



**Mekong River Commission**

# **Weekly Dry Season Situation Report in the Lower Mekong River Basin**

**28 December 2021-03 January 2022**

Prepared by  
The Regional Flood and Drought Management Centre  
04 January 2022

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Mekong River Commission

Documentation and Learning Centre

184 Fa Ngoum Road, Unit 18, Ban Sithane Neua, Sikhottabong District, Vientiane 01000, Lao PDR

Telephone: +856-21 263 263 | E-mail: [mrcs@mrcmekong.org](mailto:mrcs@mrcmekong.org) | [www.mrcmekong.org](http://www.mrcmekong.org)

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## Key Messages

Key messages for this weekly report are presented below.

### Rainfall and its forecast

- During December 28-January 3, no rainfall was observed over the Mekong region.
- There will be some rain for the next 7 days over the Mekong region from 4 to 10 January 2022 due to a low-pressure line dominating the Mekong region.

### Water level and its forecast

- The MRC's observed water level at Jinghong showed a slight increase of about **0.03 m from 535.23 m on 28 Dec 2021 to 535.26 on 3 Jan 2022** (recorded on 7:00 am), and stayed about 0.33 m below its two-year average (2020-2021) value. The outflow was down from 825 m<sup>3</sup>/s on 28 Dec 2021 to 807 m<sup>3</sup>/s on 3 Jan 2022.
- Amid the slightly increased outflow from Jinghong upstream, water level of monitoring station at **Chiang Saen in Thailand dropped about 0.09 m from 28 Dec 2021 to 3 Jan 2022 and stayed 0.35 m below its long-term average (LTA), considered critical.** Moreover, water level at Lao PDR's Luang Prabang decreased about 0.19 m compared with last week and stayed close to its historical maximum value. WLs at the monitoring stations from Chiang Khan to Vientiane in Thailand and Lao PDR decreased about 0.05 m and stayed below their LTA value. The current WL from Nong Khai in Thailand to Paksane in Lao PDR are lower than their historical minimum level, which considered very critical. WL from Thailand's Nakhon Phanom to Savannakhet in Lao PDR decreased about 0.25 m and continued staying below their LTA level. WL at Savannakhet in Lao PDR dropped down to its historical minimum level, which considered very critical. Water levels from the stretches of the river from Stung Treng to Kratie and at Kompong Cham in Cambodia, moreover, were decreasing due to less contributed rainfall from the upstream part (at Pakse and 3S area in Viet Nam).
- The water volume of the Tonle Sap Lake up to 3 Jan 2022 was lower than its LTA but higher than the levels in 2019, 2020 and 2021 during the same period from 28 December 2021 to 3 January 2022, and still considered critical.
- Over the next seven days, the water levels across most monitoring stations are expected to go down and remain lower than their long-term average value in most stations.

### Drought condition and its forecast

- Drought condition of the LMB from 26 December 2021 to 1 January 2022 was normal all over the LMB except some moderate drought in north-eastern part due to severely dry soil moistures during the beginning of dry season. The region showed no significant threat except some moderate and severe dry soil moistures in the upper and middle parts of the LMB.
- For the upcoming three-month forecast, the LMB is likely to receive average rainfall and under normal conditions in January. In February the region is forecasted to get some rain in the lower part of the LMB covering mainly Viet Nam. While, in March it is

forecasted that the entire LMB will be much wetter than its long-term mean of March mainly over the central and lower parts of the region.



# 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 **28 December 2021-03 January 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 – 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](http://ffw.mrcmekong.org/bulletin_wet.php).

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

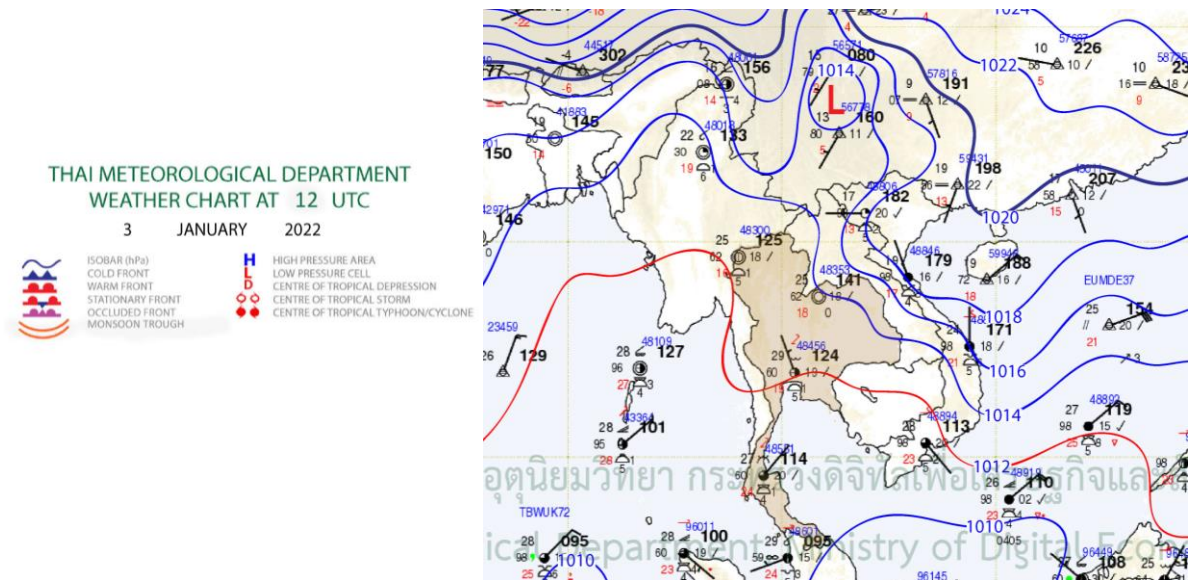
Flash flood information is accessible at: <http://ffw.mrcmekong.org/ffg.php>

## 2 General Weather Patterns

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

Since the end of December 2021, the cold weather appears because the influentially high-pressure air mass areas prevailing 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 bring cool 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 drop sharply as commonly chilly weather, specifically at the upper portion of the northern and north-eastern parts together with very cold weather in mountainous areas (within the Mekong region).

[Figure 1](#) presents the weather map of 03 January 2022, showing a line of low pressure of the Monsoon Trough crossing the upper Mekong region which means rainfall is forecasted for the next few days over the LMB.



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

According to the ASEAN Specialised Meteorological Centre (ASMC), a highest probability of warm conditions is predicted over of the lower part of the Mekong region covering Lao PDR and Thailand from 27 December 2021 to 09 January 2022, during the 4<sup>th</sup> and 1<sup>st</sup> weeks of December and January, respectively. Moreover, in Viet Nam of the LMB it is likely dominated by wetter condition, which may receive cool temperature in general in the Lower part of the LMB. **Figure 2** shows the outlook of weather condition from 27 December 2021 to 9 January 2022 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

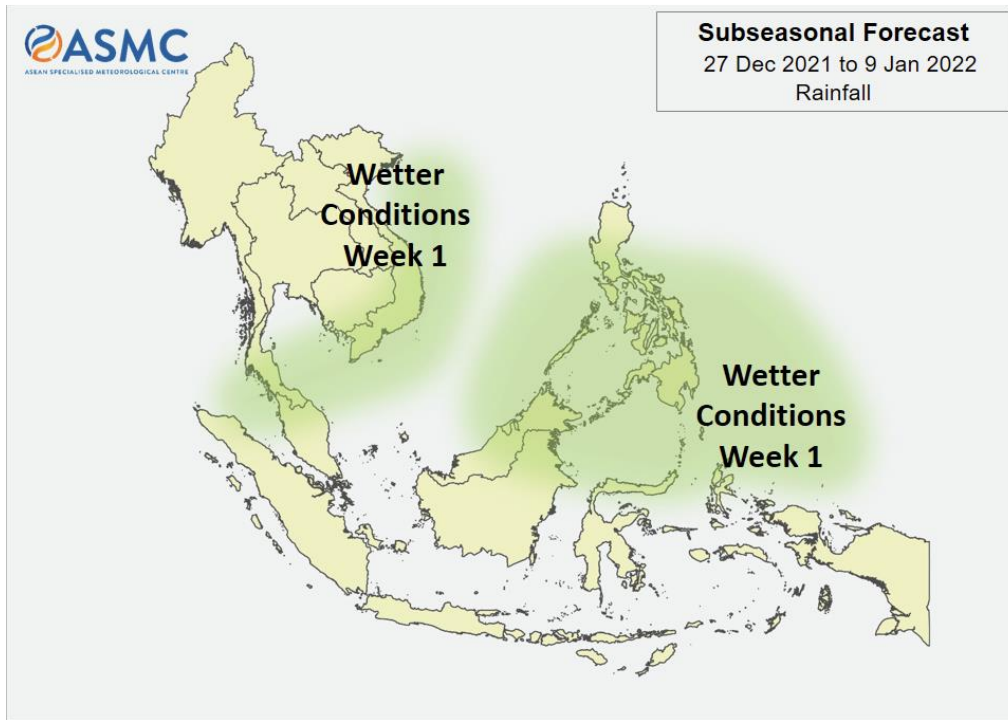


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There was tracking storm covering the LMB during 28 Dec 2021-3 January 2022, but a low-pressure line over the LMB might bring some rain in the next few days. No movement of storm was detected over Viet Nam, as displayed in [Figure 3](#).

