

Weekly Flood Situation Report for the Mekong River Basin

Draft by KHEM Sothea

covering the week from 01st to 07th October 2019 and potential trend next week

Weather Patterns, General Behaviour of the Mekong River and Flood Situation

General weather patterns

During the week from 01st to 07th October 2019, the weather outlook bulletins and maps issued by the Thailand Meteorology Department (TMD) were used to verify the weather condition in the LMB. There was no low pressures went across the LMB, except the low-lying area in Cambodia during this week. Therefore, there were some rainfall in low-lying area and the Mekong Delta, as indicated. They stated that some tropical cyclones sometime develop at the western side of the northern Pacific Ocean and move northwest and pass to the South China Sea. Consequently, LMB will meet below-average rainfall in some areas in October. **Figures 1 & 2** presented the weather map for 02nd to 07th October 2019.

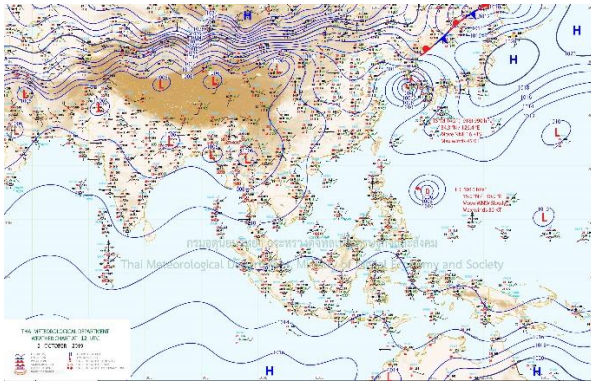


Figure 1: Weather map for 02nd Oct 2019

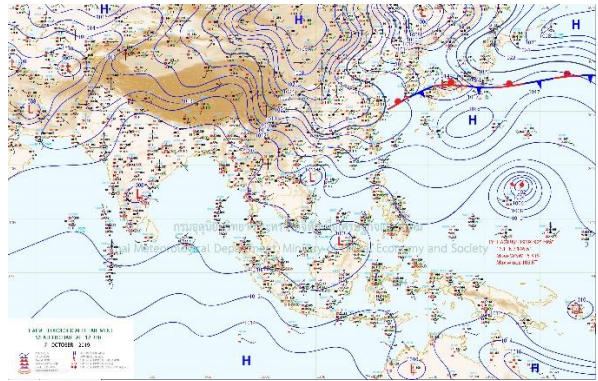


Figure 2: Weather map for 07th Oct 2019

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

No TD, TS or TY was presented in LMB during this week.

Other weather phenomena that affect the discharge

According to the Asian Specialized Meteorological Center (ASMC), climatologically, the prevailing Southwest Monsoon conditions are expected to persist till October 2019. The below-normal rainfall is predicted over the Northeastern parts of Cambodia, Thailand and Viet Nam in September- 2019. In terms of temperature, warmer-than-average conditions can be expected over the equatorial ASEAN region and the inland areas of Thailand. **Figure 2** showed the rainfall outlook over Southeast Asia in October 2019.

October 2019 Rainfall (tercile summary), NCEP

Initial conditions 6 Sep 2019 - 15 Sep 2019

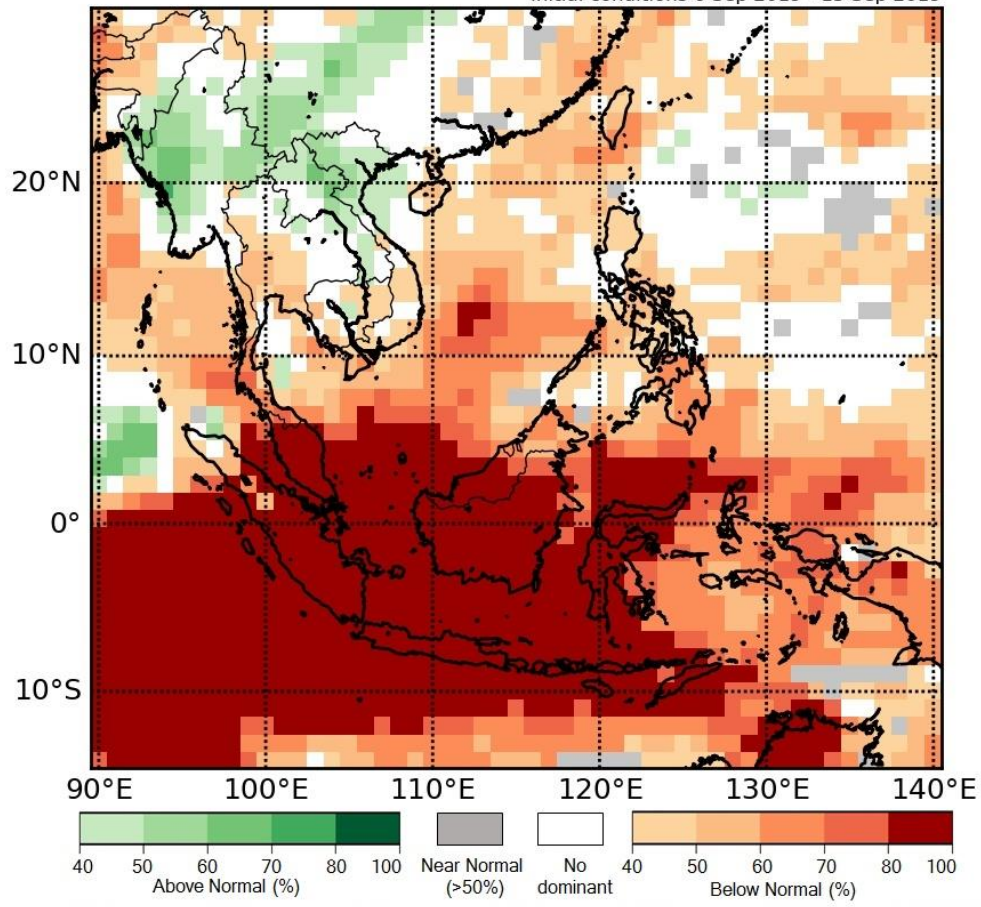


Figure 2: The predicted of below-normal rainfall in October 2019 in Southeast Asia

