Kon Tum				
16	Cambodia	Svai Rieng					39	Thailand	Chiang Rai					62	Viet Nam	Gia Lai				
17	Cambodia	Stung Treng					40	Thailand	Payao					63	Viet Nam	Dak Nong				
18	Cambodia	Kampong Speu					41	Thailand	Loei					64	Viet Nam	Dak Lak				
19	Cambodia	Kandal					42	Thailand	Nong Bua Lam Phu					65	Viet Nam	Dong Thap				
20	Cambodia	Siem Reap					43	Thailand	Khon Kaen					66	Viet Nam	Tien Giang				
21	Lao PDR	Bokeo					44	Thailand	Nong Khai					67	Viet Nam	An Giang				
22	Lao PDR	Luangnamtha					45	Thailand	Chaiyaphum					Other provinces of the Mekong Delta of Viet Nam have no data						
23	Lao PDR	Phongsali					46	Thailand	Maha Sarakham											

Note: S: short-term drought, less than 1 months; L: long-term drought, more than 1 month

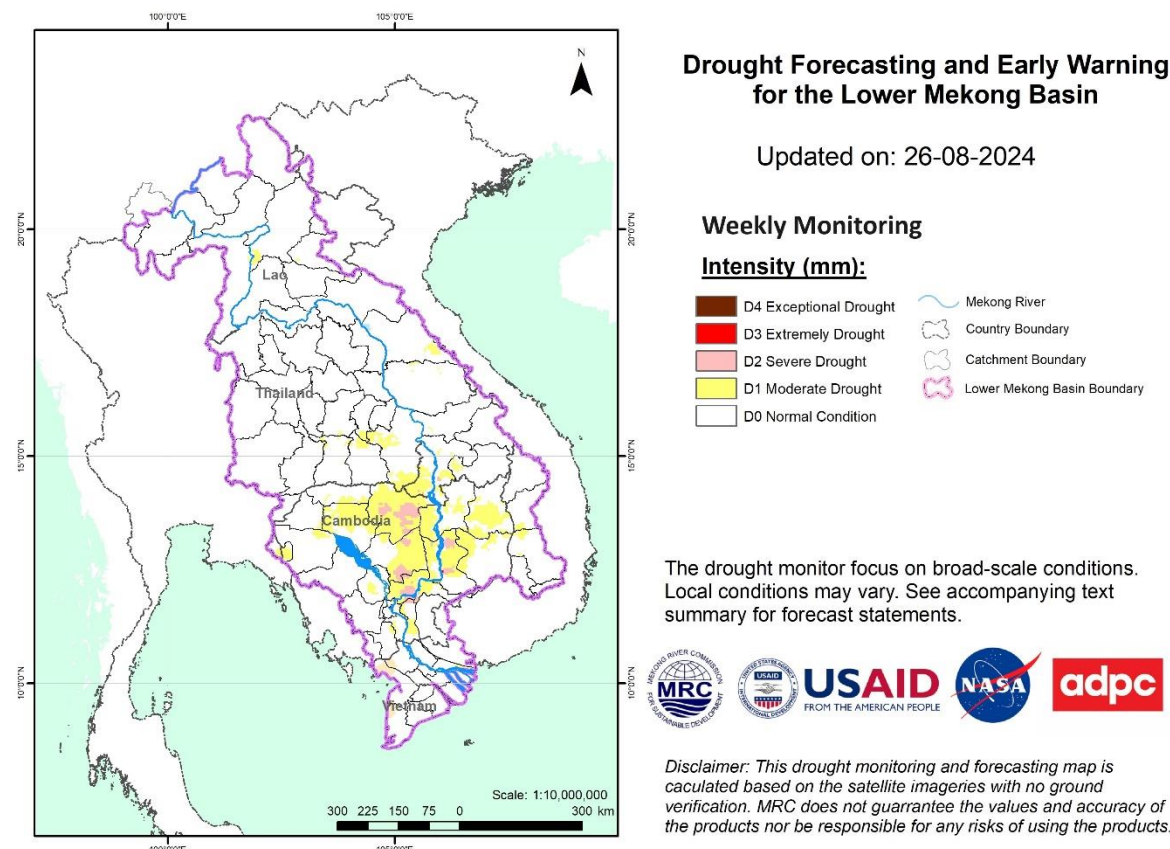


Figure 12: Weekly Combined Drought Index from August 20 to 26.

More information on Drought Forecasting and Early Warning (DFEW) as well as the explanation is available here: <http://droughtforecast.mrcmekong.org/templates/view/our->

[product](#). DFEW provides not only weekly monitoring and forecasting information but also a three-month forecast of drought indicators with seasonal outlook which are updated every month based on international weather forecast models. Details on drought forecast are described in section [6.4](#) of this report.

6 Weather and Water Level Forecast and Flash Flood information

6.1 Rainfall forecast

From 27 to 31 August 2024, the accumulated rainfall over the entire Lower Mekong Basin is distributed with light to heavy rain based on CHIRPS-GFS (**Figure 12**). the accumulated rainfall over the entire Lower Mekong Basin is distributed with light to moderate rain and thunderstorms. Moderate rainfall is expected to occur across the LMB (central to upper parts sporadically). However, during 27-31 August, heavy rainfall is likely to occur in the upper parts of the 3S basin of Sekong, Sesan, and Srepok.

