



**Mekong River Commission**

**Weekly Dry Season Situation Report in  
the Lower Mekong River Basin  
25–31 May 2021**

Prepared by  
The Regional Flood and Drought Management Centre  
1 June 2021

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## Key Messages

Key messages for this weekly report are presented below.

### Rainfall and its forecast

- Rainfall took place from Nakhon Phanom in Thailand to Pakse in Lao PDR, including the lower part of the Lower Mekong Basin at Chaktomuk in Cambodia and Tan Chau and Chau Doc in Viet Nam, varying from 3.50 mm to 180.00 mm.
- No significant rainfall is projected in the Mekong region from 1 to 6 June 2021.

### Water level and its forecast

- The outflows at Jinghong hydrological station decreased and experienced rapid fluctuations over the monitoring period, dropping from 2,693 cubic metres per second ( $\text{m}^3/\text{s}$ ) on May 25 to 2,098  $\text{m}^3/\text{s}$  on May 31. The station's daily average water level dropped by 0.81 m, while an hourly recorded level showed a 1.44 metre drop.
- At Chiang Saen in Thailand, the closest station to the Jinghong hydrological station, the water level decreased by just about 0.48 m during the same period.
- Water levels across most monitoring stations from Chiang Khan in Thailand to Pakse in Lao PDR, and from the stretches of the river between Stung Treng and Kratie in Cambodia were higher than their long-term average.
- The starting date of the outflow from the Tonle Sap Lake into the mainstream of the Mekong River took place on November 15, slightly late compared to the normal event. Due to heavy rainfall in late October 2020, the water volume of the Tonle Sap Lake at this reporting point is higher than that in 2020. However, this volume is lower than its long-term average.
- Over the next few days, water levels across most monitoring stations are expected to decrease. The water levels Tan Chau on the Mekong River and Chau Doc on the Bassac River are expected to remain fluctuating.

### Drought condition and its forecast

- From 22 to 28 May 2021, most parts of the LMB were at normal condition, except some areas in the central part of the LMB where moderate drought took place.
- It is forecasted that, in June, average to above-average rainfall is expected to fall in the entire LMB region (central part of the LMB and the eastern part of Cambodia will be the wettest). Moving into July, it is forecasted that Cambodia, the Central Highland of Viet Nam, and southern Lao PDR will be the driest in the region. In August, the entire LMB region is forecasted to experience a prolonged dry period with less than average rainfall. Lastly, the lower part of the LMB covering eastern Cambodia and Viet Nam is likely to receive below average rainfall in September.

# 1 Introduction

This Weekly Dry 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 **25 to 31 May 2021**. 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. All 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\\_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>

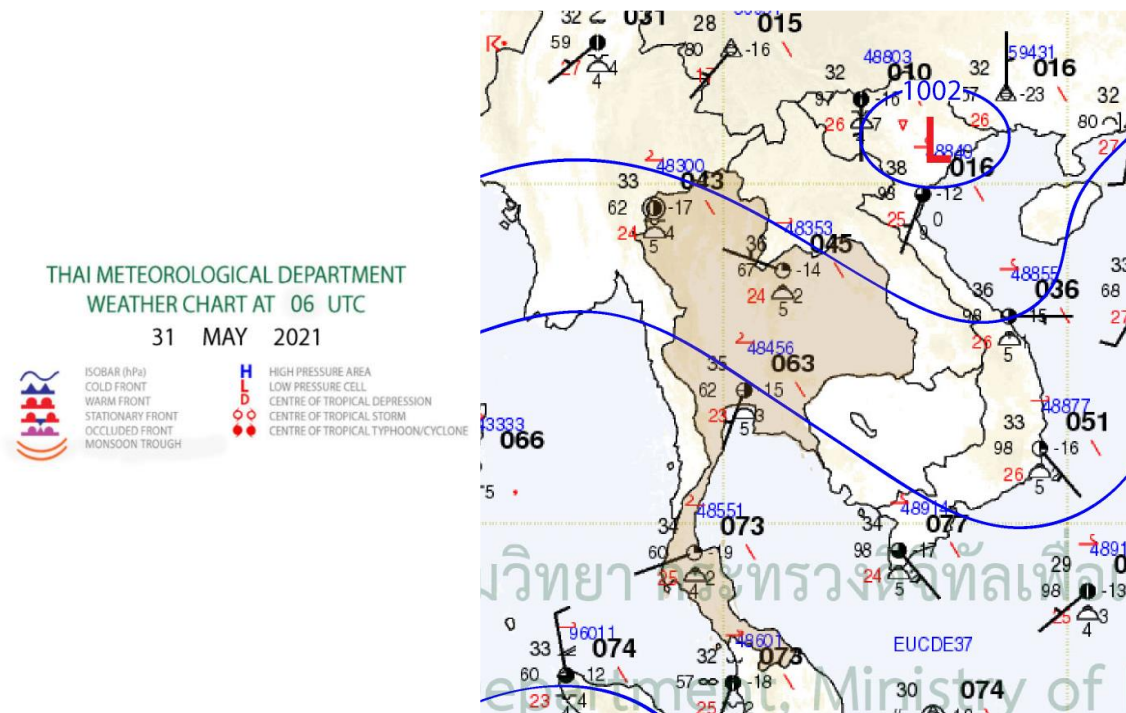


## 2 General Weather Patterns

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

The TMD stated that May is the transitional period from the dry to rainy season. During this time, there will be more thunder rainstorms, dry-season thunderstorms, and low-pressure air mass prevailing over the Mekong region. The TMD also predicted that an influential Southwest Monsoon is likely to occur and may cause average rainfall in the Mekong region between May and June.

[Figure 1](#) presents the weather map of 31 May 2021, showing that a low pressure is dominating the upper part of Lao PDR and Viet Nam, including the 3S area (Sesan, Sre Pok and Sekong) in Cambodia and Viet Nam of the LMB.



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

According to the ASEAN Specialised Meteorological Centre (ASMC), a highest probability of warm and dry conditions is predicted over of the Mekong region covering northern Lao PDR, Thailand, Cambodia, and Viet Nam during 31 May–13 June 2021. Nonetheless, the southwest Monsoon weather may be in transition in the region, causing average rainfall ).

[Figure 2](#) shows the outlook of comparative warm conditions from 31 May to 13 June 2021 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

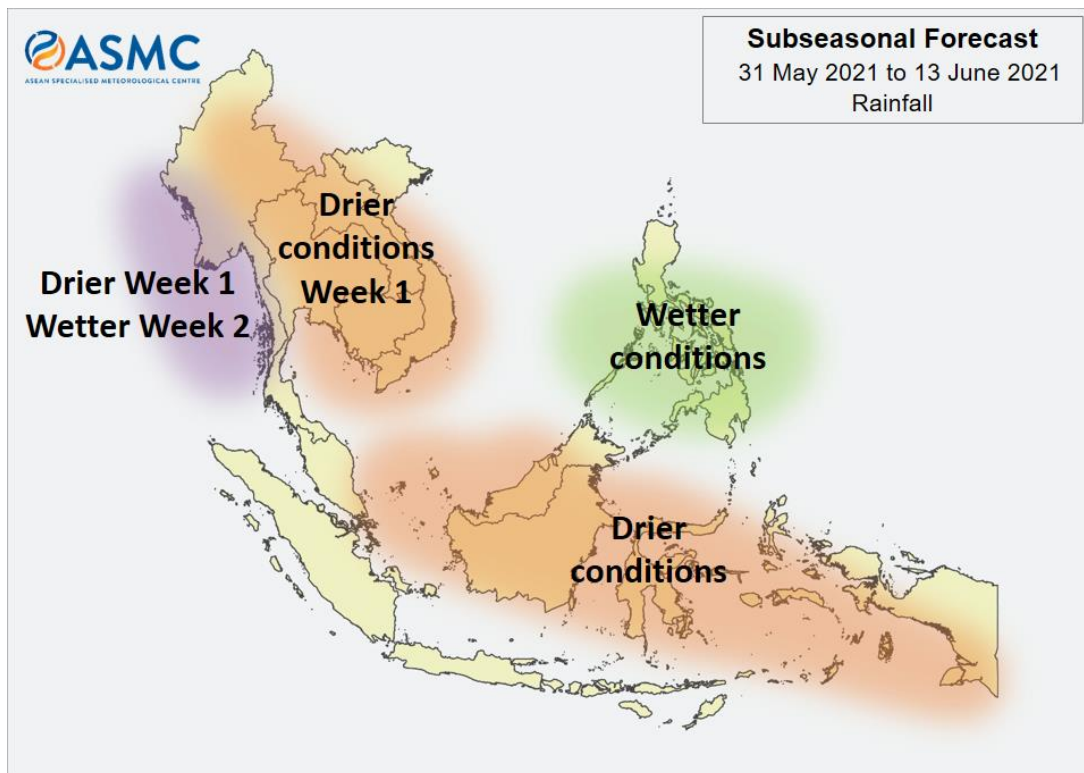


Figure 2. Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There were low-pressure lines taking place in the lower part of the LMB during 31 May 2021, as shown in [Figure 1](#), which would bring rain to some areas of the LMB. But based on a Tropical Storm Risk (TSR), as displayed in [Figure 3](#), there was no sign of tropical depression (TD), tropic storm (TS), or typhoon (TY) in the Mekong region up to 31 May 2021.

