Mekong River Commission

Weekly Dry Season Situation Report in the Lower Mekong River Basin

18-24 January 2022

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

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Contents

Figures

Table

Key Messages

Key messages for this weekly report are presented below.

Rainfall and its forecast

- During 18-24 January 2022, rainfall was observed from Chiang Sean to Mukdahan in the upper and middle parts, varied from 2.60 millimetres (mm) to 63.30 mm.
- There will be some rain for the next 7 days over the Mekong region from 25 to 31 January 2022 due to low-pressure line dominating the upper part of LMB.

Water level and its forecast

- The MRC's observed water level at Jinghong shows a decrease of about 0.70 m from 535.93 m on 18 Jan to 535.23 on 24 Jan 2022 (recorded on 7:00 am) and stayed about 0.34 m lower than its two-year average (2020-2021) value. The outflow at Jinghong station was down from 1,284.04 m3/s on 18 Jan to 807.74 m^3/s on 24 Jan 2022.
- Along with the sudden decreased outflow from Jinghong upstream, water level of monitoring station at Chiang Saen in Thailand also decreased about 0.18 m from 18 to 24 Jan 2022 but remained 0.35 m higher than its long-term average (LTA), considered normal. However, water level at Lao PDR's Luang Prabang was stable compared with last week and stayed close to its historical maximum value. WLs at the monitoring stations from Chiang Khan in Thailand to Vientiane of Lao PDR significantly increased 1.48 m and 0.68 m respectively, while at Chiang Khan it surged to 1.11 m higher than its LTA value and at Vientiane WL was about 0.02 m higher than its historical maximum value. Water levels from Nong Khai in Thailand to Paksane in Lao PDR increased about 0.76 m and 0.39 m, which remained 0.22m and 0.55 m lower than their LTA level, which considered very critical. WLs from Thailand's Nakhon Phanom to Savannakhet in Lao PDR increased about 0.10 m and continued staying below their LTA level. WL at Savannakhet in Lao PDR dropped and stayed close to its historical minimum level, which considered very critical. Water levels from the stretches of the river from Stung Treng to Kratie in Cambodia were slightly increased, but it decreased at Kompong Cham 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 17 Jan 2022 was lower than its LTA but higher than the levels in 2019, 2020 and 2021 during the same period from 4 to 10 January 2022, and still considered critical.
- Water levels at Tan Chau and Chau Doc remain fluctuating in between their Minimum and Maximum values due to the tidal process.
- Over the next seven days, the water levels across the monitoring stations are expected to go up from Nakhon Phanom in Thailand to Kratie in Cambodia. Water levels at most stations are remaining lower than their long-term average value.

Drought condition and its forecast

- Drought conditions of the LMB from 16 to 22 January 2022 were at moderate and severe droughts in the north-eastern and southern parts due to severely dry soil

moistures during the beginning of dry season. However, this situation is considered normal during dry season from December to March every year throughout the region.

- 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 **18-24 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.

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 start of January 2022, the cold weather has come 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 bring cool weather condition in the upper part of Thailand, Lao PDR and Viet Nam. From February is the transitional period from the winter to the summer, which the high-pressure air mass areas prevailing over Thailand will be weaken over the Mekong region.

Figure 1 presents the weather map of 23 January 2022, showing a line of low pressure of the Monsoon Trough crossing the upper Mekong area of Thailand and norththern part of Loa PDR which attract rainfall is forecasted for the next few days over those area.

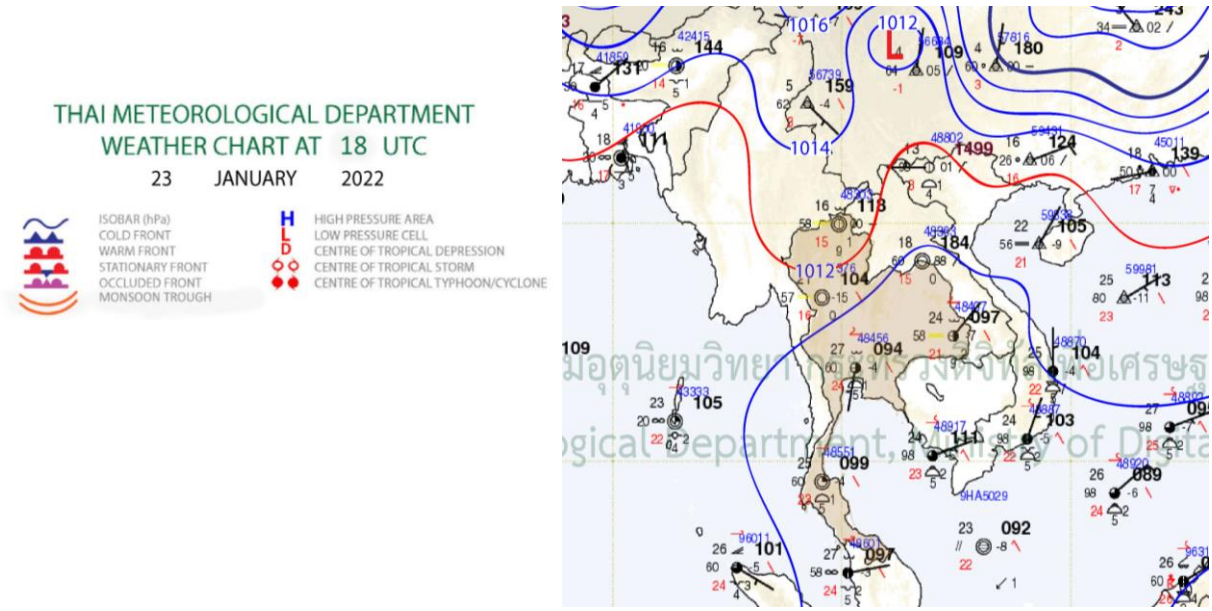


Figure 1: Summary of weather conditions over the LMB.

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 24 January to 6 February 2022, during the 4th and 1st weeks of January and February. Moreover, the Mekong region is likely dominated by dry condition, which may bring warmer temperature in general to the lower part of the LMB. **Figure 2** shows the outlook of weather condition from 24 January to 6 February 2022 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

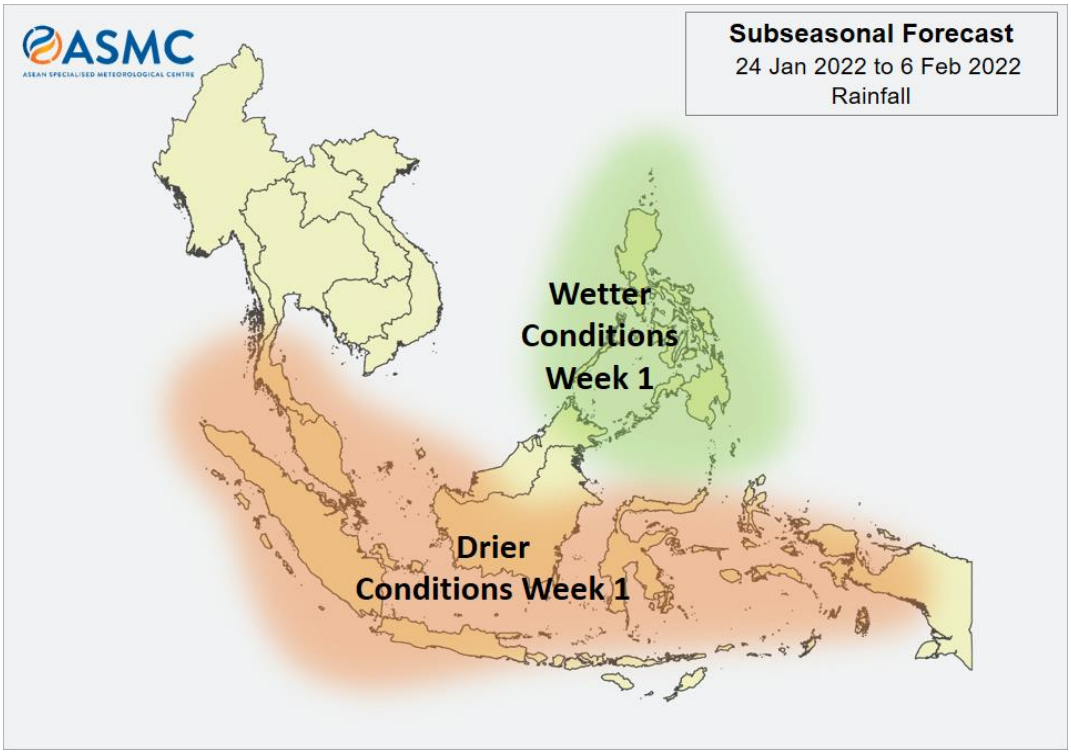


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There was no tracking storm covering the LMB during 18-24 January 2022, meaning no movement of storm detected from the South Sea of Viet Nam, as displayed in Figure 3.