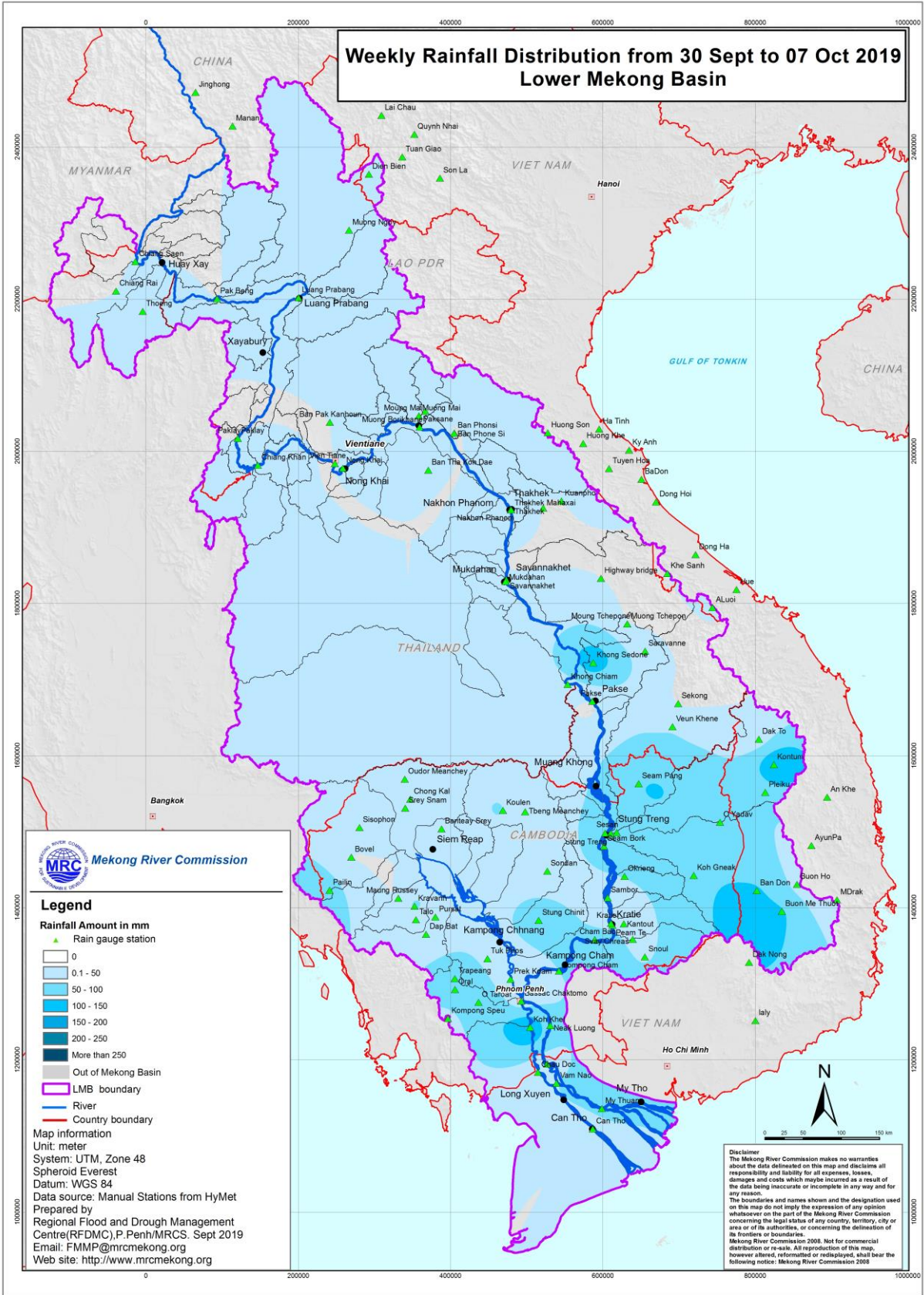
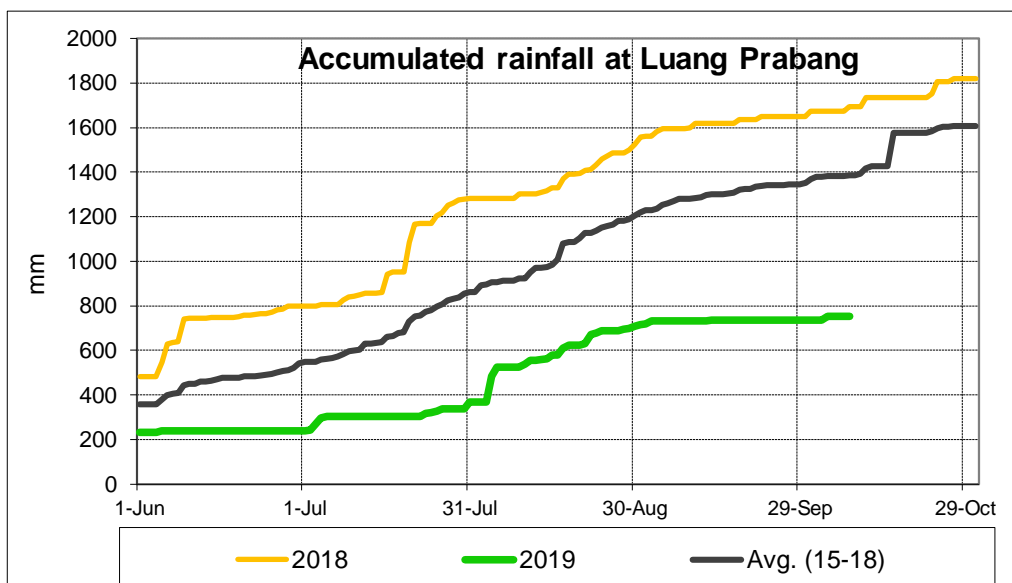
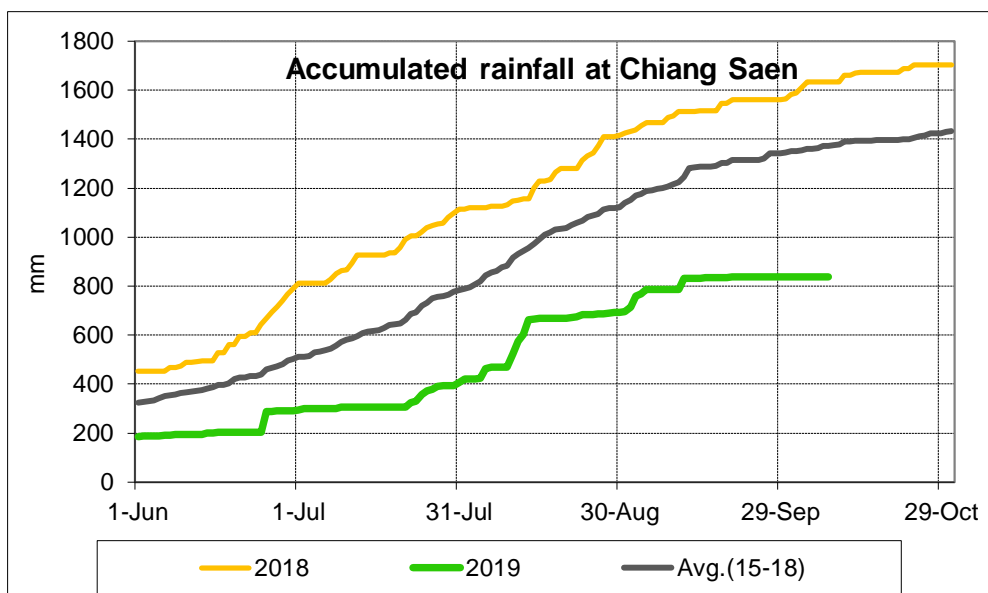
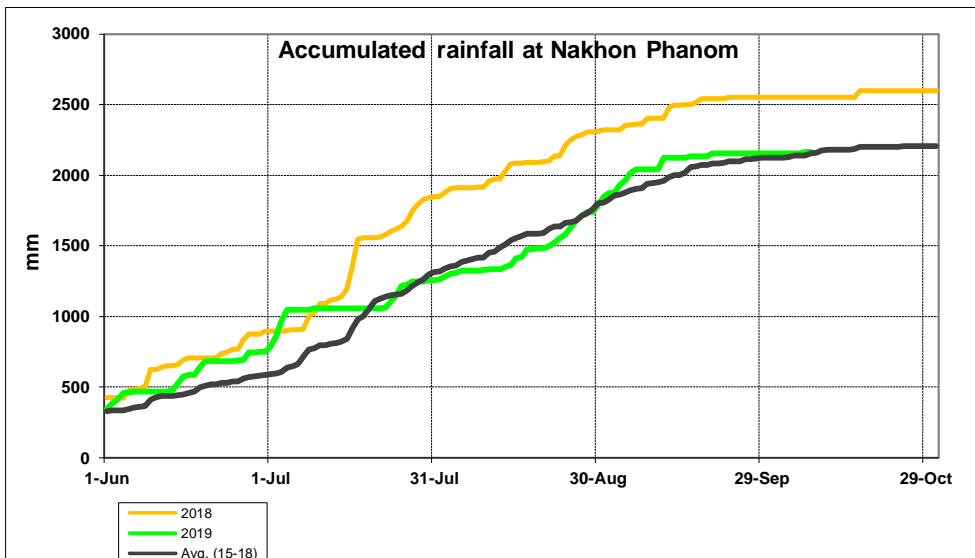
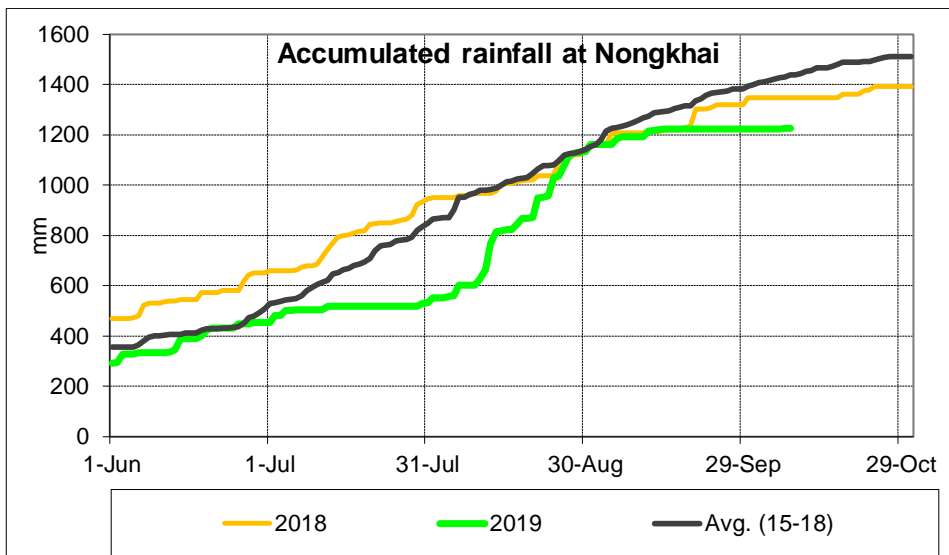
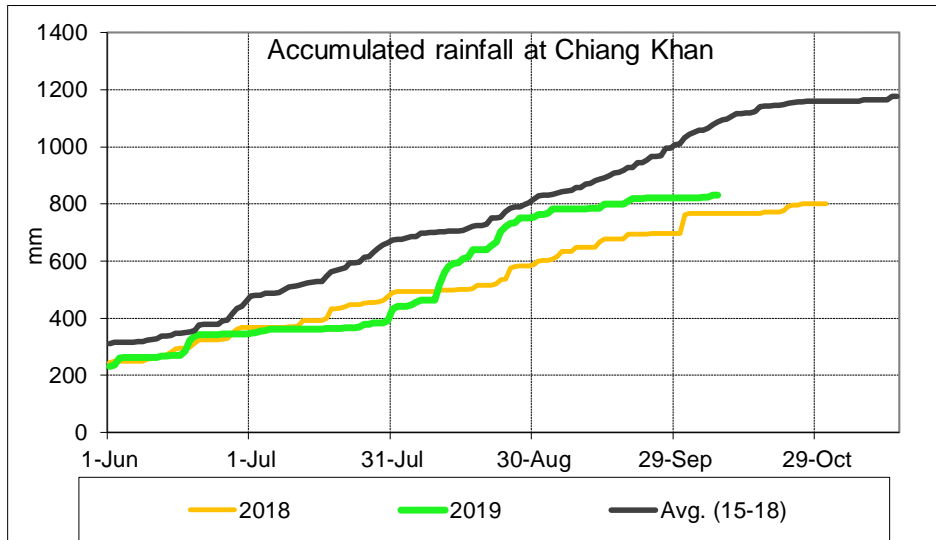