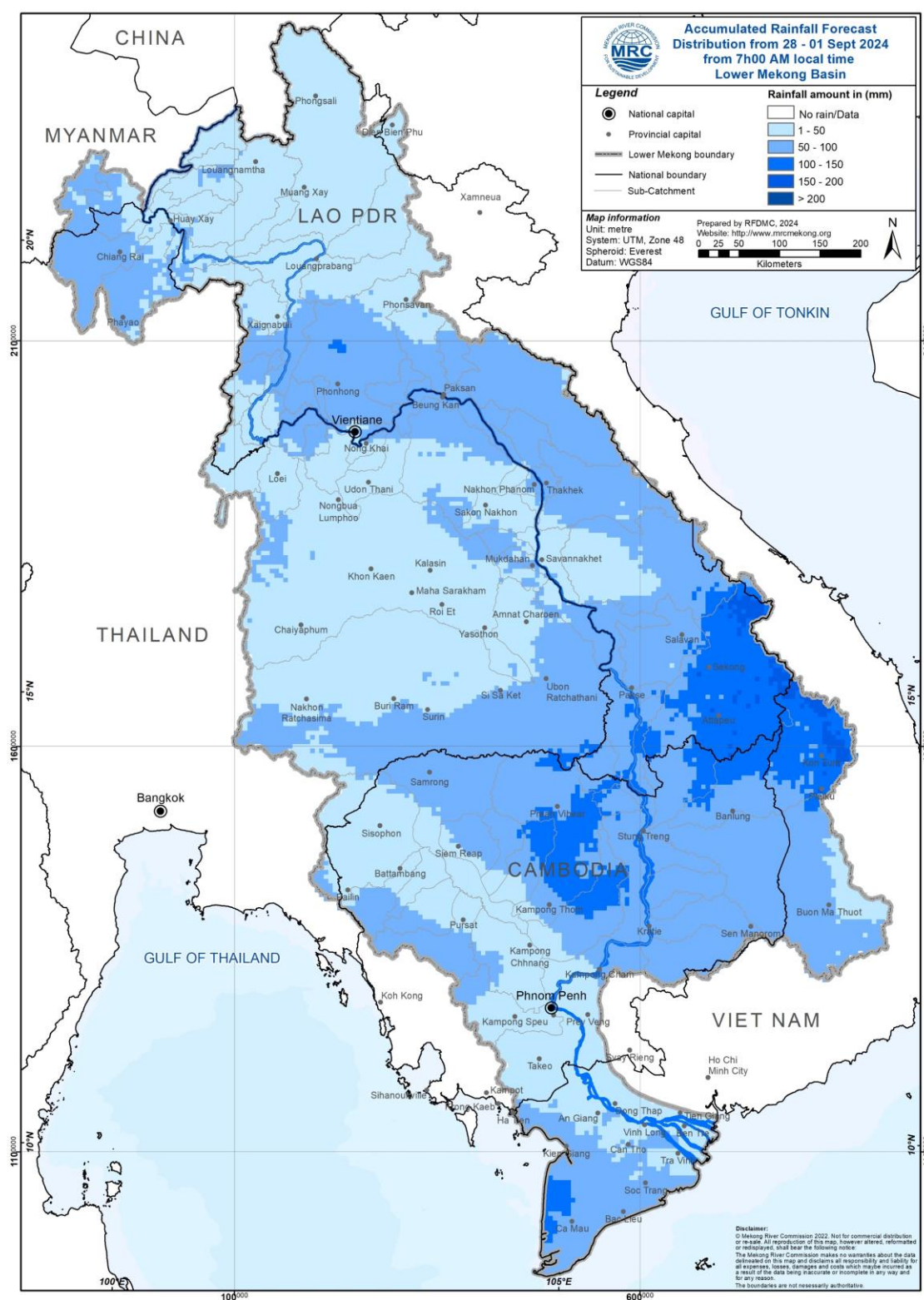


Figure 13: Accumulated rainfall forecast from CHIRPS-GFS (27 – 31 August 2024)

6.2 Water level forecast

Water level at Nongkhai station is expected to continue be at alarm level until 31 August 2024. However, other stations remain in normal conditions, which do not neither reach alarm nor flood levels. Water levels at Chiang Khan, and Vientiane are also expected to nearly reach alarm level in the next five days with minimum distance to alarm level of 0.10 m and 0.12 m, respectively.

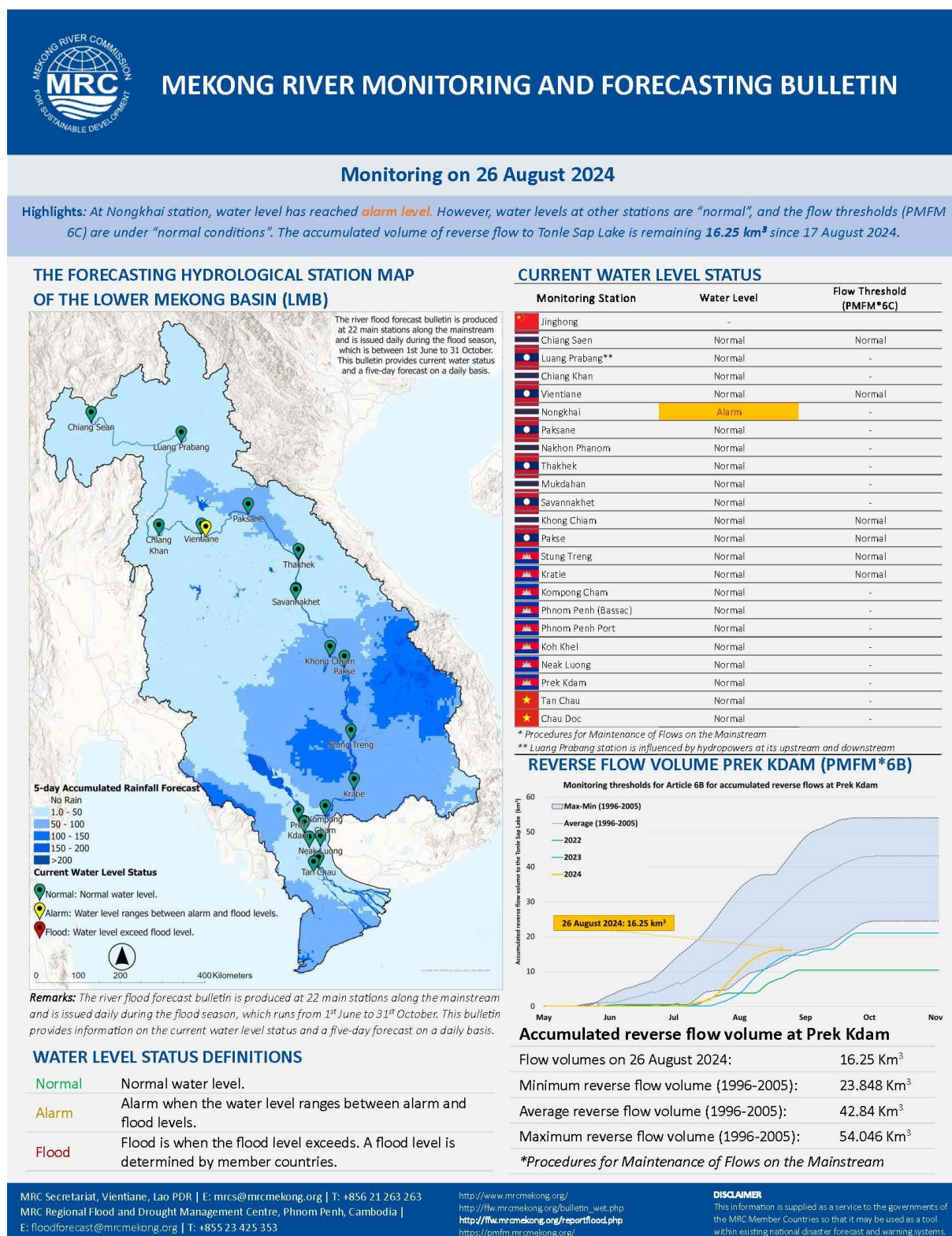
In Chiang Saen monitoring station, the water level is expected to be fluctuated over the forecasting period of 27 – 31 August 2024. However, it will decrease from 7.85 m to 7.26 m. The water levels in Luang Prabang affected by backwater is likely decreasing approximately – 0.19 m. Moreover, at Chiang Khan station, water level is expected to decrease approximately - 0.20 m.

Moving downstream at Stung Treng, Kratie, Kampong Cham, Phnom Penh Port, Phnom Penh Bassac, Neak Luong, Koh Khel and Prek Kdam, water levels are expected to rise with value of 0.42 m, 0.49 m, 0.34 m, 0.21 m, 0.21 m, 0.10 m, 0.08 m, and 0.18 m, respectively.

