

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 14/08/2018, covering the week from the 06th to 13th August 2018

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

General weather patterns

During the week of 06th to 13th August 2018, the weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps were referenced from Thailand Meteorology Department (TMD) of the 07th August and 12th August 2018 in the Figures 1 & 2 as follows:

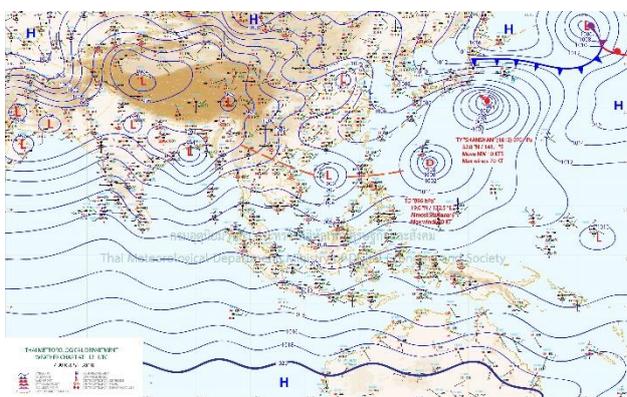


Figure 1: Weather map for 07th August 2018

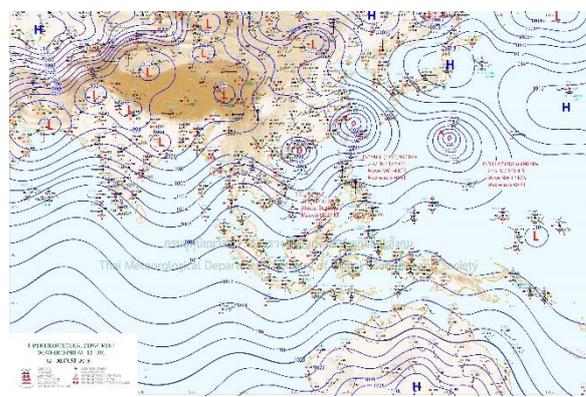


Figure 2: Weather map for 12th August 2018

Moderate South-West (SW) Monsoon

During the last week, abundant rainfall occurred due to the influential southwest monsoon prevailing over Lower Mekong Basin together with low-pressure air mass cells. (see **Figure 1** and **2**).

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

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

Other weather phenomena that affect the discharge

According to the Thai Meteorological Department (TMD), there will influence the prevailing southwest monsoon over Mekong region, including the Gulf of Thailand to become more rainfall. The low pressure was hit the upper part of the Mekong region, during that time (see **Fig.1**).

Over weather situation

During the last week, the weather was scattered thundershowers with moderate rain of the Southwest monsoon. Consequently, in this week there was moderate rainfall over Chiang Sean to Stung Treng catchment areas, included the 3S area. The observed rainfall at Nakhonphanom to Pakse showed high rainfall between 100 mm to 200mm and Stung Treng to Neak Luong shown between 67 mm to 1000 mm. The weekly rainfall distribution is shown in **Figure 3** and daily rainfall at key stations in the Lower Mekong Basin are shown **Table A2**.

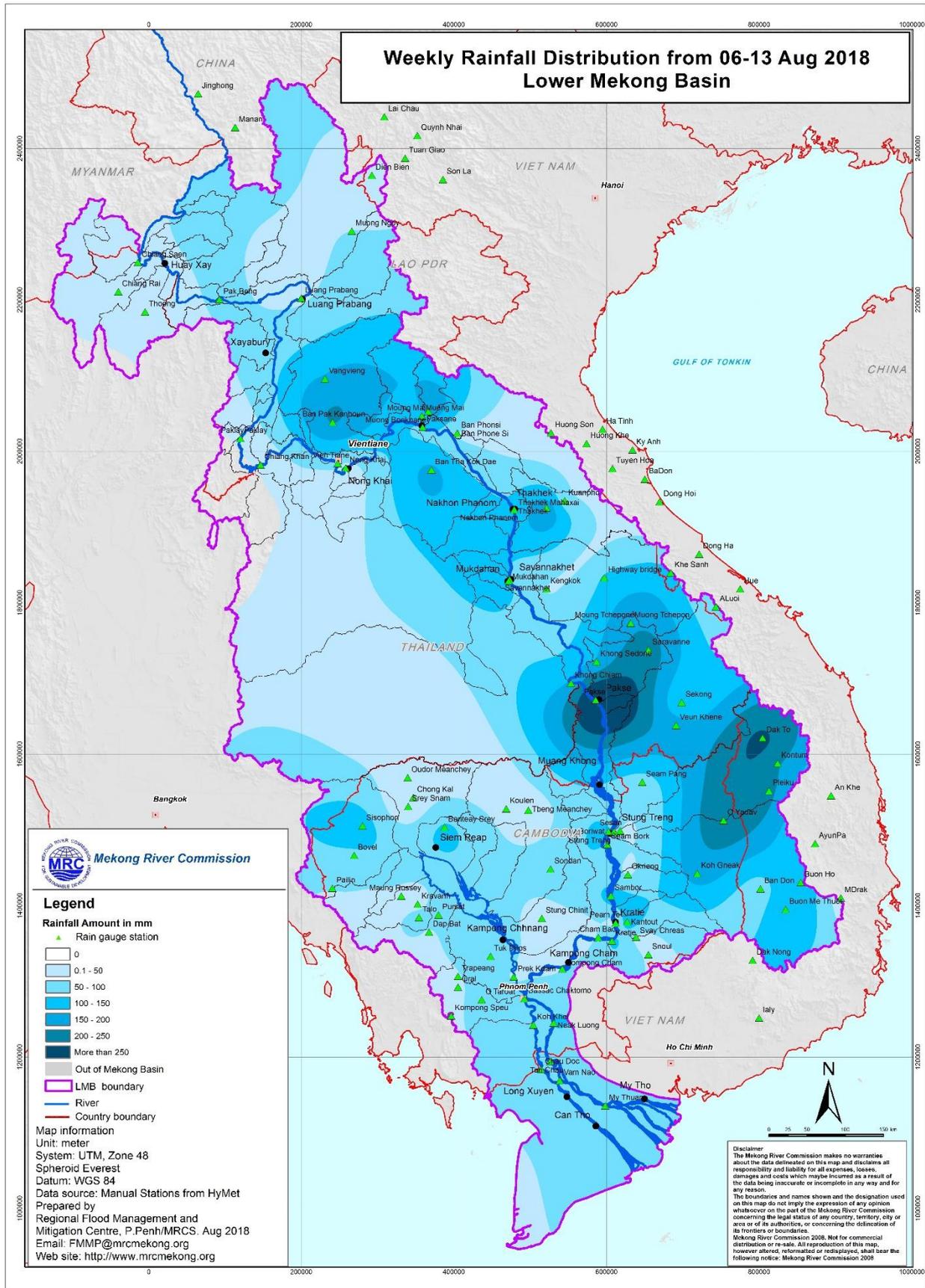


Figure 3: Weekly Rainfall Distribution over the LMB from 06th to 13th August 2018

General behaviour of the Mekong River

During the last week, the water levels at stations from upper to middle part of LMB has been decreasing due to inflow operation upstream part, while at downstream part has been slightly rising.

For stations from Chiang Saen and Luang Prabang

Water levels from 06th-13th August 2018 at Chiang Saen station were raised over its long-term average (LTA), while at Luang Prabang station water levels were continued increased that similar to the recorded value in the year 2000 at the same period from 06th to 13th August.

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

Water levels at these stations were above their LTAs and reached to the alarm level at Nong Khai on 3rd August 2018 (11.73 m), while water level at Paksane reached over alarm level on 04th August (11.50 m).

For stations from Nakhon Phanom/Thakhet to Mukdahan/Sovannakhet

Water levels from Nakhon Phanom/Thakhet to Mukdahan/Sovannakhet stations were drastically increased which reached to the flood levels from 3rd to 7th August 2018. This caused rising water level was due to the heavy rainfall from Middle part of LMB.

For stations from Khong Chiam to Pakse

Water levels from Khong Chiam to Pakse stations were continued increased, which stay above the flood levels from 3rd to 6 August 2018.

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

Water levels at these stations were slightly increasing above their LTAs and reached to the alarm levels from 9th to 13th August 2018 at Stung Treng, Kompong Cham and Koh Khel.

Tan Chau and Chau Doc

Water levels at Tan Chau and Chau Doc are strongly affected by the tidal rising from the sea, leading reached to alarm levels during this flood season. This week, water levels at these 2 stations were rise close to their long-term average (LTA).

Note: For more detail the flood situation during the last week, please see the hydrographic in Annex C.

Flood Situation

- Flood stage or alarm stage:

The alarm and flood levels appeared at Nakhon Phanom, Thakhet, Mudahan, Khong Chiam, Pakse, Stung Treng, Kompong Cham and Koh Khel. However, the water levels have been gradually decreased and reached to the lower flood levels during this week.

