Mekong River Commission
Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 03/07/2018, covering the week from the 25th June to 2nd July 2018

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

General weather patterns

During the week of 25th June to 2nd July 2018, the weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps of the 25th June – 01st July 2018 are presented in the Figures 1 & 2 below:

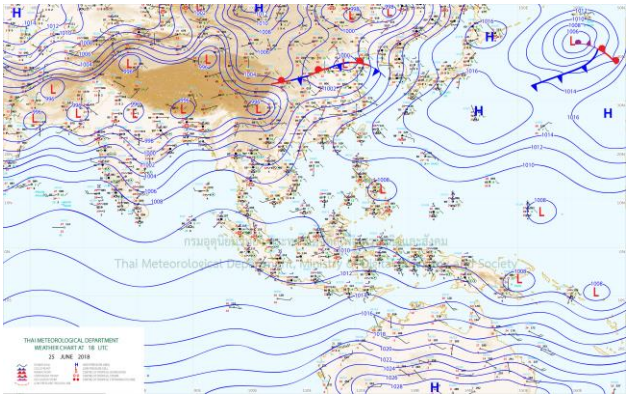


Figure 1: Weather map for 25th June 2018

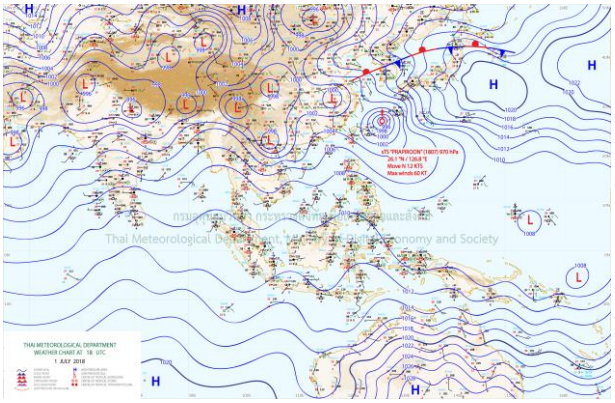


Figure 2: Weather map for 01st July 2018

Moderate South-West (SW) Monsoon

From June to July, usually, abundant rainfall occurs during this month due to the influential southwest monsoon prevailing over Lower Mekong Basin together with low-pressure air mass cells. The weather maps from Thai Meteorological Department on 25th June and 1st July, 2018 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. No low pressure was hit the Mekong region, during that time.

Over weather situation

During the last week, the weather was scattered thundershowers with isolated heavy rain of the Southwest monsoon. Consequently, on 26th there was heavy rainfall over Chiang Sean and Luang Prabang catchment areas which caused of water raised up to 5.52 m on 29th June at Chiang Sean and at Luang Prabang water level raised up to 10. 87 m on 30th June 2018. The weekly rainfall distribution from 25th June to 2nd July 2018 is shown in **Figure 3**.

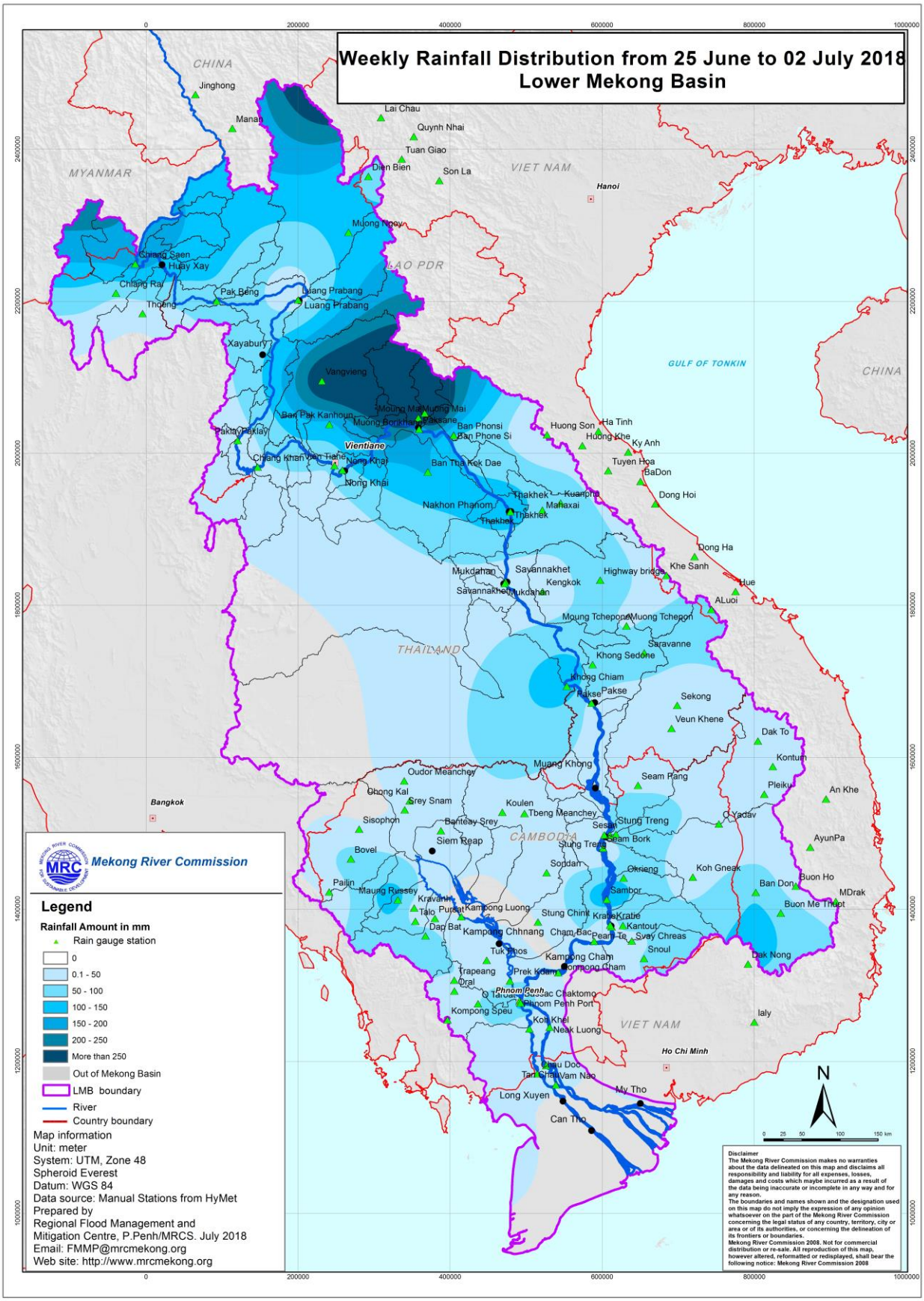


Figure 3: Weekly Rainfall Distribution over the LMB from 25thJune - 02nd July 2018

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

Compared to the long-term average (LTA), water levels from 26h June to 02nd July 2018 at Chiang Sean station were rapidly raised up to 5.52 m on 29th June which over the LTA, while at Luang Prabang station also water level were jumped up to 10.87 on 30th June, 2018.

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

Compared to the long-term average (LTA), water levels at these stations were increasing above their LTAs due to the upstream effected rainfall.

For stations from Nakon Phanom/ Thakhet to Pakse

Compared to their long-term averages (LTAs), water levels at Thakhet to Pakse stations were slightly increased due to upstream influent.

For stations from Stung Treng to Kompong Cham

Compared to their long-term averages (LTAs), water levels at these stations were slightly decreasing below their LTAs.

For stations from Phnom Penh to Koh Khel/Neak Luong

Compared to the long-term average (LTA), water levels at these stations were slightly decreasing below their LTAs.