For the Tan Chau station on the Mekong River and Chau Doc station on the Bassac River, water levels are also expected to increase approximately 0.16 m and 0.18 m, respectively.

The weekly River Monitoring Bulletin and forecasting issued on 26 August 2024 can be found in **Table 2**. Results of the weekly river monitoring and forecasting bulletin are also available at <http://ffw.mrcmekong.org/bulletin.php>

Table 3. River Monitoring and Forecasting Bulletin



Forecasting from 27 to 31 August 2024

Highlights: In the next five days, water level at Nongkhai station is expected to continue being at **alarm level** until 31 August 2024. However, it is forecasted that water levels at other remaining stations will not reach the “alarm” levels.

Forecasting Station	24 h Observed Rainfall (mm)	Zero gauge above M.S.L (m)	Observed Water Level against zero gauge (m)		Forecasted Water Level (m)					Alarm Level (m)	Flood Level (m)	Forecasted Water Levels Change in 5 days (m)	Max. Water levels change within next 5 days (m)	Min. distance to alarm level within next 5 days (m)	Min. distance to flood level within next 5 days (m)
	25-Aug		25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug						
★ Jinghong	0.0	-	536.72	↑ 536.94	-	-	-	-	-	-	-	-	-	-	-
Chiang Saen	27.3	357.110	7.82	→ 7.85	↓ 7.72	↓ 7.56	↓ 7.44	→ 7.34	→ 7.26	11.50	12.80	↓ -0.59	-0.59	3.78	5.08
● Luang Prabang	0.0	267.195	15.80	↑ 15.98	↑ 16.11	→ 16.15	→ 16.06	↓ 15.92	↓ 15.79	17.50	18.00	↓ -0.19	-0.19	1.36	1.86
Chiang Khan	3.0	194.118	14.05	↑ 14.20	↑ 14.32	→ 14.40	→ 14.28	↓ 14.15	↓ 14.00	14.50	16.00	↓ -0.20	-0.20	0.10	1.60
● Vientiane	15.3	158.040	10.96	→ 11.01	→ 11.08	↑ 11.26	→ 11.38	→ 11.32	↓ 11.18	11.50	12.50	↑ 0.17	0.37	0.12	1.12
● Nongkhai	0.0	153.648	11.78	↓ 11.73	→ 11.74	↑ 11.92	↑ 12.10	→ 12.03	↓ 11.88	11.40	12.20	↑ 0.15	0.37	-0.70	0.10
● Paksane	5.2	142.125	11.86	↑ 12.06	↑ 12.20	→ 12.24	↑ 12.52	↑ 12.72	↑ 12.83	13.50	14.50	↑ 0.77	0.77	0.67	1.67
● Nakhon Phanom	0.0	130.961	9.97	↑ 10.17	↑ 10.31	↑ 10.42	↑ 10.56	↑ 10.76	↑ 10.82	11.50	12.00	↑ 0.65	0.65	0.68	1.18
● Thakhek	0.0	129.629	10.92	↑ 11.12	↑ 11.31	↑ 11.42	↑ 11.55	↑ 11.73	↑ 11.84	13.00	14.00	↑ 0.72	0.72	1.16	2.16
● Mukdahan	0.0	124.219	9.22	↑ 9.37	↑ 9.51	→ 9.60	→ 9.56	→ 9.66	→ 9.71	12.00	12.50	↑ 0.34	0.34	2.29	2.79
● Savannakhet	0.0	124.219	7.64	↑ 7.77	↑ 7.88	→ 7.96	→ 7.93	↑ 8.04	→ 8.09	12.00	13.00	↑ 0.32	0.32	3.91	4.91
● Khong Chiam	14.5	89.030	10.01	→ 10.10	↑ 10.23	↑ 10.34	→ 10.41	→ 10.38	↑ 10.48	13.50	14.50	↑ 0.38	0.38	3.02	4.02
● Pakse	0.0	86.490	8.03	↑ 8.12	↑ 10.23	↑ 10.34	↑ 10.41	→ 10.38	↑ 10.48	11.00	12.00	↑ 2.36	2.36	0.52	1.52
● Stung Treng	6.0	36.790	7.13	→ 7.16	↑ 7.23	↑ 7.36	↑ 7.49	↑ 7.57	→ 7.58	10.70	12.00	↑ 0.42	0.42	3.12	4.42
● Kratie	0.0	-0.101	16.31	↓ 16.30	→ 16.33	↑ 16.41	↑ 16.54	↑ 16.69	↑ 16.79	22.00	23.00	↑ 0.49	0.49	5.21	6.21
● Kompong Cham	0.0	-0.930	9.86	↑ 9.90	→ 9.91	↑ 9.95	↑ 10.04	↑ 10.14	↑ 10.24	15.20	16.20	↑ 0.34	0.34	4.96	5.96
● Phnom Penh (Bassac)	21.0	-1.020	6.26	↑ 6.30	→ 6.32	→ 6.35	↑ 6.39	↑ 6.44	↑ 6.51	10.50	12.00	↑ 0.21	0.21	3.99	5.49
● Phnom Penh Port	nr	0.070	5.18	↑ 5.22	→ 5.24	→ 5.27	↑ 5.31	↑ 5.36	↑ 5.43	9.50	11.00	↑ 0.21	0.21	4.07	5.57
● Koh Khel	0.0	-1.000	5.74	→ 5.76	→ 5.78	→ 5.79	→ 5.81	→ 5.83	↑ 5.86	7.90	8.40	↑ 0.10	0.10	2.04	2.54
● Neak Luong	0.0	-0.330	4.45	↑ 4.48	→ 4.50	→ 4.51	→ 4.52	→ 4.54	→ 4.56	7.50	8.00	↑ 0.08	0.08	2.94	3.44
● Prek Kdam	0.0	0.080	5.35	↑ 5.38	→ 5.40	→ 5.42	↑ 5.45	↑ 5.50	↑ 5.56	9.50	10.00	↑ 0.18	0.18	3.94	4.44
★ Tan Chau	0.0	0.000	1.68	↑ 1.72	↑ 1.76	↑ 1.79	↑ 1.82	↑ 1.85	→ 1.88	3.50	4.50	↑ 0.16	0.16	1.62	2.62
★ Chau Doc	2.4	0.000	1.59	↑ 1.65	↑ 1.70	↑ 1.74	↑ 1.77	↑ 1.80	↑ 1.83	3.00	4.00	↑ 0.18	0.18	1.17	2.17

WATER LEVEL FORECASTING DEFINITIONS

↑	Rising water level.
→	Stable water level: 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 from Kratie downstream.
↓	Falling water level.
X	No data available.
Alarm stage	Alarm stage is when the water level ranges between alarm and flood levels.
Flood stage	Flood stage is when the flood level exceeds. A flood level is determined by member countries.

