



**Mekong River Commission**

# **Weekly Wet Season Situation Report in the Lower Mekong River Basin 09-15 August 2022**

Prepared by  
The Regional Flood and Drought Management Centre  
16 August 2022

*The MRC is funded by contributions from its Member Countries and Development Partners, including Australia, Belgium (Flanders), the European Union, France, Germany, Japan, the Netherlands, New Zealand, Sweden, and Switzerland.*

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First published (2021)

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**Title:** Weekly wet season situation report in the Lower Mekong River Basin for 09-15 August 2022

ISSN: 1728-3248

Keywords: flood/drought/weather/Mekong/Tonle Sap

For bibliographic purposes, this volume may be cited as:

Mekong River Commission. (2021). *Weekly wet season situation report in the Lower Mekong River Basin for 09-15 August 2022*. Vientiane: MRC Secretariat.

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## Key Messages

Key messages for this weekly report are presented below:

### Rainfall and its forecast

- Rainfall focused in the areas from Chiang Saen in Thailand to Tan Chau and Chau Doc in Viet Nam, including the upper, middle and lower parts in Lao PDR and Cambodia, varying from 1.10 millimetres (mm) to 185.40 mm.
- There will be above-average rainfalls for the next 5 days over the Mekong region from 16 to 20 August 2022 because there will be a low pressure dominating the Mekong region.

### Water level and its forecast

- According to MRC's observed water level at Jinghong, it showed an increased WL of about 0.09 m from 5355.36 m to 5355.45 m between 09 and 15 August 2022. The current level is staying about 0.36 m lower than its LTA (2015-2021) value. The outflow at Jinghong station decreased from 899.00 m<sup>3</sup>/s to 954.00 m<sup>3</sup>/s from 09 to 15 August 2022.
- With the increased outflow from Jinghong upstream and heavy rainfall at catchment inflow, water levels of monitoring stations at Chiang Saen in Thailand increased about 1.99 m from 09 to 15 August 2022, still staying about 0.34 m lower than its LTA level, which is **considered normal**.
- Moreover, water level at Chiang Khan in Thailand from 09 to 15 August 2022 increased about 3.00 m and stayed close to its LTA value, while water level at Vientiane also increased about 2.83 m and stayed about 0.62 m higher than its LTA level, which **considered normal**. Water levels at Nong Khai increased 2.76 m and at Paksane increased about 2.04 m, staying about 0.33 m and 1.13 m lower than their LTA value respectively, **considered critical**.
- Water levels from Nakhon Phanom in Thailand and Pakse in Lao PDR increased between 0.30 m and 0.78 m. The current WLs at these stations are staying about 1.00 m and 2.30 m lower than their LTA level, **considering critical**. From the stretches of the river at Stung Treng water level increased 0.35 m and stayed about 1.16 m lower than its LTA, while at Kratie water level increased 2.02 m, staying 0.56 m lower than its LTA level, which still **considered critical**.
- Water levels from Kompong Cham down to Chaktomuk, Koh Khel and Phnom Penh Port to Prek Kdam in Cambodia increased between 1.20 m and 2.35 m, but still staying between 0.80 m and 2.20 m lower than their LTA level, **considering critical**.

- The current water levels for most of the stations are lower than their LTA value. WLS at the 2 tidal stations at Tan Chau and Chau Doc were above their LTA value due to tidal effect during this monitoring period.
- Over the next five days, the water levels at the upper and middle parts from Chiang Khan to Pakse are expected to go up but those in downstream from Kratie to Neak Luong and Koh Khem will go down. Water levels at these stations are still staying lower than their long-term average value.

### **Drought condition and its forecast**

- During August 7-13, there were some moderate meteorological droughts in the north of the LMB covering **Phongsaly, Luangnamtha, Lao Cai, Xieng Khuang, Xaysomboun, Borikhamxay, Khammuane, and Nong Khai**. In general, the LMB was still considered normal and did not face any serious drought threat.
- During the next three months, August is likely to be severely and extremely dry, specifically in the southern part and the 3S area of the LMB covering some areas of Thailand, southern Lao PDR, and half-eastern Cambodia; September is likely to be severely dry in the lower part covering around 50% of Cambodia, Vientiane province of Lao PDR in the north, and Ca Mau, Bac Lieu, and Kien Giang of the Mekong Delta of Veit Nam; while October is forecasted to be normal and wet all over the region.



## 1 Introduction

This Weekly Wet Season Situation Report presents a preliminary analysis of the weekly hydrological and drought situation in the Lower Mekong River Basin (LMB) for the period from **09-15 August 2022**. 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 (MCs) – Cambodia, Lao PDR, Thailand, and Viet Nam – and on satellite data. All the water levels indicated in this report refer 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\\_wet.php](http://ffw.mrcmekong.org/bulletin_wet.php).

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

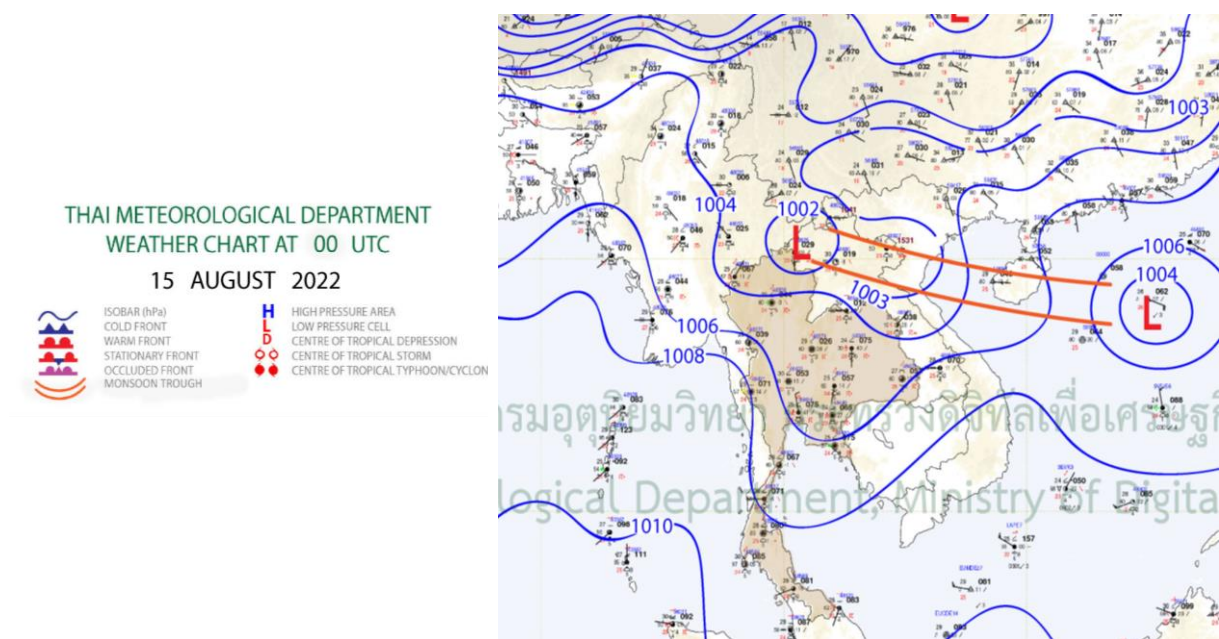
Flash flood information is accessible at: <http://ffw.mrcmekong.org/ffg.php>

## 2 General Weather Patterns

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

At the end of July 2022, below-average rainfall has dropped over the LMB with decreasing water levels in both mainstream and tributaries. The data from the TMD predict that heavy rainfall will happen again in the early week of August because of the coming back low-pressure trough moving downward in the LMB. However, at the 4<sup>th</sup> week of July, rainfall was considered lower than in the 3<sup>rd</sup> week. From August to October, the low-pressure trough is going to prevail over the Mekong region bringing rainfalls during the rainy season period in 2022.

[Figure 1](#) presents the weather map of 15 August 2022, showing low-pressure dominating the upper part of the Mekong region, which might bring some rains for the next few days. The average rainfall is also predicted over the upper and lower parts of LMB, including northern Thailand, Lao PDR and Viet Nam and the 3S area (Sesan, Sre Pok, and Sekong) of Cambodia and Viet Nam.



**Figure 1.** Summary of weather conditions over the LMB.

According to the ASEAN Specialised Meteorological Centre (ASMC), the highest probability of wet and warm conditions is predicted over the lower part of the Mekong region from 08 to 21 August 2022. Therefore, the Mekong region is likely dominated by wet and warm conditions, which may bring more rainfall and warm temperatures in general to the upper and lower parts of the LMB. **Figure 2** shows the outlook of weather condition from 08 to 21 August 2022 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

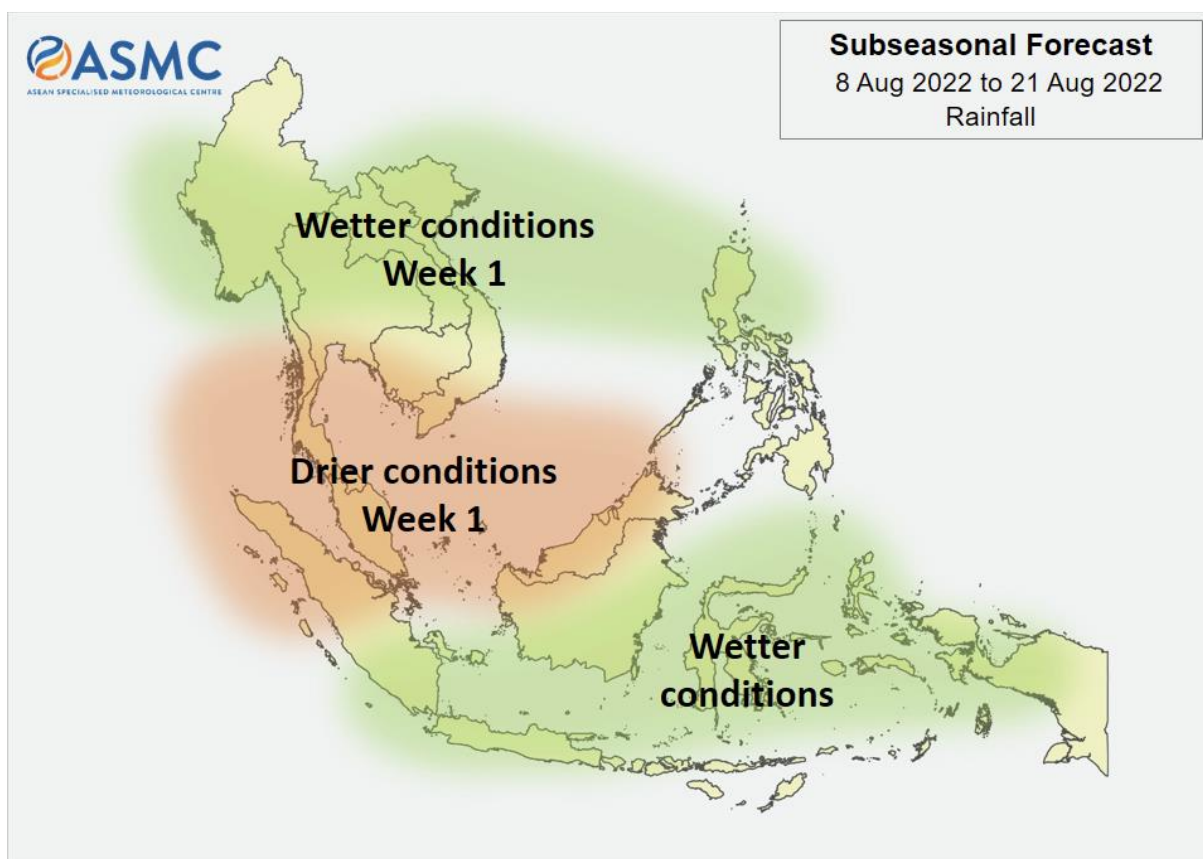


Figure 2. Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There is no sign of Tropical Storm moving from the Sea to the LMB between 09 and 15 August 2022, a low-pressure line is still presenting as shown in [Figure 1](#). No storms movement detected on August 15 in the LMB, as displayed in [Figure 3](#).