#### Active system as of 31 May 2021 2:16 GMT

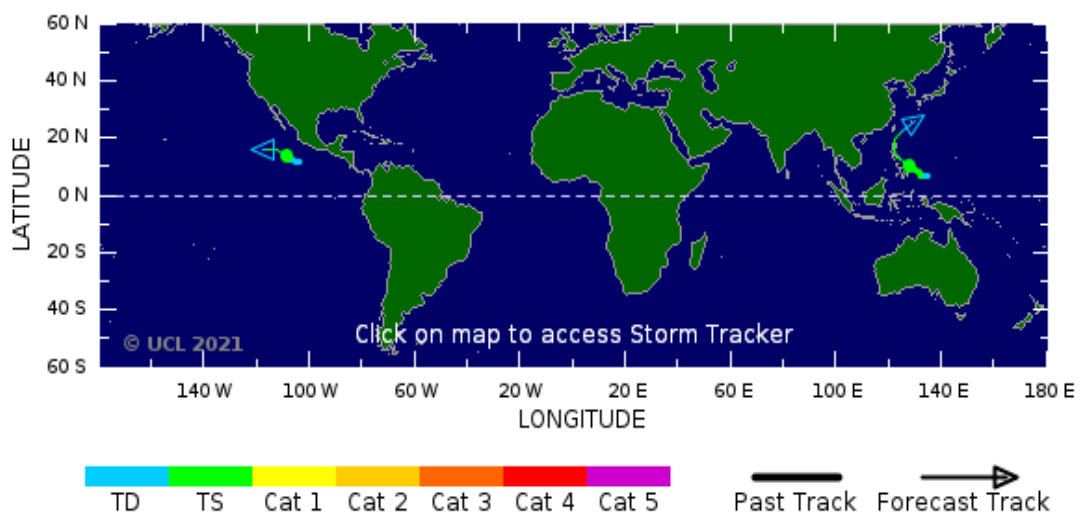
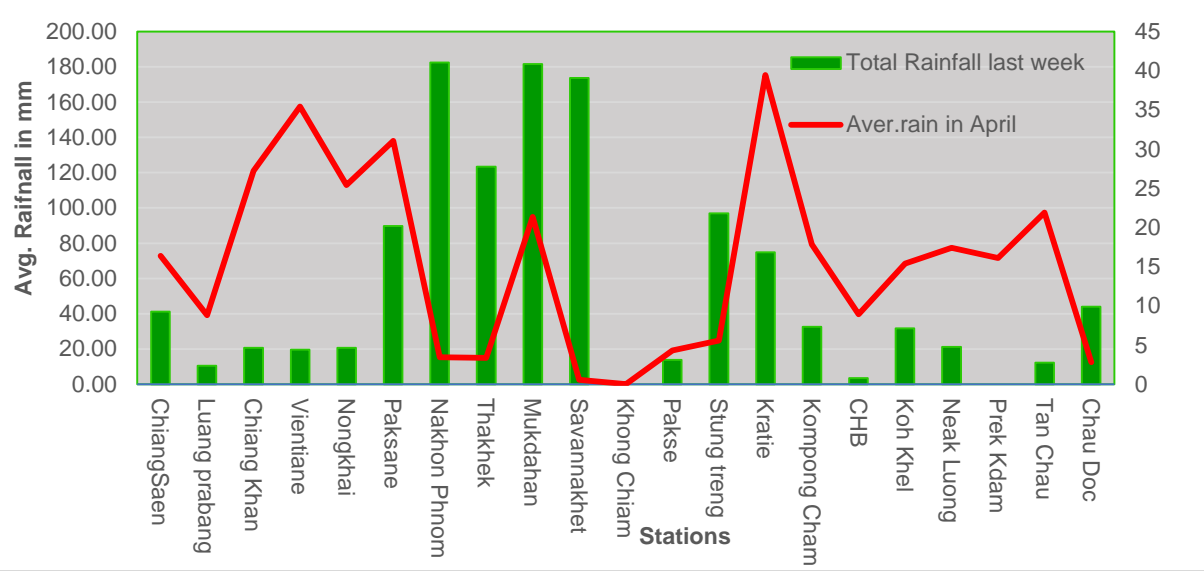


Figure 3. A tropical depression risk observed on 31 May 2021.

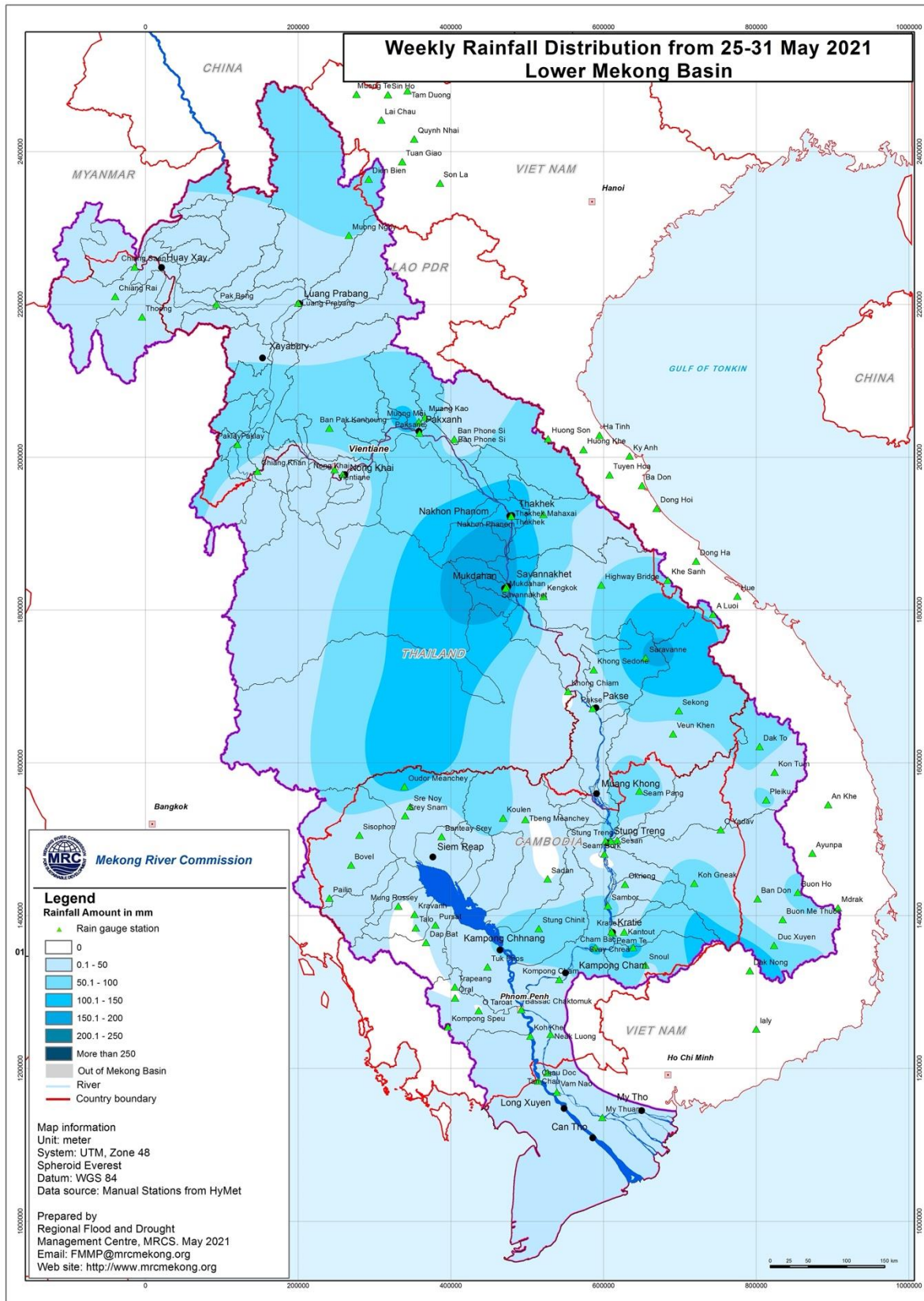
**2.2 Rainfall patterns over the LMB**

This week, rain was concentrated in the areas from Chiang Saen in Thailand to Phnom Penh in Cambodia including the lower part at Tan Chau and Chau Doc in Viet Nam, varying from 3.50 millimetres (mm) to 180 mm. The highest rainfall was observed from Nakhon Phanom in Thailand to Savannakhet in Lao PDR (180 mm). The total rainfall this week is considered high at the middle part of the LMB (see [Figure 4](#)).



**Figure 4.** Weekly total rainfall at key stations in the LMB during 25–31 May 2021.

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 25 to 31 May 2021.