- No damage or victims were reported by the Mekong member countries

For more details see the following annexes:

- tables and graphs for water level and rainfall for the last week in Annex A
- a graph for accuracy in Annex B
- a table of forecast achievement in Annex B
- tables and graphs for performance in Annex B
- the water level graphs showing the observed water level for the season in Annex C

Annex A: Graphs and Tables

Table A1: observed water levels

Unit in m

2018	Jinghong	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 Khei	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
06/08/2018	535.84	6.00	12.94	12.06	9.04	10.42	13.07	12.37	13.07	11.72	12.83	14.58	12.05	10.55	21.74	15.10	9.19	8.22	7.59	6.66	7.68	3.07	2.35
07/08/2018	535.84	6.35	13.17	11.90	8.61	9.96	13.07	12.14	13.19	11.55	12.65	14.48	12.03	10.64	21.79	15.14	9.25	8.29	7.59	6.72	7.76	3.16	2.45
08/08/2018	535.85	5.97	13.78	12.16	8.53	9.83	12.26	11.80	12.84	11.25	12.32	14.40	12.10	10.67	21.87	15.18	9.32	8.37	7.63	6.76	7.85	3.27	2.58
09/08/2018	535.84	5.66	13.64	12.44	8.84	10.03	12.06	11.45	12.51	10.88	11.98	14.45	12.06	10.74	21.90	15.22	9.37	8.40	7.64	6.80	7.89	3.35	2.71
10/08/2018	535.84	5.60	13.15	12.40	9.11	10.25	12.08	11.18	12.28	10.58	11.67	14.21	12.08	10.76	21.93	15.27	9.40	8.43	7.65	6.84	7.96	3.43	2.81
11/08/2018	536.39	5.76	12.76	12.28	9.00	10.24	12.09	11.03	12.12	10.26	11.37	13.65	11.60	10.74	21.99	15.30	9.45	8.48	7.67	6.90	8.02	3.47	2.83
12/08/2018	536.44	5.60	12.24	11.77	8.75	10.07	12.16	10.97	12.06	10.12	11.12	13.18	11.12	10.42	21.90	15.33	9.51	8.54	7.69	6.96	8.08	3.45	2.83
13/08/2018	536.54	6.10	12.42	11.50	8.30	9.65	12.20	10.97	12.15	9.92	11.02	12.85	10.77	10.05	21.66	15.28	9.53	8.58	7.69	7.00	8.13	3.43	2.79

Table A2: observed rainfall

Unit in mm

2018	Jinghong	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 Khei	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
06/08/2018	13.5	4.9	0.8	0	3.6	7.9	2.2	1.6	nr	20.7	17	47.3	24.1	12.5	55.6	10.6	nr	-	0.1	1.8	7.3	19.1	nr
07/08/2018	0	0	0.4	0	nr	0	nr	0	0.2	47.5	16	9.8	24.5	40	15	2.8	nr	-	nr	0	4.2	9.7	12
08/08/2018	0	0	nr	0	nr	1.5	3.4	1.7	1.8	4	nr	2.9	123	16	23.2	16.1	59.3	-	12.4	12.2	28.3	2.8	0.3
09/08/2018	2.5	6	20.4	0	46.5	9	13.2	1.9	6.4	17.2	56.2	67.5	nr	nr	0	2	12.5	-	46.5	83.6	nr	0.1	1
10/08/2018	8.5	16	nr	5.7	3.6	0	nr	38.7	24.2	23.4	nr	21	28.4	2.5	nr	nr	nr	-	nr	nr	nr	10	14
11/08/2018	0	3	nr	0	1.2	0	16.7	16.6	18.7	0	nr	1.6	nr	nr	12.8	3.7	nr	-	nr	1.7	nr	7.4	25
12/08/2018	7	5.7	nr	0	15.5	0	16.2	0.5	1	0	2.2	4	25	0.5	nr	7.5	3.1	-	14.2	2.8	4.3	8	20
13/08/2018	0	1.7	5.8	0	0.8	6.3	32.9	56.6	58.6	3.4	3	4.1	nr	8.5	nr	nr	7.2	-	3.1	0.6	nr	8	0.5

Figure A1: Observed water level and rainfall for Jinghong, Chiang Saen, and Luang Prabang

