Mekong River Commission

Regional Flood and Drought Management Centre

Weekly Situation Report for the Wet Season in the Mekong River Basin

Prepared on: 14/07/2020, covering the week from 07 June to 13 July 2020

Weather Patterns, General Behaviours of the Mekong River and Outlook Situation

General weather patterns

From 07 to 13 July 2020, there were brought some rainfalls over the LMB. The weather outlook bulletins for the 3 months (Jul-Aug-Sep) and weather maps issued by the Thailand Meteorology Department (TMD) were used to verify the weather condition in the LMB. They expect the low pressures of air mass cells will develop around the Mekong Region in the 3rd week of this month, resulting above-average rainfall in this period. Moreover, in August and September there will be some tropical cyclones move to dissipate nearby the LMB, which will have abundance of rainfall. **Figure 1** presented the weather map on 13 July 2020.

According to the Asian Specialized Meteorological Centre (ASMC), the increased shower rainfall over the Mekong sub-region, above-normal rainfall and hotspot activities are happening and remaining in July 2020. In the southern ASEAN region, rainfall over most parts of the equatorial region is predicted to be above normal from July-August-September 2020.

The predicted above-normal rainfall in the Mekong region is showed in July-August-September 2020. Therefore, from July to August 2020, there will increasing chance from moderate to above average rainfall for most parts of the equatorial region especially in the Mekong region. **Figure 2** showed the predicted rainfall in July 2020 in Southeast Asia, which showed the increased above-normal rainfall for the Mekong region.

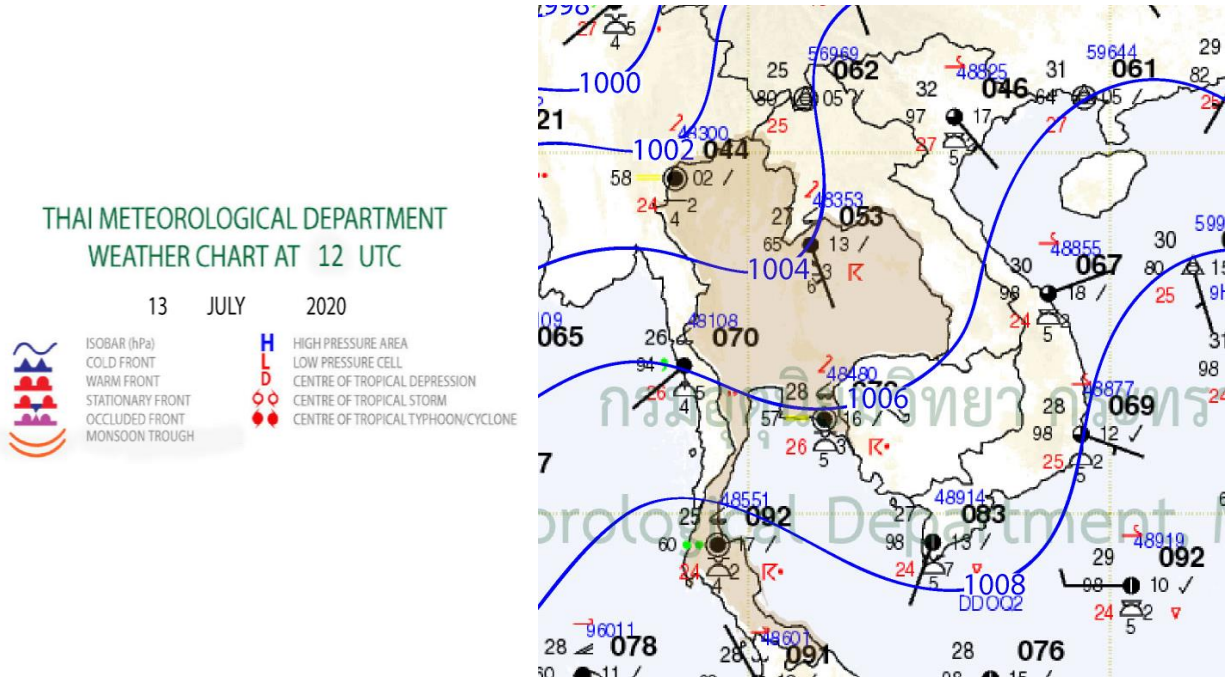


Figure 1 Summary of weather condition over the LMB on 13 July 2020

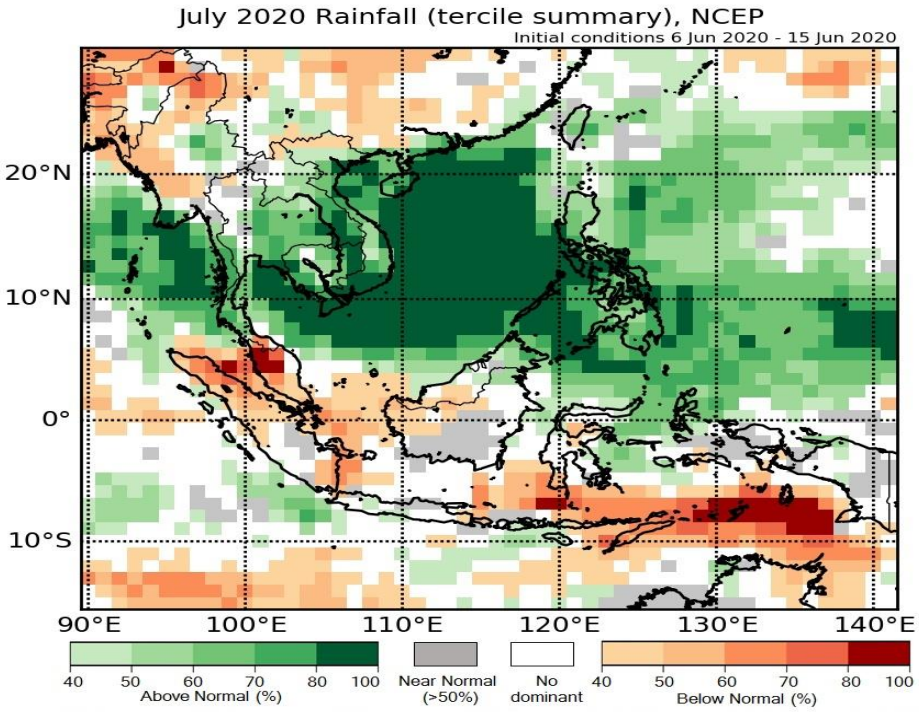


Figure 2 The July-2020 predicted rainfall over Asian Countries by ASMC

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

This week, there are no depression or tropical depression (TD), Tropical Storm (TS) or Typhoon (TY) were happened in LMB.

The rainfall pattern over the LMB

Rainfall in this week is considered above average, varied from 1 mm to 102 mm in different stations along the Lower Mekong River (LMR). Total weekly rainfall from the selected stations over the LMB is showed in **Figure 3**, while weekly rainfall distribution map in the Lover Mekong Basin from 07 to 13 July 2020 is showed in **Figure 4.** It is indicated that heavy rainfalls were accumulated at Chaing Sean, Paksane, Stung Trend and Kratie, which rainfall varied 80 mm to 102 mm. Weekly rainfall map showed the general rainfall oover th

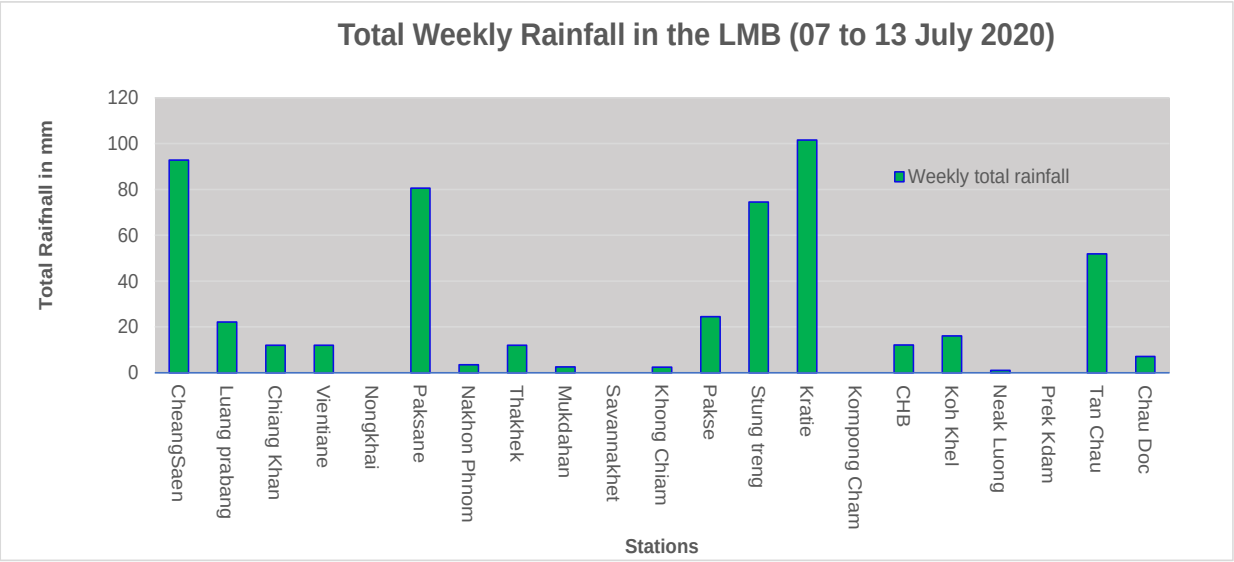


Figure 3 Weekly Total Rainfall over the LMB from 07 to 13 July 2020

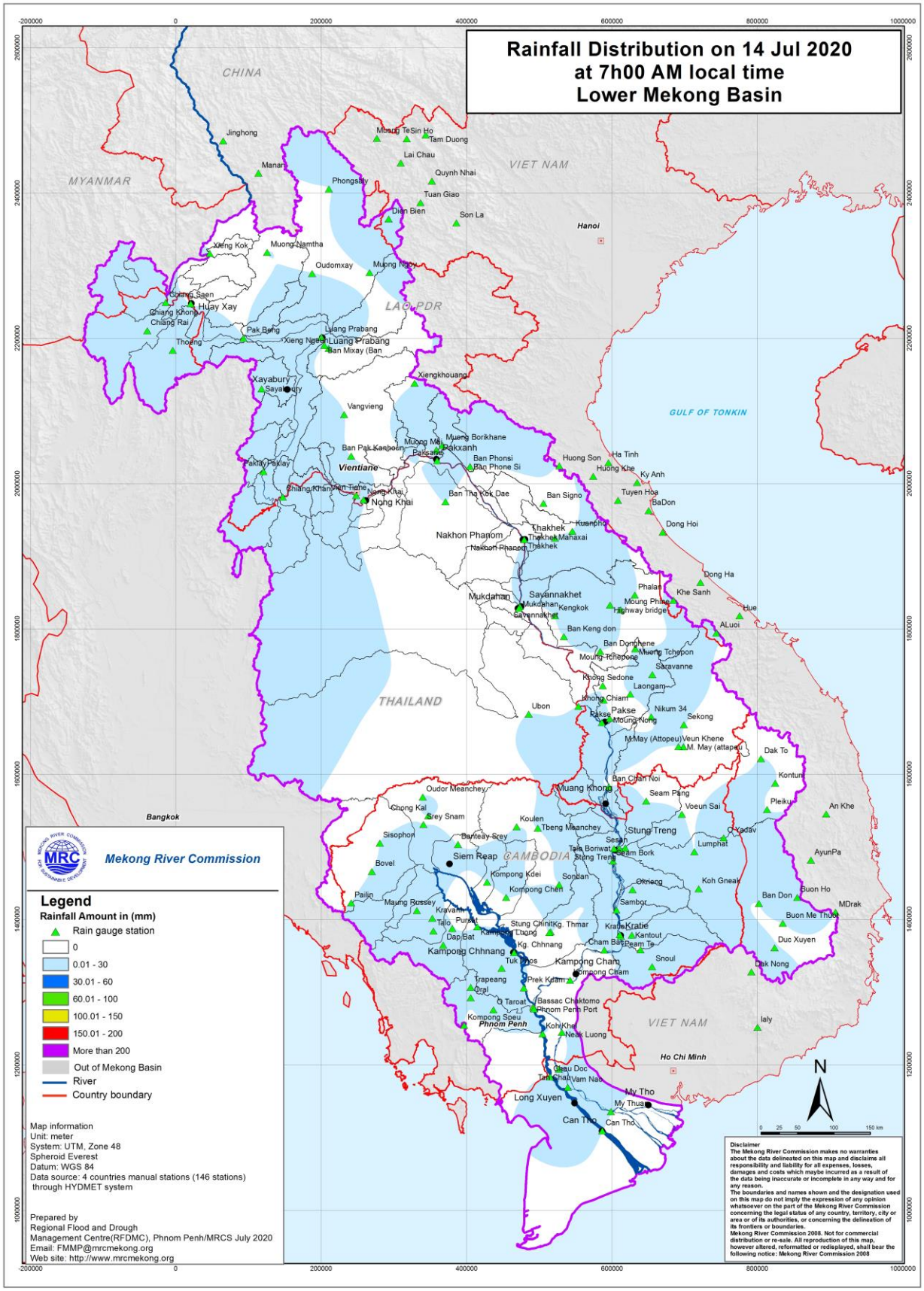


Figure 4 The weekly rainfall distribution from 06 to 14 July 2020 over the LMB

General Situation on water levels of the Mekong River

This week from 07 to 13 July 2020, water levels at the upper most station of Chiang Sean were fluctuated, varied from -0.17 m to 0.15 m. This fluctuated water levels at this station were due to the inflow from upstream and the less rainfall within this week from catchment.