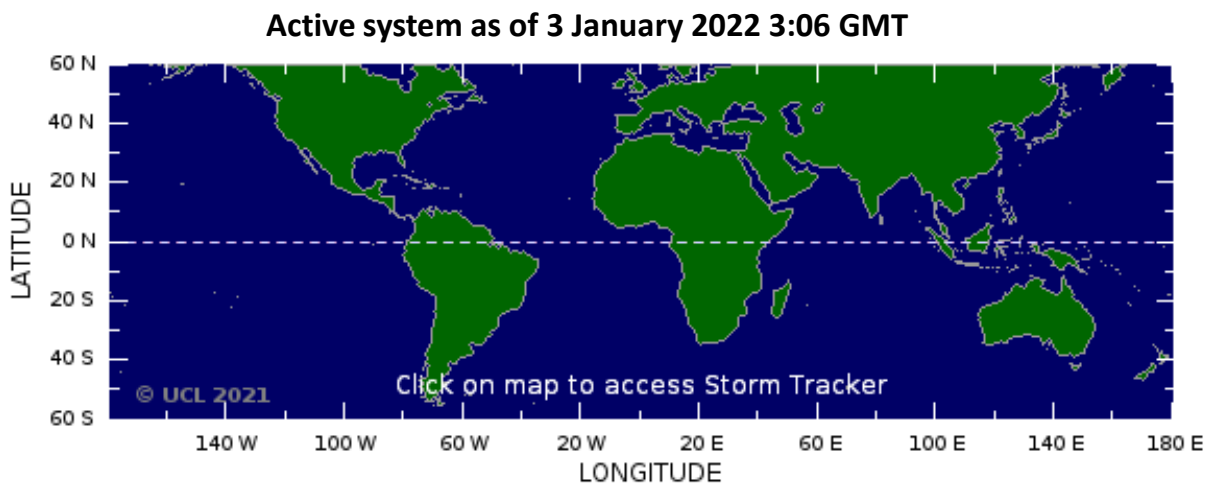
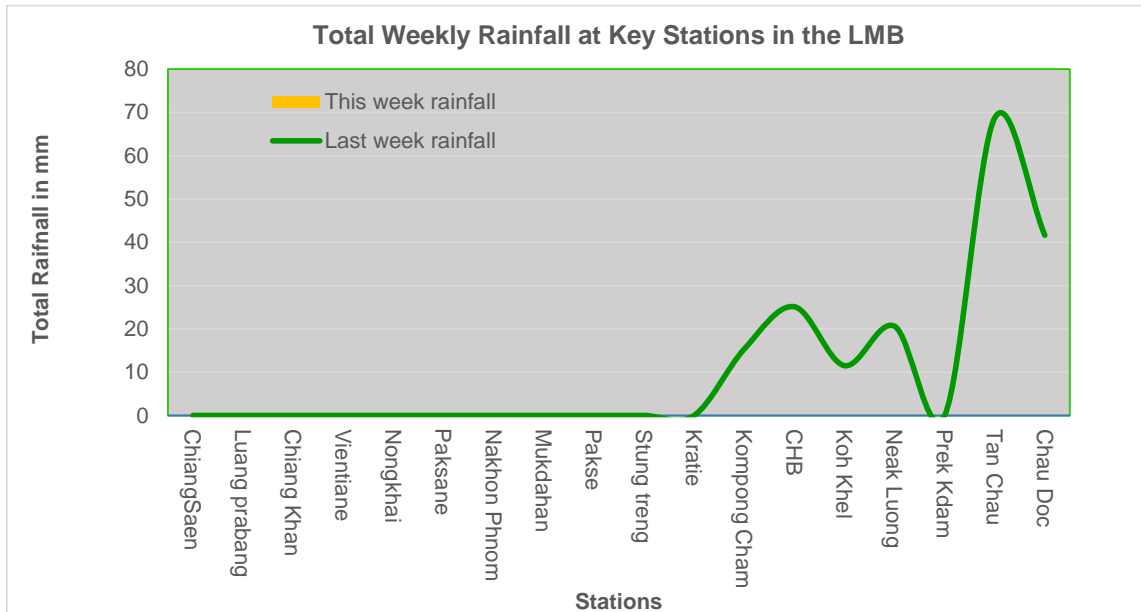


Figure 3: No tropical storm risk observed on 3 January.

## Rainfall patterns over the LMB

This week, no rainfall observed over the Mekong region. The rainfall from 28 December to 3 January, compared with last week rainfall is shown 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 28 December 2021 to 3 January 2022.

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

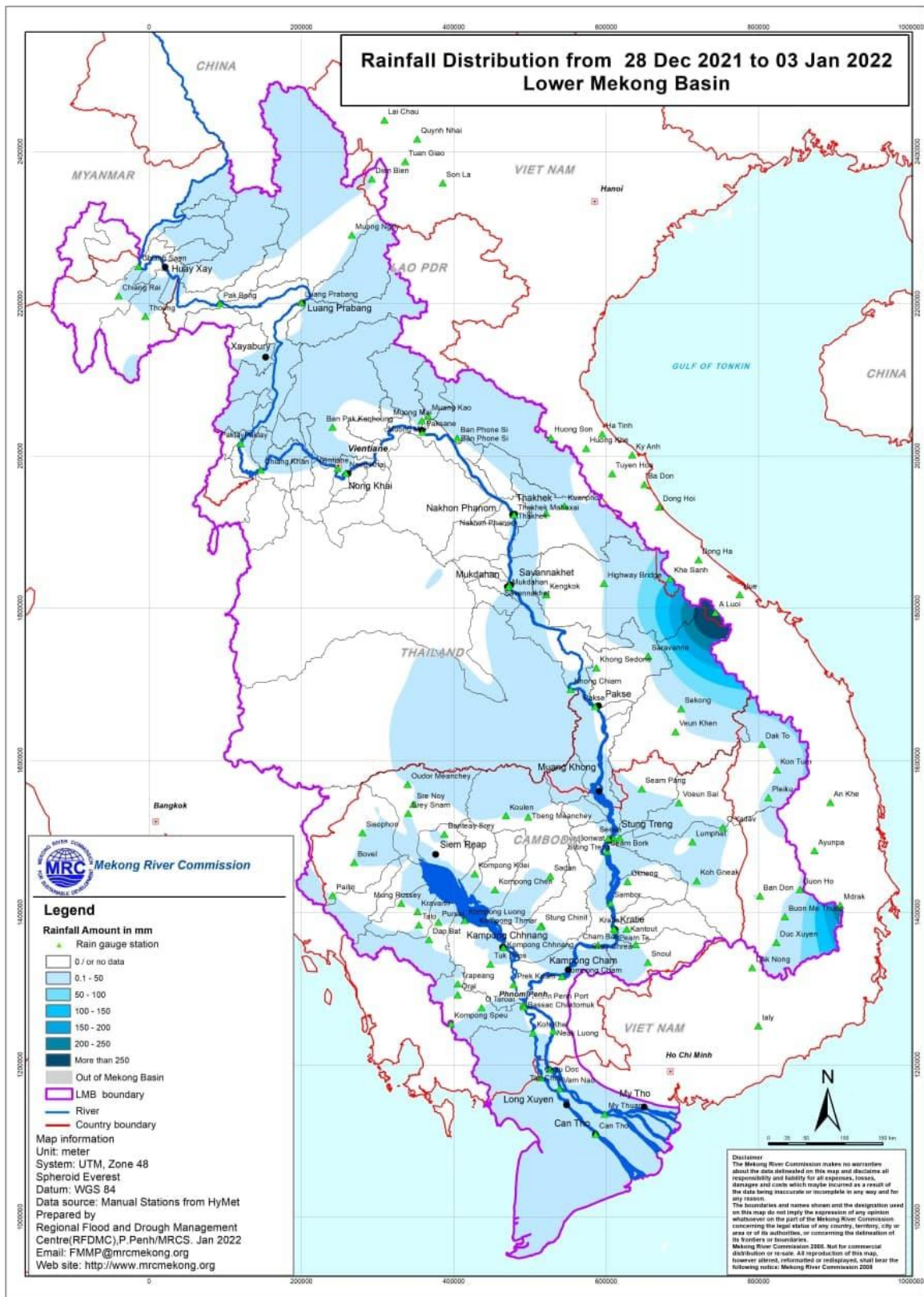


Figure 5: Weekly rainfall distribution over the LMB.



