



Mekong River Commission

**Weekly Dry Season Situation Report in
the Lower Mekong River Basin
09-15 May 2023**

Prepared by
The Regional Flood and Drought Management Centre
16 May 2023

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Key Messages

Key messages for this weekly report are presented below.

Rainfall and its forecast

- During May 09-15, rainfall was observed from Chiang Saen to Pakse stations and from Stung Treng to Tan Chau and Chau Doc along the Mekong River, which received for all key stations.
- There will be moderate average rainfall for the next 7 days over the Mekong region from 16 to 22 May 2023.

Water level and its forecast

- The MRC's observed water level (WL) at Jinghong showed a decreased level between 536.09 m and 535.33 during 09-15 May 2023. The outflow decreased from 1,430.00 m³/s to 840.00 m³/s between 09 and 15 May 2023.
- Regardless the decreased outflow at Jinghong upstream, water level of monitoring station at Chiang Saen in Thailand rapidly went up about 0.91 m during the reporting period and stayed 0.09 m above its LTA, considered normal. WLs at the monitoring stations at Chiang Khan in Thailand significantly increased about 0.94 m, staying 0.36 m below its LTA value, while at Vientiane in Lao PDR it increased about 0.68 m and stayed about 0.32 m below its LTA value. The current WL at Nong Khai in Thailand was about 1.42 m lower than its LTA value, while at Paksane in Lao PDR it was about 1.47 m lower than its LTA level, which considered low water level. WLs from Thailand's Nakhon Phanom to Savannakhet decreased between 0.02 m and 0.55 m, while at Khong Chiam and Pakse increased about 0.10 m. WLs at these stations are slightly staying lower than their LTA value, except water level at Savannakhet which staying close to its LTA value. Water levels from the stretches of the river at Stung Treng is remaining close with its LTA value, while at Kratie in Cambodia, moreover, is slightly lower than its LTA value due to contributed inflows and some rainfall from the upstream part (at Pakse and 3S area in Viet Nam). WL at Kompong Cham is about 0.86 m lower than its LTA value.
- The water volume of the Tonle Sap Lake was lower than its LTA (about 83%) during the same period from 09 to 15 May 2023, considered normal.
- The current water levels for most of the stations are below their LTA value, except at Luang Prabang, Savannakhet, Stung Treng and Neak Luong. WLs at the 2 tidal stations at Tan Chau and Chau Doc fluctuated between their LTA and minimum values, during this monitoring period.
- Over the next seven days, the water levels across most monitoring stations are expected to go up and will stay close to their long-term average value in most stations.

Drought condition and its forecast

- During May 8-14, the LMB was facing some moderate and severe droughts mainly in the central area covering Nong Bua Lamphu, Udon Thani, Chaiyaphum, Khon Kaen,

Maha Sarakham, Nakhon Ratchasima, Burirum, and Surin in Thailand and Ordar Meanchey and Banteay Meanchey of Cambodia. The situation was much better than it was during May 1-7.

- In **May** the middle and lower parts of the LMB will likely receive below average rainfall with moderate drought condition. **June** is forecasted to be normal where the region receives average rainfall, in general. And lastly, the LMB is mostly like really wet in **July** forecast except slightly below average rainfall in southern Cambodia in the lower part.

1 Introduction

This Weekly Dry Season Situation Report presents a preliminary analysis of the weekly hydrological situation in the Lower Mekong River Basin (LMB) for **09-15 May 2023**. 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. 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
- Flash flood and drought situation in the LMB
- Weather, water level and flash flood forecast, and
- Possible implications.

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

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

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

2 General Weather Patterns

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

Since the end of April 2022, the warm and hot weather has appeared because the influentially high-pressure air mass areas prevail over the LMB, with gradually decreasing water levels in both mainstream and tributaries. The data from the TMD predict that low pressure of air-mass will continue with warm weather condition in the upper part of Thailand, Lao PDR and Viet Nam. As a result, the temperature in the upper part of Thailand will rise sharply as commonly warm and hot weather, specifically at the upper portion of the northern and north-eastern parts together with very hot weather in mountainous areas (within the Mekong region).

[Figure 1](#) presents the weather map during 08-11 May 2023, indicating that a high-pressure cell was active in the South-Sea of Viet Nam, but did not impact the LMB. Generally, the Mekong region was influenced by the convergence of southerly from Equator and easterly wind from western Pacific, and the remote effect of a Tropical depression which later developed into a tropical storm and tracked towards Myanmar. Under this weather condition, there was moderate to extreme rainfall over the whole LMB region; especially northern parts of LMB in Thailand, Lao PDR, 3S area, and southern Viet Nam.

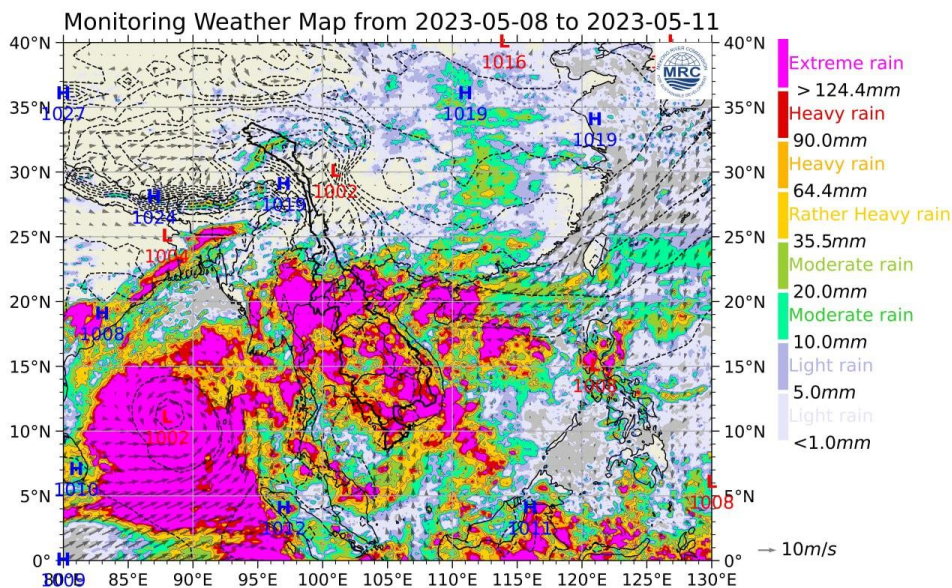


Figure 1: Summary of weather conditions over the LMB.

According to the ASEAN Specialised Meteorological Centre (ASMC), a highest probability of drier condition is predicted over the lower part of the Mekong region covering Lao PDR and Thailand from 15 to 28 May 2023. **Figure 2** shows the outlook of weather condition from 15 to 28 May 2023 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

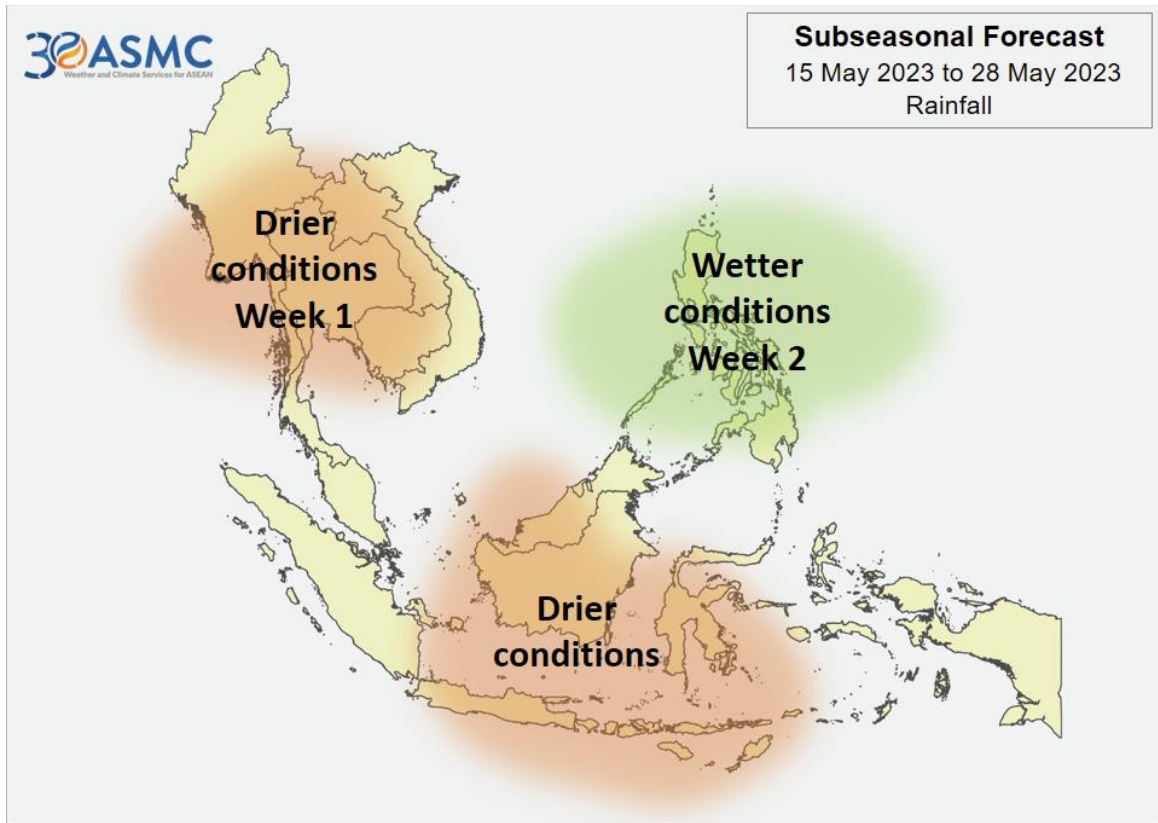


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There was a tracking storm covering the LMB during 09-15 May 2023, showing no low-pressure line over the LMB. No movement of storm was detected over Viet Nam, as displayed in [Figure 3](#).