Tan Chau and Chau Doc

Compared to the long-term average (LTA), water levels at these two tidal stations were fluctuated around their LTAs.

Note: For areas between forecast stations, please refer to the nearest forecast station.

Flood Situation

- Flood stage or alarm stage:

No alarm stage (where the forecast is expected to reach flood level within three days) was reported anywhere on the mainstream of the Mekong River during the last week. Water levels were still significantly below flood levels (as defined by the national agency) at all forecast stations.

- Damage or victims:

No damage or loss of life due to river flooding was recorded anywhere along the Mekong River during the last week.

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 Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
25/06/2018	536.14	3.55	7.45	7.42	3.70	4.46	6.42	4.30	5.47	4.15	4.43	5.00	3.70	4.62	11.48	6.35	3.66	2.48	3.42	2.48	2.74	1.17	1.25
26/06/2018	536.14	3.44	7.68	7.56	3.70	4.49	6.59	4.91	6.05	4.22	4.50	4.88	3.58	4.45	11.44	6.22	3.54	2.58	3.32	2.35	2.64	1.21	1.29
27/06/2018	536.15	4.24	8.07	7.74	3.85	4.63	6.68	5.91	7.06	5.03	5.31	5.11	3.82	4.36	11.22	6.12	3.48	2.45	3.29	2.32	2.62	1.11	1.20
28/06/2018	536.18	5.45	10.22	8.63	4.20	4.91	6.70	6.30	7.45	5.74	6.01	5.62	4.06	4.63	11.33	6.01	3.41	2.40	3.26	2.28	2.58	0.90	1.04
29/06/2018	536.16	5.52	10.48	10.10	5.54	5.85	6.47	6.20	7.36	5.82	6.13	6.28	4.64	4.68	11.67	6.25	3.51	2.48	3.29	2.30	2.64	0.72	0.73
30/06/2018	536.01	5.02	10.87	10.12	6.56	7.39	6.33	5.97	7.13	5.64	5.93	6.49	4.85	4.83	11.68	6.36	3.59	2.63	3.38	2.46	2.73	0.54	0.33
01/07/2018	535.99	4.58	10.75	10.28	6.60	7.52	7.20	6.09	7.23	5.48	5.77	6.39	4.86	4.99	11.90	6.44	3.62	2.66	3.40	2.48	2.75	0.34	0.15
02/07/2018	535.38	4.25	10.08	10.18	6.70	7.62	9.35	6.39	7.54	5.64	5.98	6.24	4.80	5.08	12.08	6.65	3.68	2.72	3.45	2.52	2.82	0.32	0.13

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 Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
25/06/2018	5	26.2	6.8	1.2	1.5	1.5	71	0	2	0	2.4	9	2.4	15	nr	nr	nr		nr	nr	8.2	18.6	0.9
26/06/2018	21	24.7	9.8	3.5	36.5	35.4	51.8	67.9	nr	7.3	24	38.9	17	nr	nr	nr	81.5		14.9	2.2	nr	4.3	0
27/06/2018	8.5	22.6	3.6	18.3	16.8	26.3	16.3	39.9	42.3	1	nr	24.9	nr	3	12	6.2	35.2		6.4	0	23.4	0.3	8.1
28/06/2018	0	24.3	13.6	12.3	2.5	7.5	5.7	1.3	2	0	nr	1	nr	24	3.2	1.6	1.5		nr	nr	nr	2.7	1.1
29/06/2018	1	25	nr	8	nr	0	nr	0	nr	17.2	nr	12	4.5	nr	nr	nr	44.7		nr	nr	7.4	0.7	1
30/06/2018	0	26	nr	0	nr	0		19.4	10.2	0	0.8	0	9.2	1	3.6	nr	1		nr	nr	nr	nr	-
01/07/2018	3.5	20	nr	0	1.5	8.7	3.8	0.4	nr	0	nr	37.3	6	nr	nr	nr	nr		nr	nr	4.2	nr	nr
02/07/2018	3	0	nr	0	nr	0	5.8	0	nr	0	nr	0	0.2	3.5	nr	nr	nr		nr	nr	nr	nr	nr