### 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**.

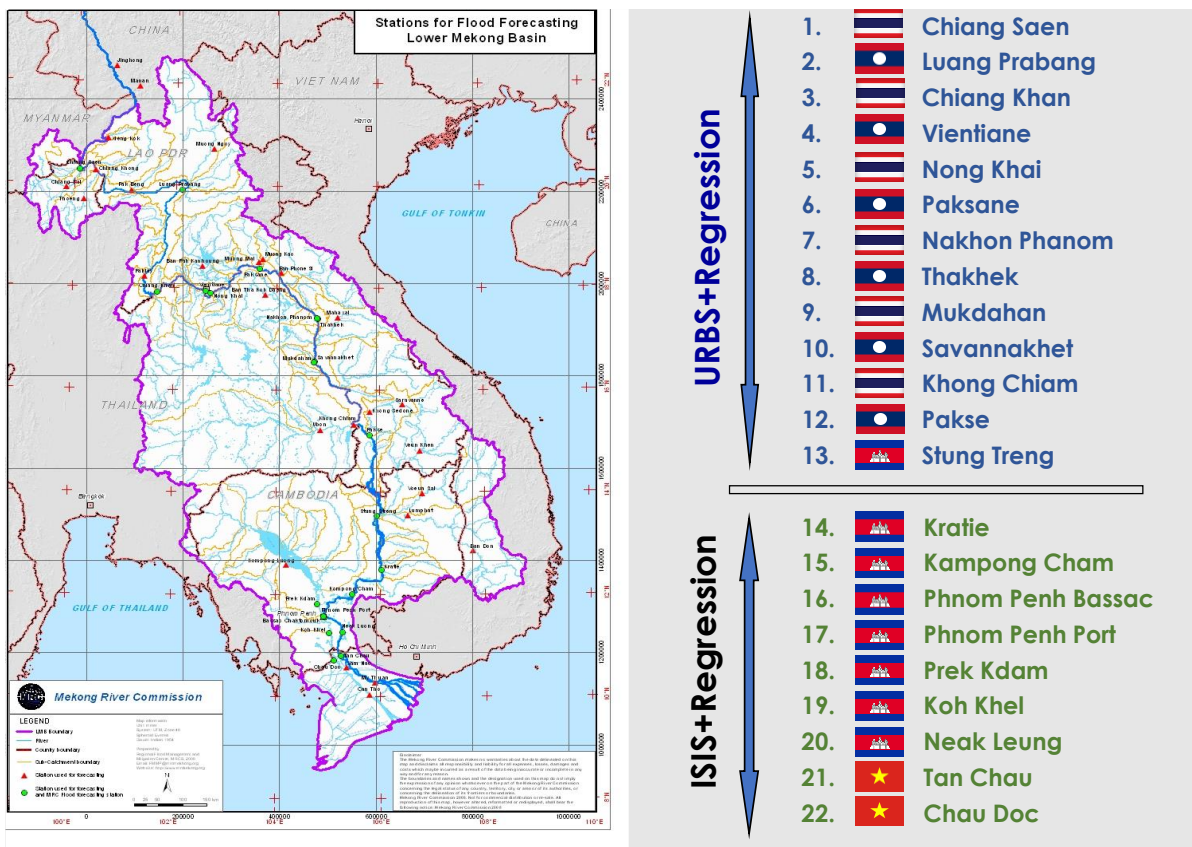
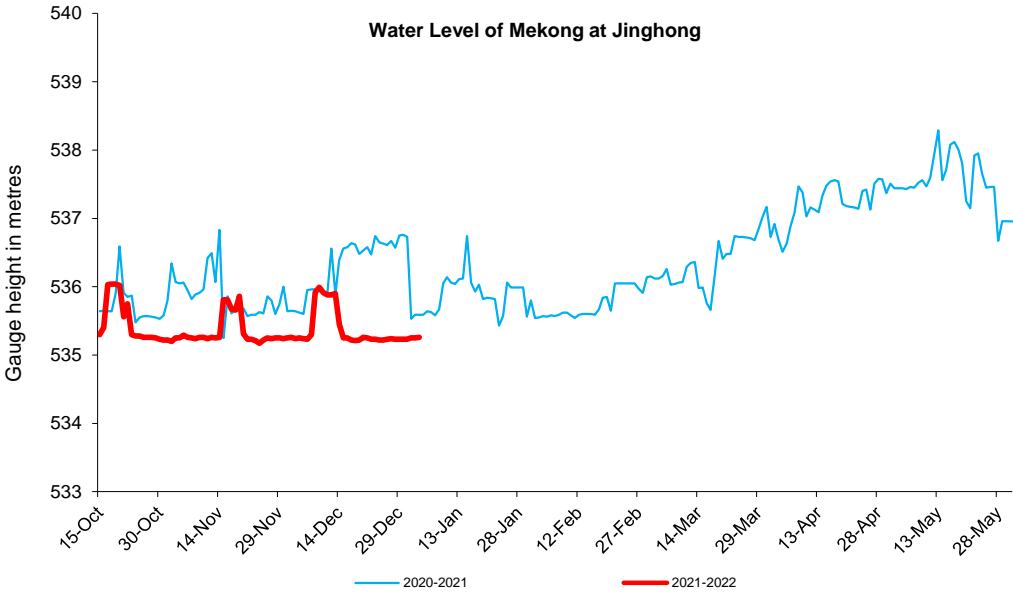


Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.

The MRC’s observed water level at Jinghong showed slightly **increased of about 0.03 m from 535.23 m on 28 Dec 2021 to 535.26 m on 3 Jan 2022 (recorded on 7:00 am)**, and stayed about 0.33 m lower than its two-year average (2020-2021) value. The Eyes on Earth (Mekong Dam Monitor) Natural Flow Model indicates that 39% of water is missing at the gauge in Chiang Saen, Thailand and just under 48% of water is missing at Vientiane, Lao PDR. Flow restrictions from dams over the course of the last month are the main driver of missing water throughout the mainstream. Three parts of the Mekong are extremely wet for this time of the year: the headwaters in Tibet, the 3S Basin and western Cambodia. The Tonle Sap basin and eastern part of Cambodia are much drier than average. Also, the Mekong Delta was much drier than normal last week. The outflow was down from 825 m<sup>3</sup>/s on 28 Dec 2021 to 807 m<sup>3</sup>/s on 3 Jan 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 3 January 2021.



**Figure 7. Water level at the Jinghong hydrological station during 15 Oct 2021 to 3 Jan 2022.**

Amid the slightly increased outflow from Jinghong upstream, water level of monitoring station at Chiang Saen in Thailand decreased about 0.09 m from 28 Dec 2021 to 3 Jan 2022 and stayed about 0.35 m lower than its long-term average (LTA), considered critical. Moreover, water level at Lao PDR’s Luang Prabang decreased about 0.19 m compared with last week and stayed close to its historical maximum value. WLS at the monitoring stations from Chiang Khan to Vientiane in Thailand and Lao PDR decreased about 0.05 m and stayed below their LTA value. The current WLS from Nong Khai in Thailand to Paksane in Lao PDR are lower than their historical minimum level, which considered very critical. WL from Thailand’s Nakhon Phanom to Savannakhet in Lao PDR decreased about 0.25 m and continued staying below their LTA level. WL at Savannakhet in Lao PDR dropped down to its historical minimum level, which considered very critical. Water levels from the stretches of the river from Stung Treng to Kratie

<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>.

and at Kompong Cham in Cambodia, moreover, were decreasing due to less contributed rainfall from the upstream part (at Pakse and 3S area in Viet Nam).

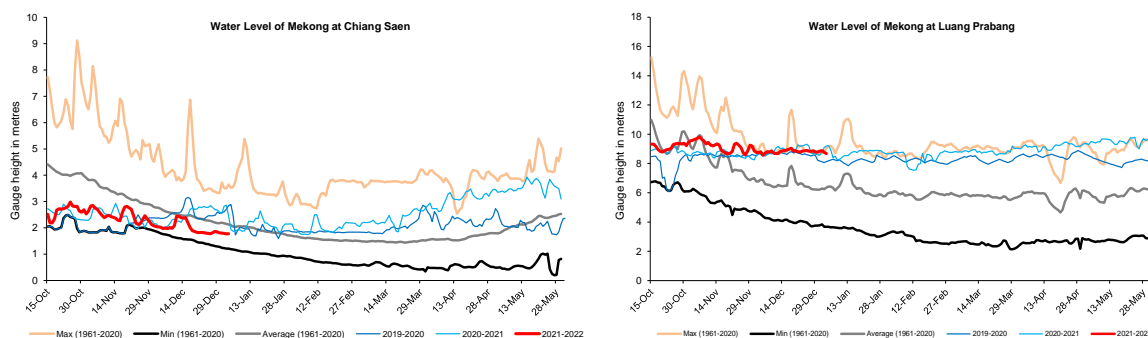
Based on hydrological phenomenon, the contribution of inflow water from the upstream of Lancang-Mekong in China to the Mekong mainstream is about 16% in total during the wet season from June to October and about 25% in total during the dry season from November to May. The whole inflow of water into the LMB is influenced by rainfall at the Mekong mainstream and its tributaries during the wet season.

### Chiang Saen and Luang Prabang

Water level during December 28-Jan 3 at Thailand’s Chiang Saen decreased from 1.87 m to 1.78 m and stayed about 0.35 m lower than its Long-Term-Average (LTA), which is considered critical. When compared to last week, this week’s water level is relatively lower.