Active system as of 15 May 2023, 6:49 GMT

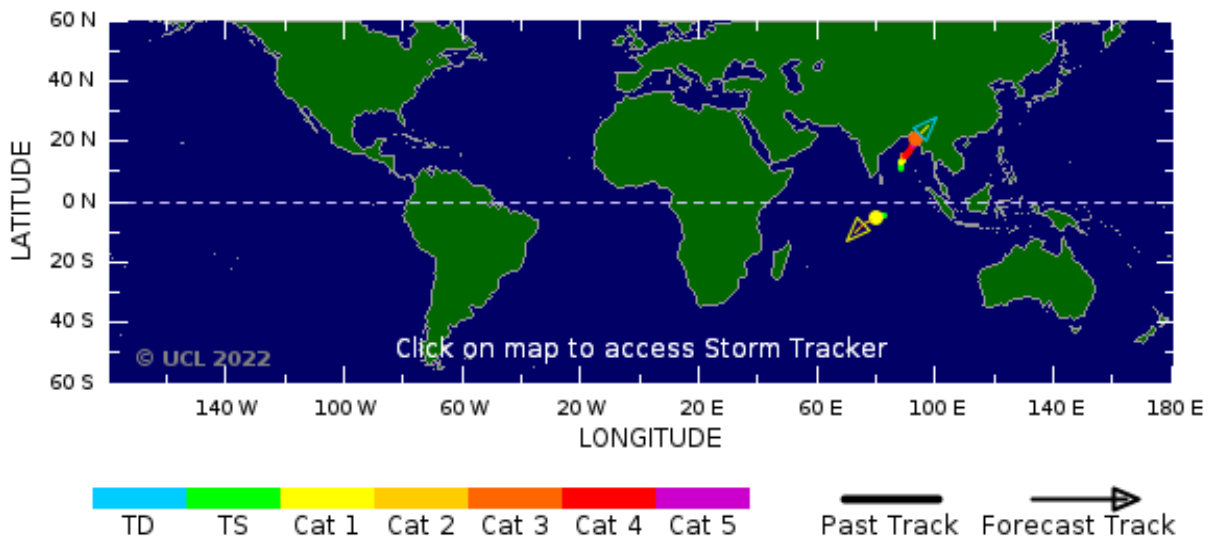


Figure 3: No tropical storm risk observed on 15 May 2023.

Rainfall patterns over the LMB

This week from 09 to 15 May 2023, rainfall was observed from Chiang Saen to Pakse, and from Stung Treng in Cambodia to Tan Chau and Chau Doc in Viet Nam, along the Mekong River of the Lower Mekong Basin (LMB). The highest rainfall was about 217.12 mm at Khong Chiam in Thailand. 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](#).

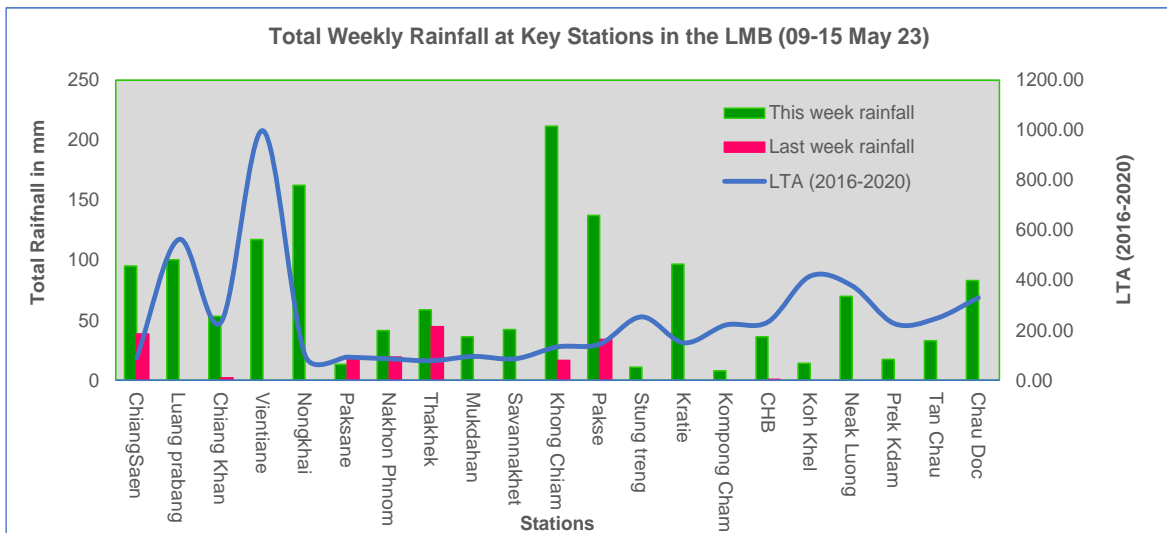


Figure 4: Weekly total rainfall at key stations in the LMB.

To verify area rainfall distribution, [Figure 5](#) shows a map of the weekly accumulated rainfall based on the observed data provided by the MRC Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – from 09 to 15 May 2023.

Absence of rain this week is an indication of the end of the rainy season in the LMB.

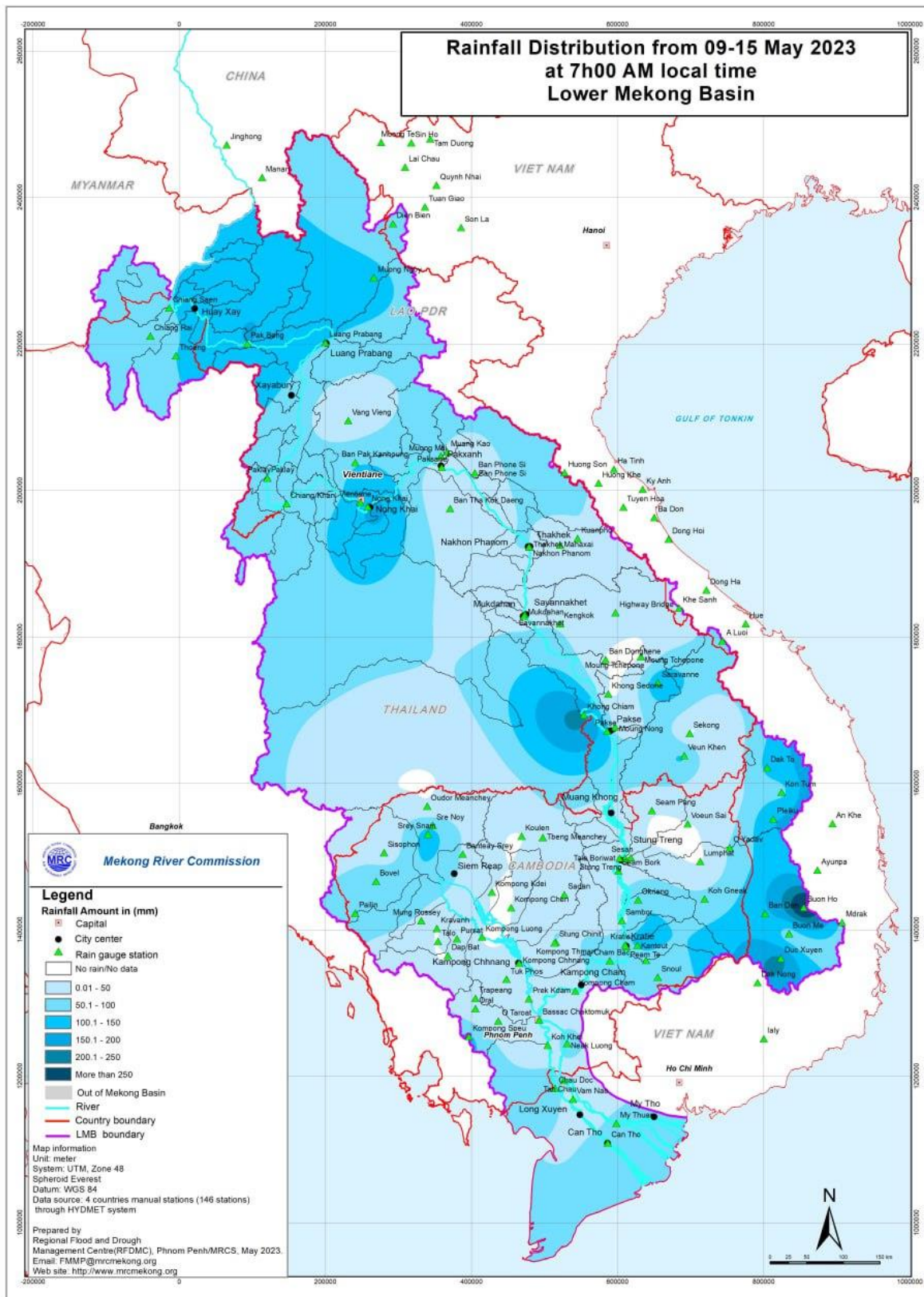


Figure 5: Weekly rainfall distribution over the LMB.

3 Water Levels in the Lower Mekong River

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

The key stations along the LMB and their respective model application for River Flood Forecasting during the wet season from June to October and River Monitoring during the dry season from November to May are presented in [Figure 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**.