Water levels at Luang Prabang and Chiang Khan are likely impacted by hydropower dam at Xayaburi and upstream hydropower dams. At Lung Prabang, water levels were stable and slightly fluctuated over their long-term average (LTA) levels, varied from -0.04 m to 0.08 m. Water levels at Chiang Khan (downstream of Xayaburi) were also fluctuated, varied from -0.38 m to 0.20 m (observed for the whole week). Water levels at stations in the middle part of LMB from Lao's Paksane to Thailand's Nakhon Phanom were also fluctuated varied from -0.53m to 0.08 m. Followed the same trends water levels at Mukdahan to Pakse were fluctuated from -0.25 m to 0.36m. However, water levels at these stations are still lower than their LATs.

This week water levels at stations of Stung Treng, Kratie, Kampong Cham, Neak Luong, on the Mekong, Chaktomuk and Koh Khel on the Bassac and Phnom Penh Port and Prekdam on the Tonle Sap are slightly fluctuated varied from -0.12 m to 0.27 m. The current water levels at these stations are below their LTAs, although some rainfall in the area.

For the 2 stations at Tan Chau and Chau Doc, water levels are having been fluctuating below their LTAs due to the daily tidal effect from the sea. The attached hydrograph at each key station is showed in **Annex A**. **Figure 5** presented the key stations with model application for river flood forecasting for the wet season from June to October.

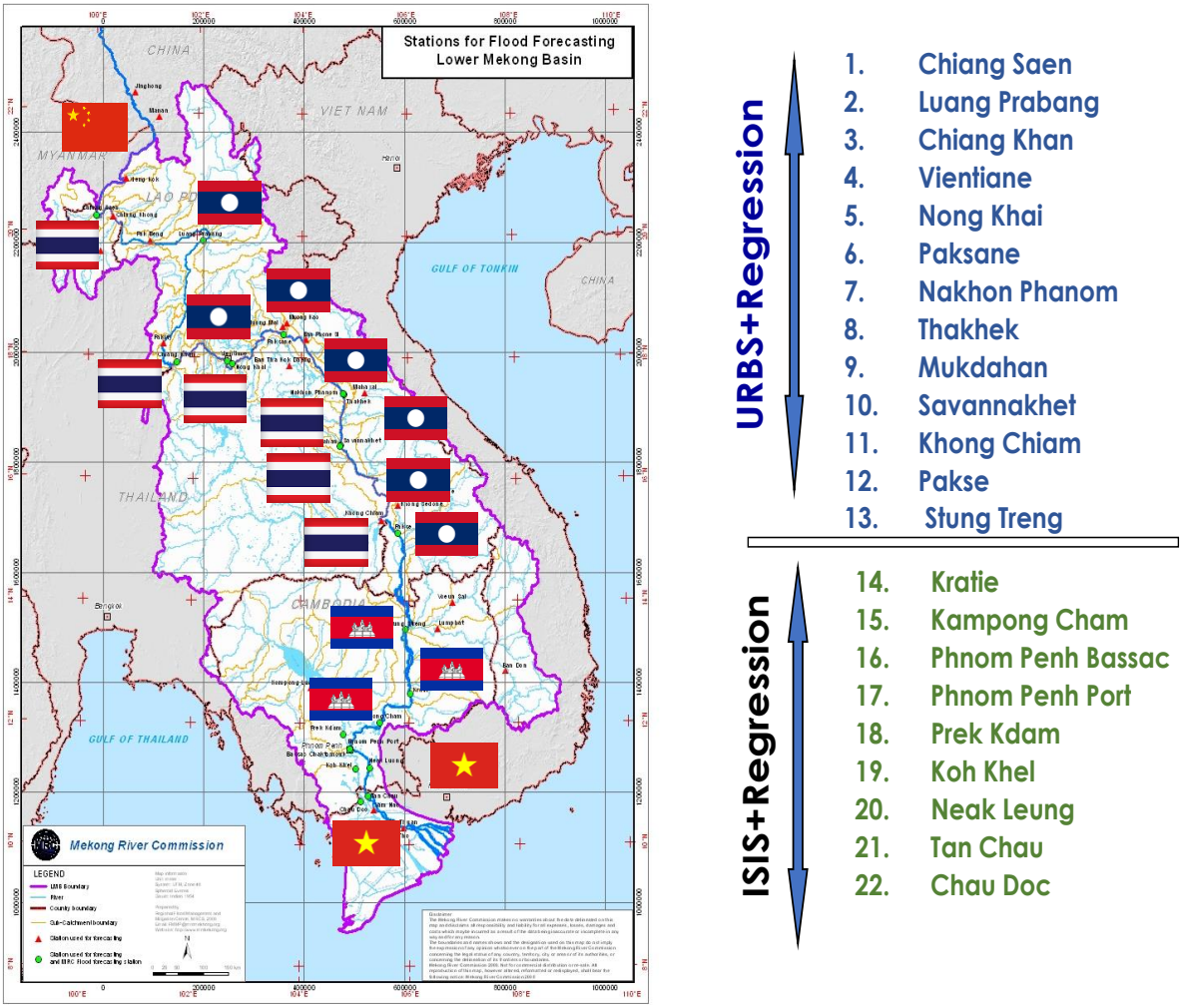


Figure 5 Stations for River Monitoring with Models Application

For stations from Chiang Saen and Luang Prabang

Water levels from 07 to 13 July 2020 at Chiang Sean station were fluctuated, varied -0.17 m to 0.15 m. At Luang Prabang station, water levels were stable and fluctuated over its LTA levels. Water levels at this station are likely impacted by back water of hydropower dam at Xayaburi and upstream dams of mayor tributaries.

For stations from Chiang Khan, Vientiane-Nong Khai and Paksane

Water levels from 07 to 13 July 2020 at Chiang Khan station were likely nominated by upstream hydropower dam of Xayaburi, which fluctuated from -0.38 m to 0.20 m. The downstream at Vientiane and Nong Khai were affected by this fluctuation and rainfall in catchments. The current observed water levels at these stations are below their LTAs.

For stations from Nakhon Phanom to Pakse

Water levels from 07 to 13 July 2020 at Nakhon Phanom to Pakse stations were also flutuated, varied from -0.35 m to 0.37 m due to the inflows and rainfall from upper sub-catchments. However, this week water levels at these stations are below their LTAs.

For stations from Stung Treng to Kampong Cham/ Phnom Penh to Koh Khel/ Neak Luong

This week from 07 to 13 July 2020, water levels at stations of Stung Treng and Kratie Kampong Cham, Chaktomuk, Koh Khel, Phnom Penh Port and Prekdam were below their LTAs, although rainfall in this area for the last few days. Their water levels varied from -0.12 m to 0.27m.

For the tidal stations at Tan Chau and Chau Doc

From 07 to 13 July 2020, water levels at the 2 tidal stations at Tan Chau and Chau Doc were fluctuated below their LTAs due to the daily tidal effect from the sea.

According to the Japan Meteorological Agency (JMA), the typical impact of El Niño on Southeast Asia is drier-than-average rainfall conditions, especially during the season June to August and can be extending to October 2020.

The Tonle Sap Flow

At the end of Dry season when water levels of the Mekong are raised up, flows of the Mekong River are being flowed into the Tonle Sap Lake (Reversed flow/inflow). It was observed that the reversed flows into the Tonle Sap Lake (TSL) are not happened yet, due to the low water levels of the Mekong mainstream. **Figure 5** showed the seasonal change of inflow/reversed flows and outflows of the TSL.

Table 1 showed the monthly change in volume of flow for the Tonle Sap Lake, which indicated low volume since January 2020. To verify this low volume of flow, **Figure 6** shown the seasonal change in monthly of volume flows up to 13 July 2020 for the Tole Sap Lake. Due to the low inflow from the Mekong and the less rainfall in the surrounding sub-catchments, it caused the volume flow of the TLS Lake up to 13 July 2020 are in a very critical. The low volume flow of the Tonle Sap Lake could affect the surrounding floodplain of fish spawning in the flooded forest and could face of water shortage for agricultural production in that area.

The low outflow from the Tonle Sap could also affect the expanding unsaturated soil that may cause bank erosion and increase salinity intrusion from the sea in the Mekong Delta during the dry season.

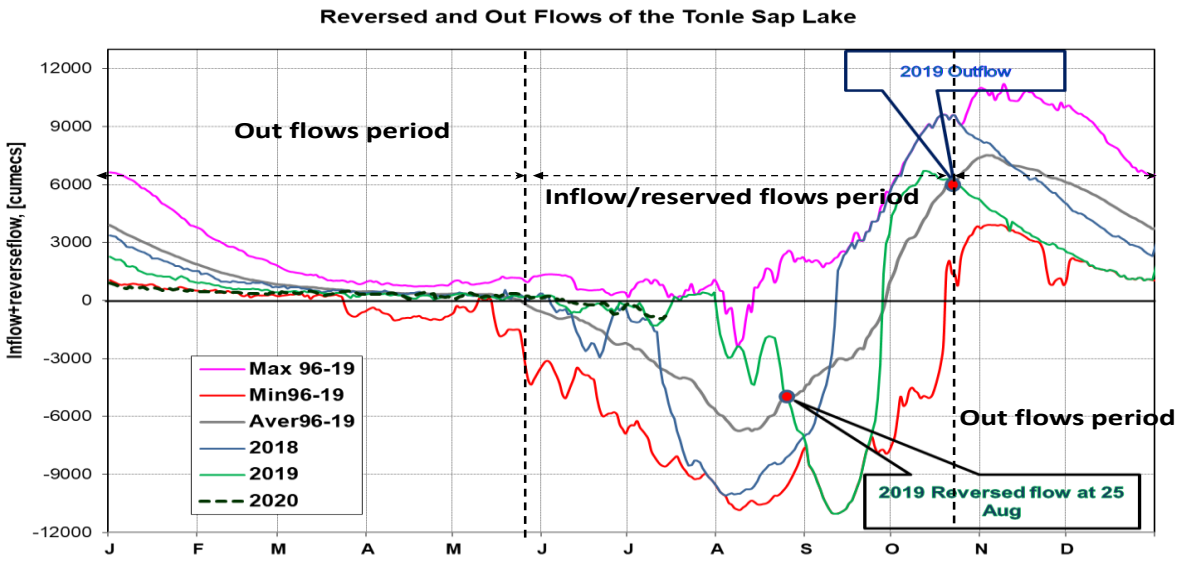


Figure 5 The seasonal change of inflows and outflows of the Tole Sap Lake up to 13 July 2020

Table 1: The monthly change in flow volume of the Tonle Sap Lake up to 13 July 2020