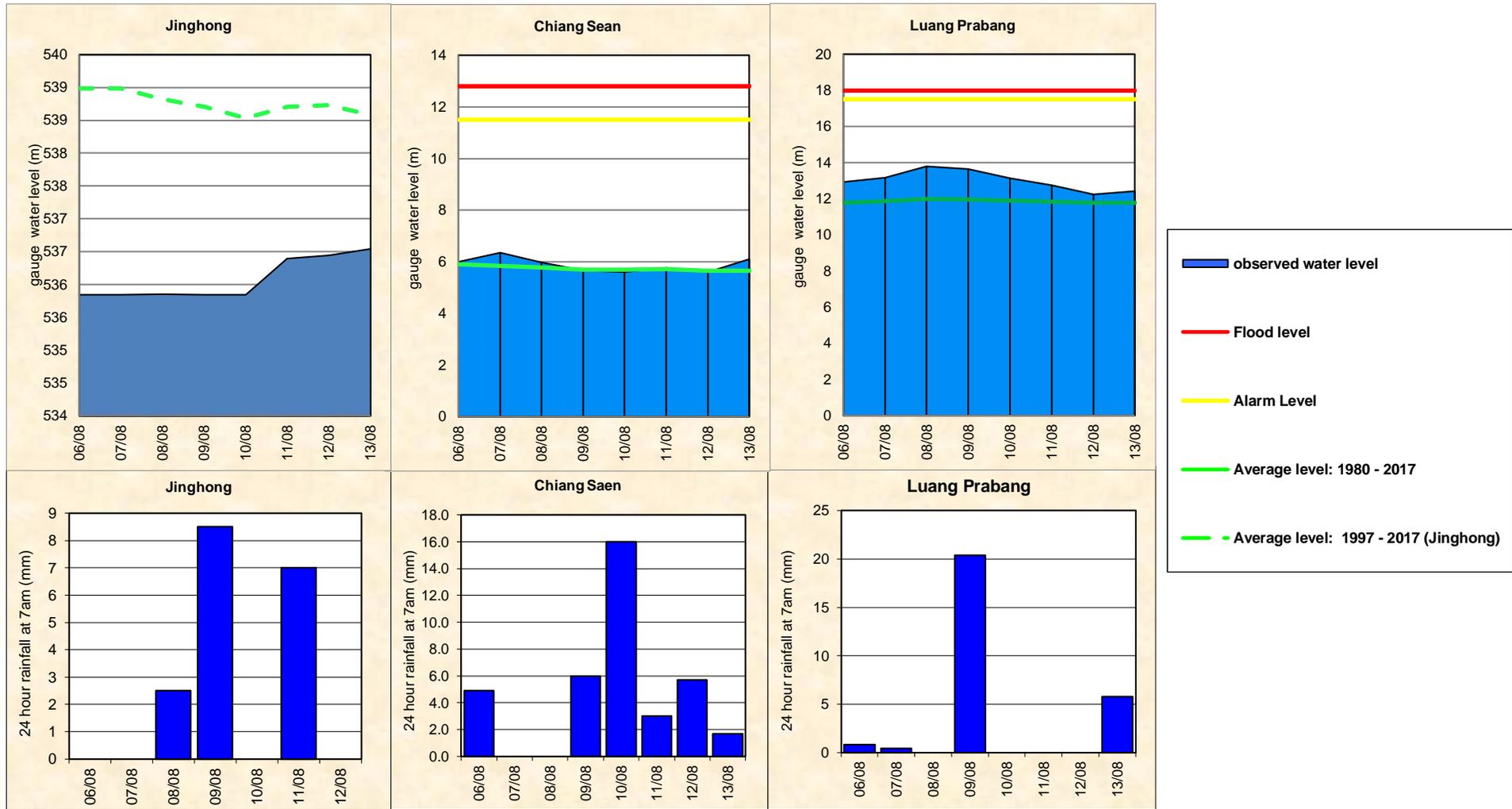


Figure A2: Observed water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

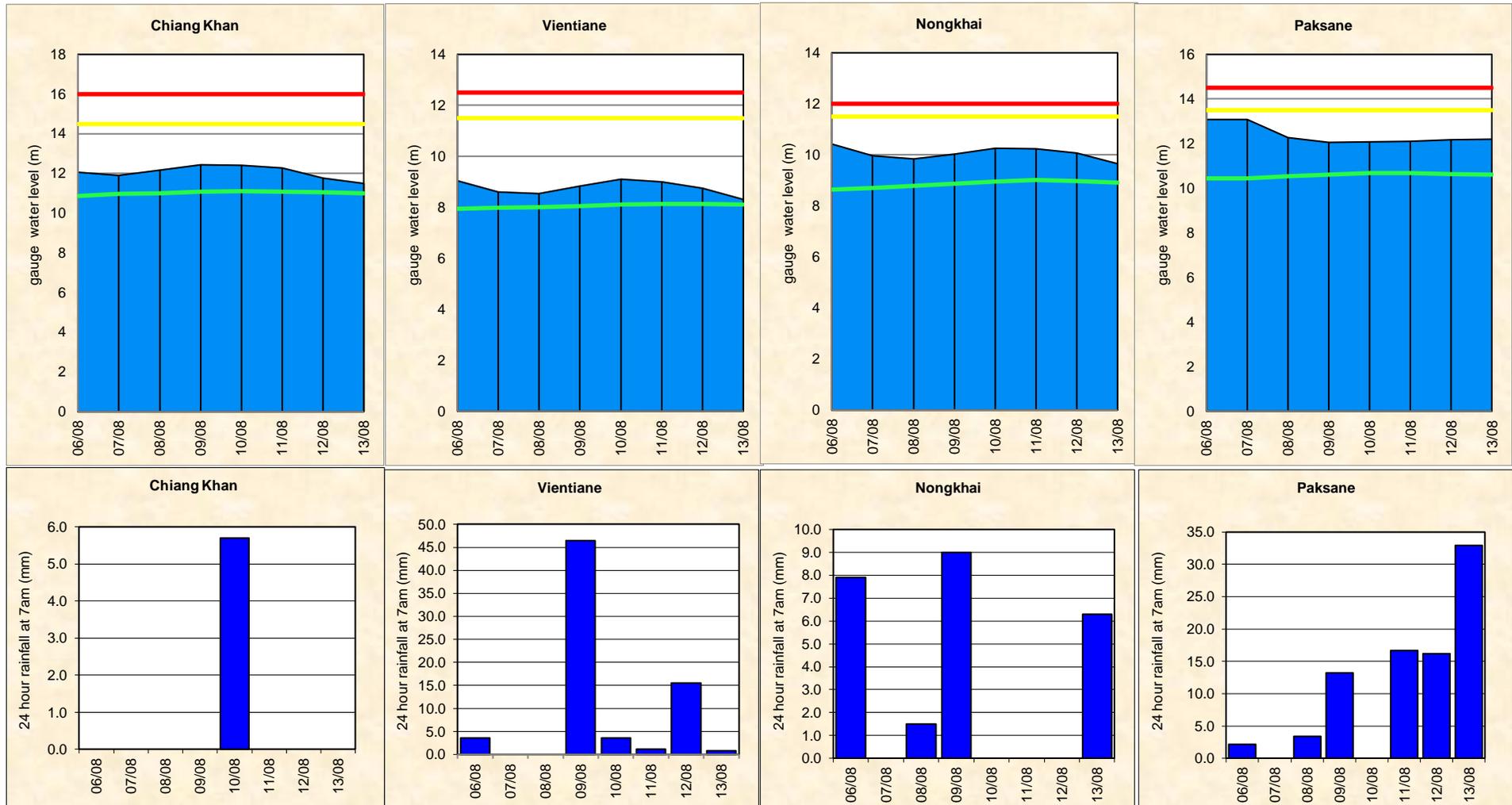


Figure A3: Observed water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

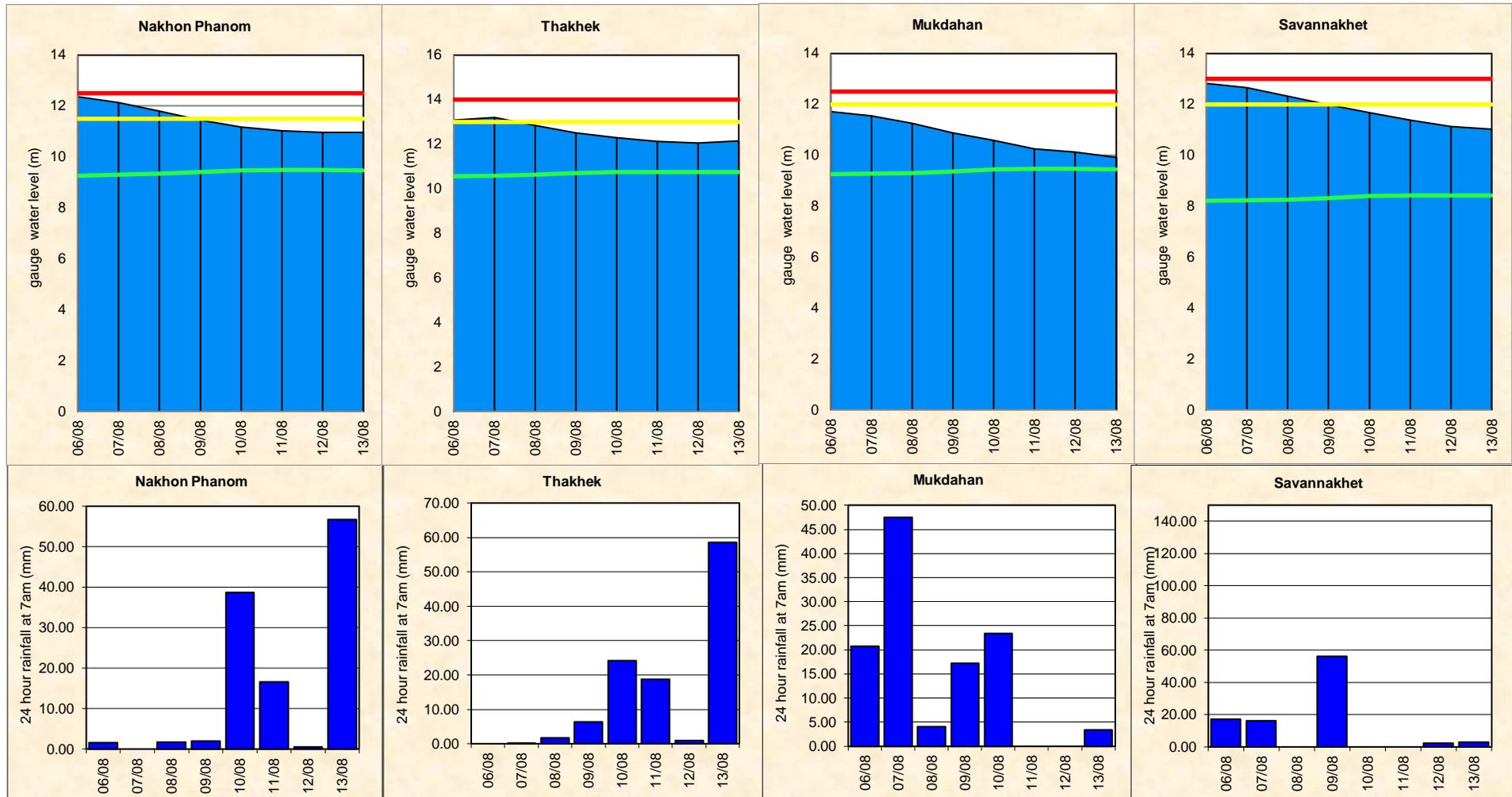


Figure A4: Observed water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

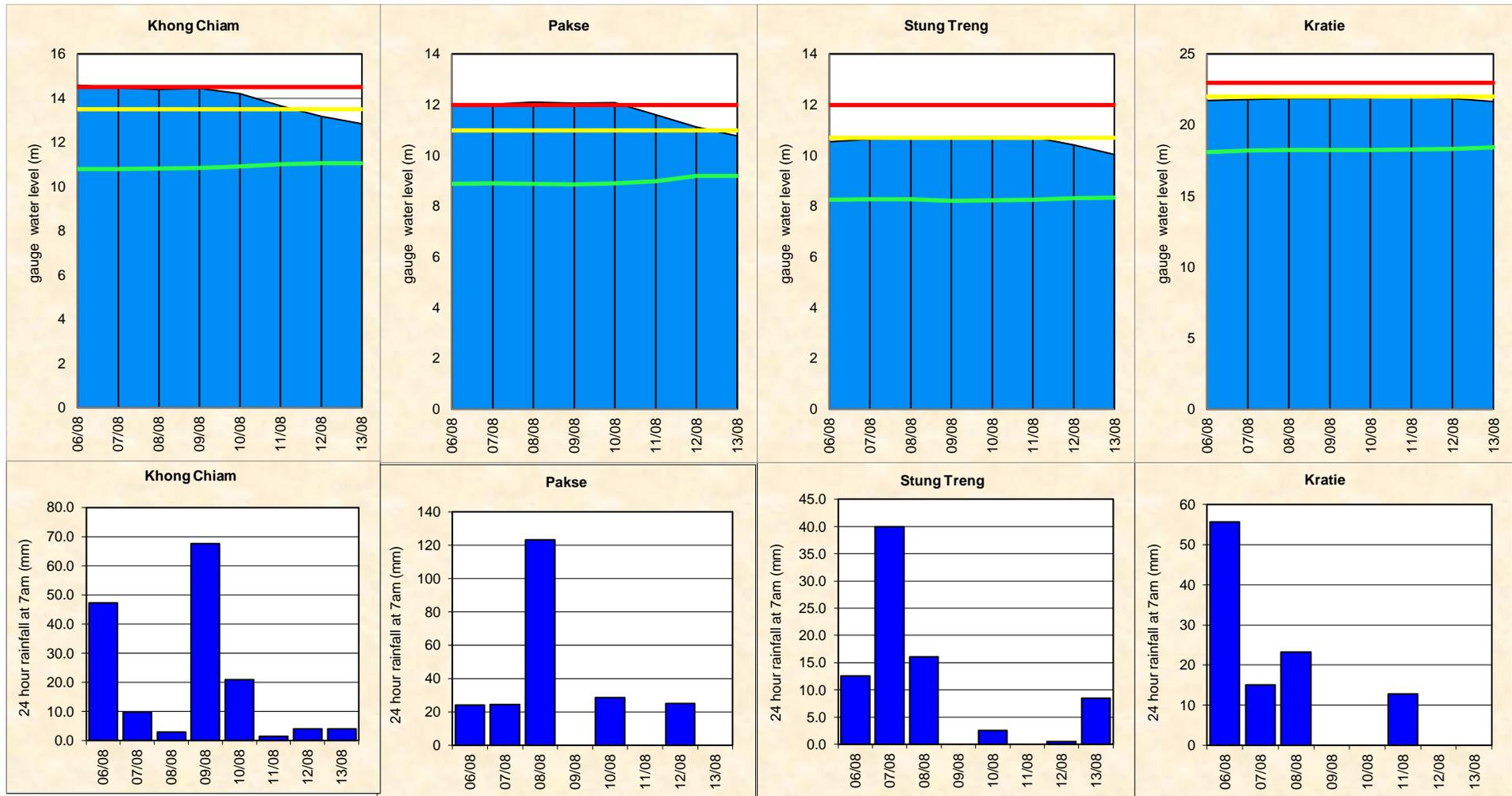


Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

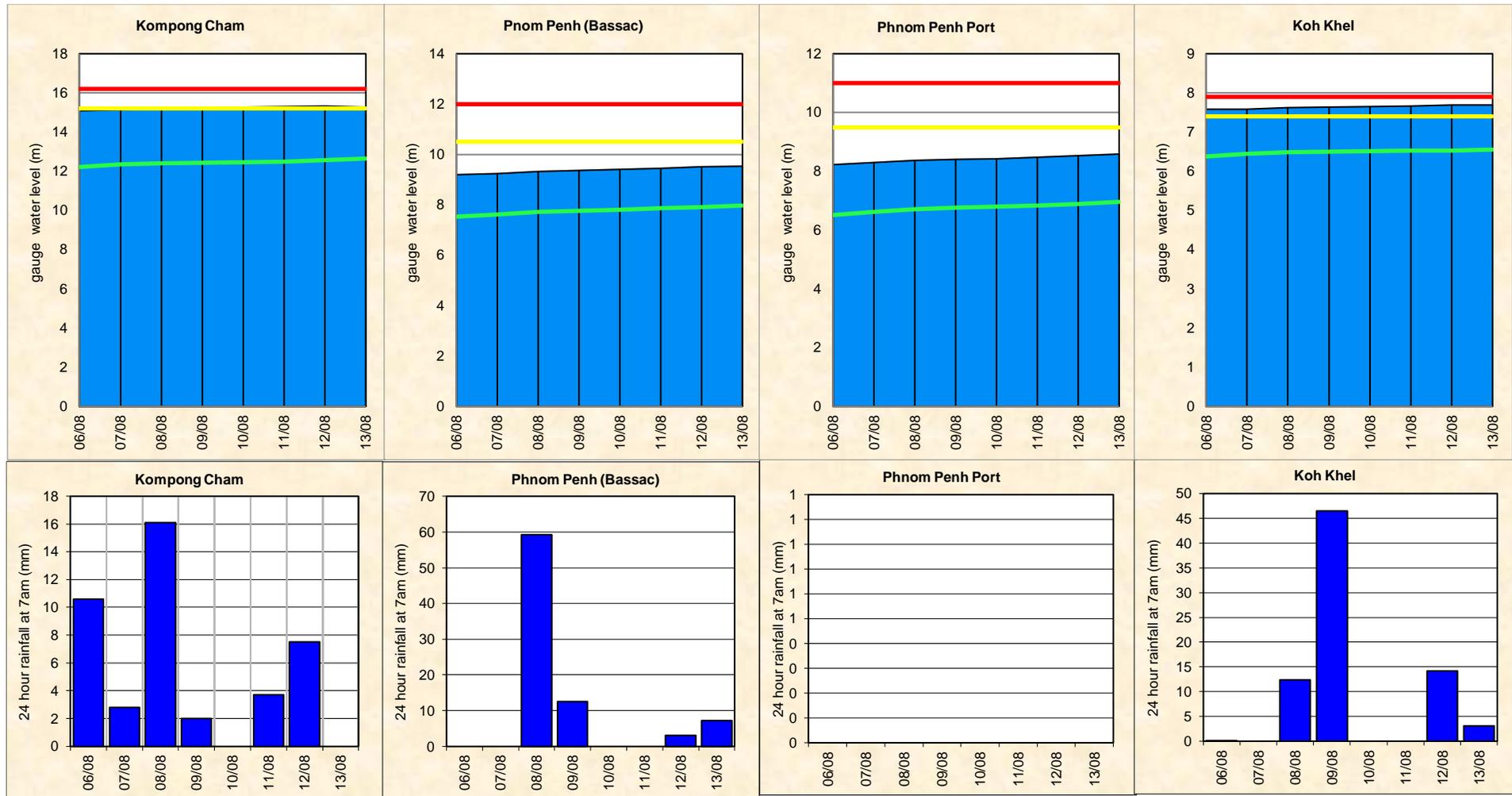
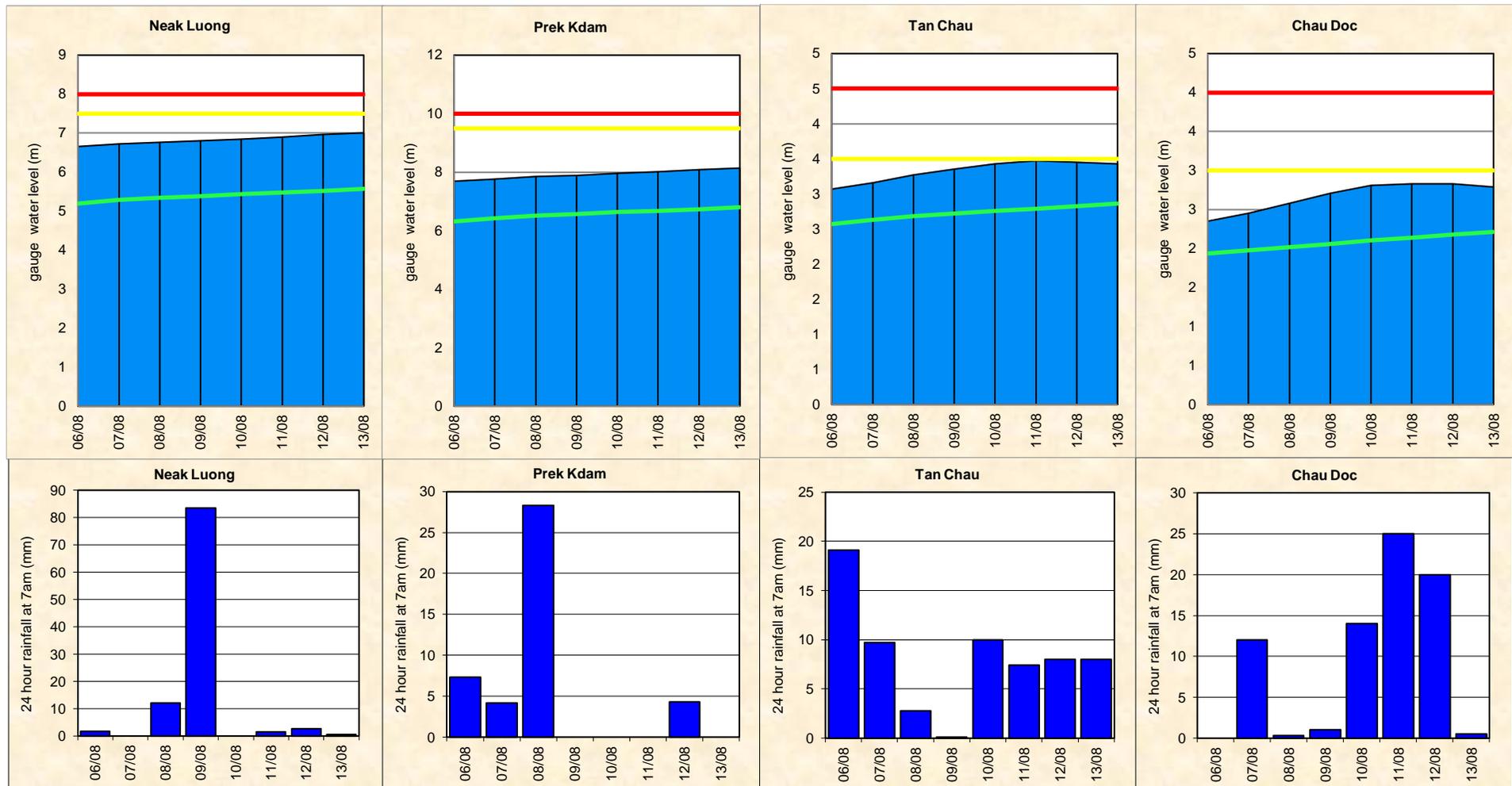


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

“Accuracy” describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model system and the hydrology of the Mekong River Basin. The information is presented as a graph below, showing the average flood forecasting accuracy along the Mekong mainstream.

In general, the overall accuracy is fair for 1-day to 5-day forecast lead time at stations in the upper and lower parts of the LMB. However,