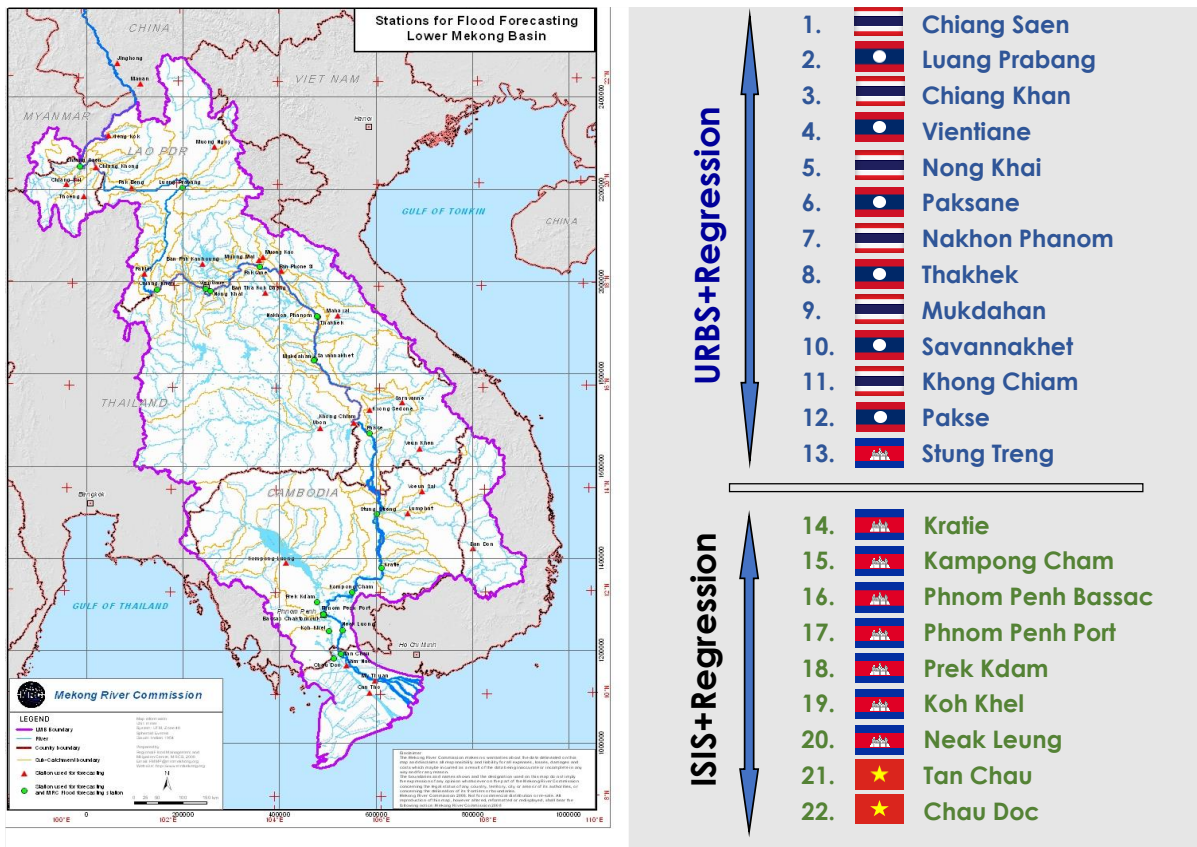


Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.

The MRC’s observed water level (WL) at Jinghong showed decreased values between 536.09 m and 535.33 m from 09 to 15 May 2023 (recorded on 7:00 am). The outflow decreased from 1,430.00 m³/s to 891.00 m³/s between 09 and 15 May 2023.

[Figure 7](#) below presents water level that decreased at the Jinghong hydrological station¹, indicating the trend of fluctuating water level up to 15 May 2023.

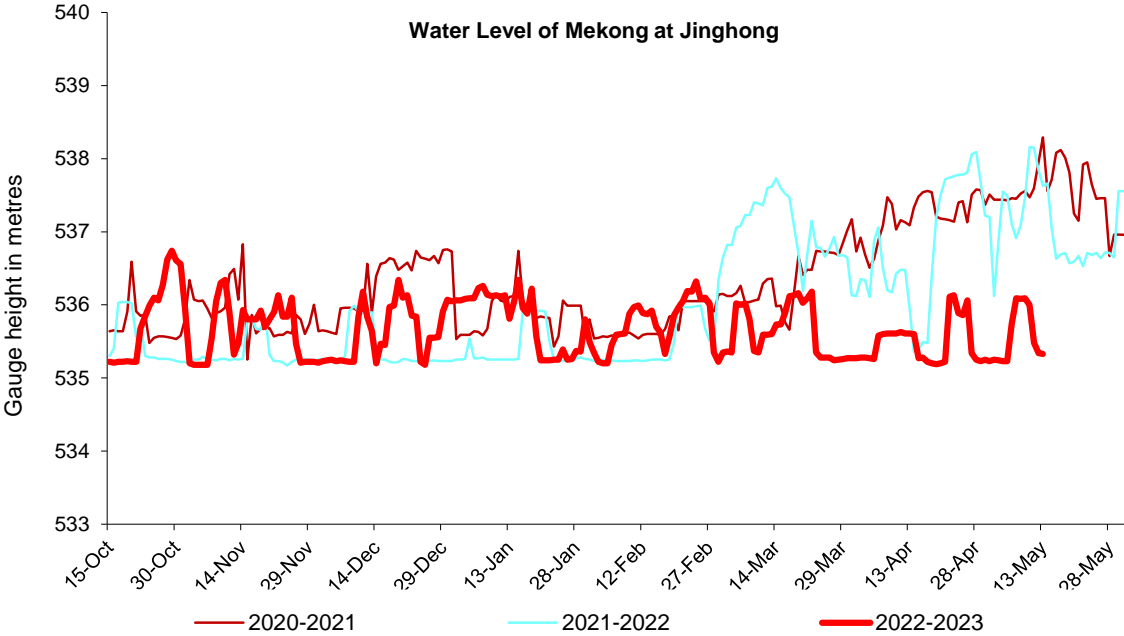


Figure 7. Water level at the Jinghong hydrological station during 09-15 May 2023.

Regardless the decreased outflow from Jinghong upstream, water level of monitoring station at Chiang Saen in Thailand significantly increased 0.91 m from 09 to 15 May 2023 and stayed about 0.09 m higher than its long-term average (LTA), which considered normal level. WLs at the monitoring station at Chiang Khan in Thailand rapidly increased about 0.91 m but still stayed 0.36 m lower than its LTA, while at Vientiane in Lao PDR it increased about 0.68 m and stayed about 0.32 m below its LTA value, considered low water levels. The current WLs at Nong Khai in Thailand, moreover, increased 0.13 m but still stayed 1.42 m lower than its LTA, while at Paksane in Lao PDR it decreased about 0.21 m and stayed 1.47 m lower than its LTA value. WLs at these stations were considered low. Water levels from Nakhon Phanom in Thailand to Savannakhet decreased between 0.01 m and 0.55 m, while WLs at Khong Chiam in Thailand and Pakse in Lao PDR increased about 0.10 m. WLs at these stations are staying slightly below their LTA value, considered low levels, except at Savannakhet the WL nearly matched with its LTA value. Water levels from the stretches of the river from Stung Treng to Kratie in Cambodia were increasing by 0.15 m and 0.47 m respectively. The water levels at Kompong Cham increased about 0.04 m due to inflow and some rainfall from the upstream part. WLs at Stung Treng stayed about 0.02 m lower than its LTA value and at Kratie it was 0.01 m lower than its LTA value. WL at Kompong Cham was about 0.86 m lower than its LTA value.

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

Based on hydrological phenomenon, the contribution of inflow water from the upstream of Lancang-Mekong in China to the Mekong mainstream is about 16% in total during the wet season from June to October and about 25% in total during the dry season from November to May. 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

Water level during 09-15 May 2023 at Thailand’s Chiang Saen increased from 1.41 m to 2.32 m, staying about 0.09 m higher than its Long-Term-Average (LTA), which is considered normal. When compared to last week, this week’s water level is relatively higher.

Water level at the Luang Prabang station in Lao PDR increased from 8.72 m to 9.02 m, during the reporting period. Compared to last week, the figure shows it is down about 0.30 m. The water level at this station was 2.62 m higher than its LTA value and staying about 1.01 m below its historical maximum value. 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 dry season.**

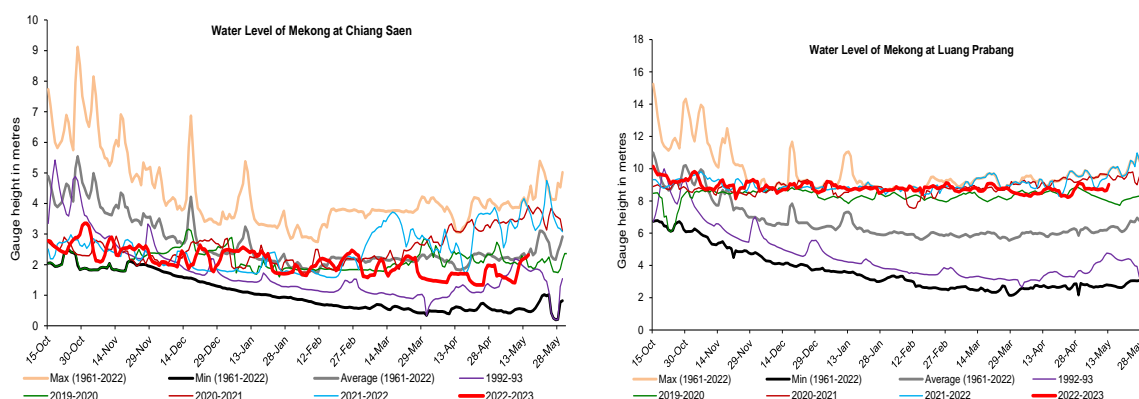


Figure 8. Water levels at Chiang Saen in Thailand and Luang Prabang in Lao PDR.

Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand (downstream of the Xayaburi dam) significantly increased about 0.91 m, during the reporting week. It still showed 0.36 m below its LTA. Also, the water level downstream at Vientiane in Lao PDR rapidly increased from 0.97 m to 1.65 m but still stayed about 0.32 m lower than its LTA during 09-15 May 2023. At Nong Khai station in Thailand, the water level increased about 0.13 m during the reporting period. It showed 1.42 m lower than its LTA value, which still considered low water level. At Paksane in Lao PDR, water level decreased about 0.21 m staying about 1.47 m lower than its LTA value. The recently increased and decreased water levels were obviously due to rainfall and inflow from upstream and water operation from upstream in the sub-catchment area. The water levels at Vientiane and Paksane are shown in [Figure 9](#) below.