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

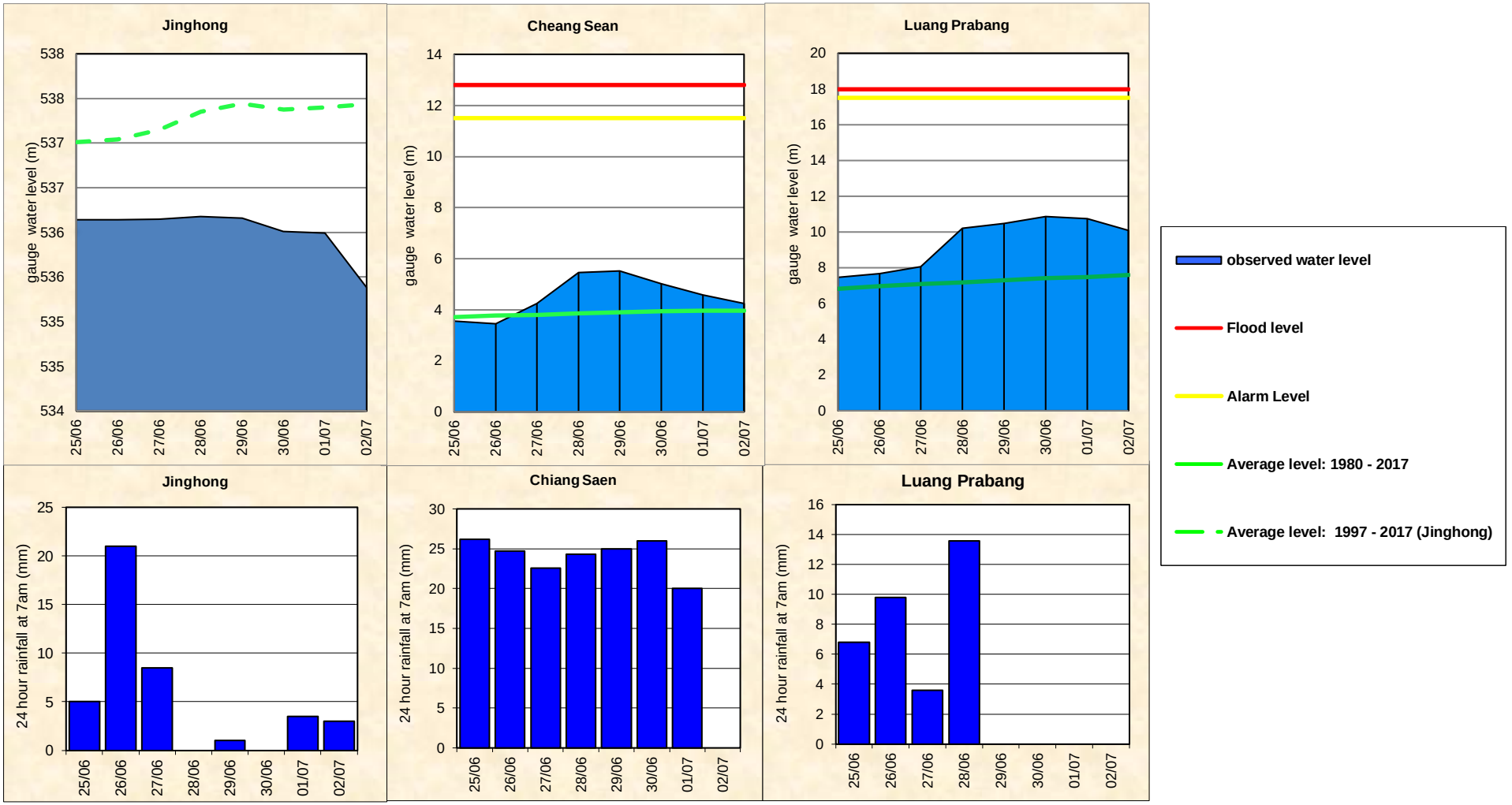


Figure A2: Observed water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

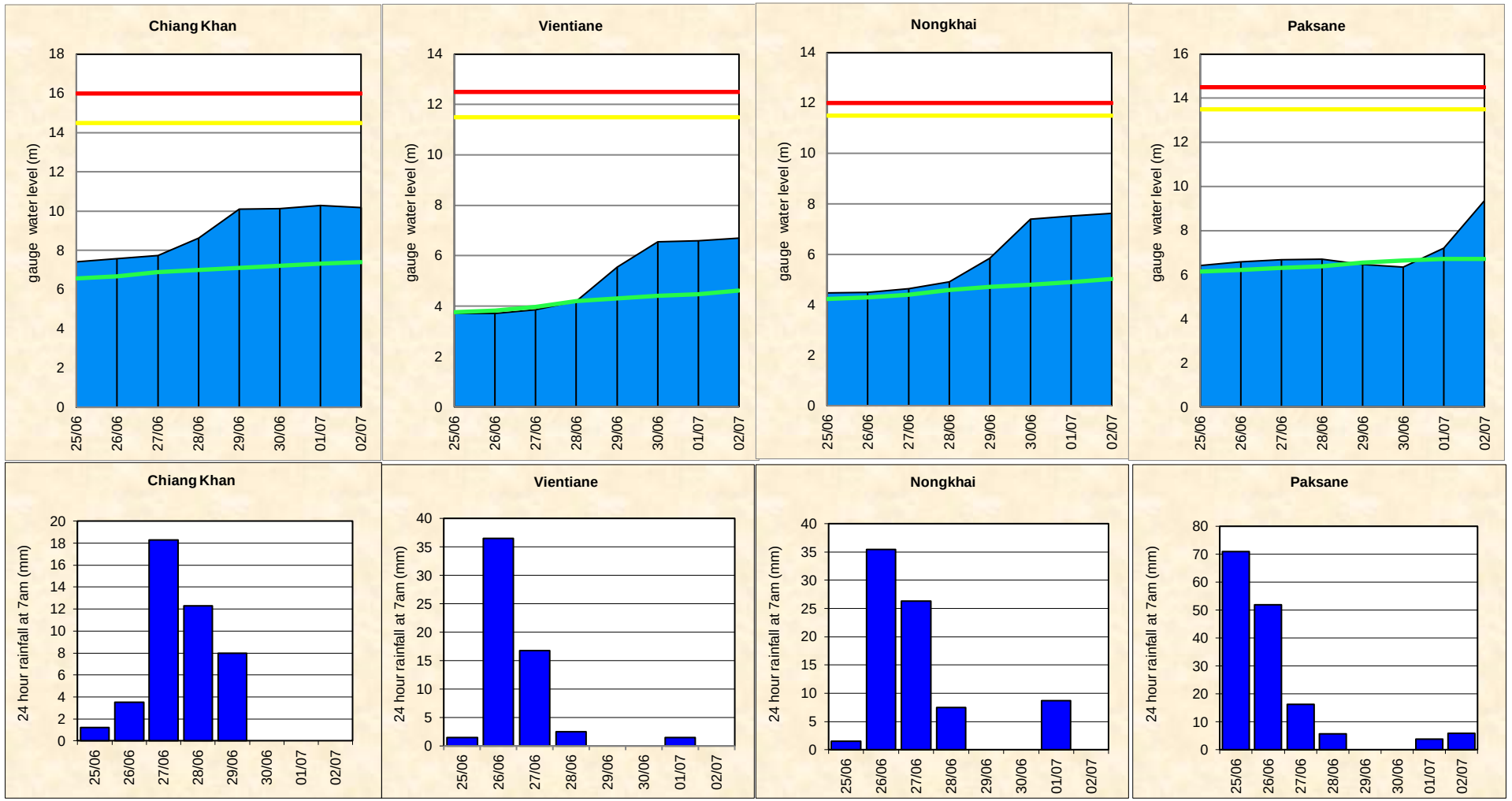


Figure A3: Observed water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

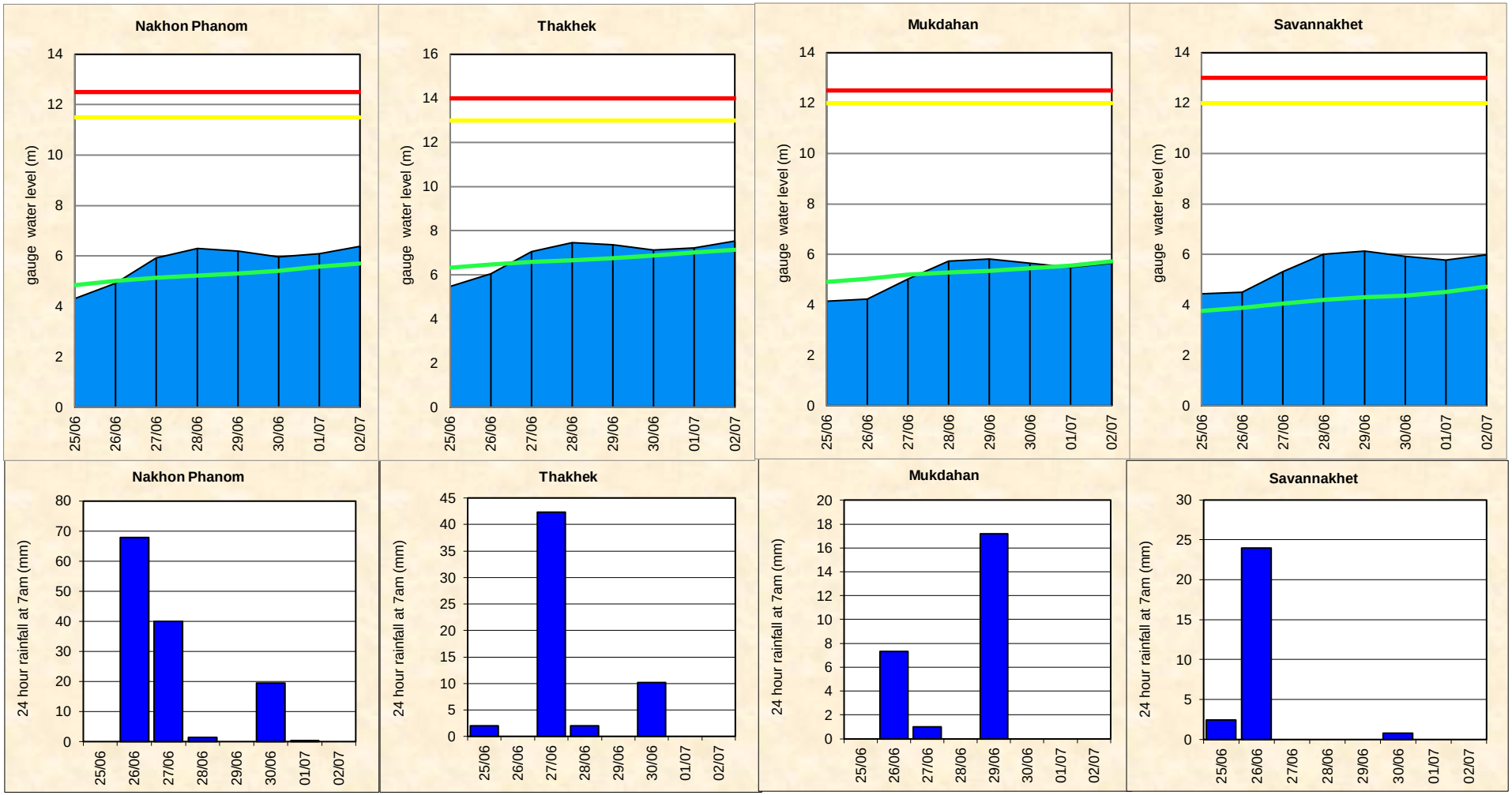


Figure A4: Observed water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

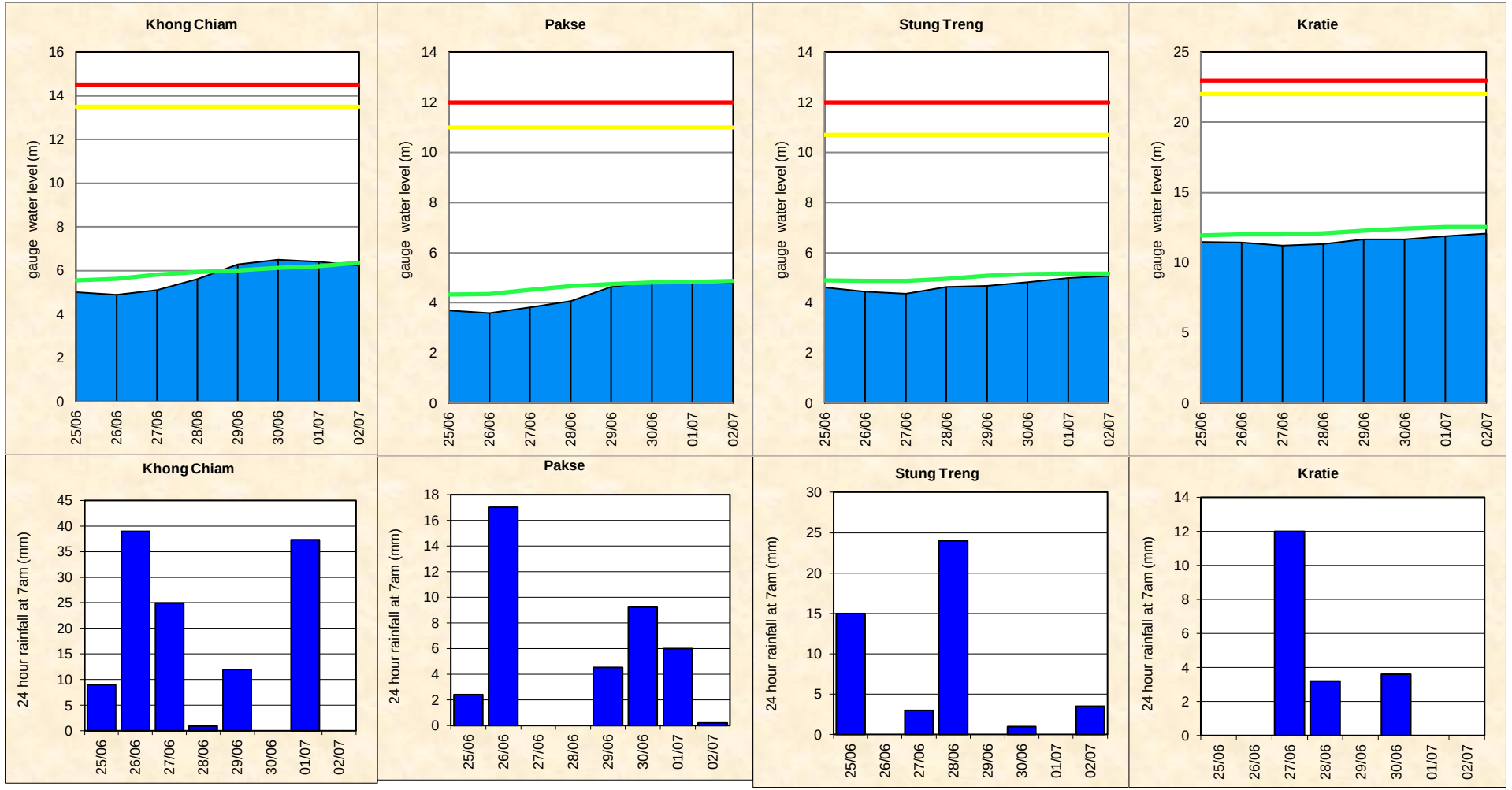


Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

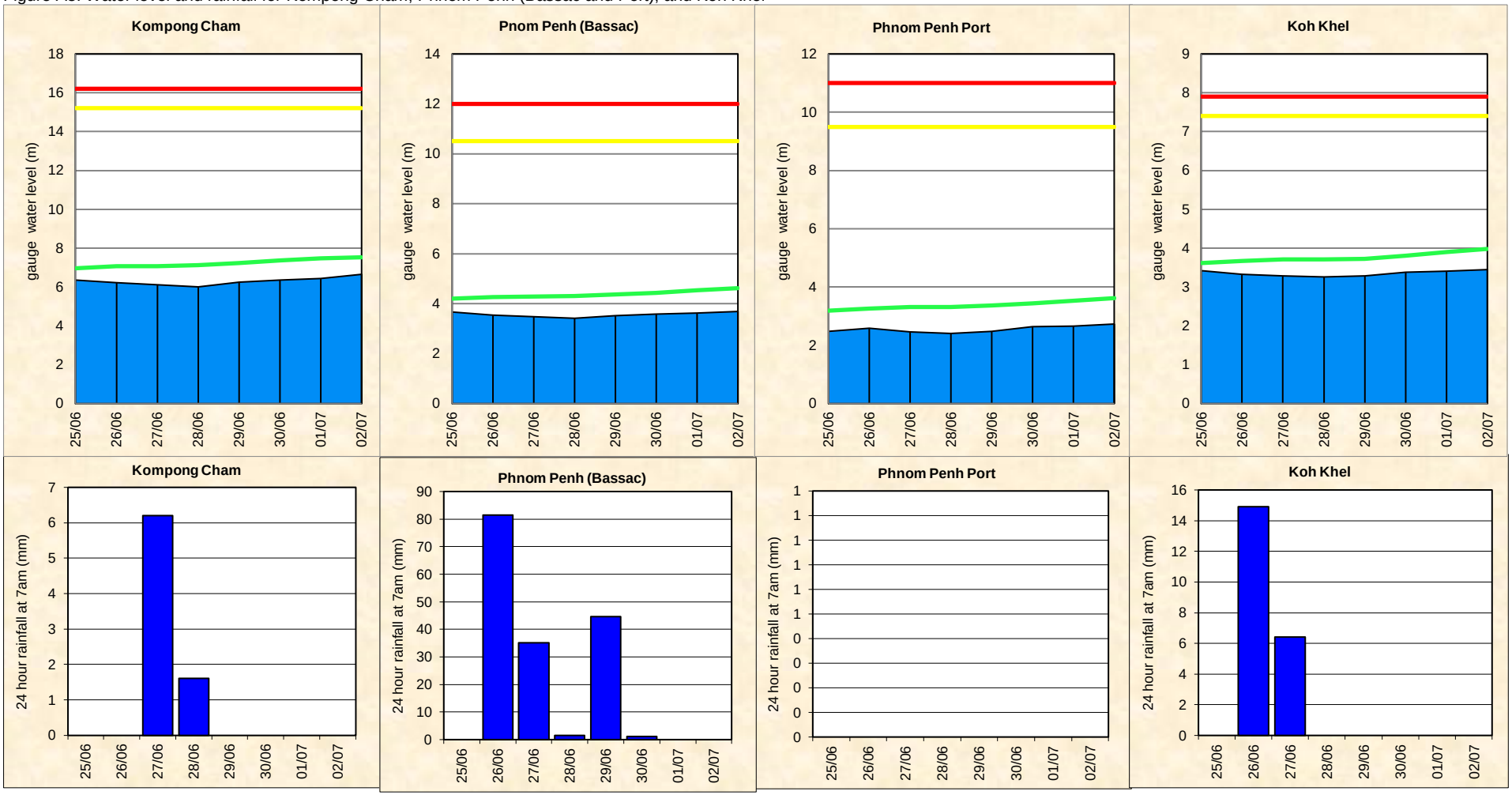
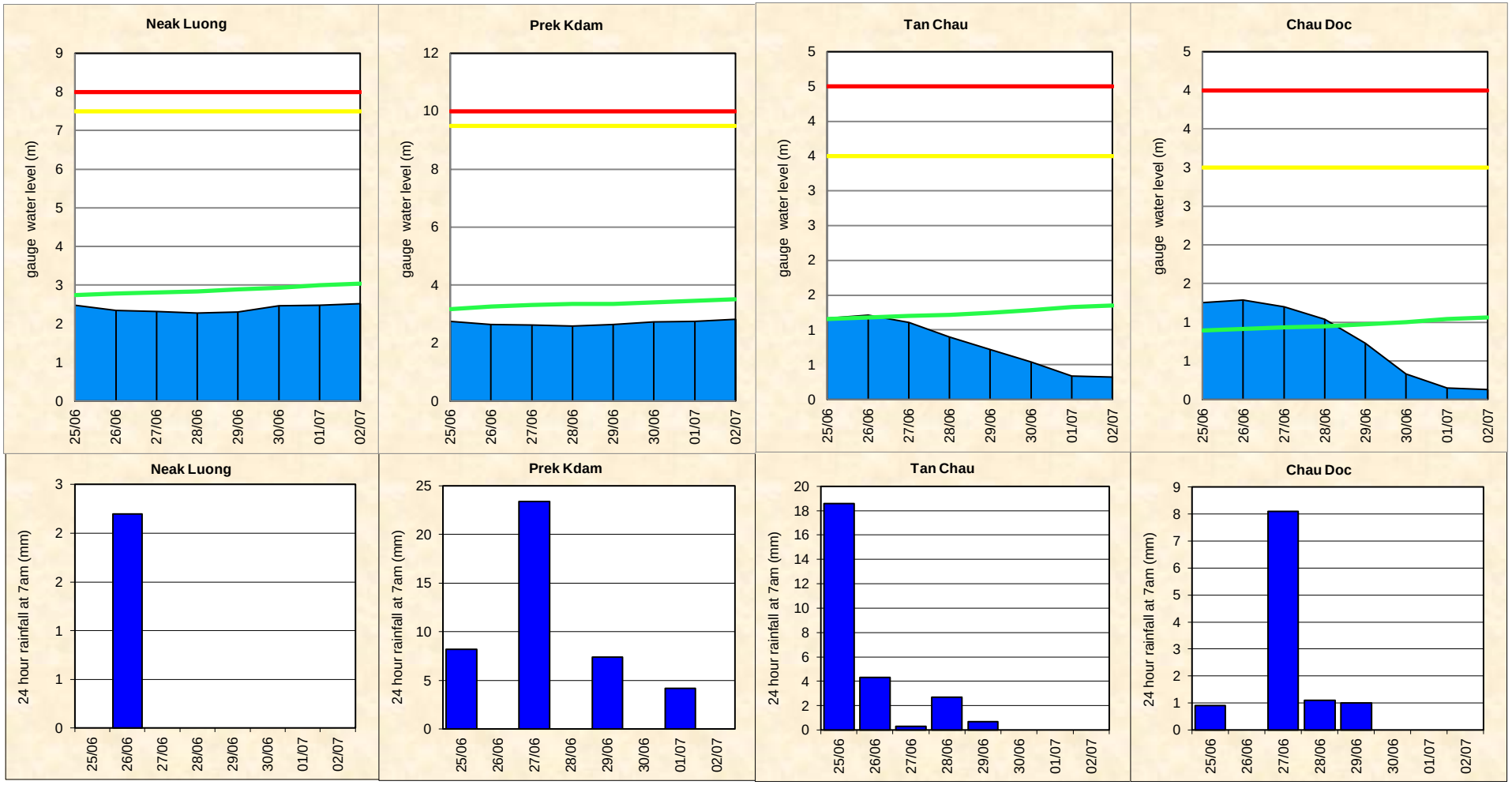


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



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 Chaing Sean to Paksane 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.

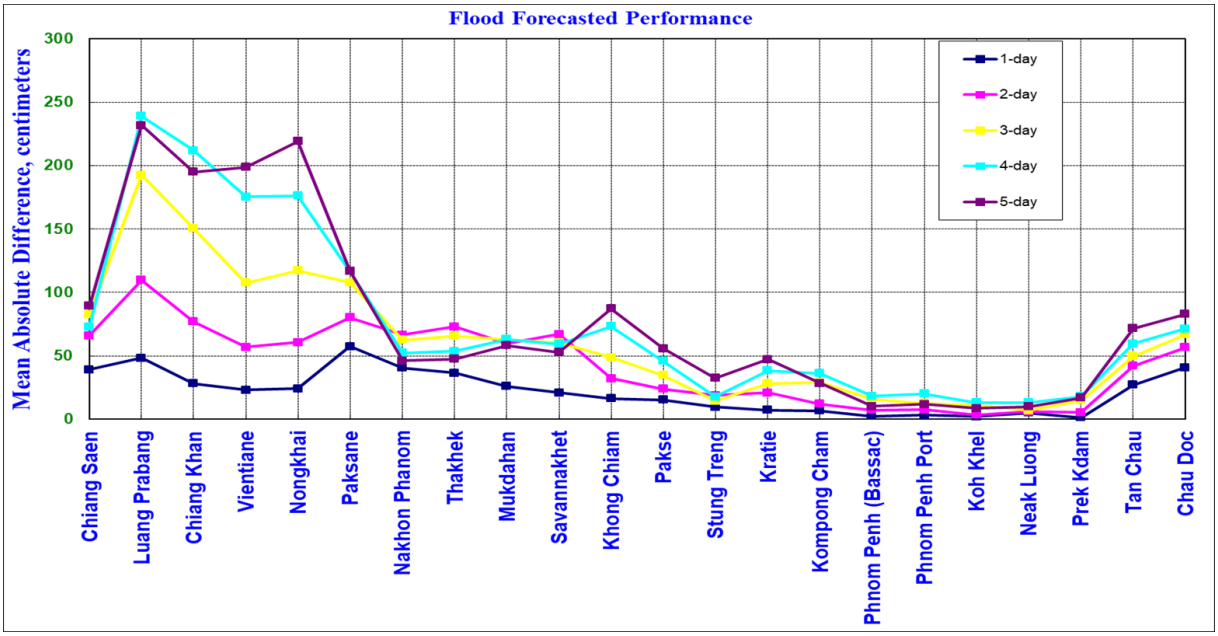


Figure B1: Average flood forecast accuracy along the Mekong mainstream

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 25 June-2 July 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	57	71	86	71	43	43	43	57	57	86	86	71	100	100	100	86	100	86	100	14	14	***69***
2-day	50	33	50	50	50	33	17	33	50	33	67	67	83	100	100	100	100	100	83	100	17	0	***60***
3-day	60	20	20	40	20	20	20	40	40	40	60	100	100	100	80	100	100	80	100	80	0	20	***56***
4-day	50	0	0	0	25	25	75	75	75	50	50	100	100	100	75	100	100	100	100	100	0	0	***59***
5-day	33	0	0	0	0	33	67	67	67	67	100	100	100	100	100	100	100	100	100	100	0	0	***61***