NOTES

- On **26 August**, At Nongkhai station, water level has reached alarm level, while other stations are in normal conditions, which do not reach alarm and flood levels. However, at Chiang Khan, Vientiane, and Nakhon Phanom distance to alarm level is 0.30 m, and 0.49 m, and 1.33 m respectively.
- During **27-31 August**, moderate rainfall is expected to sporadically occur in the LMB. However, heavy rainfall is expected to occur in upper parts of the 3S Basin.
- For **27-31 August**, water levels at all stations of Mekong mainstream except from Chiang Saen to Chiang Khan are expected to rise. It is noted that **water level at Nongkhai station is expected to continue being at alarm level until 31 August. Its minimum distance to flood level is 0.10 m.**
- During **27-31 August**, in other remaining stations such as Chiang Khan, Vientiane, Paksane and Nakhon Phanom, the minimum distance to alarm level is expected to be 0.10 m, 0.12 m, 0.67 m, and 0.68 m, respectively.

DISCLAIMER

6.3 Flash Flood Information

With the predicted rainfall for the coming week, flash floods might be detected in some areas in the LMB. Local heavy rain in a short period of time is possible with unpredictable short flash floods.

Further detailed information on Flash Flood Guidance Information, as well as its explanation, is available for download [here](#).

6.4 Drought forecast

There are several climate-prediction models with different scenarios in the upcoming months. The MRC's DFEWS adopts the global scale of North America Multi-Model Ensemble (NMME) for the seasonal outlook of rainfall.

Figure 13 below shows the monthly forecasts of combined drought indicator from September to November 2024 over the LMB area.

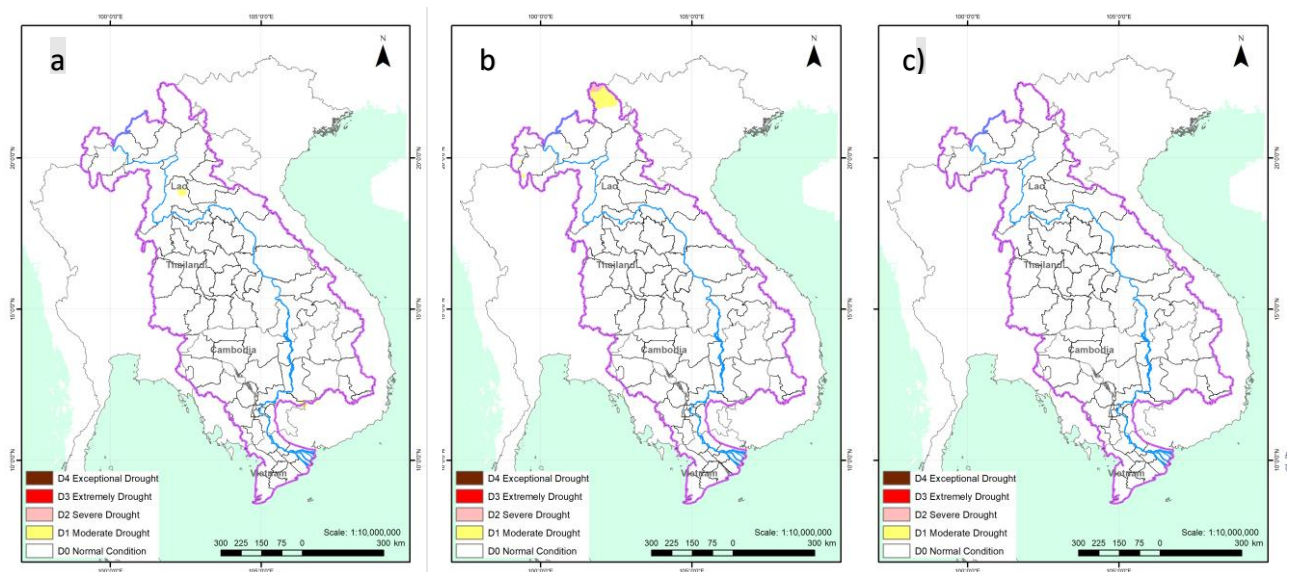


Figure 14. Monthly forecasts of combined drought indicator for a) September, b) October and c) November 2024.

Figure 14 shows that August is expected to be abnormally dry over the central and lower parts. Eastern Cambodia and 3S area are likely the driest area of the region. The forecast also indicates that central and eastern Cambodia and Mekong Delta of Viet Nam are likely at moderately dry during September. While no drought is anticipated for October. More rain is expected to come during October before the end of the rainy season.

7 Summary and Possible Implications

7.1. Rainfall and its forecast

In the period of 20 – 26 August 2024, light to very heavy rainfall has been observed over the LMB. Especially in the period from August 20 - 22, due to the monsoon trough laying across the upper part of Laos into the low-pressure cell over upper Viet Nam, heavy to very heavy rain occurred in the Northern part of Laos and Thai land, including Chiang Rai, Chiang Saen, Nong Khai, Thoeng, Pklay, Vang Vieng, Vientiane, Muong Mai, Muong Kao.

From 27 August - 02 September 2024, the accumulated rainfall over the entire Lower Mekong Basin is distributed with light to heavy rain and thunderstorms. Heavy rainfall is expected to occur in the upper parts of the 3S Basin of Sekong, Sesan, and Srepok.

7.2. Water level and its forecast

At 22 key monitoring stations along the Mekong mainstream from 20 – 26 August 2024, water level at Nongkhai station has reached alarm level since 24 August 2024. the water levels at other stations are in normal conditions, which do not reach alarm and flood levels. The total accumulated volume of the reverse flow to Tonle Sap Lake remains 16.25 Km³ since 17 August 2024.

In the period of 27 – 31 August 2024, water levels at stations along Mekong mainstream from are likely expected to rise except for upper stations including Chaing Saen, Luang Prabang and Chiang Khan stations. However, at Nongkhai station, water level is expected to continue at alarm level till 31 August 2024. Other stations are expected in normal conditions, which do not neither reach alarm nor flood levels.