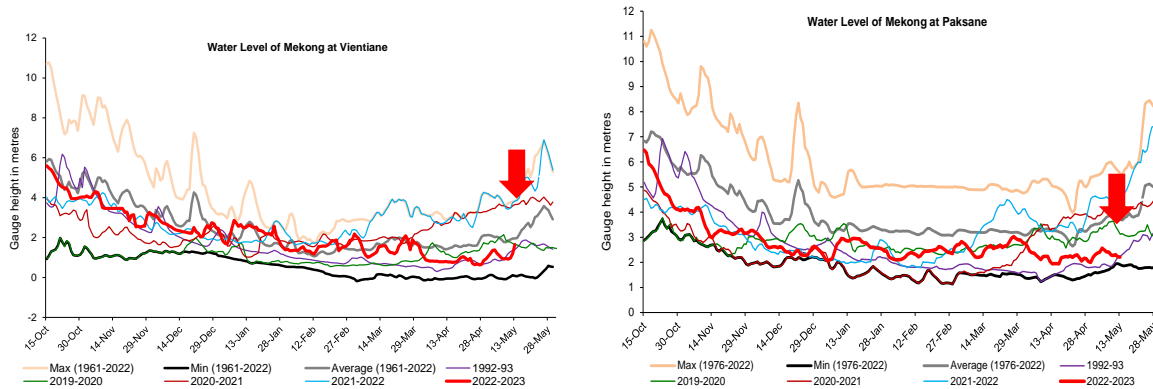


Figure 9. Water levels Vientiane and Paksane in Thailand and Lao PDR.

Nakhon Phanom to Pakse

Moreover, water levels from Nakhon Phanom in Thailand to Savannakhet in Lao PDR decreased between 0.01 and 0.55 m, while at Khong Chiam in Thailand and Pakse in Lao PDR increased about 0.10 m. Water levels for most of the stations are staying lower to their LTA levels except at Savannakhet which water levels is matched with its LTA value. [Figure 10](#) shows the water levels at Nakhon Phanom and Pakse stations.

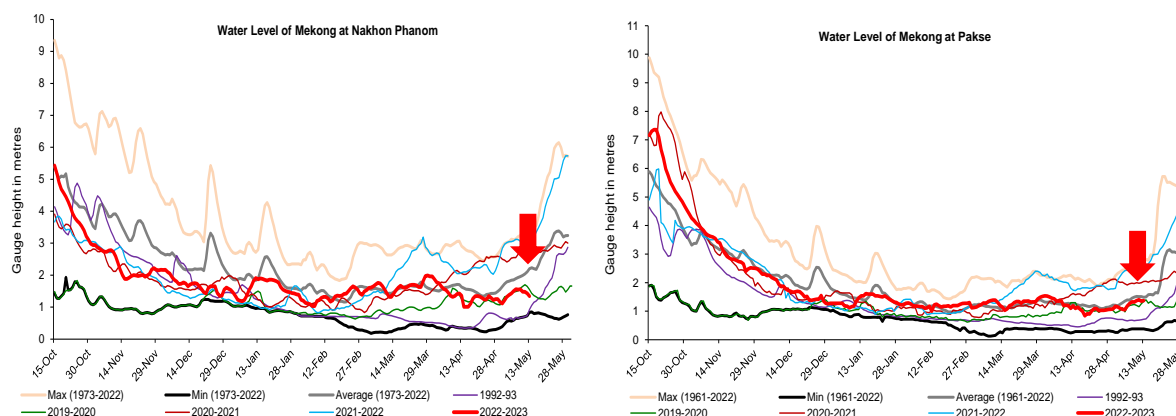


Figure 10: Water levels at Nakhon Phanom and Savannakhet of Thailand and Lao PDR.

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

Due to the fact that there was rainfall 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 kept increasing during 09-15 May 2023, respectively. The water level at Stung Treng increased about 0.15 m, while at Kratie it increased about 0.47 m. Water levels at Stung Treng is staying about 0.02 m lower than its LTA value and at Kratie is about 0.01 m lower than its LTA value. Water levels at these two stations were considered normal during the dry season (as showed in [Figure 11](#)).

This week, the water levels at Kompong Cham were up about 0.04 m and stayed 0.86 m below its LTA value, which considered low.

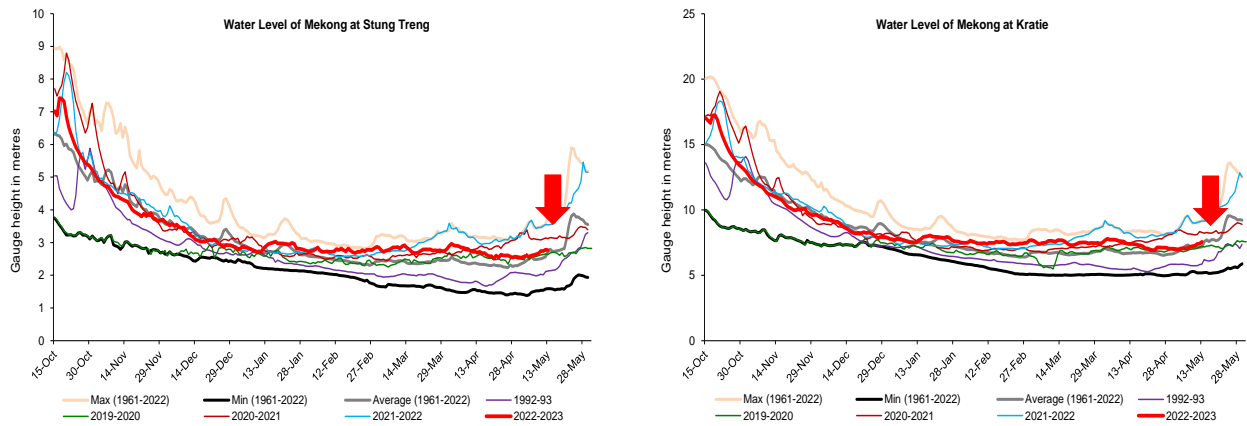


Figure 11: Water levels at Stung Treng and Kratie on the Mekong River.

At Chaktomuk on the Bassac River, the water level was up by about 0.22 m and stayed 0.19 m lower than its LTA value; while at Koh Khel, water level increased about 0.22 m, staying 0.21 m lower than its LTA value. It was observed that the WLs at Koh Khel and Neak Luong were affected by tidal from downstream stations of Tan Chau and Chau Doc in Viet Nam, during the dry season period. However, water level at Prek Kdam on the Tonle Sap Lake increased about 0.02 m and stayed 0.23 m lower than its LTA value. The water level at the Tonle Sap Lake (observed at Kompong Luong) was similar to Prek Kdam station's water level. The recently increased water level was due to some rain 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 Kompong Luong) followed the same trend of Prek Kdam station's water level. **Water levels at these stations were mostly staying lower than their LTA level, which still considered low water level.**

Tidal stations at Tan Chau and Chau Doc

Like last week, the water levels from 09 to 15 May 2023 at Viet Nam's Tan Chau and Chau Doc were fluctuating between their LTA and minimum values due to daily tidal effects from the sea. The fluctuated levels were between -0.47 m and 0.31 m, which were lower than their LTA level. In Tan Chau and Chau Doc, the fluctuation of water levels at these stations were lower than their minimum level, which **considered critical**.

The Tonle Sap Flow

At the end of the wet season, when water levels along the Mekong River subside, the outflows of the Tonle Sap Lake return to the Mekong River and then to the Delta. This phenomenon normally takes place between September and October. Based on flow observation at Prek Kdam, the outflow of the Tonle Sap Lake took place since 29 October 2022.

The flows of the Tonle Sap Lake were calculated based on a formula of rating-curves using by different water levels at Kompong Luong and Phnom Penh Port for slop and Prek Kdam as cross-section of the Lake. The formula of flows at the Tonle Sap Lake is as follows:

$$\text{Flows} = (\text{WL at Prek Kdam})^{1.2} * \text{SQRT} (\text{WL difference between PP port and Kampong Luong})$$

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

[Figure 12](#) shows the seasonal changes of the inflow/reverse flow and the outflow of the TSL at Prek Kdam in comparison with the flows of 2019-2021 and 2022, and their LTA level (1997-2022). Up to May 15 of this reporting period, **it was observed that the main outflow to Tonle Sap Lake decreased due to less rainfall and inflows from upstream**. This decreased outflow of Tonle Sap Lake was most likely caused by less inflows and rainfall from the catchment area. Up to this date, the outflow from the Tonle Sap Lake condition in 2022 is higher than 2020, 2021 and 2022 outflow conditions. It is noted that the outflow in early 2023 is still slightly lower than its LTA. For next week, rainfall is forecasted for the Tonle Sap area; thus, the outflow into the Tonle Sap Lake is likely to slightly increase from the current level.

[Figure 13](#) shows seasonal changes in monthly flow volumes up to 15 May 2023 for the Lake compared with the volumes in 2020, 2021, 2022 and their LTA, and the fluctuation levels (1997–2021). It shows that up to 15 May 2023, **the water volume of the Tonle Sap Lake was staying slightly lower than its LTA (about 83 %) and higher than 2020, 2021, 2022 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 Mekong River, the tributaries, and rainfall in the surrounding sub-catchments and ***considered normal***.

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 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.