Water level at the Luang Prabang station in Lao PDR slightly decreased from 8.87 m to 8.68 m, during the reporting period. Compared to last week, the figure shows down by about 0.19 m. The water level at this station was 0.35 m lower than its 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.**



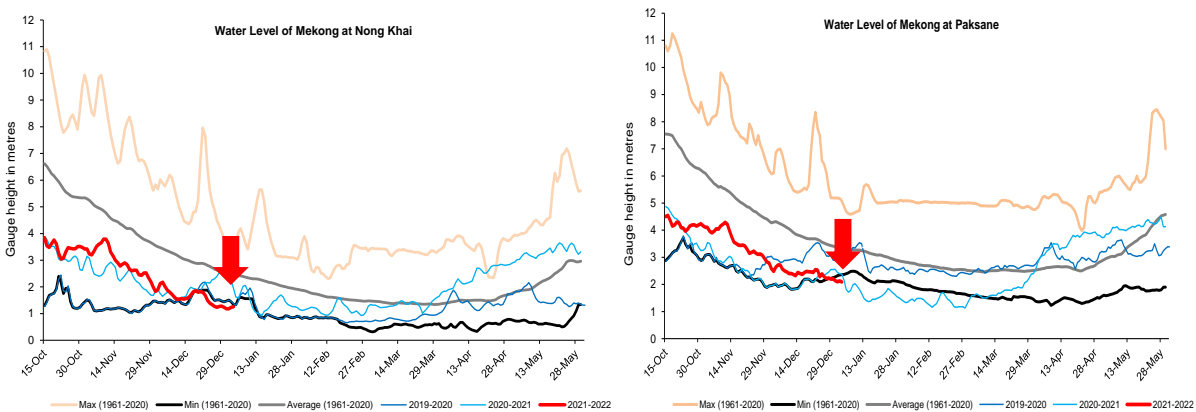
**Figure 8. Water levels at Chiang Saen in Thailand and Luang Prabang in Lao PDR.**

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

The water level at Chiang Khan in Thailand (downstream of the Xayaburi dam) decreased during the reporting week. It showed 0.71 m lower than its LTA. Furthermore, water level downstream at Vientiane in Lao PDR decreased from 1.94 m to 1.93 m and was about 0.01 m higher than its LTA during 28 Dec-3 Jan. At Nong Khai station in Thailand, the water level was also down during the reporting period. It decreased from 1.27 m to 1.26 m and showing 0.08 m lower than its historical minimum value, **which considered very critical**. At Paksane in Lao PDR, water levels decreased about 0.15 m, down from 2.24 m to 2.09 m. **The current water levels at Paksane in Lao PDR are lower than its historical minimum level, which considered**



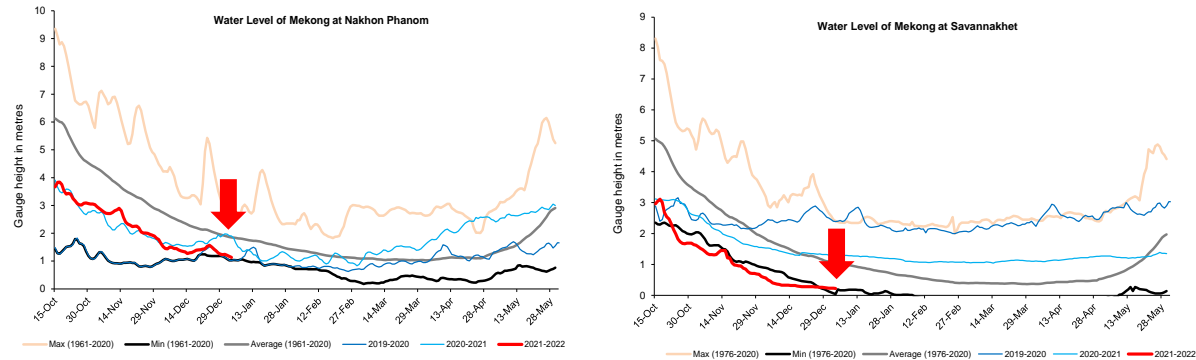
**very critical.** The recently decreased water levels were obvious due to low inflow from upstream, less rainfall in the sub-catchment area and water released from upstream. The water levels at Nong Khai and Paksane are shown in [Figure 9](#) below.



**Figure 9. Water levels Nong Khai and Paksane in Thailand and Lao PDR.**

**Nakhon Phanom to Pakse**

Similarly, water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR decreased in between 0.05 m and 0.25 metres, during the reporting period. **Water levels at these stations were staying below their LTA level.** The current WL at Savannakhet in Lao PDR is **close to its historical minimum level, which considered very critical.** [Figure 10](#) shows the water levels at Nakhon Phanom and Savannakhet stations.

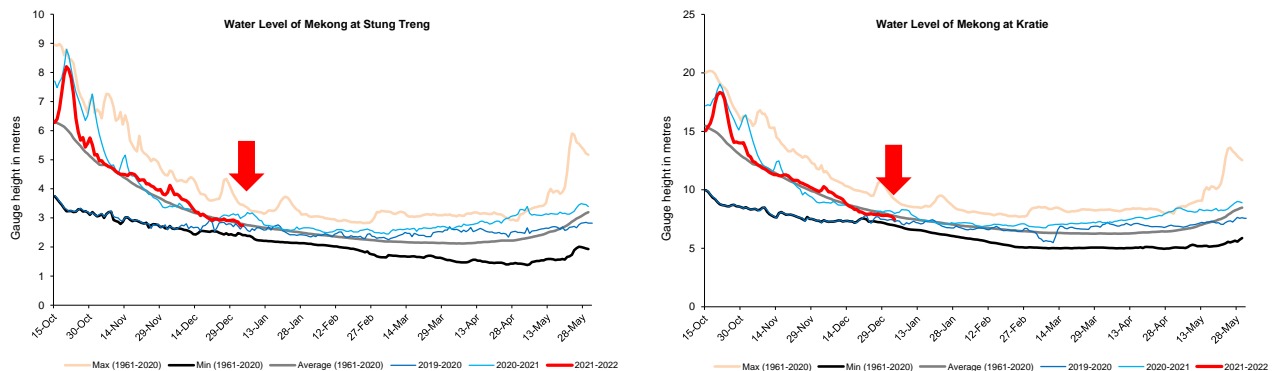


**Figure 10: Water levels at Nakhon Phanom and Savannakhet of Thailand and Lao PDR.**

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

Due to some 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 were decreasing during 28 December 2021-3 January 2022. This week water level from Stung Treng to Kratie decreased about 0.16 m and 0.36 m, respectively. Water levels at Stung Treng and Kratie are staying about 0.04 m and 0.29 m lower than their LTA value respectively, while water level at Kompong Cham was about 0.95 m below their LTA (as showed in [Figure 11](#)).

This week, the Water levels at Stung Treng and Kratie were 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 less contributed flows from upstream catchment, the water level was down by about 0.02 m and stayed 1.05 m lower than its LTA value; while at Koh Khel, water level decreased about 0.08 m, staying 0.62 m lower than its LTA value. The water level at Prek Kdam on the Tonle Sap Lake decreased about 0.17 m and was about 0.70 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 decreased water level was due to low 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 Kompong Luong) followed the same trend of Prek Kdam station's water level. **Water levels at these stations were staying below their LTA level, which still considered critical.**

### Tidal stations at Tan Chau and Chau Doc

Like last week, the water levels from 28 December 2021 to 3 January 2022 at Viet Nam's Tan Chau and Chau Doc were fluctuating in between their LTA and maximum values due to daily tidal effects from the sea. The fluctuation levels were between 1.00 m and 1.59 m. In Chau Doc, the fluctuation of water level was higher than its Maximum level, which **considered very critical**. For Tan Chau, the fluctuation was in between the range of its LTA and Maximum level, **which consider normal**.

### 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 into the Mekong River and then to the Delta. This phenomenon normally takes place from end of September to October. Based on flow observation at Prek Kdam, the outflow of the Tonle Sap Lake was taking place since 10 October 2021.

[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 and 2020, and their LTA level (1997-2020). Up to January 3 of this reporting period, **it was observed that the main outflow to Tonle Sap Lake slightly 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 2021 is higher than 2019 and 2020 outflow conditions. The early outflow of 2022 is also higher than 2019, 2020 and 2021. For next week, less rainfall is forecasted for the Tonle Sap area; thus, the outflow into the Tonle Sap Lake is likely continuing to decrease from the current level.

Figure 13 shows seasonal changes in monthly flow volumes up to 3 January 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 January 3, the water volume of the Tonle Sap Lake was lower than its LTA but higher than 2019, 2020, 2021 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 critical***.

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.

