



**Mekong River Commission**

# **Weekly Dry Season Situation Report in the Lower Mekong River Basin 2–8 November 2021**

Prepared by  
The Regional Flood and Drought Management Centre  
09 November 2021

*The MRC is funded by contributions from its Member Countries and Development Partners, including Australia, Belgium, the European Union, Finland, France, Germany, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the United States and the World Bank.*

**Copyright © Mekong River Commission, 2020**

First published (2020)

Some rights reserved

This work is the product of the Mekong River Commission Secretariat. While all efforts are made to present accurate information, the Secretariat does not guarantee the accuracy of the data included in this work. The boundaries, colours, denomination, and other information shown on any map in this work do not imply any judgement on the part of the MRC concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be considered to be a limitation upon or waiver of the privileges and immunities of the MRC, all of which are specifically reserved.

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made and notification is sent to the MRC. The MRC would appreciate receiving a copy of any publication that uses this publication as a source. This publication cannot be used for sale or for any other commercial purpose whatsoever without permission in writing from the MRC.

**Title:** Weekly wet season situation report in the Lower Mekong River Basin for 2-8 November 2021

ISSN: 1728-3248

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

For bibliographic purposes, this volume may be cited as:

Mekong River Commission. (2020). *Weekly dry season situation report in the Lower Mekong River Basin for 2–8 November 2021*. Vientiane: MRC Secretariat.

Information on MRC publications and digital products can be found at  
<http://www.mrcmekong.org/publications/>

**All queries on rights and licenses should be addressed to:**

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: [mrcc@mrcmekong.org](mailto:mrcc@mrcmekong.org) | [www.mrcmekong.org](http://www.mrcmekong.org)

# Contents

- Figures..... ii
- Table ..... iii
- Key Messages ..... v
- 1 Introduction ..... 1
- 2 General Weather Patterns ..... 2
- 3 Water Levels in the Lower Mekong River ..... 6
- 4 Flash Flood in the Lower Mekong Basin ..... 13
- 5 Drought Monitoring in the Lower Mekong Basin..... 14
- 6 Weather and Water Level Forecast and Flash Flood Information ..... 17
  - 6.1 Weather and rainfall forecast ..... 17
  - 6.2 Water level forecast ..... 18
  - 6.3 Flash Flood Information..... 19
  - 6.4 Drought forecast ..... 20
- 7 Summary and Possible Implications ..... 22
  - 7.1 Rainfall and its forecast..... 22
  - 7.2 Water level and its forecast ..... 22
  - 7.3 Flash flood and its trends..... 23
  - 7.4 Drought condition and its forecast ..... 23

## Figures

<b>Figure 1: Summary of weather conditions over the LMB.</b> .....	2
<b>Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.</b> .....	3
<b>Figure 3: No tropical storm risk observed on 8 November.</b> .....	3
<b>Figure 4: Weekly total rainfall at key stations in the LMB.</b> .....	4
<b>Figure 5: Weekly rainfall distribution over the LMB.</b> .....	5
<b>Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.</b> .	6
<b>Figure 7. Water level at the Jinghong hydrological station during 15 Oct to 8 Nov 2021.</b> .....	7
<b>Figure 8. Water levels at Chiang Saen in Thailand and Luang Prabang in Lao PDR.</b> .....	8
<b>Figure 9. Water levels Veintiane and Paksane in Lao PDR.</b> .....	9
<b>Figure 10: Water levels at Nakhon Phanom and Mukdahan of Thailand.</b> .....	9
<b>Figure 11: Water levels at Stung Treng and Kratie on the Mekong River.</b> .....	10
<b>Figure 9: Seasonal change of inflows and outflows of Tonle Sap Lake.</b> .....	11
<b>Figure 13. The seasonal change in monthly flow volume of Tonle Sap Lake.</b> .....	12
<b>Figure 10: The seasonal change in monthly flow volume of Tonle Sap Lake.</b> .....	12
<b>Figure 11: Weekly standardised precipitation index from Oct 30-Nov 5.</b> .....	14
<b>Figure 12: Weekly Soil Moisture Anomaly from Oct 30-Nov 5.</b> .....	15
<b>Figure 13: Weekly Combined Drought Index during Oct 30-Nov 5.</b> .....	16
<b>Figure 14: Accumulated rainfall forecast (24 hrs) of model GFS.</b> .....	18
<b>Figure 15. Daily average of monthly rainfall anomaly forecast from November 2021 to January 2022.</b> .....	20

**Table**

**Table 1. The monthly change in the flow volume of Tonle Sap Lake. .... 12**

**Table 2. Weekly River Monitoring Bulletin. .... 21**



## Key Messages

Key messages for this weekly report are presented below.

### **Rainfall and its forecast**

- Rainfall focused in the areas from Chaktomuk in Cambodia to Tan Chau and Chau Doc in Viet Nam, including the 3S area in Cambodia and Viet Nam, varying from 1.40 millimetres (mm) to 107.00 mm.
- There will be average rainfalls for the next 7 days over the Mekong region from 9 to 15 November 2021 because there is still a low-pressure dominating the Mekong region.

### **Water level and its forecast**

- According to MRC's observed water level data, the outflows at Jinghong hydrological station showed water level changes over the monitoring period from 2 to 8 November 2021. Water levels at this station slightly increased about 0.04 m from 535.20 m on 2 Nov to 535.24 on 8 Nov 2021 (recorded on 7:00 am) and stayed about 0.65 m lower than its two-average (2020-2021) value. The outflow rose from 790.00 m<sup>3</sup>/s on 2 Nov to 813.00 m<sup>3</sup>/s on 8 Nov 2021.
- Amid the slightly increased outflow from Jinghong upstream, water levels of monitoring stations at Chiang Saen in Thailand decreased about 0.15 m from 2 to 8 Nov 2021. However, from Chiang Khan in Thailand to Vientiane in Lao PDR, water levels increased about 0.15 m during Nov 2-8 due to some rainfall in the area and influence of dam operation. Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR, on the other hand, were decreasing. Water levels from the stretches of the river from Stung Treng to Kratie and at Kampong Cham in Cambodia, moreover, were drastically 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 in 2021 was lower than its LTA but higher than the levels in 2019 and 2020 during the same period from 2 to 8 November 2021, 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 from October 30 to November 5 was normal all over the LMB. The region showed no drought threat except some moderate and severe dry soil moisture in the upper part of the LMB.
- For the upcoming three-month forecast, the LMB is likely to receive from average to above average rainfall from November 2021 to January 2022. There will be some more rain dropping over the southern part of the LMB during November and December 2021 making the condition cooler than normal year, while normal condition is likely taking place in the upper and middle parts of the region during the last two months of the year.



# 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 **2-8 November 2021**. The trend and outlook for water levels are also presented.

This analysis is based on the daily hydro-meteorological data provided by the Mekong River Commission (MRC) Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – and on satellite data. 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 (November, December and January) and the weather maps issued by the Thai Meteorological Department (TMD) were used to verify weather conditions in the LMB.

At the end of October 2021, rainfall was much reduced in 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 08 November 2021, showing a line of low pressure of the Monsoon Trough crossing the lower Mekong region which can still bring some rainfall over the next few days.

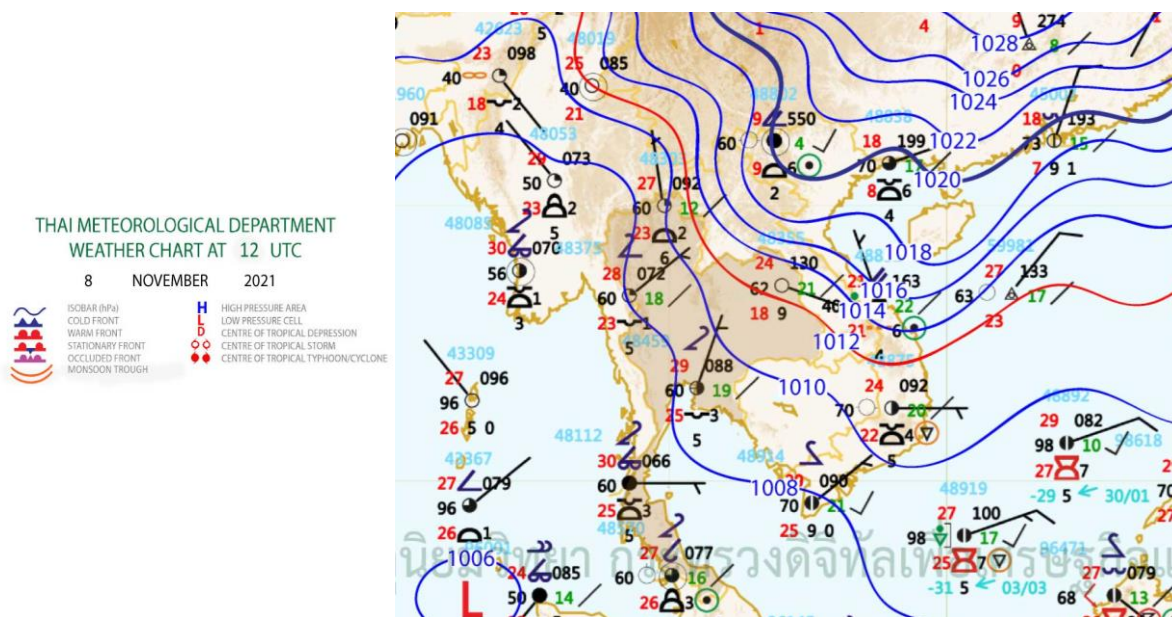


Figure 1: Summary of weather conditions over the LMB.