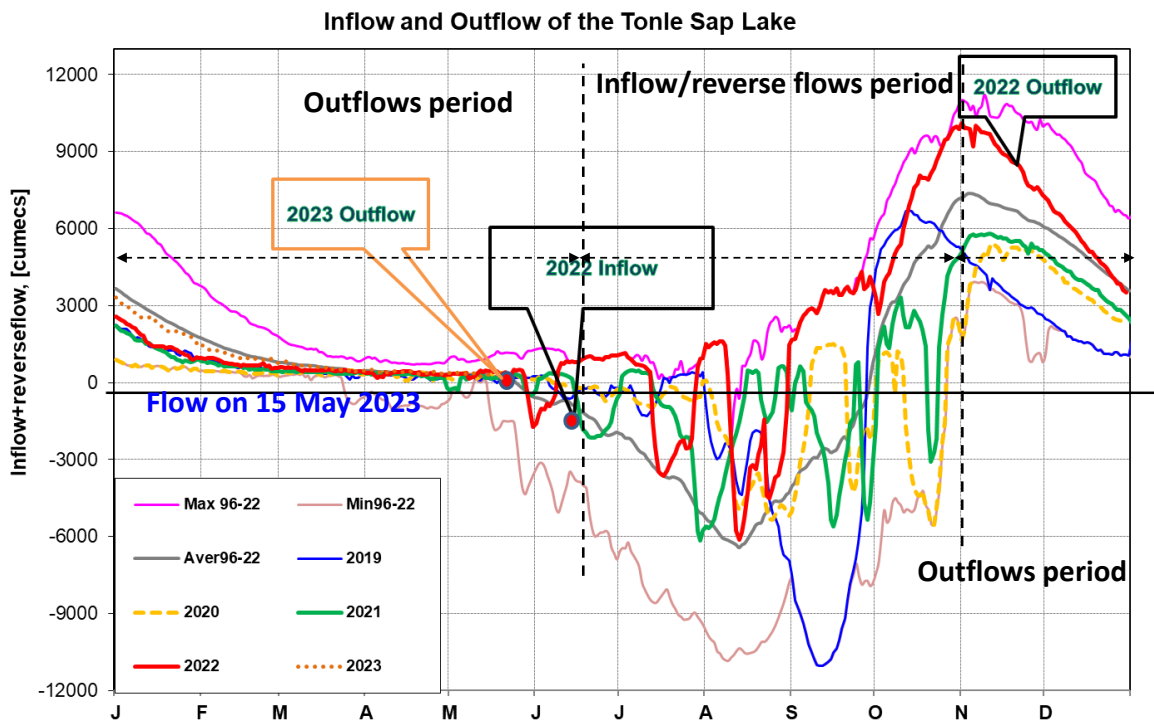


Figure 12: Seasonal change of inflows and outflows of Tonle Sap Lake.

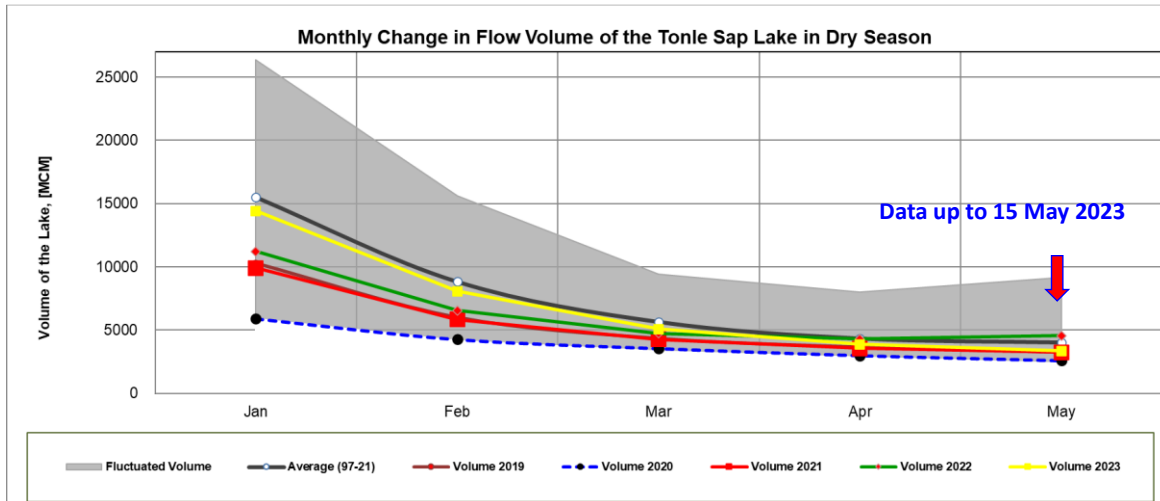


Figure 13. The seasonal change in monthly flow volume of Tonle Sap Lake.

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

Month	LTA (97-22) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]	Volume 2022 [MCM]	Volume 2023 [MCM]	Volume in 2023 [%], compared with its LTA
Jan	15523.23	26357.53	5906.80	10285.31	5906.80	9923.80	11214.32	14422.11	92.91
Feb	8837.89	15596.22	4198.60	6019.30	4264.19	5832.97	6558.79	8069.29	91.30
Mar	5654.18	9438.24	3347.07	4354.62	3553.99	4264.88	4736.52	5080.64	89.86
Apr	4346.65	8009.14	2866.91	3667.47	2992.61	3556.68	4288.31	3884.16	89.36
May	4030.23	9176.93	2417.81	3266.43	2594.92	3240.78	4556.83	3354.11	83.22
Jun	5708.30	13635.01	2468.70	3517.06	2641.88	3798.29	7489.04		
Jul	11493.25	28599.56	2925.86	4001.99	2925.86	5346.73	9703.79		
Aug	24666.69	39015.12	4433.46	7622.71	5941.07	10547.80	19554.70		
Sep	39634.03	65632.35	12105.31	24194.19	12105.31	16382.34	32860.34		
Oct	46873.44	73757.23	19705.50	30358.38	20799.13	27318.21	48199.12		
Nov	37823.16	60367.33	18534.61	19112.65	27546.80	28982.93	39452.53		
Dec	25126.11	38888.95	10563.49	10577.29	18251.65	20170.76	25346.65		
	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 ³)				LTA: Long-Term-Average					

4 Flash Flood in the Lower Mekong Basin

During the weekly monitoring period from May 09 to 15, the LMB was affected by two main weather factors being (1) the high-pressure system which prevailed over the LMB from May 09 to 14 and (2) the heat low-pressure system which affected the LMB on May 15. These conditions caused light to heavy rain and isolated thundershowers in some areas of the LMB.

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

5 Drought Monitoring in the Lower Mekong Basin

Weekly drought monitoring from 08 to 14 May 2023

Drought monitoring data for 2023 are available from Monday to Sunday every week; thus, the reporting period is normally delayed by one day compared to Flood and Flash Flood reports. We adopt the Index of Soil Water Fraction (ISWF) data obtained from FFGS to represent soil moisture of agricultural indicator for both dry and wet seasons.

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

Meteorological drought condition of the LMB from May 8 to 14, as shown in [Figure 11](#), was relatively dry in the central area due to much below average rainfall during the monitoring week. The map shows that the LMB was covered by moderate to severe drought in the central and lower parts of the region. More rain was observed during the week over the Member Countries.

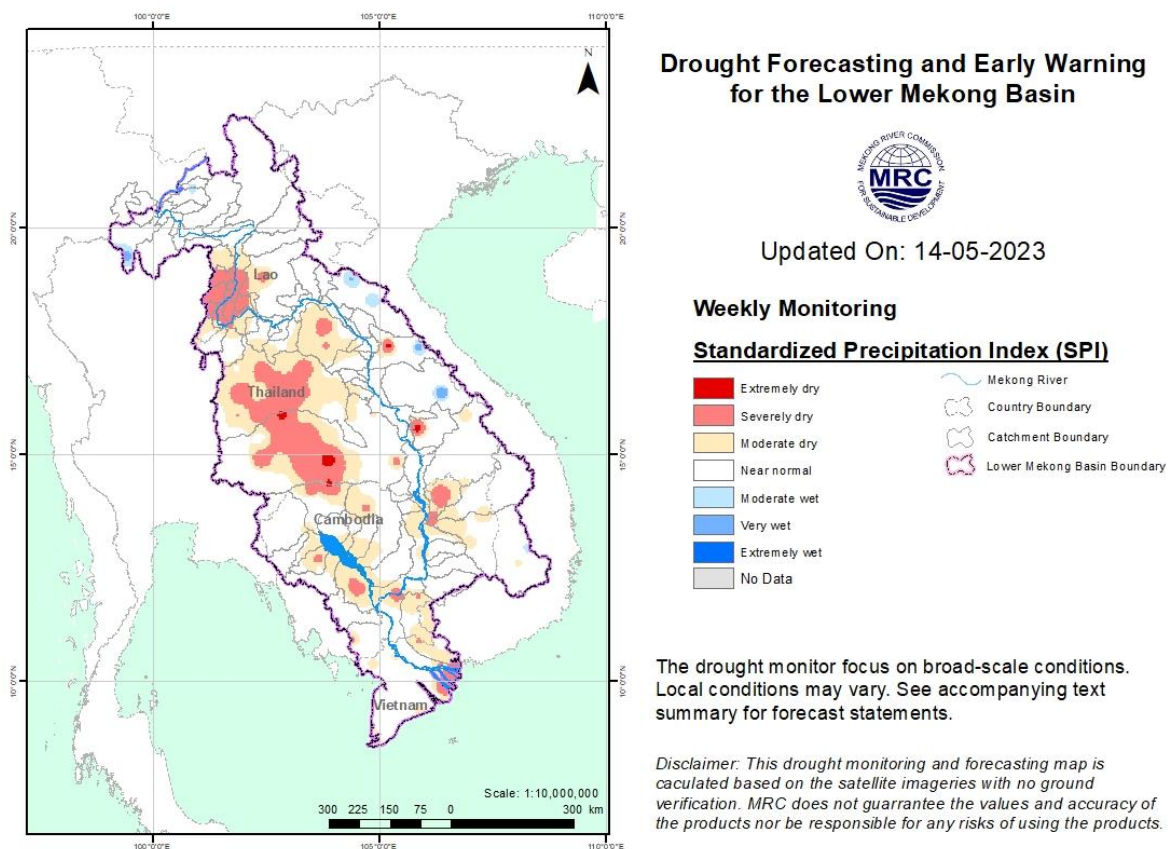


Figure 14: Weekly standardised precipitation index from May 8 to 14.

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

Soil moisture condition from May 8 to 14, as displayed in [Figure 12](#), were mainly wet in the north and south and normal with some moderate and severe dry in the centre. Moderate and severe dry soil moisture was detected over the areas of Burirum, Surin, Otdar Meanchey, Banteay Meanchey, and Sakeo in Thailand. The situation was much better than the previous weeks.