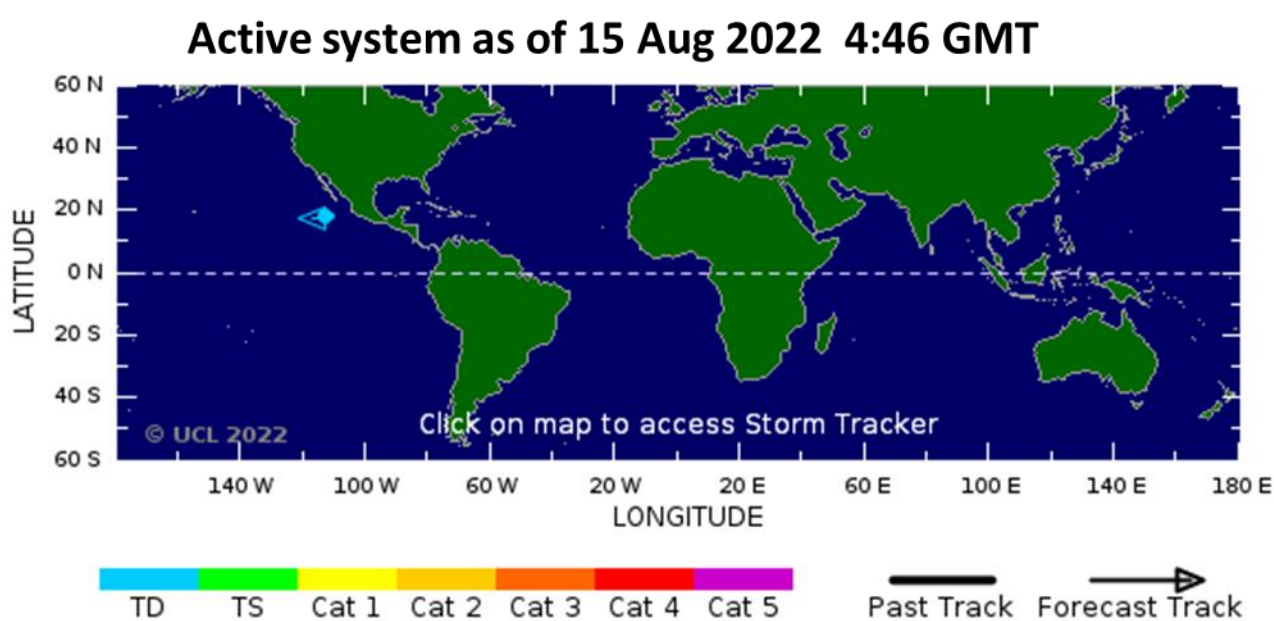
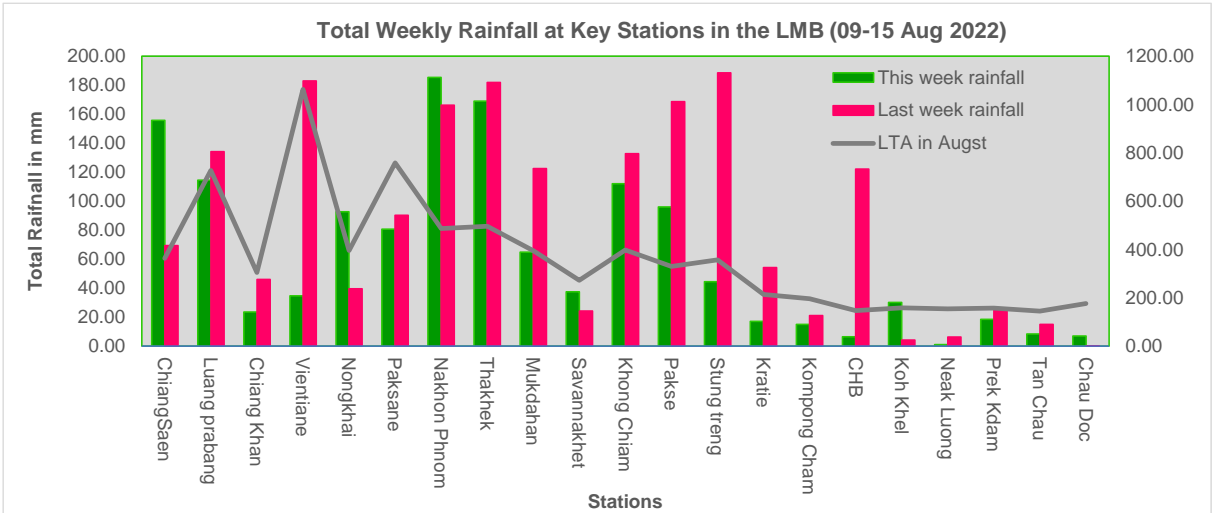


Figure 3. A tropical depression risk observed on 15 August 2022.

**2.2 Rainfall patterns over the LMB**

This week from 09 to 15 August 2022, rainfall was observed from the upper to lower part starting from Chiang Saen in Thailand to Tan Chau and Chau Doc in Viet Nam of the Lower Mekong Basin, varied from 1.10 mm to 185.40 mm. The highest rainfall of this week report concentrated from Chiang Saen in Thailand to Pakse in Lao PDR, which reached up to 185.40 mm at Nakhon Phanom. The total rainfall of this week report in the Mekong region, compared with last week and its long-term-average (LTA) is showed in [Figure 4](#). The total rainfall of this week was considered high, compared with its LTA but lower than last week.



**Figure 4.** Weekly total rainfall at key stations in the LMB during 09-15 August 2022.

To verify area rainfall distribution, [Figure 5](#) 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 09 to 15 August 2022.

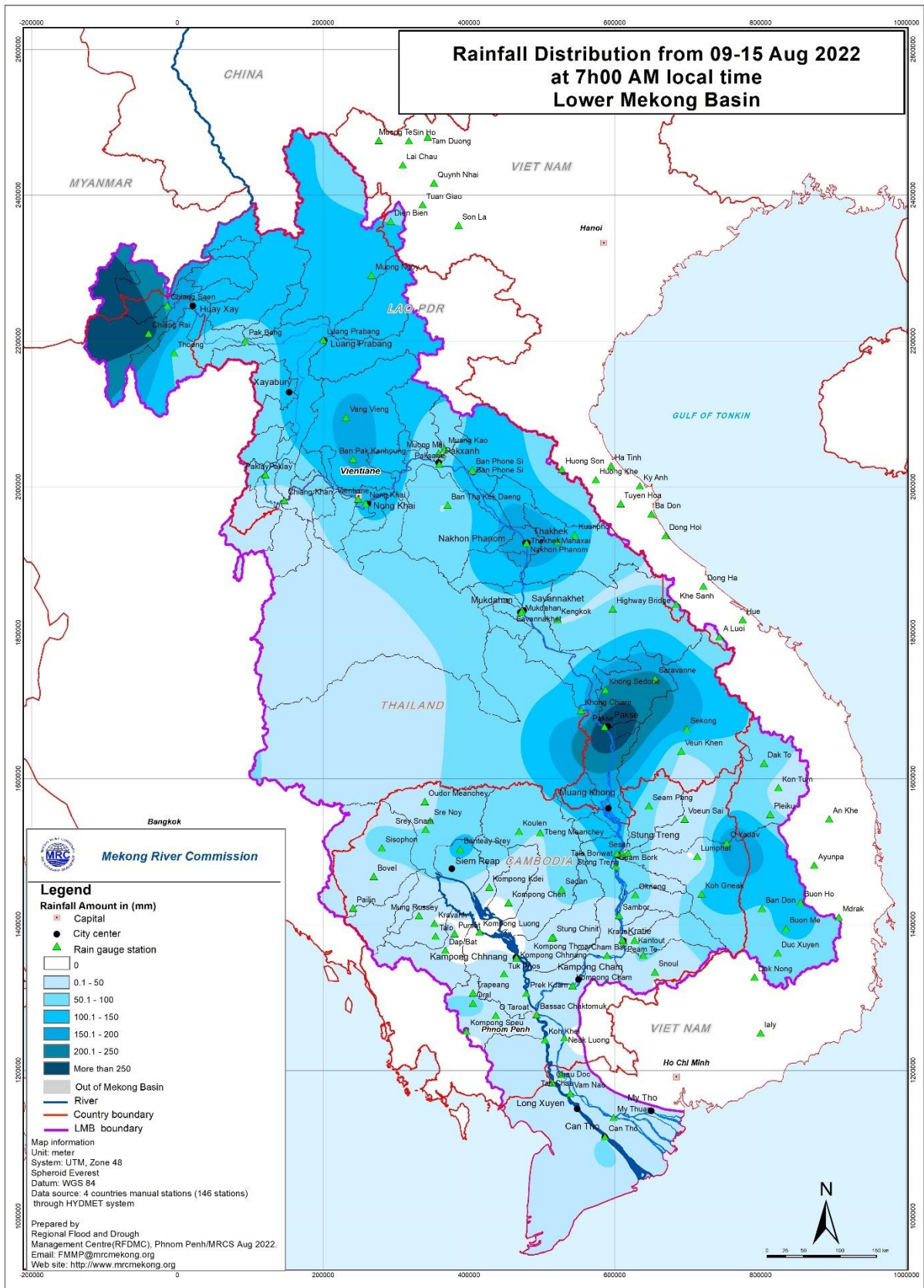
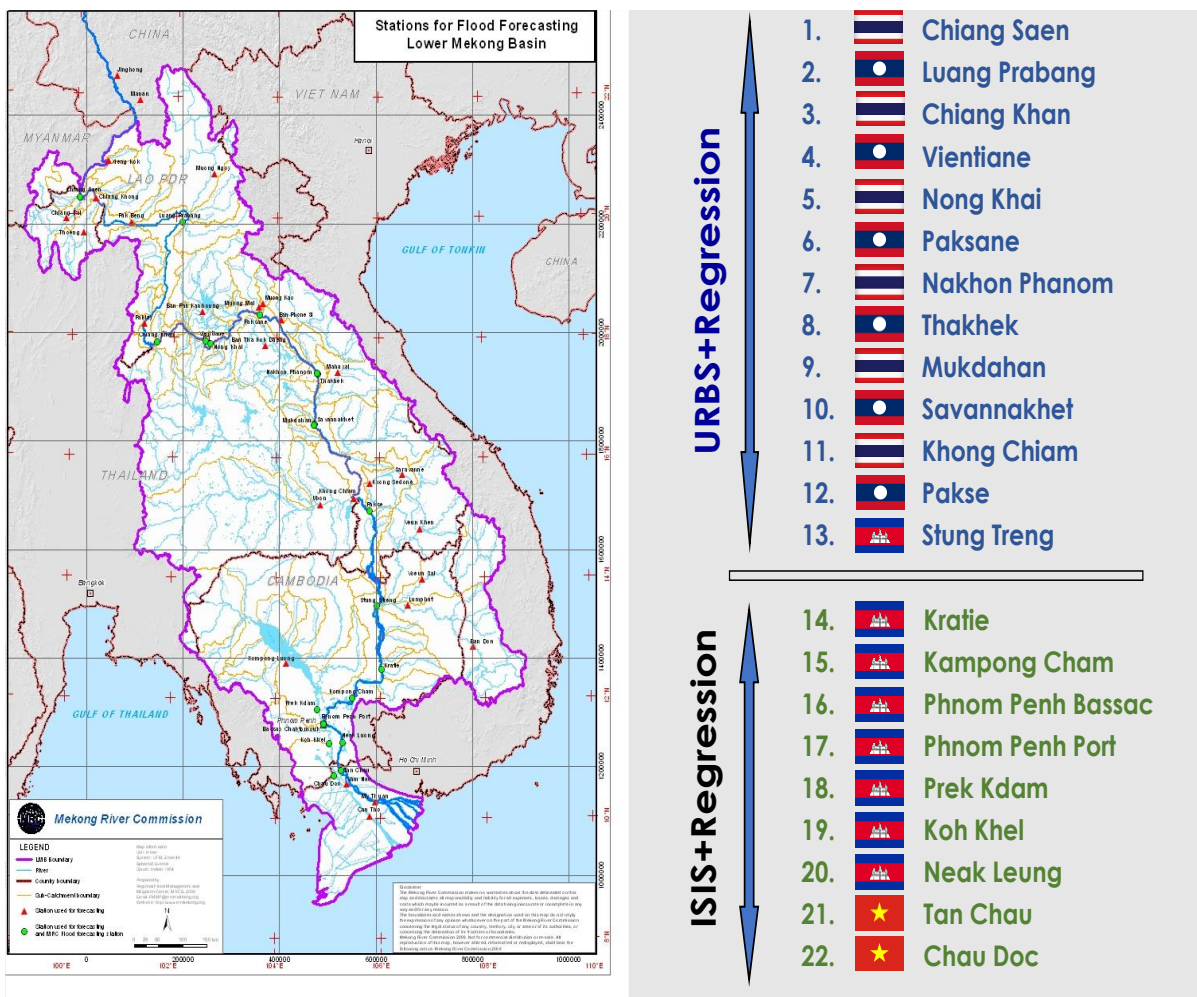


Figure 5. Weekly rainfall distribution over the LMB during 09-15 August 2022.

### 3 Water Levels in the Lower Mekong River

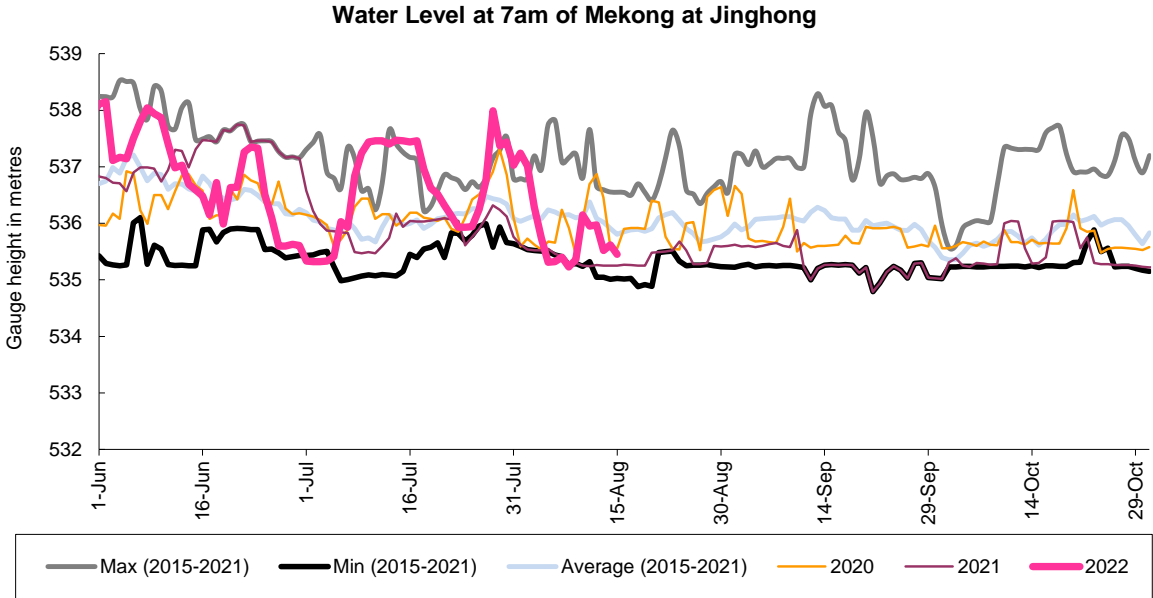
The hydrological regimes of the Mekong mainstream are illustrated by recorded water levels and flows at key mainstream stations: at Chiang Saen in Thailand to capture mainstream flows entering from the Upper Mekong Basin (UMB); at Vientiane in Lao PDR to present flows generated by climate conditions in the upper part of the LMB; at Pakse in Lao PDR 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 6](#). The hydrograph for each key station is available from the MRC’s River Flood Forecasting: <http://ffw.mrcmekong.org/overview.php>. The weekly water levels and rainfall at each key station are summarised in [Annex A](#).