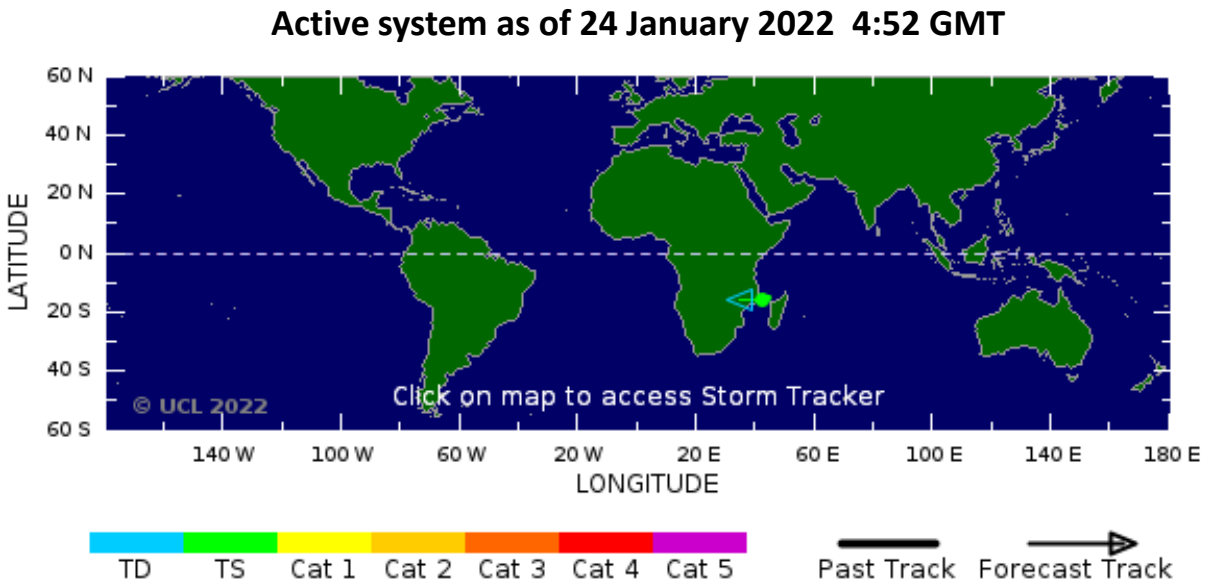


Figure 3: No tropical storm risk observed on 24 January.

Rainfall patterns over the LMB

This week, rainfall observed from Chiang Sean to Mukdahan in the upper and middle parts, but no rainfall in the lower part from Stung Treng in Cambodia to Tan Chau and Chau Doc in Viet Nam. The rainfall was varied from 2.60 mm to 64.30 mm. The rainfall from 18 to 24 January, compared with last week rainfall, is shown in Figure 4.

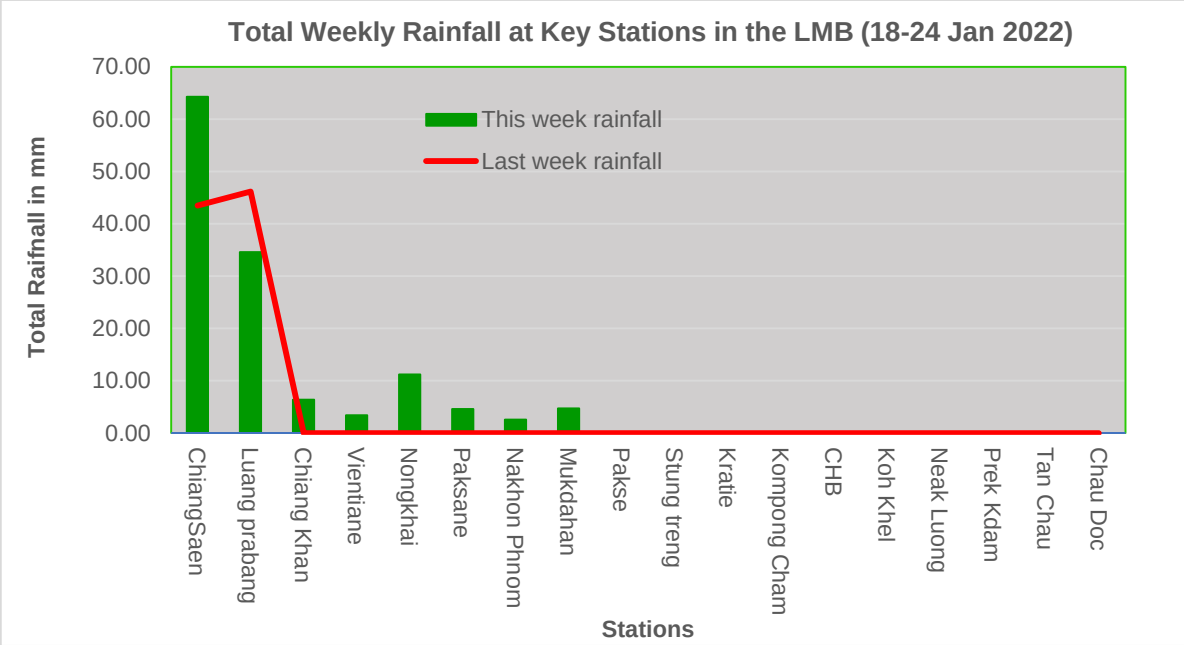


Figure 4: Weekly total rainfall at key stations in the LMB.

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 18 to 24 January 2022.

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

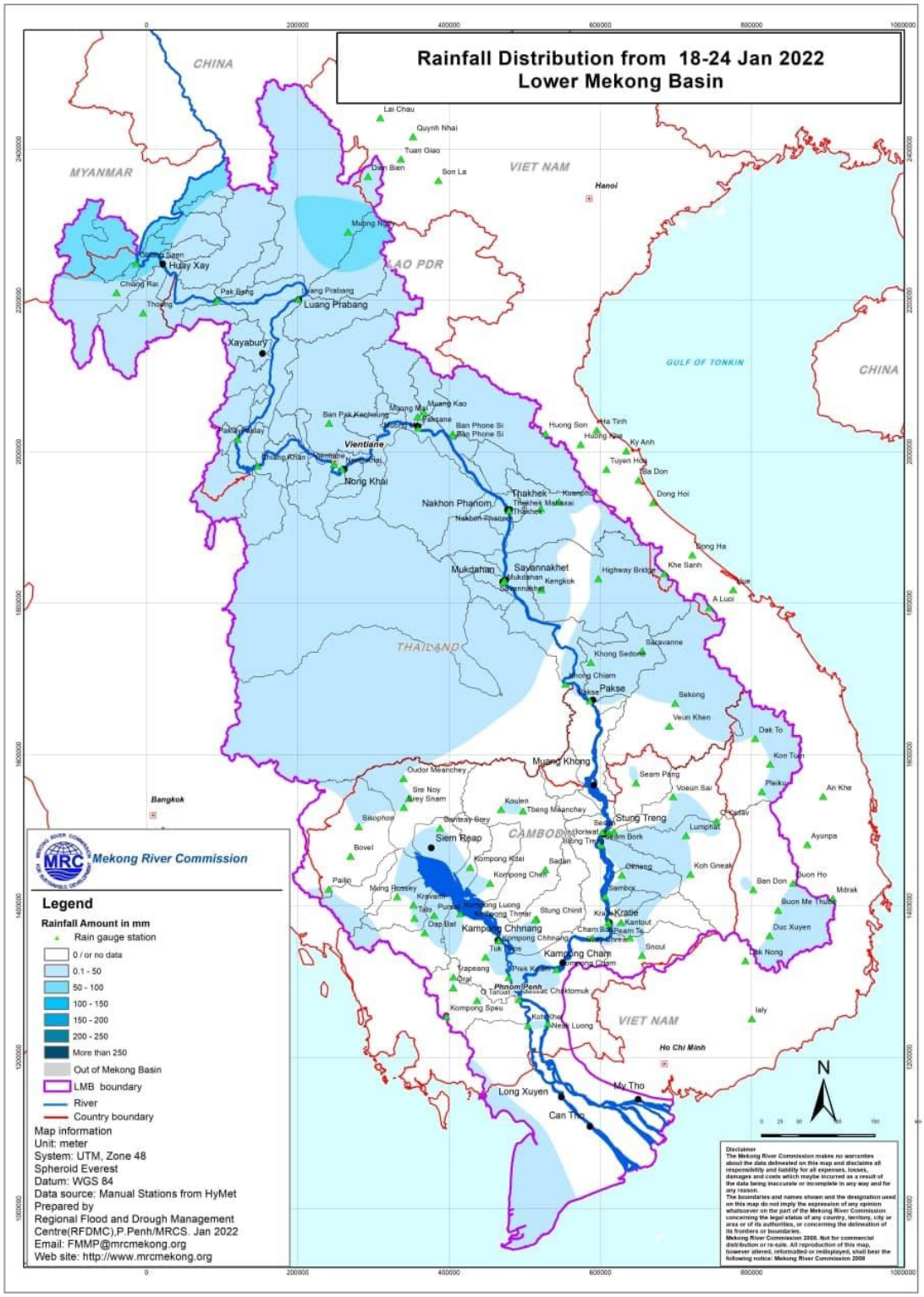


Figure 5: Weekly rainfall distribution over the LMB.