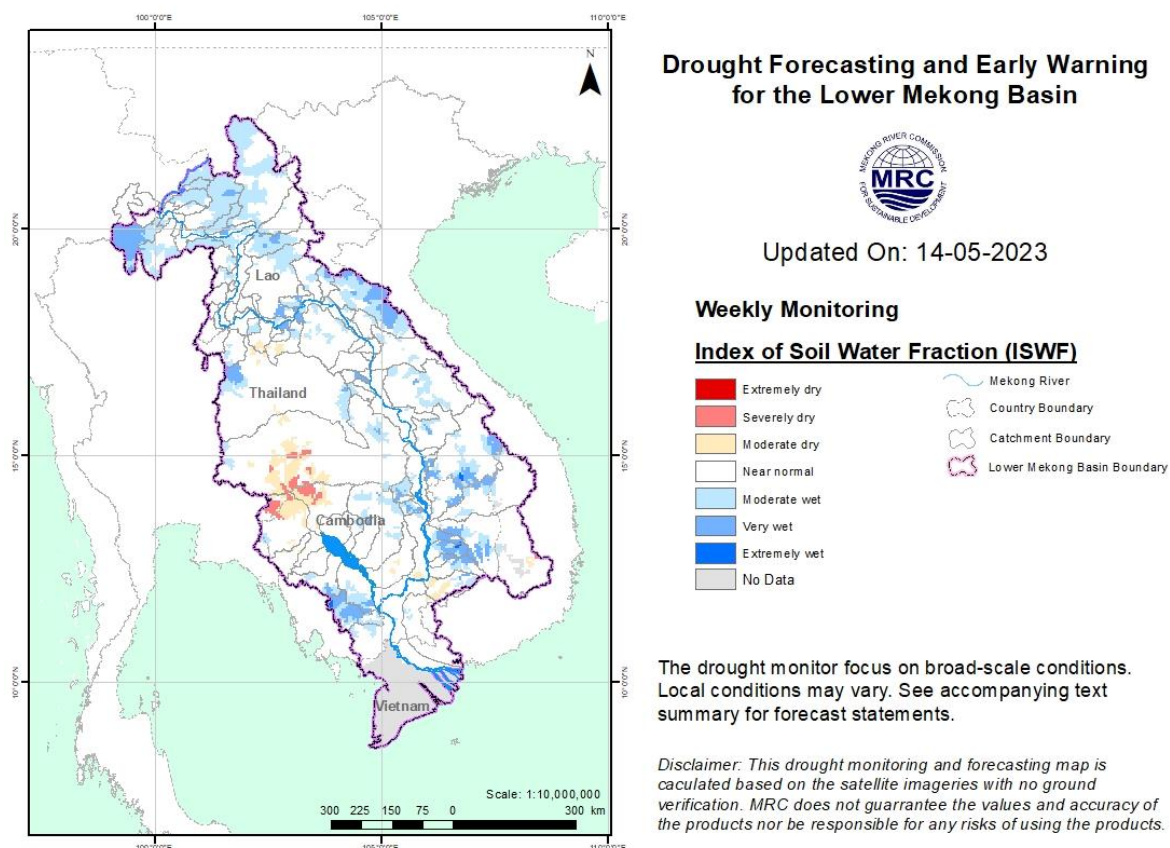


Figure 15: Weekly Index of Soil Water Fraction from May 8 to 14.

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

With a wetter condition of soil moisture during May 8-14, the combined drought indicator in [Figure 13](#) shows that the LMB was facing some moderate and severe droughts mainly in the central area covering Nong Bua Lamphu, Udon Thani, Chaiyaphum, Khon Kaen, Maha Sarakham, Nakhon Ratchasima, Burirum, and Surin in Thailand and Otdar Meanchey and Banteay Meanchey of Cambodia. The situation was much better than it was during May 1-7.

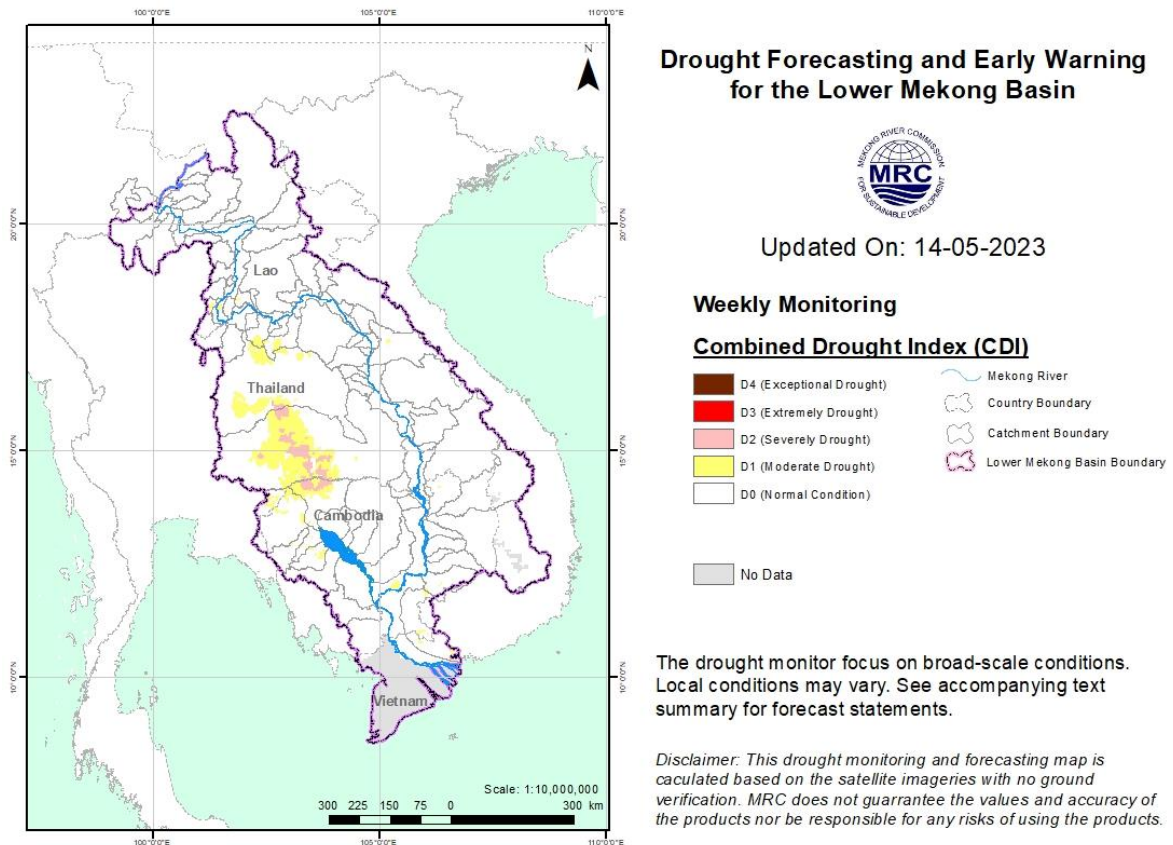


Figure 16: Weekly Combined Drought Index during May 8-14.

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.

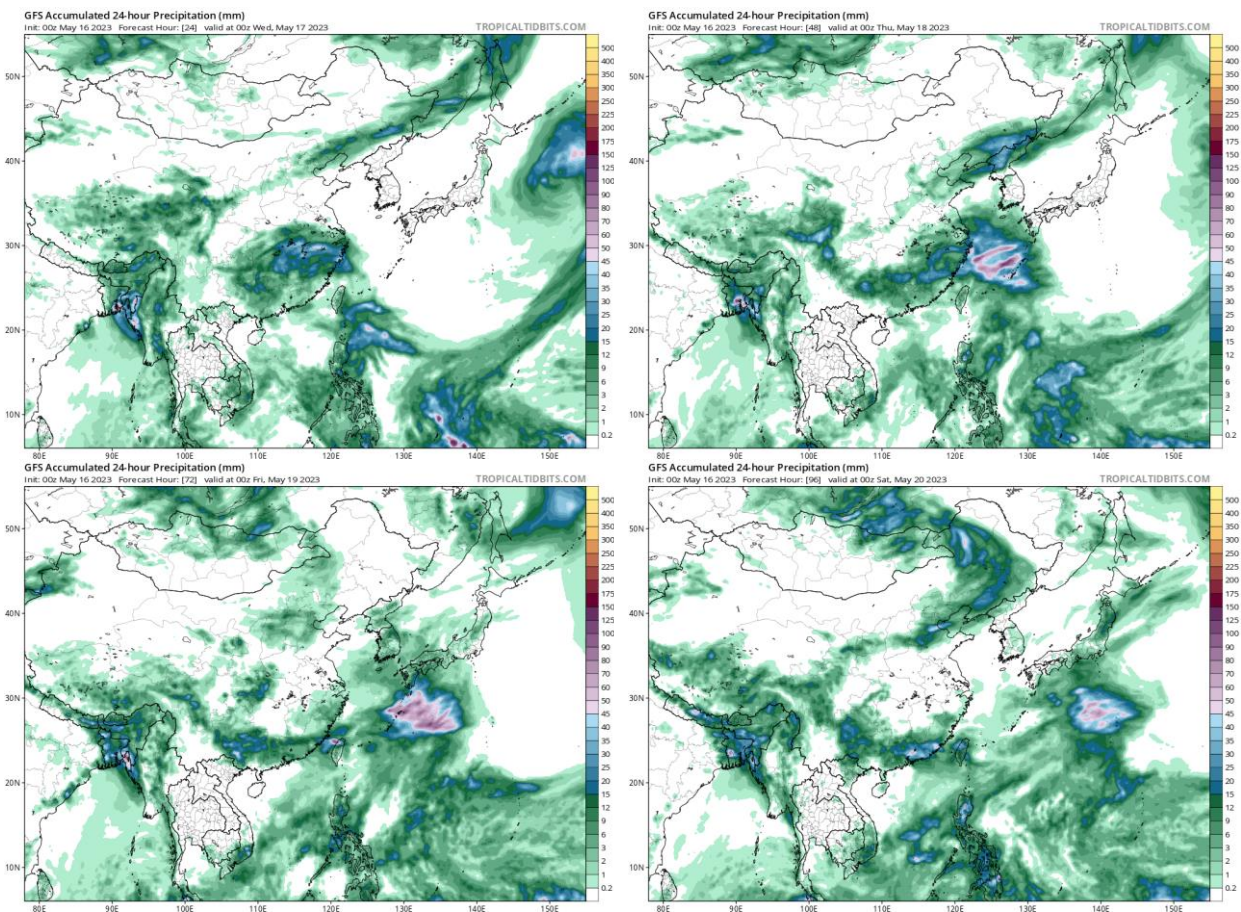
6 Weather and Water Level Forecast and Flash Flood Information

6.1 Weather and rainfall forecast

Based on the result of the Global Forecast System (GFS) model, the heat low-pressure system is likely covering almost the entire LMB from May 16 to 22. In particularly, the south-westerly winds are likely strengthening and prevailing over the Gulf of Thailand and the lower part of LMB from May 21 to 22.