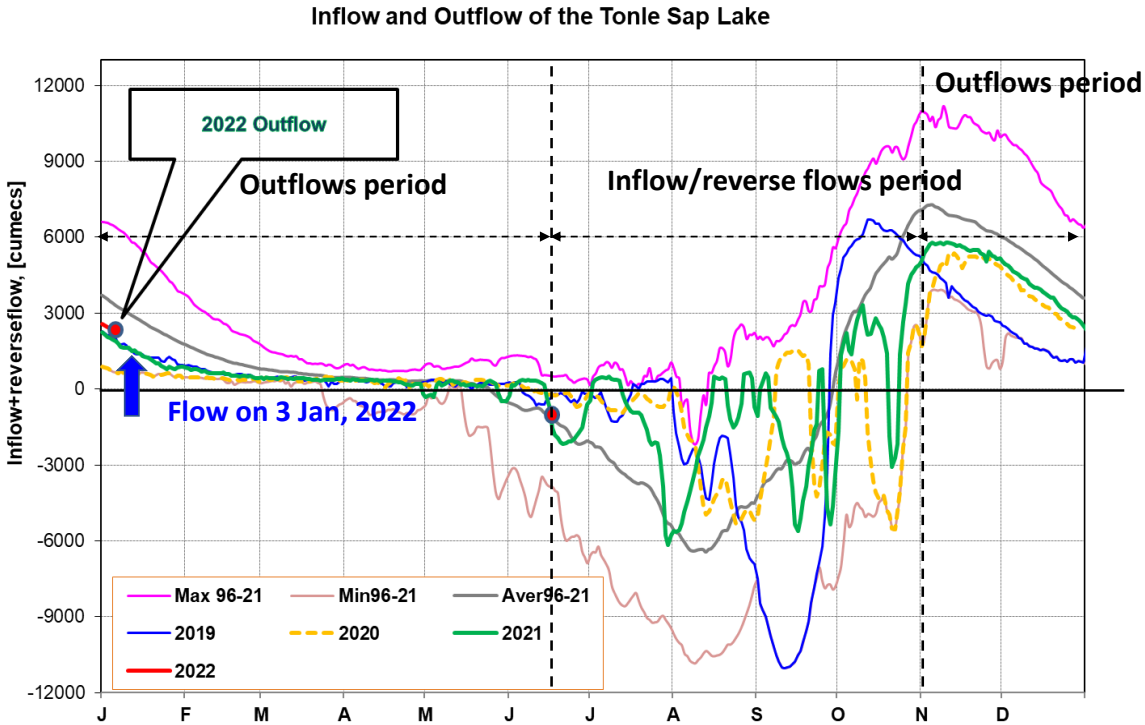
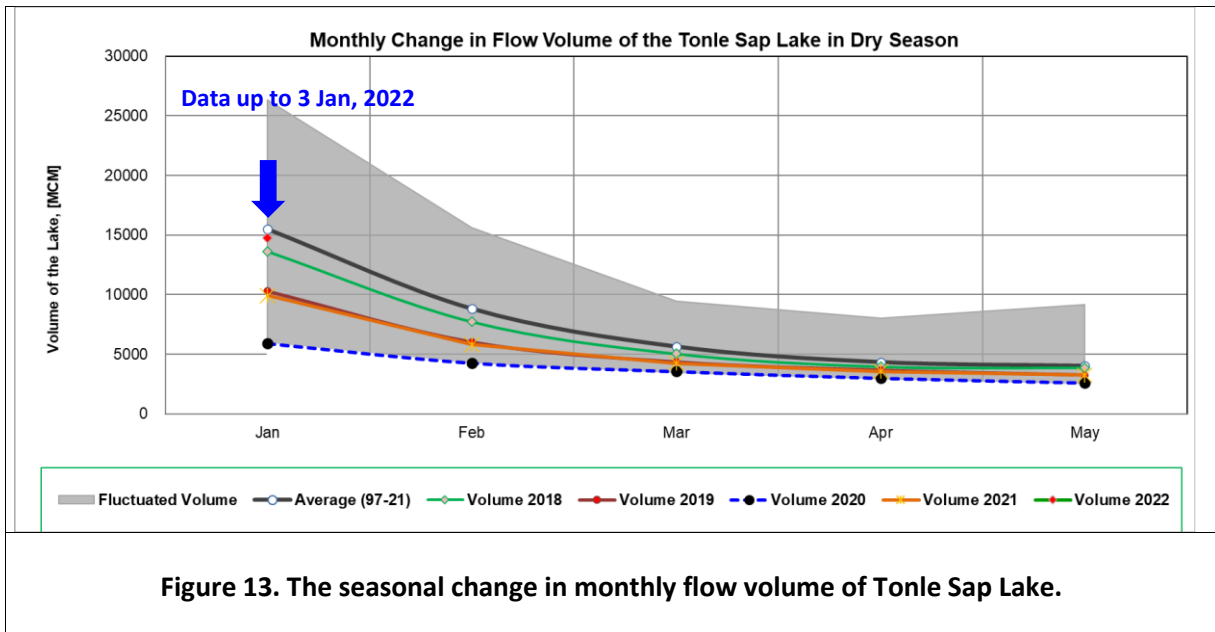


Figure 12: Seasonal change of inflows and outflows of Tonle Sap Lake.



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

Month	Average Volume (97-21) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2018 [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]	Volume 2022 [MCM]
Jan	15523.23	26357.53	5906.80	13633.41	10285.31	5906.80	9923.80	14745.78
Feb	8837.89	15596.22	4198.60	7729.72	6019.30	4264.19	5832.97	
Mar	5654.18	9438.24	3347.07	5037.06	4354.62	3553.99	4264.88	
Apr	4346.65	8009.14	2866.91	3956.47	3667.47	2992.61	3556.68	
May	4030.23	9176.93	2417.81	3864.00	3266.43	2594.92	3240.78	
Jun	5708.30	13635.01	2468.70	5919.18	3517.06	2641.88	3798.29	
Jul	11493.25	28599.56	2925.86	12024.96	4001.99	2925.86	5346.73	
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> )								

## 4 Flash Flood in the Lower Mekong Basin

During 28 December 2021 - 3 January 2022, the LMB was affected by three main weather factors. These include (i) The active high pressure covered upper and middle parts of the region on the weekend; (ii) the westerly trough moved through the upper northern part on December 30; (iii) the active northeast monsoon prevailed over the Gulf of Thailand. These conditions caused generally cool weather in the northern and north-eastern parts while the central and eastern parts had cold weather in several areas particularly during the second half of the week.

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 26 December 2021 to 01 January 2022

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

Meteorological drought condition of the LMB from December 26 to January 1, as shown in [Figure 11](#), was normal in most parts of the region. Weekly SPI map shows that the LMB received average rainfall in most parts of the region.