Figure 3: Weekly Rainfall Distribution over the LMB from 01st to 07th Oct 2019

Over weather situation

The weather of this week was brought moderate rainfall in the LMB. Rainfall in this week was considered below average, covered in the 3S area, low-lying area in Cambodia and Vietnam, varied from 50 mm to 100 mm. The weekly rainfall distribution in the Lower Mekong Basin from 01st to 07th Oct 2019 is showed in **Figure 3**. The accumulated rainfall in the specific location at Chiang Sean, Luang Prabang, Chiang Khan, Nong Khai, Nakhon Phanom, Pakse, Kratie and Chau Doc up to 8th Oct 2019 are showed in **Figure 4**. The below- average rainfalls were found from Chiang Sean to Nong Khai, while from Nakhon Phanom and Kratie were considered above average condition, during this week. It also indicated that last week rainfall over the LMB varied from place to places, which showed the less rainfall in the upper most part (Chiang Sean to Nong Khai), but at Nakhon Phanom and Kratie were showed higher than their LTAs (2015-2018).





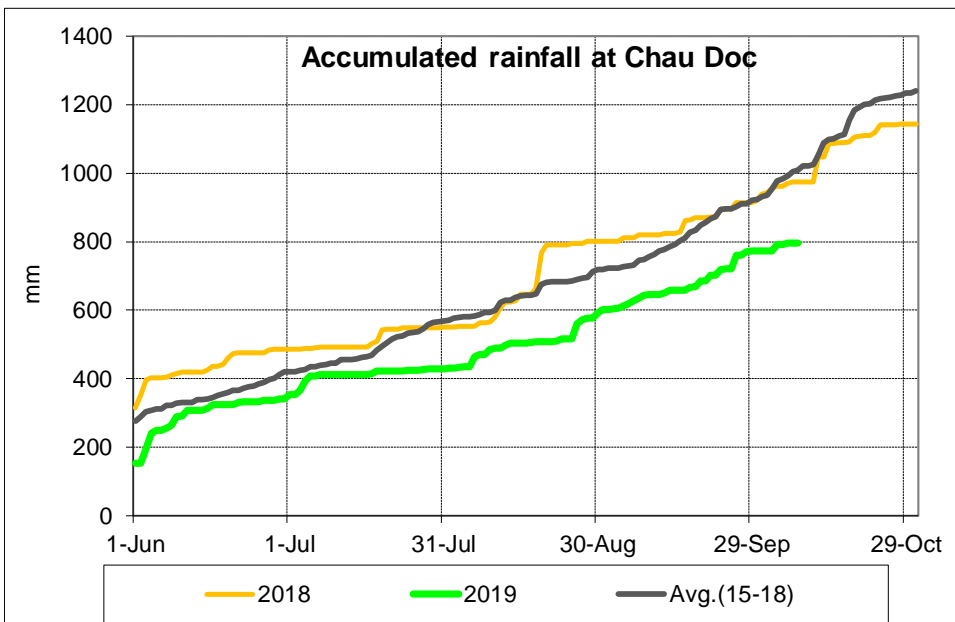
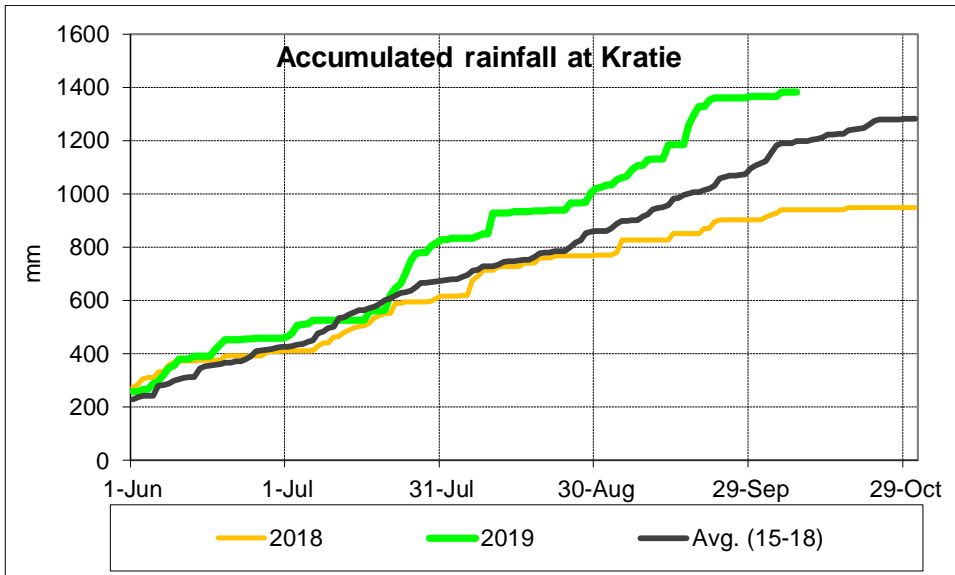
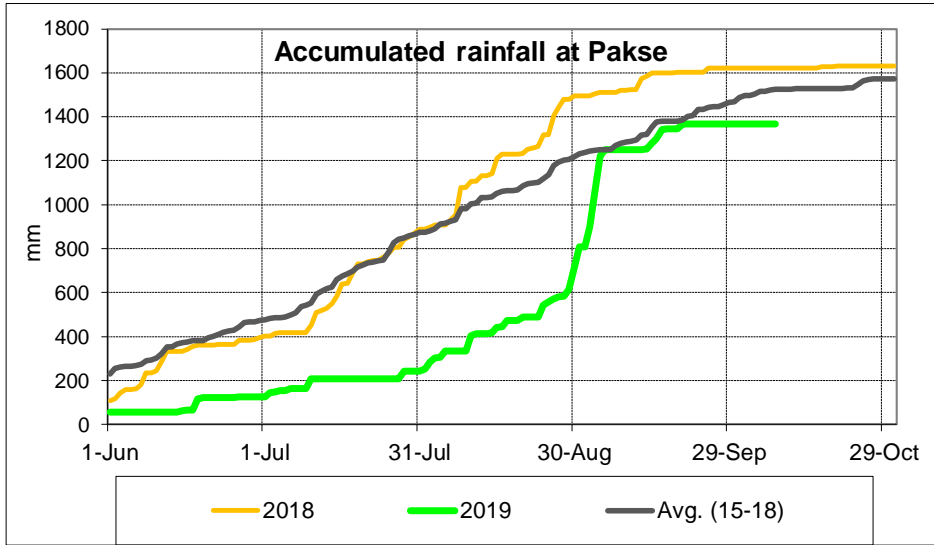