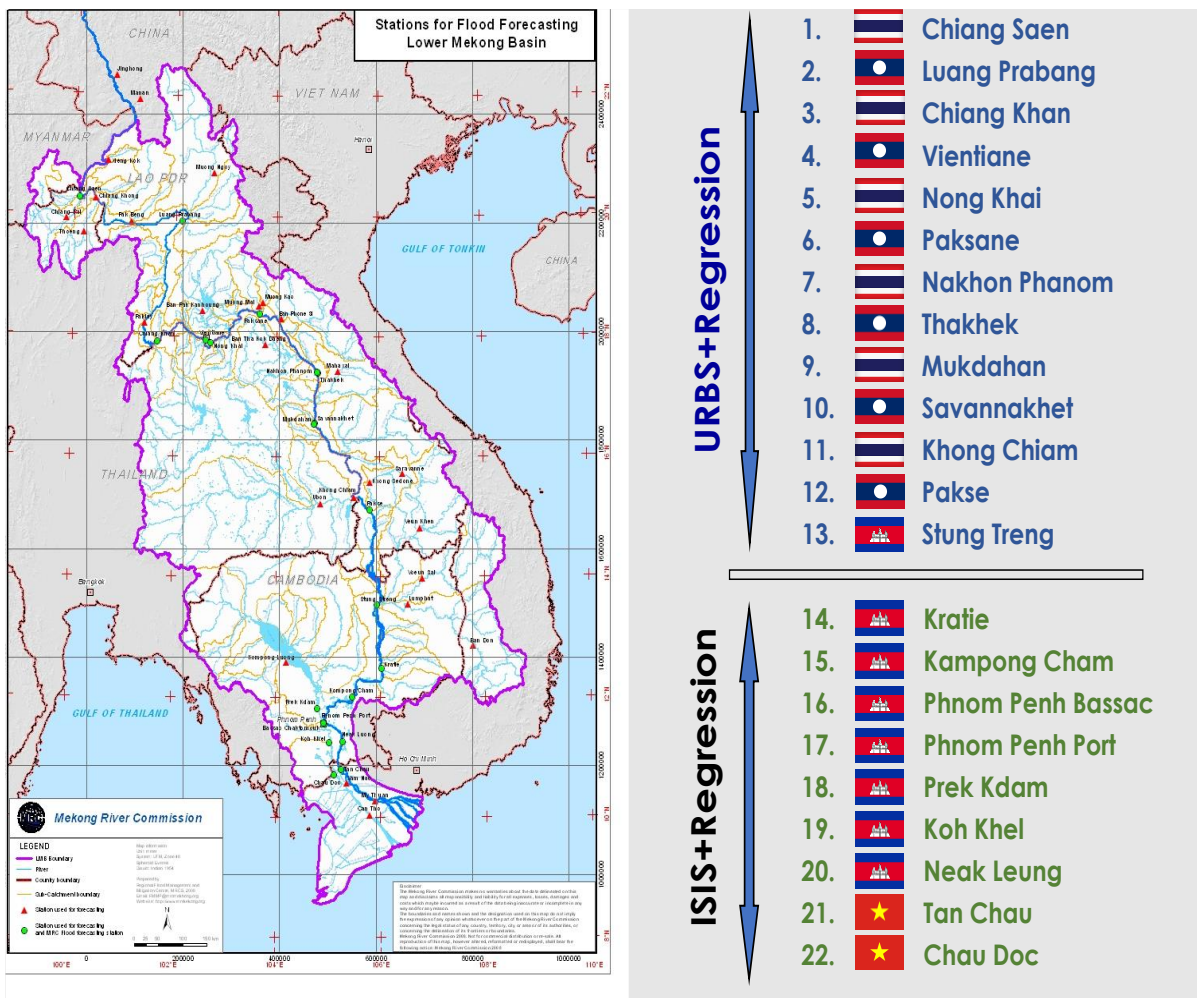


**Figure 5.** Weekly rainfall distribution over the LMB during 25–31 May 2021.

### 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](#).

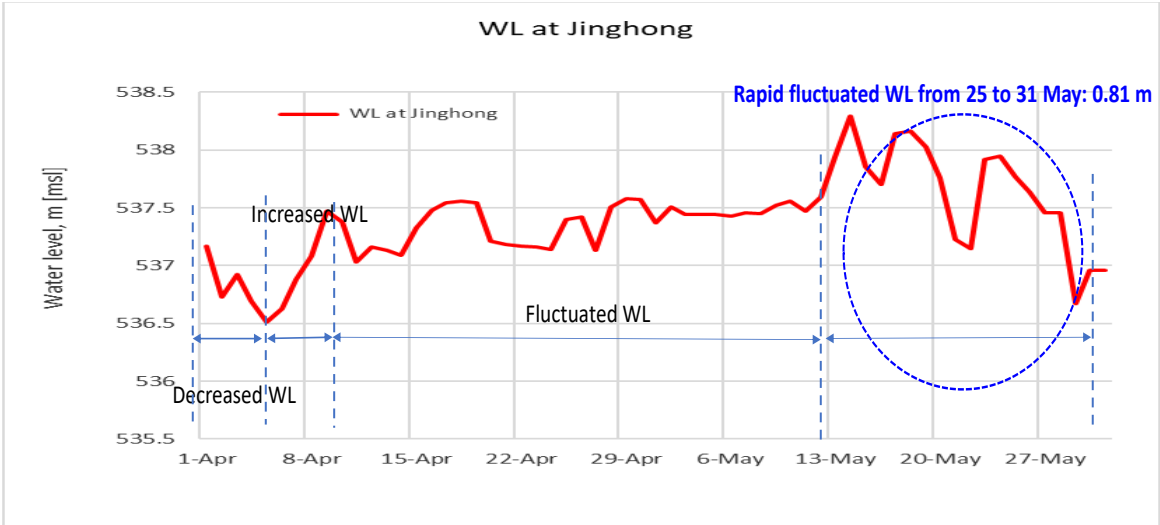


**Figure 6.** Key stations and model application for River Monitoring and Flood Forecasting.

According to MRC’s observed water level data, the outflows at Jinghong hydrological station decreased and experienced rapid fluctuations over the monitoring period.

The outflows dropped from 2,693 cubic metres per second (m<sup>3</sup>/s) on May 25 to 2,098 m<sup>3</sup>/s on May 31. The station’s daily average water level dropped by 0.81 m (from 537.47 metres on May 25 to 536.52 metres on May 29). Continuing into an hourly recorded water level, it showed that the drop was more sudden. For instance, the level decreased from 537.92 metres (m) on May 26 at 17:00 to 536.48 m on May 29 at 3:00, representing a 1.44 m drop over the period.

[Figure 7](#) below presents water level fluctuations at the Jinghong hydrological station<sup>1</sup> during 1 April – 31 May 2021.



**Figure 7.** Water level at the Jinghong hydrological station during 1 Apr–31 May 2021.

However, the water level at Chiang Saen in Thailand dropped by about 0.48 m during the same period. In spite of this, the station’s recorded water level was still higher than its long-term average (LTA).

Besides, water levels across most monitoring stations from Chiang Khan in Thailand to Pakse in Lao PDR, and from the stretches of the river between Stung Treng and Kratie in Cambodia were higher than their LTA up to 31 May 2021.

Based on a hydrological phenomenon, the contribution of inflow water from the upstream of Lancang-Mekong in China to the Mekong mainstream is about 25% in total during the dry season from November to May. The whole inflow of water into the LMB is influenced not only by the Mekong-Lancang upstream but also by downstream dam operations at the Mekong mainstream and its tributaries during the dry season.

<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>.

## Chiang Saen and Luang Prabang

The water level from 25 to 31 May 2021 at Thailand's Chiang Saen decreased from 3.58 m to 3.10 m, representing a drop of 0.48 m over the week. The level was still about 0.57 m higher than its LTA, and was slightly higher than last week's level.

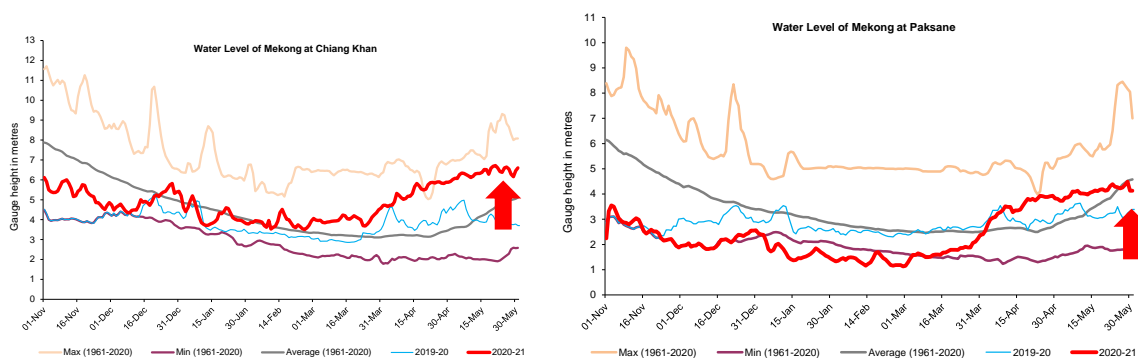
The water level at Luang Prabang station in Lao PDR also saw a slight decrease, dropping from 9.80 m to 9.66 m during the reporting period. This level shows 0.08 m above its historical maximum value. The trend (higher and high level or closer to its historical maximum value) has been observed since late 2020. The phenomenon was potentially caused by upstream dam operations, downstream Xayaburi dam, and rainfall in the surrounding areas.

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 wet and dry season.**

## Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand (downstream of the Xayaburi dam) was stable. The station's water level was recorded at 6.60 m during this week, representing about 1.49 m higher than its LTA value. This situation may probably be influenced by rainfall and Xayaburi dam operation which is situated upstream.

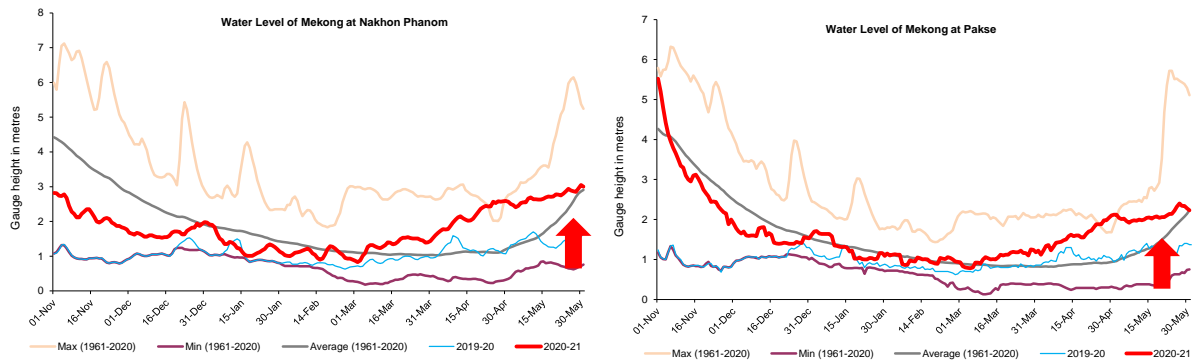
The water level downstream at Vientiane in Lao PDR followed the same trend of the upstream one. It slightly decreased from 3.80 m to 3.78 m, but was still about 1.47 metres higher than its LTA. At Nong Khai station in Thailand, the water level was stable. It was recorded at 3.33 m, representing about 0.36 m higher than its LTA. The water level at Paksane in Lao PDR decreased by about 0.14 m and was about 0.45 m lower than its LTA. The decreased water levels at Paksane were probably influenced by Nam Ngum dam operation located upstream. The water levels at Chiang Khan and Paksane are shown in [Figure 8](#).