Under the weather forecast patterns for the next coming week, light to moderate rain (5-35 mm/24h) and isolated thundershowers are likely taking place in some areas of the LMB. Especially, heavy rain (40-65mm/24h) will occur in some areas of the lower part of LMB during May 21-22.

[Figure 17](#) shows accumulated rainfall forecast (24hrs) of the GFS model during May 17-22, 2023.



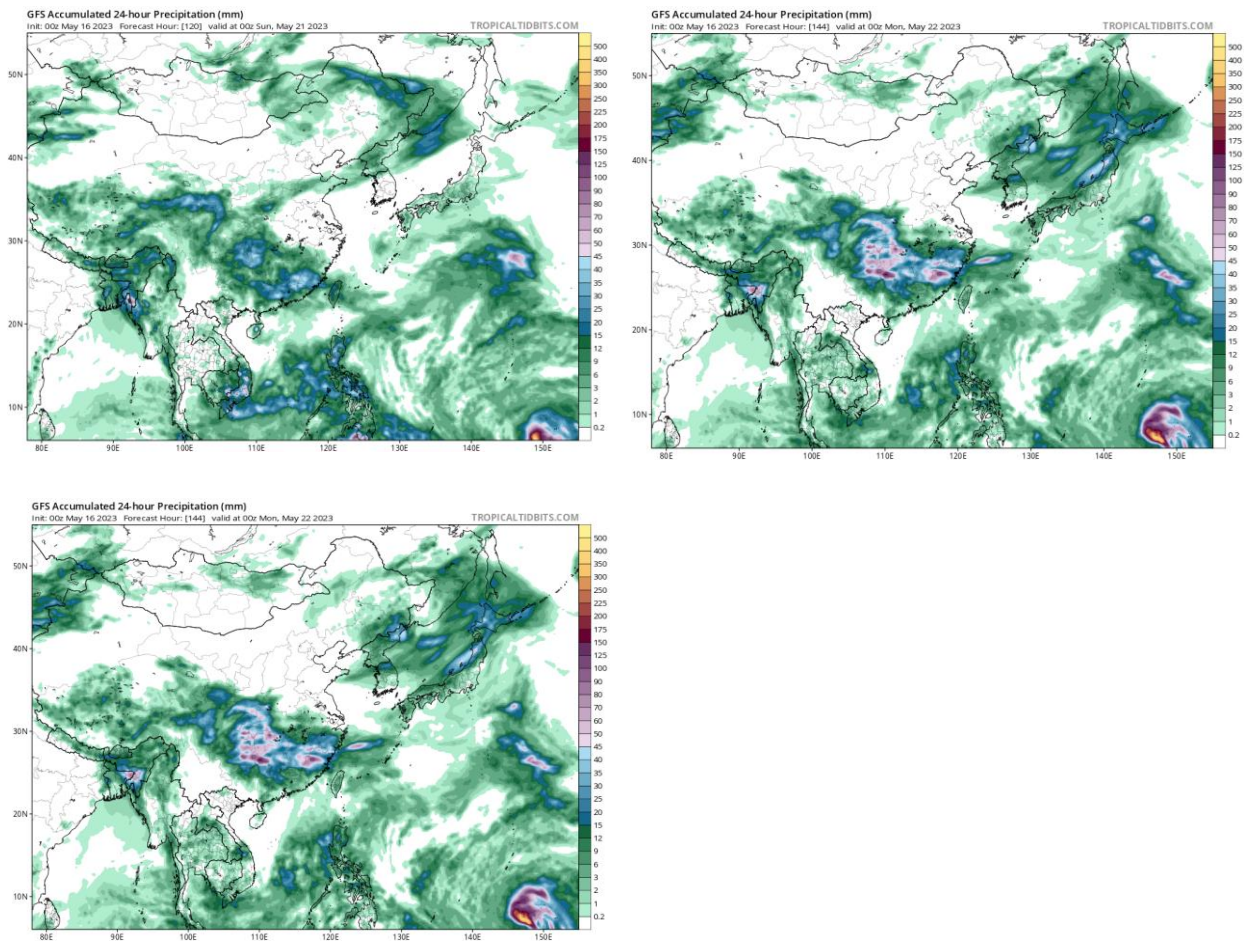


Figure 17: Accumulated rainfall forecast (24 hrs) of model GFS.

6.2 Water level forecast

Chiang Saen and Luang Prabang

Based on May 15's weekly river monitoring bulletin, the weekly forecast water level at Chiang Saen in Thailand is expected to increase from 2.32 m to 2.80 m in the next seven days. The trend of water levels at these stations will continue staying above its LTA. Next week some precipitation is forecasted in the area.

For Luang Prabang in Lao PDR, the water level is likely increasing about 0.50 m during the same period. The current water level is about 2.62 m higher than its LTA and staying about 1.01 m lower than its historical maximum value. Next week some precipitation is forecasted in the area.

Chiang Khan, Vientiane-Nong Khai and Paksane

Water level at Chiang Khan station in Thailand is forecasted to be up about 0.74 m for the next seven days. At Vientiane in Lao PDR and Nong Khai in Thailand WLS will be up by about 1.00 m in the next seven days. At Paksane in Lao PDR, water level will increase about 0.10 m due to some effect of inflows from the upper catchments. Rainfalls are forecasted in the area due

to air pressure dominating in the upper sub-catchments. The water levels here will remain lower than their LTA.

Nakhon Phanom to Pakse

Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR will increase between 0.60 and 0.90 m. Water levels at these stations will stay higher with their LTA level. Next week some precipitation is forecasted in the area.

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

From Stung Treng on the Mekong River in Cambodia, the water level will likely go up about 0.50 m, while at Kratie it will be up about 0.44 m over the next seven days. For Kompong Cham, the WL will be up about 0.26 m and stay below than its LTA. Some rainfall 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 up between 0.02 m and 0.15 m over the next seven days.

Water levels at more than half of the stations will continue to stay lower than their LTA value, particularly in the lower part of the region from the Bassac in Phnom Penh to Koh Khel as well as from Tonle Sap in Prek Kdam to Phnom Penh Port, including the Tonle Sap Lake. Rainfall 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 moving up between their LTA and maximum values following daily tidal effects from the sea.

[Table 3](#) shows the weekly River Monitoring Bulletin issued on May 15. Results of the started weekly river monitoring bulletin are also available at http://ffw.mrcmekong.org/bulletin_wet.php. Tables for weekly updated water levels and rainfall at the Key Stations are presented in **Annex A**.

6.3 Flash Flood Information

Flash flood events are not likely to happen in the LMB next week. However, local heavy rain in a short period of time might still be possible with unexpected short flash floods. During the dry season if extreme weather occurs, the information on flash flood guidance for the next one, three, and six hours is updated at <http://ffw.mrcmekong.org/ffg.php>.

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

6.4 Drought forecast

There are several climate-prediction models with different scenarios in the upcoming months. The MRC’s DFEWS adopts an ensemble model called the North America Multi-Model Ensemble (NMME).

Figure 18 below shows the global NMME forecast of rainfall for May, June and July 2023 over the LMB area.

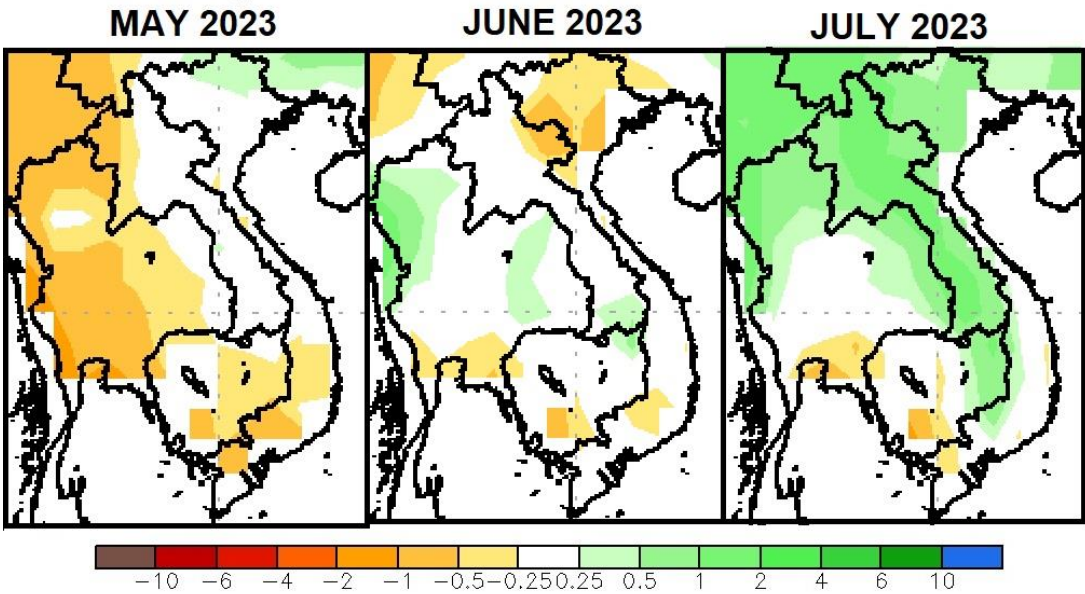


Figure 18. Monthly forecast of SPI for Mar, Apr, and May 2023.