**Figure 6.** Key stations and model application for River Monitoring and Flood Forecasting.

According to MRC’s observed water level at Jinghong, it showed an increased water level of about 0.09 m from **5355.36 m to 535.45 m between 09 and 15 August 2022 (recorded on 7:00 am)**. The current level is staying about 0.36 m lower than its Long-Term-Average (LTA: 2015-2021) value. The outflow at Jinghong station increased from 899.00 m<sup>3</sup>/s to 954.00 m<sup>3</sup>/s from 09 to 15 August 2022. [Figure 7](#) below presents water level that increased at the Jinghong hydrological station<sup>1</sup>, indicating the trend of fluctuating water level up to 15 August 2022



**Figure 7.** Water level at the Jinghong hydrological station up to 15 August 2022.

Along with the increasing outflow from Jinghong upstream, water levels of monitoring stations at Chiang Saen in Thailand showed a significant increase of about 1.99 m from 09 to 15 August 2022, staying about 0.34 m lower than its LTA level, **which is considered normal situation**.

Water level at Chiang Khan in Thailand from 09 to 15 August 2022, moreover, surged about 3.00 m and stayed about 0.01 m higher than its LTA value, while water level at Vientiane also increased about 2.83 m and still stayed about 0.62 m higher than its LTA level, **which considered normal situation**. Water levels at Nong Khai increased 2.76 m and at Paksane increased about 1.49 m, staying about 0.33 m higher and 1.68 m lower than their LTA value, respectively **which is still considered critical**.

Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR increased between 0.29 m and 10.85 m. The current WLS at these stations are staying between 1.50 m and 2.80 m lower than their LTA level, considering **critical**. From the stretches of the river at Stung Treng WL increased 0.35 m and stayed about 1.16 m lower than its LTA, while at Kratie water level rose about 2.02 m, staying 0.56 m lower than its LTA level, **which considered normal**.

Water levels from Kompong Cham down to Chaktomuk, Koh Khel and Phnom Penh Port to Prek Kdam in Cambodia increased between 1.25 m and 2.30 m, staying between 0.10 m and 2.00 m lower than their LTA level, **considering critical**.

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

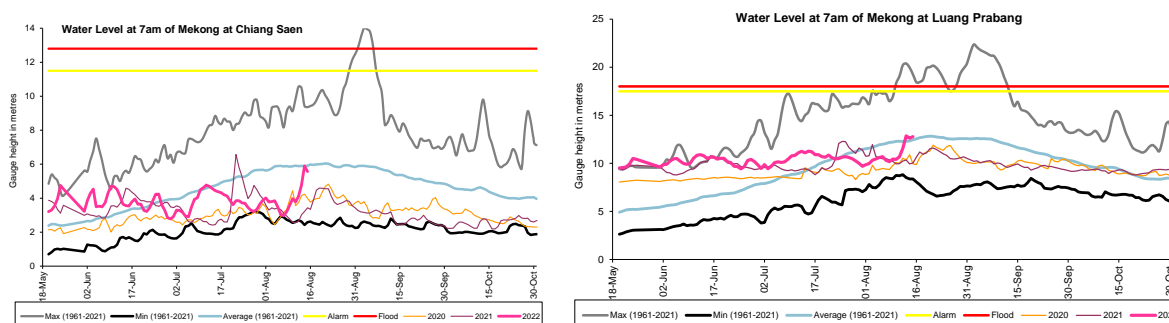
Except water levels at Luang Prabang, Chiang Khan, Vientiane and Nong Khai, the rest of water levels at key stations were lower than their LTA value. The tidal stations at Tan Chau and Chau Doc have WL lower than their LTA value due to tidal effect during this monitoring period.

Based on hydrological phenomenon, the contribution of inflow water from the upstream of Lancang-Mekong in China to the Mekong mainstream is from 16% to 18% in total during the wet season from June to October. The whole inflow of water into the LMB is influenced by rainfall at the Mekong mainstream and its tributaries during the wet season.

### Chiang Saen and Luang Prabang

The water level from 09 to 15 August 2022 at Thailand’s Chiang Saen station significantly increased from 3.58 m to 5.57 m, showing 0.34 m lower than its Long-Term-Average (LTA) value, which considered normal. The water level at Luang Prabang station in Lao PDR rose about 2.34 m from 10.44 m to 12.78 m during the reporting period. This level shows 0.33 m higher than its LTA. The trend – sometimes higher or lower to its historical maximum and LTA values – has been observed since early 2022. The phenomenon was potentially caused by upstream dam operations, downstream Xayaburi dam, and heavy rainfall in the surrounding areas. The water levels at Chiang Saen and Luang Prabang are shown in [Figure 8](#) below.

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



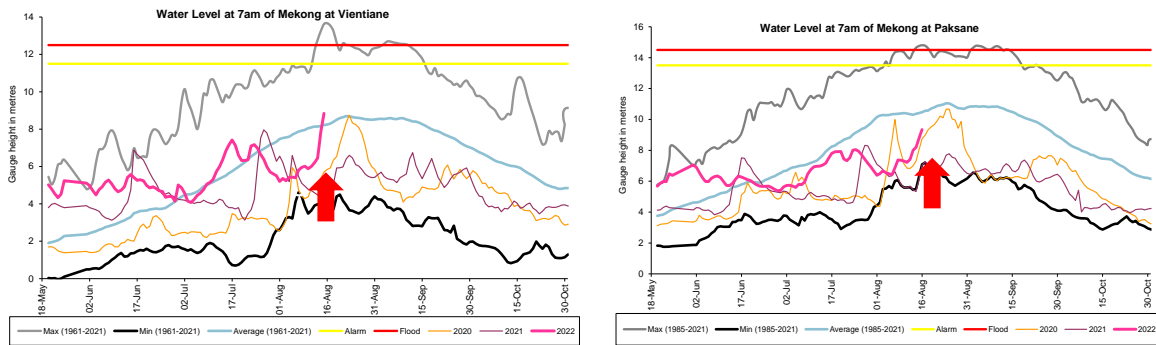
**Figure 8.** Water levels at Chiang Saen in Thailand and Luang Prabang in Lao PDR.

### Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand (downstream of the Xayaburi dam) climbed from 8.22 m to 11.22 m during the reporting week. It showed 0.01 m higher than its LTA value. The water level downstream at Vientiane in Lao PDR followed the upstream trend. It also increased from 6.01 m to 8.84 m and was about 0.62 m higher than its LTA during 09-15 August 2022. At Nong Khai station in Thailand, the water level was also up during the reporting period. It increased about 2.76 m from 5.90 m to 8.66 m and still showed 0.33 m lower than its LTA. At Paksane in Lao PDR, water level increased about 2.04 m from 7.30 m to 9.34 m. The water level at this station was about 1.13 m lower than its LTA value. The recently increased water levels were obviously due to the heavy rainfall in the sub-catchment area, along with the



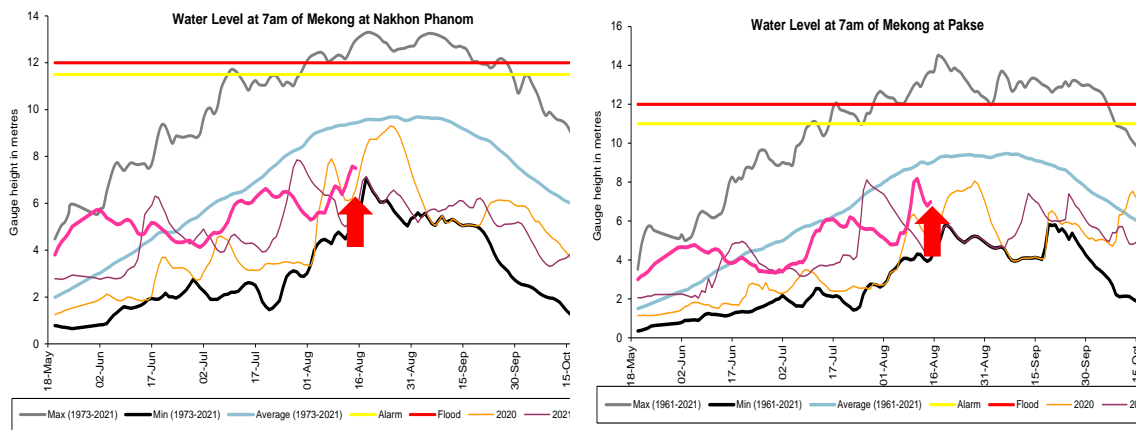
inflows and water released from upstream. The water levels at Vientiane and Paksane are shown in [Figure 9](#) below.



**Figure 9.** Water levels Veintiane and Paksane in Lao PDR.

### Nakhon Phanom to Pakse

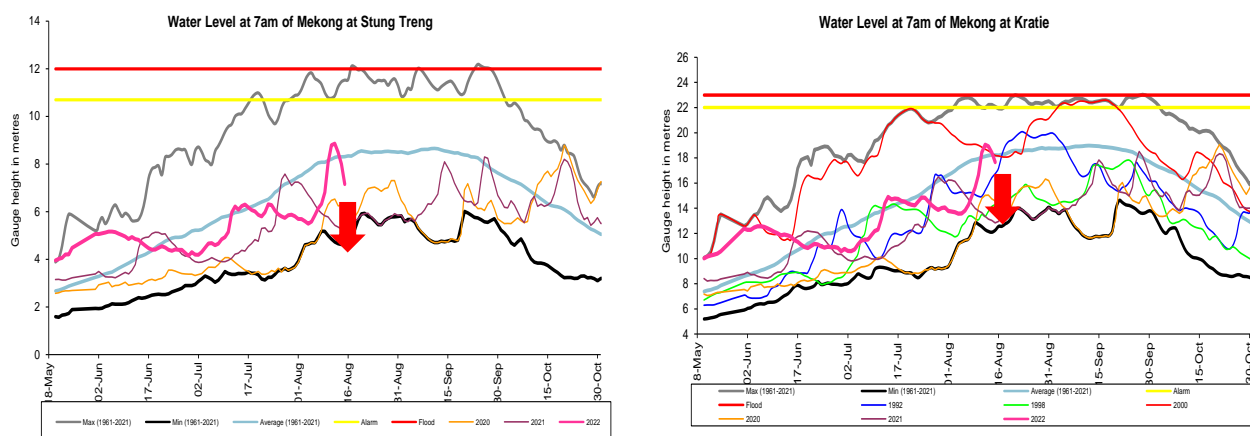
The water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR were increasing between 0.29 m and 0.85 m due to high contribution of rainfalls and inflow from upstream. **However, water levels at these stations are staying about over 2.00 m lower than their LTA level, which considered critical.** [Figure 10](#) shows the water levels at Nakhon Phanom and Pakse stations.



**Figure 10.** Weekly water levels at Nakhon Phanom in Thailand and Pakse in Lao PDR

### Stung Treng to Kompong Cham/Phnom Penh to Koh Khel/Neak Luong/Prek Kdam

Following the same trend from the upstream part of the Mekong River and the 3S river (Sekong, Se San, and Sre Pok), the water levels from Stung Treng to Kratie in Cambodia were increasing during 09-15 August 2022. The water levels at Stung Treng increased about 0.35 m, while at Kratie it increased about 2.02 m, staying about 1.16 m and 0.56 m lower than their LTA respectively (as showed in [Figure 11](#)), still **considered critical**. The water level at Kompong Cham station increased about 2.34 m and was still about 1.04 m lower than its LTA. **The water levels at downstream stations were also lower than their LTA, which considered critical.**



**Figure 11.** Water levels at Stung Treng and Kratie on the Mekong River.

At Chaktomuk on the Bassac River, due to high accumulated rainfall and contributed flows from upstream catchment, the water level was up by about 1.58 m and stayed 0.88 m lower than its LTA value; while at Koh Khel, water level increased about 1.28 m, staying 0.04 m lower than its LTA value. The water level at Prek Kdam on the Tonle Sap Lake increased about 1.31 m and was about 0.86 m lower than its LTA value. The water level at the Tonle Sap Lake (observed at Kampong Luong) was similar to Prek Kdam station's water level. The recently increased water level was due to high rainfall and inflow contributed from upstream of the Tonle Sap Lake area during the reporting period. The water level at the Tonle Sap Lake (observed at Kampong Luong) followed the same trend of Prek Kdam station's water level. From next week, **water levels at most of those stations will stay lower than their LTA level, which are considered critical.**

### Tidal stations at Tan Chau and Chau Doc

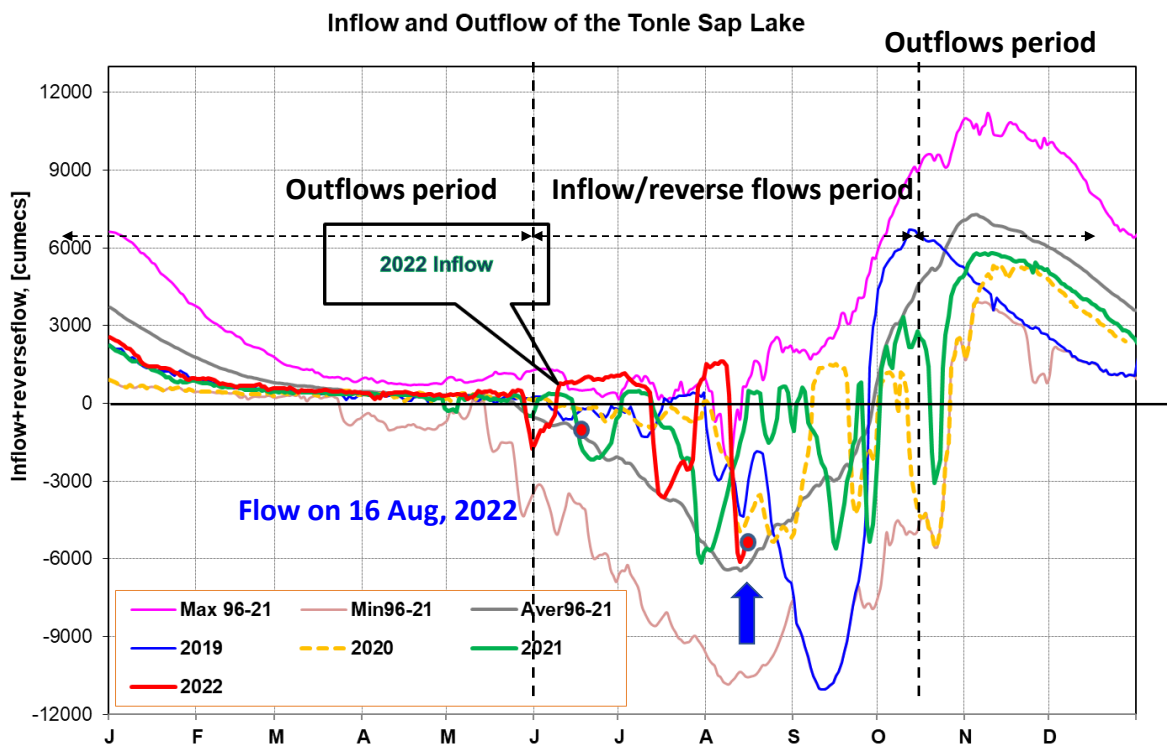
Like last week, the water levels from 09 to 15 August 2022 at Viet Nam's Tan Chau and Chau Doc were fluctuating due to daily tidal effects from the sea. The fluctuation levels were between 1.44 m and 1.94 m; they were in between the range of their LTA and historical maximum level and **considered critical**. The current water levels at Tan Chau and Chau Doc are lower than their LTA level up to 15 August 2022.