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**.

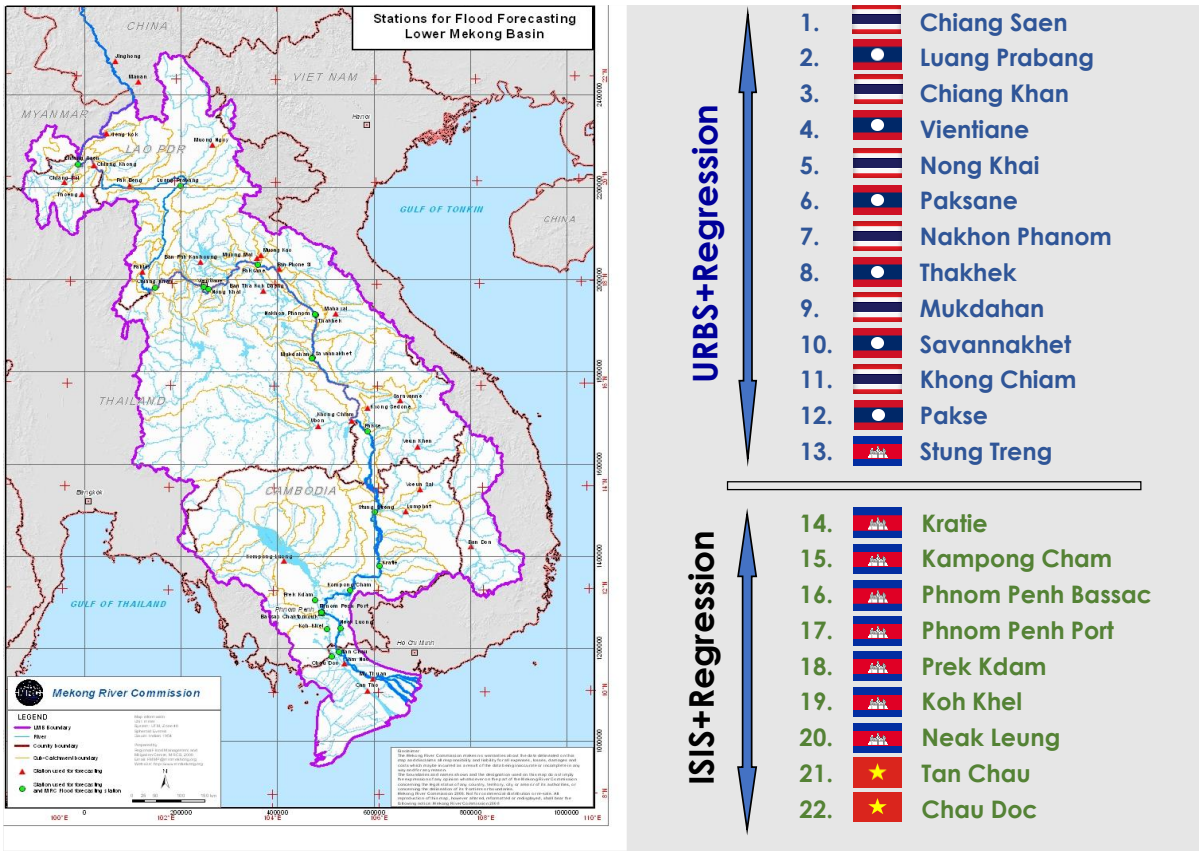


Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.

The MRC's observed water level at Jinghong shows a **decrease of about 0.70 m from 535.93 m on 18 Jan to 535.23 on 24 Jan 2022 (recorded on 7:00 am)** and stayed about 0.34 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 restriction from dams over the course of the last month was 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 outflow at Jinghong station was down from 1,284.04 m^3/s on 18 Jan to 807.74 m^3/s on 24 Jan 2022.

Figure 7 below presents water level that increased at the Jinghong hydrological station[1], indicating the trend of fluctuating water level up to 24 January 2021.

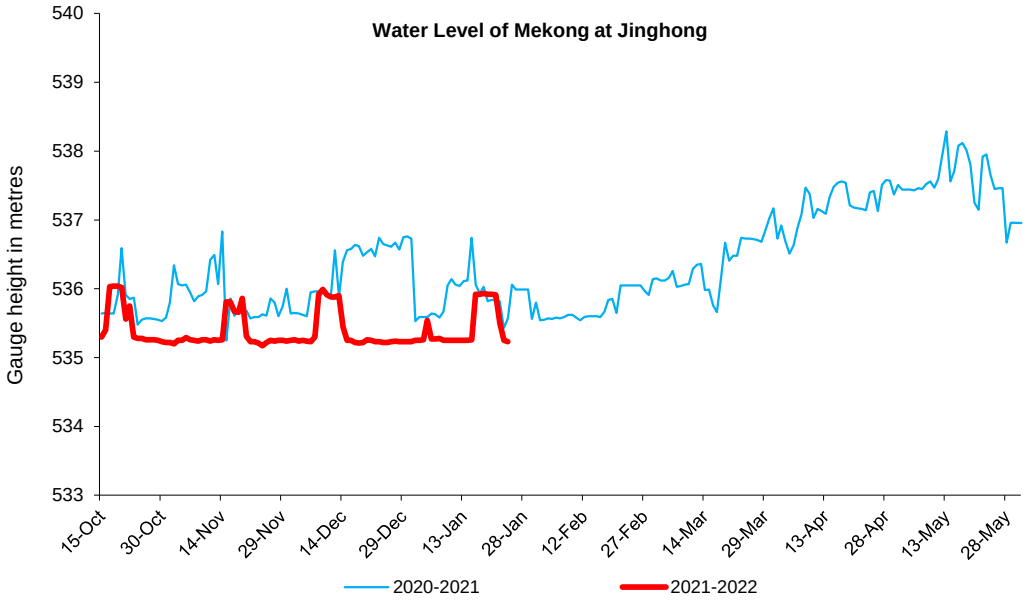


Figure 7. Water level at the Jinghong hydrological station during 15 Oct 2021 to 24 Jan 2022.

Along with the sudden decreased outflow from Jinghong upstream, water level of monitoring station at Chiang Saen in Thailand also decreased about 0.18 m from 18 to 24 Jan 2022 but remained 0.35 m higher than its long-term average (LTA), considered normal. However, water level at Lao PDR's Luang Prabang was stable compared with last week and stayed close to its historical maximum value. WLs at the monitoring stations from Chiang Khan in Thailand to Vientiane of Lao PDR significantly increased 1.48 m and 0.68 m respectively, while at Chiang Khan it surged to 1.11 m higher than its LTA value and at Vientiane WL was about 0.02 m higher than its historical maximum value. Water levels from Nong Khai in Thailand to Paksane in Lao PDR increased about 0.76 m and 0.39 m, which remained 0.22m and 0.55 m lower than their LTA level, which considered very critical. WLs from Thailand's Nakhon Phanom to Savannakhet in Lao PDR increased about 0.10 m and continued staying below their LTA level. WL at Savannakhet in Lao PDR dropped and stayed close to its historical minimum level, which considered very critical. Water levels from the stretches of the river from Stung Treng to Kratie

[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.

in Cambodia were slightly increased, but it decreased at Kompong Cham 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 Jan 18-24 at Thailand's Chiang Saen decreased from 2.35 m to 2.17 m and stayed about 0.35 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 was considered stable, which stayed at 8.93 m, during the reporting period. Compared to last week, the figure shows the same level. The water level at this station was 0.07 m higher 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**.