the accuracies at upper and middle reaches of the LMB stations from Chiang Saen to Kratie stations for 4-day to 5-day forecast were considered large.

The above differences due to three main factors: (1) internal model functionality in forecasting; for which the parameter adjustment in the model is not possible especially at stations in the upper part and in the Mekong delta where are affected by tidal; (2) the adjustment by utilizing the practical knowledge and experience of flood forecaster-in-charge; and (3) the forecasted accumulated rainfall was not well represented.

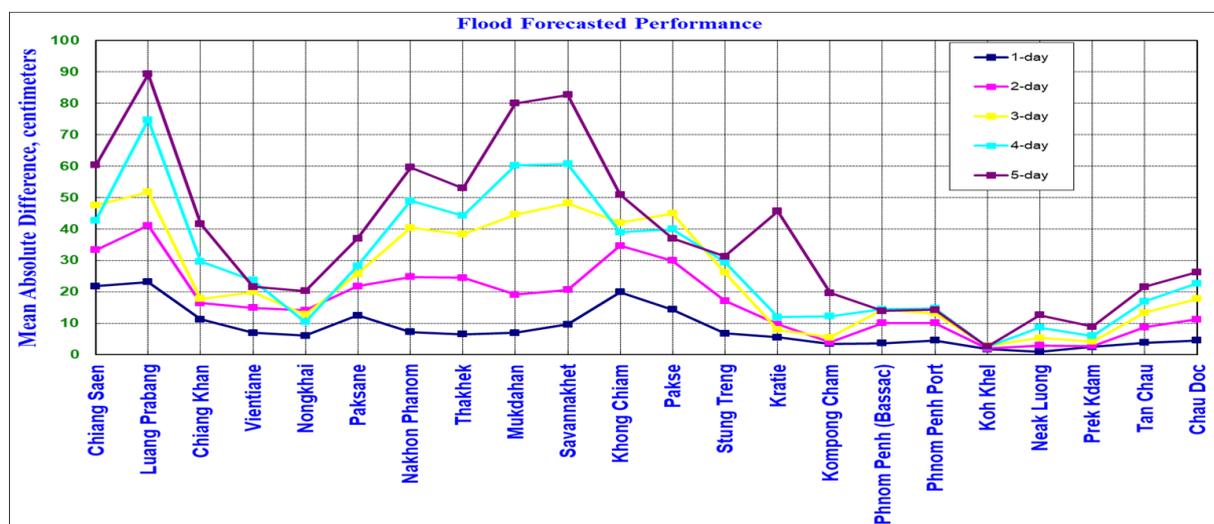


Figure B1: Average flood forecast accuracy along the Mekong mainstream

Forecast Achievement

The forecast achievement indicates the % of days that the forecast at a particular station for a lead-time is successful against a respective benchmark (Table B2).

Table B1: Evaluation performance forecasting (from 06th to 13th Aug 2018) base on New Benchmark (%).