**Figure 8.** Water levels at Chiang Khan in Thailand and Paksane in Lao PDR.

## Nakhon Phanom to Pakse

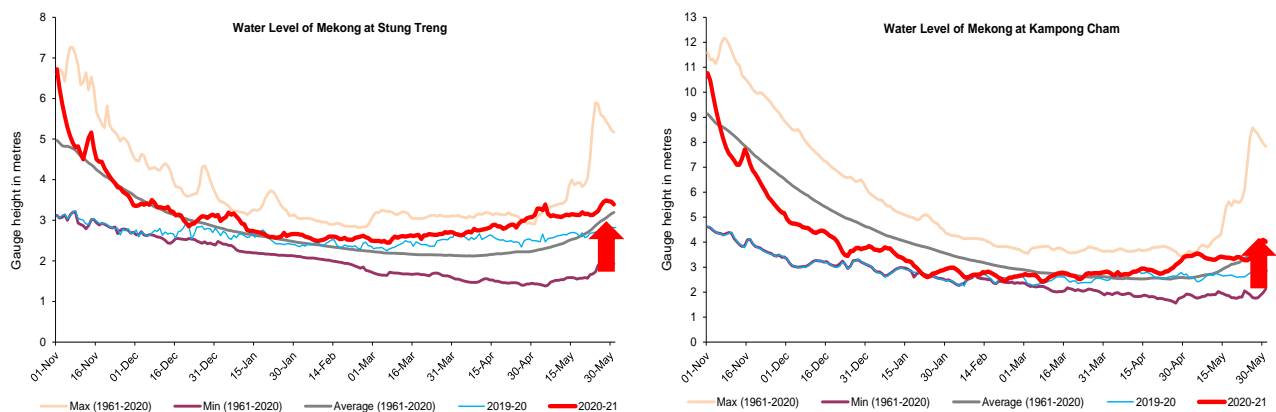
Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR increased by about 0.03 m and were about 0.10 m above their LTA. The weekly water levels at Nakhon Phanom and Pakse are shown in [Figure 9](#).



**Figure 9.** Weekly water levels at Nakhon Phanom in Thailand and Pakse in Lao PDR.

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

Through a contribution of flows 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 slightly increased. This week water levels were about 0.35 m above their LTA at these stations (see [Figure 10](#) for the levels in Stung Treng and Kompong Cham). The water level at Kompong Cham increased about 0.67 metres but stayed 0.05 m below its LTA.



**Figure 10.** Water levels at Stung Treng and Kompong Cham on the Mekong River.

At Neak Luong on the Mekong River and Koh Khel on the Bassac River, the water levels were influenced by the tidal effect extending from the Mekong Delta, causing their levels to fluctuate by about 0.10 m from May 25 to 31 and stayed close to their LTA. At Chaktomuk on the Bassac River, the water level increased by about 0.57 metres and stayed 0.16 m below its LTA. The water level at Prek Kdam on the Tonle Sap Lake increased about 0.52 m but was still about 0.06 m below its LTA. The water level at the Tonle Sap Lake (observed at Kompong



Luong) was similar to Prek Kdam station’s water level. The decreased water level was likely due to a low rainfall contribution from upstream of the Tonle Sap Lake area. The water level at the Tonle Sap Lake (observed at Kompong Luong) followed the same trend of Prek Kdam station’s one.

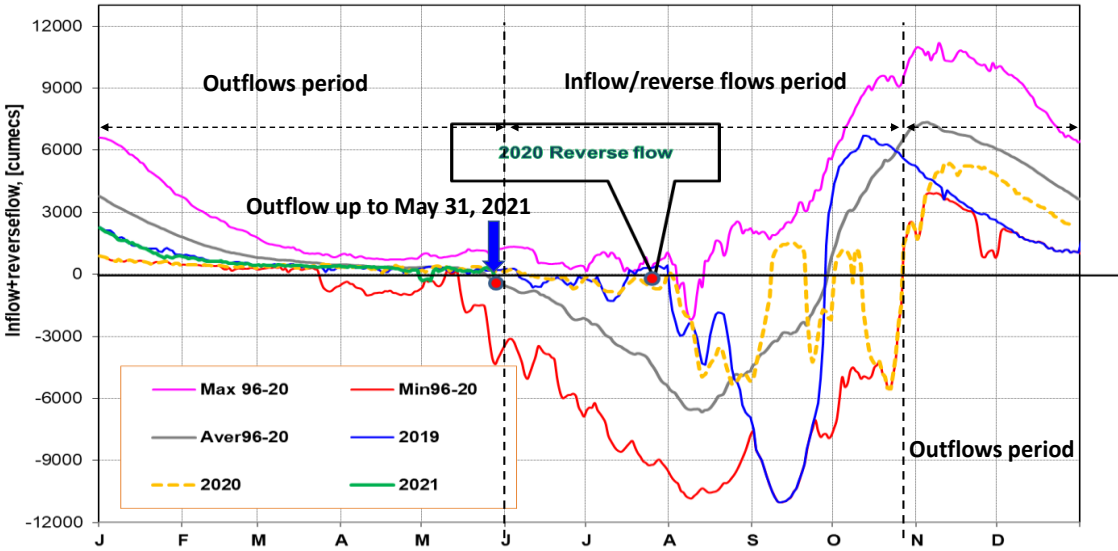
**Tidal stations at Tan Chau and Chau Doc**

Like last week, the water levels this week from 25 to 31 May 2021 at Viet Nam’s Tan Chau and Chau Doc fluctuated due to daily tidal effects from the sea. The fluctuation levels were between -0.21 m and 1.06 m. This fluctuation levels have been out of the historical range between maximum and minimum levels for almost six months and **considered critical**.

**The Tonle Sap Flow**

At the end of the wet season, when water levels along the Mekong River decrease, flows of the Tonle Sap Lake return to the Mekong mainstream and then to the Delta. This phenomenon normally takes place from mid-October to early November.

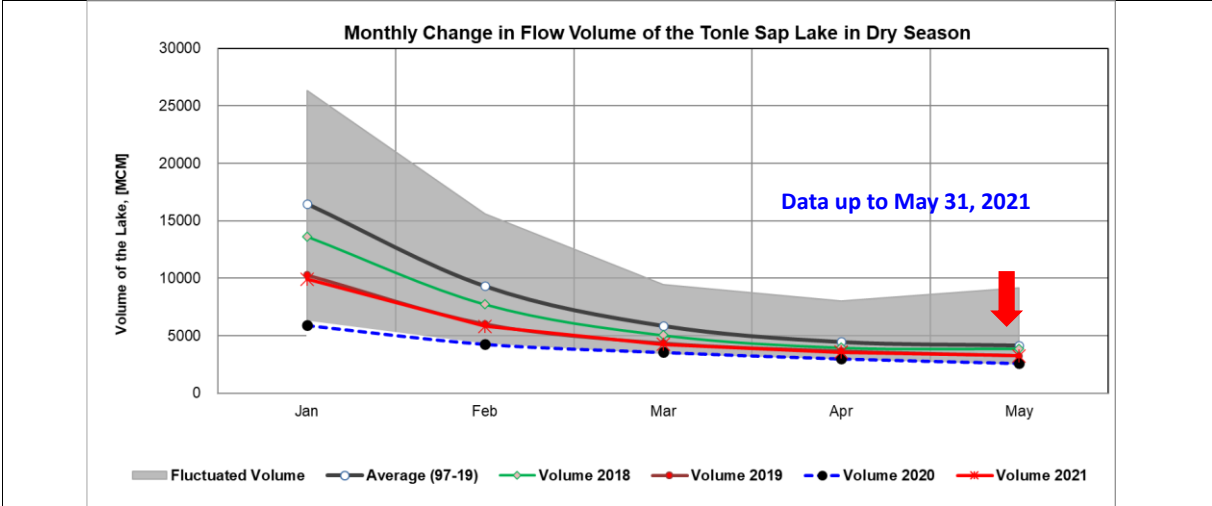
[Figure 11](#) shows the seasonal changes of the outflow of the Tonle Sap Lake at Prek Kdam in comparison with the flows of 2018 and 2019, and their LTA levels (1997–2019). Up to 31 May of this reporting period, it is observed that **the main inflow/reverse flow to the Tonle Sap Lake has not started yet**. The outflow condition in 2021 was lower than its average flow but was similar to the 2019 flow and higher than the 2020 condition. Since the water level at Prek Kdam on the Tonle Sap River rapidly increased and moved closer to its LTA value, it could be inferred that the flows at the Tonle Sap Lake also increased during this reporting period. However, the outflow of the Tonle Sap Lake is expected to slightly increase starting from next week due to some predicted rainfall from inflow catchments.