According to the ASEAN Specialised Meteorological Centre (ASMC), a highest probability of wetter condition is predicted over of the lower part of the Mekong region covering Lao PDR and Thailand from 1 to 14 November 2021, during the 1<sup>st</sup> and 2<sup>nd</sup> weeks of November. Moreover, LMB is likely dominated by wetter condition, which may receive cool temperature in general in the Lower part to the LMB. **Figure 2** shows the outlook of weather condition from 1 to 14 November 2021 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

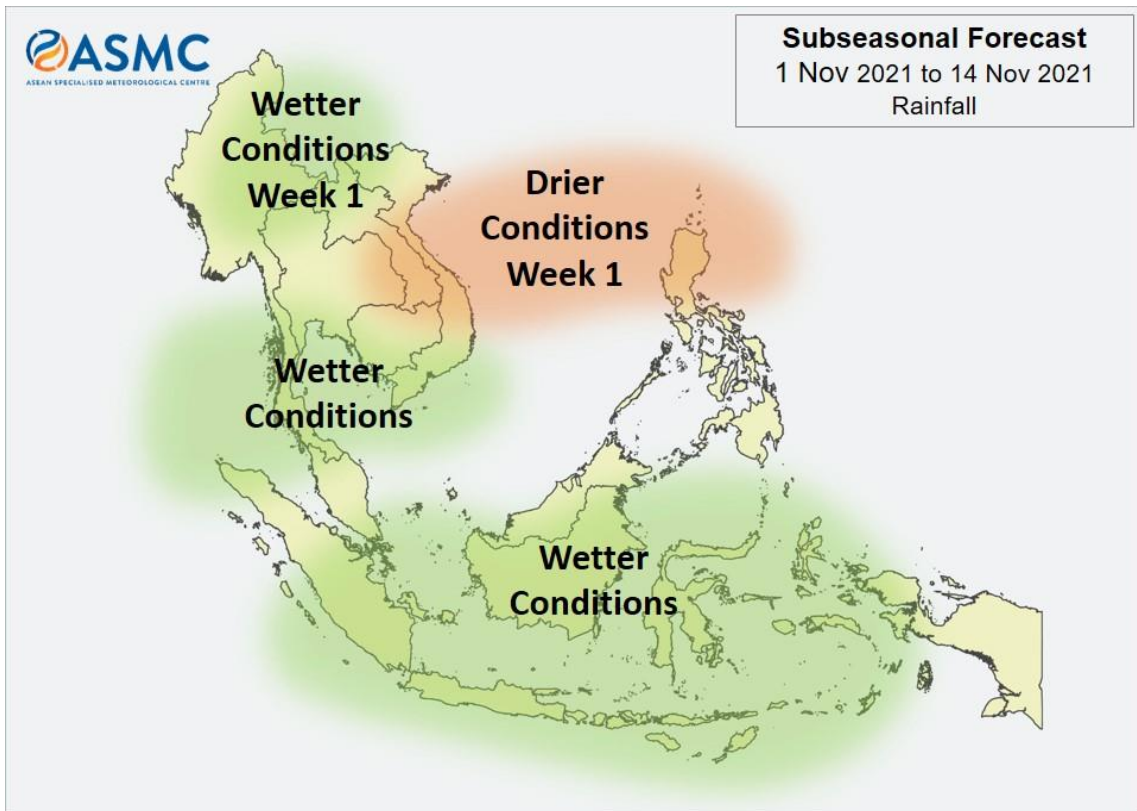


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There was a low pressure hitting the LMB during 2–8 November 2021. This may probably caused some rainfall in the middle and the lower parts of the LMB, as well as in the Mekong Delta in Viet Nam and the 3S area (Sesan, Sre Pok, and Sekong) of Cambodia and Viet Nam. No storms movement detected on 08 November in the LMB, as displayed in [Figure 3](#).

**Active system as of 08 November 2021 4:50 GMT**

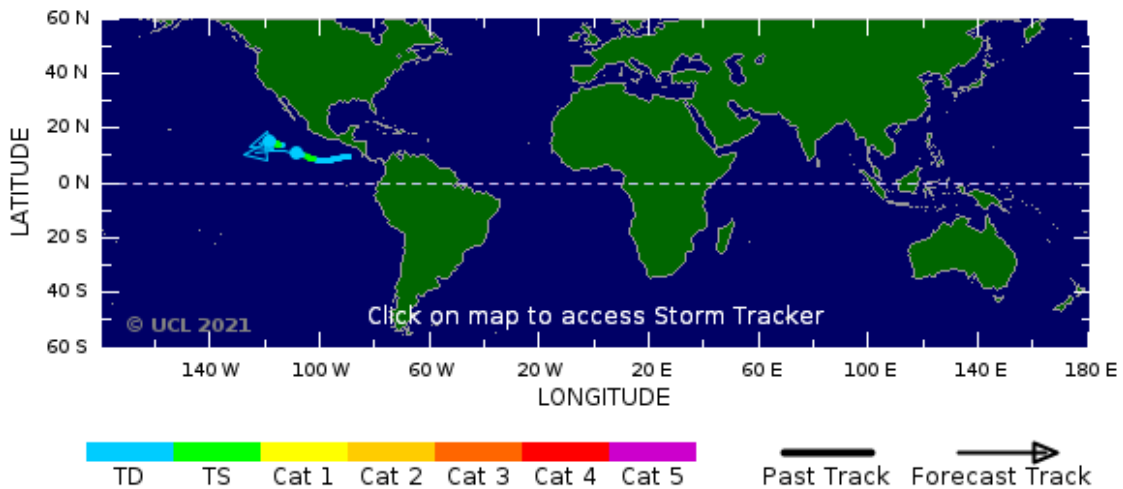
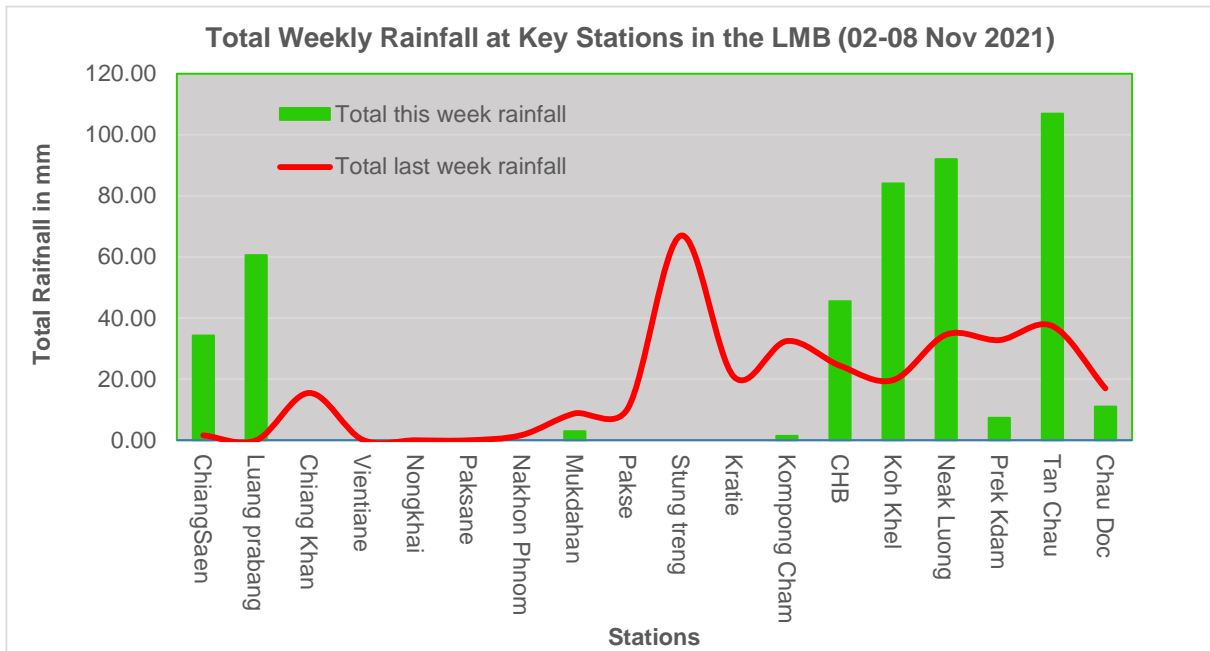


Figure 3: No tropical storm risk observed on 8 November.