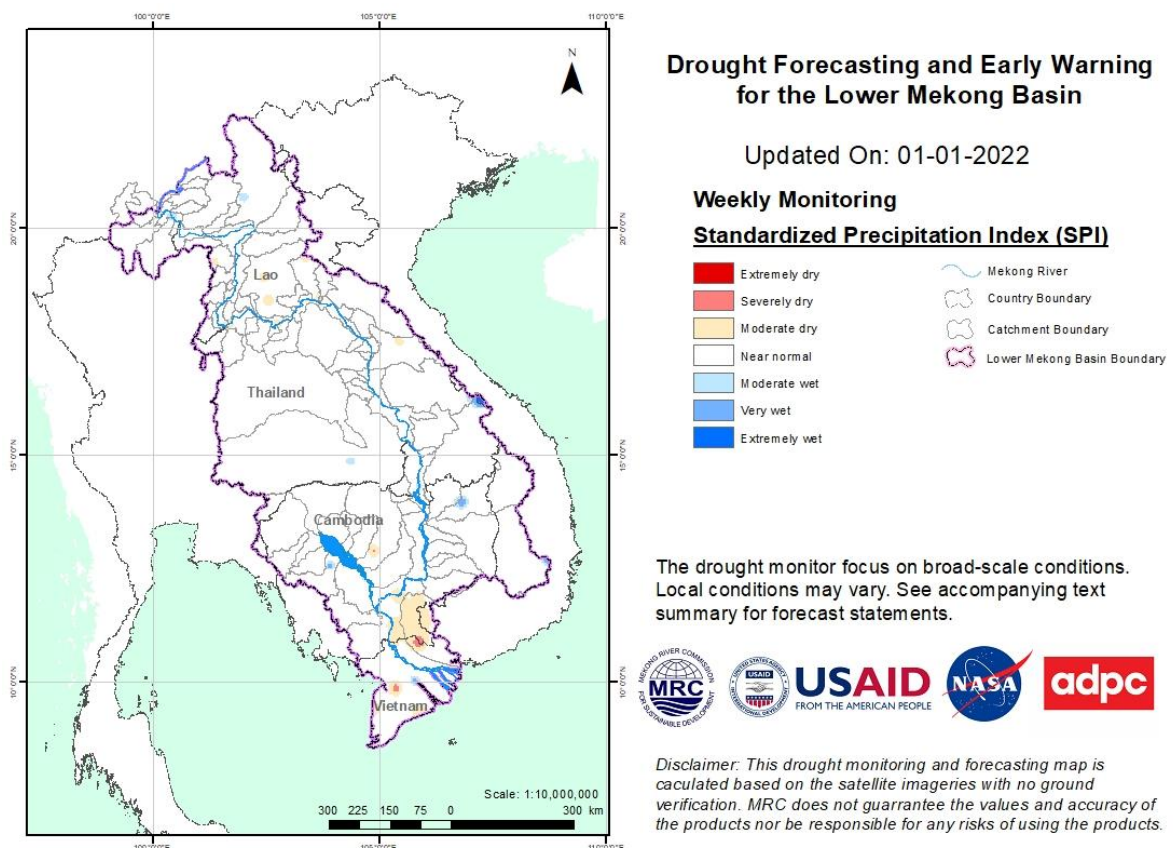


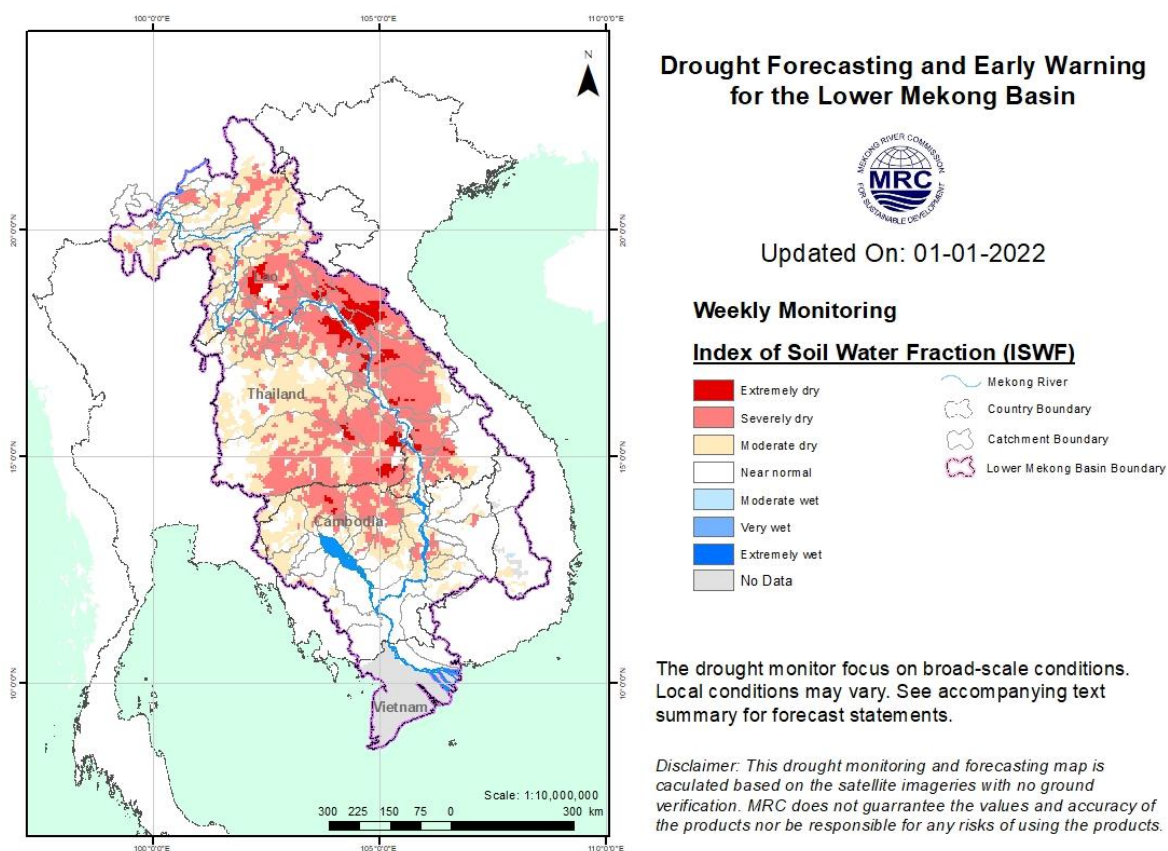
Figure 14: Weekly standardised precipitation index from Dec 26 to Jan 1.



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

With much less rainfall in the northern and middle parts of the region, soil moisture conditions from Dec 26 to Jan 1, as displayed in [Figure 12](#), were severely and extremely dry in most areas of the LMB especially the north and middle part.

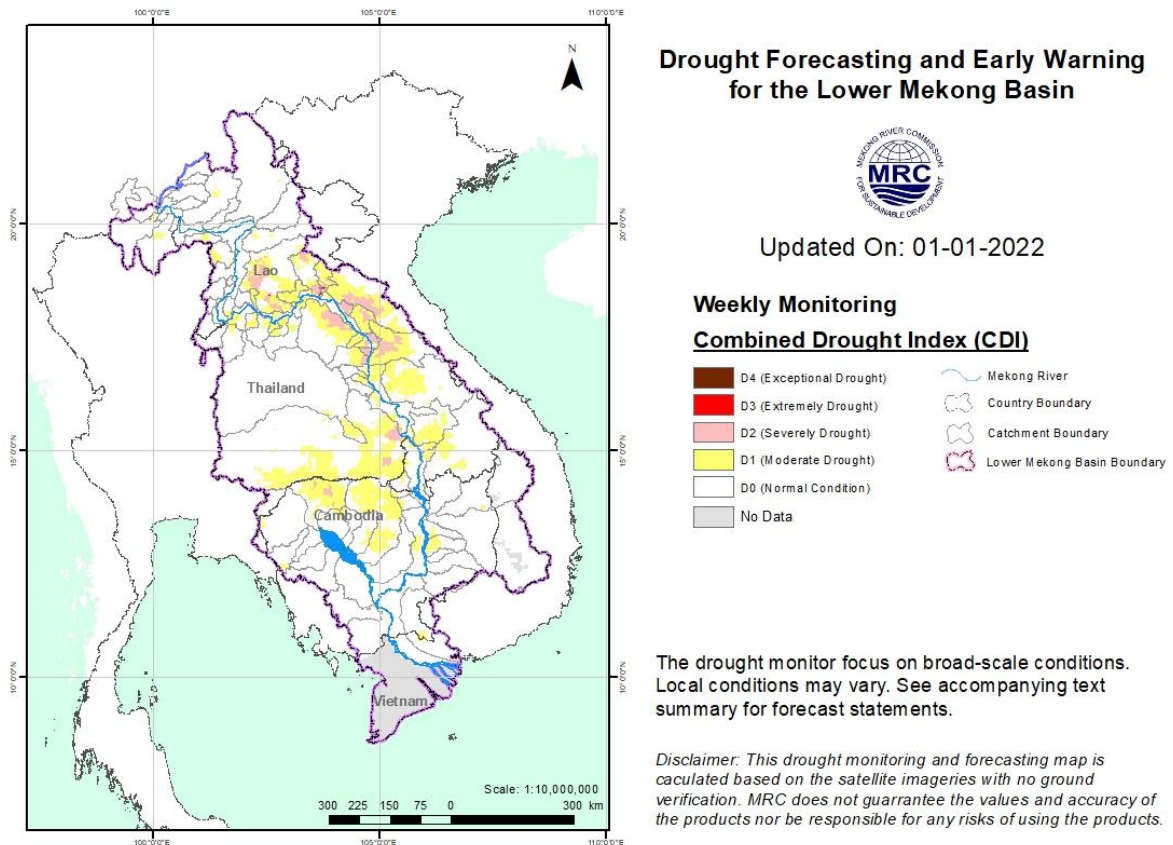
**Note:** The index of soil water fraction presents the current soil water fraction conditions compared with normal month; therefore, it normally shows extremely dry during dry season which is completely different from SPI that is standardized to its specific month of the years. However, this does not mean that the areas are threatened by agricultural drought as generally during transition period of wet and dry seasons and dry season only the irrigated areas are used for agricultural plantation.



**Figure 15: Weekly Index of Soil Water Fraction from Dec 26 to Jan 1.**

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

The combined drought indicator, as displayed in [Figure 13](#), reveals that during 26 Dec 2021-01 Jan 2022 the LMB was facing some moderate and severe droughts mainly in the northeast of the LMB covering Phongsaly, Xayaburi, Vientiane, Xaysomboun, Xiengkhuang, Borikhamxay, Khammuane, Nong Khai, Nakhon Phanom, Sakon Nakhon, and Savannakhet due to severely dry soil moisture as described above. The other areas, however, were normal during the reporting week. No serious drought risk was detected during the reporting week.



**Figure 16: Weekly Combined Drought Index during Dec 26 to Jan 1.**

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.



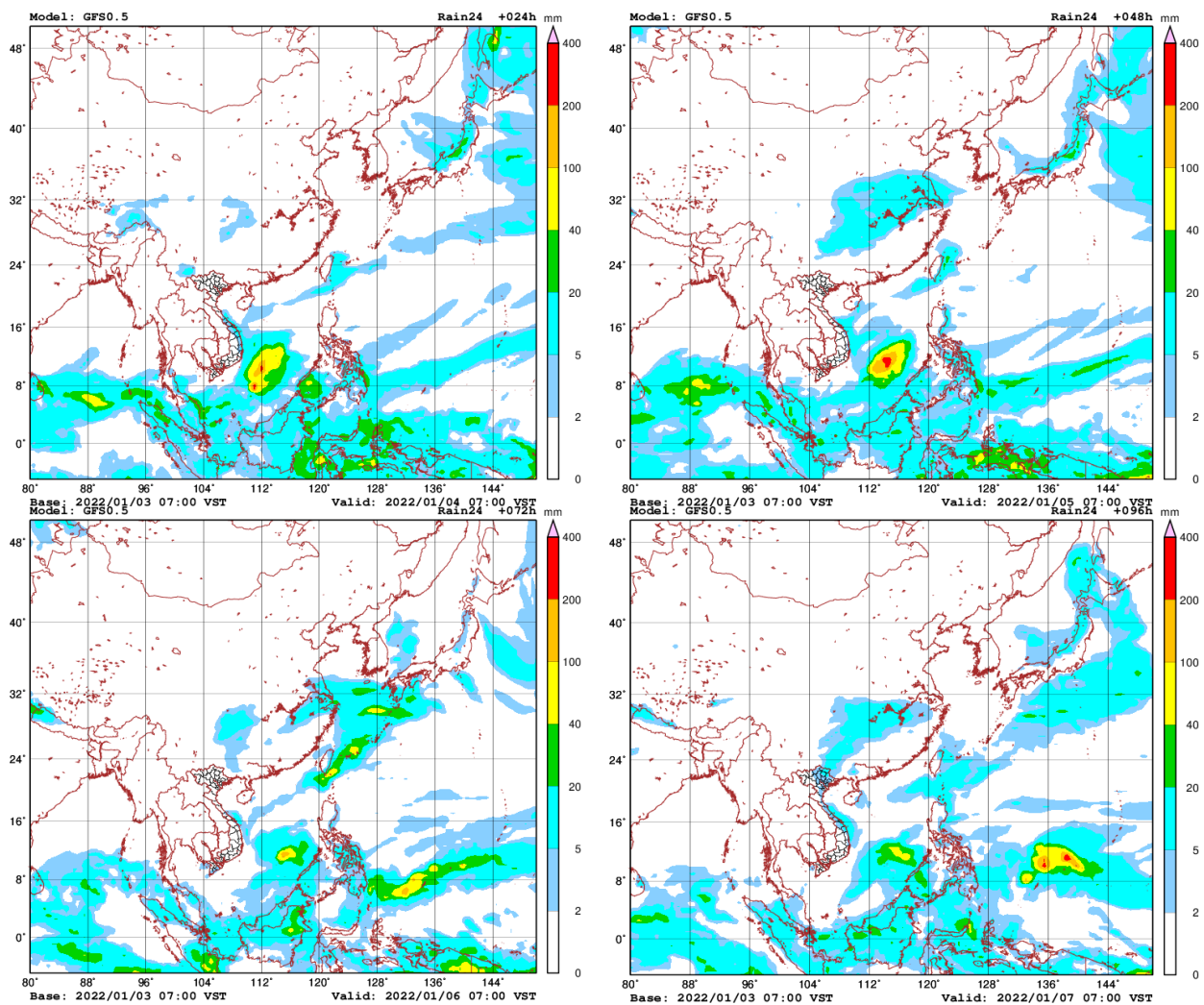
## 6 Weather and Water Level Forecast and Flash Flood Information

### 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, two main factors might affect the LMB. They include (i) High pressure from China in the upper part and (ii) the on-going prevailing Southwest Monsoon from the Gulf of Thailand to the lower part of the LMB.