**Figure 11.** Seasonal change of inflows and outflows of Tonle Sap Lake.

The water volume of the Tonle Sap Lake up to this point has been considered low in comparison with its LTA level. [Figure 12](#) shows seasonal changes in monthly flow volumes up

to May 31 for the TSL compared with the volumes in 2018 and 2019, their LTA, and the fluctuation levels (1997–2019). It shows that up to May 31 **the water volumes of the Tonle Sap Lake remained constant and was higher than the level in 2020 and close to that of 2019 during the same period.** This is displayed in [Table 1](#), which indicates that the Tonle Sap Lake has been affected by water levels from the Mekong River, the tributaries, and rainfall in the surrounding sub-catchments.



**Figure 12.** The seasonal change in monthly flow volume of Tonle Sap Lake.

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

Month	Average Volume (97-19) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2018 [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]
Jan	16452.95	26357.53	6272.01	13633.41	10285.31	5906.80	9923.80
Feb	9312.36	15596.22	4281.41	7729.72	6019.30	4264.19	5832.97
Mar	5868.92	9438.24	3350.92	5037.06	4354.62	3553.99	4264.88
Apr	4474.98	8009.14	2875.42	3956.47	3667.47	2992.61	3556.68
May	4166.07	9176.93	2417.81	3864.00	3266.43	2594.92	3240.78
Jun	6034.10	13635.01	2470.54	5919.18	3517.06	2641.88	
Jul	12502.58	28599.56	3832.51	12024.96	4001.99	2925.86	
Aug	26934.35	39015.12	7554.93	22399.65	7622.71	5941.07	
Sep	42644.05	65632.35	22180.73	53639.54	24194.19	12105.31	
Oct	49698.19	73757.23	24276.79	48193.08	30358.38	20799.13	
Nov	39542.58	60367.33	18576.01	31036.07	19112.65	27546.80	
Dec	26325.13	38888.95	10869.43	18469.21	10577.29	18251.65	
	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> )							

The increased inflows from the Mekong River and tributaries of the Tonle Sap Lake in October of the 2020 wet season have resulted in a higher flow in 2021 than in 2019. This demonstrates the influence of the relationships between the reverse 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 season. 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.

## **4 Flash Flood in the Lower Mekong Basin**

From May 25 to 31, the LMB was affected by the active southwest monsoon, which prevailed over LMB during the beginning and the middle of last week before it weakened. This monsoon trough laid across the lower northern, central, and northeaster parts of the LMB during the beginning and the middle of last week. The phenomenon caused extremely hot weather in some areas and heavy rain in late afternoons in the LMB.

According to the MRC-Flash Flood Guidance System (FFGS) and analysis, flash flood events were not detected in the LMB.

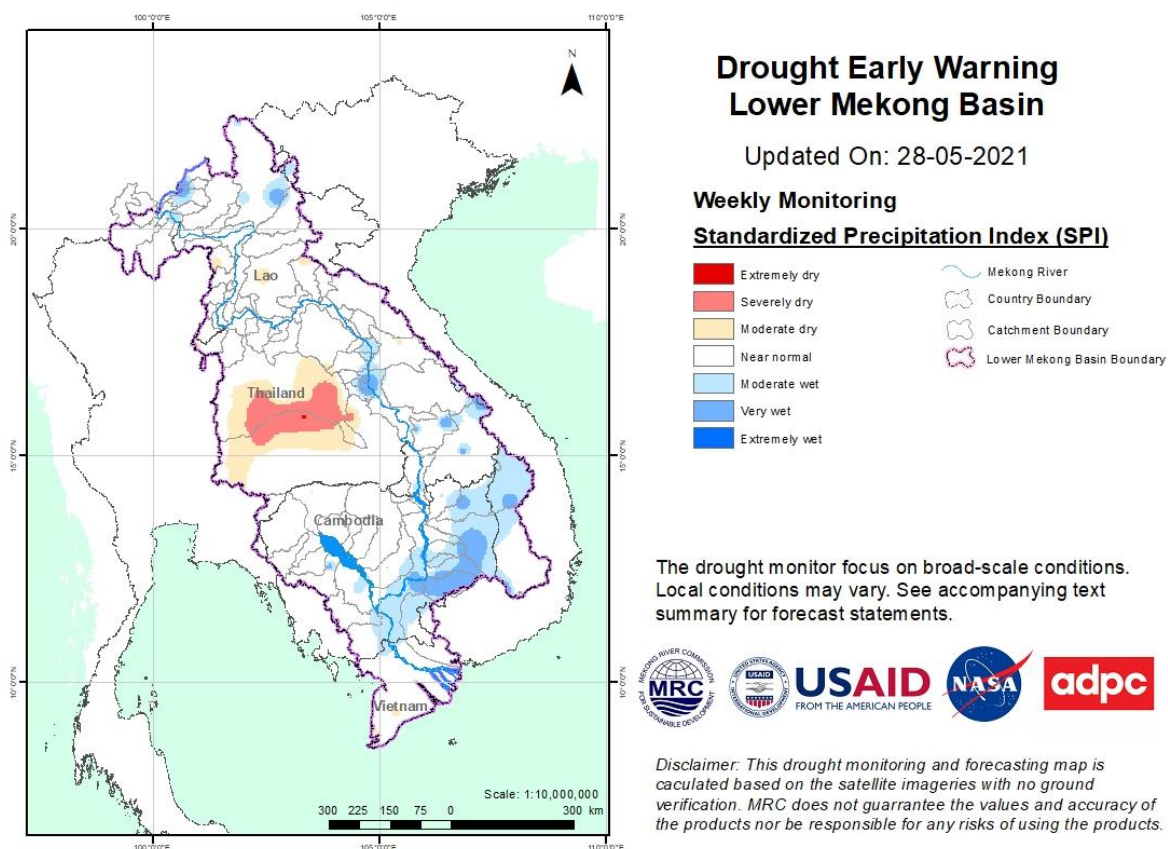
## 5 Drought Monitoring in the Lower Mekong Basin

### Weekly drought monitoring from 22 to 28 May 2021

Drought monitoring data for 2021 are available from Saturday to Friday 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 during the wet season.

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

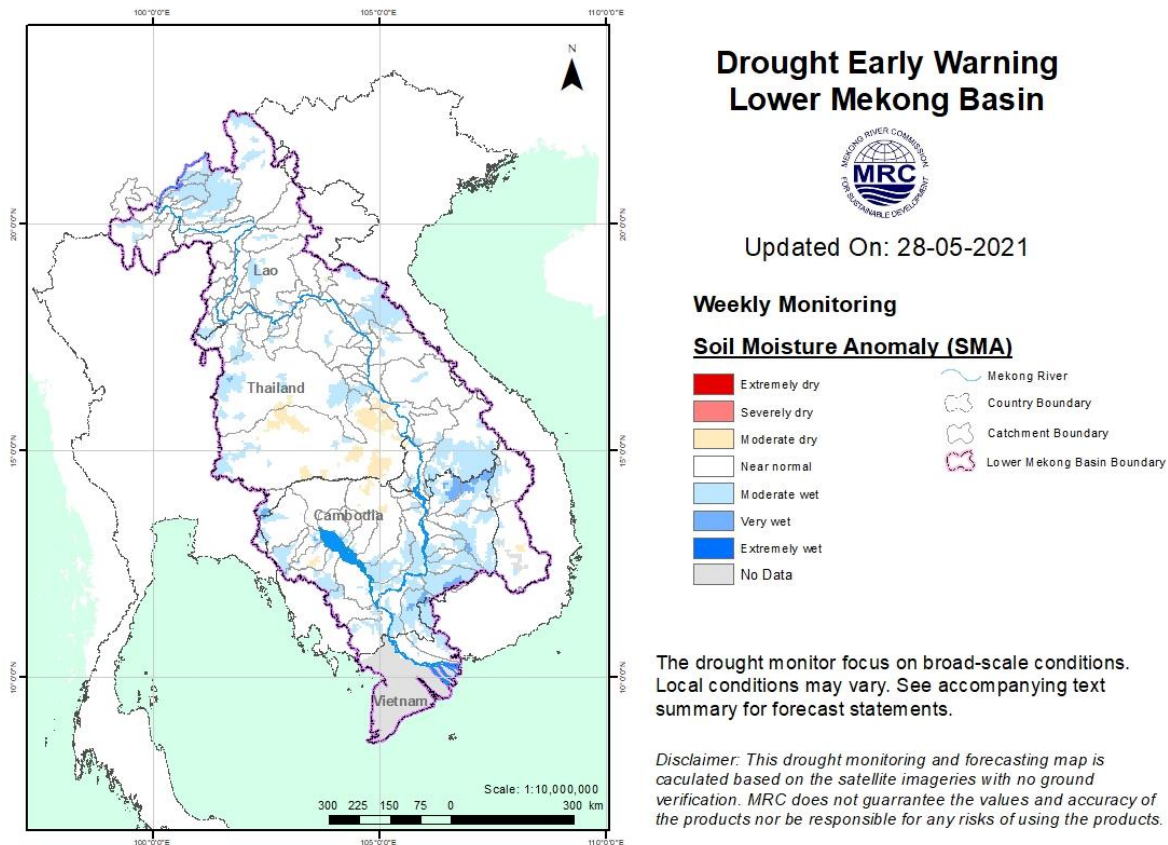
Meteorological drought conditions from 22 to 28 May 2021, as shown in [Figure 13](#), were normal in most parts of the LMB but dry in some areas of the middle part of the region. Those dry areas cover parts of Kalasin, Yasothon, Roi Et, Maha Sarakham, Khon Kaen, Chaiyaphum, Nakhon Ratchasima, Burirum, Surin, and Si Saket of Thailand. They were at moderate and severe meteorological droughts.