Unit in %

Lead time Forecast	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	57.14	100.00	85.71	100.00	100.00	100.00	85.71	85.71	100.00	85.71	71.43	85.71	85.71	100.00	100.00	85.71	85.71	100.00	100.00	100.00	85.71	85.71	85.71	90.26
2-day	66.67	66.67	100.00	83.33	100.00	100.00	66.67	83.33	83.33	83.33	83.33	83.33	83.33	100.00	100.00	83.33	83.33	100.00	100.00	100.00	83.33	66.67	66.67	86.36
3-day	60.00	80.00	100.00	100.00	100.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	80.00	60.00	60.00	87.27
4-day	75.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	75.00	75.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	75.00	75.00	75.00	89.77
5-day	66.67	66.67	66.67	100.00	100.00	100.00	100.00	100.00	66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	66.67	66.67	66.67	89.39

Unit in cm

Lead time Forecast	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	22	31	22	23	23	23	20	20	20	20	24	22	18	28	20	9	9	6	7	9	6	6
2-day	39	55	41	42	43	42	38	39	39	38	46	41	33	52	38	18	18	12	14	17	11	11
3-day	51	76	57	59	59	58	54	54	55	54	65	58	46	73	54	26	26	18	20	24	16	16
4-day	60	93	70	72	74	72	68	68	70	68	82	73	57	92	69	34	34	22	26	31	20	21
5-day	66	107	81	84	86	85	81	81	83	80	98	87	67	109	82	41	41	27	31	38	24	24

Table B2: Evaluation performance forecasting (from 06th to 13th Aug 2018) base on Old Benchmark (%).

Lead time Forecast	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	28.57	57.14	100.00	42.86	57.14	57.14	100.00	85.71	71.43	71.43	71.43	42.86	57.14	85.71	100.00	100.00	85.71	100.00	100.00	100.00	100.00	100.00	85.71	77.27
2-day	16.67	33.33	83.33	100.00	83.33	83.33	100.00	83.33	100.00	100.00	83.33	66.67	50.00	83.33	83.33	83.33	66.67	100.00	100.00	100.00	100.00	100.00	100.00	81.82
3-day	0.00	40.00	80.00	40.00	40.00	80.00	60.00	60.00	40.00	60.00	80.00	60.00	20.00	40.00	80.00	80.00	100.00	100.00	80.00	80.00	100.00	100.00	100.00	64.55
4-day	50.00	50.00	50.00	50.00	75.00	100.00	100.00	75.00	100.00	100.00	100.00	100.00	75.00	100.00	100.00	100.00	100.00	100.00	100.00	75.00	100.00	100.00	100.00	86.36
5-day	33.33	33.33	33.33	66.67	66.67	100.00	66.67	66.67	100.00	66.67	66.67	100.00	66.67	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	78.79

Unit in %

Unit in cm

Lead time Forecast	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	25	25	25	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2-day	50	50	50	25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10	10	10	10	10
3-day	50	50	50	25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10	10	10	10	10
4-day	75	75	50	50	50	50	50	50	50	50	50	50	50	50	50	10	25	10	25	25	10	10	10
5-day	75	75	50	50	50	50	50	50	50	50	50	50	50	50	50	25	25	25	25	25	25	25	25

Note: An indication of the accuracy given in the Table B2 is based on the performance of the forecast made in 2008 from the new flood forecasting system and the configuration for the 2009 flood season and is published on the website of MRC (<http://ffw.mrcmekong.org/accuracy.htm>).

A new set of performance indicators that is established by combining international standards and the specific circumstances in the Mekong River Basin, is applied officially for the flood season of 2011 onward.

Performance

Performance is assessed by evaluating a number of performance indicators, see table and graphs below:

Table B3: Overview of performance indicators for the past 7 days including the current report date

	FF time sent				Arrival time of input data								Missing data (number-mainstream and trib.st.)								
	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	
2018																					
<i>week</i>	10:23	00:00	-	-	08:15	07:10	07:09	07:54	08:35	08:08	07:01	08:04	0	0	0	0	64	0	0	0	
<i>month</i>	10:16	00:00	-	-	08:14	07:10	07:24	07:55	08:24	08:08	07:01	08:12	0	0	1	0	276	0	2	0	

Week is the week for which this report is made; *Month* is actually the last 30 days (or less if the flood season has just begun); *Season* is the current flood season up to the date of this report.

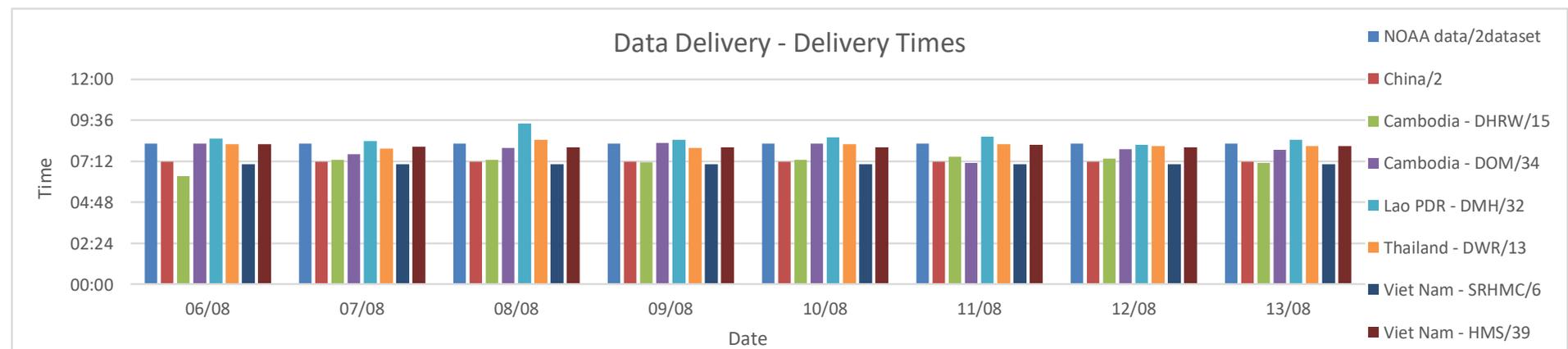


Figure B2: Data delivery times for the past 8 days including the current report date