From January 4 to 10, small rainfall (5-20 mm/24h) or no rain may occur in some areas of the LMB.

[Figure 14](#) shows accumulated rainfall forecast (24hrs) of the GFS model during January 4-10.



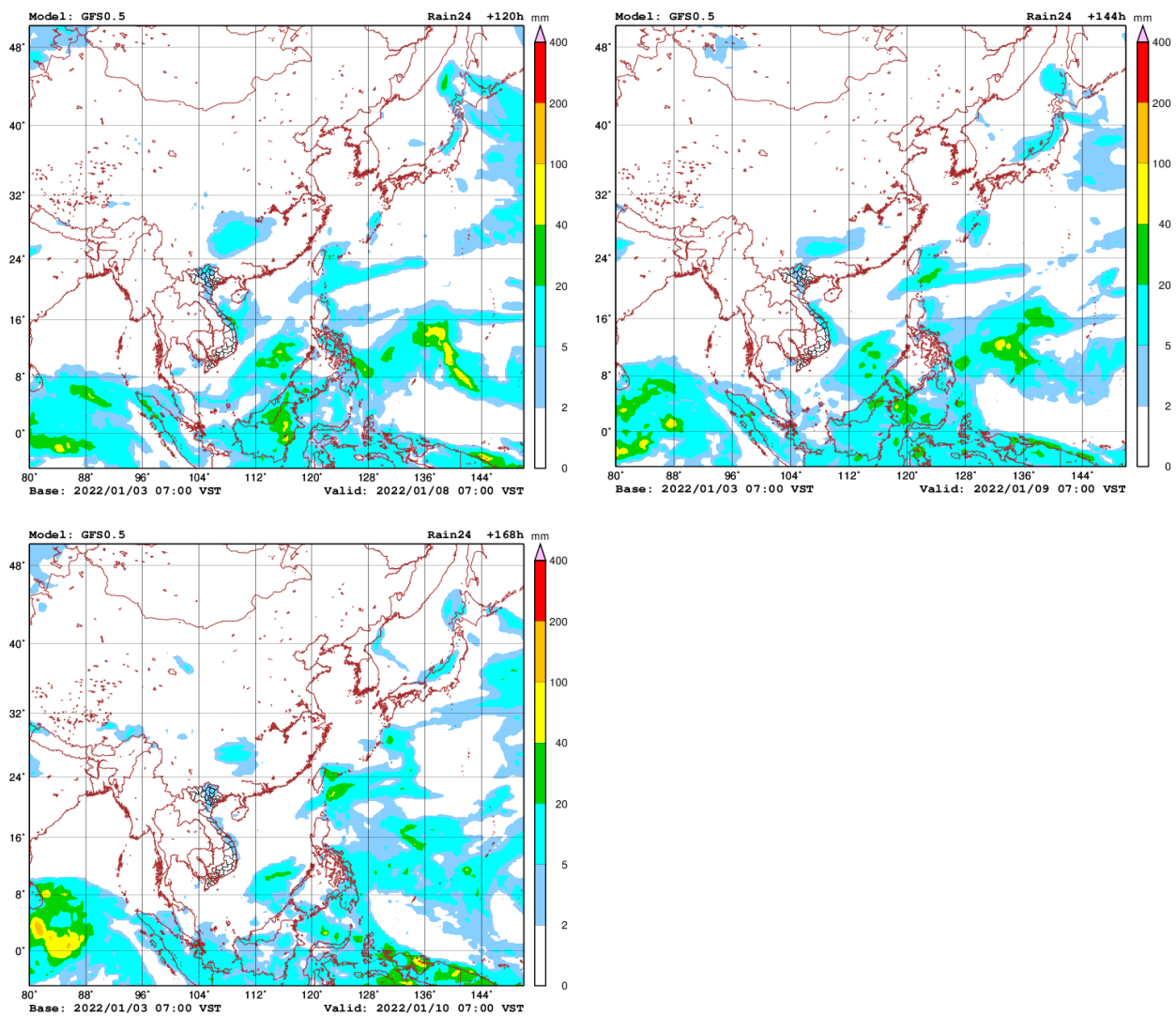


Figure 17: Accumulated rainfall forecast (24 hrs) of model GFS.

## 6.2 Water level forecast

### Chiang Saen and Luang Prabang

Based on January 3's weekly river monitoring bulletin, the weekly forecast water level at Chiang Saen in Thailand is expected to slightly increase from 1.78 m to 1.92 m in the next seven days. The trend of water levels at these stations will continue staying below their LTA.

For Luang Prabang in Lao PDR, the water level is likely to decrease, staying between 8.68 m and 8.63 m during the same period. The current water levels are lower than their maximum value.

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

Water level at Chiang Khan station in Thailand is forecasted to be down about 0.10 m for the next seven days. Also, from Vientiane in Lao PDR and Nong Khai in Thailand will decrease of about 0.16 m in the next seven days. At Paksane in Lao PDR, water level will decrease about

0.13 m due to less inflow from the upper catchments. No rainfall is forecasted in the area. The water levels here will remain lower than their LTA.

### **Nakhon Phanom to Pakse**

Water levels from Nakhon Phanom to Mukdahan in Thailand will slightly decrease by about 0.25 m in the next seven days. However, water levels from Khong Chiam in Thailand to Pakse in Lao PDR will increase by about 0.10 m. Water levels at these stations will stay lower than their LTA level. Next week no precipitation is forecasted in the area.

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

From Stung Treng to Kompong Cham along the Mekong River in Cambodia, the water levels will go down between 0.05 m and 0.10 m over the next seven days. 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 decrease about 0.13 m over the next seven days.

Water levels at most of the stations will continue to stay lower than their LTA value, particularly in the lower part of the region 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. No 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 and down in between their LTA, Minimum and Maximum values following daily tidal effects from the sea.

[Table 3](#) shows the weekly River Monitoring Bulletin issued on January 3. Results of the started 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**

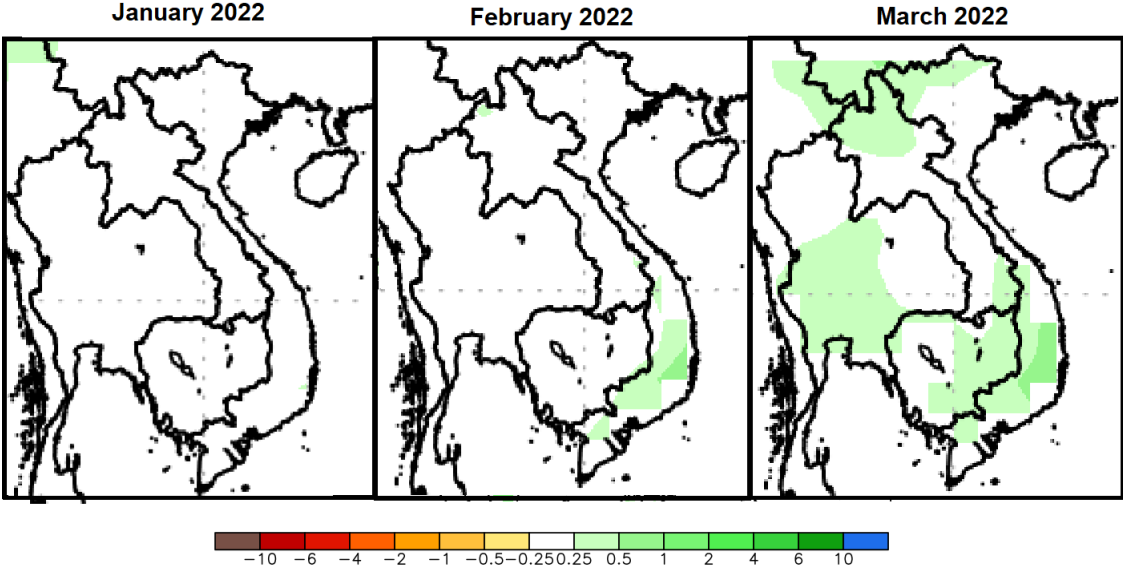
Flash flood events are not likely to happen in the LMB. However, local heavy rain in a short period of time might still be possible with unexpected short flash floods. During the dry season if extreme weather occurs, the information on flash flood guidance for the next one, three, and six hours is updated 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 on the upcoming months until March 2022. 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 15](#) shows the ensemble mean of daily average precipitation (mm/day) each month from January to March 2022 produced by the NMME.