**Figure 13.** Weekly standardized precipitation index from 22 to 28 May 2021.

- **Weekly Soil Moisture Anomaly (SMA)**

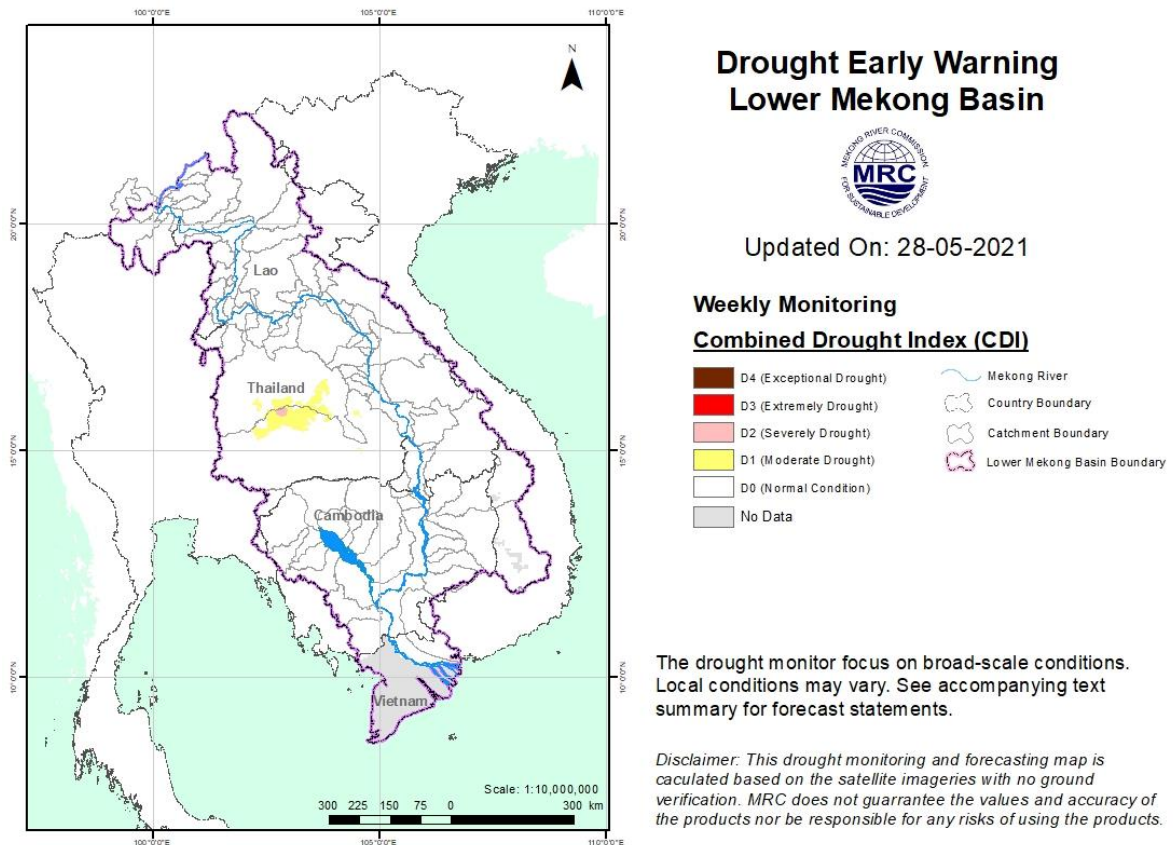
Unlike last week, soil moisture conditions from May 22 to 28, as shown in [Figure 14](#), shows that most parts of the LMB were normal and wet. The wettest parts were found in the upper and lower areas of the region, while the central part was at normal and moderate dry. No threat found for agriculture during the monitoring week.



**Figure 14.** Weekly Soil Moisture Anomaly from 22 to 28 May 2021.

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

The overall drought conditions through combined drought index from 22 to 28 May 2021, as displayed in [Figure 15](#), indicates normal conditions in most parts of the LMB except some areas in the central part of the LMB where moderate drought took place. Those areas include Khon Kaen, Maha Sarakham, Roi Et, Kalasin, and Nakhon Ratchasima of Thailand. In general, there was no significant threat found for the LMB during the reporting week.



**Figure 15.** Weekly Combined Drought Index from 22 to 28 May 2021.

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.

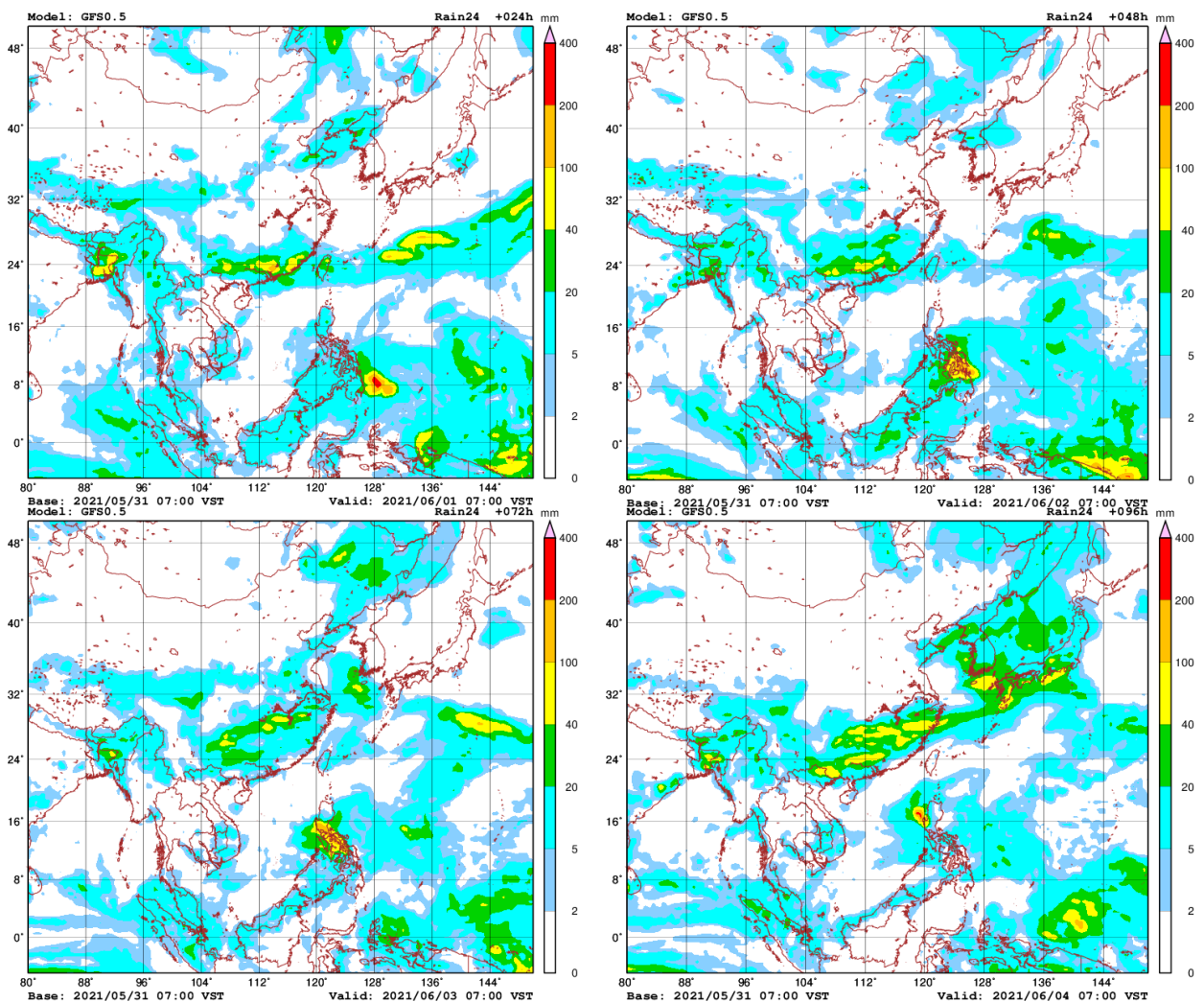
## 6 Weather and Water Level Forecast and Flash Flood Information

### 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 will continue prevailing over the LMB.

From June 1 to 6, very small rainfall (2–5 mm/24 h) and moderate rainfall (10–20 mm/24 h) will likely occur in some parts of the LMB.