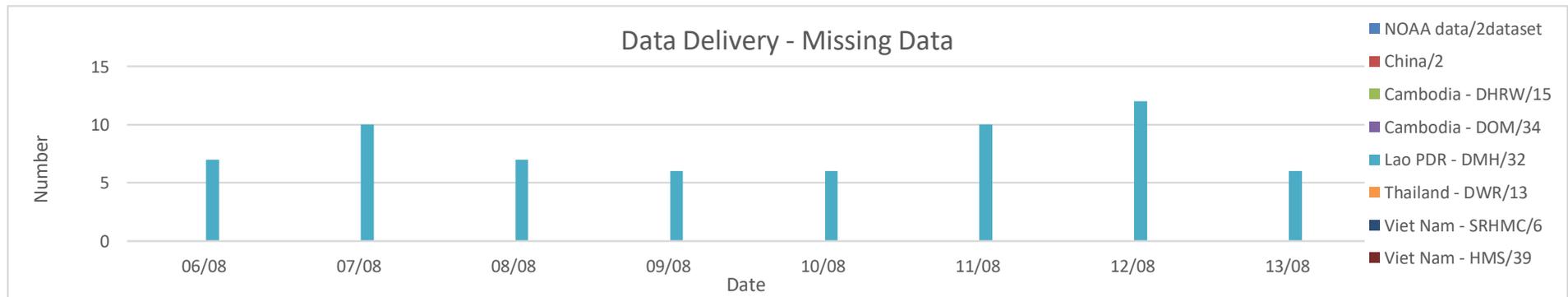


Figure B3: Missing data for the past 8 days including the current report date

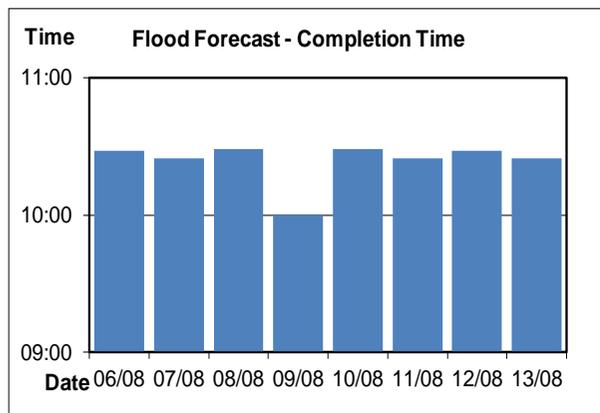


Figure B4: Flood forecast completion time

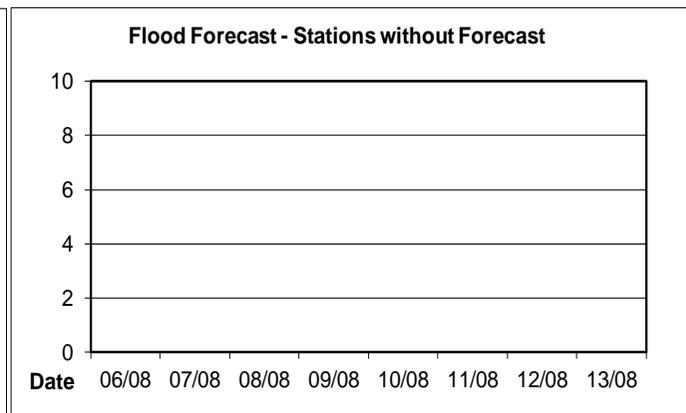


Figure B5: Flood forecast stations without forecast

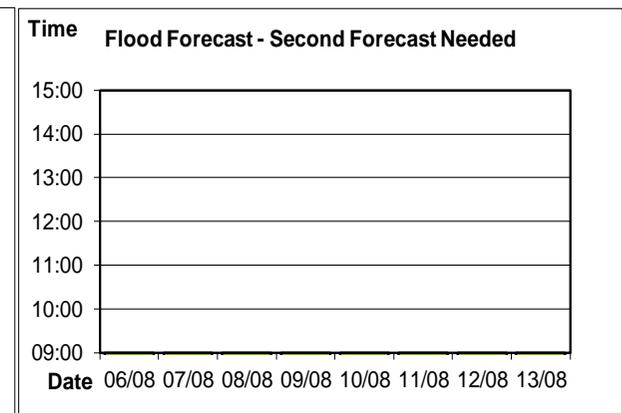


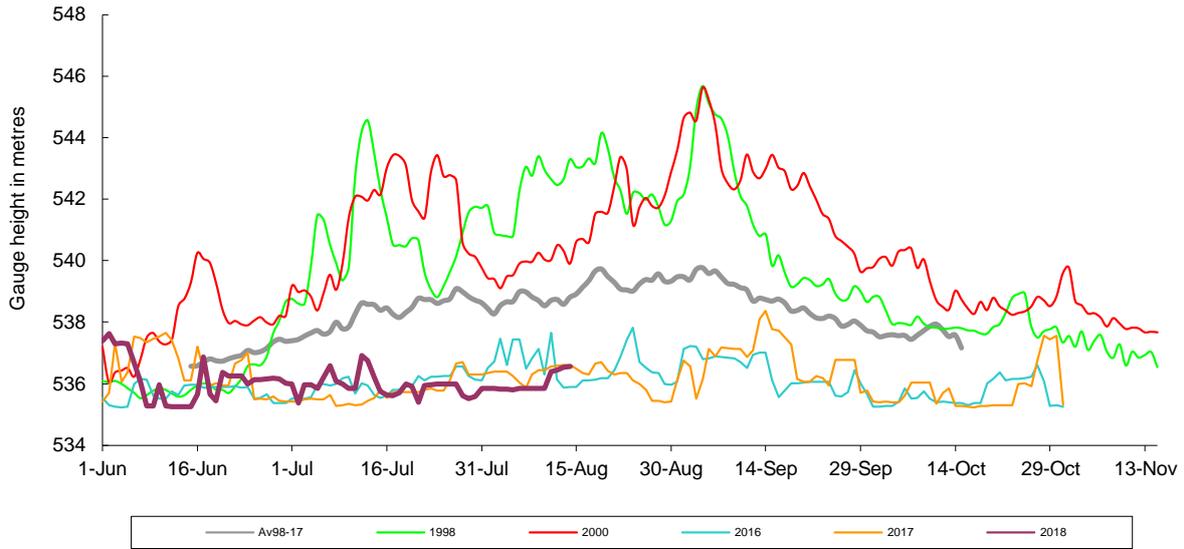
Figure B6: Second forecast needed

Annex C: Season Water Level Graphs

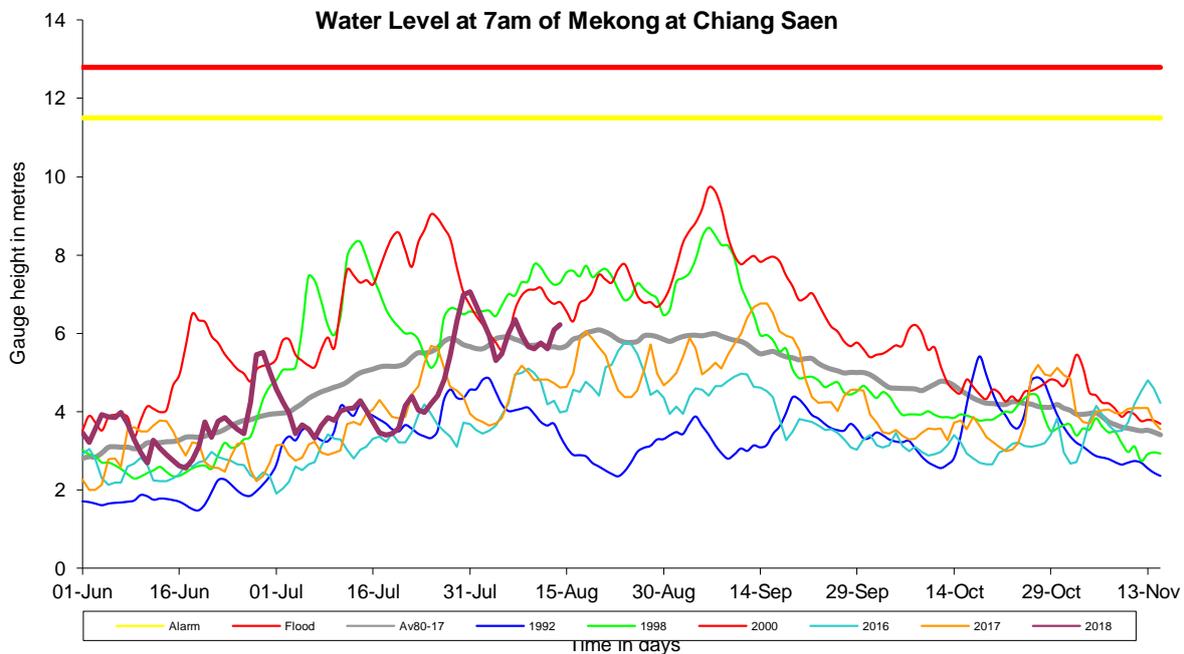
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

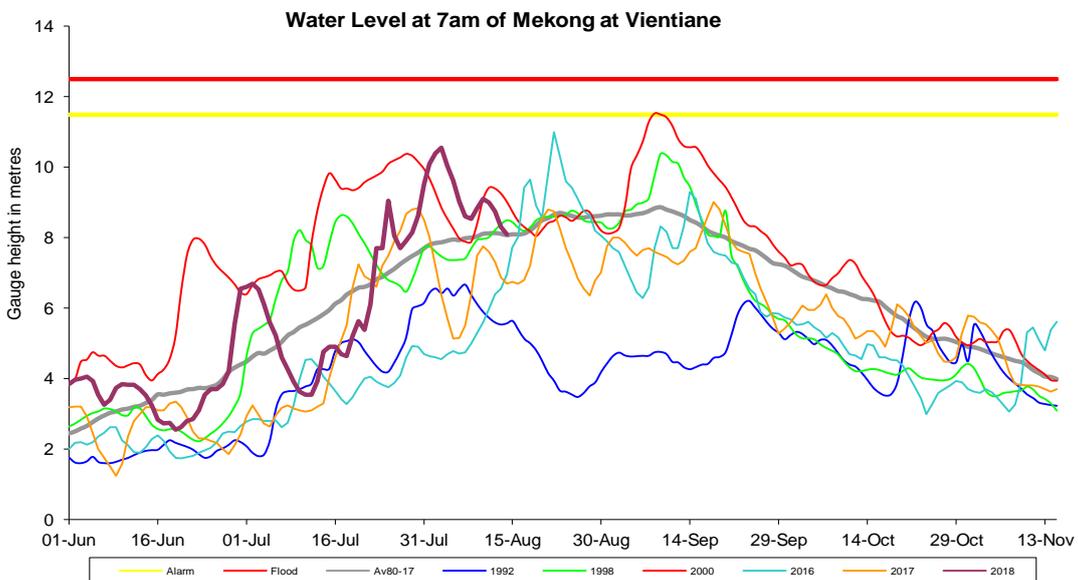
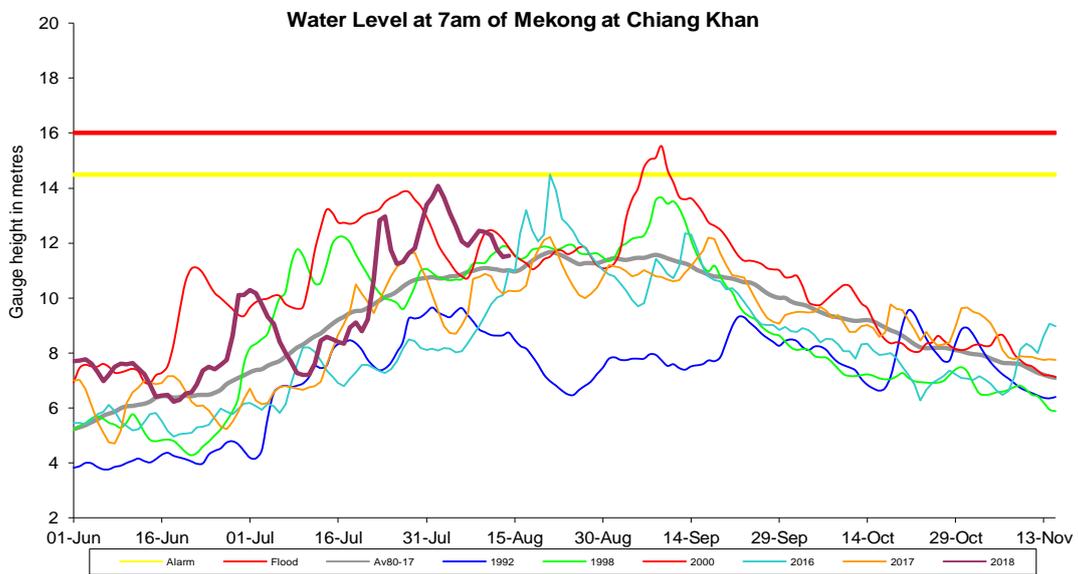
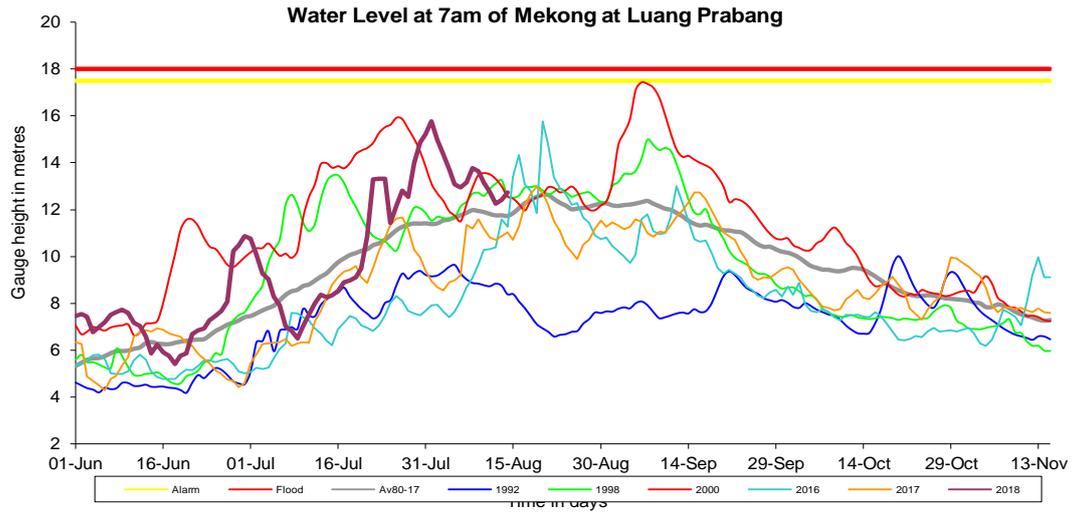
**HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER**