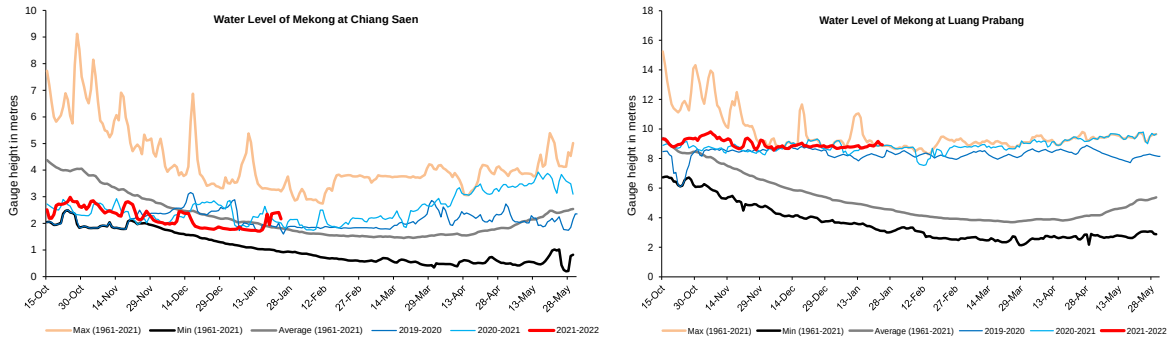


Figure 8. Water levels at Chiang Saen in Thailand and Luang Prabang in Lao PDR.

Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand (downstream of the Xayaburi dam) significantly increased about 1.48m during the reporting week. It showed 1.11 m higher than its LTA. Moreover, water level downstream at Vientiane in Lao PDR also increased from 1.82 m to 2.50 m and was about 0.02 m higher than its maximum levels during Jan 18-24. At Nong Khai station in Thailand, the water level was also up during the reporting period. It increased from 1.04 m to 1.80 m and showing 0.22 m lower than its LTA value, **which still considered critical**. At Paksane in Lao PDR, water levels increased about 0.39 m, up from 2.03 m to 2.42 m. **The**

current water level at Paksane in Lao PDR is about 0.55 m lower than its LTA level, which still considered critical. The recently increased water levels from Chiang Khan to Nong Khai were obvious due to hydropower operation and water released from upstream. The water levels at Vientiane and Paksane are shown in Figure 9 below.

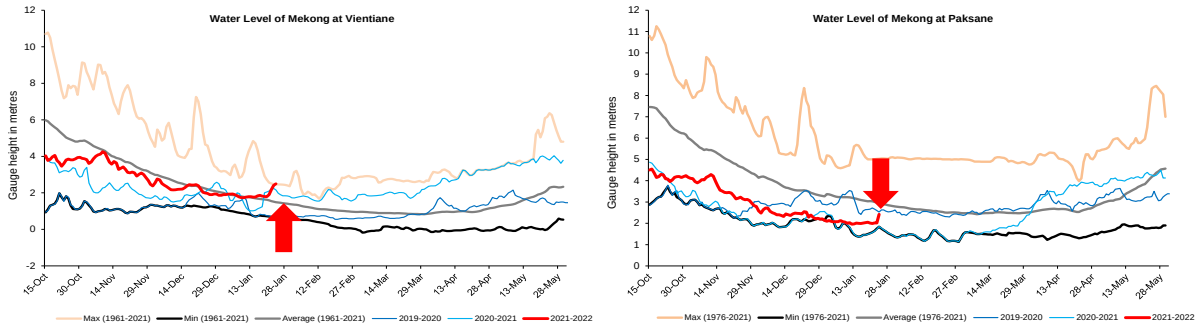


Figure 9. Water levels Nong Khai and Paksane in Thailand and Lao PDR.

Nakhon Phanom to Pakse

Similarly, water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR slightly increased in between 0.04 m and 0.10 m, 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.

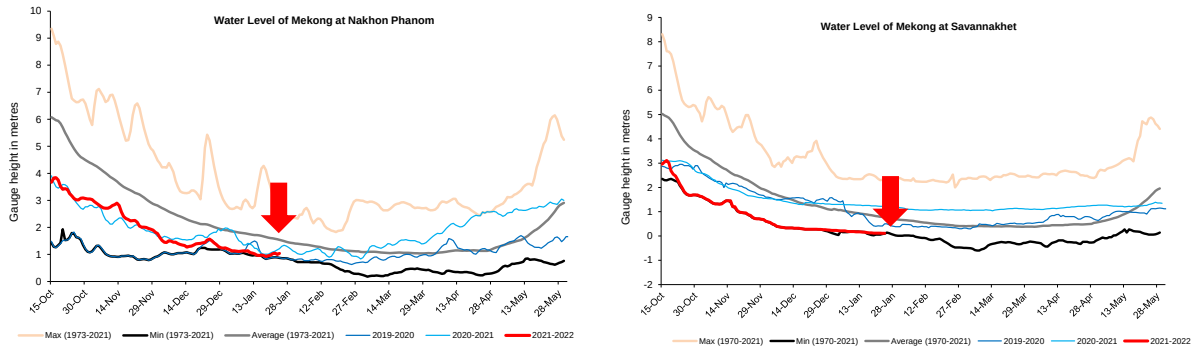


Figure 10: Water levels at Nakhon Phanom and Savannakhet of Thailand and Lao PDR.

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

Due to no 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 18-24 January 2022. This week water level from Stung Treng to Kratie decreased about 0.04 m and 0.05 m, respectively. The current water levels at Stung Treng and Kratie are staying about 0.12 m and 0.10 m higher than their LTA value, respectively. Water level at Kompong Cham was about 0.84 m below their LTA.

This week, the water levels at Stung Treng and Kratie are higher than their LTA, which considered normal (as showed in Figure 11).

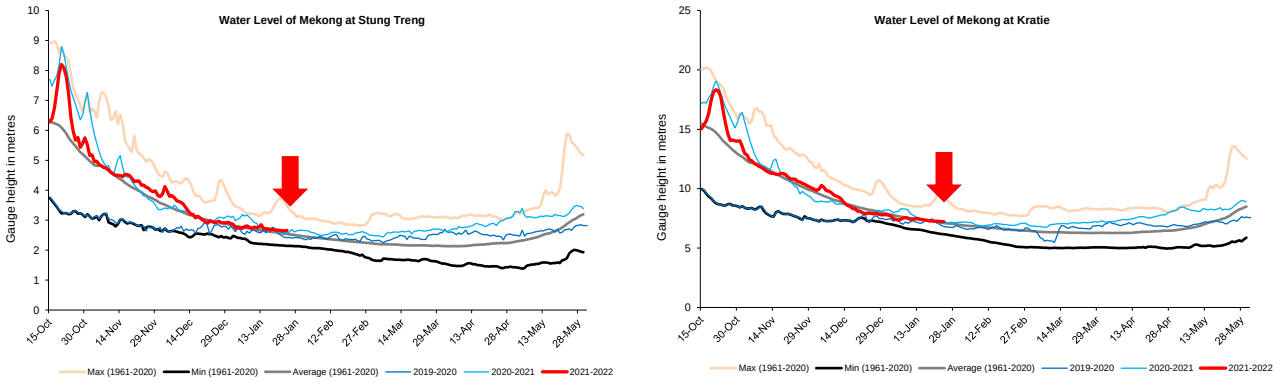


Figure 11: Water levels at Stung Treng and Kratie on the Mekong River.

At Chaktomuk on the Bassac River, due to less contributed flows from upstream catchment, the water level was down by about 0.14 m and stayed 0.96 m lower than its LTA value; while at Koh Khel, water level increased about 0.10 m, staying 0.42 m lower than its LTA value. The water level at Prek Kdam on the Tonle Sap Lake decreased about 0.09 m and was about 0.74 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

This week, the water levels from 18 to 24 January 2022 at Viet Nam's Tan Chau and Chau Doc were fluctuating in between their Minimum and Maximum values due to daily tidal effects from the sea. The fluctuation is in between 0.38 m and 1.56 m. The current water levels at **Tan Chau and Chau Doc reached their minimum level, which considered very 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 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 24 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 no rainfall from the catchment area. Up to present, the outflow from the Tonle Sap Lake condition in 2022 is higher than 2019, 2020 and 2021 outflow conditions. However, the outflow of 2022 is still lower than its

LTA (1997-2020). For next week, no 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 24 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 24, **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.