7.3. Flash flood and its trends

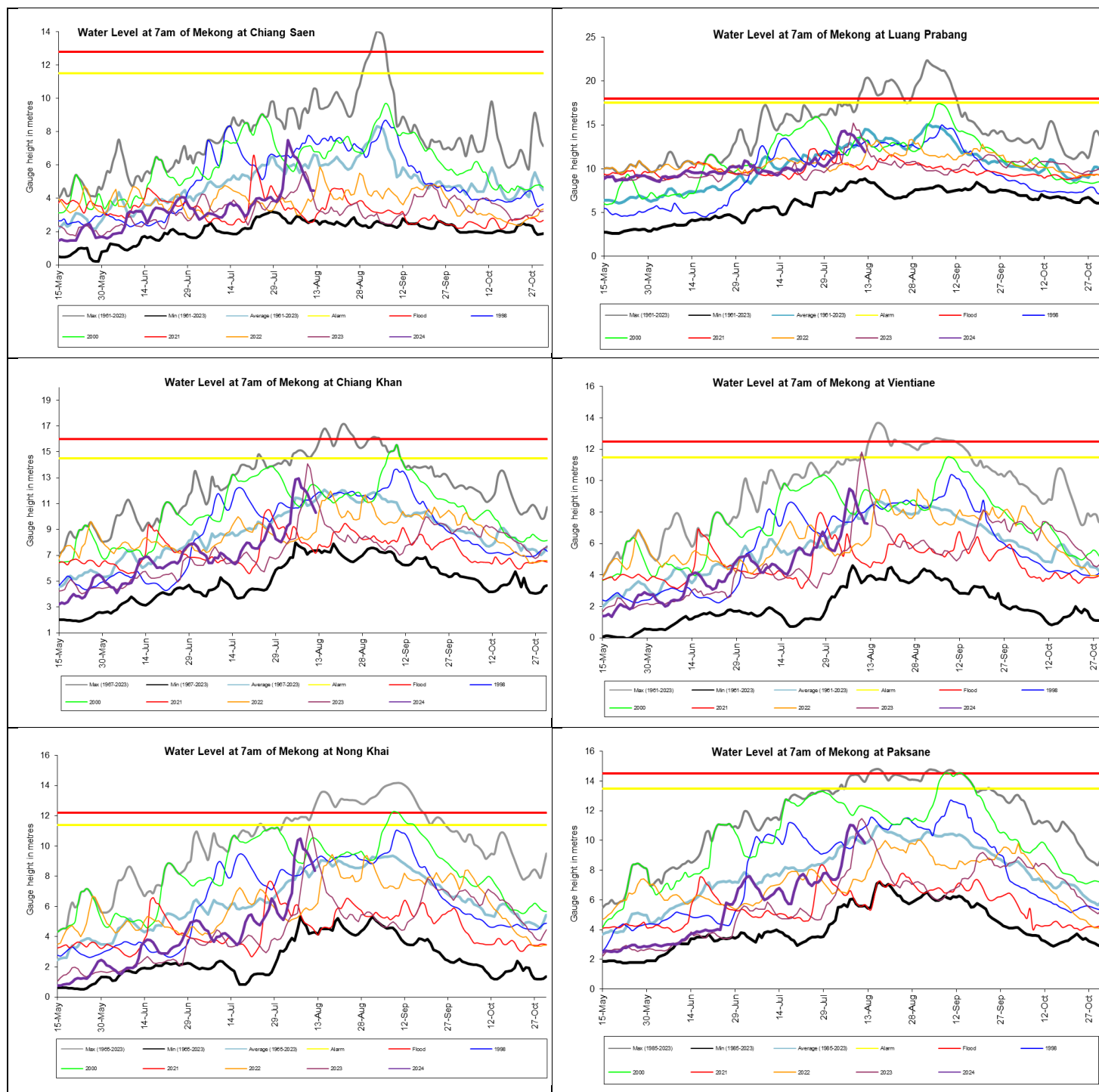
Due to the heavy to very heavy rainfall, flash flood events occurred in Lao DPR from 20 – 21 August in some provinces: Xayaboury, Bokeo, Vientiane, Oudomxay, Luangnamtha, Luangphabang.