### The Tonle Sap Flow

At the end of the dry season, when water levels along the Mekong River rise and the inflows of the Mekong River return into the Tonle Sap Lake. This phenomenon normally takes place from end of May to July. Based on flow observation at Prek Kdam, the inflow of the Tonle Sap Lake took place first from 29 May up to 09 June and the second inflow from 13 to 27 July 2022.

[Figure 12](#) shows the seasonal changes of the outflow and the inflow of the TSL at Prek Kdam in comparison with the flows of 2019 and 2020, and their LTA level (1997-2020). Up to 15 August of this reporting period, **it was observed that the main outflow into Tonle Sap Lake increased due to rainfall and inflows from upstream**. This increased inflow into the Tonle Sap Lake was most likely caused by inflows and rainfall from the catchment area. Up to present, the inflow into the Tonle Sap Lake condition in 2022 is higher than 2019, 2020, 2021 but stays

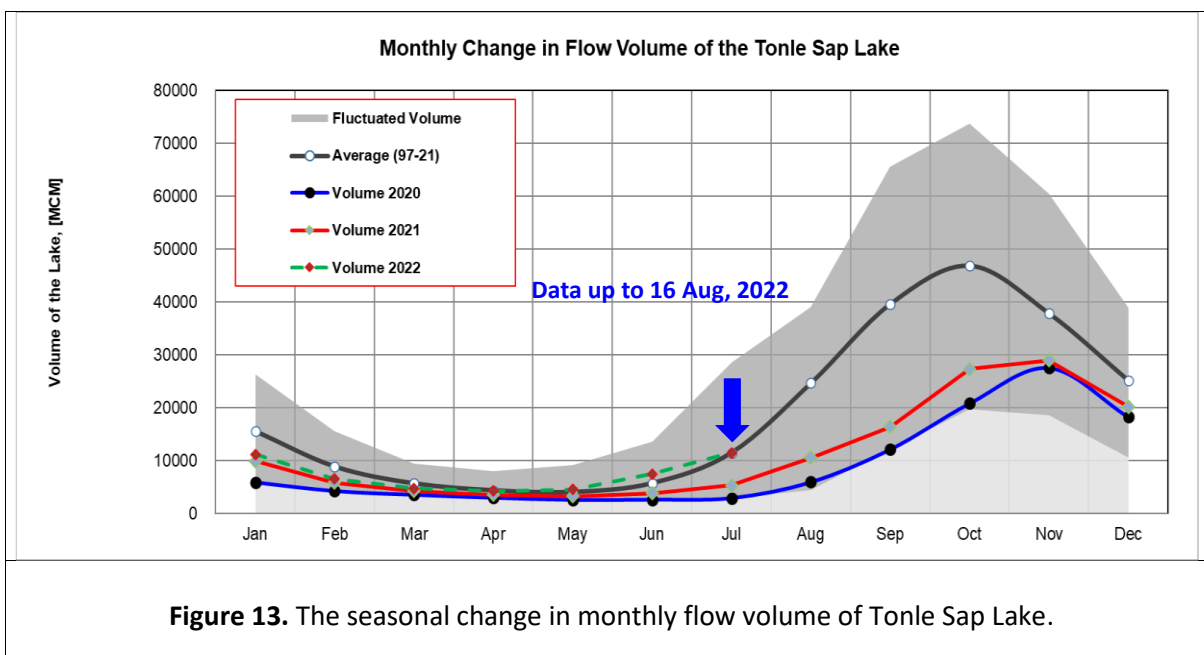
matched with its LTA (1997-2021) inflow conditions. For next week, some rainfall is forecasted for the Tonle Sap area; thus, the outflow from the Tonle Sap Lake is likely continuing to go up from the current level.



**Figure 12.** Seasonal change of inflows and outflows of Tonle Sap Lake

[Figure 13](#) shows seasonal changes in monthly flow volumes up to 15 August 2022 for the Lake compared with the volumes in 2019, 2020, 2021 and their LTA, and the fluctuation levels (1997–2021). It shows that up to August 15, **the water volume of the Tonle Sap Lake was even higher than 2019, 2020, 2021 and stay matched with its LTA (about 100%), during the same period.** The figure is displayed in [Table 1](#), which indicates that the Tonle Sap Lake has been affected by water levels from the tributaries and rainfall in the surrounding sub-catchments and **considered normal**.

This demonstrates the influence of the relationships of the reverse and out flows, water levels of the Mekong River, inflows from tributaries, and the flow direction in the complex hydraulic environment of the Tonle Sap Lake during the wet and dry seasons. The data show that about half of the annual inflow volume into the Tonle Sap Lake has originated from the Mekong mainstream. Thus, flow alterations in the mainstream could have direct impact on the Tonle Sap Lake water levels and on its hydrology.



**Figure 13.** 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	LTA (97-21) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2018 [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]	Volume 2022 [MCM]	Volume in 2022 [%], compared with its LTA
Jan	15523.23	26357.53	5906.80	13633.41	10285.31	5906.80	9923.80	11214.32	72.24
Feb	8837.89	15596.22	4198.60	7729.72	6019.30	4264.19	5832.97	6558.79	74.21
Mar	5654.18	9438.24	3347.07	5037.06	4354.62	3553.99	4264.88	4736.52	83.77
Apr	4346.65	8009.14	2866.91	3956.47	3667.47	2992.61	3556.68	4288.31	98.66
May	4030.23	9176.93	2417.81	3864.00	3266.43	2594.92	3240.78	4556.83	113.07
Jun	5708.30	13635.01	2468.70	5919.18	3517.06	2641.88	3798.29	7489.04	131.20
Jul	11493.25	28599.56	2925.86	12024.96	4001.99	2925.86	5346.73	11499.82	100.06
Aug	24666.69	39015.12	4433.46	22399.65	7622.71	5941.07	10547.80		
Sep	39634.03	65632.35	12105.31	53639.54	24194.19	12105.31	16382.34		
Oct	46873.44	73757.23	19705.50	48193.08	30358.38	20799.13	27318.21		
Nov	37823.16	60367.33	18534.61	31036.07	19112.65	27546.80	28982.93		
Dec	25126.11	38888.95	10563.49	18469.21	10577.29	18251.65	20170.76		
	Critical situation, compared with historical Min values								
	Normal condition, compared with LTA (Long term average)								
	Low volume situation, compared with LTA values								
Unit: Million Cubic Meter (1 MCM= 0.001 Km <sup>3</sup> )						LTA: Long-Term-Average			

## 4 Flash Flood in the Lower Mekong Basin

From 08 to 15 August 2022, the LMB was affected by three weather factors including (i) The monsoon trough laid across the northern and north-eastern parts towards the active low-pressure cell over the East Sea on the first day of the week. Then the low-pressure cell intensified and transformed into the tropical depression in the afternoon of Aug 8, and reached the Tropical Storm (TS) “MULAN” in the afternoon of Aug 9. The TS moved through the Gulf of Tonkin before making landfall over Quang Ninh province of Viet Nam in the early morning of Aug 11. Then it downgraded into the tropical depression over Lang Son province, Viet Nam on 07:00 a.m. After that, it degenerated into an active low-pressure cell covered the upper portion of the northern part of Myanmar on Aug 12; (ii) the monsoon trough which shifted further north to lie across Myanmar and upper northern Lao PDR towards a low pressure cell over upper Viet Nam and the Gulf of Tonkin on Aug 13, and (iii) the moderate to rather active southwest monsoon prevailed over the Andaman Sea, Thailand and the Gulf of Thailand during the first half of the week then it weakened afterwards. These conditions caused heavy rainfall over the upper part during the early and middle week with flooding in some areas of the LMB.

According to the MRC-Flash Flood Guidance System (MRC-FFGS) and analysis, flash flood events were detected during the reporting period in several areas in Thailand, Lao PDR, Cambodia, and Viet Nam ranging from low-risk to high-risk levels as shown in [Figure 14](#) and [Table 2](#).

**Table 2.** Detected flash flood in Thailand, Lao PDR, Cambodia, and Viet Nam on August 12

Rate-risk and location of the flash flood may occur in the next 1, 3, and 6 hours in Thailand											
Date of FFG product: 8/12/2022 6:00 UTC time											
01-Hour Flash Flood Risk and Location				03-Hour Flash Flood Risk and Location				06-Hour Flash Flood Risk and Location			
Provinces	Districts	Region	Level Risk	Provinces	Districts	Region	Level Risk	Provinces	Districts	Region	Level Risk
Chanthaburi	Laem Sing	Eastern	Low-Risk	Mae Hong Son	King Amphoe Pangmapha	Northern	Low-Risk	Chanthaburi	Laem Sing	Eastern	Low-Risk
Chiang Mai	Omkoi	Northern	High-Risk	Mae Hong Son	Pai	Northern	Low-Risk	Mae Hong Son	King Amphoe Pangmapha	Northern	Low-Risk
Mae Hong Son	Mae Sariang	Northern	Low-Risk	Mae Hong Son	Muang Mae Hong Son	Northern	Low-Risk	Mae Hong Son	Pai	Northern	Moderate-Risk
Chiang Mai	Hot	Northern	Low-Risk	Chiang Mai	Mae Chaem	Northern	Low-Risk	Mae Hong Son	Khun Yuam	Northern	Low-Risk
Mae Hong Son	King Amphoe Pangmapha	Northern	Low-Risk	Chiang Rai	Mae Suai	Northern	Low-Risk	Mae Hong Son	Muang Mae Hong Son	Northern	Low-Risk
Mae Hong Son	Pai	Northern	Moderate-Risk	Mae Hong Son	Sobmuai	Northern	Low-Risk	Chiang Mai	Mae Chaem	Northern	Low-Risk
Mae Hong Son	Khun Yuam	Northern	Low-Risk	Tak	Tha Song Yang	Northern	Moderate-Risk	Chiang Mai	Fang	Northern	Low-Risk
Mae Hong Son	Muang Mae Hong Son	Northern	Low-Risk	Tak	Um Phang	Northern	Low-Risk	Chiang Rai	Mae Suai	Northern	Low-Risk
Chiang Mai	Mae Chaem	Northern	Low-Risk	Chiang Mai	Omkoi	Northern	High-Risk	Mae Hong Son	Sobmuai	Northern	Low-Risk
Mae Hong Son	Mae La Noi	Northern	Low-Risk	Mae Hong Son	Mae La Noi	Northern	Low-Risk	Tak	Tha Song Yang	Northern	Moderate-Risk
Chiang Rai	Mae Suai	Northern	Low-Risk	Chiang Mai	Hot	Northern	Low-Risk	Tak	Phop Phra	Northern	Low-Risk
Mae Hong Son	Sobmuai	Northern	Low-Risk					Tak	Um Phang	Northern	Moderate-Risk
Tak	Tha Song Yang	Northern	Moderate-Risk					Mae Hong Son	Mae La Noi	Northern	Low-Risk
Tak	Phop Phra	Northern	Low-Risk					Mae Hong Son	Mae Sariang	Northern	Low-Risk
Tak	Um Phang	Northern	Moderate-Risk					Chiang Mai	Omkoi	Northern	Moderate-Risk
								Chiang Mai	Chiang Dao	Northern	Low-Risk



Rate-risk and location of the flash flood may occur in the next 1, 3, and 6 hours in Lao PDR