Figure 4: Accumulated Rainfall up to 08th October to 2019 in specific stations over the LMB

General behaviour of the Mekong River

This week from 01st to 07th October 2019, water levels from Chiang Sean to Vientiane/Nong Khai were still continuing decreased below their drought year 1992s, varied from 0.01 m to 0.43 m. The water level trend at Luang Prabang is likely affected by the operation of downstream at Xayaburi. Water levels at stations at the middle part of LMB from Paksane to Sovanakheth have also decreased significantly below their Minimum levels. Also followed the trend from upstream, water levels at Khong Chiam, Pakse were also significantly decreased and stay below their minimum levels. At Stung Treng, Kratie, Chaktomuk on the Bassac, Phnom Penh Port and Neak Luong were get down rapidly and stay close to their Minimum levels. For the 2 tidal stations at Tan Chau and Chau Doc, water levels decreased since early of October 2019, and stayed below their LTAs.

For stations from Chiang Saen and Luang Prabang

Water levels from 01st to 07th October 2019 at Chiang Sean station were significantly decreased and stay below its drought year 1992 and its minimum level, due to the decreased low rainfall and low inflow from Jinghong from 28th Sept which they kept water levels the same track at Jinghong (see its hydrograph in **Annex A**). At this station water levels decreased from 0.01 m to 0.18 m. At Luang Prabang station, water levels were decreased below its drought year level (1992), varied from 0.08 to 0.47 m due to the low inflow from Chiang Sean and the released from reservoir downstream at Xayaburi. The current water level at this station is below its drought year 1992. It was observed that the Luang Prabang stations is likely nominated by hydro power dam operation upstream (tributaries) and downstream (Xayaburi) in which water levels always fluctuated above their LTAs, during the impounding reservoir at Xayaburi from end of October 2018 to May 2019.

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

Water levels from 01st to 07th October 2019 at these stations were followed the same trend of upstream inflowed at Chiang Sean, which decreased from 0.03 m to 0.22 m. The current observed water levels at Chiang Khan, Vientiane/Nong Khai and Paksane stations are lower than their historical minimum levels and drought year of 1992 .

For stations from Nakhon Phanom/Thakhet to Mukdaha/Sovannakhet

Water levels from 01st to 07th October 2019 at Nakhon Phanom/Thakhet to Mukdahan/Sovannakhet stations were significantly decreased due to less inflow from upstream and below average rainfalls from the contribution inflow areas. The decreased water levels were varied from 0.02 m to 0.15 m. The current water levels at these stations reached below their minimum historical levels and drought years 1992.

For stations from Khong Chiam to Pakse

Water levels from 01st to 07th October 2019 at Khong Chiam to Pakse stations were significantly decreased after flood effected in early this month. The water levels decreased from 0.10 m to 0.37 m. The current water levels at these stations reached to their minimum historical levels.

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

Water levels from 01st to 07th October 2019 at Stung Treng, Kratie and Kompong Cham were drastically decreased, varied from 0.02 m to 0.48 m. The current water levels at Stung Treng, Kratie, Kompong Cham and Koh Khel stations were below their historical minimum levels, while at Chaktomuk and Koh Khel on the Bassac, Phnom Penh Port and Prekdam on the Tonle Sap and Neak Luong on the Mekong are below their LTAs levels (1980-2018).

Tan Chau and Chau Doc

Water levels from 01st to 07th October 2019 at the 2 tidal stations at Tan Chau and Chau Doc were dropped below their LTAs. However, these stations are effected by tidal and sometime affected by the El Nino process in the South China Sea.

According to the Japan Meteorological Agency (JMA), Sea surface temperature (SST) variability in the tropics can significantly impact on the global climate through atmospheric circulation. El Niño event, which are identified by SST fluctuations from the central to the eastern equatorial Pacific (NINO.3), are not widely spread as previous months. The NINO3 index is one of several El Niño/Southern Oscillation (ENSO) indicators based on sea surface temperatures.

Discussion and Conclusion

From 01st to 07th October 2019, the trend of water levels at Chiang Sean were continued to decrease due to the less outflow from Jinghong and low rainfall in catchment areas. Water level at Chiang Sean is relied from inflow from Jinghong Hydropower Station on Lancang and its catchment rainfall. The impact could obviously see the gradually decreasing water level to downstream to Vientiane/Nong Khai. Based on a hydrological phenomenon, the inflow contribution of water from the upstream of Lancang-Mekong in China to the Mekong mainstream is about 16% in total during the Dry season from Nov to May, while 24% in the Wet season (Adamson. 2010). The whole inflow of water into the lower Mekong basin is influenced more by inflow from tributaries and the direct rainfall catchment.

The low inflows from upstream and less rainfall in catchments, resulting water levels from Paksane to Pakse are drastically dropped below their LTAs.

However, from Stung Treng, Kratie and Kompong Cham stations water levels are followed the same trend from upstream which stay close to their minimum levels.

Wet Season 2019 (Aug-Sep) is characterized low rainfall at the upper part but high at the lower part from Khong Chiam to Kratie.

Due to the low flow of the Mekong, the upcoming *Dry Season* can be possible to face the dangerous shortage of water for drinking and agricultural production, fishery production, ecological systems, biodiversity, bank erosion, salinity intrusion in the Mekong Delta and waterway transport because not enough water for fish spawning and also aquatic lives ect. The reduced water flow could also affect to the expanding unsaturated soil which cause bank erosion and salinity intrusion from the sea.

Note: For detail information on the current flows and water levels situation from upstream to downstream, **Annex A** presented hydrographs of water level at the 22 key stations on the Mekong River.