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



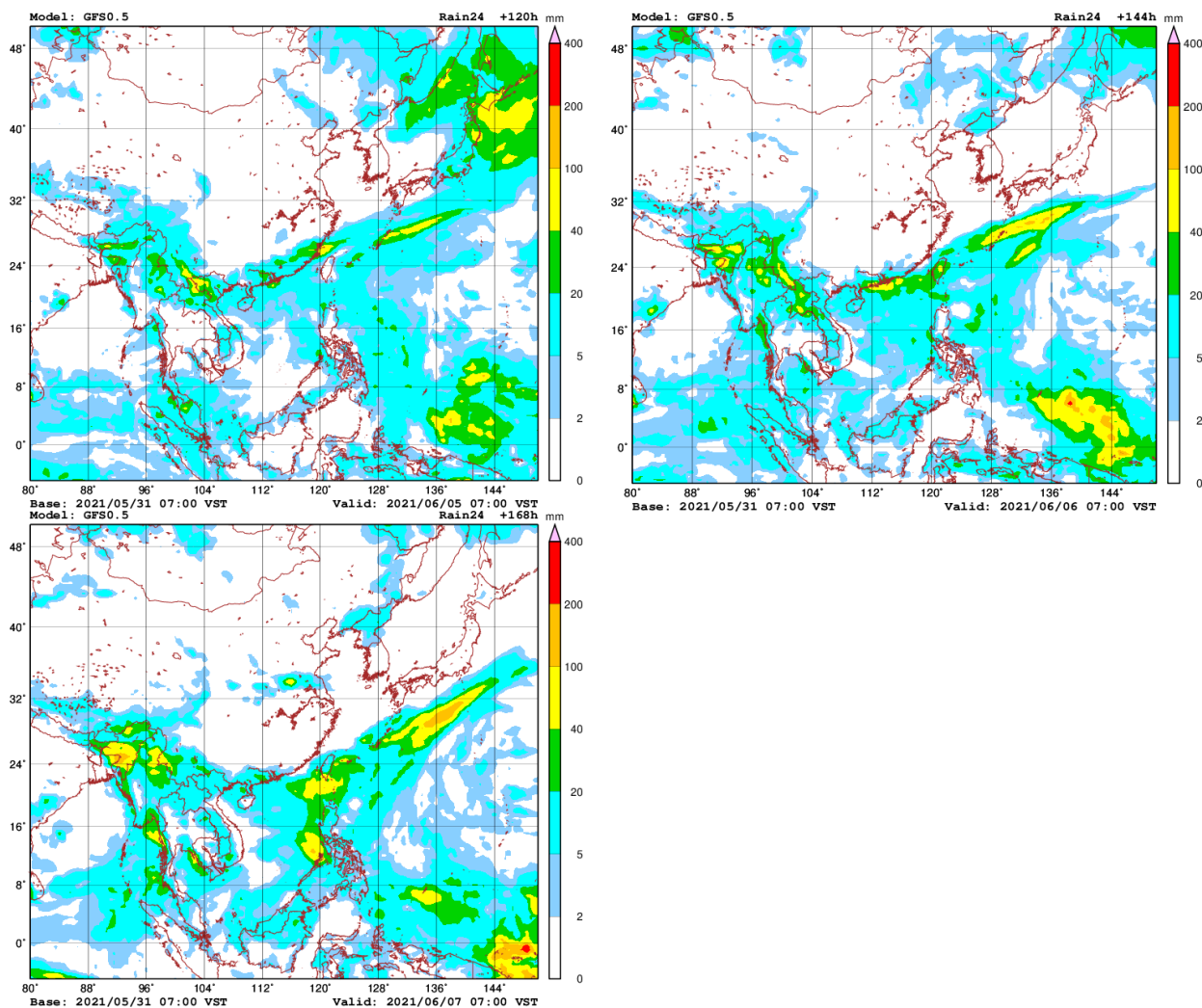


Figure 16. Accumulated rainfall forecast (24 h) based on a GFS model.

## 6.2 Water level forecast

### Chiang Saen and Luang Prabang

Based on May 31's weekly river monitoring bulletin, the weekly forecasted water level at Chiang Saen in Thailand is expected to decrease from 3.10 m to 2.98 m in the next seven days. The trend will keep the water level at this station above its LTA.

For Luang Prabang in Lao PDR, the water level will decrease from 9.96 m to 9.56 m during next week. The current water level is slightly close to its maximum value. Precipitation is forecasted for the areas 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 decline by about 0.30 m, and about 0.10 m at Vientiane in Lao PDR. From Nong Khai in Thailand to Paksane in Lao PDR, the water levels will decrease by about 0.06 m over the next seven days. Rainfall is forecasted for the areas between Chiang Khan and Paksane next week.



The water levels are expected to remain higher than their LTA at Chiang Khan, Vientiane and Nong Khai, except at Paksane where the level will be lower than its LTA.

### **Nakhon Phanom to Pakse**

Water levels from Nakhon Phanom in Thailand to Savannakhet in Lao PDR may decrease by about 0.05 m in the next seven days. But from Khong Chiam in Thailand to Pakse in Lao PDR, the stations will likely see an increase of water level by about 0.06 m. Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR will stay higher than their LTA while some rainfall is forecasted for these areas next week.

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

From Stung Treng to Kampong Cham along the Mekong River in Cambodia, water levels will decrease by about 0.07 m in the next seven days. Precipitation is forecasted for the area between Stung Treng and Kratie during next week.

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 by about 0.15 m over the next seven days.

With the trend, water levels at these stations will be staying close to their LTA values, particularly from the Bassac at Phnom Penh to Koh Khel as well as from Tonle Sap at Prek Kdam to Phnom Penh Port, including the Tonle Sap Lake. 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, water levels will be fluctuating below their LTA, following daily tidal effects from the sea. Rainfall is forecasted for the Delta area next week.

[Table 2](#) shows the weekly River Monitoring Bulletin issued on May 31. 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**

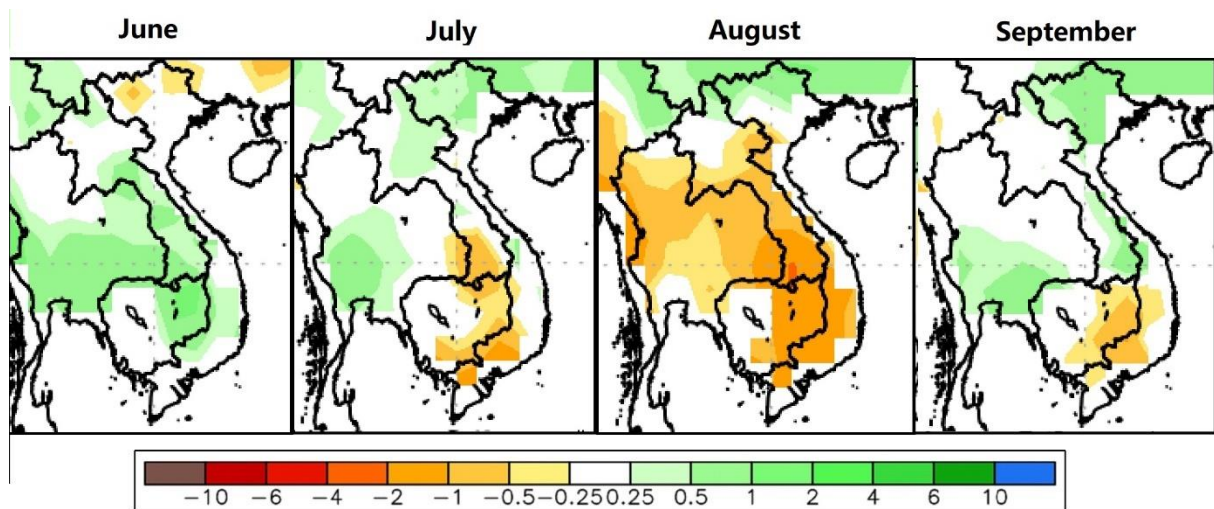
Based on the rainfall forecast, the amount of rainfall will not be much during next week. Thus, the possibility of flash flood occurrence is low. Nevertheless, local heavy rain in a short period of time is still possible with unexpected flash floods. The information about flash flood guidance for the next one, three, and six hours is updated twice daily at: <http://ffw.mrcmekong.org/ffg.php>.

Detailed information on Flash Flood Warning Information as well as on its explanation is available for download [here](#).

## 6.4 Drought forecast

There are several climate-prediction models with different scenarios on the upcoming months until June 2021. The MRC's DFEWS adopts an ensemble model called the North America Multi-Model Ensemble (NMME), which averages all scenarios.

The global scale of rainfall prediction is used to see how the rain distribution looks like for the coming months. [Figure 17](#) shows the ensemble mean of daily average precipitation (mm/day) each month from June to September 2021 produced by the NMME.



**Figure 17.** Daily average of monthly rainfall anomaly forecast from April to July 2021.

The ensemble prediction model forecasts that June is likely to receive from average to above-average rainfall in the entire LMB region; the central part of the LMB and the eastern part of Cambodia are forecasted to be the wettest areas. Moving into July, it is forecasted that Cambodia, the Central Highland of Viet Nam, and southern Lao PDR will be the driest in the region. In August, the entire LMB region is forecasted to experience some meteorological drought, a situation when there is a prolonged period with less than average rainfall. Lastly, the lower part of the LMB covering eastern Cambodia and Viet Nam is likely to receive below average rainfall in September.

It seems that the 2021 dry season is slightly wetter than that of 2020 and that the monsoon rain may come earlier in the 2021 wet season than it did in 2019 and 2020.