Month	Average (97-19)	Volume2018	Volume2019	Volume2020	Percentage of Volume in 2020 [%]
Jan	16452.95	13633.41	10285.31	5906.80	35.90
Feb	9312.36	7729.72	6019.30	4264.19	45.79
Mar	5868.92	5037.06	4354.62	3553.99	60.56
Apr	4474.98	3956.47	3667.47	2992.61	66.87
May	4166.07	3864.00	3266.43	2594.92	62.29
Jun	6034.10	5919.18	3517.06	2635.32	43.67
Jul	12502.58	12024.96	4001.99	2763.83	
Aug	19718.46	22399.65	5812.35		
Sep	42644.05	53639.54	24194.19		
Oct	49698.19	48193.08	30358.38		
Nov	39542.58	31036.07	19112.65		
Dec	26325.13	18469.21	10577.29		
	Low-flow condition, comapred with LTA (Long term average)				
	Normal condition, compared with LTA (Long term average)				

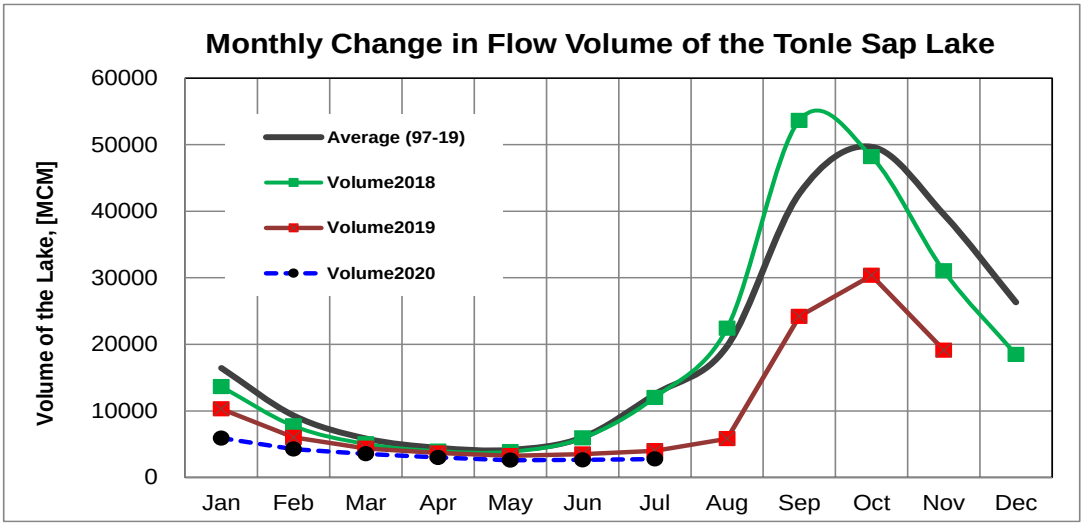


Figure 6 The seasonal change in monthly Volume Flows of the Tole Sap Lake up to 13 July 2020

Discussion and Conclusion

07 to 13 July 2020, the trend of water levels at Chiang Sean were fluctuated due to the inflow from upstream and amount rainfall from catchments. Water level at Chiang Sean is relied from inflow at Jinghong Hydropower Station on Lancang and its catchment rainfall.

Luang Prabang stations is likely nominated by back water effect due to hydropower dam operation from upstream (tributaries) and downstream (Xayaburi) which showed their water levels are almost stable and slightly fluctuated above their LTAs. It was observed that water levels at this station have been affected, since the impounding reservoir at Xayaburi last year in October 2019.

Analysis of the Mekong River Commission's data revealed that the drop of water levels along the Mekong mainstream were resulted from less rainfall at catchments and low inflows from upstream in June 2020 due to reservoir operation and water retention. This is including dam operation on the major tributaries of the Mekong river also.

Water levels at stations in the middle part of LMB from Vientiane to Pakse were fluctuated, following the same trend of upstream and rainfall in catchments. The recent water levels at all stations are below their LTAs. These low water levels indicated the low inflow from upstream and less rainfall from catchments.

From Stung Treng, Kratie, Kampong Cham and Neak Luong on the Mekong, Phnom Penh Port to Prekdam on the Tonle Sap and Chaktomuk and Koh Khel on the Bassac showed the current water levels below their LTAs, although some rainfall in the low-lying area this week.

The Mekong river flow depends not only on the flow from the upstream, but also on the rainfall from sub-catchment inflows. The contribution to the Mekong river's flow from the Upper Mekong Basin in China (Yunnan component) is about 16% by the time the river discharges through the Mekong Delta into the South China Sea. By far the major contribution comes from the two majors 'left-bank' (eastern) tributaries between Vientiane – Nakhon Phanom and Pakse – Stung Treng, which together contribute more than 40% of the flows.

Since the beginning of this year 2020, there were very low water level in the lower Mekong River, due to low rainfall in the basin in 2019. Like many parts of the world, the Mekong region has been affected by the prolonged El Nino phenomenon, the phenomenon that usually causes extreme heat and insufficient rain in 2019. The cause of below average water levels in the Mekong mainstream in Jan-Feb-Mar 2020 is likely due to unusual low rainfall in 2019 and the effected El Nino process over the Mekong region 2019.

The amount of water flowing from Jinghong dam in China could also be a potential contribution of the low flow at the upper part of the LMB (Chiang Saen-Vientiane). According to the notification from China, were decreased about 0.76m, due to the test of equipment of hydropower dam at Jinghong from 27 Dec 2019 to 4 Jan 2020.

Another potential important reason of low flow in the mainstream (Jan-Feb-Mar-April-May-June) were the contribution from major tributary dams. Potentially, there were storing waters that contributed to the Mekong river basin in time of no or low rainfall. This has impacted the basin situation. However, we do not have any official data to quantify their amount of contributions.

The Trend of water level and its Outlook

Based on daily flood bulletin on 14 July 2020, water levels along the lower Mekong River from 15 to 19 July 2020 at Chiang Saen will expect slightly increase in daily from 0.05 m to 0.09 m.
For Luang Prabang, water levels will maintain above their LTAs.

From Chiang Khan to Vientiane/Nong Khai and Paksane, water levels will follow the same trend from upstream which fluctuated in daily from -0.04 m to 0.44 m in. From Nakhon Phanom to Pakse, water levels will increase from 0.03 m to 0.25 m.

From Cambodia's Stung Treng to Neak Loung on the Mekong River, water will be fluctuated in daily varies from -0.21 m to 0.08 m.

The water levels of the Tonle Sap Lake at Prekdam and Phnom Penh Port will be decreased from -0.07 m to -0.03 m. Water levels at Phnom Penh at Chaktomuk and Koh Khel on the Bassac River will also be creased in daily vary from -0.07 m to -0.03 m.

For Viet Nam's Tan Chau on the Mekong River and Chau Doc on the Bassac River, water levels will be increased and fluctuated below their LTAs, follow the daily effect tidal from the sea.

The weekly flood forecasting performance, accuracy and data input evaluation from 07 to 13 July 2020 are presented in **Annex B**.

It is expected the above-normal rainfall can be occurred at from July, August and September 2020, which can contribute to the increased flow in the Mekong River.

According to the Asian Specialized Meteorological Centre (ASMC), from July, August and September 2020, there will increase chance of above-normal rainfall in the Mekong-sub region. Although the Dry Season 2020 is finished, but still the scattered hotspots were detected in Cambodia and Thailand, and isolated ones were also detected in Myanmar, Lao PDR and southern Viet Nam in June 2020.

Additionally, some tropical cyclones from the Pacific Ocean or the South China Sea may feasibly move near or toward Mekong region, based the seasonal outlook of TMD.

Results of daily flood forecasting bulletin is available at http://ffw.mrcmekong.org/bulletin_wet.php.

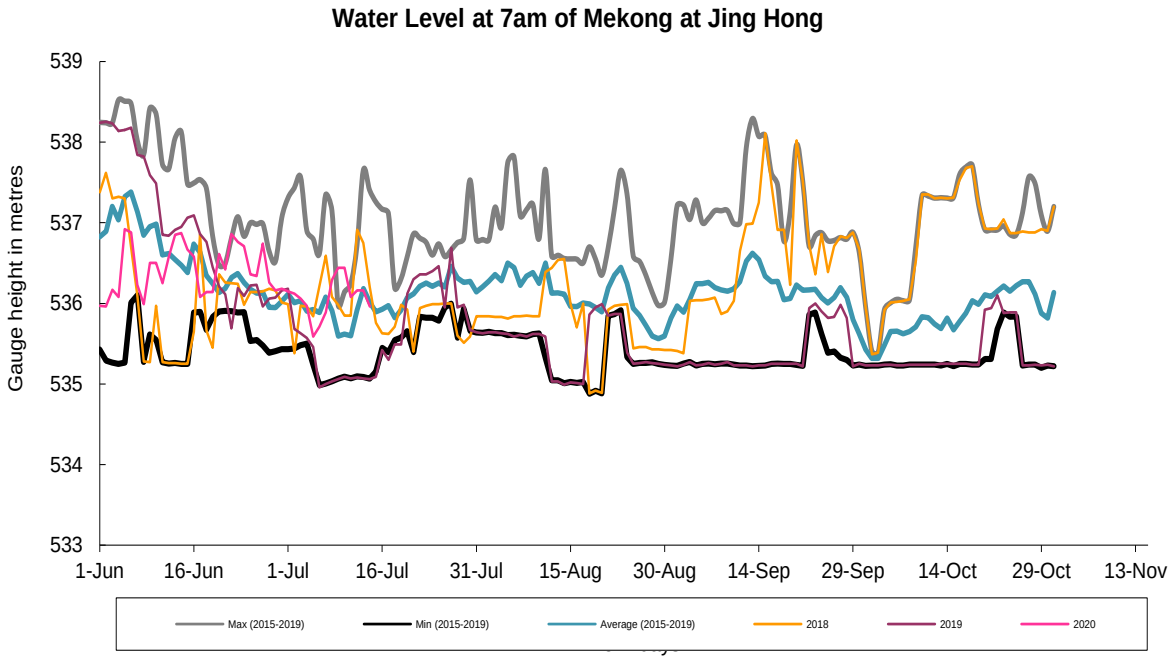
Remark:

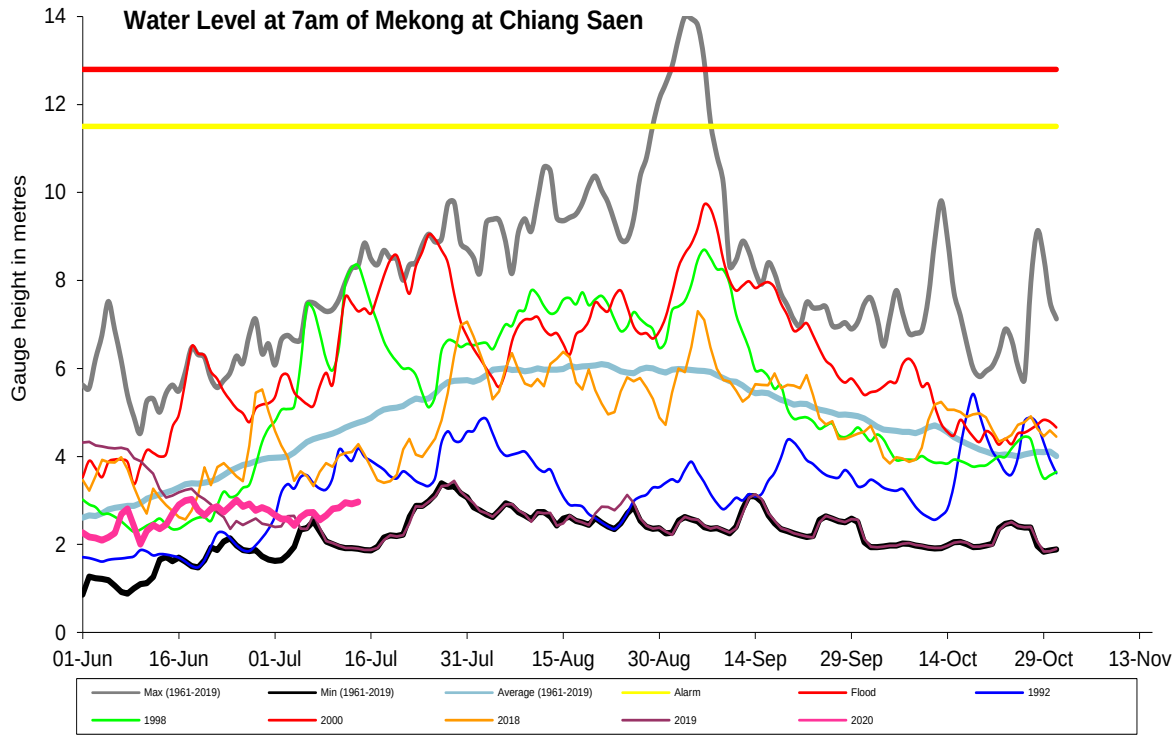
For details information on water levels and rainfall hydrographs at each key station are presented in **Annex A** and **Annex B** showed the Accuracy and performance of weekly flood forecasting activities.