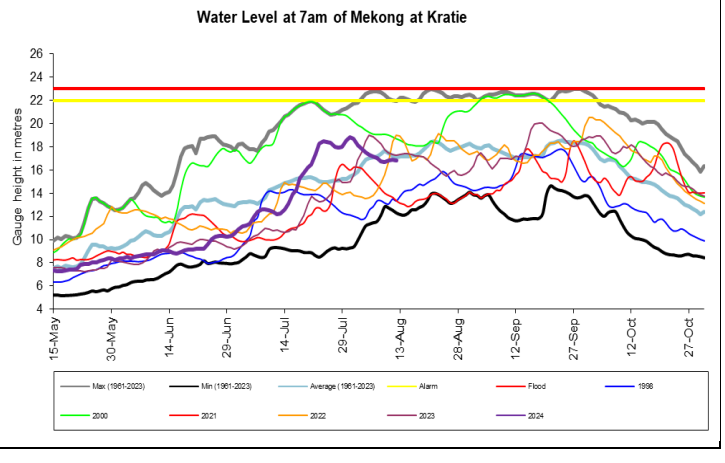
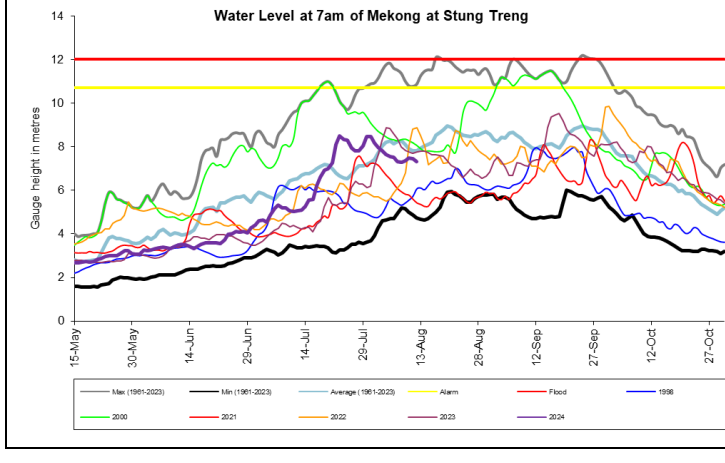
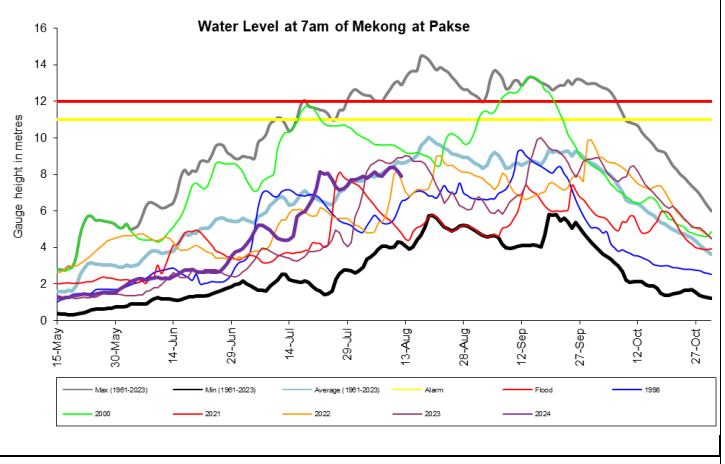
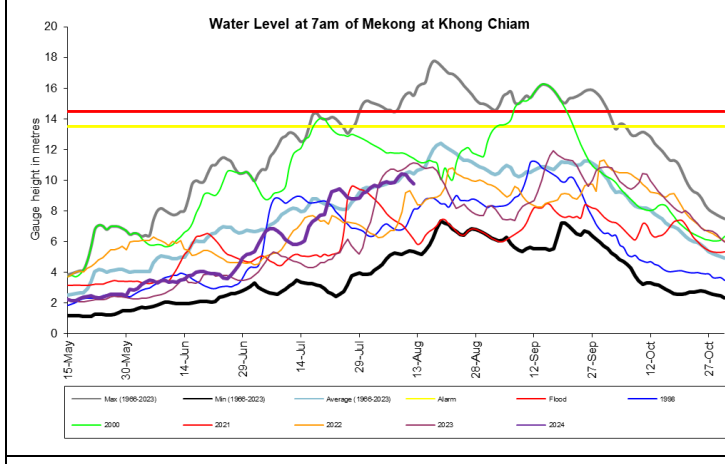
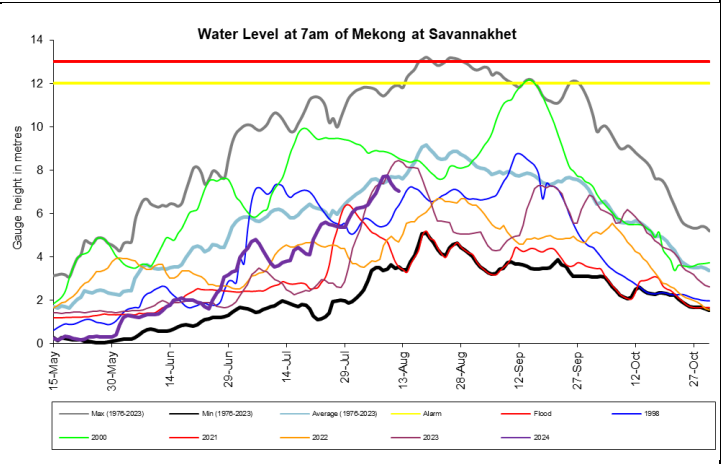
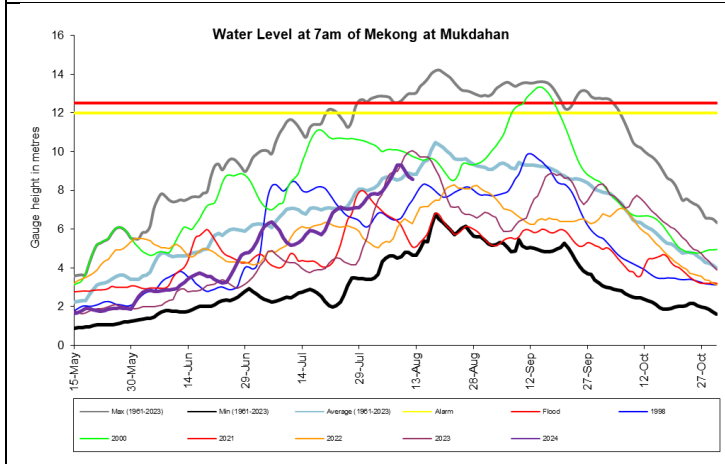
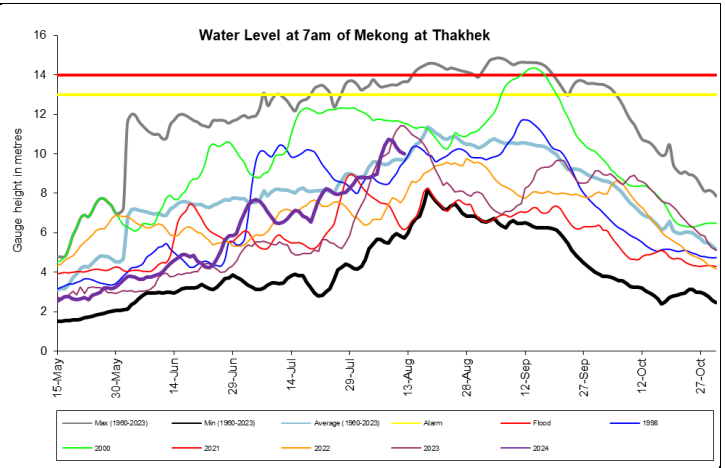
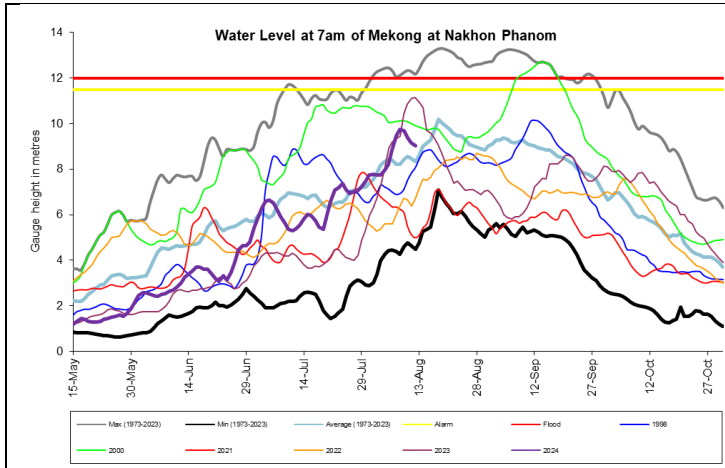
With the predicted of rainfall for the coming week as mentioned earlier in part 2, the flash flood guidance at a low to high level will likely be detected in some areas of the LMB.