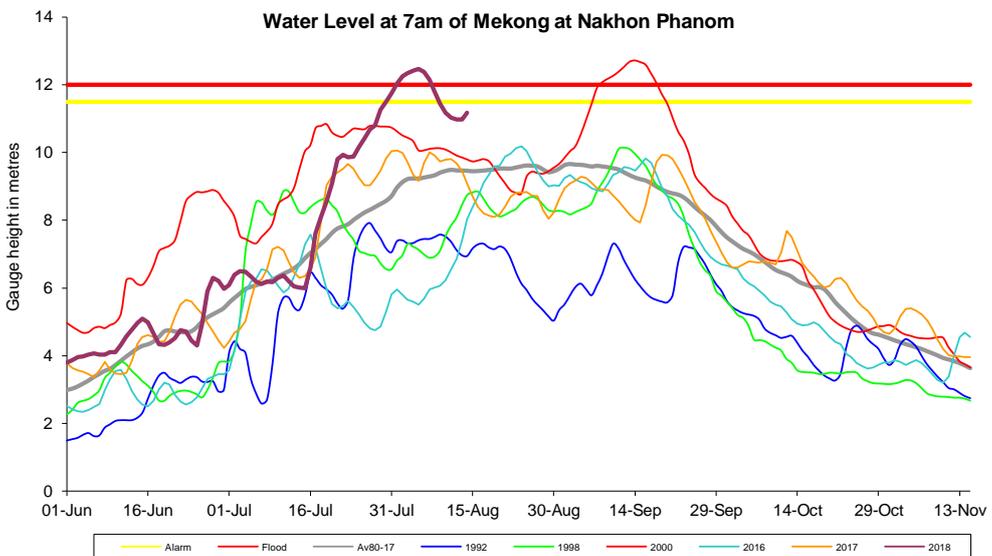
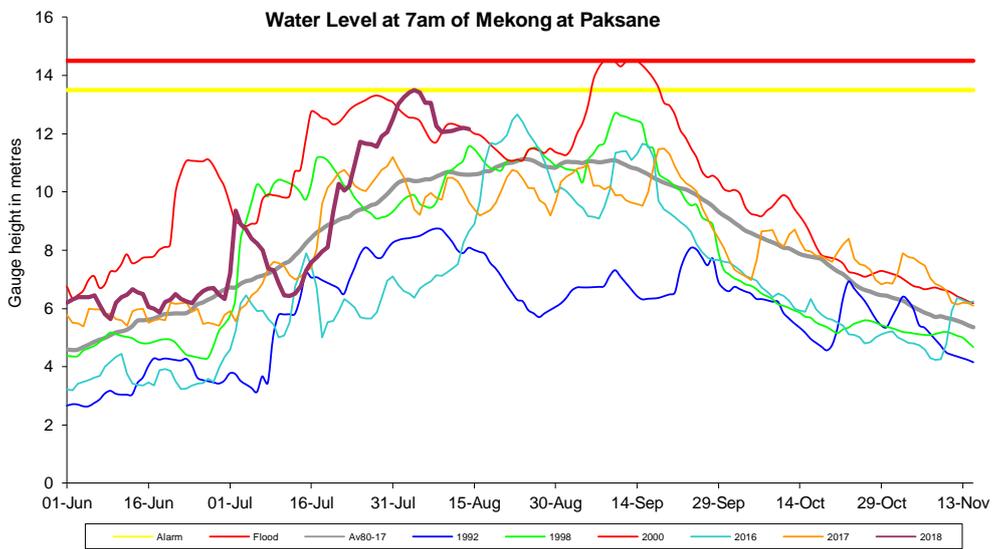
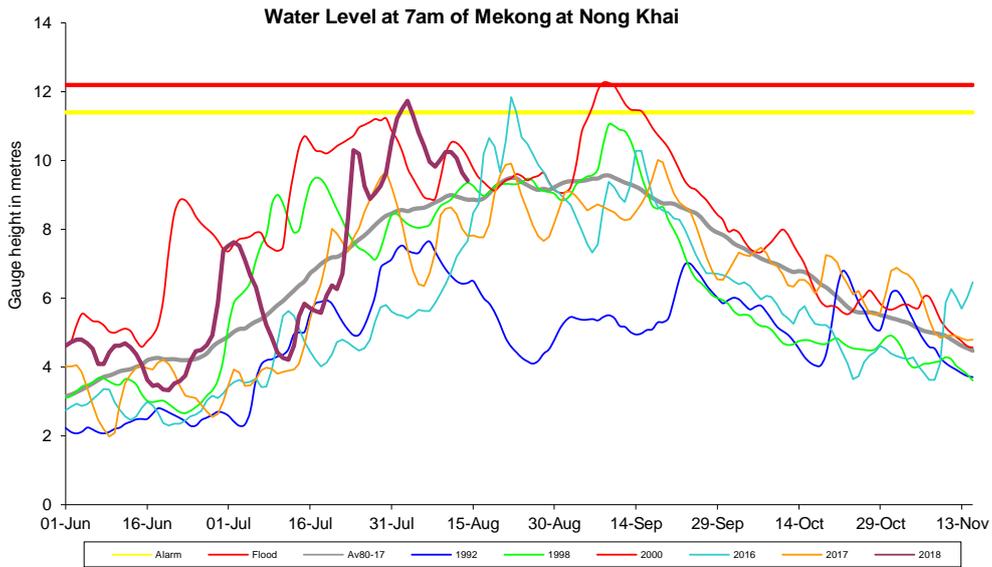
Water Level at 7am of Mekong at Jing Hong

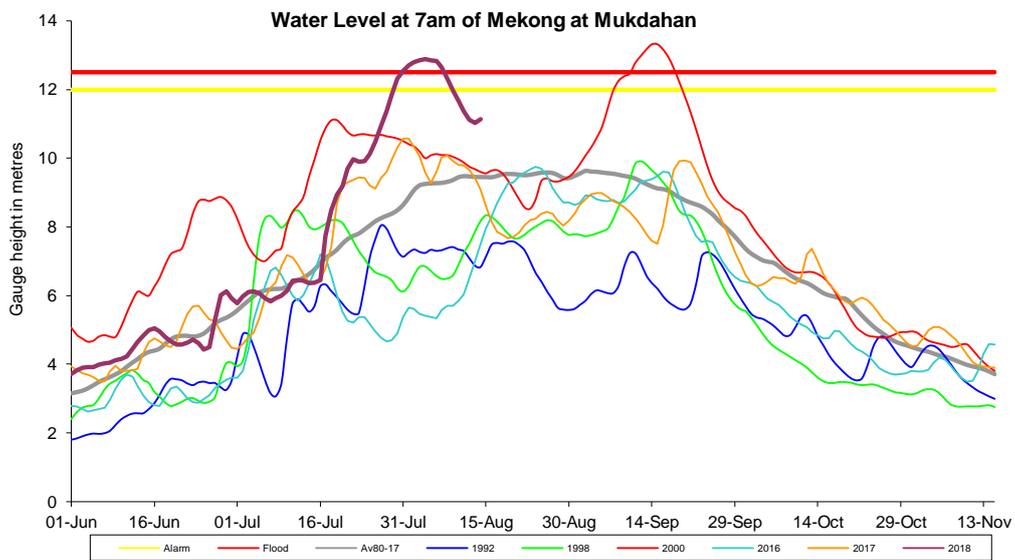
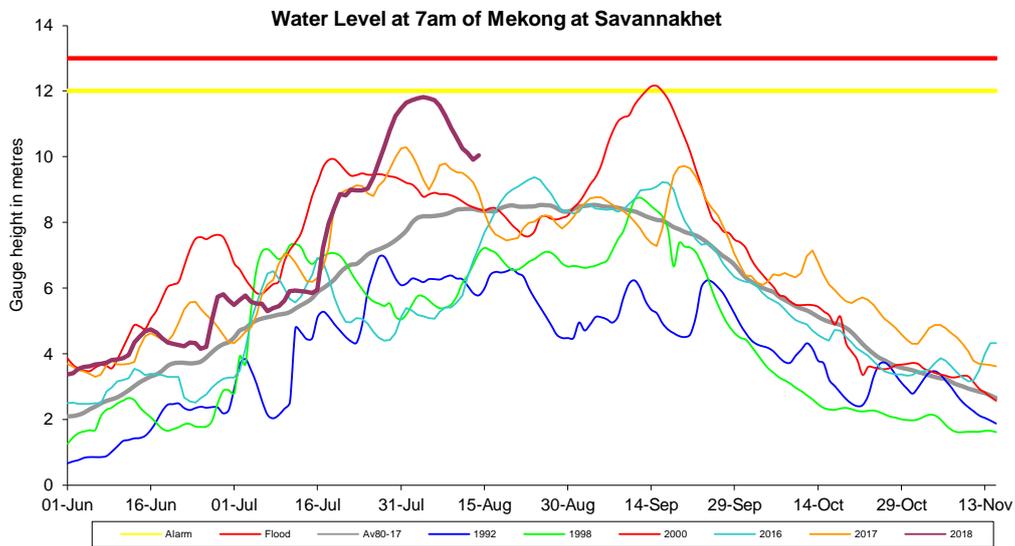
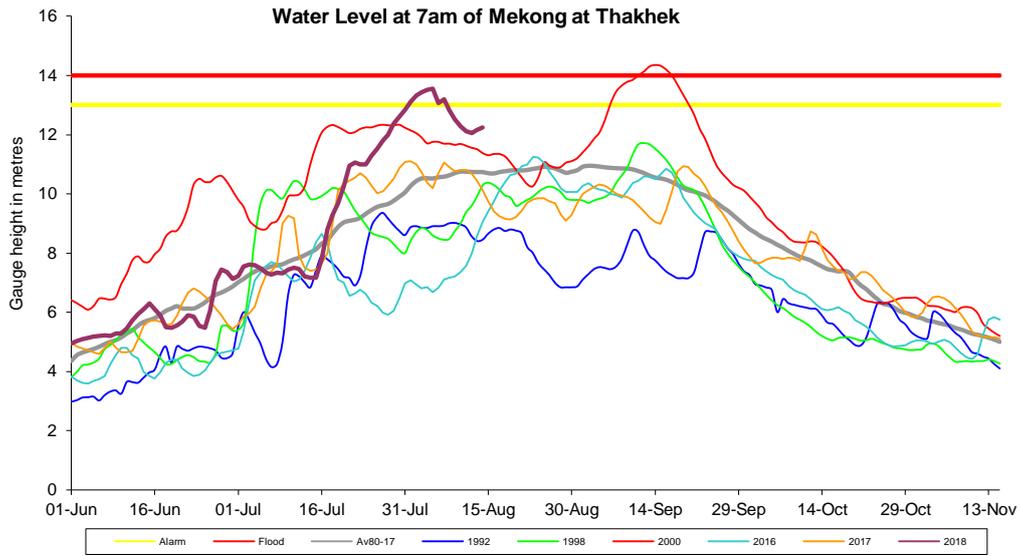