Figure 18 above shows that in **May** the middle and lower parts of the LMB will receive below average rainfall with moderate drought condition. **June** is forecasted to be normal where the region receives average rainfall, in general. And lastly, the LMB is mostly like really wet in **July** forecast except slightly below average rainfall in southern Cambodia in the lower part.

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: 16 May to 22 May 2023

Date: 15 May 2023

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)						
					14-May	15-May	16-May	17-May	18-May	19-May	20-May	21-May	22-May
Jinhong		2.0	-	-	535.34	535.33							
Chiang Saen		5.2	357.110	0.00	2.24	2.32	2.38	2.45	2.50	2.60	2.68	2.75	2.80
Luang Prabang		12.4	267.195	2.53	8.66	9.02	9.10	9.20	9.25	9.30	9.36	9.45	9.53
Chiang Khan		11.6	194.118	1.91	3.77	4.22	4.60	4.68	4.76	4.80	4.84	4.90	4.96
Vientiane		25.5	158.040	-0.28	1.20	1.65	2.12	2.51	2.60	2.69	2.73	2.78	2.85
Nongkhai		22.6	153.648	0.33	0.90	1.05	1.42	1.85	2.15	2.22	2.30	2.33	2.37
Paksane		1.8	142.125	0.10	2.22	2.21	2.30	2.51	2.79	3.00	3.03	3.08	3.10
Nakhon Phanom		4.9	130.961	0.18	1.43	1.34	1.35	1.45	1.66	1.95	2.17	2.20	2.25
Thakhek		16.3	129.629	1.38	2.88	2.78	2.80	2.91	3.13	3.43	3.66	3.69	3.75
Mukdahan		0.9	124.219	0.72	1.88	1.78	1.68	1.70	1.81	2.01	2.30	2.50	2.53
Savannakhet		0.0	125.410	-0.65	1.46	1.44	1.41	1.42	1.50	1.66	1.88	2.04	2.06
Khong Chiam		12.4	89.030	1.02	2.27	2.24	2.13	2.04	2.07	2.20	2.42	2.74	2.97
Pakse		0.0	86.490	0.03	1.35	1.37	1.38	1.40	1.43	1.53	1.70	1.92	2.05
Stung Treng		4.0	36.790	0.32	2.78	2.77	2.79	2.81	2.83	2.86	2.95	3.10	3.30
Kratie		nr	-1.080	3.06	7.42	7.56	7.59	7.63	7.67	7.70	7.74	7.84	8.00
Kompong Cham		nr	-0.930	0.65	2.60	2.54	2.59	2.60	2.63	2.66	2.70	2.73	2.80
Phnom Penh (Bassac)		nr	-1.020	1.58	1.97	1.96	1.97	1.98	1.99	2.01	2.03	2.05	2.09
Phnom Penh Port		-	0.000	0.14	0.92	0.91	0.92	0.93	0.94	0.96	0.98	1.00	1.04
Koh Khel		nr	-1.000	1.52	2.02	1.86	1.79	1.77	1.77	1.80	1.81	1.83	1.84
Neak Luong		nr	-0.330	0.81	1.39	1.55	1.50	1.46	1.47	1.50	1.52	1.54	1.56
Prek Kdam		nr	0.080	0.58	0.94	0.95	0.96	0.97	0.99	1.01	1.04	1.06	1.08
Tan Chau		0.0	0.000	-0.37	-0.04	0.20	0.50	0.70	0.86	0.93	0.99	1.06	1.09
Chau Doc		30.0	0.000	-0.60	0.08	0.33	0.66	0.90	1.10	1.17	1.24	1.32	1.36

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/reportflood.php>

7 Summary and Possible Implications

7.1 Rainfall and its forecast

This week, rainfall was observed from Chiang Saen to Pakse station and from Stung Treng to Tan Chau and Chau Doc along the Mekong River. Compared with last week's amount, the rainfall this week was considered high in the Mekong region.

Based on the forecasted rainfall from satellite using GFS data, some amount of rainfall is forecasted to cover the areas of the lower part from Cambodia to the 3S area and Mekong Delta in Viet Nam from 16 to 22 May 2023. There will be from moderate to extreme rainfall occurring from the central to the southern part of LMB (especially, over Cambodia), central and southern Lao PDR, and Central Viet Nam.

7.2 Water level and its forecast

The MRC's observed water level (WL) at Jinghong showed a decreased level from 536.09 m to 535.33 m between 09 and 15 May 2023 (recorded on 7:00 am) while the outflow decreased from 1,430.00 m³/s to 840.00 m³/s between 09 and 15 May 2023.

Mekong water levels this week remain as normal condition—with 4 out of 22 stations have water levels below their long-term average. In general, this hydrological condition is influenced by the inflows from the upper Mekong River in China and dam operations in the tributaries of the Lower Mekong River Basin.

Stay updated with our river monitoring and forecasting to better prepare for flood and drought events. Find more details at <https://www.mrcmekong.org/>.

The flow volume of the Tonle Sap Lake is lower than its LTA (about 83%). From next week, the flow is expected to be increasing due to some rainfall is forecasted in the inflow catchments of the Tonle Sap Lake.

From Stung Treng to Kratie, the water levels will most likely go up, while at Kompong Cham they will also go up. 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 stay close with their LTA.

The situation in Tan Chau on the Mekong River and Chau Doc on the Bassac River is expected to remain fluctuating. In Tan Chau and Chau Doc, the fluctuation of water levels will move higher than their LTA value during the monitoring period, which will **considered normal**.

Since the third week of September 2022, water levels across most monitoring stations in the LMB have increased due to the above-average rainfall but still staying lower than their LTA value (from middle to lower stretches within the LMB). The preliminary analysis of the hydrological conditions in the LMB over July–December 2020 and from 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 of rainfall for the coming week as mentioned earlier in [section 6.1](#), major flash floods are not likely to happen in the LMB.

7.4 Drought condition and its forecast

During May 8-14, the LMB was facing some moderate and severe droughts mainly in the central area covering Nong Bua Lamphu, Udon Thani, Chaiyaphum, Khon Kaen, Maha Sarakham, Nakhon Ratchasima, Burirum, and Surin in Thailand and Ordar Meanchey and Banteay Meanchey of Cambodia. The situation was much better than it was during May 1-7.

In this **May** the middle and lower parts of the LMB will likely receive below average rainfall with moderate drought conditions. **June** is forecasted to be normal where the region receives average rainfall, in general. And lastly, the LMB is mostly like really wet in **July** forecast except slightly below average rainfall in southern Cambodia in the lower part.

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

Table A1: Weekly observed water levels

2023	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
09-05-2023	536.09	1.41	8.72	3.28	0.97	0.92	2.42	1.56	3.29	1.85	1.45	2.16	1.27	2.62	7.09	2.50	1.74	0.75	1.64	1.10	0.93	-0.29	-0.47
10-05-2023	536.08	1.71	8.70	3.32	0.93	0.86	2.41	1.55	3.07	1.88	1.51	2.21	1.33	2.64	7.17	2.50	1.71	0.69	1.78	1.04	0.97	-0.53	-0.51
11-05-2023	536.09	2.03	8.72	3.28	0.96	0.88	2.29	1.56	3.21	1.92	1.52	2.25	1.32	2.67	7.23	2.58	1.87	0.84	1.88	1.22	0.97	-0.42	-0.36
12-05-2023	536.00	2.15	8.74	3.26	0.92	0.88	2.27	1.48	3.06	1.90	1.50	2.29	1.37	2.74	7.26	2.66	1.96	0.91	1.94	1.28	0.98	-0.35	-0.25
13-05-2023	535.48	2.20	8.62	3.36	0.97	0.92	2.31	1.48	2.70	1.86	1.48	2.30	1.40	2.74	7.40	2.52	1.91	0.87	1.96	1.22	0.96	-0.20	-0.10
14-05-2023	535.34	2.24	8.66	3.77	1.20	0.90	2.22	1.43	2.88	1.88	1.46	2.27	1.35	2.78	7.42	2.60	1.97	0.92	2.02	1.39	0.94	-0.04	0.06
15-05-2023	535.33	2.32	9.02	4.22	1.65	1.05	2.21	1.34	2.78	1.78	1.44	2.24	1.37	2.77	7.56	2.54	1.96	0.91	1.86	1.55	0.95	0.20	0.31

Table A2: Weekly observed rainfall

2023	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
09-05-2023	0	42.5	41.6	0	0	1.1	2.4	0	5.8	0	0	5.9	46.3	0	0	1.3	21		14.1	63.5	17.3	12.9	9
10-05-2023	4	0.1	0	0	0	0	0	0	0	0	0	19.5	0	2.1	0	0	0		0	0	0	0	0
11-05-2023	1.5	17.4	8	19	0	5.3	0	34.9	36.2	30.3	31.8	87.3	32.2	2	88	0	0		0	0.8	0	20	40
12-05-2023	0	0	17.8	0	0	10	2.2	1.2	0.3	0	5	30	0	0	0	0	0		0	0	0	0	0
13-05-2023	3	6.3	16.2	22.5	81.6	115.5	3.2	0	0	1.4	0	56.6	45.8	1.8	8.7	6.5	15.2		0	5.6	0	0	4
14-05-2023	19.5	23.6	4.4	0	10.2	7.8	3.6	0.3	0	3.6	5.4	0	13.1	1	0	0	0		0	0	0	0	0
15-05-2023	2	5.2	12.4	11.6	25.5	22.6	1.8	4.9	16.3	0.9	0	12.4	0	4	0	0	0		0	0	0	0	30
Sum	30.0	95.1	100.4	53.1	117.3	162.3	13.2	41.3	58.6	36.2	42.2	211.7	137.4	10.9	96.7	7.8	36.2		14.1	69.9	17.3	32.9	83.0



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