Date of FFG products 8/12/2022 6:00 UTC time

01-Hour Flash Flood Risk and Location					03-Hour Flash Flood Risk and Location					06-Hour Flash Flood Risk and Location				
Provinces	Districts	Villages	Region	Level Risk	Provinces	Districts	Villages	Region	Level Risk	Provinces	Districts	Villages	Region	Level Risk
Huaphanh	Xamtay	HINTANG	Eastern	Moderate-Risk	Huaphanh	Xamtay	HINTANG	Eastern	Low-Risk	Xiangkuang	Khoun	POUNG	Northeast	Low-Risk
Huaphanh	Xamtay	NAMOUANG	Eastern	Low-Risk	Huaphanh	Xamtay	HOUAYSAMONG	Eastern	Moderate-Risk	Xaysomboun	Hom	KORMI	province is mountainous Northeast	Low-Risk
Huaphanh	Xamtay	HOUAYSAMONG	Eastern	High-Risk	Huaphanh	Xamtay	GNORT-INN	Eastern	Moderate-Risk	Xaysomboun	Hom	MUANGSOUM	province is mountainous Northeast	Low-Risk
Huaphanh	Xamtay	GNORT-INN	Eastern	High-Risk	Huaphanh	Xamtay	NAMMORN	Eastern	Moderate-Risk	Luangprabang	Chomphet	HUAYHAN	North	Low-Risk
Huaphanh	Xamtay	NAMMORN	Eastern	High-Risk	Huaphanh	Xamtay	LONGKUANG	Eastern	Moderate-Risk	Luangprabang	Chomphet	HUAYYAKHAO	North	Low-Risk
Huaphanh	Xamtay	LONGKUANG	Eastern	Moderate-Risk	Huaphanh	Viengxay	TA-AN	Eastern	Low-Risk	Xayaboury	Hongsa	HOUY SUUNE	Northwest	Low-Risk
Huaphanh	Viengxay	TA-AN	Eastern	Low-Risk	Huaphanh	Xiangkhor	HOUAYLO	Eastern	Low-Risk	Luangprabang	Ngoi	NAMTAN	North	Low-Risk
Huaphanh	Xiangkhor	HOUAYLO	Eastern	Low-Risk	Huaphanh	Xamtay	PHALOM	Eastern	Low-Risk	Luangprabang	Phonxay	HEUADOI	North	Low-Risk
Huaphanh	Viengxay	HOUAYTHONG	Eastern	Low-Risk	Huaphanh	Xamtay	PHAKHAO	Eastern	Moderate-Risk	Luangprabang	Phonxay	HUAYCHANG	North	Low-Risk
Huaphanh	Xamtay	PHALOM	Eastern	Low-Risk	Xiangkuang	Nonghed	SUAN OI	Northeast	Low-Risk	Luangprabang	Phoukhoun	NAKUEN	North	Low-Risk
Huaphanh	Xamtay	PHAKHAO	Eastern	High-Risk	Huaphanh	Huameuang	KADAENG	Eastern	Low-Risk	Xayaboury	Hongsa	DONE XAI	Northwest	Low-Risk
Xiangkuang	Nonghed	SUAN OI	Northeast	Moderate-Risk	Xiangkuang	Nonghed	DAN	Northeast	Low-Risk	Huaphanh	Xamtay	HINTANG	Eastern	Moderate-Risk
Huaphanh	Huameuang	KADAENG	Eastern	Low-Risk	Xiangkuang	Kham	YORTUENG	Northeast	Low-Risk	Huaphanh	Xamtay	NAMOUANG	Eastern	Low-Risk
Xiangkuang	Nonghed	DAN	Northeast	Moderate-Risk	Xiangkuang	Nonghed	SANGKET	Northeast	Low-Risk	Huaphanh	Xamtay	HOUAYSAMONG	Eastern	Moderate-Risk
Xiangkuang	Kham	YORTUENG	Northeast	Low-Risk	Xiangkuang	Nonghed	DONGKOR	Northeast	Low-Risk	Huaphanh	Xamtay	GNORT-INN	Eastern	Moderate-Risk
Xiangkuang	Nonghed	SANGKET	Northeast	Moderate-Risk	Huaphanh	Xamtay	NAMMORN	Eastern	Low-Risk	Huaphanh	Xamtay	LONGKUANG	Eastern	Moderate-Risk
Xiangkuang	Nonghed	DONGKOR	Northeast	Moderate-Risk	Huaphanh	Xamnya	SATHORN	Eastern	Low-Risk	Huaphanh	Viengxay	TA-AN	Eastern	Low-Risk
Huaphanh	Xamtay	HOUAYTHA TAI	Eastern	Low-Risk	Huaphanh	Xiengkhor	HOUAYLO	Eastern	Low-Risk	Huaphanh	Viengxay	ONGKHATHAM	Eastern	Low-Risk
					Huaphanh	Viengxay	HOUAYTHONG	Eastern	Low-Risk					



Rate-risk and location of the flash flood may occur in the next 1, 3, and 6 hours in Cambodia

Date of FFG products 8/12/2022 6:00 UTC time

01-Hour Flash Flood Risk and Location					03-Hour Flash Flood Risk and Location					06-Hour Flash Flood Risk and Location				
Provinces	Districts	Villages	Region	Level Risk	Provinces	Districts	Villages	Region	Level Risk	Provinces	Districts	Villages	Region	Level Risk
NO ANY DETECTION OF FLASH FLOOD WITHIN NEXT 01-HOUR					NO ANY DETECTION OF FLASH FLOOD WITHIN NEXT 03-HOUR					Koh Kong Botum Sakor Bak Ronoas Southwestern Low-Risk				

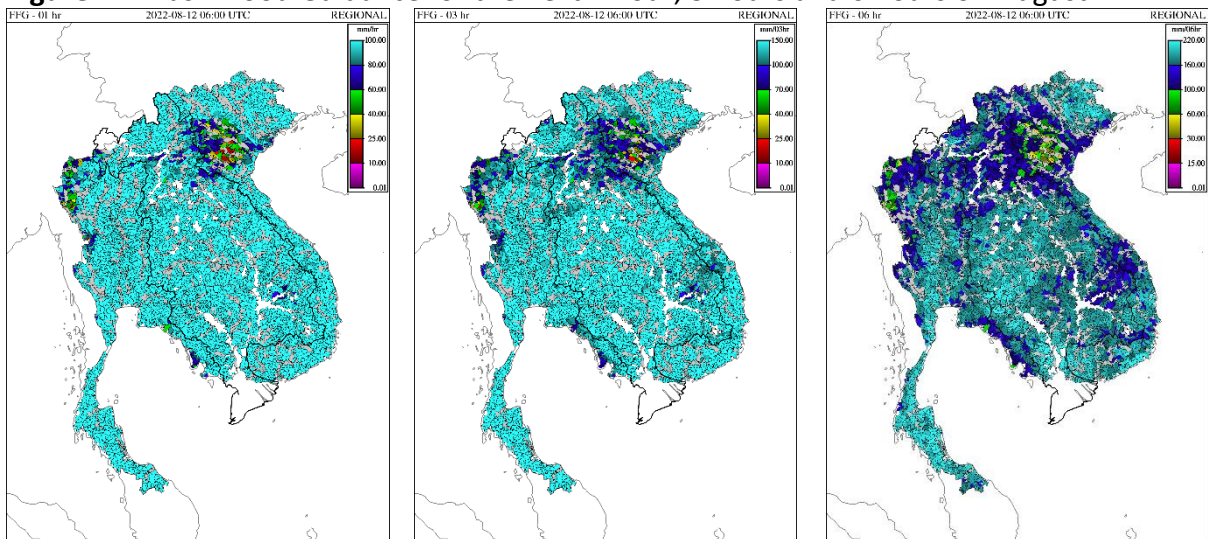


Rate-risk and location of the flash flood may occur in the next 1, 3, and 6 hours in Viet Nam

Date of FFG products 8/12/2022 6:00 UTC time

01-Hour Flash Flood Risk and Location				3-Hour Flash Flood Risk and Location in Vietnam				6-Hour Flash Flood Risk and Location in Vietnam			
Provinces	Districts	Region	Level Risks	Provinces	Districts	Region	Level Risks	Provinces	Districts	Region	Level Risks
Hoa Binh	Da Bac	Northwest	Low-Risk	Hoa Binh	Da Bac	Northwest	Low-Risk	Son La	Mai Son	Northwest	Low-Risk
Son La	Mai Son	Northwest	Low-Risk	Thanh Hoa	Quan Son	North Central	Moderate-Risk	Nghe An	Quy Chau	North Central	Moderate-Risk
Son La	Moc Chau	Northwest	Moderate-Risk	Son La	Mai Son	Northwest	Low-Risk	Nghe An	Tuong Duong	North Central	Moderate-Risk
Son La	Phu yen	Northwest	Low-Risk	Nghe An	Tuong Duong	North Central	High-Risk	Nghe An	Que Phong	North Central	Moderate-Risk
Hoa Binh	Mai Chau	Northwest	Low-Risk	Son La	Moc Chau	Northwest	Low-Risk	Son La	Phu yen	Northwest	Low-Risk
Thanh Hoa	Tho Xuan	North Central	Low-Risk	Son La	Phu yen	Northwest	Low-Risk	Son La	Song Ma	Northwest	Moderate-Risk
Thanh Hoa	Thuong Xuan	North Central	High-Risk	Thanh Hoa	Quan Hoa	North Central	Low-Risk	Hoa Binh	Da Bac	Northwest	Low-Risk
Nghe An	Tuong Duong	North Central	High-Risk	Thanh Hoa	Muong Lat	North Central	Moderate-Risk	Hoa Binh	Mai Chau	Northwest	Low-Risk
Nghe An	Que Phong	North Central	High-Risk	Hoa Binh	Mai Chau	Northwest	Low-Risk	Hoa Binh	Yen Thuy	Northwest	Low-Risk
Nghe An	Quy Chau	North Central	Moderate-Risk	Nghe An	Con Cuong	North Central	Low-Risk	Thanh Hoa	Thuong Xuan	North Central	Moderate-Risk
Thanh Hoa	Ba Thuoc	North Central	Low-Risk	Nghe An	Que Phong	North Central	High-Risk	Son La	Yen Chau	Northwest	Moderate-Risk
Thanh Hoa	Quan Hoa	North Central	Low-Risk	Son La	Song Ma	Northwest	Low-Risk	Son La	Moc Chau	Northwest	Low-Risk
Son La	Yen Chau	Northwest	Moderate-Risk	Nghe An	Quy Chau	North Central	Moderate-Risk	Thanh Hoa	Muong Lat	North Central	Moderate-Risk
Son La	Song Ma	Northwest	Moderate-Risk	Son La	Yen Chau	Northwest	Low-Risk	Thanh Hoa	Quan Son	North Central	Moderate-Risk
Nghe An	Con Cuong	North Central	Low-Risk					Thanh Hoa	Ba Thuoc	North Central	Low-Risk
Hoa Binh	Ky Son	Northwest	Low-Risk					Thanh Hoa	Quan Hoa	North Central	Low-Risk
Thanh Hoa	Muong Lat	North Central	Moderate-Risk					Thanh Hoa	Tho Xuan	North Central	Low-Risk
Thanh Hoa	Lang Chanh	North Central	Low-Risk					Hoa Binh	Ky Son	Northwest	Low-Risk
Thanh Hoa	Quan Son	North Central	High-Risk					Nghe An	Con Cuong	North Central	Low-Risk

Figure 14. Flash Flood Guidance for the next 1 hour, 3 hours and 6 hours on August 12



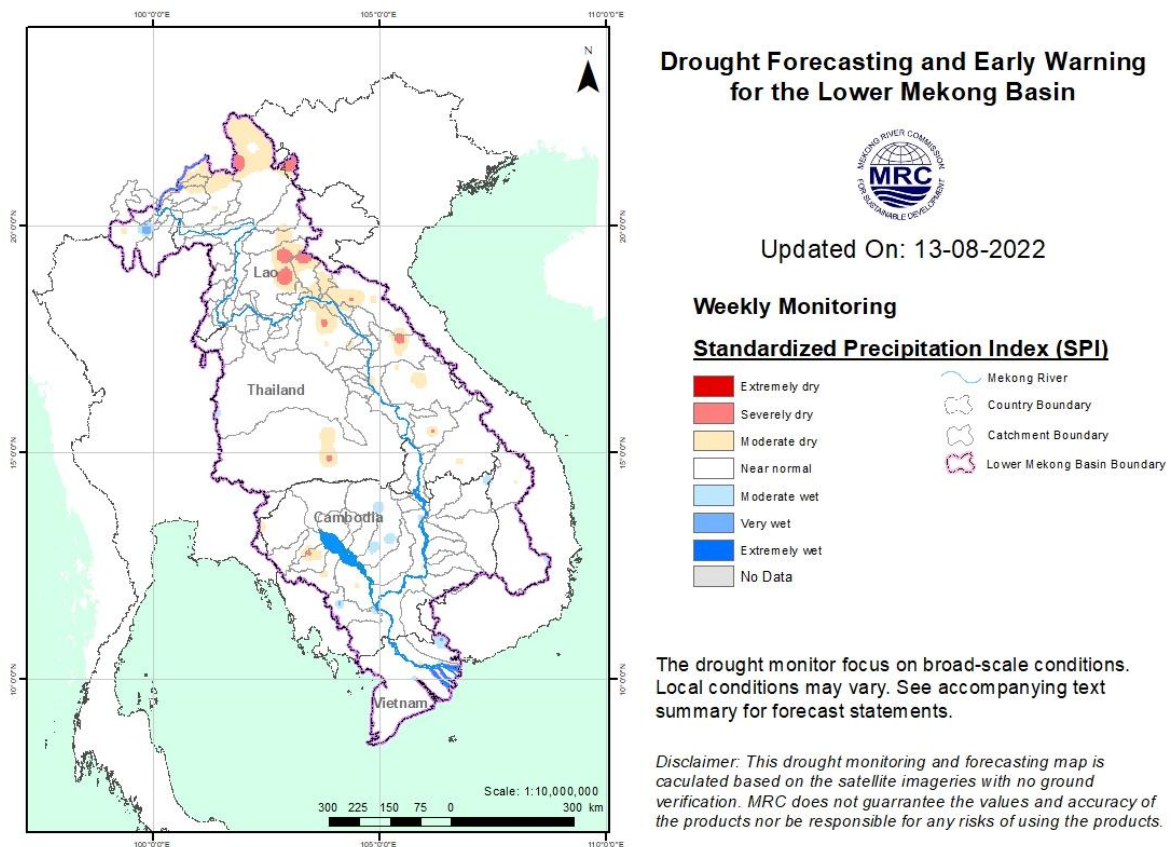
## 5 Drought Monitoring in the Lower Mekong Basin