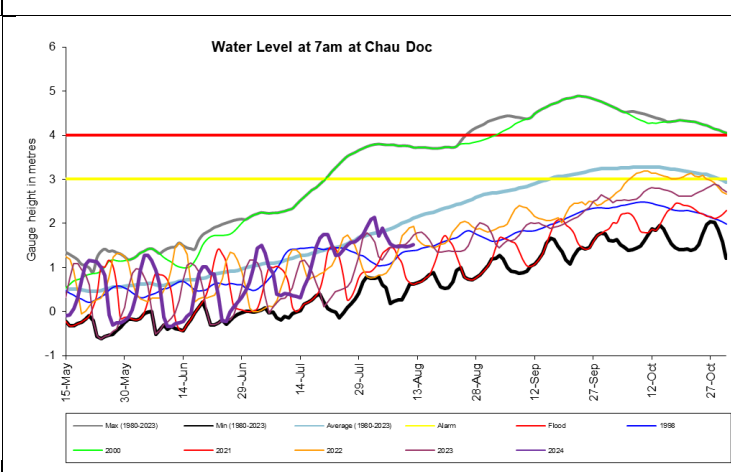
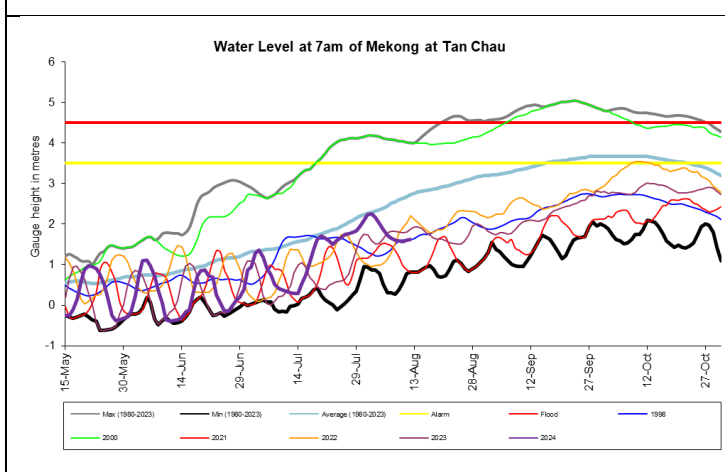
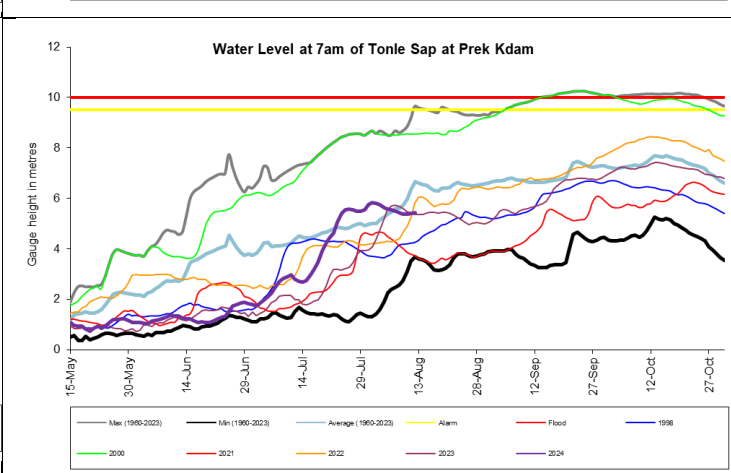
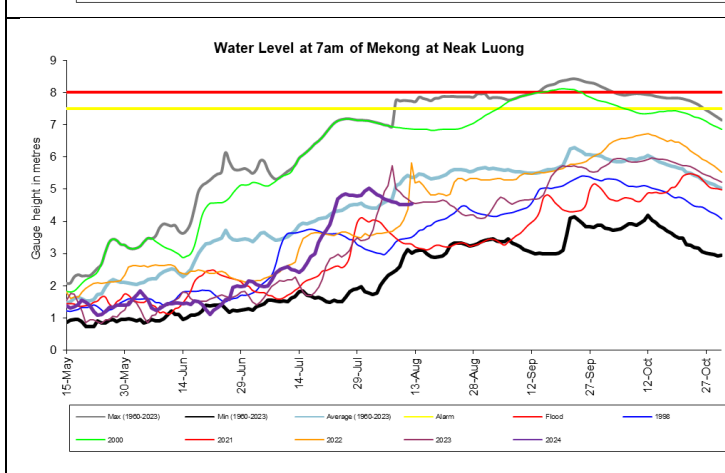
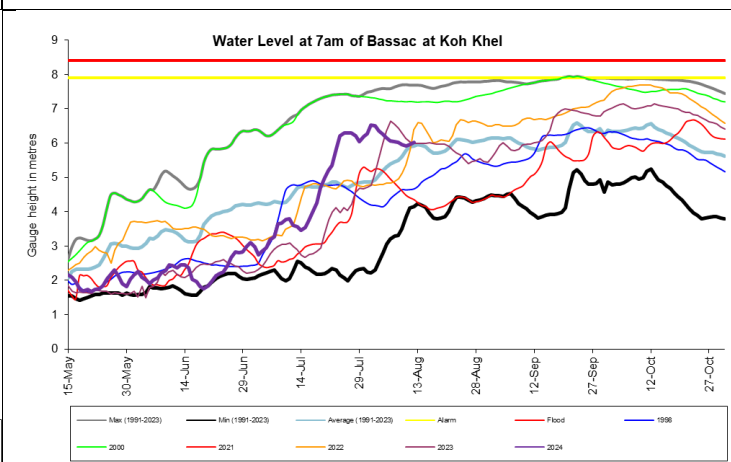
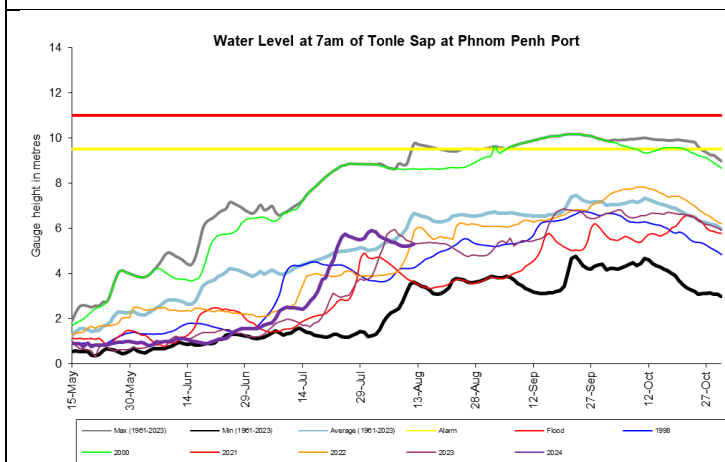
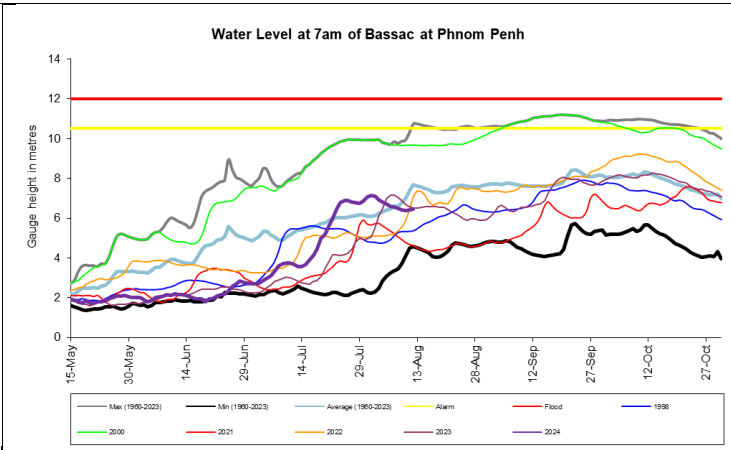
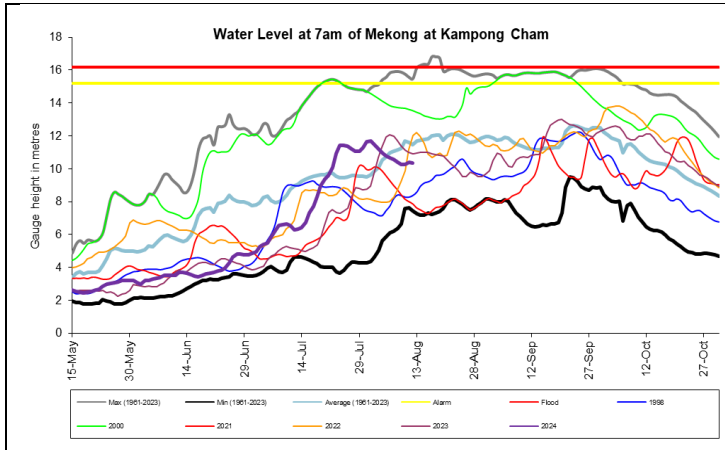
7.4. Drought condition and its forecast

During 20-26 August 2024, the LMB was experiencing moderate and severe droughts over the southern part. Severe drought was taking place in Kampong Cham, Kampong Thom, Kratie, and Preah Vihear of Cambodia. The observed drought was caused primarily by meteorological indicator.