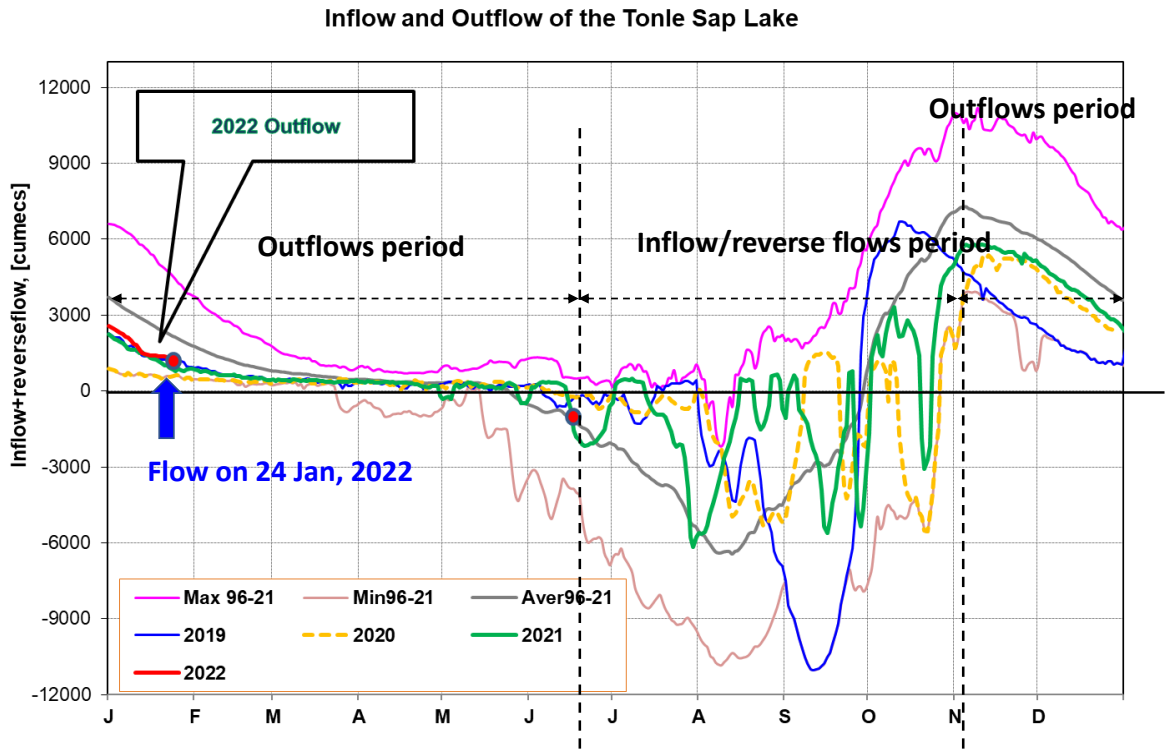


Figure 12: Seasonal change of inflows and outflows of Tonle Sap Lake.

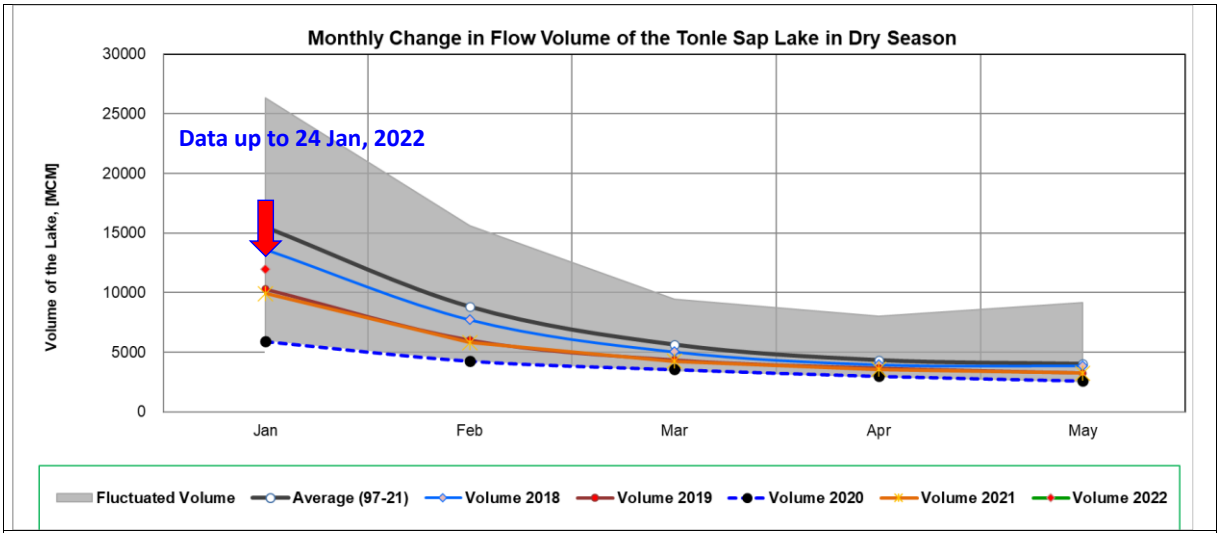


Figure 13. The seasonal change in monthly flow volume of Tonle Sap Lake.

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

Month	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	11964.07
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, comapred with historical Min values							
	Normal condition, compared with LTA (Long term average)							
	Low volume situation, comapred with LTA values							
Unit: Million Cubic Meter (1 MCM= 0.001 Km^3)								

4 Flash Flood in the Lower Mekong Basin

During January 18-24, the LMB was affected by three main weather factors. These include (i) The high-pressure area covered the upper parts almost the entire week accompanied with the upper westerly wind prevailing over the northern and central parts on the last day of the week; (ii) the south-westerly wind prevailed over the northern and central parts on 22 Jan; and (iii) the weak northeast monsoon prevailed over the southern part throughout the week.

These conditions caused unusual rain and cool weather to occur in the northern part throughout the week while rainfall was found in the other parts 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 16 to 22 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 January 16 to 22, 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.

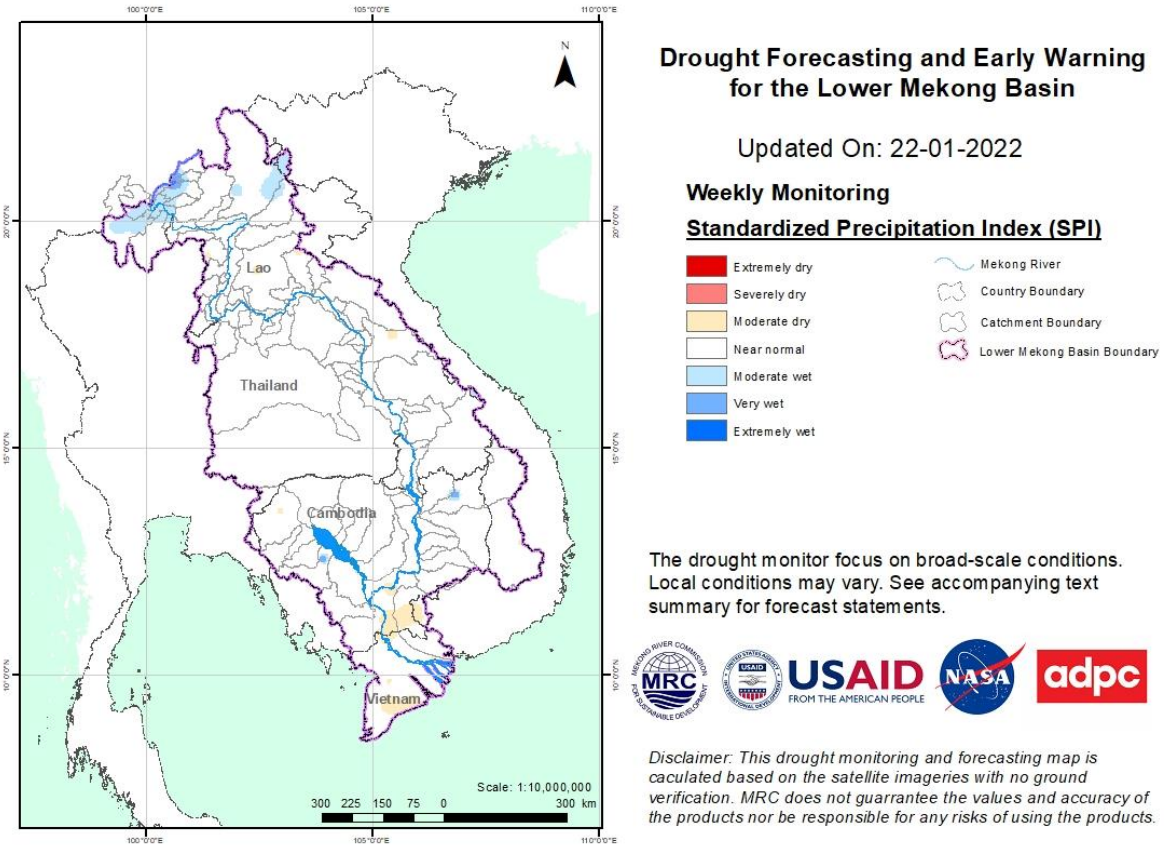


Figure 14: Weekly standardised precipitation index from Jan 16 to 22.