## Rainfall patterns over the LMB

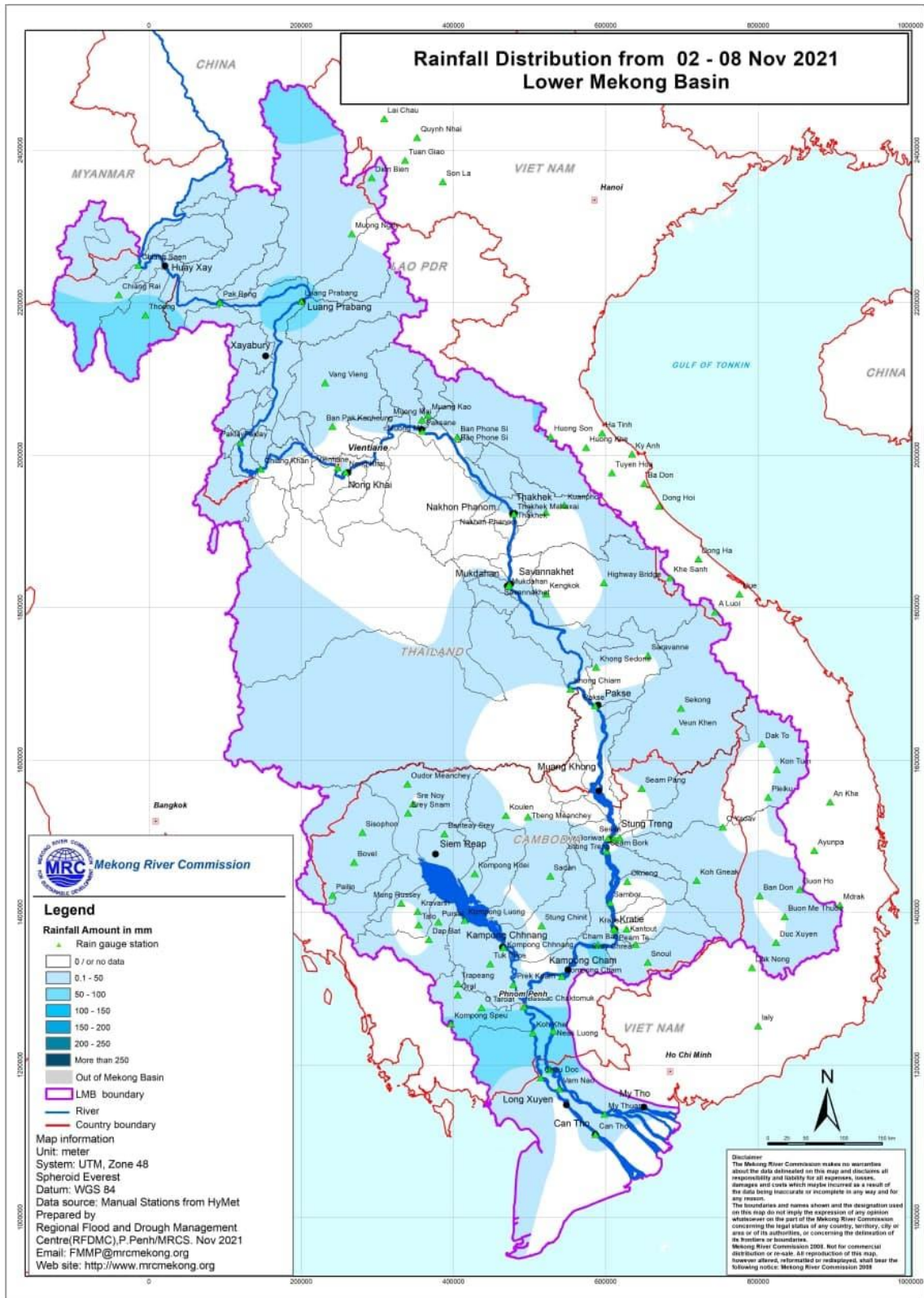
This week, the rain concentrated in the upper part at Chiang Saen in Thailand and Lung Prabang in Lao PDR and the lower part in Cambod and Viet Nam's Tan Chau and Chau Doc. The amount of rainfall over the Mekong region is considered high at the lower part, varying from 1.40 mm to 107 mm. No rain was observed at the middle part of the Mekong basin. Compared with last week's amount, the rainfall this week was considered the lower across the Mekong region. This week rainfall was lower than last week rainfall in entire LMB (see [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 observed data provided by the MRC Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – from 2 to 8 November 2021.

The very small amount of rainfall this week is considered 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**.

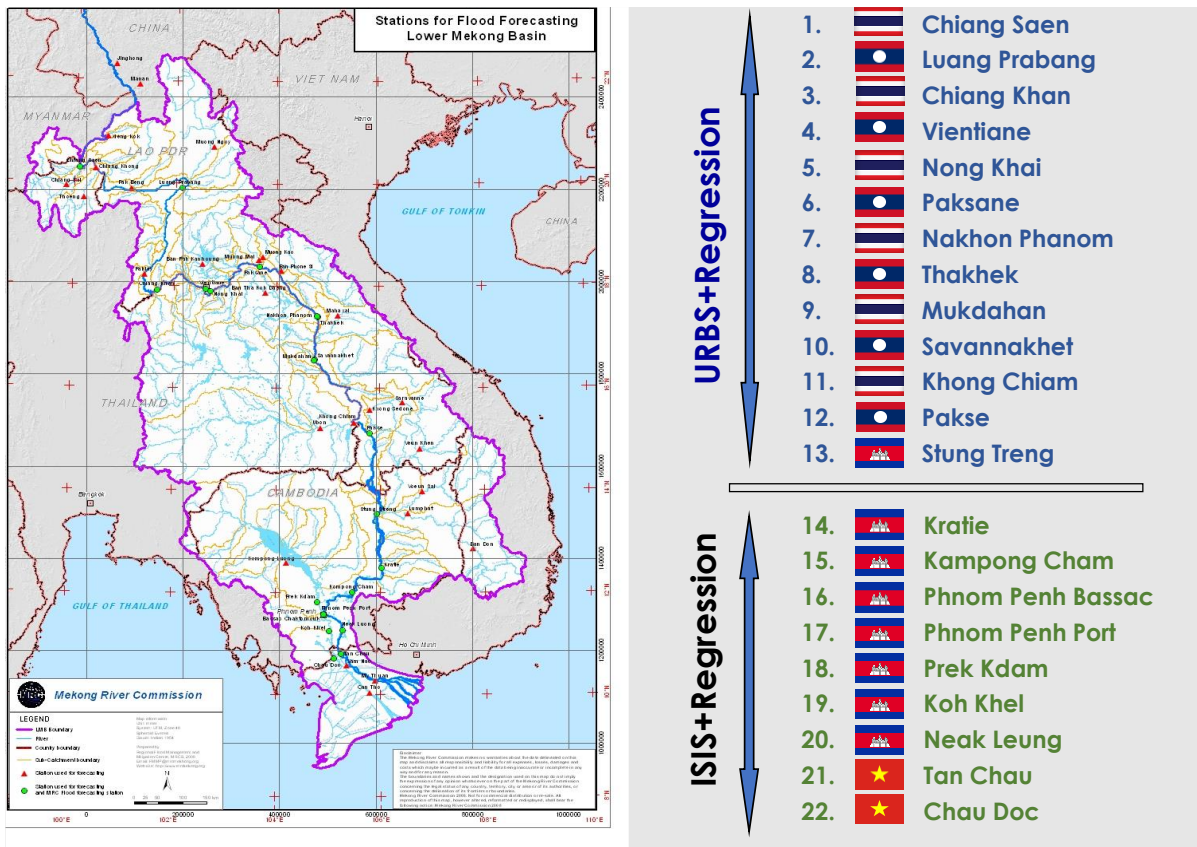
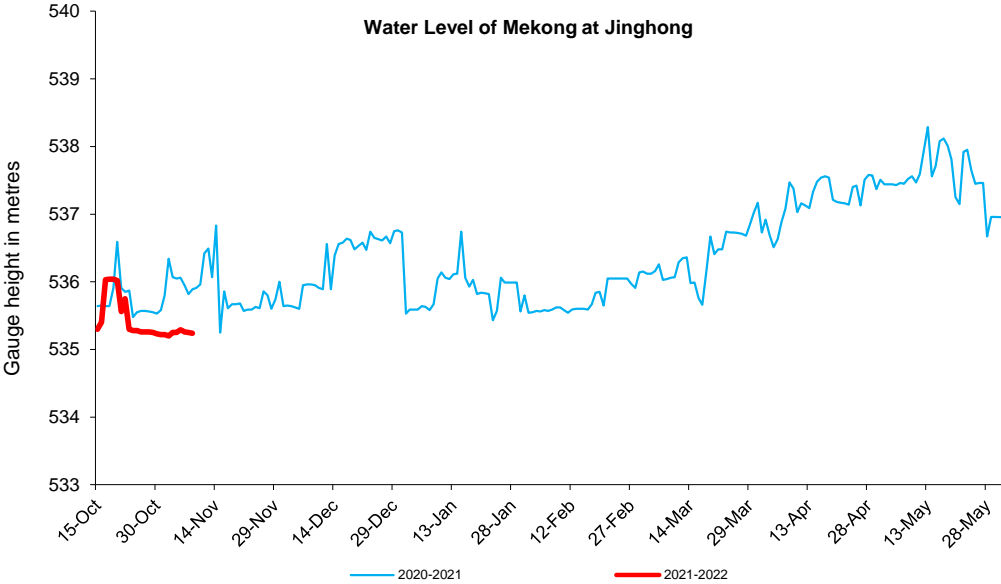


Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.

According to MRC’s observed water level data, the outflows at Jinghong hydrological station showed water level changes over the monitoring period from 2 to 8 November 2021. Water levels at this station slightly increased about 0.04 m from 535.20 m on 2 Nov to 535.24 on 8 Nov 2021 (recorded on 7:00 am) and stayed about 0.65 m lower than its two-average (2020-2021) value. The outflow rised from 790.00 m<sup>3</sup>/s on 2 Nov to 813.00 m<sup>3</sup>/s on 8 Nov 2021.

[Figure 7](#) below presents water level that decreased at the Jinghong hydrological station<sup>1</sup>, indicating the trend of fluctuating water level up to 8 November 2021.



**Figure 7. Water level at the Jinghong hydrological station during 15 Oct to 8 Nov 2021.**

Amid the slightly increased outflow from Jinghong upstream, water levels of monitoring stations at Chiang Saen in Thailand decreased about 0.15 m from 2 to 8 Nov 2021. However, from Chiang Khan in Thailand to Vientiane in Lao PDR, water levels increased about 0.15 m during Nov 2-8 due to some rainfall in the area and influence of dam operation. Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR, on the other hand, were decreasing. Water levels from the stretches of the river from Stung Treng to Kratie and at Kampong Cham in Cambodia, moreover, were drastically 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.