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 25 June- 2 July 2018) base on Old 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	29	71	29	43	29	29	43	14	29	29	14	43	57	86	100	100	100	86	100	14	14	51
2-day	50	33	50	33	50	17	17	17	17	33	50	67	67	67	83	83	67	100	83	83	17	0	49
3-day	60	20	0	20	20	20	20	20	40	40	60	40	100	60	60	0	40	60	80	40	0	20	37
4-day	50	0	0	0	0	25	75	75	25	50	25	75	100	100	75	25	75	50	100	50	0	0	44
5-day	33	0	0	0	0	33	33	33	67	67	0	67	100	67	100	100	100	100	100	67	0	0	48

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
2-day	50	50	50	25	25	25	25	25	25	25	25	25	25	25	25	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
4-day	75	75	50	50	50	50	50	50	50	50	50	50	50	50	50	10	25	10	25	25	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

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 8 days including the current report date

	FF time sent				Arrival time of input data								Missing data (number-mainstream and trib.st.)							
2018	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/34	Thailand - DWR/13	Viet Nam - SRHMC/6	Viet Nam - HMS/39
week	*10:18*	*00:00*	-	-	*08:15*	*07:10*	*07:11*	*07:58*	*08:36*	*08:09*	*07:01*	*08:15*	*0*	*0*	*0*	*0*	*77*	*0*	*0*	*0*
month	*10:16*	*00:00*	-	-	*08:14*	*07:10*	*07:24*	*07:55*	*08:24*	*08:08*	*07:01*	*08:12*	*0*	*0*	*1*	*0*	*387*	*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.

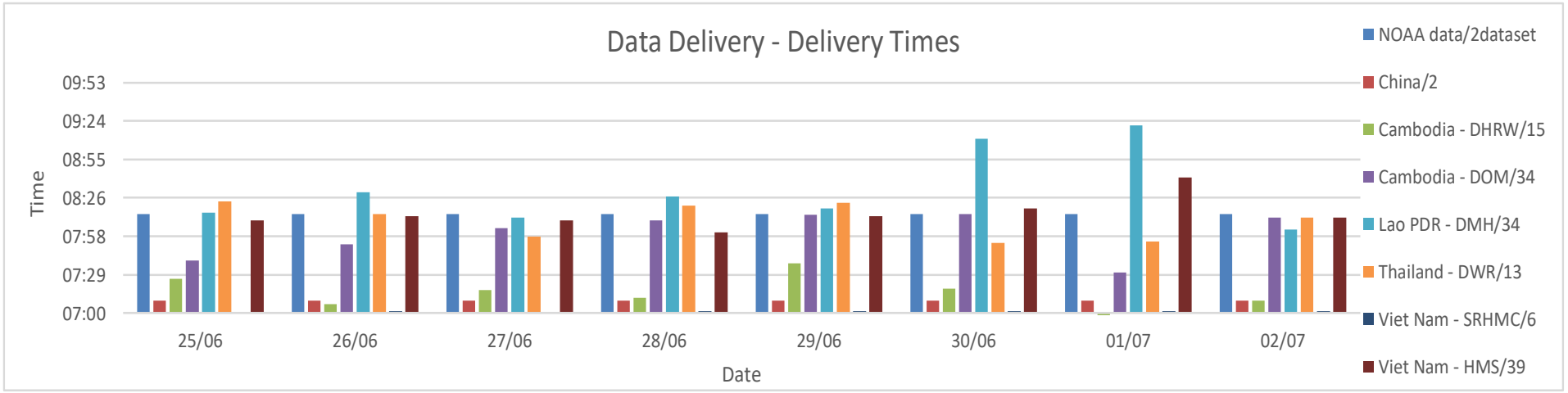


Figure B2: Data delivery times for the past 8 days including the current report date