Annex A: Weekly water level monitoring at the 22 key stations







Annex B: Tables for weekly updated water levels and rainfall at the Key Stations

Table A1: Weekly observed water levels

2024	Jinghong	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
06-08-2024	537.08	6.43	13.92	12.95	9.48	10.38	10.56	8.85	9.83	8.51	6.92	9.83	7.96	7.50	17.19	10.66	6.61	5.40	6.06	4.65	5.54	1.72	1.53
07-08-2024	537.08	6.08	14.00	12.24	9.31	10.49	11.03	9.46	10.42	8.92	7.35	9.88	7.92	7.32	17.00	10.56	6.56	5.37	6.04	4.62	5.48	1.66	1.49
08-08-2024	536.75	5.65	13.78	12.06	8.75	9.82	11.01	9.75	10.73	9.29	7.69	10.19	8.16	7.27	16.74	10.38	6.49	5.29	6.02	4.58	5.44	1.61	1.47
09-08-2024	536.62	5.27	13.34	11.77	8.03	9.68	10.69	9.68	10.65	9.29	7.72	10.40	8.38	7.35	16.67	10.26	6.40	5.21	5.95	4.53	5.38	1.59	1.48
10-08-2024	537.05	4.88	12.82	11.28	7.82	9.36	10.36	9.38	10.33	9.03	7.40	10.35	8.38	7.49	16.82	10.28	6.38	5.20	5.92	4.52	5.38	1.57	1.47
11-08-2024	536.52	4.48	12.38	10.74	7.32	8.86	10.08	9.15	10.12	8.72	7.12	10.06	8.18	7.44	16.92	10.38	6.41	5.24	5.96	4.53	5.41	1.60	1.49
12-08-2024	536.51	4.46	11.94	10.30	7.28	8.35	9.83	9.04	10.01	8.58	7.03	9.78	7.92	7.32	16.82	10.36	6.47	5.31	6.02	4.54	5.43	1.63	1.51
Flood level		12.80	18.00	16.00	12.50	12.00	14.50	12.50	14.00	12.50	13.00	14.50	12.00	12.00	23.00	16.20	12.00	11.00	7.90	8.00	10.00	4.50	4.00

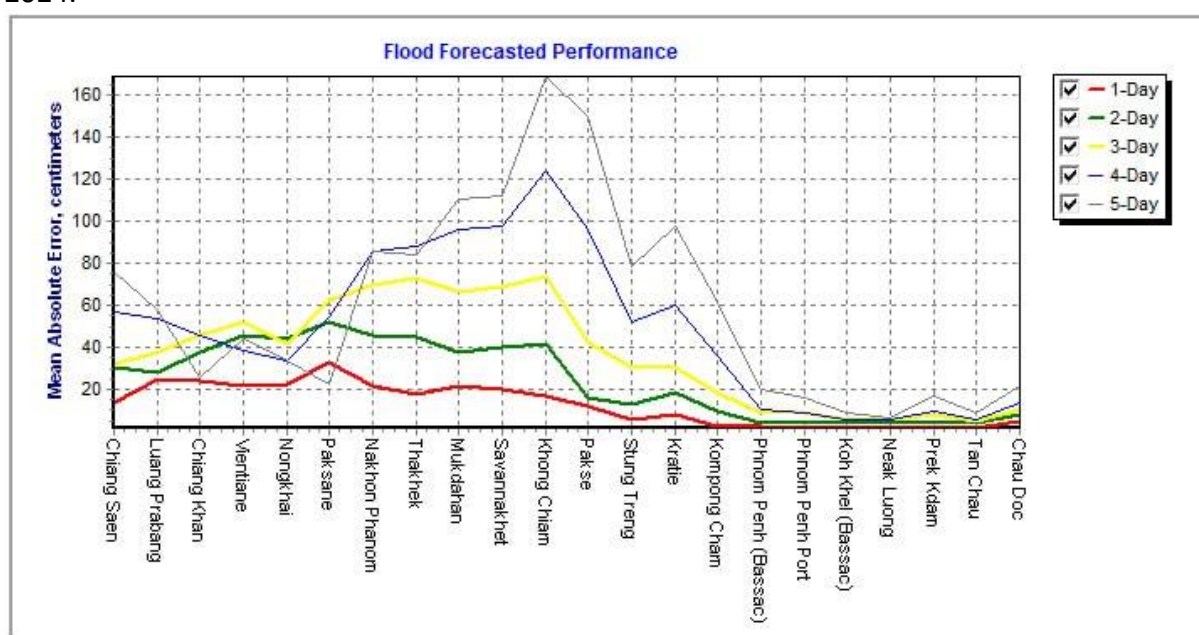
Table A2: Weekly observed rainfall

2024	Jinghong	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
06-08-2024	8.5	13.2	0	0	1	0	2.2	0	0	0	0	0	0	6.5	0	0	21		0	0	0	30.4	46
07-08-2024	0	4	0	7.2	9.8	0	2.5	0	0	0	0	0	0	28	5.7	0	3.1		0	5.4	0	0	0
08-08-2024	0	1.5	17.8	9.3	0	1.3	0	0	0	7.8	0	0	0	0	53.4	0	0.3		1	2.3	0	0	0
09-08-2024	1	14.7	0	0	1.8	0	1	0	0	0	0	0	0	2	0	0	136		16.8	0	34.3	3.8	0
10-08-2024	0	0	0	0	0	0.9	2.3	0	0	0	0	0	0	0	0	0	3.7		14.6	0	12.2	0	0.7
11-08-2024	0	0	0	0	0	0	113.2	86.1	87.7	0	0	0	5.4	0	35	0	0		0	0	0	0	0
12-08-2024	26.5	6.2	41.2	7.3	35	73	70.5	79.7	46.8	17.5	3.8	0	20.6	0	0	0	0		0	0	0	0	0.8
Sum	36.0	39.6	59.0	23.8	47.6	75.2	191.7	165.8	134.5	25.3	3.8	0.0	26.0	36.5	94.1	0.0	164.1	0.0	32.4	7.7	46.5	34.2	47.5

Annex C: Performance of the weekly flood forecasting

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

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 06 to 12 August 2024.



The forecasting values from 06 to 12 August 2024 show that the overall accuracy is fair for a four-day to five-day forecast in lead time (less than 250 cm) for all forecasting station. However, it has been over forecasted for some stations such as Khong Chiam and Pakse (more 100 cm)

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

- Missing rainfall in Cambodia (DOM) data and data input are not sufficient to be used for inputting into the flood forecasting model system.
- Chiang Saen station is influencing by hydropower upstream operation from China.
- Luang Prabang to Chiang Khan and Paksane to Stung Treng to Kratie have been influenced by hydropower operations upstream, tributaries inflows.
- The influence of heavy rainfall caused by storms and hydropower operations from upstream, tributaries inflows and the lower part of the Mekong floodplain, including the 3S (Stung Treng and Kratie).
- Fluctuations of the water levels at Tan Chau and Chau Doc stations were due to daily tidal effects of the sea in the Mekong Delta.
- Satellite rainfall data were not representative of the actual rainfall at ground stations in some areas of the Mekong region.



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