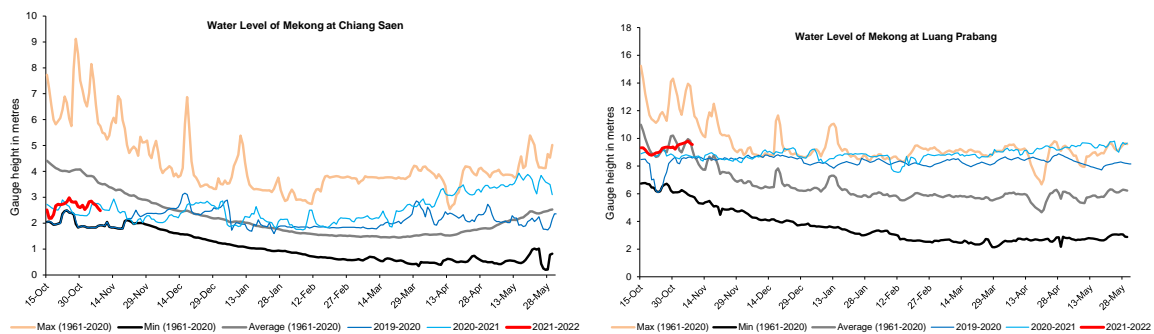
<sup>1</sup> Near-real time data of hydro-meteorological monitoring at the Jinghong hydrological station is available at <https://portal.mrcmekong.org/monitoring/river-monitoring-telemetry>.

## Chiang Saen and Luang Prabang

Water level during November 2–8 at Thailand’s Chiang Saen slightly decreased from 2.63 metres to 2.48 metres. When compared to last week, this week’s water level is relatively lower.

Water level at the Luang Prabang station in Lao PDR decreased from 9.56 metres to 9.55 metres, during the reporting period. Compared to last week, the figure shows a slight decrease by about 0.01 metres. However, the water level was 0.37 metres higher than its long-term average (LTA). 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) slightly increased from 6.46 m to 6.98 m during the reporting week. It showed 0.48 m lower than its Long-Term- Average (LTA). The water level downstream at Vientiane in Lao PDR followed the upstream trend. It also increased from 3.82 m to 4.12 m and was about 0.28 m lower than its LTA during 2-8 November 2021. At Nong Khai station in Thailand, the water level was also up during the reporting period. It increased from 3.42 m to 3.65 m, and still showing 1.26 m lower than its LTA. At Paksane in Lao PDR, water levels decreased about 0.07 m, down from 4.11 m to 4.04 m. The WL at this station was still about 1.54 m lower than its LTA. The recently slightly increased water levels were obviously due to the low rainfall in the sub-catchment area, amid the inflows and water storing from upstream. The water levels at Vientiane and Paksane are shown in [Figure 9](#) below.



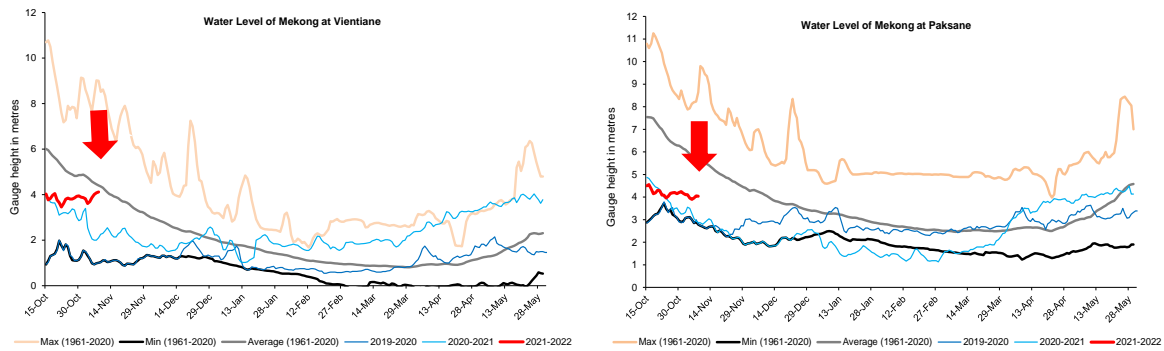


Figure 9. Water levels Veintiane and Paksane in Lao PDR.

### Nakhon Phanom to Pakse

Similarly, water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR slightly decreased by about 0.25 metres, during the reporting period. **Water levels at these stations were staying below their LTA level, which considered critical.** [Figure 10](#) shows the water levels at Nakhon Phanom and Pakse stations.

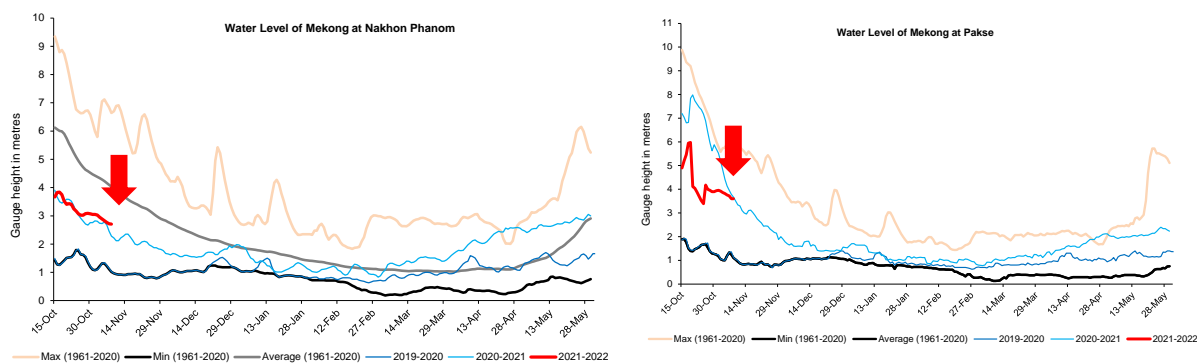
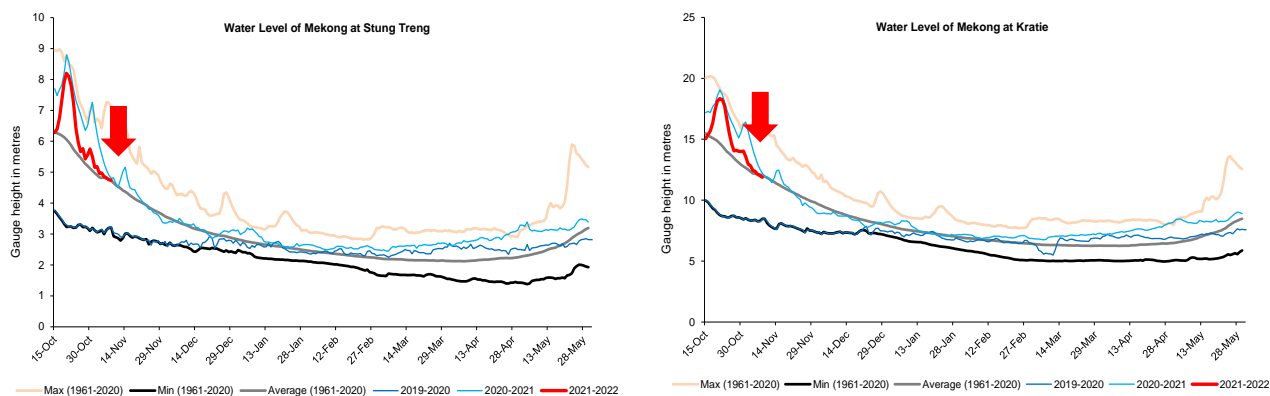


Figure 10: Water levels at Nakhon Phanom and Mukdahan of Thailand.

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

Following the same trend from the upstream part of the Mekong River and the 3S river (Sekong, Se San, and Sre Pok), the water levels from Stung Treng to Kratie in Cambodia remarkably down, during 2-8 November 2021. This week water level at Stung Treng and Kratie decreased about 0.40 m and 1.09 m, respectively, but still remained about 0.01 m and 0.15 m below their LTA (as showed in [Figure 11](#)). The water level at Kampong Cham decreased about 1.07 m and was still about 1.12 m lower than its LTA. Generally, the **Water levels at these stations were lower than their LTA, which considered critical.**



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

However, at Chaktomuk on the Bassac River, due to less rainfall and contributed flows from upstream catchment, the water level was down by about 0.65 m and stayed 1.48 m lower than its LTA value; while at Koh Khel, water level increased about 0.55 m, staying 0.52 m lower than its LTA value. The water level at Prek Kdam on the Tonle Sap Lake decreased about 0.45 m and was about 1.18 m lower than its LTA value. The water level at the Tonle Sap Lake (observed at Kampong Luong) was similar to Prek Kdam station’s water level. The recently decreased water level was because of less rain and low inflow contributed from upstream of the Tonle Sap Lake area during the reporting period. The water level at the Tonle Sap Lake (observed at Kampong Luong) followed the same trend of Prek Kdam station’s water level. **Water levels at these stations were staying lower than their LTA level, which still considered critical.**

#### Tidal stations at Tan Chau and Chau Doc

Like last week, the water levels from 2 to 8 November 2021 at Viet Nam’s Tan Chau and Chau Doc were fluctuating due to daily tidal effects from the sea. The fluctuation levels were between 2.13 m and 2.54 m; they were in between the range of their LTA and historical minimum levels and **considered normal.**