The Trend of water level and its Outlook

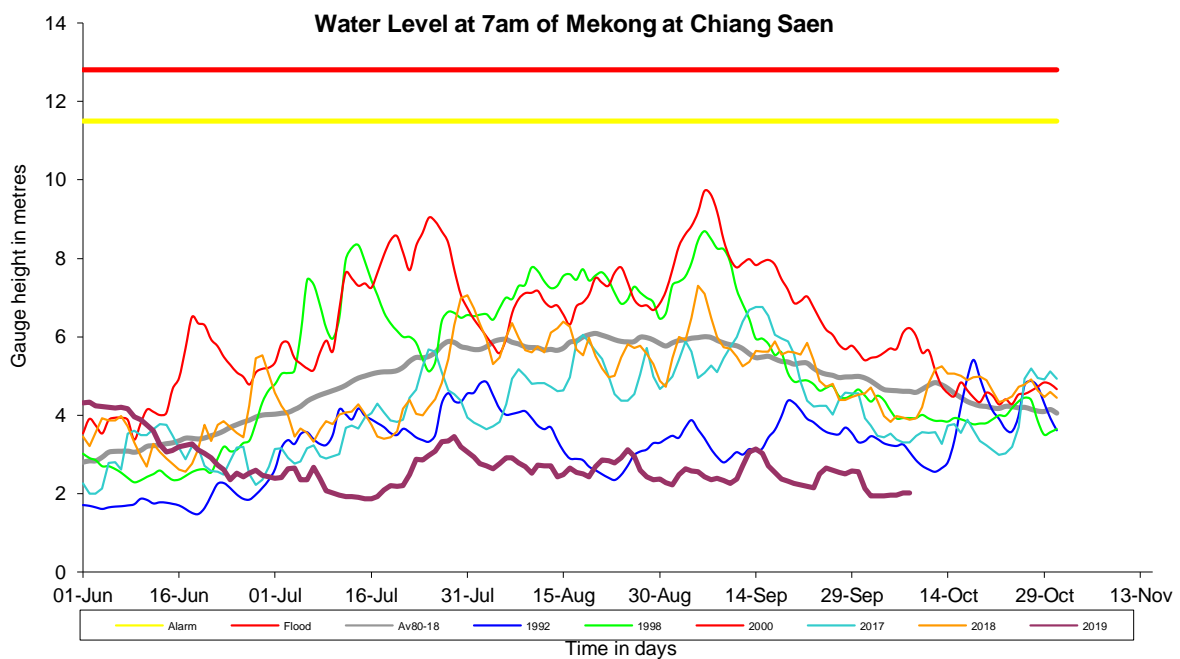
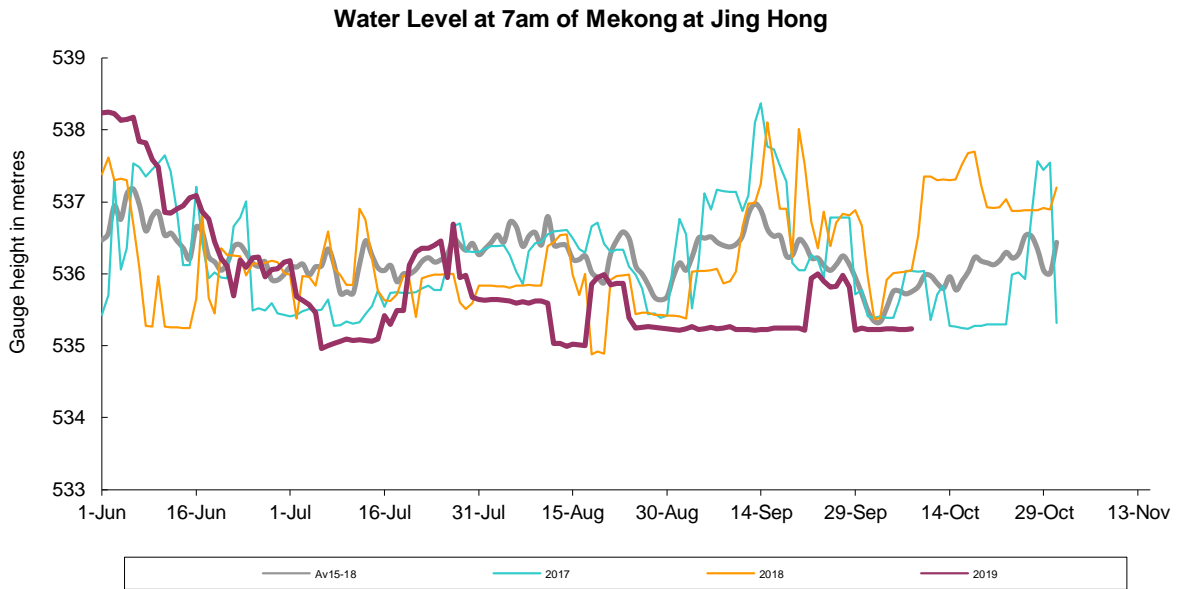
Based on daily river flood forecasting bulletin next week from 09st to 13th October 2019, water levels at Chiang Saen will continue to decrease that can be varied from 0.02 to 0.10 m, while the water level of the station at Luang Prabang will be fluctuated due to the impact of the inflow from reservoir operation upstream and downstream. Water levels at Chiang Khan, Vientiane /Nong Khai and Paksane will also continue to decrease, varied from 0.05 to 0.20 m. From Nakhon Phanom to Sovanakheth, water levels will be decreased from 0.04 m to 0.15 m. The 5 days forecasted rainfall of NOAA (GFAS) of showed below-normal rainfall will continue in the next 5 days in some places mainly in the low-lying area and the Mekong Delta.

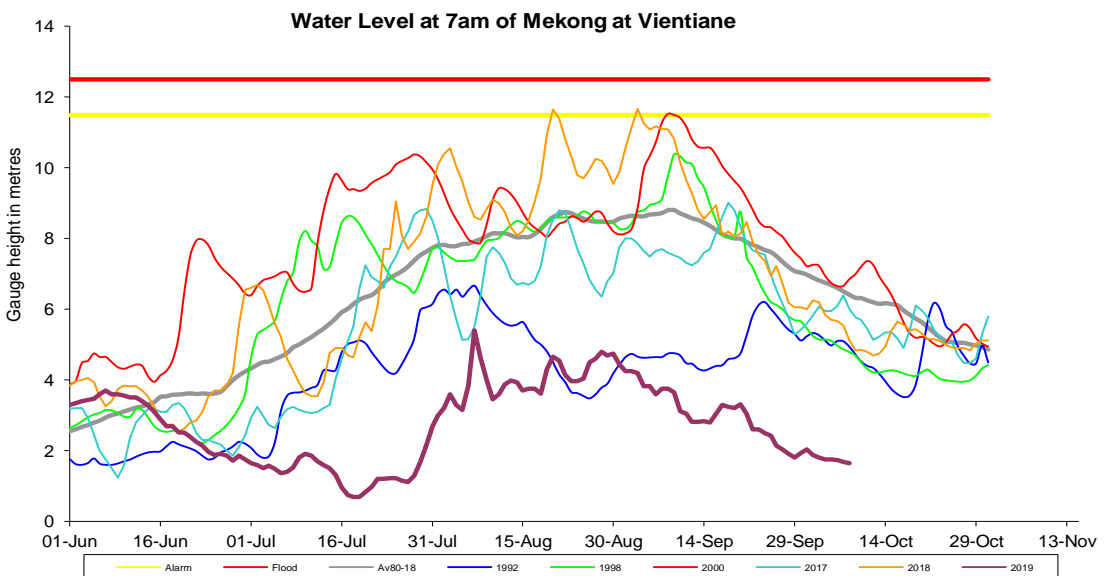
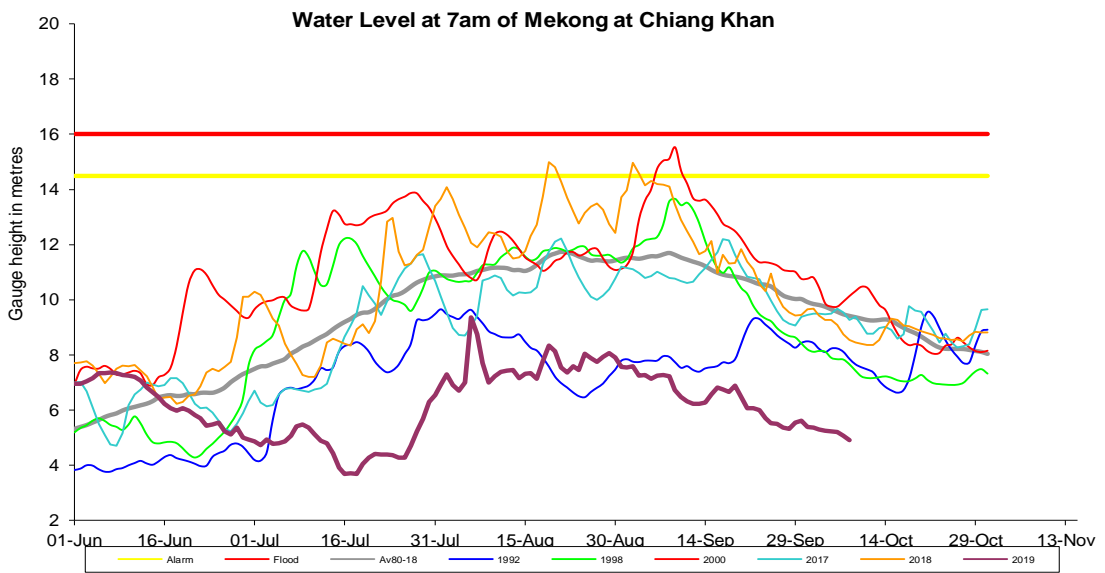
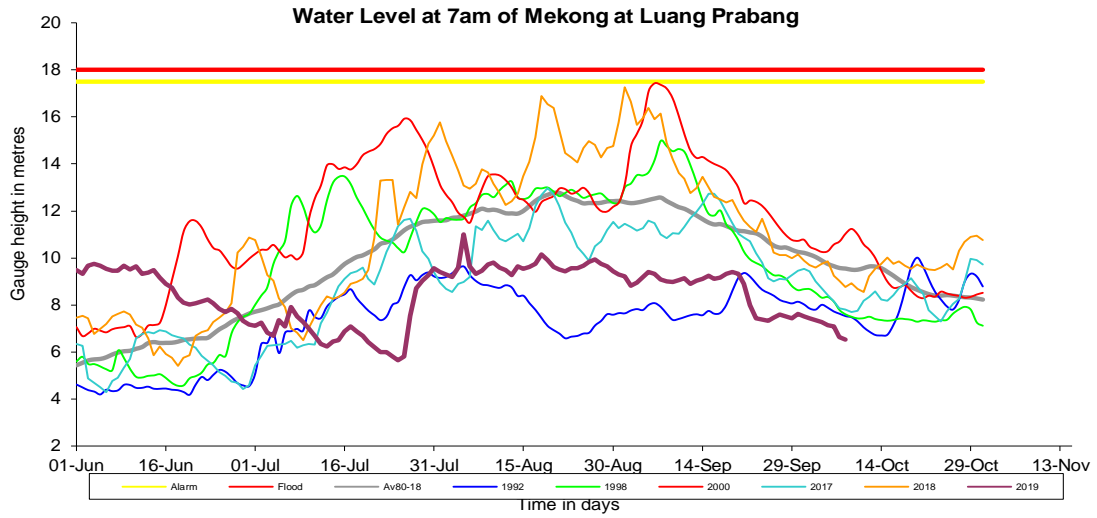
From Stung Treng, Kratie and Kompong Cham, water levels for the 5 days forecasting from 09st to 13th October 2019 showed decreased from 0.05 m to 0.35 m, while at Chaktomuk, Tole Sap at Phnom Penh Port, Prekdam on the Tonle Sap and Neak Luong on the Mekong will slightly increase due to the inflow from upstream of Kompong Cham.