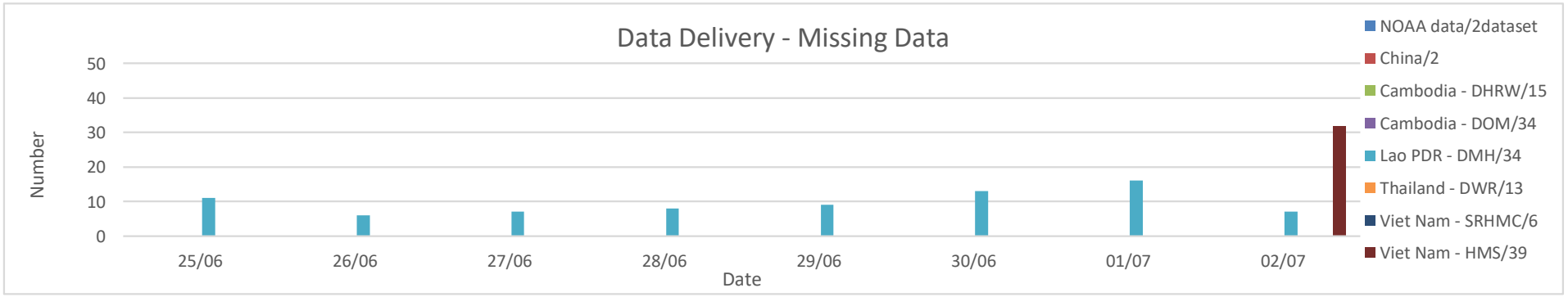


Figure B3: Missing data for the past 8 days including the current report date

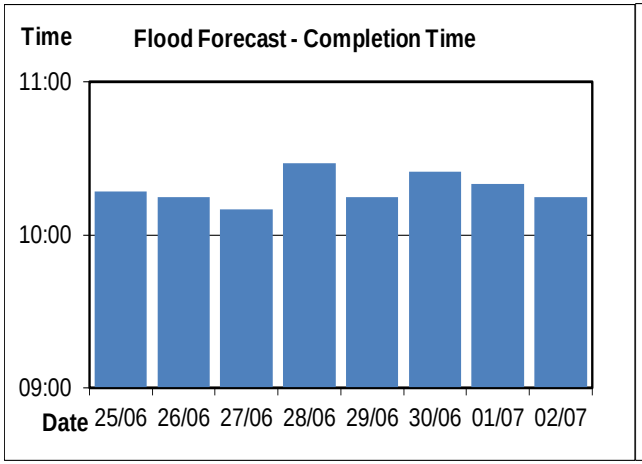


Figure B4: Flood forecast completion time

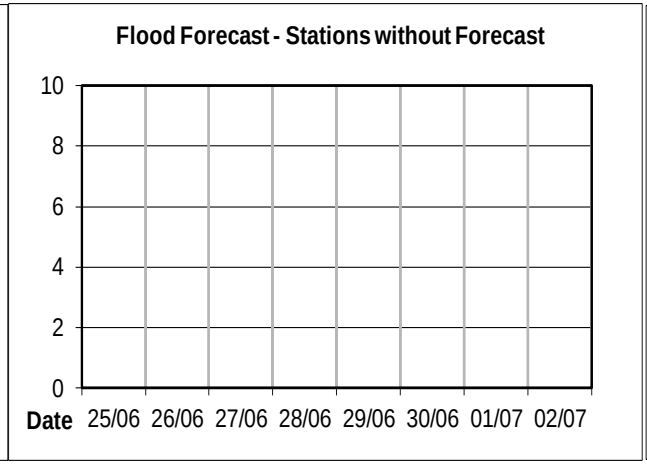


Figure B5: Flood forecast stations without forecast

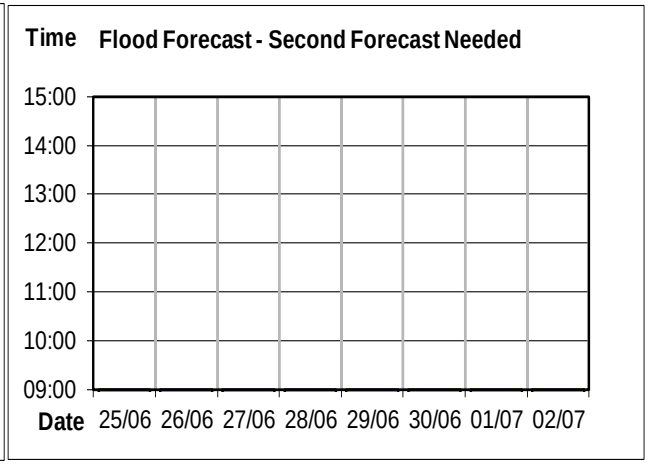


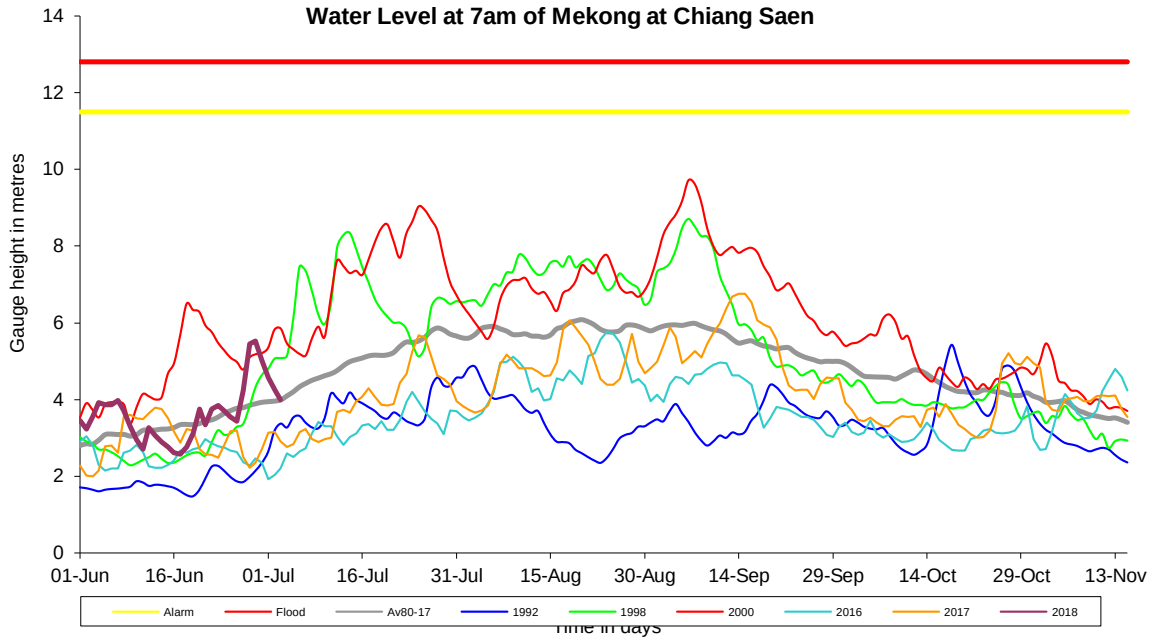
Figure B6: Second forecast needed

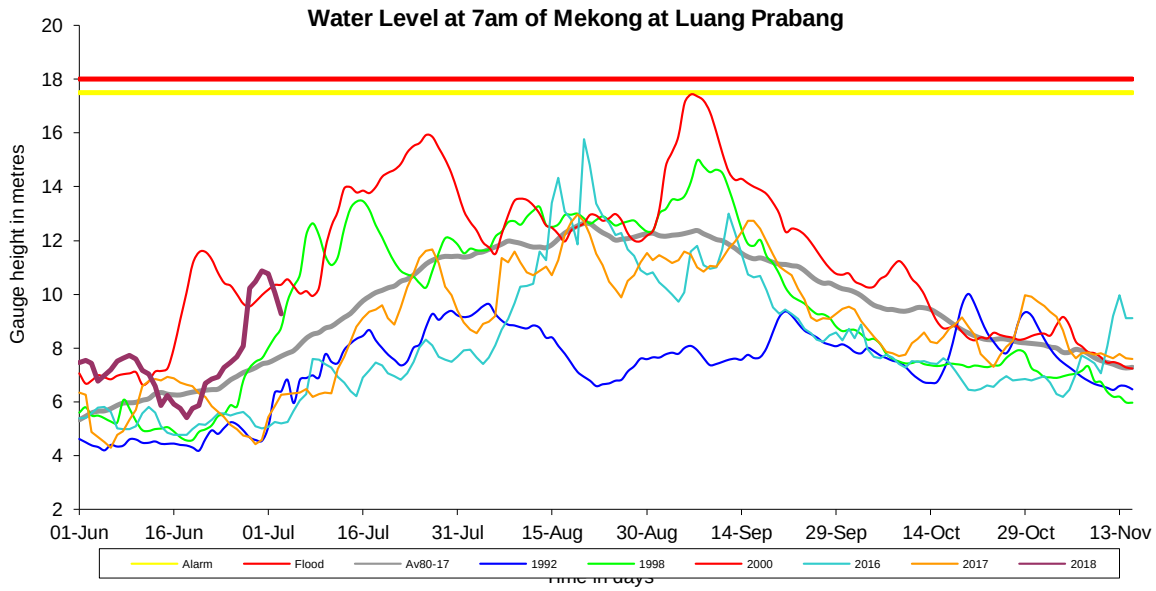
Annex C: Season Water Level Graphs

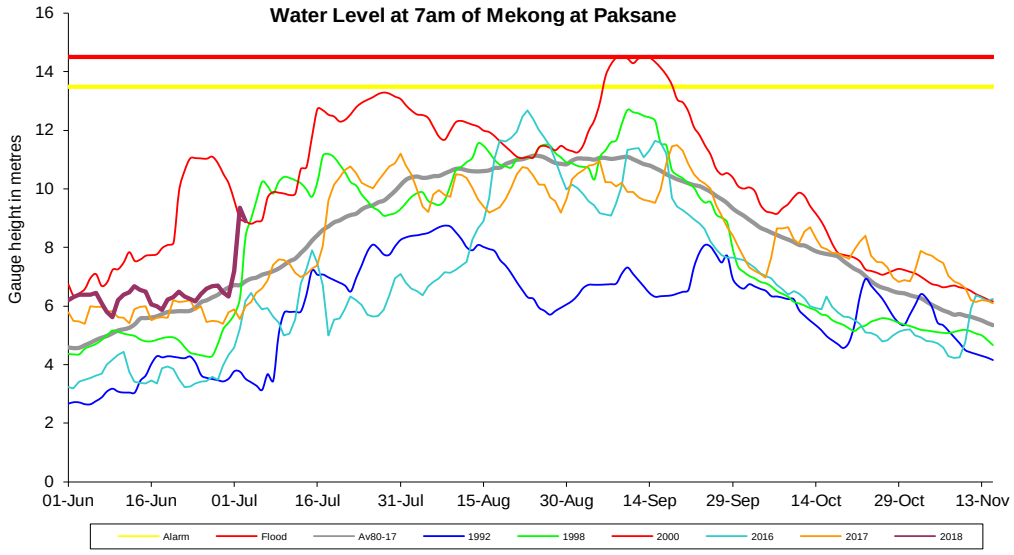
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