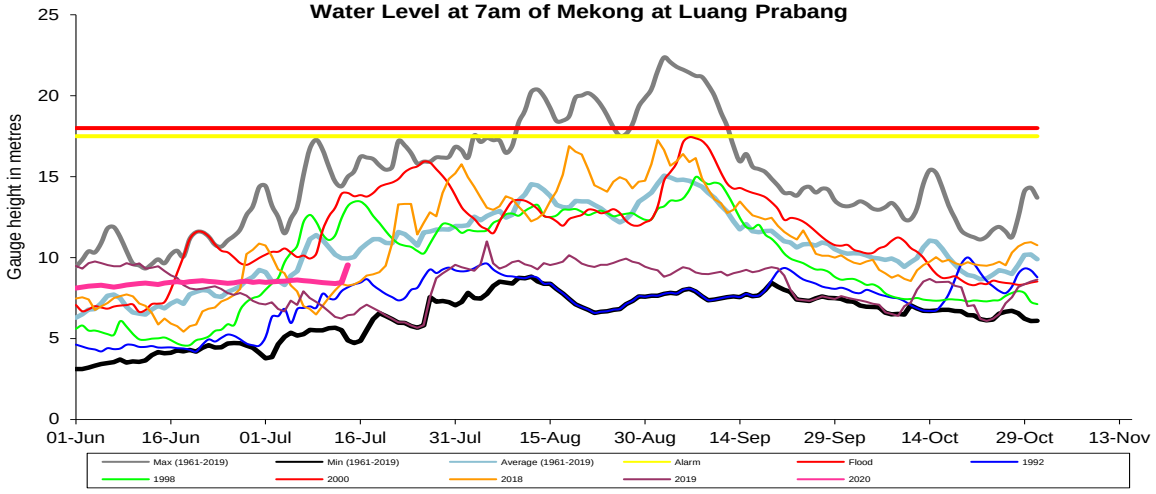
- The water levels hydrographs showing the observed water levels for the Wet Season (**Annex A**)
- Weekly Accuracy and Performance of weekly river flood forecasting (**Annex B**)

Annex A: Weekly Water Level Hydrographs at each key station

HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS IN FLOOD SEASON UP TO 31 OCTOBER 2020