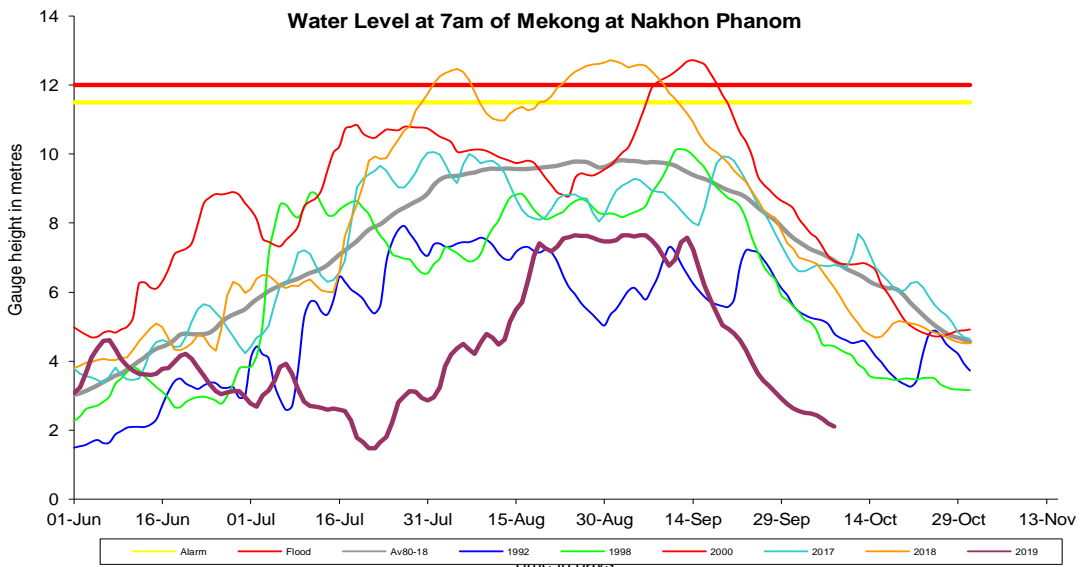
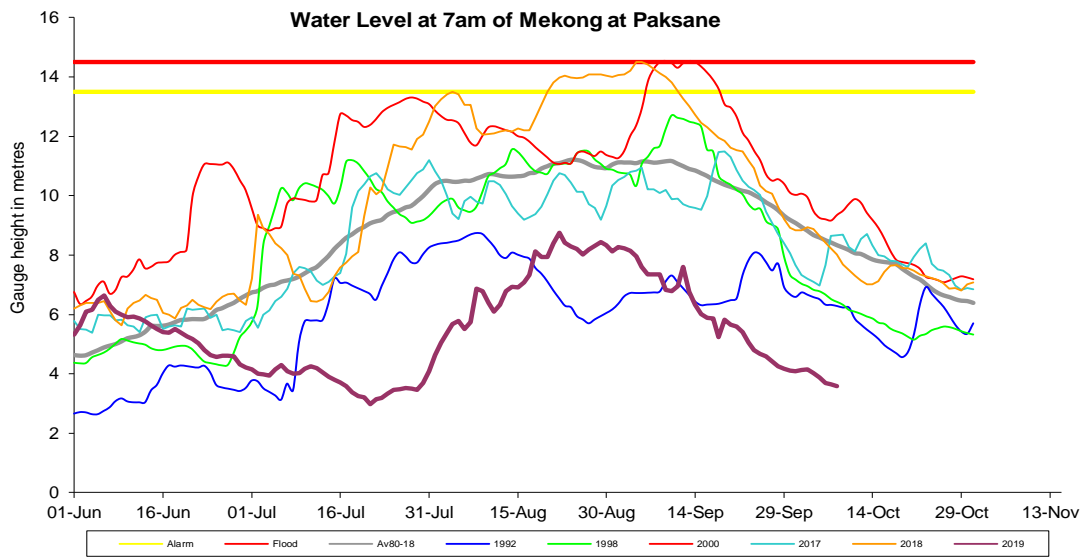
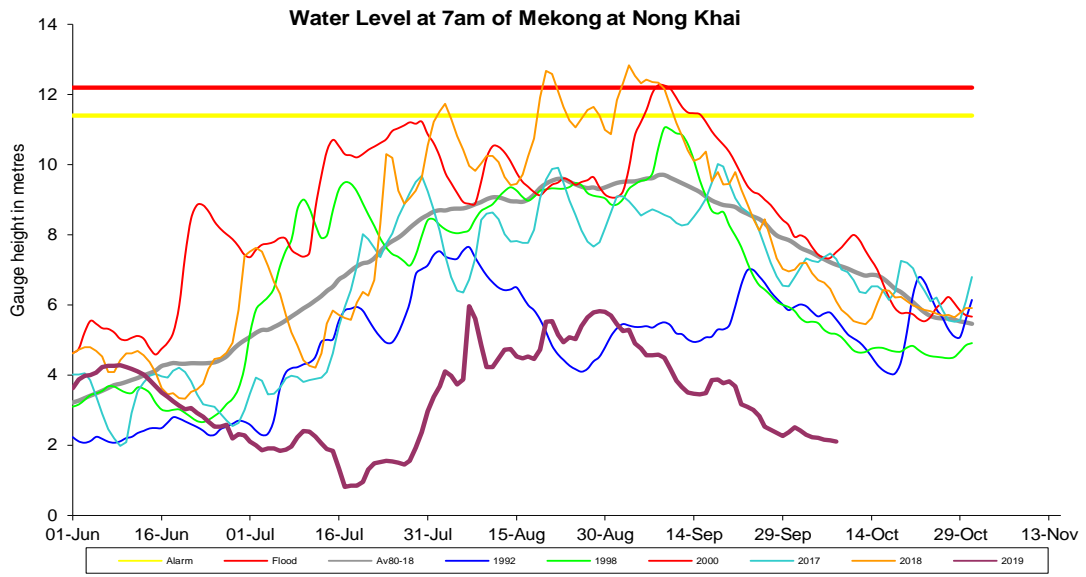
Also, the tidal stations at Tan Chau and Chau Doc will be decreased and stay below their LTAs from 09st to 13th October Oct 2019.