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

With very little rain during the monitoring week, soil moisture conditions from Jan 16 to 22, as displayed in Figure 12, were severely and extremely dry in most areas of the LMB especially the middle and lower parts. The conditions are not preferable for crop growing. However, this does not mean the region are facing any serious agricultural drought as normal phenomenon that during dry season the LMB receives very little or no rain.

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.

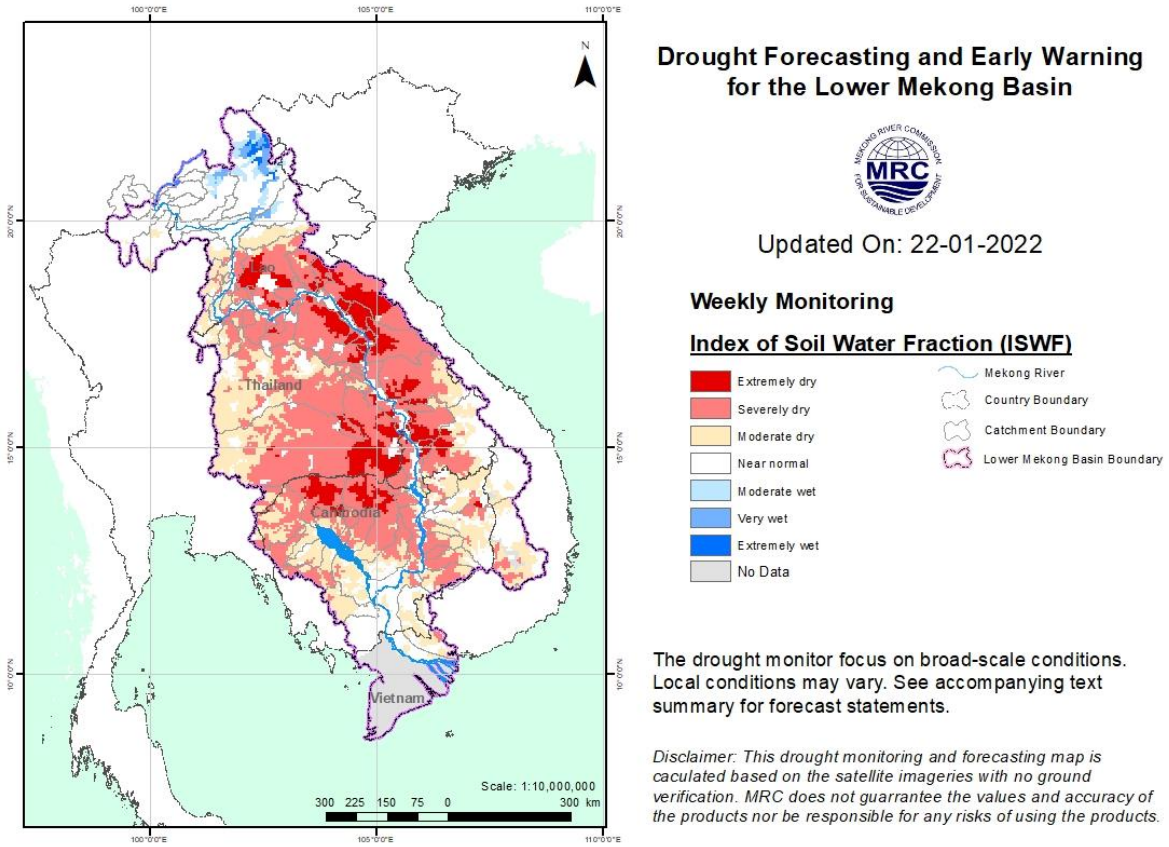


Figure 15: Weekly Index of Soil Water Fraction from Jan 16 to 22.

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

The combined drought indicator, as displayed in Figure 13, reveals that during 16-22 Jan 2022 the LMB was facing some moderate and severe droughts mainly in the northeast and southern parts of the LMB covering 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. It is considered normal during dry season from December to March each year. The conditions were very much similar to the those of the previous week.

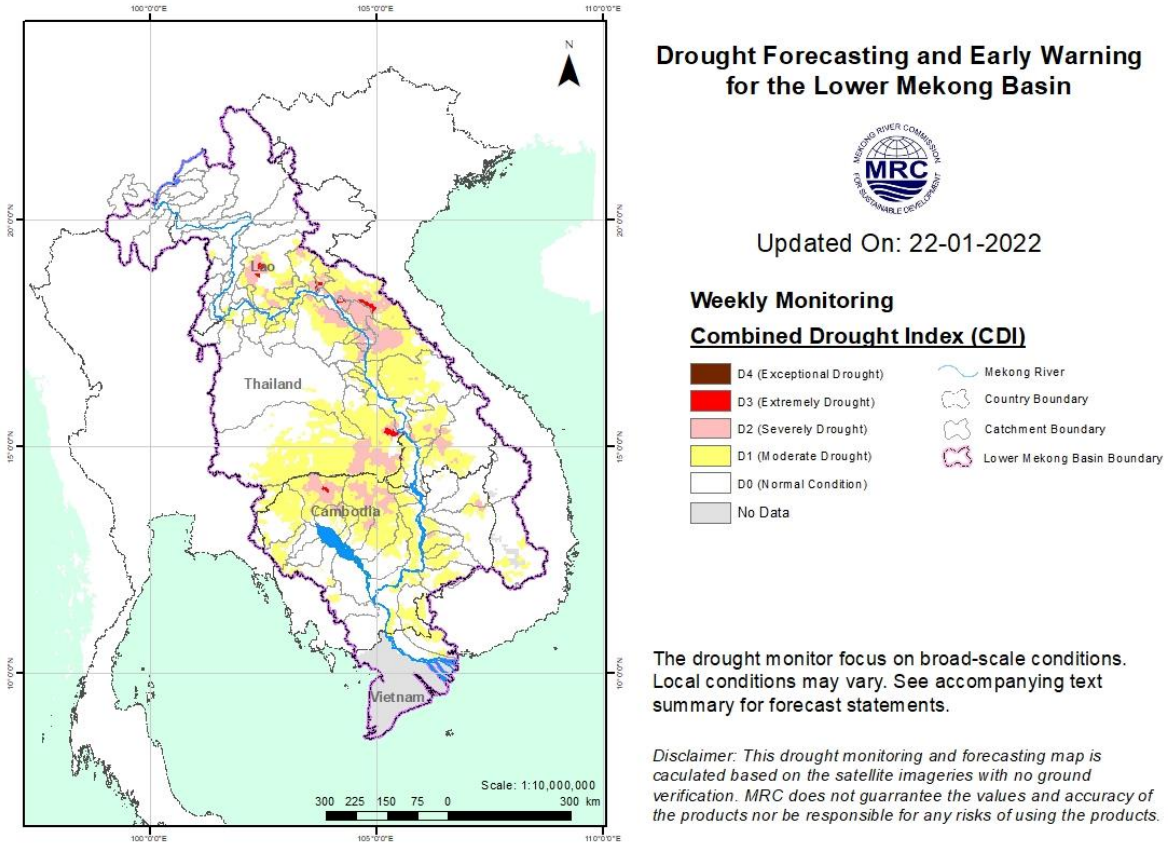


Figure 16: Weekly Combined Drought Index during Jan 16-22.

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.