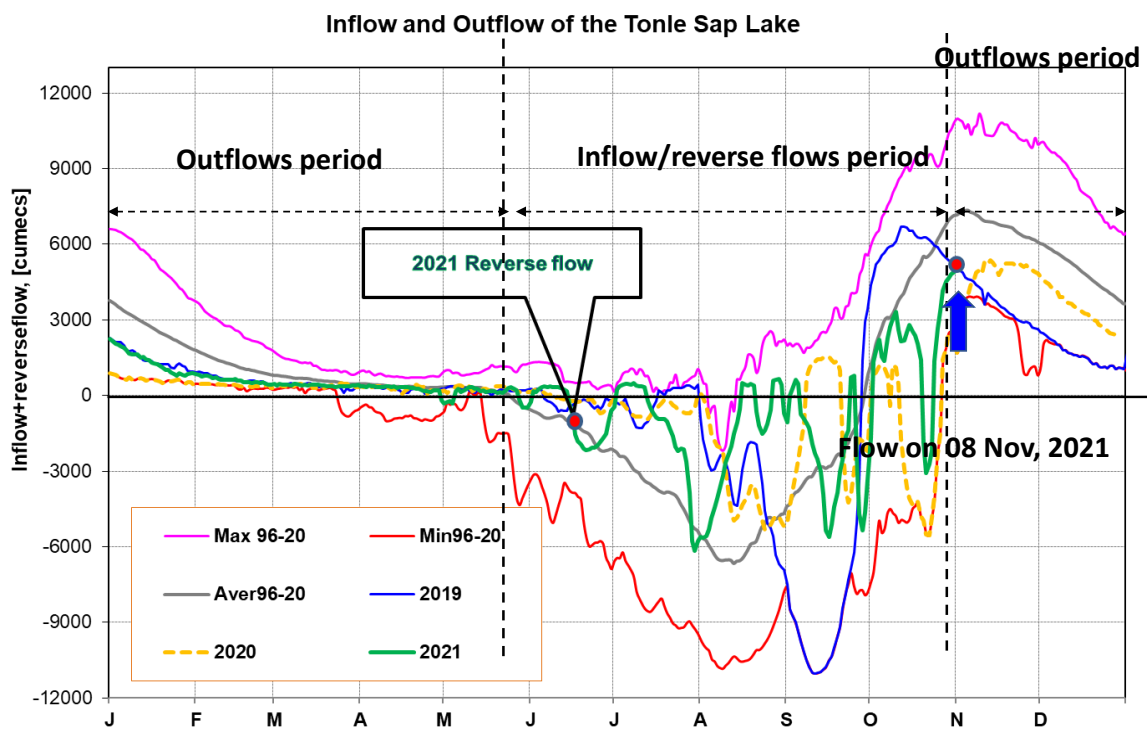
#### The Tonle Sap Flow

At the end of the wet season, when water levels along the Mekong River subside, outflows of the Tonle Sap Lake (TSL) 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 taken 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 November 8 of this reporting period, **it was observed that the main outflow to Tonle Sap Lake slightly increased due to some rainfall from upstream.** This increased outflow of Tonle Sap Lake was most likely caused by inflows due to 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. For next week, small rainfall is forecasted for the Tonle Sap area; thus, the outflow into the Tonle Sap Lake is likely to continue slightly increase from the current level.

[Figure 13](#) shows seasonal changes in monthly flow volumes up to November 8 for the Lake compared with the volumes in 2019, 2020 and their LTA, and the fluctuation levels (1997–2020). It shows that up to November 8, **the water volume of the Tonle Sap Lake is lower than its LTA but higher than 2019 and 2020 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.**

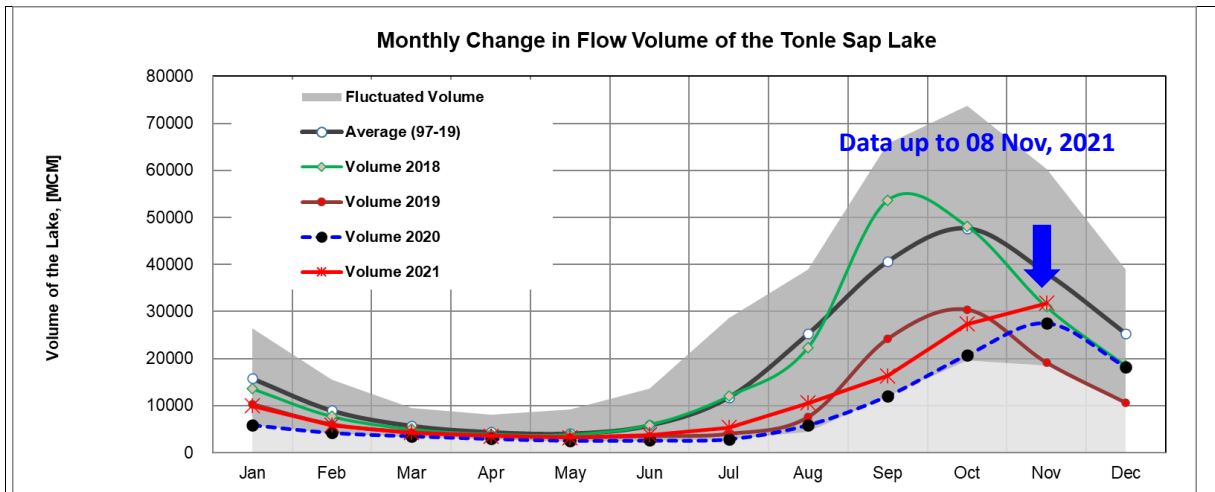


Figure 13. The seasonal change in monthly flow volume of Tonle Sap Lake.

Figure 14: The seasonal change in monthly flow volume of Tonle Sap Lake.

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

Month	Average Volume (97-19) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2018 [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]
Jan	15756.54	26357.53	5906.80	13633.41	10285.31	5906.80	9923.80
Feb	8964.81	15596.22	4198.60	7729.72	6019.30	4264.19	5832.97
Mar	5711.41	9438.24	3347.07	5037.06	4354.62	3553.99	4264.88
Apr	4379.57	8009.14	2866.91	3956.47	3667.47	2992.61	3556.68
May	4063.12	9176.93	2417.81	3864.00	3266.43	2594.92	3240.78
Jun	5787.88	13635.01	2468.70	5919.18	3517.06	2641.88	3798.29
Jul	11749.36	28599.56	2925.86	12024.96	4001.99	2925.86	5346.73
Aug	25254.98	39015.12	4433.46	22399.65	7622.71	5941.07	10547.80
Sep	40602.85	65632.35	12105.31	53639.54	24194.19	12105.31	16382.34
Oct	47688.24	73757.23	19705.50	48193.08	30358.38	20799.13	27318.21
Nov	38191.50	60367.33	18534.61	31036.07	19112.65	27546.80	31769.01
Dec	25332.58	38888.95	10563.49	18469.21	10577.29	18251.65	
	Critical situation, compared with historical Min values						
	Normal condition, compared with LTA (Long term average)						
	Low volume situation, compared with LTA values						
Unit: Million Cubic Meter (1 MCM= 0.001 Km <sup>3</sup> )							

## 4 Flash Flood in the Lower Mekong Basin

During November 2-8, the LMB was affected by three main weather factors. These include (i) the high-pressure from China extended its ridge to cover the upper part during the second half of the week; (ii) the easterly and northeasterly winds prevailed from the Gulf of Thailand for almost the entire week, and (iii) the low-pressure cell which covered lower Viet Nam moving towards the middle and the lower parts (including Lao PDR, Cambodia and eastern part of Thailand) of the region. These conditions caused small and moderate rainfall mainly during the second half of the week with cool weather in the upper part during the first half of the week and heavy rain during daily afternoon in the lower part (Viet Nam and Cambodia) of the LMB.

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

## 5 Drought Monitoring in the Lower Mekong Basin

### Weekly drought monitoring from 30 October to 05 November 2021

Drought monitoring data for 2021 are available from Saturday to Friday every week; thus, the reporting period is normally delayed by three days compared to Flood and Flash Flood reports. We adopt the Index of Soil Water Fraction (ISWF) data obtained from FFGS to represent soil moisture of agricultural indicator for both dry and wet seasons.

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

Drought condition of the LMB from October 30 to November 5, as shown in [Figure 11](#), was normal in most parts. Meteorological indicator of SPI shows that the LMB received average rainfall in almost all parts of the region during the monitoring week.