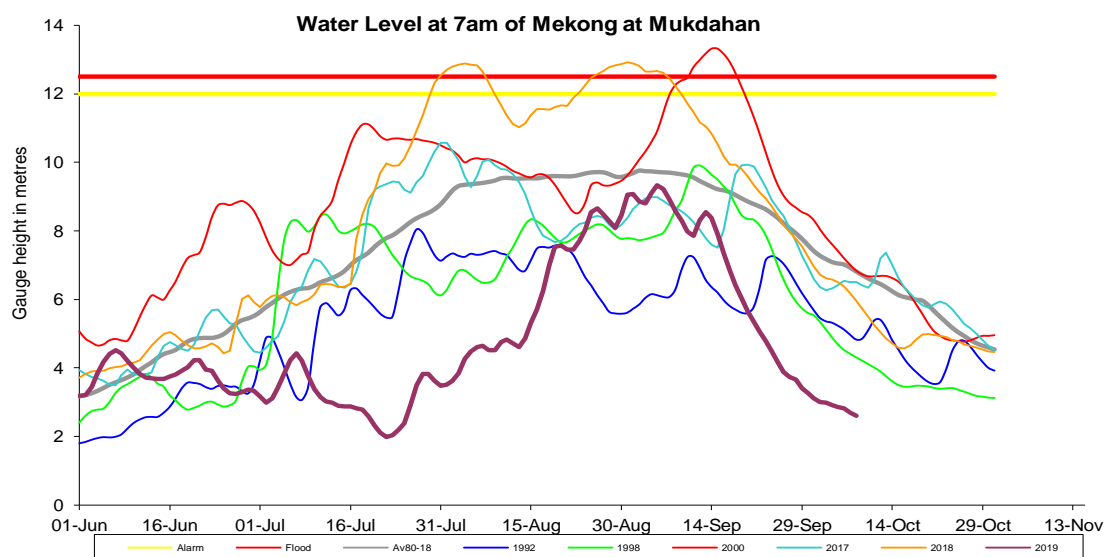
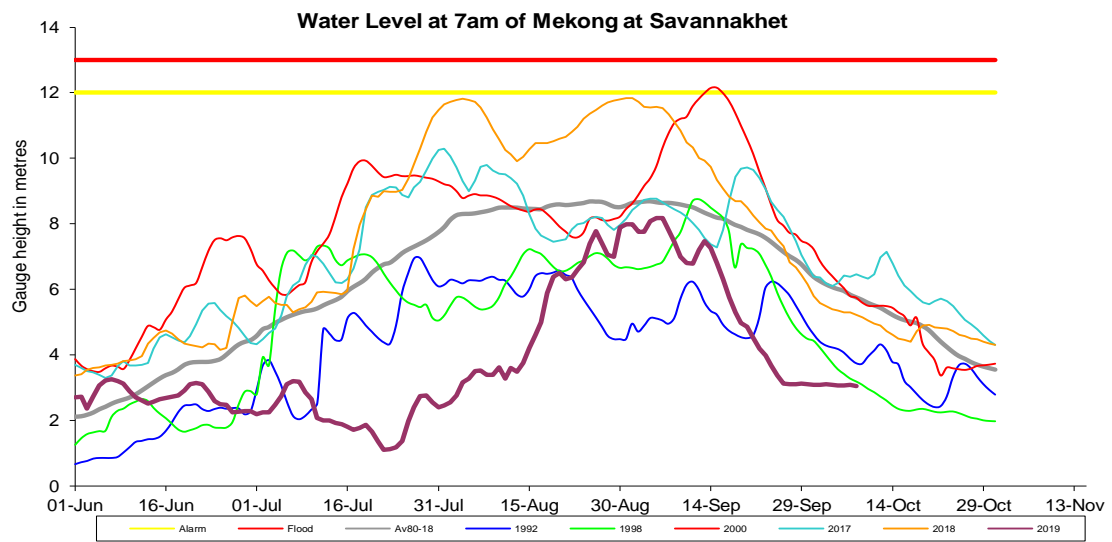
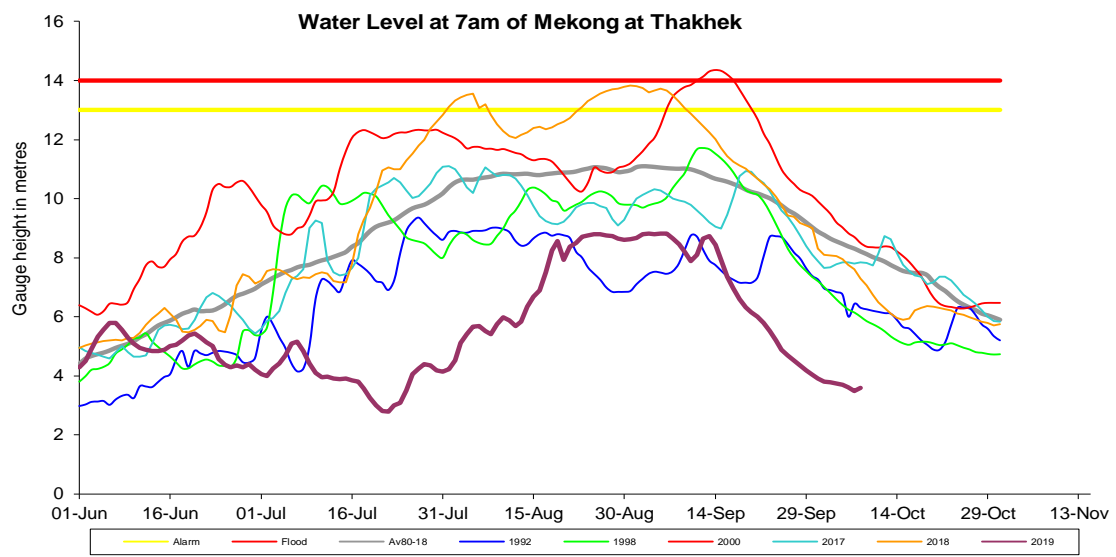
Annex A: Seasonal Water Level Hydrographs