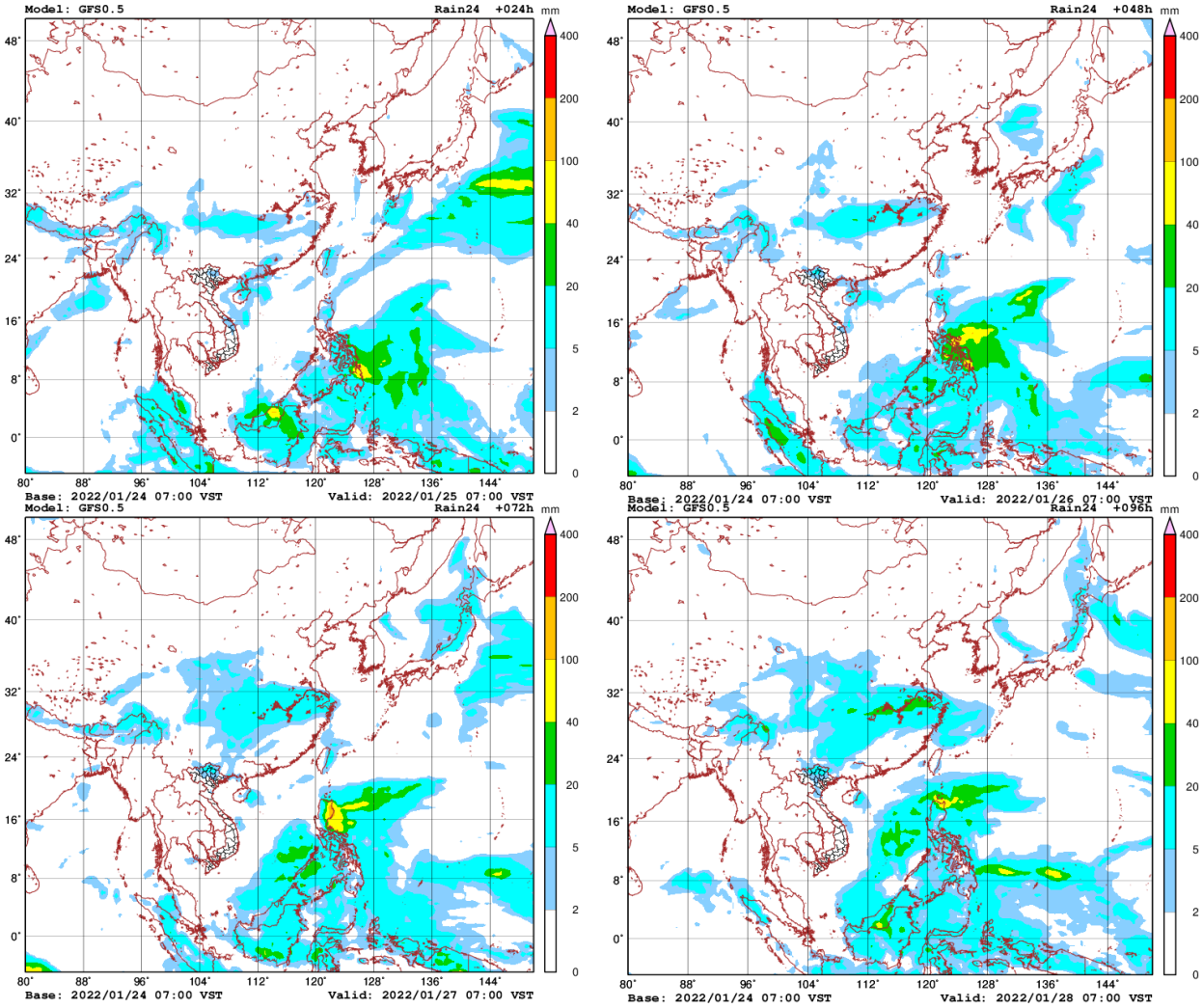
6 Weather and Water Level Forecast and Flash Flood Information

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 prevailing weak Southwest Monsoon from the Gulf of Thailand to the lower part of the LMB.

During January 25-31, 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 25-31.



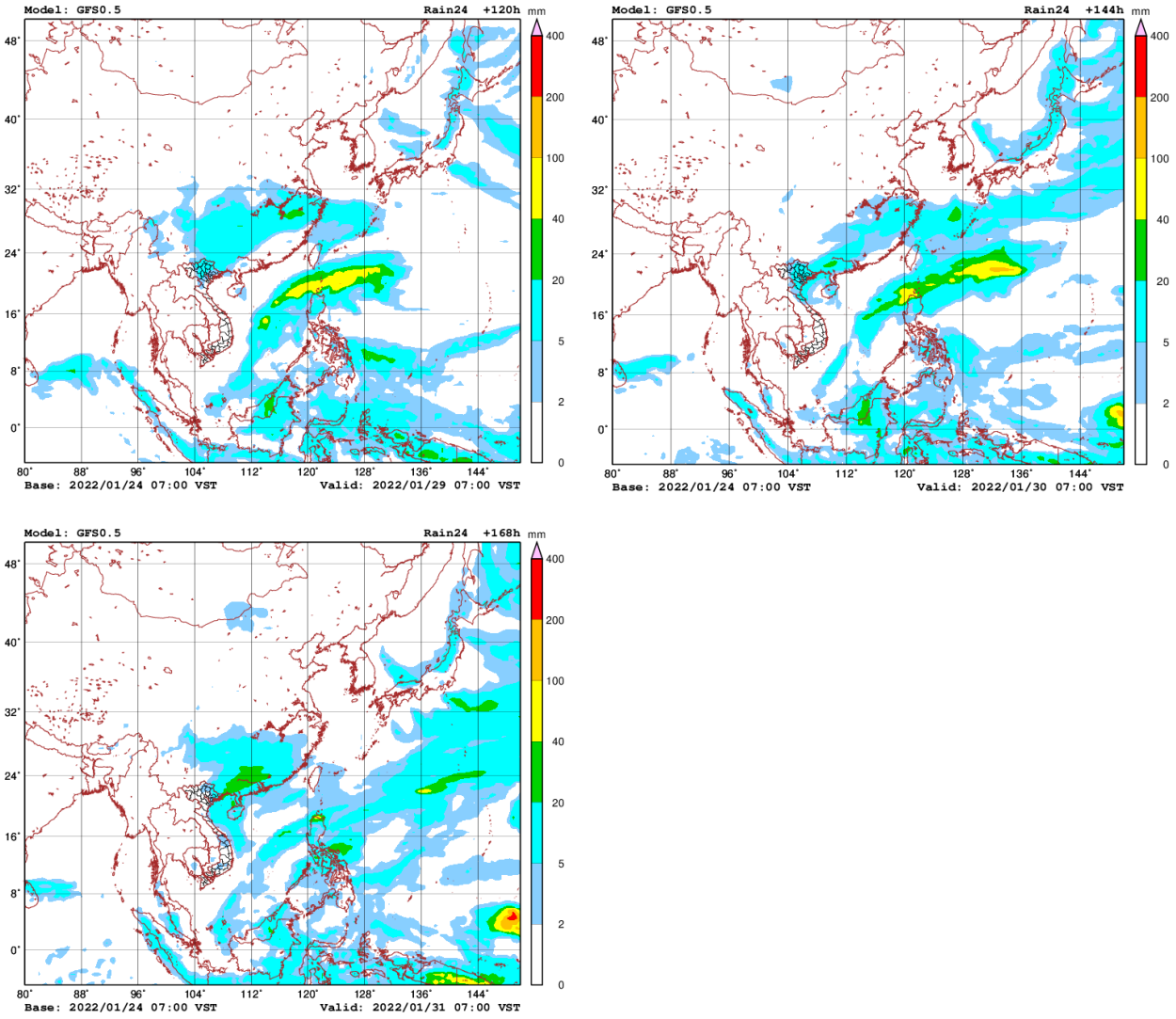


Figure 17: Accumulated rainfall forecast (24 hrs) of model GFS.

6.2 Water level forecast

Chiang Saen and Luang Prabang

Based on January 24's weekly river monitoring bulletin, the weekly forecast water level at Chiang Saen in Thailand is expected to decrease from 2.17 m to 1.86 m in the next seven days. The trend of water level at these stations will continue staying slightly higher than its LTA.

For Luang Prabang in Lao PDR, the water level is likely to decrease, staying between 8.93 m and 8.34 m during the same period. The current water level is higher than its maximum value. Rainfall is forecasted in the area in the next seven days.

Chiang Khan, Vientiane-Nong Khai and Paksane

Water level at Chiang Khan station in Thailand is forecasted to be down about 0.38 m for the next seven days. From Vientiane in Lao PDR and Nong Khai in Thailand, WLs will slightly increase of about 0.03 m in the next seven days. At Paksane in Lao PDR, water level will

decrease about 0.02 m due to less inflow from the upper catchments. No rainfall is forecasted in the area. The water levels at Nong Khai and Paksane will remain close to their LTA level.

Nakhon Phanom to Pakse

Water levels from Nakhon Phanom to Mukdahan in Thailand will slightly increase between 0.10 m and 0.36 m in the next seven days. Also, water levels from Khong Chiam in Thailand to Pakse in Lao PDR will increase about 0.25 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 up between 0.02 m and 0.33 m over the next seven days. No 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 0.17 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 Minimum and Maximum values following daily tidal effects from the sea.

Table 3 shows the weekly River Monitoring Bulletin issued on January 24. Results of the started weekly river monitoring bulletin are also available at 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.