**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

Forecast period from: 01 June to 07 June 2021

Date: 31 May 2021

LOCATION	Country	Observed Rainfall (mm)	Zero gauge above M.S.L (m)	Min water level against zero gauge (m)	Observed W. level against zero gauge (m)		Forecasted Water Levels (m)						
		30-May			30-May	31-May	01-Jun	02-Jun	03-Jun	04-Jun	05-Jun	06-Jun	07-Jun
Jinhong		0.0	-	-	537.04	536.96							
Chiang Saen		32.4	357.110	0.00	3.49	3.10	3.25	3.28	3.13	3.00	2.90	2.81	2.99
Luang Prabang		0.0	267.195	2.53	9.57	9.66	9.72	9.35	9.50	9.53	9.59	9.65	9.55
Chiang Khan		0.0	194.118	1.91	6.46	6.60	6.67	6.72	6.46	6.52	6.44	6.36	6.30
Vientiane		0.0	158.040	-0.28	3.62	3.78	3.89	3.95	4.00	3.78	3.83	3.77	3.70
Nongkhai		0.0	153.648	0.33	3.22	3.32	3.44	3.51	3.58	3.35	3.40	3.34	3.26
Paksane		0.0	142.125	0.10	4.13	4.13	4.21	4.29	4.33	4.38	4.25	4.20	4.16
Nakhon Phanom		0.0	130.961	0.18	3.05	3.00	2.91	2.96	3.00	3.03	3.06	3.00	2.95
Thakhek		0.0	129.629	1.38	4.25	4.21	4.10	4.16	4.21	4.25	4.29	4.22	4.15
Mukdahan		0.0	124.219	0.72	3.09	3.09	3.06	3.00	3.04	3.07	3.09	3.11	3.07
Savannakhet		0.0	125.410	-0.65	1.36	1.35	1.35	1.30	1.32	1.34	1.35	1.36	1.34
Khong Chiam		0.0	89.030	1.02	3.39	3.40	3.32	3.15	3.25	3.34	3.42	3.47	3.37
Pakse		0.0	86.490	0.03	2.28	2.23	2.17	2.05	2.12	2.17	2.22	2.27	2.20
Stung Treng		nr	36.790	0.32	3.46	3.39	3.35	3.3	3.22	3.27	3.32	3.35	3.4
Kratie		nr	-1.080	3.06	8.97	8.90	8.82	8.77	8.70	8.60	8.66	8.72	8.76
Kompong Cham		nr	-0.930	0.65	4.09	4.01	3.92	3.82	3.75	3.67	3.55	3.63	3.71
Phnom Penh (Bassac)		nr	-1.020	1.58	2.47	2.45	2.43	2.38	2.35	2.32	2.26	2.31	2.35
Phnom Penh Port		nr	0.000	0.14	1.49	1.47	1.45	1.40	1.37	1.34	1.28	1.34	1.40
Koh Khel		nr	-1.000	1.52	2.55	2.56	2.60	2.63	2.64	2.56	2.50	2.45	2.48
Neak Luong		15.5	-0.330	0.81	1.74	1.70	1.66	1.62	1.66	1.72	1.77	1.79	1.72
Prek Kdam		nr	0.080	0.58	1.52	1.55	1.52	1.48	1.45	1.41	1.35	1.41	1.45
Tan Chau		nr	0.000	-0.37	-0.13	-0.21	-0.10	0.17	0.48	0.77	0.97	1.05	1.12
Chau Doc		nr	0.000	-0.60	-0.13	-0.13	0.01	0.30	0.62	0.92	1.15	1.26	1.34

**REMARKS:**

-: not available.  
 \*: reference stations without forecast.  
 nr: no rain.

River Flood Forecaster

KHEM Sothea

**NOTE:** Discharge at Luang Prabang may be influenced by hydropower operations (at both upstream and downstream).  
 For more info, please refer to this link:  
<http://www.mrcmekong.org/>; [http://ffw.mrcmekong.org/bulletin\\_wet.php](http://ffw.mrcmekong.org/bulletin_wet.php); <http://ffw.mrcmekong.org/reportflood.php>

## 7 Summary and Possible Implications

### 7.1 Rainfall and its forecast

During this reporting week, rainfall took place from Nakhon Phanom in Thailand to Pakse in Lao PDR, including the lower part of the LMB at Chaktomuk in Cambodia and Tan Chau and Chau Doc in Viet Nam, varying from 3.50 mm to 180.00 mm.

Based on the forecasted satellite data, rainfall is forecasted for some areas of the LMB, with value ranging from 10 to 100 mm for the next seven days. The forecasting model using GFS data, on the other hand, shows that no significant rainfall (>70 mm) is likely to take place in the Mekong region from 1 to 6 June 2021.

### 7.2 Water level and its forecast

According to MRC's observed water level data, the outflows at Jinghong hydrological station decreased and experienced rapid fluctuations over the monitoring period.

The outflows dropped from 2,693 cubic metres per second (m<sup>3</sup>/s) on May 25 to 2,098 m<sup>3</sup>/s on May 31. The station's daily average water level dropped by 0.81 m (from 537.47 metres on May 25 to 536.52 metres on May 29). Continuing into an hourly recorded water level, it showed that the drop was more sudden. For instance, the level decreased from 537.92 metres (m) on May 26 at 17:00 to 536.48 m on May 29 at 3:00, representing a 1.44 m drop over the period.

However, the water level at Chiang Saen in Thailand dropped by about 0.48 m during the same period. In spite of this, the station's recorded water level was still higher than its long-term average (LTA).

Besides, water levels across most monitoring stations from Chiang Khan in Thailand to Pakse in Lao PDR, and from the stretches of the river between Stung Treng and Kratie in Cambodia were higher than their LTA up to 31 May 2021.

Over the next few days, water levels from Chiang Khan to Vientiane are expected to slightly decrease by about 0.25 m, and by about 0.05 m from Nakhon Phanom to Pakse. Nonetheless, this situation will continue to put most stations' water levels higher than their LTA.

The starting date of the outflow from the Tonle Sap Lake into the mainstream of the Mekong River took place on November 15, slightly late compared to the normal event. Due to heavy rainfall in late October 2020, the water volume of the Tonle Sap Lake at this reporting point is higher than that in 2020. However, this volume is lower than its LTA. From next week, the flow might continue to slightly increase due to predicted rainfall in the inflow catchments and the increased water levels along the lower part of the Mekong and Bassac rivers.

From Stung Treng to Kompong Cham, the water levels will slightly decrease but remain higher than their LTA. 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 remain close to their LTA.

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

The low rainfall during the past months of 2020 (except in October) is believed to be one of the main factors causing low water levels at most of the stations along the Mekong mainstream.

Since the beginning of March 2021, water levels in the LMB have increased above their LTA across all the monitoring stations (from upper to lower stretches within the LMB). Like many parts of the world, the Mekong region was affected by the prolonged El Nino event, the phenomenon that usually causes extreme heat and insufficient rainfall. This climate change impact has been observed since 2019 and 2020. For a more complete preliminary analysis of the hydrological conditions in the LMB over January–July 2020, see this [Situation Report](#), and for July–December 2020, see this [Situation Report](#).

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 a small predicted amount of rainfall for the upcoming week as mentioned earlier in [section 6.1](#), flash floods are likely not to happen in the region.

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

From 22 to 28 May 2021, most parts of the LMB were at normal condition except some areas in the central part of the LMB where moderate drought took place. Those areas include Khon Kaen, Maha Sarakham, Roi Et, Kalasin, and Nakhon Ratchasima. In general, there was no significant threat found for the LMB during the reporting week.

The ensemble prediction model forecasts that June is likely to receive from average to above-average rainfall in the entire LMB region; the central part of the LMB and the eastern part of Cambodia are forecasted to be the wettest areas. Moving into July, it is forecasted that Cambodia, the Central Highland of Viet Nam, and southern Lao PDR will be the driest area in the region. In August, the entire LMB region is forecasted to experience some meteorological drought, a situation when there is a prolonged period with less than average rainfall. Lastly, the lower part of the LMB covering eastern Cambodia and Viet Nam is likely to receive below average rainfall in September.

**Annex A: Tables for weekly updated water levels and rainfall at the Key Stations from 25 to 31 May 2021**

Table A1: Weekly observed water levels in metres

2021	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khei	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
25-05-2021	537.65	3.58	9.80	6.60	3.80	3.33	4.27	2.94	3.07	2.22	3.23	8.38	3.34	1.88	1.84	1.65	1.03	1.06	1.01
26-05-2021	537.45	3.84	9.15	6.64	3.92	3.54	4.22	2.89	3.02	2.32	3.35	8.56	3.54	2.07	2.07	1.44	1.15	1.01	1.17
27-05-2021	537.46	3.71	9.00	6.54	4.03	3.64	4.26	2.87	3.02	2.40	3.45	8.73	3.71	2.21	2.23	1.36	1.29	0.81	1.06
28-05-2021	537.46	3.59	9.48	6.28	3.90	3.58	4.36	2.85	3.02	2.34	3.49	8.89	3.88	2.31	2.37	1.50	1.42	0.55	0.63
29-05-2021	536.67	3.54	9.70	6.16	3.78	3.36	4.49	2.95	3.02	2.34	3.47	9.01	4.04	2.45	2.47	1.58	1.53	0.08	-0.15
30-05-2021	536.96	3.49	9.57	6.46	3.62	3.22	4.13	3.05	3.09	2.28	3.46	8.97	4.09	2.47	2.55	1.74	1.52	-0.13	-0.13
31-05-2021	536.96	3.10	9.66	6.60	3.78	3.32	4.13	3.00	3.09	2.23	3.39	8.90	4.01	2.45	2.56	1.70	1.55	-0.21	-0.13

Table A2: Weekly observed rainfall in mm

2021	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khei	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
25-05-2021	2.5	2	7.4	19	4.6	8.8	17.8	33.1	116.2	9.8	75	0.8	4.4	3.5	9.4	4	0	10.3	16
26-05-2021	9	0	0	1	0.8	0	0	61.3	15.7	0	20	74	24.3	0	0	1.1	0	1.9	12
27-05-2021	2	0	0	0	0	0	7.2	15.5	13.3	0	0	0	3.9	0	17.7	0	0	0	0
28-05-2021	4	6.8	2.6	0.6	0	11.9	58	61.9	36.5	4	2	0	0	0	4.6	0.6	0	0	1
29-05-2021	5.5	0	0	0	14.2	0	6.8	3	0	0	0	0	0	0	0	0	0	0	0
30-05-2021	0	0	0.4	0	0	0	0	7.7	0	0	0	0	0	0	0	0	0	0	15
31-05-2021	0	32.4	0	0	0	0	0	0	0	0	0	0	0	0	0	15.5	0	0	0



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