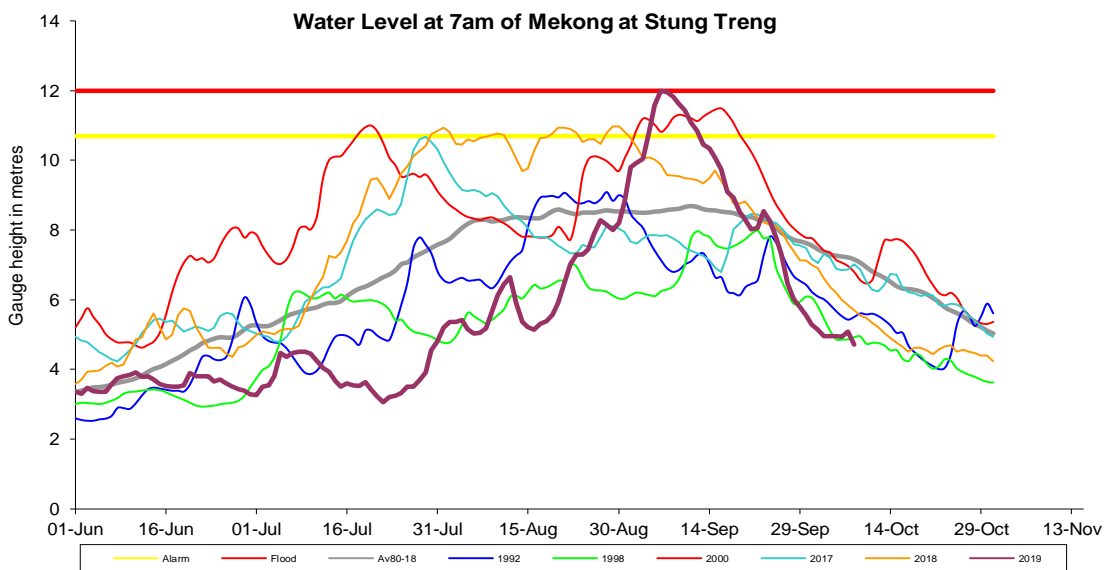
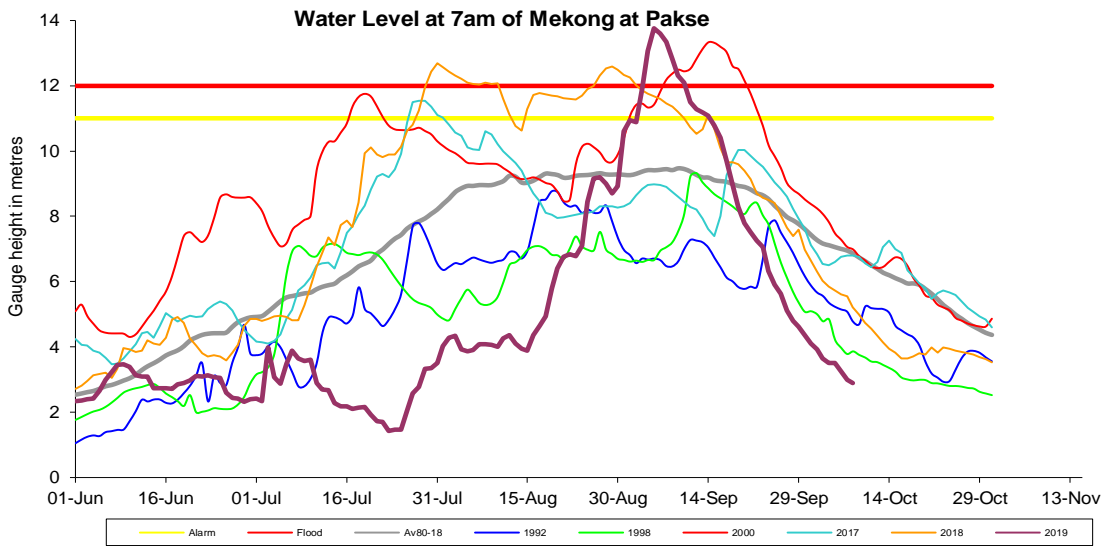
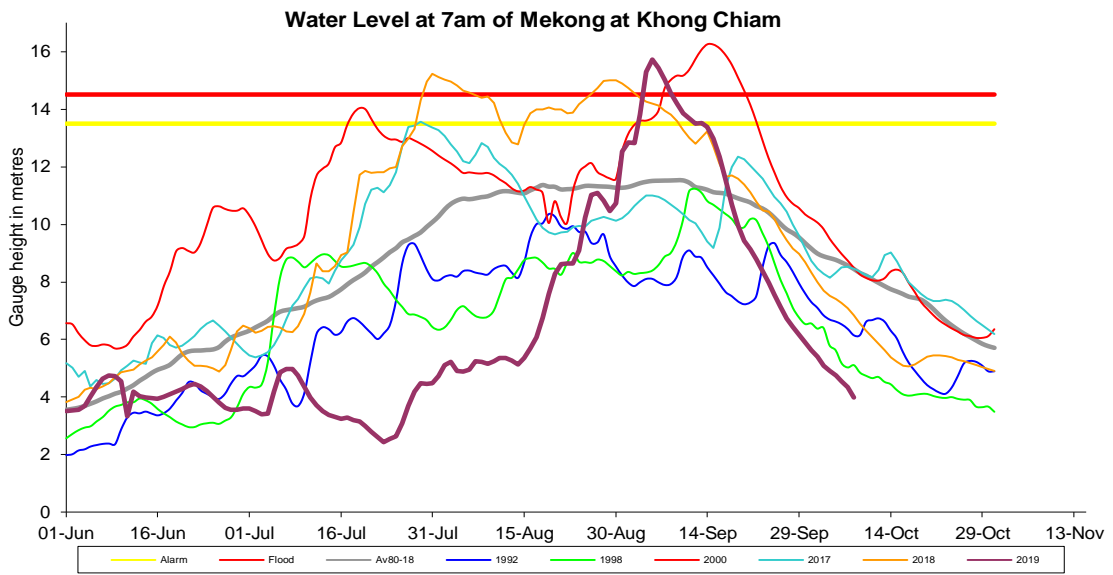
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS IN FLOOD SEASON FROM UP TO 08 OCTOBER 2019



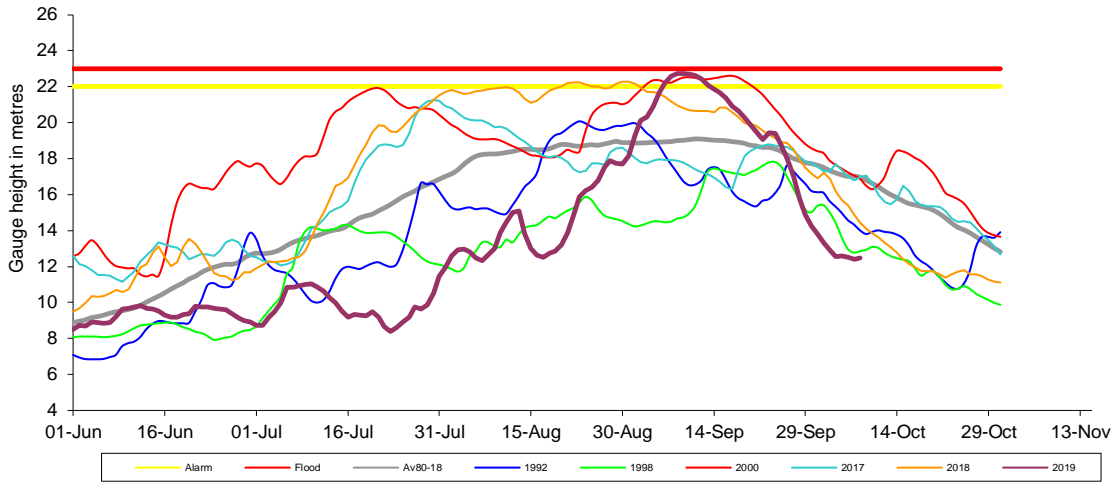




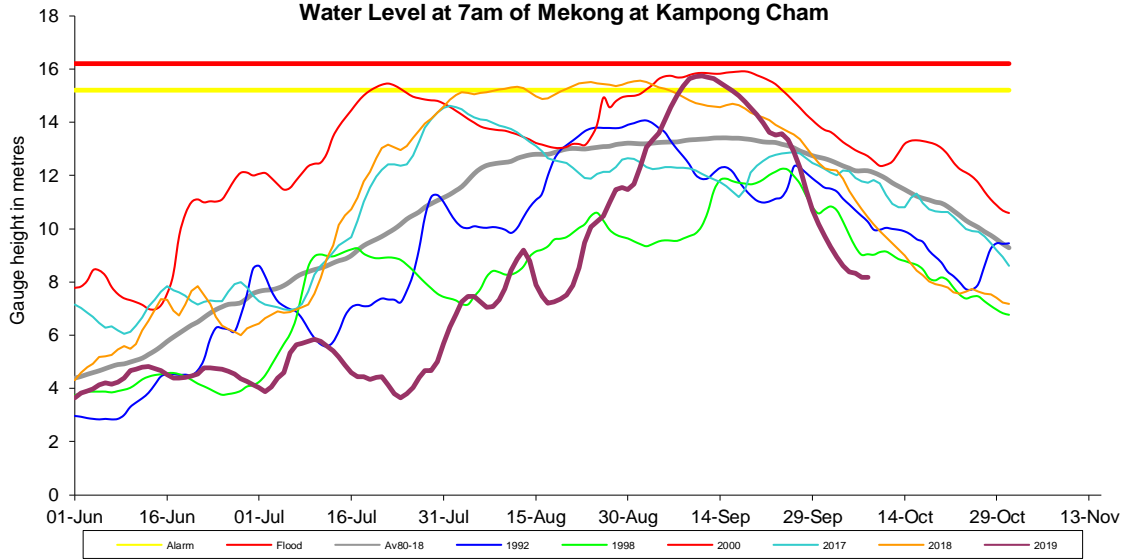




Water Level at 7am of Mekong at Kratie



Water Level at 7am of Mekong at Kampong Cham



Water Level at 7am of Mekong at Phnom Penh Chaktomuk