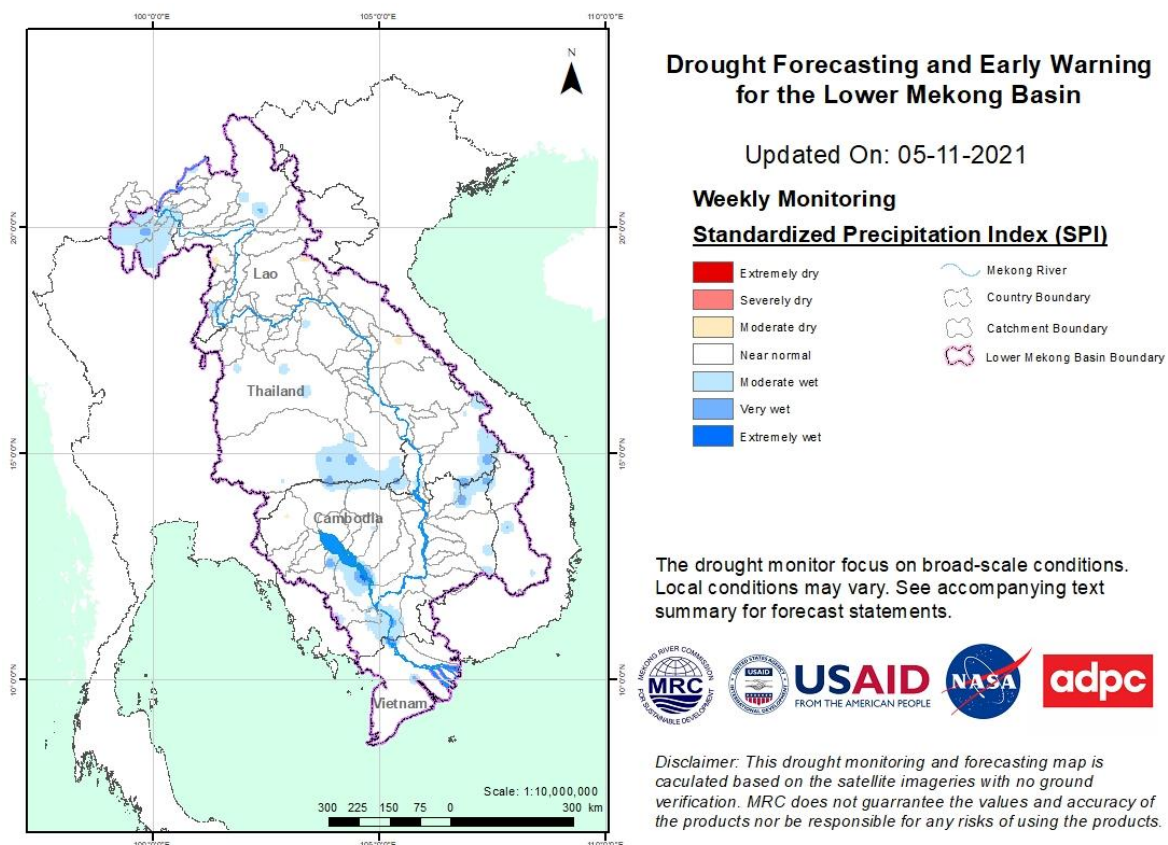
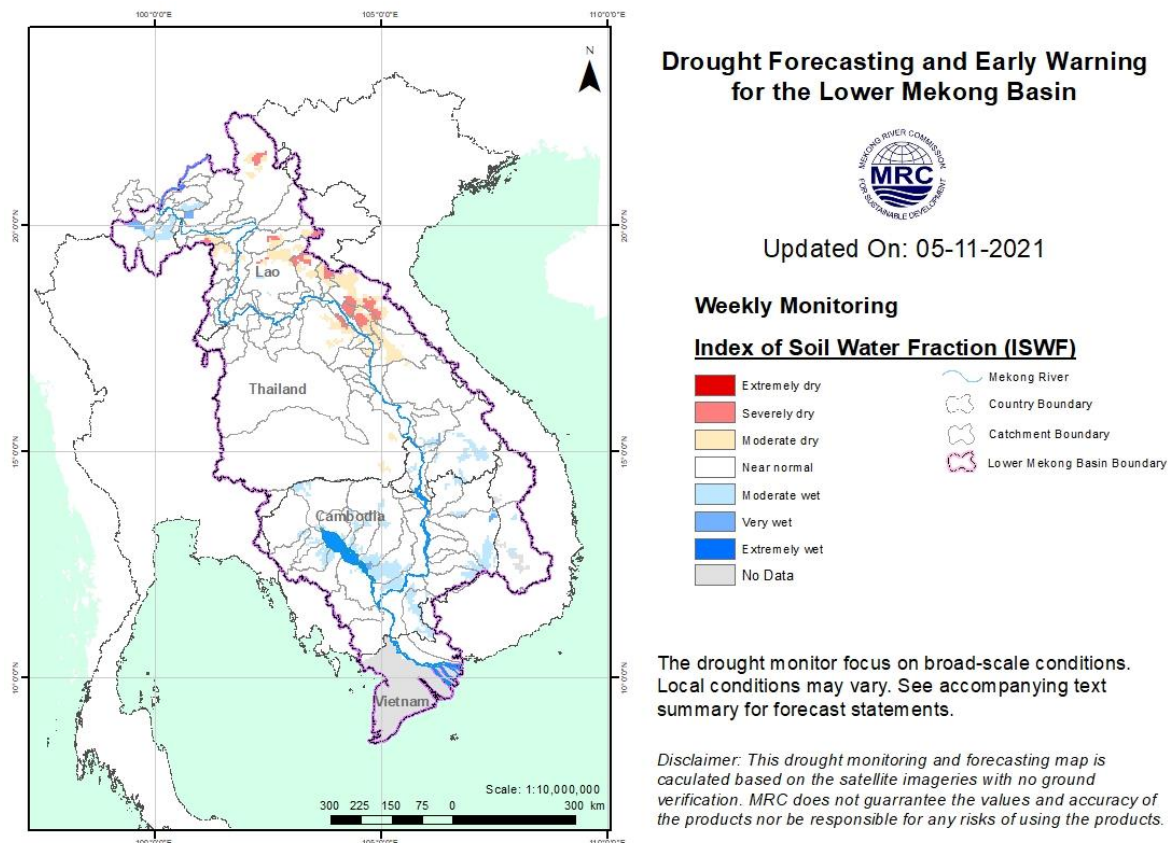


Figure 15: Weekly standardised precipitation index from Oct 30-Nov 5.

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

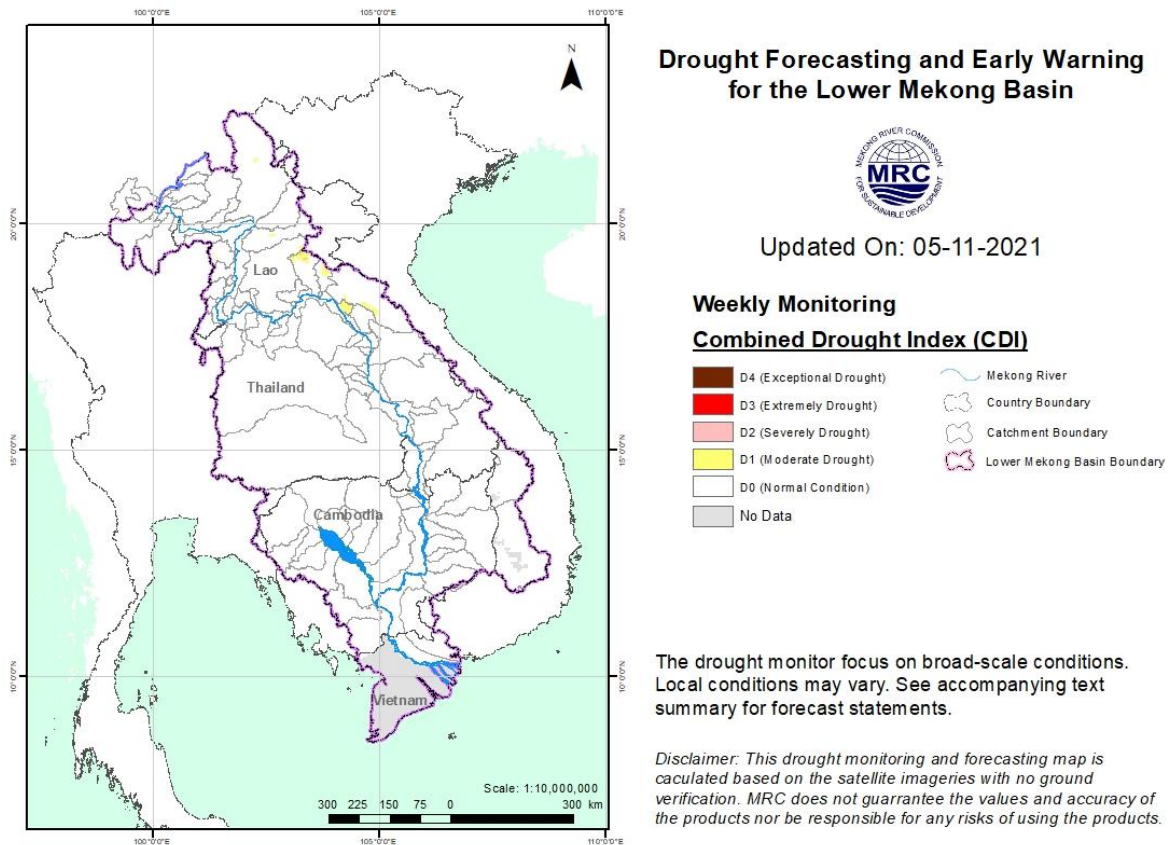
Soil moisture condition from October 30 to November 5, as displayed in [Figure 12](#), was at normal condition in most parts of the LMB. The ISWF indicates abnormally dry soil moisture took place in Borikhamxay and Khammuane of Lao PDR during the monitoring week. However, the situation was not serious.



**Figure 16: Weekly Soil Moisture Anomaly from Oct 30-Nov 5.**

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

The combined drought indicator, as displayed in [Figure 13](#), reveals that the LMB was normal during October 30-November 5 amid some abnormally dry soil moisture in northern Lao PDR. No drought risk was detected during the reporting week.



**Figure 17: Weekly Combined Drought Index during Oct 30-Nov 5.**

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.