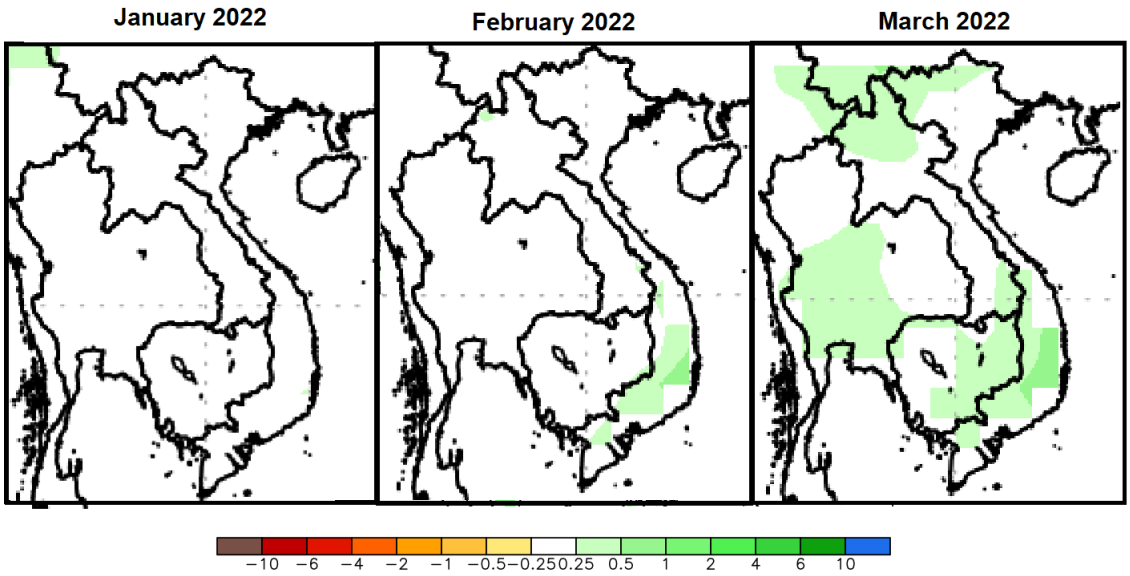


Figure 18. Daily average of monthly rainfall anomaly forecast from January to March 2022.

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: floodforecast@mrcmekong.org

Forecast period from: 25 January to 31 January 2022

Date: 24 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)						
		23-Jan			23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan
Jinhong		0.0	-	-	535.25	535.23							
Chiang Saen		0.0	357.110	0.00	2.41	2.17	2.04	2.02	1.97	1.90	1.85	1.82	1.86
Luang Prabang		0.0	267.195	2.53	8.98	8.93	8.86	8.63	8.54	8.52	8.48	8.40	8.34
Chiang Khan		0.0	194.118	1.91	4.88	5.30	5.46	5.33	5.18	5.10	5.06	5.00	4.92
Vientiane		0.0	158.040	-0.28	2.41	2.50	2.86	2.99	2.86	2.72	2.63	2.58	2.52
Nongkhai		0.0	153.648	0.33	1.69	1.80	2.15	2.29	2.17	2.03	1.93	1.88	1.83
Paksane		0.0	142.125	0.10	2.02	2.42	2.63	2.70	2.62	2.55	2.50	2.45	2.40
Nakhon Phanom		0.0	130.961	0.18	1.00	1.04	1.35	1.52	1.55	1.50	1.45	1.42	1.40
Thakhek		0.2	129.629	1.38	2.35	2.37	2.67	2.83	2.86	2.80	2.74	2.70	2.67
Mukdahan		0.0	124.219	0.72	1.71	1.65	1.62	1.75	1.85	1.87	1.83	1.80	1.76
Savannakhet		0.0	125.410	-0.65	0.11	0.11	0.10	0.18	0.25	0.27	0.25	0.23	0.21
Khong Chiam		0.0	89.030	1.02	1.92	2.02	1.95	1.90	2.07	2.27	2.32	2.26	2.21
Pakse		0.0	86.490	0.03	1.04	1.08	1.10	1.12	1.25	1.40	1.43	1.40	1.37
Stung Treng		nr	36.790	0.32	2.65	2.66	2.67	2.69	2.7	2.8	2.91	2.92	2.9
Kratie		nr	-1.080	3.06	7.23	7.23	7.25	7.27	7.30	7.32	7.43	7.55	7.57
Kompong Cham		nr	-0.930	0.65	3.00	2.90	2.85	2.82	2.80	2.78	2.77	2.83	2.91
Phnom Penh (Bassac)		nr	-1.020	1.58	2.46	2.28	2.23	2.20	2.18	2.16	2.14	2.16	2.20
Phnom Penh Port		-	0.000	0.14	1.48	1.50	1.44	1.41	1.38	1.35	1.33	1.31	1.33
Koh Khel		nr	-1.000	1.52	2.53	2.50	2.55	2.60	2.55	2.50	2.45	2.45	2.42
Neak Luong		nr	-0.330	0.81	1.78	1.74	1.68	1.65	1.63	1.61	1.59	1.57	1.55
Prek Kdam		nr	0.080	0.58	1.73	1.66	1.60	1.55	1.50	1.46	1.42	1.40	1.38
Tan Chau		nr	0.000	-0.37	0.57	0.38	0.22	0.15	0.12	0.15	0.40	0.64	0.88
Chau Doc		nr	0.000	-0.60	0.64	0.46	0.30	0.22	0.20	0.25	0.47	0.69	0.90

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 the upper and middle parts of the Mekong region. Rainfall was observed from Chaing Sean to Mukdahan and no rainfall at the lower part of the Mekong region during this reporting week. Compared with last week's amount, the rainfall this week was considered higher in the upper part of 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 during January 25-31, varying from 0.05 mm to 50 mm. This indicates that the warm weather has already started over the LMB.

7.2 Water level and its forecast

The MRC's observed water level at Jinghong shows a decrease about 0.70 m from 535.93 m on 18 Jan to 535.23 on 24 Jan 2022 (recorded on 7:00 am), and stayed about 0.34 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. The outflow at Jinghong station was down from 1,284.04 m^3/s on 18 Jan to 807.74 m^3/s on 24 Jan 2022.

Water levels in the lower part of the monitoring locations in the LMB during this reporting week were increasing from Chiang Khan in Thailand to Pakse in Lao PDR. However, water levels at Savannakhet remained close to their historical minimum level, considered very critical. In Cambodia, water levels at Stung Treng and Kratie were higher than its LTA value, while at Kompong Cham, 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 11 to 17 January 2022. Generally, this week's water levels were relatively lower than those of last week from the middle to the lower part of the LMB.
Water levels at Chiang Saen, Luang Prabang, Chiang Khan, Vientiane, Stung Treng and Kratie stations are higher than their LTA levels, while those at other stations are lower than to their LTA levels.

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 Kratie water levels will go up, but from Kompong Cham to Chaktomuk in Phnom Penh, the water levels will go down. The water levels – at Neak Luong on the Mekong River, from Prek Kdam to Phnom Penh Port on the Tonle Sap, and Koh Khel on the Bassac – are forecasted to continue staying below their LTA level.

The situation in Tan Chau on the Mekong River and Chau Doc on the Bassac River is expected to remain fluctuting. The current fluctuation of water level was in between their Minimum and Maximum levels, which considered very critical.

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 conditions of the LMB from 16 to 22 January 2022 were normal all over the LMB except some moderate drought in the northeast and southern parts 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 which are normal during dry season.

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
18-01-2022	535.93	2.35	8.92	3.82	1.82	1.04	2.03	0.92	1.58	1.02	2.70	7.28	3.09	2.42	2.40	2.06	1.75	1.39	1.56
19-01-2022	535.92	1.95	8.88	3.84	1.80	1.01	2.05	0.95	1.56	0.90	2.67	7.31	3.08	2.46	2.43	2.05	1.74	1.44	1.64
20-01-2022	535.92	2.36	8.84	4.13	1.79	1.00	2.01	0.97	1.57	0.98	2.67	7.25	3.10	2.47	2.52	1.94	1.77	1.41	1.54
21-01-2022	535.91	2.38	9.00	4.62	1.90	1.17	1.99	1.03	1.62	1.00	2.66	7.27	3.11	2.41	2.53	1.85	1.75	1.20	1.34
22-01-2022	535.50	2.40	9.17	4.74	2.18	1.42	2.02	1.05	1.65	1.00	2.65	7.25	3.05	2.48	2.60	1.82	1.76	0.96	1.00
23-01-2022	535.25	2.41	8.98	4.88	2.41	1.69	2.02	1.00	1.71	1.04	2.65	7.23	3.00	2.46	2.53	1.78	1.73	0.57	0.64
24-01-2022	535.23	2.17	8.93	5.30	2.50	1.80	2.42	1.04	1.65	1.08	2.66	7.23	2.90	2.28	2.50	1.74	1.66	0.38	0.46

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
18-01-2022	0	0	11.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-01-2022	0	0.8	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-01-2022	2	37	17.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-01-2022	1	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-01-2022	0	25.8	0	5.5	0.8	0	3	0	0	0	0	0	0	0	0	0	0	0	0
23-01-2022	0	0	0	0.9	2.6	11.2	1.6	2.6	4.7	0	0	0	0	0	0	0	0	0	0
24-01-2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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