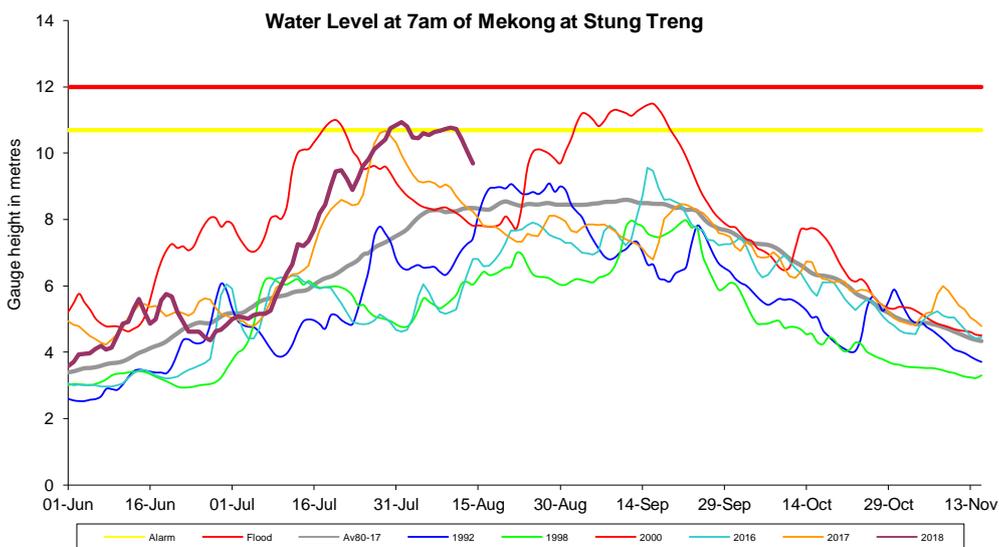
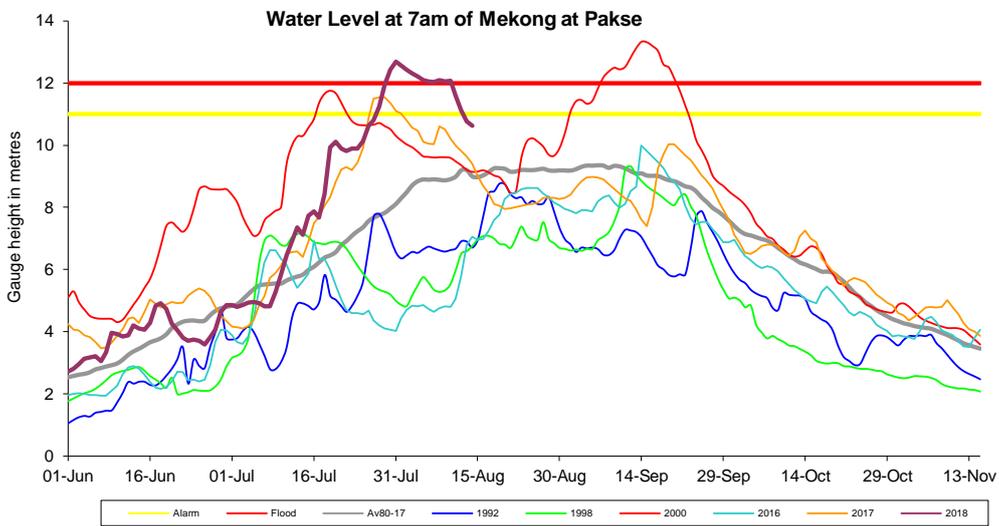
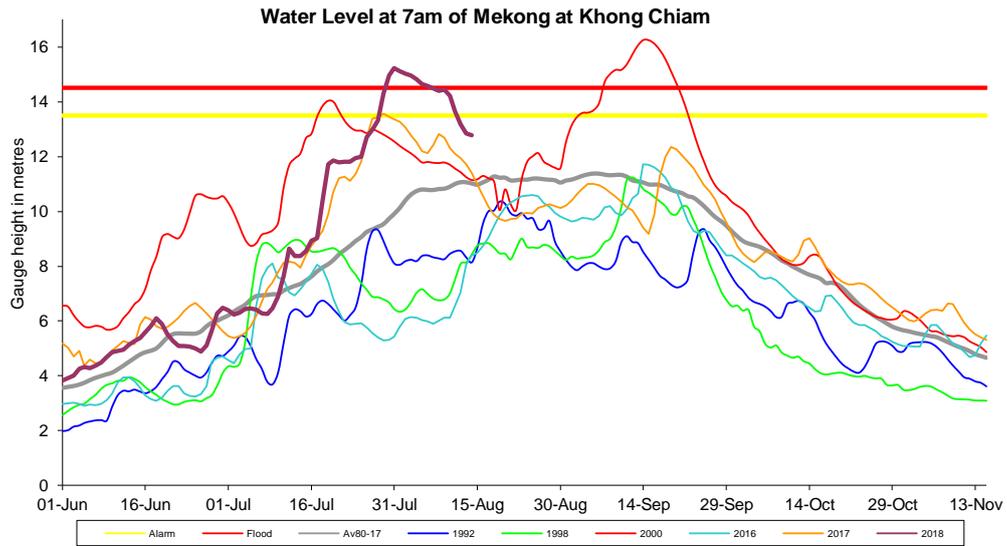
Water Level at 7am of Mekong at Chiang Saen



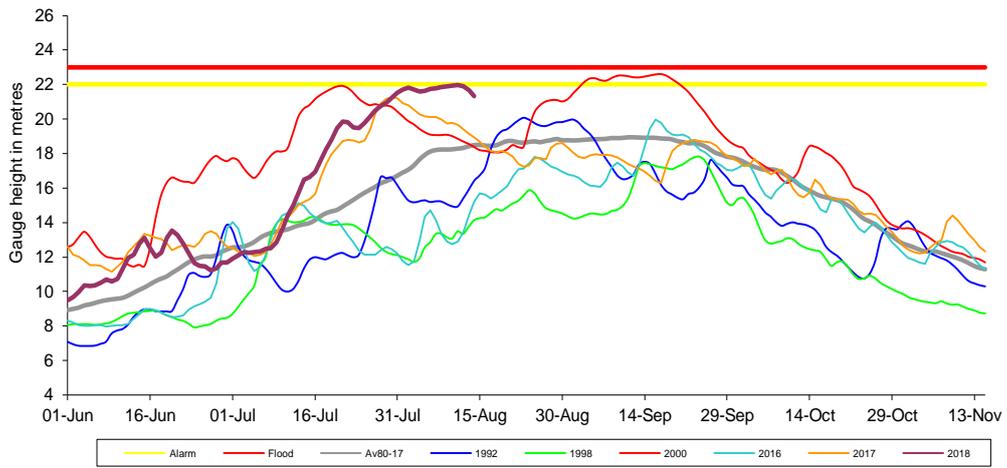




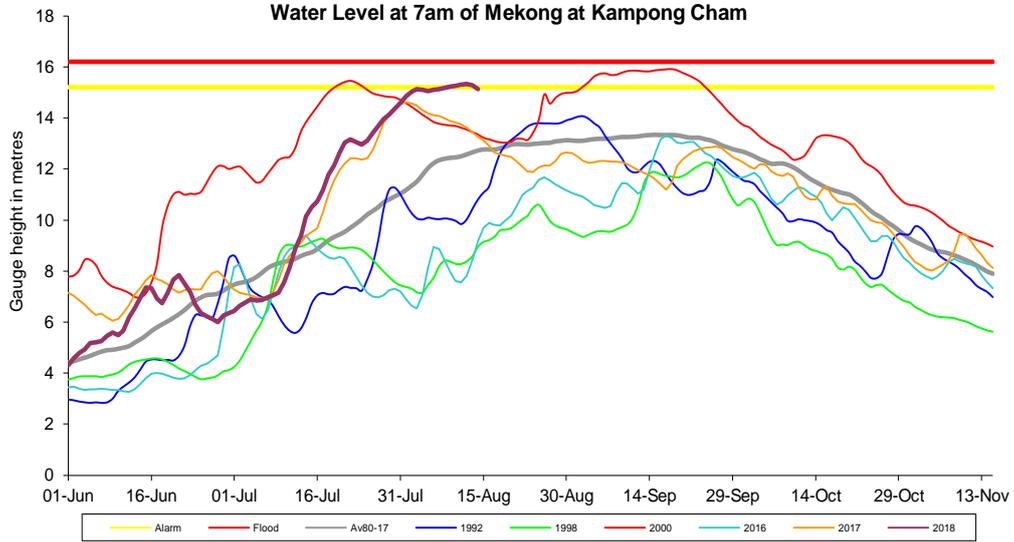




Water Level at 7am of Mekong at Kratie



Water Level at 7am of Mekong at Kampong Cham



Water Level at 7am of Mekong at Phnom Penh Chaktomuk