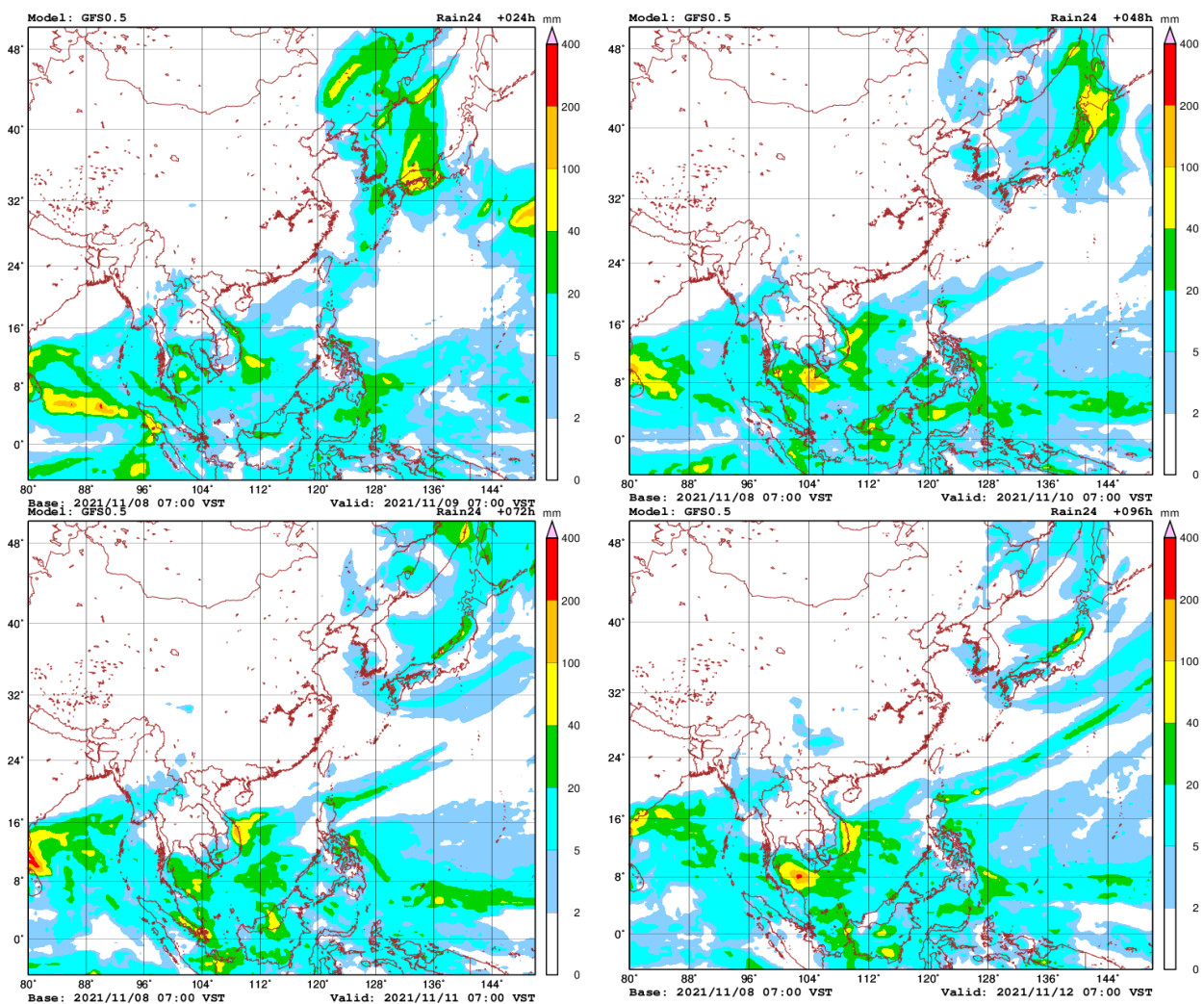
## 6 Weather and Water Level Forecast and Flash Flood Information

### 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, three factors might affect the LMB. They include (i) high pressure from China, (ii) the on-going prevailing Southwest Monsoon from the Gulf of Thailand to the lower part of the LMB; and (iii) the low-pressure cell which will cover lower Viet Nam and move over to the middle and the lower parts of the Country.

During period November 9-12, small rainfall (5-20 mm/24h) may occur in some areas of the LMB. However, during the period of November 13-15, moderate (20- 50 mm/24h) and heavy rain (50-100 mm/24h) may occur in some areas of from the middle to the lower parts of LMB.

[Figure 14](#) shows accumulated rainfall forecast (24hrs) of the GFS model from November 9 to 15.



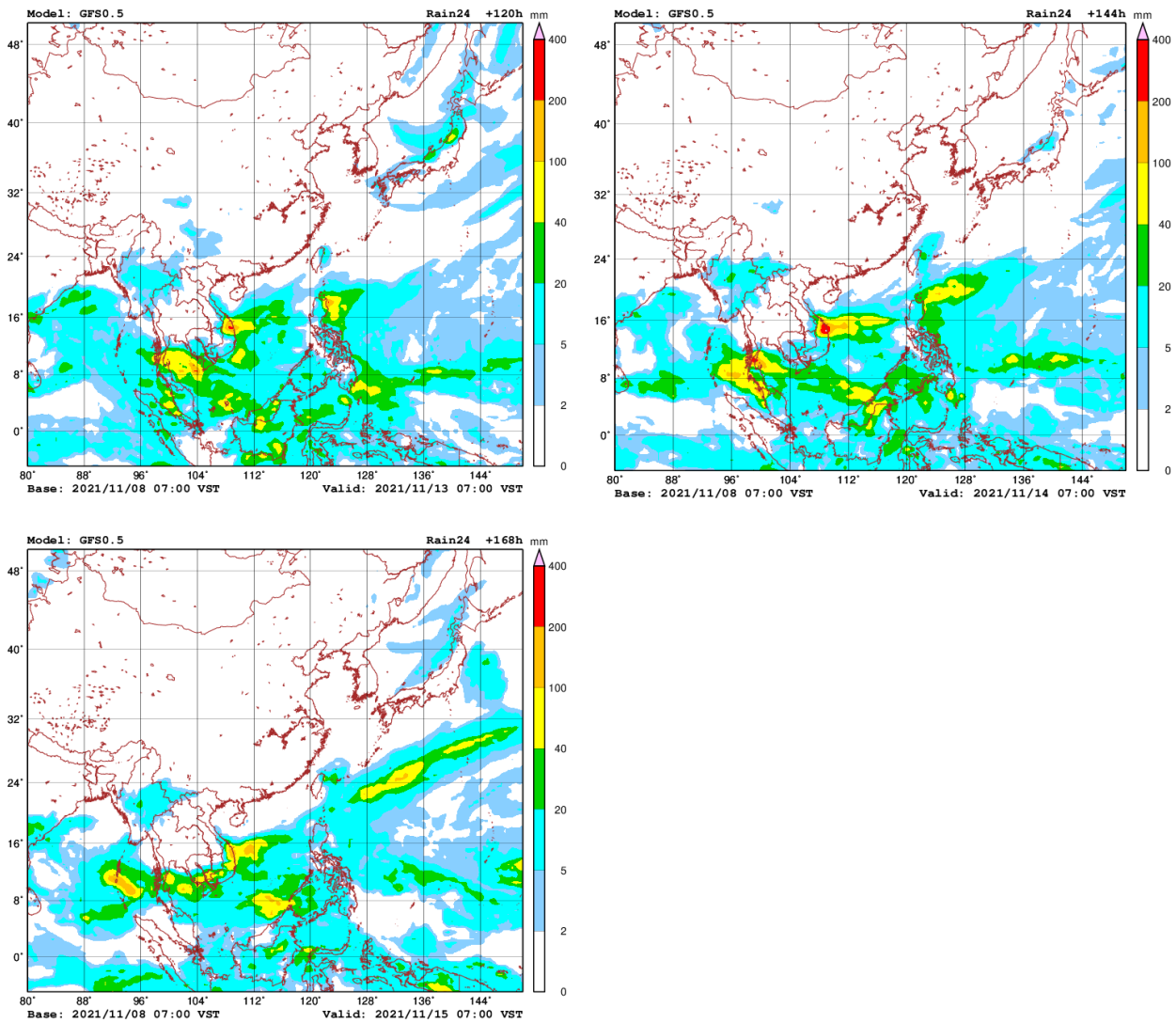


Figure 18: Accumulated rainfall forecast (24 hrs) of model GFS.

## 6.2 Water level forecast

### Chiang Saen and Luang Prabang

Based on November 8's weekly river monitoring bulletin, the weekly forecast water level at Chiang Saen in Thailand is expected to slightly increase from 2.48 metres to 2.49 metres in the next seven days. Even so, the trend of water levels at these stations will continue staying below their LTAs.

For Luang Prabang in Lao PDR, the water level is likely to decrease, staying between 9.55 metres and 9.40 metres during the same period. The current water levels are higher than their LTAs.

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

Water level at Chiang Khan station in Thailand is forecasted to be stable for the next seven days. But Vientiane in Lao PDR and Nong Khai in Thailand will see a very slight increase about 0.15 metres in the next seven days. At Paksane in Lao PDR, water level will decrease about 0.04 m due to less inflow from the upper catchments. Rainfall is forecasted for the area of Paksane next week Low-average quantity of precipitation is forecasted in the area. The water levels here will remain lower than their LTAs.

### **Nakhon Phanom to Pakse**

Water levels from Nakhon Phanom in Thailand and Savannakhet in Lao PDR may will slightly decrease by about 0.35 metres in the next seven days. From Khong Chiam in Thailand to Pakse in Lao PDR the water will decrease by about 0.40 metres. Water level at these stations will stay lower than their LTA level. Next week Low-average quantity of precipitation is forecasted in the area.

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

From Stung Treng to Kampong Cham along the Mekong River in Cambodia, the water levels will go down from 0.30 m to 0.50 m over the next seven days. Precipitation is forecasted for the area between Stung Treng and Kampong 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 0.35 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. Precipitation is forecasted for the low-lying area of Cambodia next week.

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

For Viet Nam's Tan Chau on the Mekong River and Chau Doc on the Bassac River, water levels will be moving up and down below their LTAs, following daily tidal effects from the sea.