Water Level at 7am of Mekong at Luang Prabang
Gauge height in metres
25
20
15
10
5
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1961-2019)
Min (1961-2019)
Average (1961-2019)
Alarm
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1992
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2000
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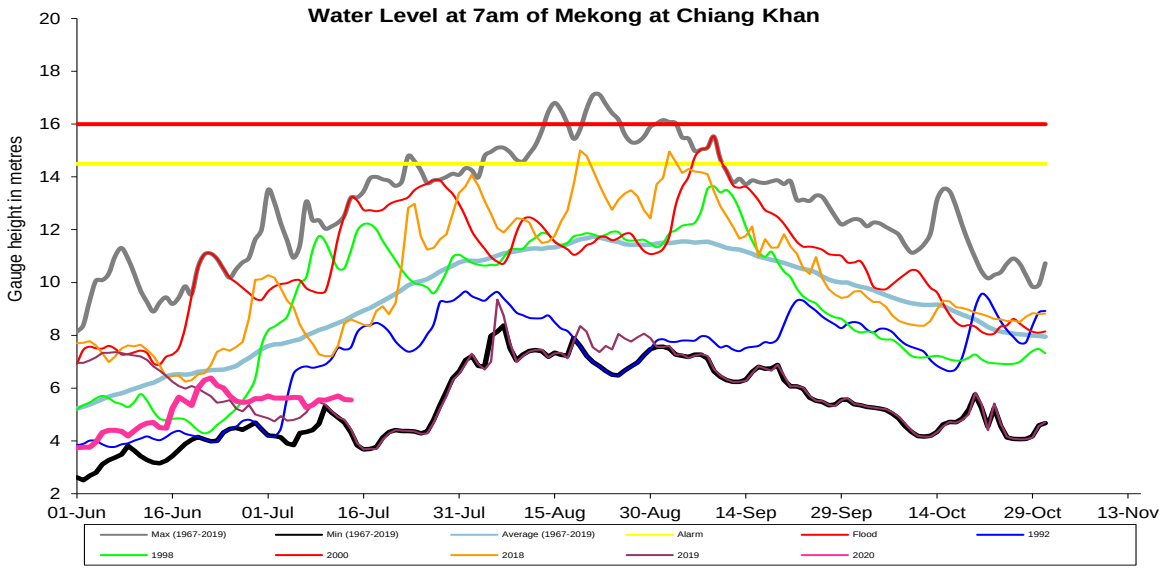
Water Level at 7am of Mekong at Chiang Khan
Gauge height in metres
20
18
16
14
12
10
8
6
4
2
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1967-2019)
Min (1967-2019)
Average (1967-2019)
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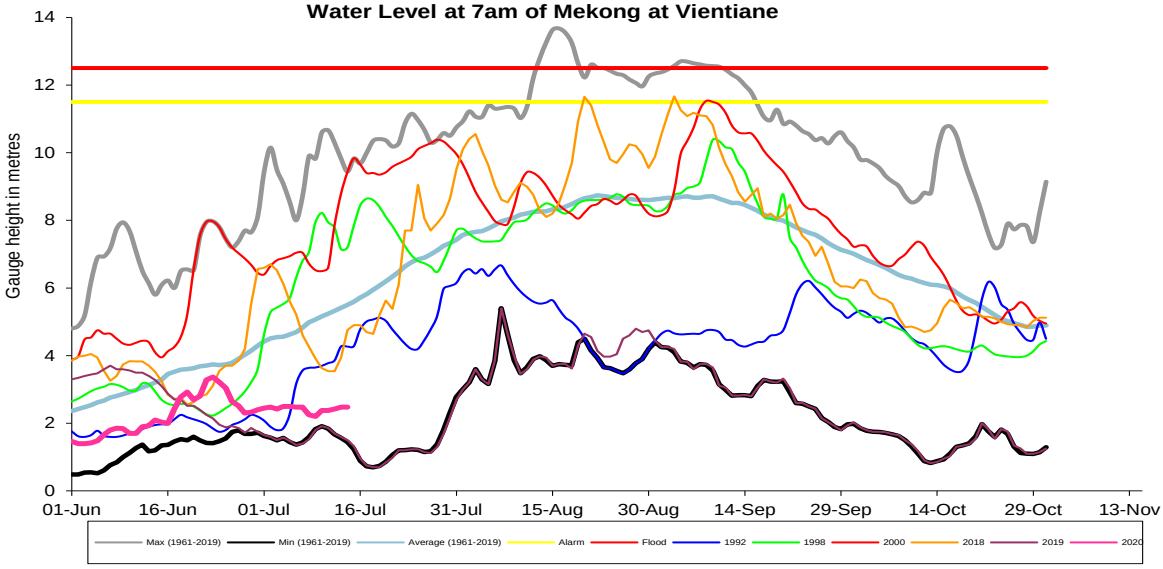
Water Level at 7am of Mekong at Vientiane
Gauge height in metres
14
12
10
8
6
4
2
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01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
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Max (1961-2019)
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Average (1961-2019)
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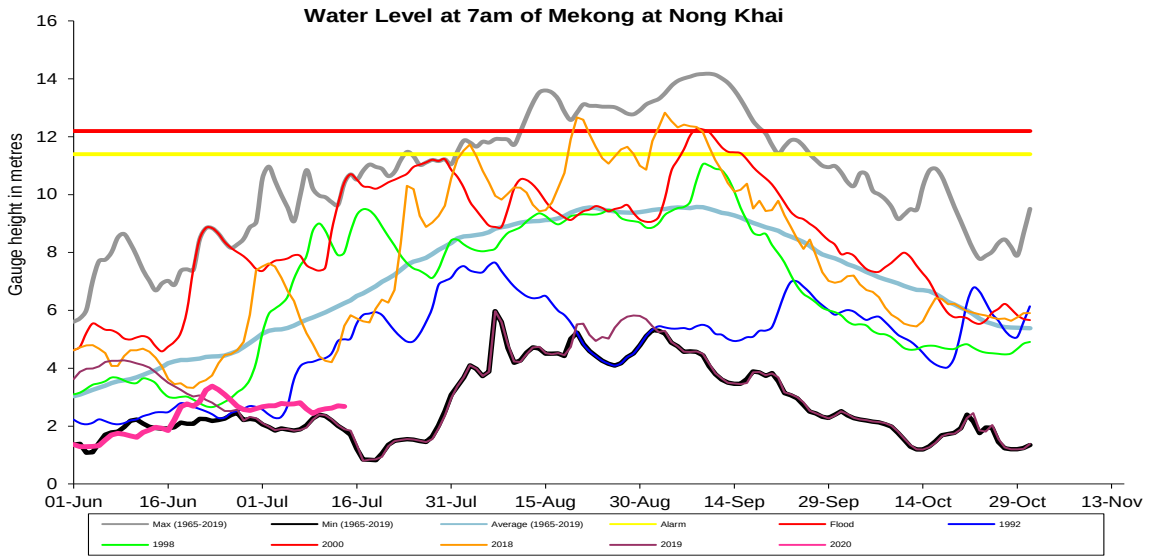
Water Level at 7am of Mekong at Nong Khai
Gauge height in metres
16
14
12
10
8
6
4
2
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01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1965-2019)
Min (1965-2019)
Average (1965-2019)
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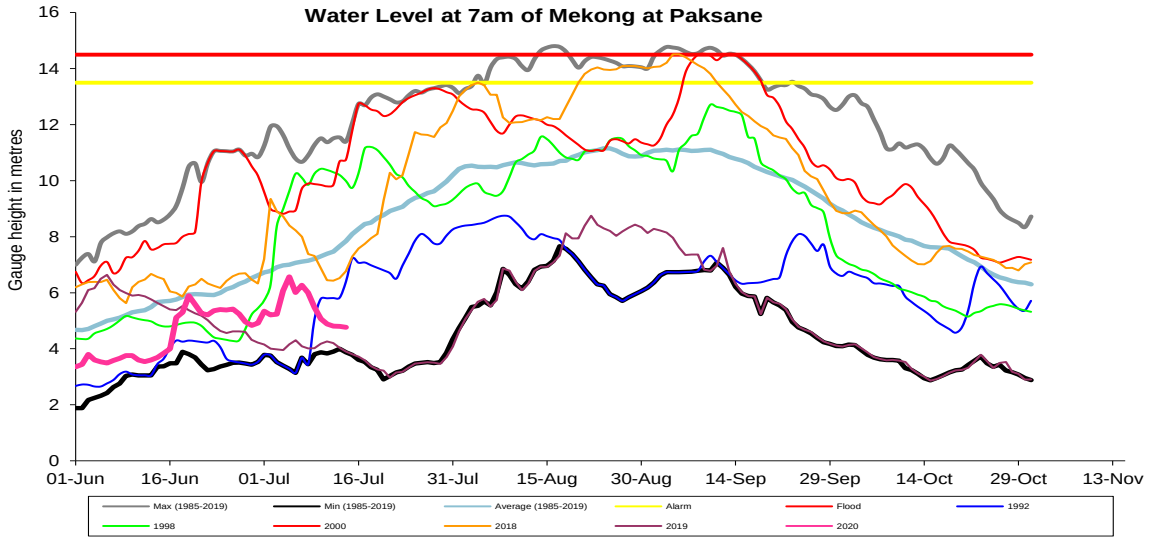
Water Level at 7am of Mekong at Paksane
Gauge height in metres
16
14
12
10
8
6
4
2
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01-Jun
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01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1985-2019)
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Average (1985-2019)
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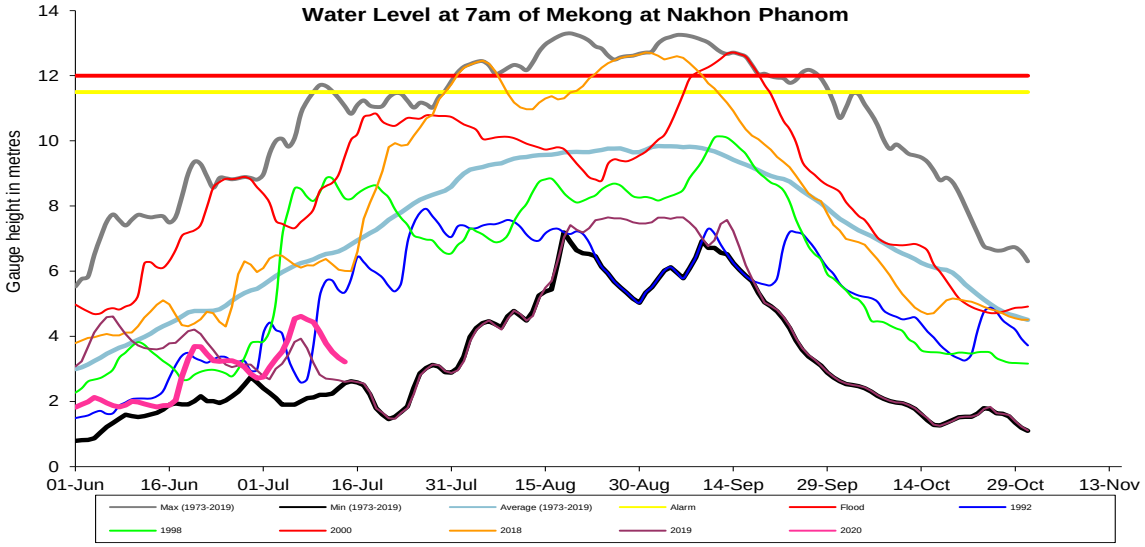
Water Level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
14
12
10
8
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01-Jun
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01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1973-2019)
Min (1973-2019)
Average (1973-2019)
Alarm
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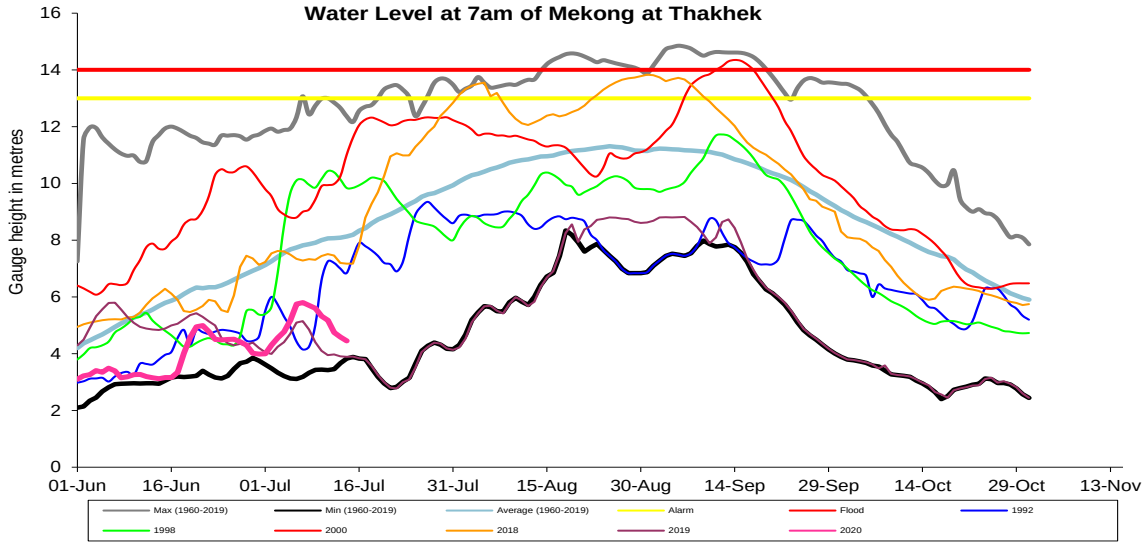
Water Level at 7am of Mekong at Thakhek
Gauge height in metres
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01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1960-2019)
Min (1960-2019)
Average (1960-2019)
Alarm
Flood
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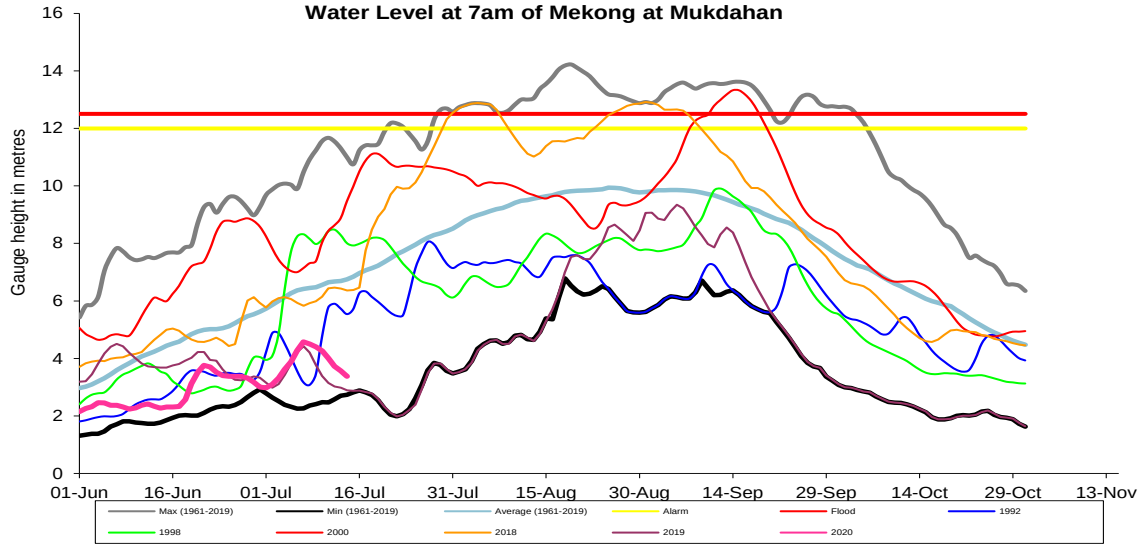
Water Level at 7am of Mekong at Mukdahan
Gauge height in metres
16
14
12
10
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01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1961-2019)
Min (1961-2019)
Average (1961-2019)
Alarm
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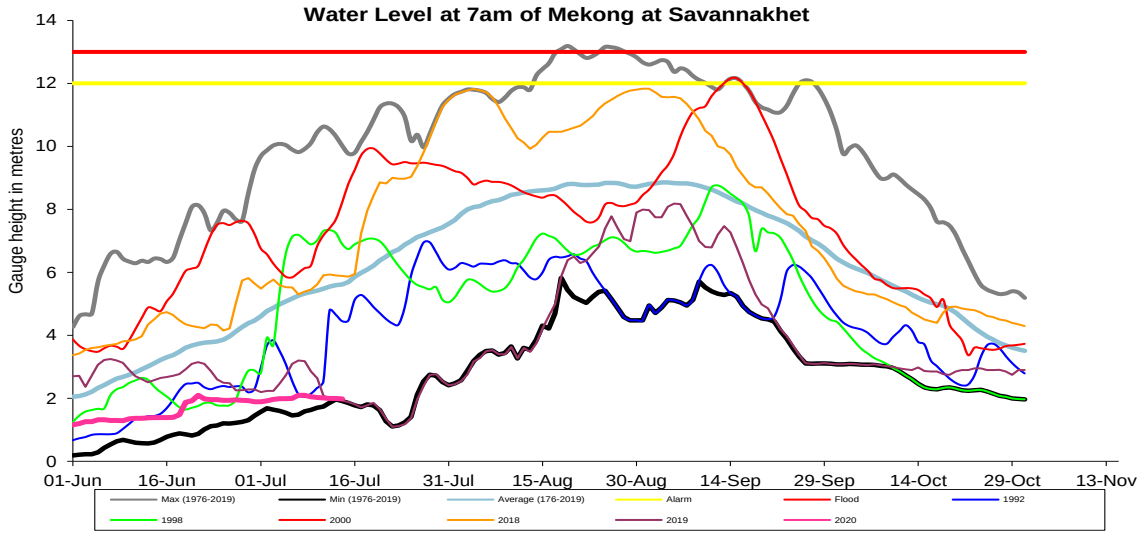
Water Level at 7am of Mekong at Savannakhet
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1976-2019)
Min (1976-2019)
Average (176-2019)
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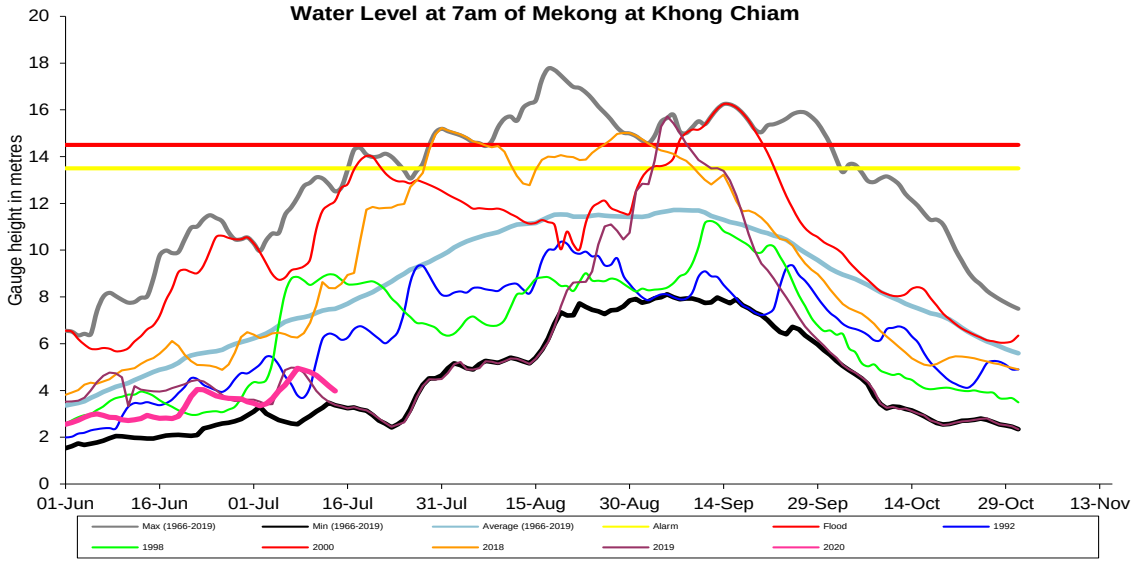
Water Level at 7am of Mekong at Khong Chiam
Gauge height in metres
20
18
16
14
12
10
8
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4
2
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01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1966-2019)
Min (1966-2019)
Average (1966-2019)
Alarm
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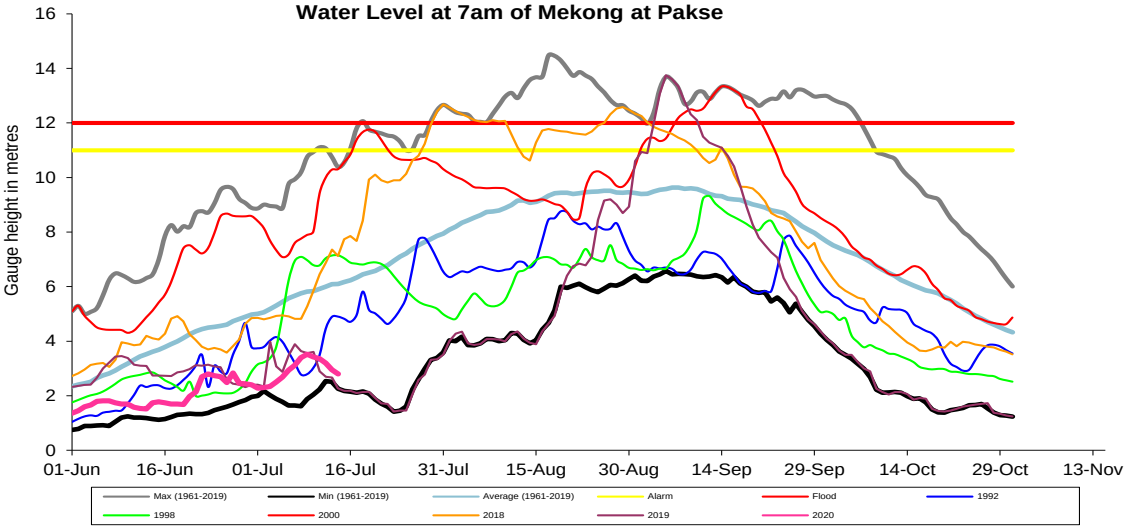
Water Level at 7am of Mekong at Pakse
Gauge height in metres
16
14
12
10
8
6
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2
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01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1961-2019)
Min (1961-2019)
Average (1961-2019)
Alarm
Flood
1992
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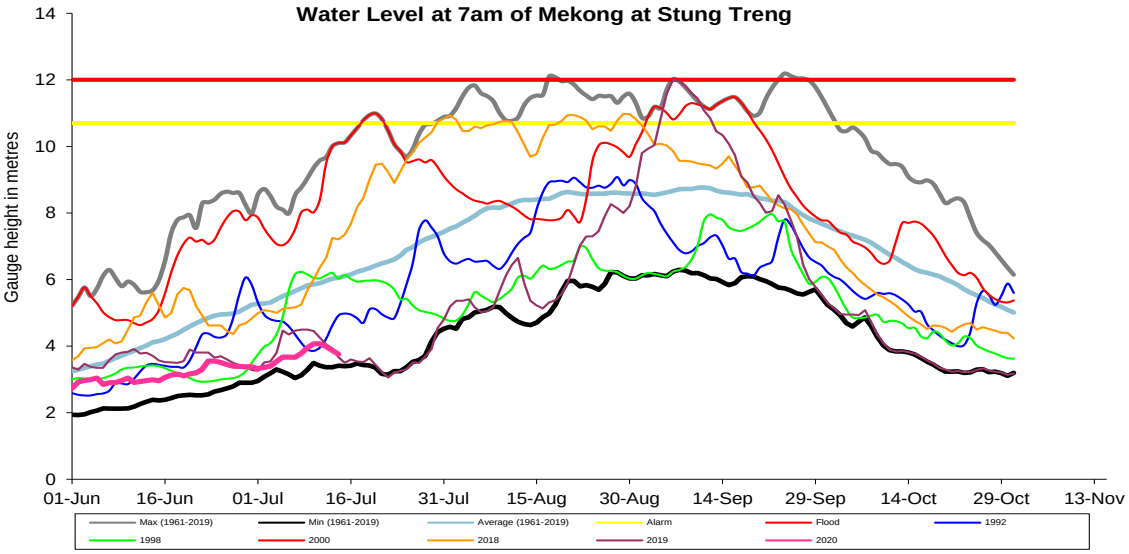
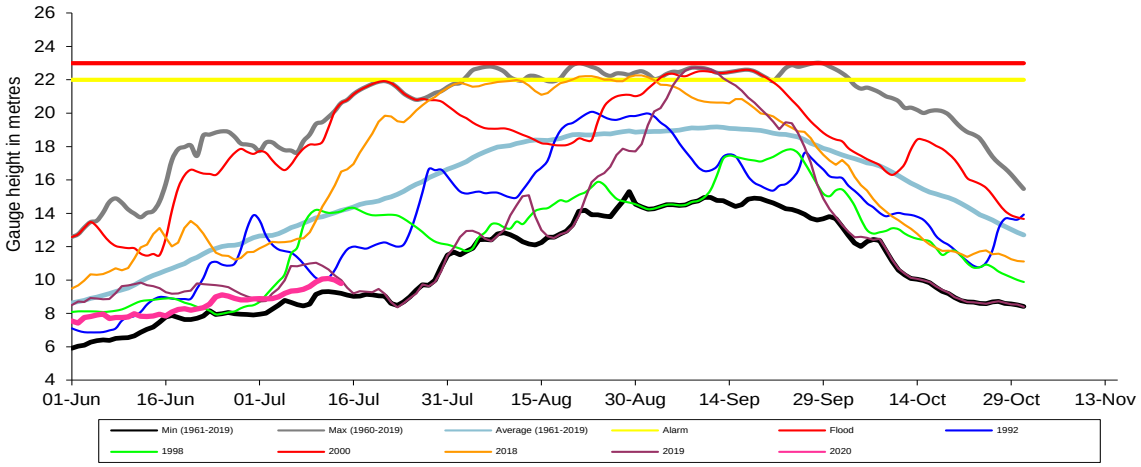
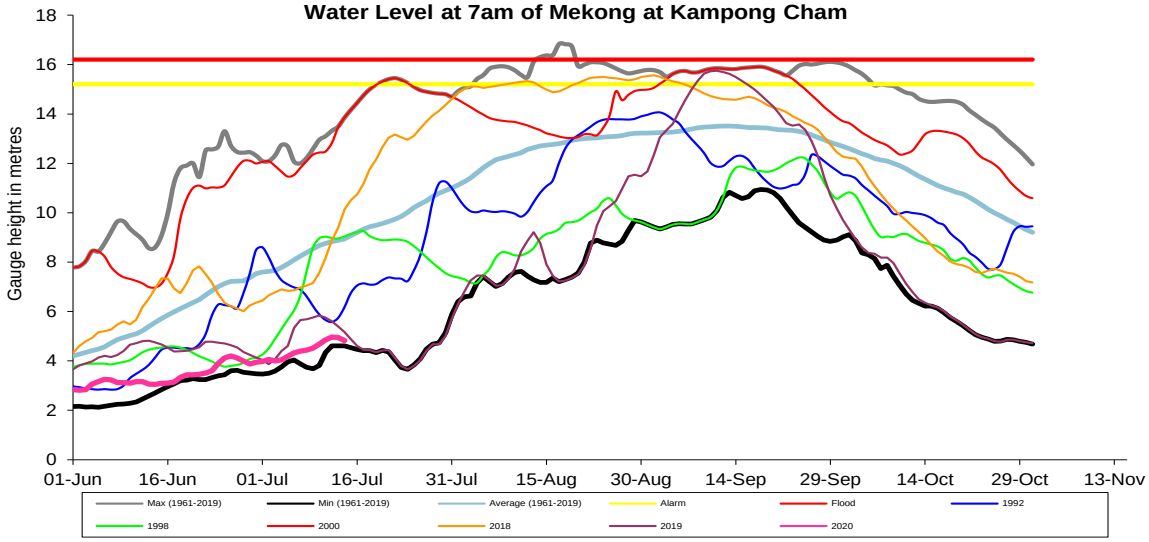
2018
2019
2020