### Weekly drought monitoring from 07 to 13 August 2022

Drought monitoring data in 2022 are available from Sunday to Saturday every week; thus, the reporting period is normally delayed by three days 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)**

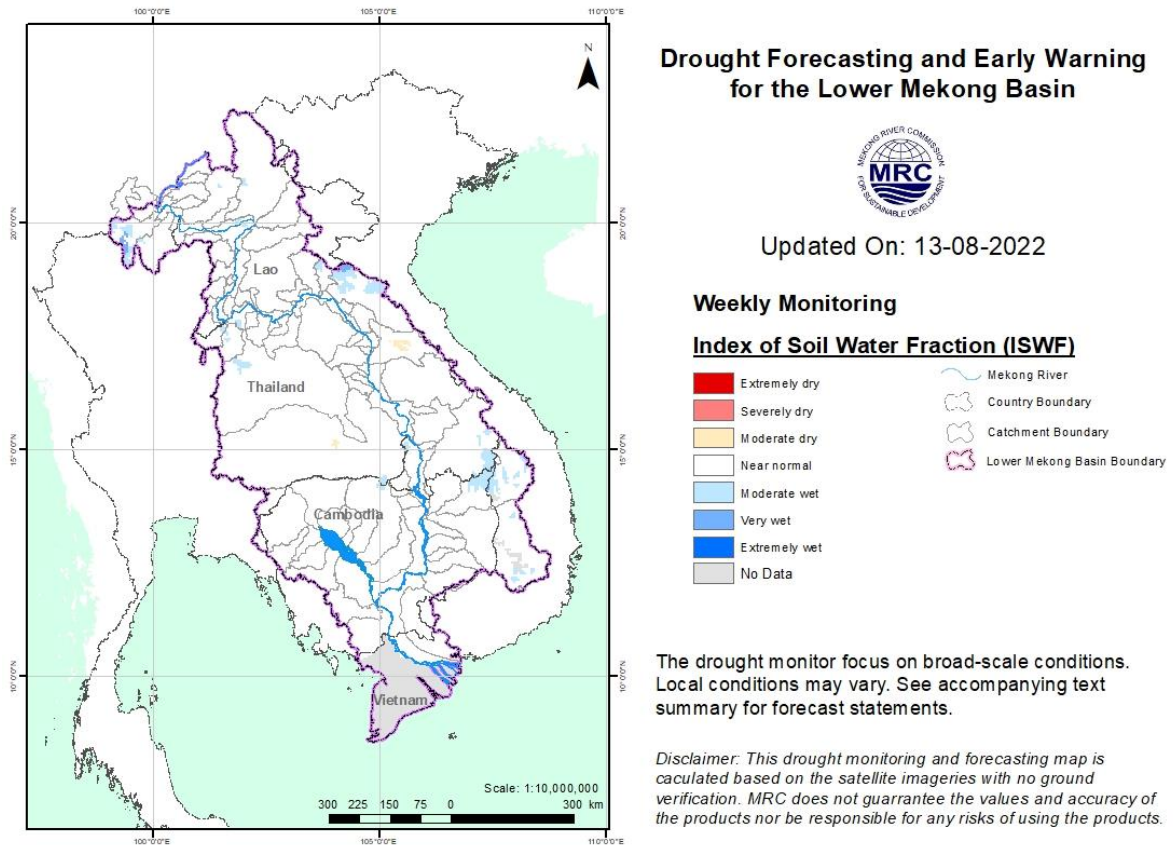
The meteorological drought indicator of SPI from August 7 to 13, as displayed in [Figure 15](#), shows a moderate dry condition in the north of the LMB covering mainly **Phongsaly, Luangnamtha, Lao Cai, Xieng Khuang, Xaysomboun, Borikhamxay, Khammuane, and Nong Khai**. The middle and southern parts of the region were normal. In general, the LMB received average rainfall during the monitoring week.



**Figure 15.** Weekly standardized precipitation index from 07 to 13 August 2022.

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

Unlike last week (July 31-Aug 6), the soil water fraction from August 7 to 13, as displayed in [Figure 16](#), shows no dry condition in all parts of the region. **No agricultural drought was found during the monitoring week.**

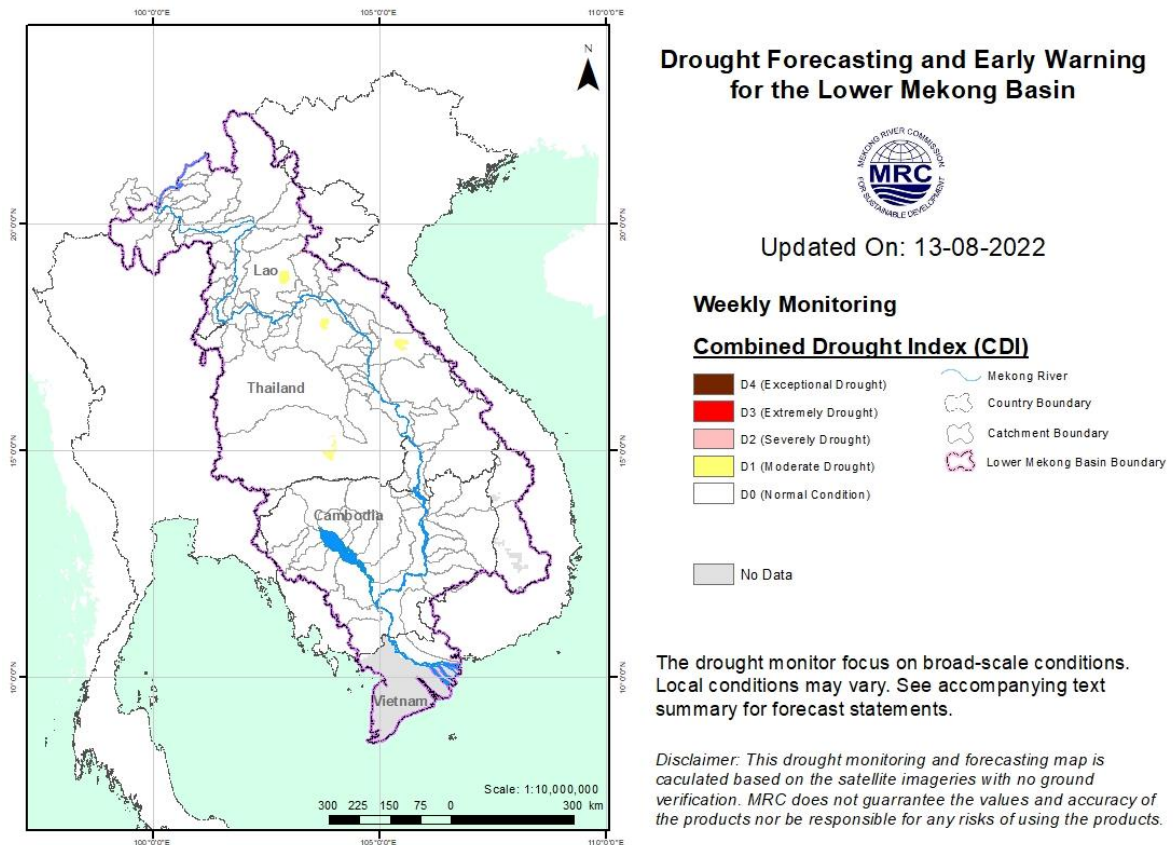


**Figure 16.** Index of Soil Water Fraction from 07 to 13 August 2022.

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

The combined drought indicator from the meteorological and agricultural indices, as displayed in [Figure 17](#), shows that the LMB was normal and did not face any drought threat during the monitoring period of August 7-13.





**Figure 17.** Weekly Combined Drought Index from 07 to 13 August 2022.

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.

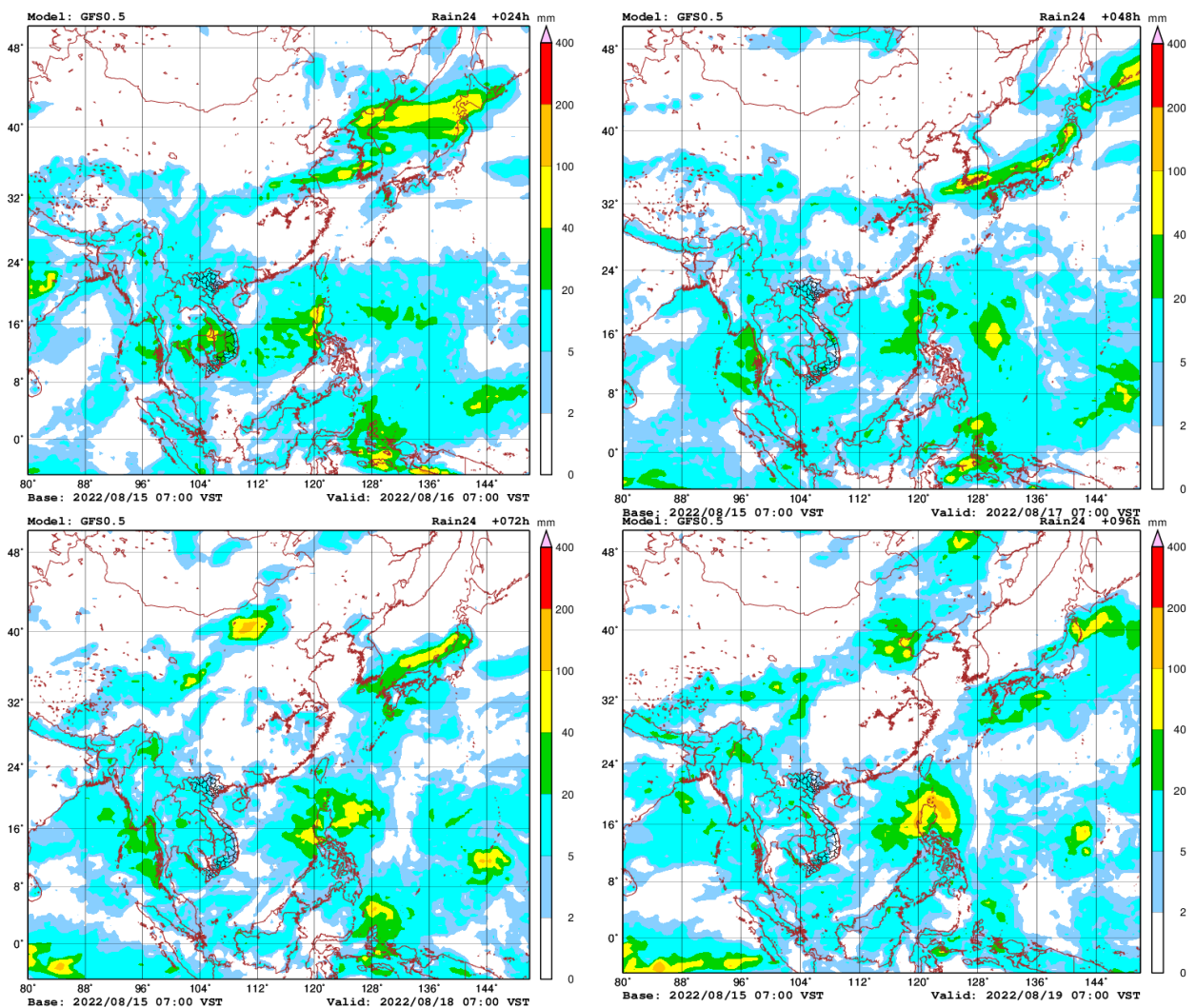
## 6 Weather and Water Level Forecast and Flash Flood Information

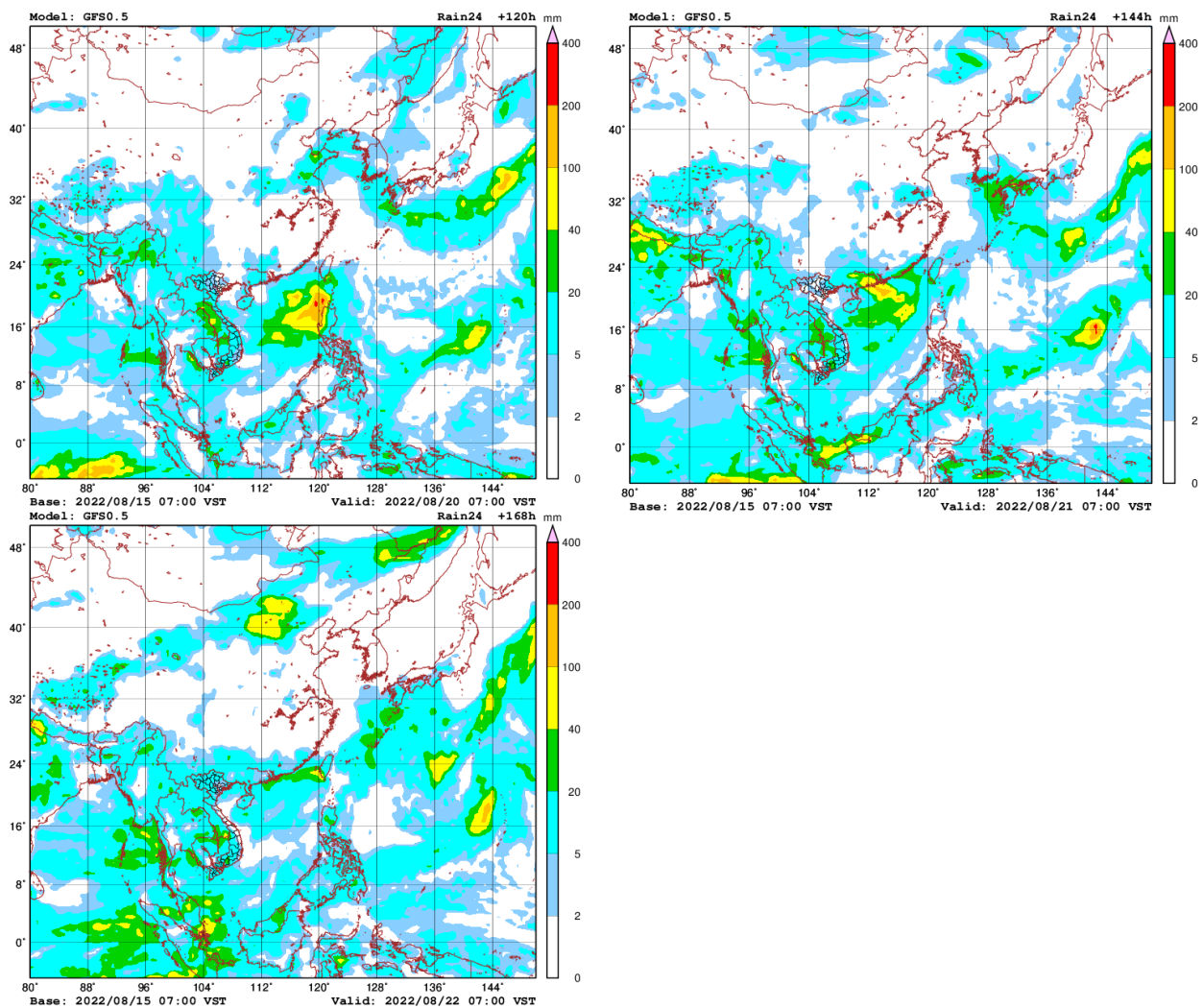
### 6.1 Weather and rainfall forecast

Based on the analysis of the synoptic meteorological information and result from the Global Forecast System (GFS) model, in the coming week, the southwest monsoon and low-pressure cell will continue prevailing over the LMB.