[Table 3](#) shows the weekly River Monitoring Bulletin issued on November 8. 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**

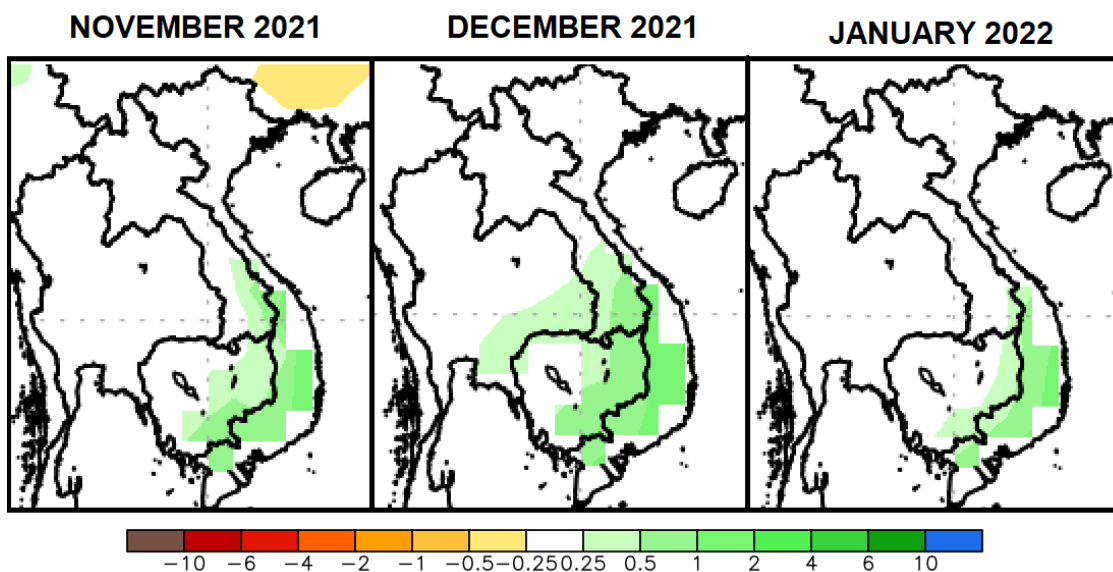
Flash flood events are likely to happen in some areas from middle to lower of LMB on the date of from November 13 to 15. However, local heavy rain in a short period of time might still be possible with unexpected short flash floods. During the dry season if extreme weather occurs, the information on 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 November 2021. The MRC's DFEWS adopts an ensemble model called the North America Multi-Model Ensemble (NMME), which averages all scenarios.

The global scale of rainfall prediction is used to see how the rain distribution looks like for the coming months. [Figure 15](#) shows the ensemble mean of daily average precipitation (mm/day) each month from November 2021 to January 2022 produced by the NMME.



**Figure 195. Daily average of monthly rainfall anomaly forecast from November 2021 to January 2022.**

The ensemble prediction model based on the initial conditions in October reveals that the LMB is likely to receive from average to above average rainfall from November 2021 to January 2022. There will be some more rain dropping over the southern part of the LMB during November and December 2021 making the condition cooler than normal year, while normal condition is likely taking place in the upper and middle parts of the region during the last two months of the year.

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: 09 November to 15 November 2021

Date: 08 November 2021

LOCATION	Country	Observed Rainfall (mm)	Zero gauge above M.S.L (m)	Min water level against zero gauge (m)	Observed W. level against zero gauge (m)		Forecasted Water Levels (m)							
					07-Feb	07-Nov	08-Nov	09-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov
Jinhong		29.5	-	-	535.25	535.24								
Chiang Saen		32.0	357.110	0.00	2.58	2.48	2.43	2.40	2.42	2.47	2.51	2.53	2.48	
Luang Prabang		0.0	267.195	2.53	9.65	9.55	9.43	9.33	9.27	9.25	9.30	9.35	9.40	
Chiang Khan		0.0	194.118	1.91	6.82	6.98	7.06	7.00	6.92	6.86	6.89	6.93	6.98	
Vientiane		0.0	158.040	-0.28	4.08	4.12	4.26	4.35	4.30	4.22	4.15	4.20	4.25	
Nongkhai		0.0	153.648	0.33	3.60	3.65	3.80	3.90	3.85	3.77	3.70	3.76	3.81	
Paksane		0.0	142.125	0.10	4.05	4.04	4.00	4.06	4.12	4.07	4.00	3.95	4.00	
Nakhon Phanom		0.0	130.961	0.18	2.72	2.71	2.66	2.58	2.57	2.60	2.56	2.52	2.48	
Thakhek		0.0	129.629	1.38	4.00	3.96	3.90	3.80	3.78	3.82	3.77	3.72	3.67	
Mukdahan		0.0	124.219	0.72	2.92	2.90	2.84	2.75	2.62	2.60	2.62	2.60	2.57	
Savannakhet		0.0	125.410	-0.65	1.35	1.32	1.26	1.18	1.17	1.18	1.20	1.19	1.17	
Khong Chiam		0.0	89.030	1.02	5.02	4.96	4.91	4.83	4.72	4.56	4.51	4.55	4.57	
Pakse		0.0	86.490	0.03	3.60	3.60	3.60	3.55	3.50	3.40	3.37	3.39	3.40	
Stung Treng		nr	36.790	0.32	4.76	4.74	4.68	4.63	4.58	4.53	4.45	4.42	4.44	
Kratie		nr	-1.080	3.06	12.01	11.87	11.79	11.71	11.64	11.58	11.51	11.42	11.38	
Kompong Cham		nr	-0.930	0.65	7.51	7.40	7.31	7.22	7.14	7.07	7.00	6.92	6.82	
Phnom Penh (Bassac)		nr	-1.020	1.58	5.96	5.88	5.81	5.75	5.70	5.66	5.62	5.58	5.52	
Phnom Penh Port		-	0.000	0.14	4.98	4.90	4.83	4.77	4.72	4.68	4.64	4.60	4.53	
Koh Khel		nr	-1.000	1.52	5.50	5.45	5.40	5.35	5.32	5.30	5.27	5.24	5.18	
Neak Luong		nr	-0.330	0.81	4.39	4.34	4.30	4.25	4.21	4.18	4.15	4.11	4.08	
Prek Kdam		nr	0.080	0.58	5.63	5.58	5.51	5.45	5.40	5.35	5.30	5.26	5.20	
Tan Chau		0.0	0.000	-0.37	2.33	2.21	2.12	2.05	2.00	1.96	1.93	1.90	1.87	
Chau Doc		nr	0.000	-0.60	2.29	2.13	2.02	1.94	1.87	1.81	1.76	1.72	1.68	

**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

Rainfall during this reporting week was considered high in the lower part of the LMB (.40 mm to 107 mm) due to do any low-pressure ling dominating in the LMB. No rainfall in the middle part of the Mekong region were recorded during this week report. Compared with last week's amount, the rainfall this week was considered very low in the whole 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 November 9–15, varying from 0.10 mm to 60 mm. This indicates the start of the dry season from November over the LMB.

### 7.2 Water level and its forecast

According to MRC's observed water level data, the outflows at Jinghong hydrological station showed water level changes over the monitoring period from 2 to 8 November 2021. Water levels at this station slightly increased about 0.04 m from 535.20 m on 2 Nov to 535.24 on 8 Nov 2021 (recorded on 7:00 am) and and stayed about 0.65 m lower than its two-average (2020-2021) value. The outflow rose from 790.00 m<sup>3</sup>/s on 2 Nov to 813.00 m<sup>3</sup>/s on 8 Nov 2021.

Water levels in the lower part of the monitoring locations in the LMB during this reporting week were decreasing from Nakhon Phanom in Thailand to Stung Treng, Kratie and Kompong Cham in Cambodia, after the end of the heavy rainfall in October. Water levels at Neak Luong, Bassac at Phnom Penh, and Prek Kdam in Cambodia were still lower than their LTA levels. The low level was due to low inflows from upstream and little rainfall in the region from November 9 to 15. 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 the less rainfall forecasted in the inflow catchments of the Tonle Sap Lake.

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

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

Since the 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 and November 2020 to May 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 likely to happen in the region from middle to lower of LMB on 13 to 15 November.

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

Drought condition of the LMB from October 30 to November 5 was normal all over the LMB. The region showed no drought threat except some moderate and severe dry soil moisture in the upper part of the LMB.

For the upcoming three-month forecast, the LMB is likely to receive from average to above average rainfall from November 2021 to January 2022. There will be some more rain dropping over the southern part of the LMB during November and December 2021 making the condition cooler than normal year, while normal condition is likely taking place in the upper and middle parts of the region during the last two months of the year.

**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
02-11-2021	535.20	2.63	9.56	6.46	3.82	3.42	4.11	3.03	3.18	3.92	5.18	12.96	8.47	6.53	6.00	4.82	6.03	2.54	2.43
03-11-2021	535.25	2.83	9.60	6.35	3.61	3.23	4.10	2.95	3.13	3.86	4.96	12.83	8.20	6.36	5.87	4.70	5.92	2.56	2.50
04-11-2021	535.25	2.85	9.66	6.56	3.69	3.20	3.96	2.89	3.07	3.82	4.97	12.43	7.99	6.24	5.73	4.60	5.85	2.56	2.51
05-11-2021	535.29	2.75	9.72	6.72	3.87	3.34	3.90	2.83	3.03	3.76	4.86	12.35	7.79	6.11	5.64	4.50	5.76	2.56	2.51
06-11-2021	535.26	2.70	9.81	6.78	4.01	3.52	3.96	2.77	2.98	3.72	4.82	12.12	7.66	6.07	5.56	4.44	5.72	2.42	2.45
07-11-2021	535.25	2.58	9.65	6.82	4.08	3.60	4.05	2.72	2.92	3.60	4.76	12.01	7.51	5.96	5.50	4.39	5.63	2.33	2.29
08-11-2021	535.24	2.48	9.55	6.98	4.12	3.65	4.04	2.71	2.90	3.60	4.74	11.87	7.40	5.88	5.45	4.34	5.58	2.21	2.13

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
02-11-2021	0.5	0	29.8	0	0	0	0	0	0	0	0	0	0	1.5	36.5	15.3	0	83.7	10
03-11-2021	0	11.5	30.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0
04-11-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0
05-11-2021	0	22.3	0	0	0	0	0	0	0	0	0	0	1.4	5	7.2	51.4	0	0	0
06-11-2021	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	7.4	0	0	0
07-11-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	30.5	1.7	0	7.3	1.3	0
08-11-2021	0	0	0	0	0	0	0	0	2.9	0	0	0	0	8.5	31.7	17.9	0	21.3	1





## 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)

© Mekong River Commission 2020