Water Level at 7am of Mekong at Stung Treng
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1961-2019)
Min (1961-2019)
Average (1961-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020

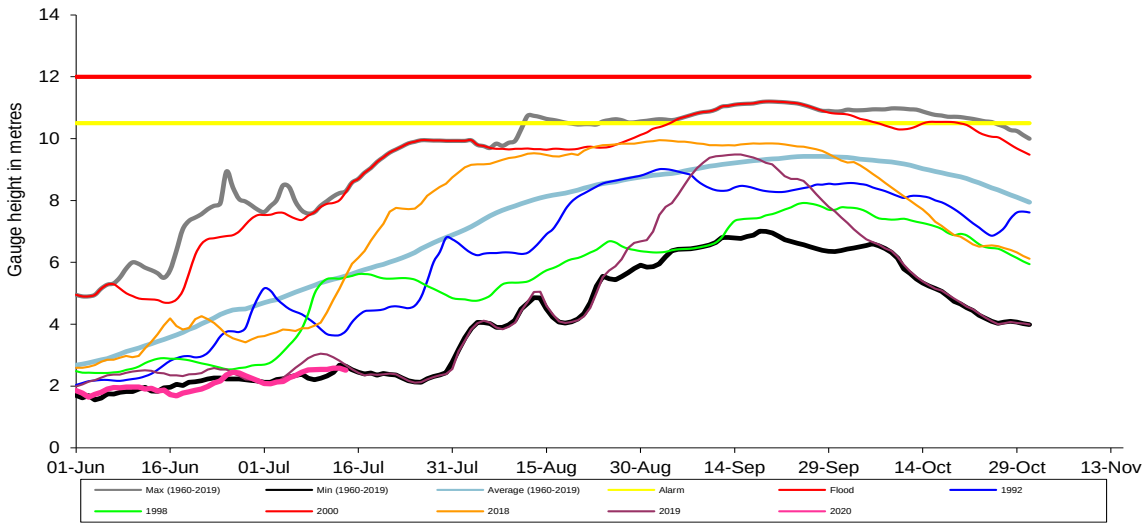
Water Level at 7am of Mekong at Kratie

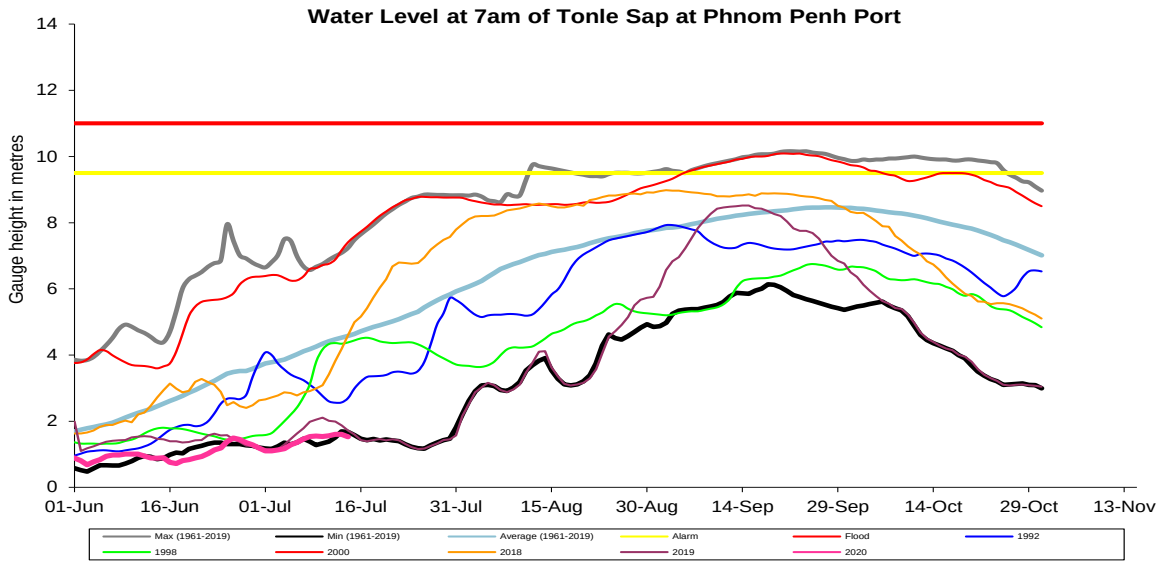


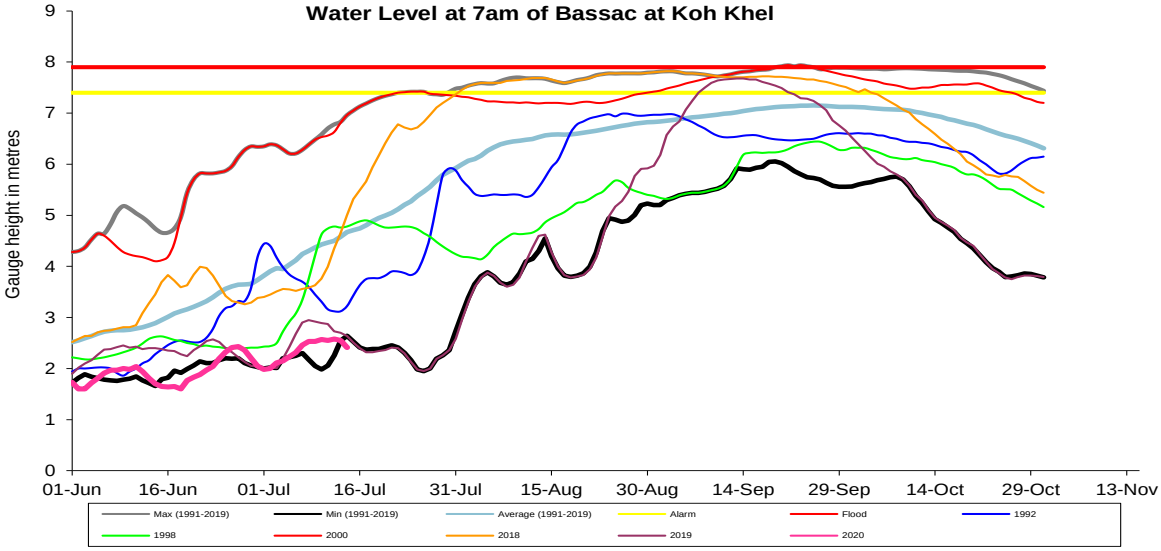
Water Level at 7am of Mekong at Kampong Cham