In general, during August 9-15, small (5 -20 mm/24h) and moderate (20-50 mm/24h) amounts of rainfall will likely occur over the LMB.

[Figure 18](#) shows accumulated rainfall forecast (24 h) of the GFS model from 16-22 August.





**Figure 18.** Accumulated rainfall forecast (24 h) based on a GFS model.

## 6.2 Water level forecast

### Chiang Saen and Luang Prabang

Based on August 15's daily flood forecasting bulletin, the daily forecasted water level at Chiang Saen in Thailand indicates a decrease of water level from 5.57 m to 5.55 m over the next five days. The trend will keep the water level at this station above its LTA.

For Luang Prabang in Lao PDR, the water level will increase from 12.78 m to 13.14 m during the next five days. The current water level is higher than its LTA. Precipitation is forecasted for the area between Chiang Saen and Luang Prabang next week.

### Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand is forecasted to go up approximately 0.35 m, while water level at Vientiane in Lao PDR will increase about 0.40 m. Furthermore, from Nong Khai in Thailand, the water level will increase about 0.50 m over the next five days; at Paksane in Lao PDR water level will increase about 0.90 m due to high forecasted rainfall and dam operation in the upper catchments. Rainfall is forecasted for the area of Paksane next week.

The water levels at these stations are remaining lower than their LTA.

### **Nakhon Phanom to Pakse**

The water levels from Nakhon Phanom in Thailand and Thakhek in Lao PDR are forecasted to go up by about 1.00 m, while from Mukdahan in Thailand to Pakse in Lao PDR will go up from about 0.50 m to 0.85 m over the next five days. Water level at these stations will stay close to their LTA level. Rainfall is forecasted for the area next week.

### **Stung Treng to Kompong Cham/Phnom Penh to Koh Khel/Neak Luong**

From Stung Treng will go up by about 0.42 m, while from Kratie to Kompong Cham along the Mekong River in Cambodia, the water levels will go down about 1.20 m over the next five days. Precipitation is forecasted for the area between Stung Treng and Kompong Cham during next week.

The water levels of the Tonle Sap Lake at Prek Kdam and Phnom Penh Port as well as at Phnom Penh's Chaktomuk on the Bassac River will decrease about 0.50 m over the next five days.

Water levels at most of the stations will go up and down, which some stations are staying close to their LTA value, particularly in the middle part of the region from the Chiang Khan to Nong Khai. From Nakhon Phanom to Pakse as well as the lower part at Stung Treng, Kratie and Kompong Cham stations, water levels will still be staying below their LTA. Precipitation is forecasted for the low-lying area of Cambodia next week.

### **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, the water levels will be fluctuating above their LTA level, following daily tidal effects from the sea. Rainfall is forecasted for the Delta area next week.

The performance of the weekly flood forecast, with an accuracy and data input evaluation from 09 to 15 August 2022, is presented in **Annex 1**.

[Table 2](#) shows the daily flood forecasting Bulletin issued on 15 August 2022. Results of the weekly river monitoring bulletin are also available at [http://ffw.mrcmekong.org/bulletin\\_wet.php](http://ffw.mrcmekong.org/bulletin_wet.php).

## **6.3 Flash Flood Information**

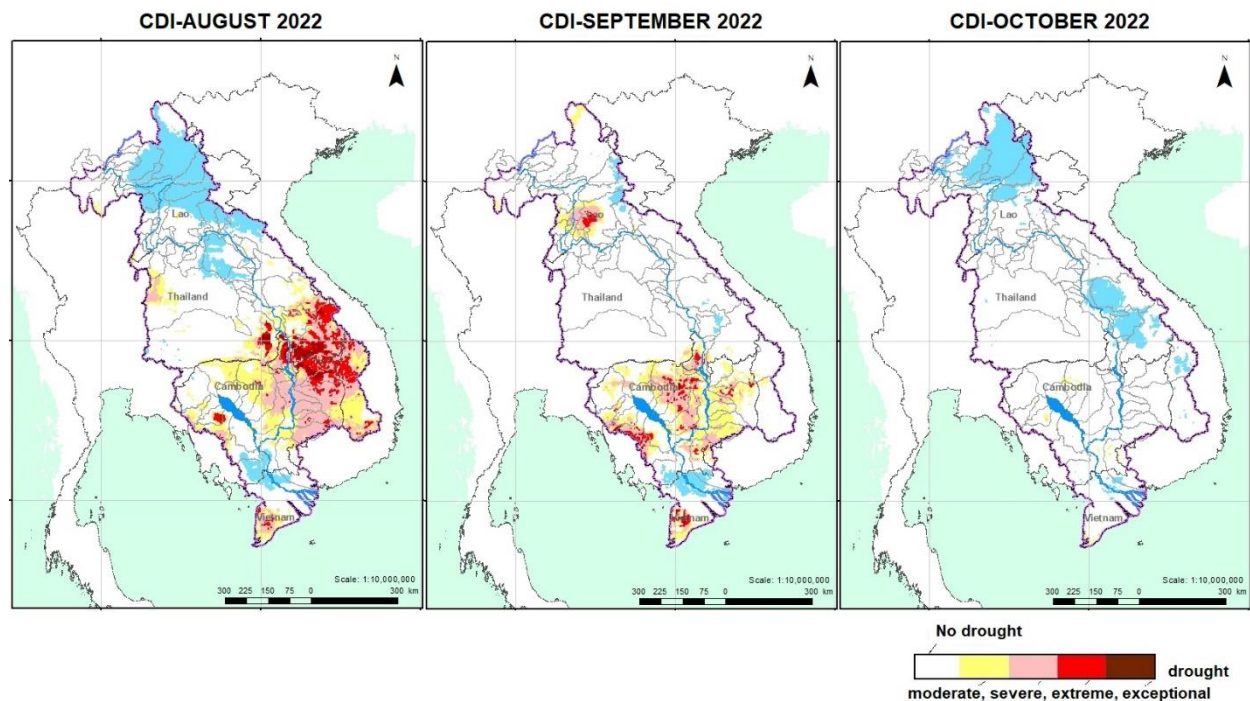
With small and moderate rainfall forecasted for next week, flash floods with high levels are not expected to take place in the LMB. However local heavy rain in a short period of time, especially during August 20-22, is possible with unexpected short flash floods. The information on flash flood guidance for the next one, three, and six hours is updated twice a day at: <http://ffw.mrcmekong.org/ffg.php>.

Detailed information on Flash Flood Warning 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 until November 2022. The MRC's DFEWS adopts an ensemble model called the North America Multi-Model Ensemble (NMME), which averages all scenarios, and downscales the forecasts to the regional level. The Viable Infiltration Capability (VIC) is then used to generate soil moisture and runoff for the whole basin.

[Figure 19](#) below shows the Combine Drought Indicator (CDI) forecast for August, September, and October 2022. CDI is a combination of meteorological and agricultural indicators.



**Figure 19.** Monthly forecast of CDI for August, September, and October in 2022.

Figure 19 above shows that August is likely to be severely and extremely dry, specifically in the southern part and the 3S area of the LMB covering some areas of Thailand, southern Lao PDR, and half-eastern Cambodia; September is likely to be severely dry in the lower part covering around 50% of Cambodia, Vientiane province of Lao PDR in the north, and Ca Mau, Bac Lieu, and Kien Giang of the Mekong Delta of Vietnam; while October is forecasted to be normal and wet all over the region.

**Table 2. Weekly River Monitoring 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: 16 August - 20 August 2022

Date: 15 August 2022

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								
						14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	15	16	17	18	19	20			
Jinghong		15.0				535.62	535.45									↓	×	×	×	×	×
Chiang Saen		0.0	357.110	12.80	11.50	5.90	5.57	5.48	5.40	5.46	5.51	5.55				↓					
Luang Prabang		13.2	267.195	18.00	17.50	12.62	12.78	13.53	13.24	13.16	13.10	13.14				↑	↑	↓			
Chiang Khan		2.0	194.118	16.00	14.50	11.24	11.22	11.32	11.82	11.62	11.58	11.53						↑	↓		
Vientiane		7.6	158.040	12.50	11.50	7.88	8.84	8.85	8.98	9.50	9.30	9.24				↑		↑	↑	↓	
Nongkhai		21.9	153.648	12.20	11.40	7.55	8.66	8.74	8.90	9.48	9.23	9.16				↑		↑	↑	↓	
Paksane		3.0	142.125	14.50	13.50	8.20	8.79	9.30	9.34	9.44	9.83	9.69				↑	↑			↑	↓
Nakhon Phanom		17.4	130.961	12.00	11.50	7.58	7.50	7.73	8.05	8.08	8.16	8.50					↑	↑			↑
Thakhek		16.3	129.629	14.00	13.00	8.61	8.55	8.78	9.10	9.14	9.22	9.56					↑	↑			↑
Mukdahan		0.0	124.219	12.50	12.00	7.12	7.18	7.25	7.40	7.65	7.67	7.73						↑	↑		
Savannakhet		0.4	125.410	13.00	12.00	5.56	5.62	5.69	5.83	6.05	6.06	6.10						↑	↑		
Khong Chiam		39.4	89.030	14.50	13.50	8.39	8.71	8.89	9.00	9.20	9.48	9.54				↑	↑	↑	↑		
Pakse		60.8	86.490	12.00	11.00	6.78	6.98	7.23	7.37	7.55	7.79	7.82				↑	↑	↑	↑		
Stung Treng		nr	36.790	12.00	10.70	8.01	7.16	7.00	7.15	7.25	7.38	7.58				↓	↓	↑	↑	↑	↑
Kratie		16.0	-0.101	23.00	22.00	18.42	17.66	16.66	16.27	16.35	16.42	16.51				↓	↓	↓	↓	↑	↑
Kompong Cham		13.0	-0.930	16.20	15.20	11.96	11.54	10.95	10.30	10.20	10.27	10.34				↓	↓	↓	↓	↑	↑
Phnom Penh (Bassac)		nr	-1.020	12.00	10.50	7.32	7.14	6.86	6.55	6.50	6.53	6.56				↓	↓	↓	↓	↑	↑
Phnom Penh Port		-	0.070	11.00	9.50	6.03	5.87	5.62	5.32	5.27	5.30	5.33				↓	↓	↓	↓	↑	↑
Koh Khel (Bassac)		nr	-1.000	8.40	7.90	6.58	6.40	6.16	5.94	5.92	5.93	5.95				↓	↓	↓			
Neak Luong		nr	-0.330	8.00	7.50	5.24	5.14	4.95	4.65	4.38	4.34	4.38				↓	↓	↓	↓	↑	↑
Prek Kdam		nr	0.080	10.00	9.50	6.04	5.97	5.80	5.60	5.57	5.60	5.63				↓	↓	↓	↓	↑	↑
Tan Chau		0.0	0.000	4.50	3.50	2.03	1.94	1.82	1.70	1.62	1.56	1.50				↓	↓	↓	↓	↓	↓
Chau Doc		nr	0.000	4.00	3.00	1.54	1.49	1.40	1.32	1.26	1.22	1.17				↓	↓	↓	↓	↓	↓

**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	

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 *K. Sothea*  
**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://fw.mrcmekong.org/bulletin\\_wel.php](http://fw.mrcmekong.org/bulletin_wel.php); <http://fw.mrcmekong.org/reportflood.php>

## 7 Summary and Possible Implications

### 7.1 Rainfall and its forecast

Rain was observed from Chiang Saen in Thailand to Tan Chau and Chau Doc in Viet Nam during August 9-15, including the lower part in Lao PDR and Cambodia, varying from 1.10 mm to 185.40 mm due to low pressure dominating the LMB. However, this week rainfall was considered high in the upper, middle and lower parts of the LMB compared with last week rainfall.

Based on the forecasted satellite data, rainfall is forecasted for some areas of the LMB with the value range from 70 mm to 200 mm for the next seven days. The forecasting model using GFS data, moreover, shows that no significant rainfall (<100 mm) is likely to take place in the Mekong region from 16 to 20 August 2022.

### 7.2 Water level and its forecast

According to MRC's observed water level at Jinghong, it showed an increased water level of about 0.09 m from 5355.36 m to 535.45 m between 09 and 15 August 2022. The current level is staying about 0.36 m lower than its LTA (2015-2021) value. The outflow at Jinghong station decreased from 899.00 m<sup>3</sup>/s to 954.00 m<sup>3</sup>/s from 09 to 15 August 2022.