**Figure 8. Daily average of monthly rainfall anomaly forecast from January to March 2022.**

The ensemble prediction model based on the initial conditions in December 2021 reveals that the LMB is likely to receive average rainfall and under normal conditions in January. In February the region is forecasted to get some rain in the lower part of the LMB covering mainly Viet Nam. While, in March it is forecasted that the entire LMB will be much wetter than its long-term mean of March mainly over the central and lower parts of the region.

The 2021 dry season is relatively wetter than that of 2020 and the monsoon rain in the 2021 wet season has arrived earlier than it did in 2019 and 2020 especially over the upper and central parts of the LMB.

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: [foodforecast@mrcmekong.org](mailto:foodforecast@mrcmekong.org)

Forecast period from: 04 January to 10 January 2022

Date: 03 January 2022

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)						
					02-Jan	03-Jan	04-Jan	05-Jan	06-Jan	07-Jan	08-Jan	09-Jan	10-Jan
Jinhong		0.0	-	-	535.25	535.26							
Chiang Saen		0.0	357.110	0.00	1.77	1.78	1.78	1.80	1.83	1.85	1.88	1.90	1.92
Luang Prabang		0.0	267.195	2.53	8.76	8.68	8.58	8.52	8.48	8.52	8.55	8.58	8.63
Chiang Khan		0.0	194.118	1.91	4.16	4.11	4.05	3.97	3.93	3.90	3.95	3.98	4.03
Vientiane		0.0	158.040	-0.28	1.90	1.93	1.89	1.85	1.80	1.75	1.72	1.75	1.77
Nongkhai		0.0	153.648	0.33	1.24	1.26	1.21	1.16	1.11	1.07	1.04	1.08	1.10
Paksane		0.0	142.125	0.10	2.13	2.09	2.07	2.04	2.01	1.97	1.95	1.93	1.96
Nakhon Phanom		0.0	130.961	0.18	1.17	1.13	1.10	1.08	1.05	1.02	1.00	0.98	0.97
Thakhek		0.0	129.629	1.38	2.45	2.42	2.38	2.36	2.34	2.32	2.30	2.28	2.26
Mukdahan		0.0	124.219	0.72	1.69	1.60	1.53	1.48	1.45	1.42	1.40	1.38	1.36
Savannakhet		0.0	125.410	-0.65	0.23	0.22	0.19	0.18	0.18	0.19	0.20	0.22	0.23
Khong Chiam		0.0	89.030	1.02	2.07	2.07	2.08	2.09	2.10	2.11	2.12	2.14	2.16
Pakse		0.0	86.490	0.03	1.12	1.14	1.17	1.19	1.20	1.21	1.22	1.24	1.26
Stung Treng		nr	36.790	0.32	2.74	2.75	2.76	2.78	2.79	2.8	2.8	2.81	2.82
Kratie		nr	-1.080	3.06	7.69	7.47	7.38	7.30	7.33	7.35	7.38	7.40	7.42
Kompong Cham		nr	-0.930	0.65	3.56	3.54	3.42	3.37	3.33	3.36	3.40	3.44	3.46
Phnom Penh (Bassac)		nr	-1.020	1.58	2.97	2.93	2.89	2.86	2.84	2.85	2.87	2.89	2.90
Phnom Penh Port		-	0.000	0.14	1.99	1.96	1.92	1.89	1.87	1.87	1.89	1.91	1.92
Koh Khel		nr	-1.000	1.52	2.92	2.92	2.89	2.87	2.86	2.86	2.87	2.89	2.90
Neak Luong		nr	-0.330	0.81	2.68	2.54	2.51	2.50	2.48	2.45	2.42	2.40	2.37
Prek Kdam		nr	0.080	0.58	2.58	2.58	2.55	2.52	2.50	2.48	2.47	2.46	2.45
Tan Chau		0.0	0.000	-0.37	1.73	1.82	1.87	1.90	1.92	1.86	1.78	1.70	1.60
Chau Doc		nr	0.000	-0.60	1.86	1.95	1.99	2.00	2.02	1.90	1.80	1.70	1.60

**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

This week, no rainfall observed over the Mekong region. Also, no rainfall in the upper and middle parts of the Mekong region were recorded during this reporting week. Compared with last week's amount, the rainfall this week was considered low in the Mekong region.

Based on the forecasted rainfall from satellite using GFS data, rainfall is likely to take place in the areas from the lower part of Cambodia, the 3S area and Mekong Delta in Viet Nam between January 4-10, varying from 0.05 mm to 50 mm. This indicates that the dry season has started for the LMB.

### 7.2 Water level and its forecast

The MRC's observed water level at Jinghong showed a slight increase of about 0.03 m from 535.23 m on 28 Dec 2021 to 535.26 on 3 Jan 2022 (recorded on 7:00 am), and stayed about 0.33 m below its two-year average (2020-2021) value. The outflow was down from 825 m<sup>3</sup>/s on 28 Dec 2021 to 807 m<sup>3</sup>/s on 3 Jan 2022.

Water levels in the lower part of the monitoring locations in the LMB during this reporting week were decreasing from Chiang Khan in Thailand to Pakse in Lao PDR. Water levels at Nong Khai, Paksane and Savannakhet were staying close to their historical minimum level, considered very critical. Also, at Stung Treng, Kratie and Kompong Cham in Cambodia, water levels dropped lower than their LTA level. Water levels at Neak Luong, Bassac at Phnom Penh, and Prek Kdam in Cambodia were also lower than their LTA level. The low level was due to low inflows from upstream and less rainfall in the region from 28 December 2021 to 3 January 2022. Generally, this week's water levels were relatively lower than those of last week from the upper to the lower part of the LMB.

The flow volume of the Tonle Sap Lake is lower than its LTA. From next week, the flow is expected to continue decreasing due to less rainfall forecasted in the inflow catchments of the Tonle Sap Lake.

From Stung Treng to Kompong Cham, the water levels will continue to go down. 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 below their LTA.

The situation in Tan Chau on the Mekong River and Chau Doc on the Bassac River is expected to remain in fluctuating. In Chau Doc, the fluctuation of water level was higher than its Maximum level, which **considered very critical**. For Tan Chau, the fluctuation was in between the range of its LTA and Maximum level, **which consider normal**.



Since the fourth week of October 2021, water levels across most monitoring stations in the LMB have significantly dropped to the level lower than their LTA (from upper to lower stretches within the LMB). For a more complete preliminary analysis of the hydrological conditions in the LMB over July–December 2020, November 2020 to May 2021 and June to October 2021 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 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**

Drought condition of the LMB from 26 December 2021 to 1 January 2022 was normal all over the LMB except some moderate drought in northeastern part due to severely dry soil moistures during the beginning of dry season. The region showed no significant threat except some moderate and severe dry soil moistures in the upper and middle parts of the LMB.

For the upcoming three-month forecast, the LMB is likely to receive average rainfall and under normal conditions in January. In February the region is forecasted to get some rain in the lower part of the LMB covering mainly Viet Nam. While, in March it is forecasted that the entire LMB will be much wetter than its long-term mean of March mainly over the central and lower parts of the region.

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

Table A1: Weekly observed water levels

2021	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
28-12-2021	535.23	1.87	8.87	4.16	1.94	1.27	2.24	1.29	1.78	1.40	2.91	7.83	3.50	2.95	3.00	2.47	2.75	1.00	1.06
29-12-2021	535.23	1.84	8.78	4.08	1.93	1.28	2.20	1.25	1.76	1.27	2.92	7.80	3.42	2.88	2.80	2.52	2.67	1.12	1.18
30-12-2021	535.23	1.81	8.78	4.10	1.87	1.24	2.21	1.23	1.76	1.18	2.93	7.81	3.38	2.86	2.86	2.63	2.59	1.28	1.33
31-12-2021	535.23	1.80	8.84	4.12	1.87	1.18	2.14	1.24	1.77	1.17	2.89	7.81	3.36	2.98	2.92	2.66	2.57	1.37	1.46
01-01-2022	535.25	1.79	8.88	4.10	1.90	1.18	2.10	1.21	1.72	1.12	2.86	7.76	3.36	2.86	2.84	2.72	2.59	1.54	1.68
02-01-2022	535.25	1.77	8.76	4.16	1.90	1.24	2.13	1.17	1.69	1.12	2.74	7.69	3.56	2.97	2.92	2.68	2.58	1.73	1.86
03-01-2022	535.26	1.78	8.68	4.11	1.93	1.26	2.09	1.13	1.60	1.14	2.75	7.47	3.54	2.93	2.92	2.54	2.58	1.82	1.95

Table A2: Weekly observed rainfall

2021	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
28-12-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-12-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-12-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-12-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-01-2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02-01-2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-01-2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





## Mekong River Commission Secretariat

P. O. Box 6101, 184 Fa Ngoum Road, Unit 18 Ban Sithane Neua, Sikhottabong District, Vientiane 01000, Lao PDR  
Tel: +856 21 263 263. Fax: +856 21 263 264 [www.mrcmekong.org](http://www.mrcmekong.org)

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