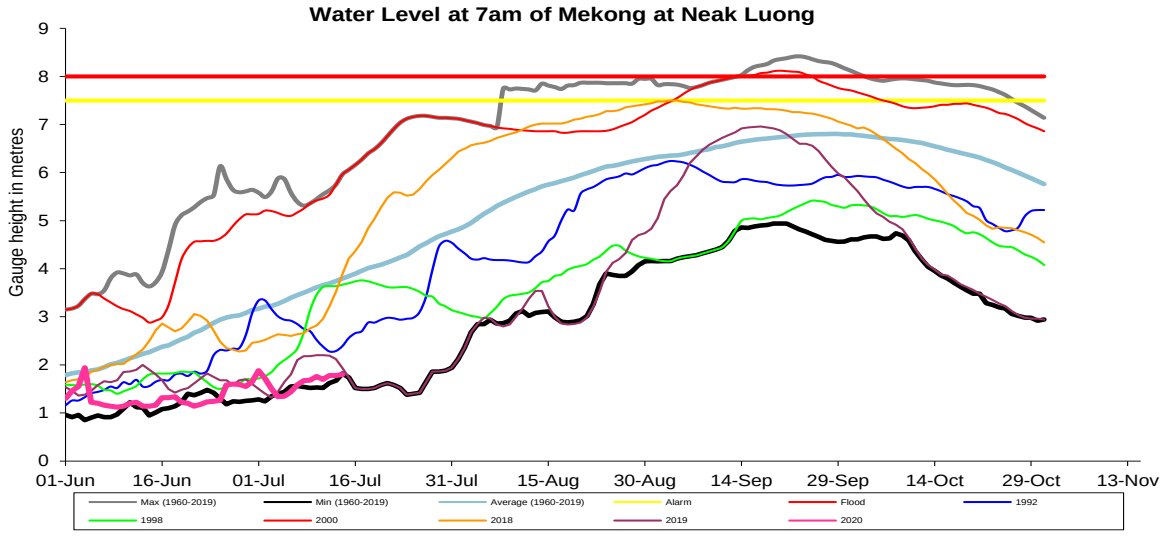


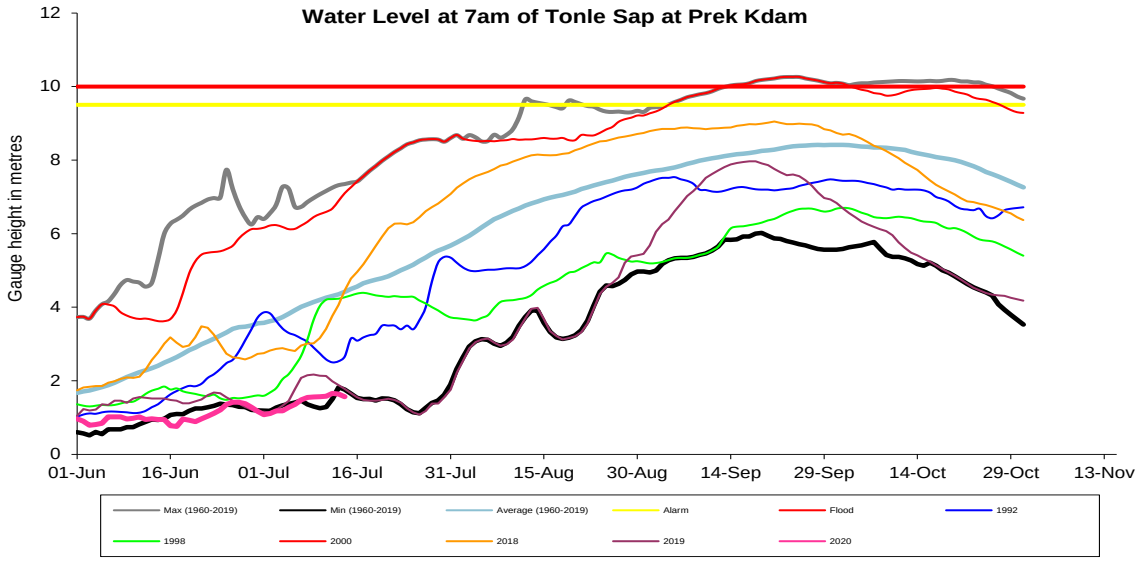
Water Level at 7am of Mekong at Phnom Penh Chaktomuk

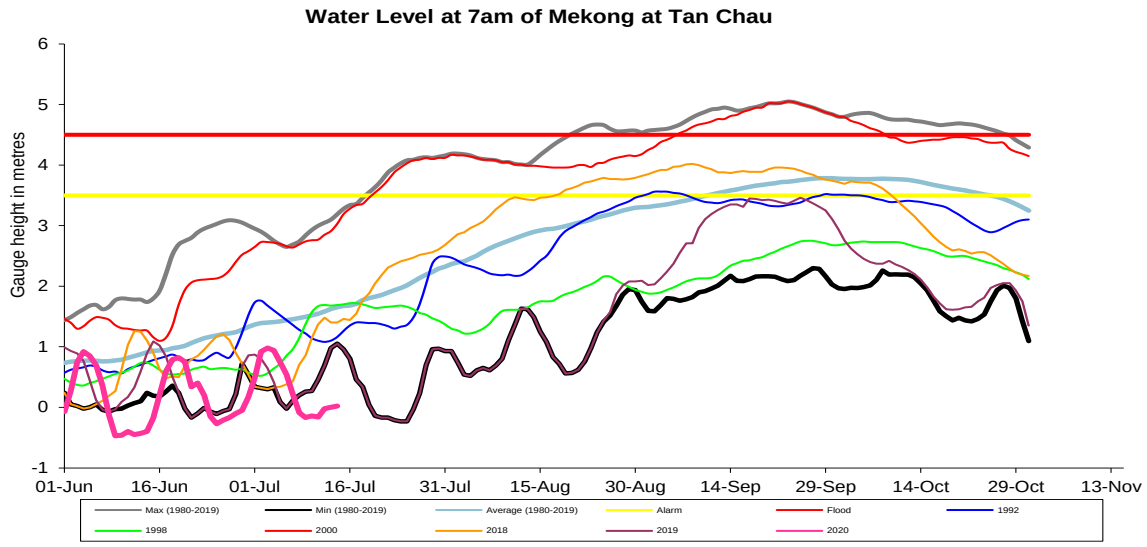


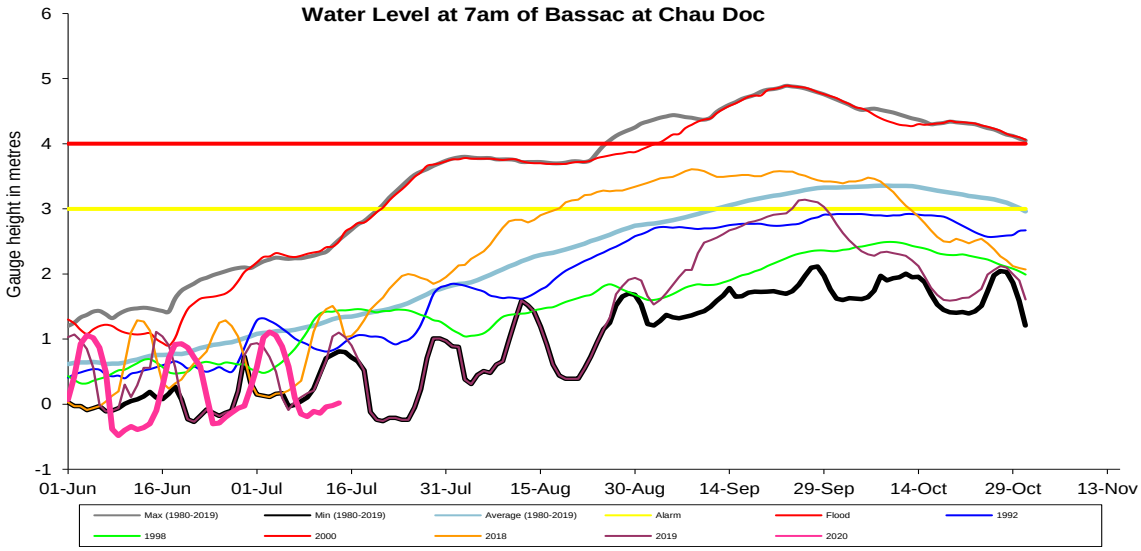

Water Level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1961-2019)
Min (1961-2019)
Average (1961-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020


Water Level at 7am of Bassac at Koh Khel
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1991-2019)
Min (1991-2019)
Average (1991-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020


Water Level at 7am of Mekong at Neak Luong
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1960-2019)
Min (1960-2019)
Average (1960-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020


Water Level at 7am of Tonle Sap at Prek Kdam
Gauge height in metres
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1960-2019)
Min (1960-2019)
Average (1960-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020


Water Level at 7am of Mekong at Tan Chau
Gauge height in metres
6
5
4
3
2
1
0
-1
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1980-2019)
Min (1980-2019)
Average (1980-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020

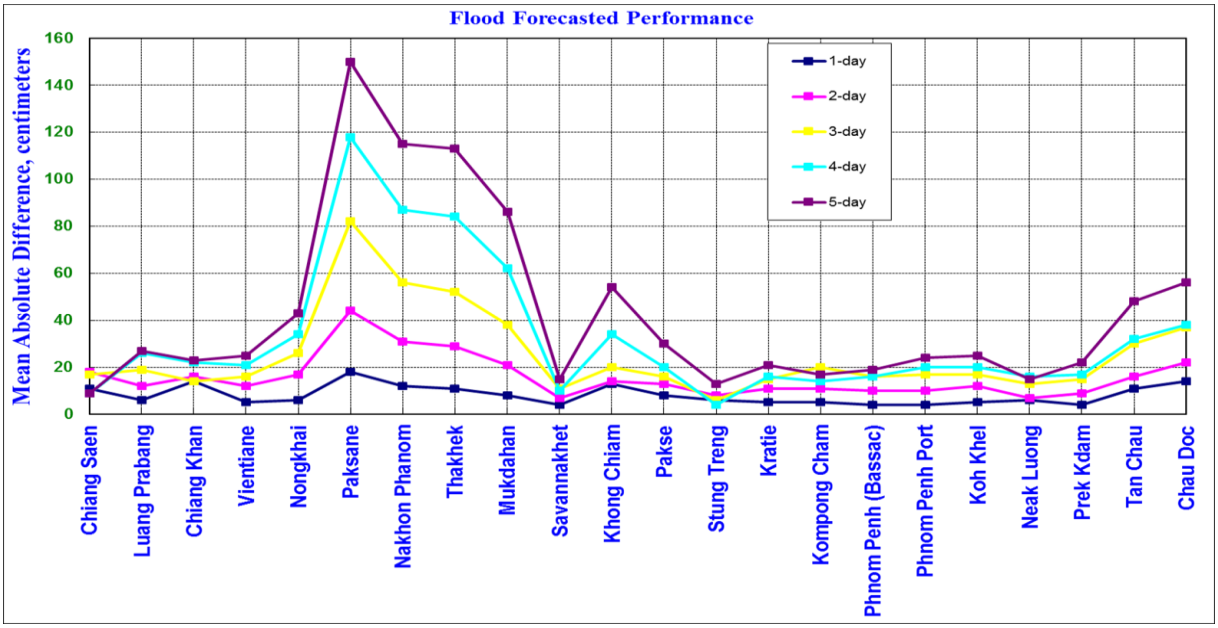

Water Level at 7am of Bassac at Chau Doc
Gauge height in metres
6
5
4
3
2
1
0
-1
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Max (1980-2019)
Min (1980-2019)
Average (1980-2019)
Alarm
Flood
1992
1998
2000
2018
2019
2020

Annex B: Accuracy and Performance of weekly flood forecasting

1. Accuracy

"Accuracy" is referred to the results of the MRC Mekong Flood Forecasting System, after adjusted by forecaster and shared them in public information. The adjustment of flood forecasting outcome from the flood forecasting system, required Flood Forecasters to have strong knowledge in hydrology and statistical modelling for estimating the relationships between stations at upstream to downstream of the Mekong River Basin. The flood forecasting performance presented in a graph below showed the average flood forecasting accuracy at each key station along the Mekong mainstream from 07 to 13 July 2020.