Along with the increased outflow from Jinghong upstream, water levels of monitoring stations at Chiang Saen in Thailand increased about 1.99 m from 09 to 15 August 2022. Furthermore, from Chiang Khan in Thailand to Vientiane in Lao PDR, water levels increased between 2.80 m and 3.00 m during Aug 9-15 due to influence of heavy rainfall and dam operation upstream. Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR were also increasing about 0.70 m. Water levels from the stretches of the river from Stung Treng to Kratie and at Kompong Cham in Cambodia were increasing from 0.30 m to 2.30 m, due to high contributed rainfall from the upstream part (at Pakse and 3S area in Viet Nam).

Over the next five days, the water levels from Chiang Saen down to Stung Treng and to the lower part at key stations in Cambodia are expected to go down between 0.20 m and 0.55 m.

The flow volume of the Tonle Sap Lake is lower than its LTA up to August 15. From next week, the flow is expected to increase due to average-rainfall forecasted in the inflow catchments of the Tonle Sap Lake.

From Stung Treng to Kratie, the water levels will continue staying lower than their LTA value. The water levels – at Neak Luong on the Mekong River, from Prek Kdam to Phnom Penh Port on the Tonle Sap, and from Chaktomuk to Koh Khel on the Bassac – are forecasted to continue staying lower than their LTA.

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

Since the second week of June 2022, water levels across most monitoring stations in the LMB have significantly dropped to the level lower than their LTA (from middle to lower stretches within the LMB). The preliminary analysis of the hydrological conditions in the LMB over July–December 2020 and November 2020 to May 2021 was done as [Situation Report](#), which can be used as reference for the trend of water level and flows of the Mekong River Basin.

The contribution to the Mekong River’s flow from the UMB 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

With the predicted amount of rainfall for the coming week as mentioned earlier in [section 6.1](#), the major flash floods are not expected in the LMB during next week. However local heavy rain in a short period of time during August 20-22 is possible with unexpected short flash floods.

### 7.4 Drought condition and its forecast

During August 7-13, there were some moderate meteorological droughts in the north of the LMB covering **Phongsaly, Luangnamtha, Lao Cai, Xieng Khuang, Xaysomboun, Borikhamxay, Khammuane, and Nong Khai**. In general, the LMB was still considered normal and did not face any serious drought threat.

During the next three months, August is likely to be severely and extremely dry, specifically in the southern part and the 3S area of the LMB covering some areas of Thailand, southern Lao PDR, and half-eastern Cambodia; September is likely to be severely dry in the lower part covering around 50% of Cambodia, Vientiane province of Lao PDR in the north, and Ca Mau, Bac Lieu, and Kien Giang of the Mekong Delta of Veit Nam; while October is forecasted to be normal and wet all over the region.



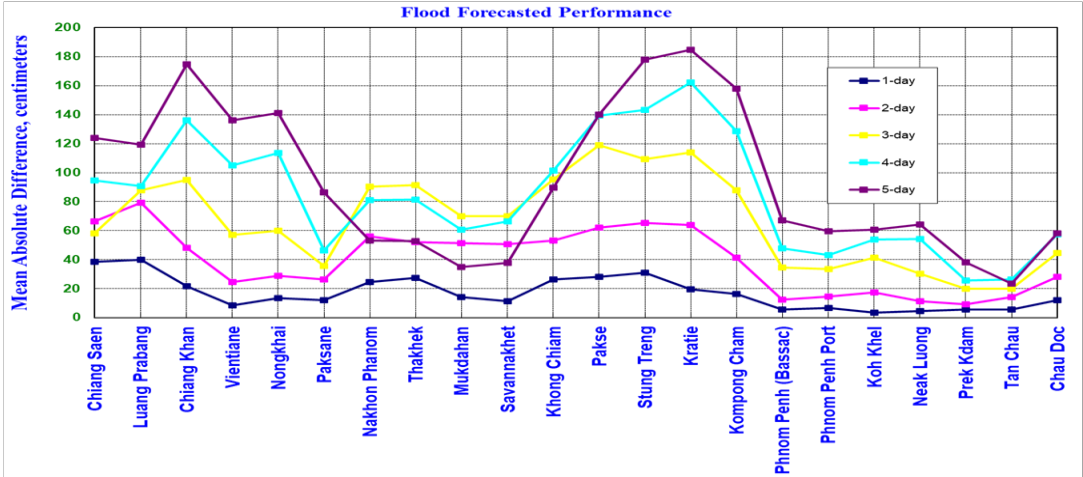
# Annex 1: Performance of the weekly flood forecasting

## Accuracy

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

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 09 to 15 August 2022.

The forecasting values from 09 to 15 August 2022 show that the overall accuracy is fair for a one-day to three-day forecast in lead time at stations in the lower parts of the Mekong River from Luang Prabang in Lao PDR to Kratie in Cambodia due to the effect of heavy rainfall and dams' operation in this area during the report period.



**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.
- Luang Prabang to Chiang Khan and Stung Treng to Kratie have been effluent 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).
- Khong Chiam, Pakse, Stung Treng and Kratie stations have been affected by heavy rainfall from Viet Nam and some hydropower operations on Sekong, Sesan and Sre Pok (water retention and release). Rainfall always accumulates at this spot, which could be causing rapidly high-water levels.
- 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.

### **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 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 09 to 15 August 2022.

**Table B1:** The Mean Absolute Difference (Error) of Flood Forecasting base on old defined Benchmark from 09 to 15 August 2022 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	<u>39</u>	<u>40</u>	<u>22</u>	8	14	12	<u>25</u>	<u>27</u>	14	11	<u>26</u>	<u>28</u>	<u>31</u>	19	16	6	7	3	5	6	6	12
2-day	66	79	<u>48</u>	<u>25</u>	<u>29</u>	<u>27</u>	56	52	51	51	53	62	65	64	<u>42</u>	13	15	18	11	9	14	<u>28</u>
3-day	58	88	95	57	60	<u>36</u>	90	91	70	70	95	119	109	114	88	<u>35</u>	<u>34</u>	<u>41</u>	<u>30</u>	<u>20</u>	<u>20</u>	<u>44</u>
4-day	95	91	136	105	114	<u>47</u>	81	82	61	66	102	140	143	162	129	<u>48</u>	<u>43</u>	54	54	<u>26</u>	<u>27</u>	58
5-day	124	119	175	136	141	86	53	53	<u>35</u>	<u>38</u>	90	140	178	185	158	67	60	61	64	<u>38</u>	<u>23</u>	58

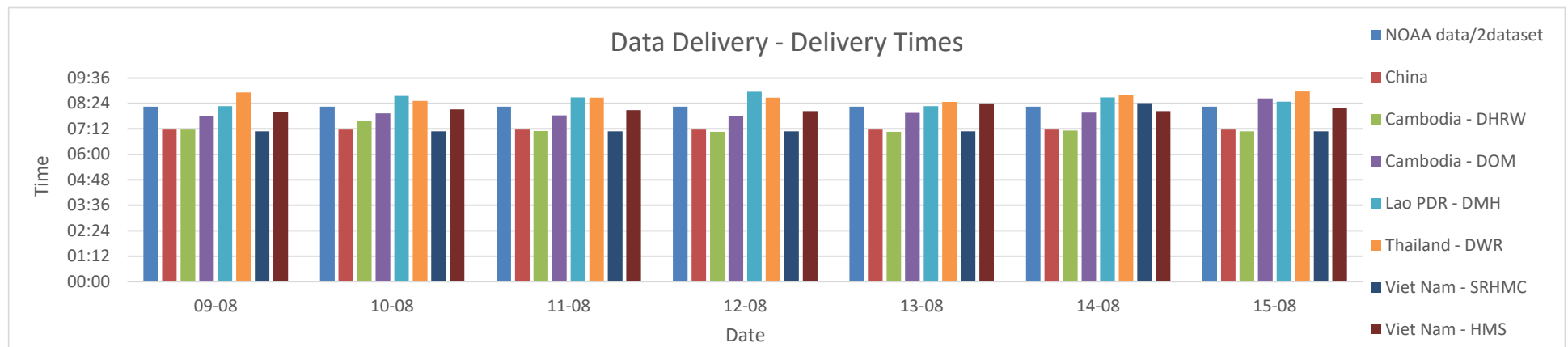
**Table B2:** The Mean Absolute Difference (Error) of Flood Forecasting base on old defined Benchmark from 09 to 15 August 2022 in %

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	57.1	85.7	57.1	<u>42.9</u>	57.1	71.4	57.1	57.1	71.4	57.1	<u>42.9</u>	57.1	57.1	71.4	57.1	57.1	57.1	57.1	57.1	57.1	71.4	71.4	<b>60.4</b>
2-day	<u>33.3</u>	66.7	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>50.0</u>	<u>33.3</u>	83.3	66.7	<u>50.0</u>	66.7	<u>50.0</u>	<u>33.3</u>	66.7	<u>50.0</u>	66.7	66.7	66.7	<b>54.5</b>
3-day	80.0	<u>40.0</u>	<u>40.0</u>	60.0	60.0	60.0	60.0	60.0	60.0	60.0	<u>40.0</u>	<u>40.0</u>	<u>40.0</u>	<u>40.0</u>	<u>40.0</u>	60.0	60.0	60.0	<u>20.0</u>	60.0	<u>40.0</u>	60.0	60.0	<b>51.8</b>
4-day	<u>50.0</u>	<u>25.0</u>	<u>50.0</u>	<u>50.0</u>	75.0	<u>50.0</u>	<u>25.0</u>	<u>25.0</u>	<u>50.0</u>	<u>50.0</u>	<u>25.0</u>	<u>25.0</u>	<u>25.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>25.0</u>	<u>50.0</u>	<u>50.0</u>	<u>50.0</u>	<u>25.0</u>	66.7	<b>42.0</b>
5-day	66.7	66.7	66.7	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	66.7	66.7	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	<u>33.3</u>	66.7	<u>33.3</u>	<u>33.3</u>	66.7	<u>33.3</u>	66.7	<b>43.9</b>

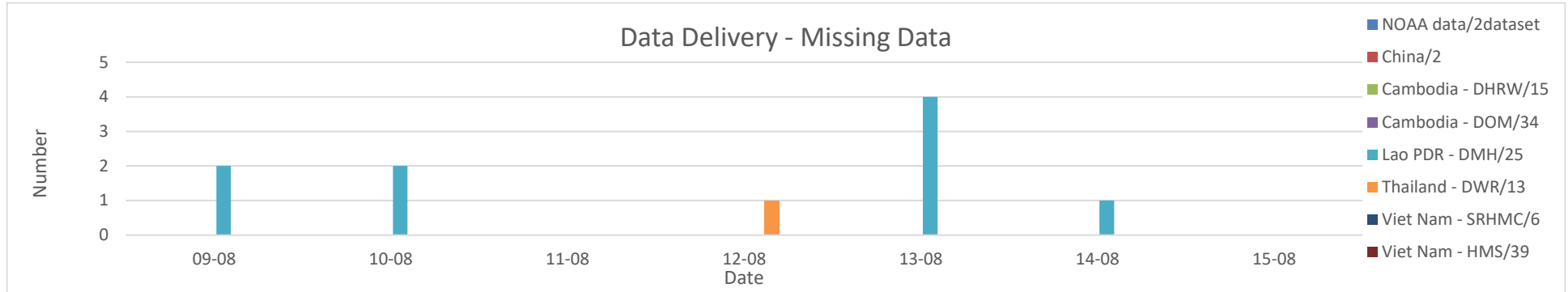
**Table B3: Overview of performance indicators for the past 7 days from 09 to 15 August 2022**

	FF time sent				Arrival time of input data								Missing data (number-mainstream and trib.st.)							
	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
<b>2022</b>																				
<i>week</i>	10:36	#DIV/0!	-	-	08:15	07:10	07:10	07:59	08:35	08:42	07:16	08:07	0	0	0	0	9	1	0	0
<i>month</i>	10:27	#DIV/0!	-	-	08:15	07:10	07:16	08:01	08:33	08:25	07:16	08:08	0	0	0	34	69	0	0	2

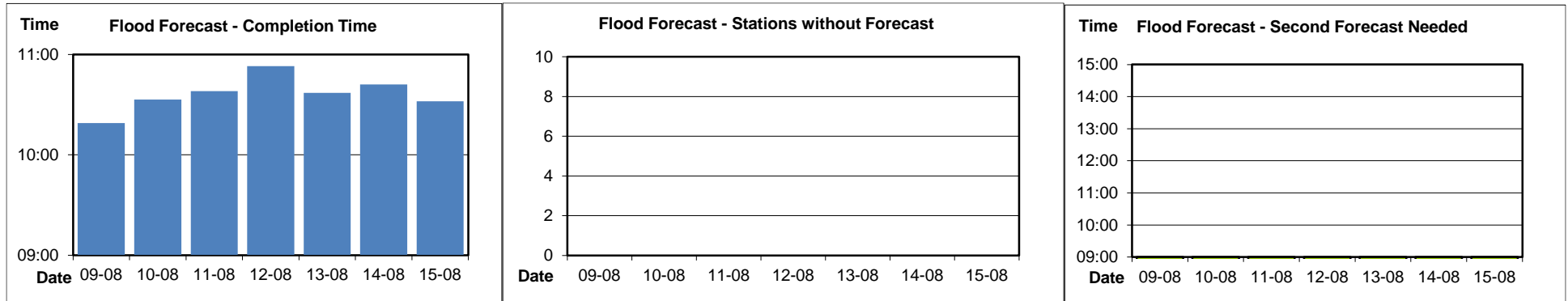
**Fig. B4: Data delivery times for the past 7 days from 09 to 15 August 2022**



**Fig. B5: Missing data for the past 7 days from 09 to 15 August 2022**



**Fig. B6: Flood forecast completion time, stations without forecasts, and second forecasts need from 09 to 15 August 2022**





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