The forecasting values from 07 to 13 July 2020 showed in overall accuracy is fair for 1-day to 3-day of forecast lead time at stations in the middle from Paksane to Mukdahan of the Mekong River. However, the accuracies at upper at Chiang Khan to Nong Khai for 4-day to 5-day forecast were found higher than 50%.



Note: The higher percentage of flood forecasting accuracy is due to some key factors as mentioned as follows:

1) Missing data and data input is not sufficient to be used as input into the flood forecasting model system.
2) Influence of hydropower operations from upstream (Xayaburi) and tributaries inflows.
3) Paksane also effected by hydropower operation of Nam Nguem (water retention and release) and rainfall always accumulated at this spot that could cause rapid high-water levels.
4) Rapid up and down of water levels at stations of Tan Chau and Chau Doc due to daily tidal effect from the Sea in the Mekong Delta.
5) Rainfall from satellite was not well represented to the actual rainfall at ground stations in the Mekong region.

Forecast Achievement

The flood forecasting achievement indicated in (%) and (cm) from 1-day to 5-day at each key station, against with New Benchmark for a successful lead-time are presented in **Table B1** and **Table B2**.

Table B1: Evaluation performance forecasting (from 07 to 13 July 2020) base on Old Benchmark (%).

Unit in %

Lead-time Forecasted	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc	*Average*
1-day	57.1	42.9	71.4	71.4	57.1	57.1	42.9	71.4	57.1	85.7	57.1	57.1	71.4	71.4	42.9	42.9	57.1	42.9	71.4	28.6	42.9	42.9	***56.5***
2-day	50.0	33.3	50.0	66.7	50.0	50.0	50.0	50.0	50.0	66.7	50.0	50.0	66.7	66.7	50.0	50.0	50.0	66.7	50.0	50.0	66.7	50.0	***53.8***
3-day	40.0	40.0	60.0	80.0	80.0	60.0	40.0	60.0	60.0	60.0	60.0	60.0	40.0	40.0	40.0	20.0	40.0	20.0	80.0	40.0	80.0	60.0	***52.7***
4-day	50.0	75.0	50.0	50.0	50.0	25.0	25.0	50.0	25.0	50.0	50.0	50.0	75.0	50.0	50.0	25.0	50.0	50.0	50.0	75.0	75.0	50.0	***50.0***
5-day	66.7	33.3	66.7	33.3	33.3	66.7	66.7	66.7	66.7	33.3	33.3	66.7	66.7	33.3	66.7	33.3	33.3	33.3	33.3	66.7	33.3	33.3	***48.5***

Table B2: Evaluation performance forecasting (from 07 to 13 July 2020) base on Old Benchmark (cm).

Unit in cm

Lead-time Forecasted	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
1-day	11	6	14	5	6	18	12	11	8	4	13	8	6	5	5	4	4	5	6	4	11	14
2-day	18	12	16	12	17	44	31	29	21	7	14	13	8	11	11	10	10	12	7	9	16	22
3-day	17	19	14	16	26	82	56	52	38	11	20	16	6	15	20	16	17	17	13	15	30	37
4-day	9	26	22	21	34	118	87	84	62	10	34	20	4	16	14	16	20	20	16	17	32	38
5-day	9	27	23	25	43	150	115	113	86	15	54	30	13	21	17	19	24	25	15	22	48	56

Note: Red values are not well matched with the actual values in (%) and (cm)

2. Performance based on data collection from Member Countries

Flood forecasting performance is based on hydro-met data received from Member Countries (MCs), evaluating performance indicators, missing data and completed time for flood forecasting are presented in **Table B4** and **Figure B1**, **B2** and **B3**, respectively from 07 to 13 July 2020.

Table B4: Overview of performance indicators for the past 8 days from 07 to 13 July 2020

	FF time sent				Arrival time of input data								Missing data (number-mainstream and trib.st.)							
2020	FF completed and sent (time)	Stations without forecast	FF2 completed and sent (time)	Weather data available (time)	NOAA data	China	Cambodia - DHRW	Cambodia - DOM	Lao PDR - DMH	Thailand - DWR	Viet Nam - SRHMC	Viet Nam - HMS	NOAA data/2dataset	China/2	Cambodia - DHRW/15	Cambodia - DOM/34	Lao PDR - DMH/32	Thailand - DWR/13	Viet Nam - SRHMC/6	Viet Nam - HMS/39
week	*10:19*	*00:00*	-	-	*08:15*	*07:10*	*07:06*	*08:51*	*08:29*	*08:30*	*07:00*	*08:31*	*0*	*0*	*3*	*14*	*81*	*0*	*0*	*0*
month	*10:24*	*00:00*	-	-	*08:15*	*07:10*	*07:38*	*08:11*	*08:39*	*08:26*	*07:14*	*08:31*	*0*	*0*	*37*	*0*	*184*	*0*	*2*	*38*

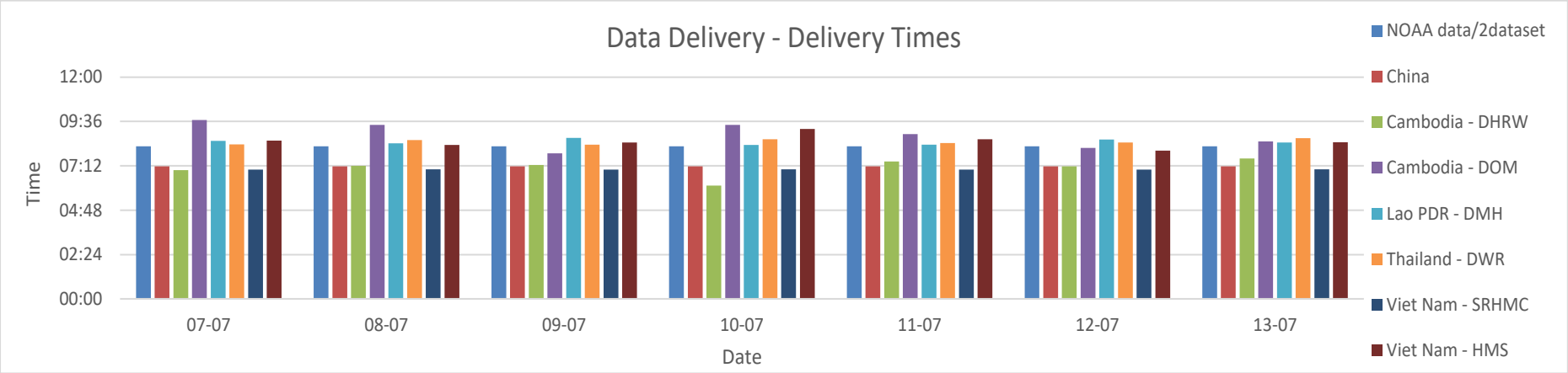


Fig. B1: Data delivery times for the past 8 days from 07 to 13 July 2020

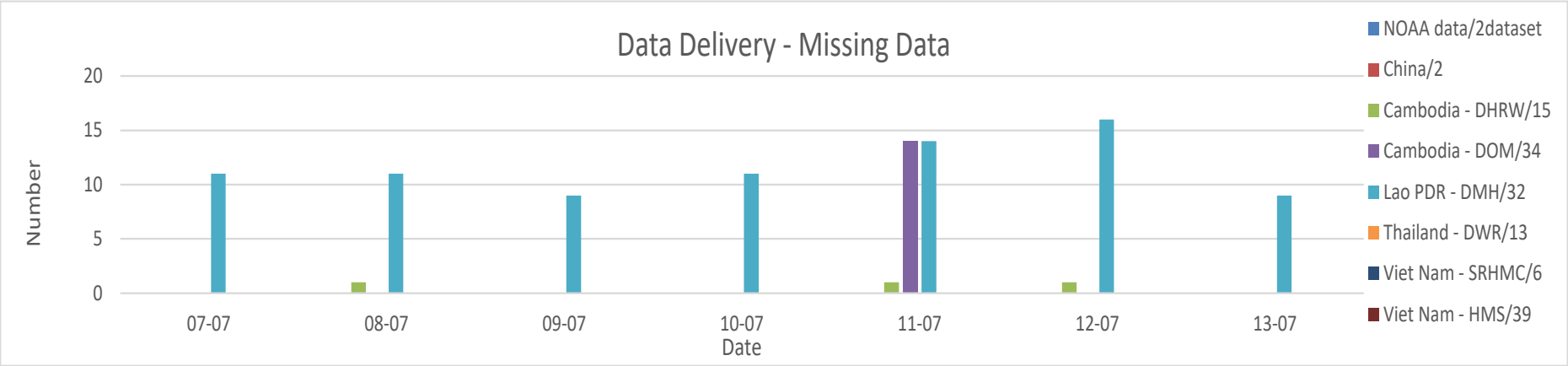


Fig. B2: Missing data for the past 7 days from 07 to 13 July 2020

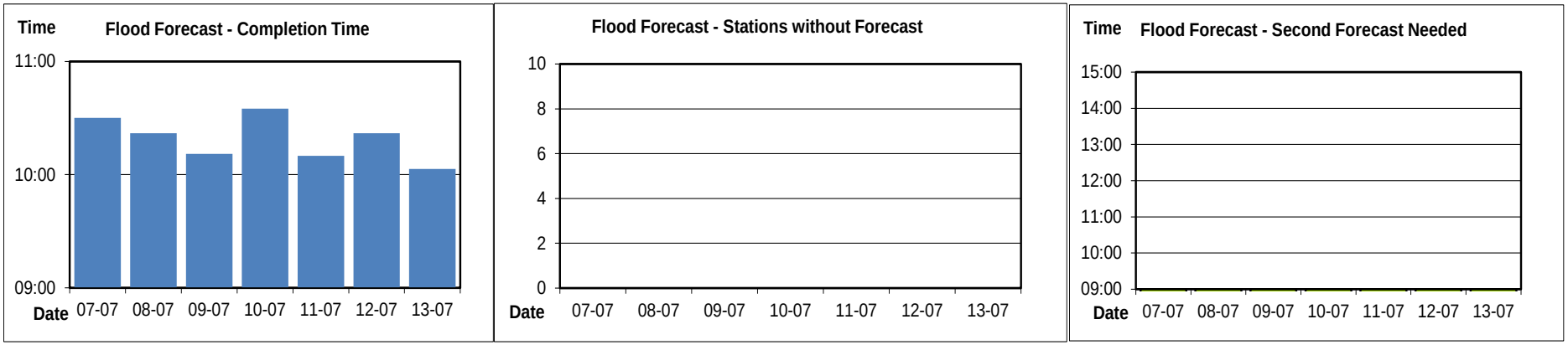


Fig. B3: Flood forecast completion time, stations without forecast and second forecast need from 07 to 13 July 2020