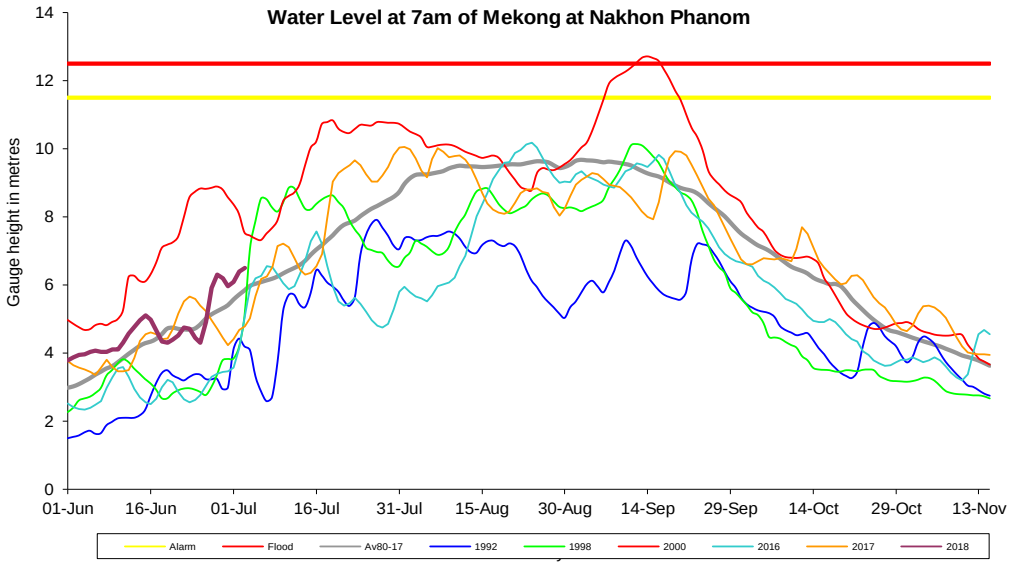
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

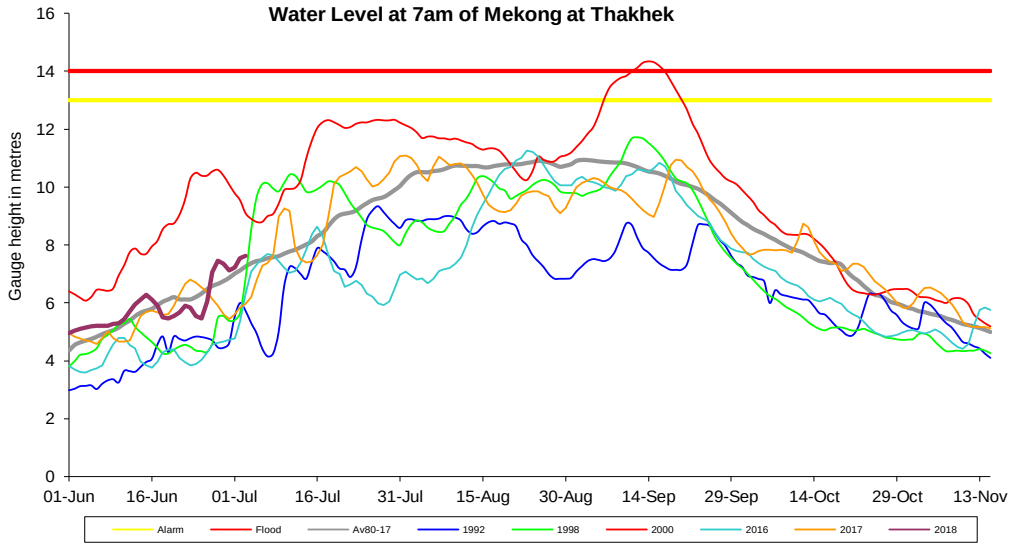
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

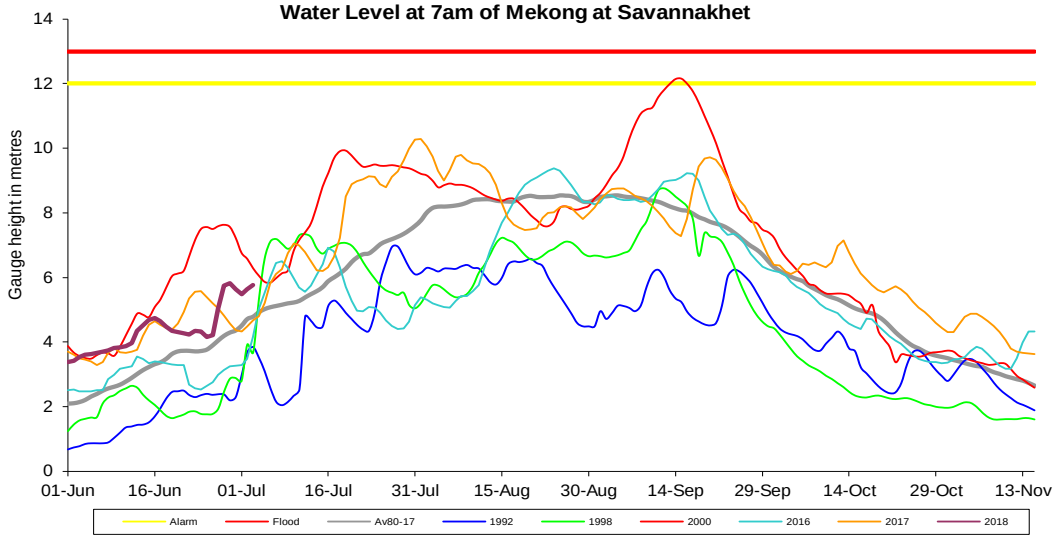


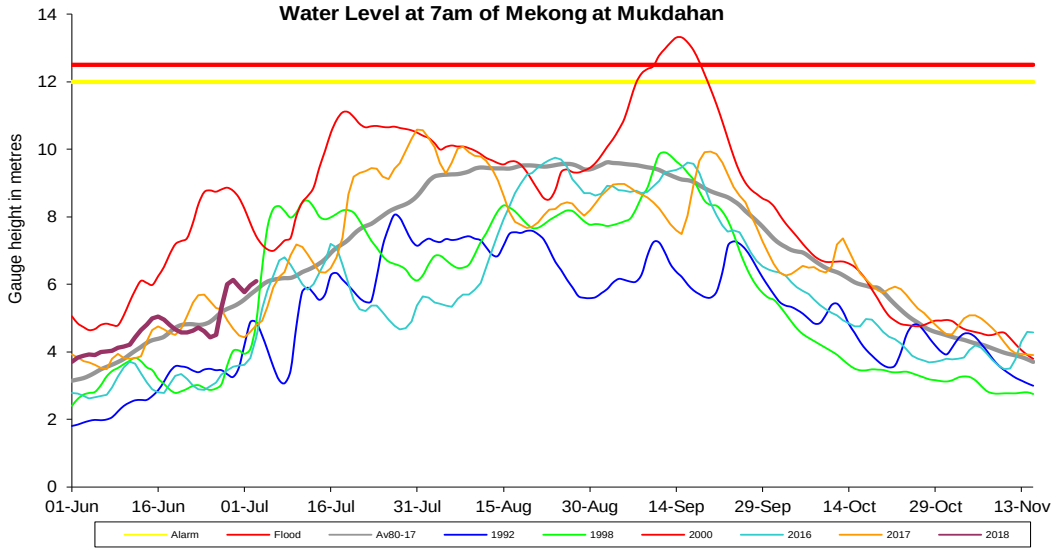


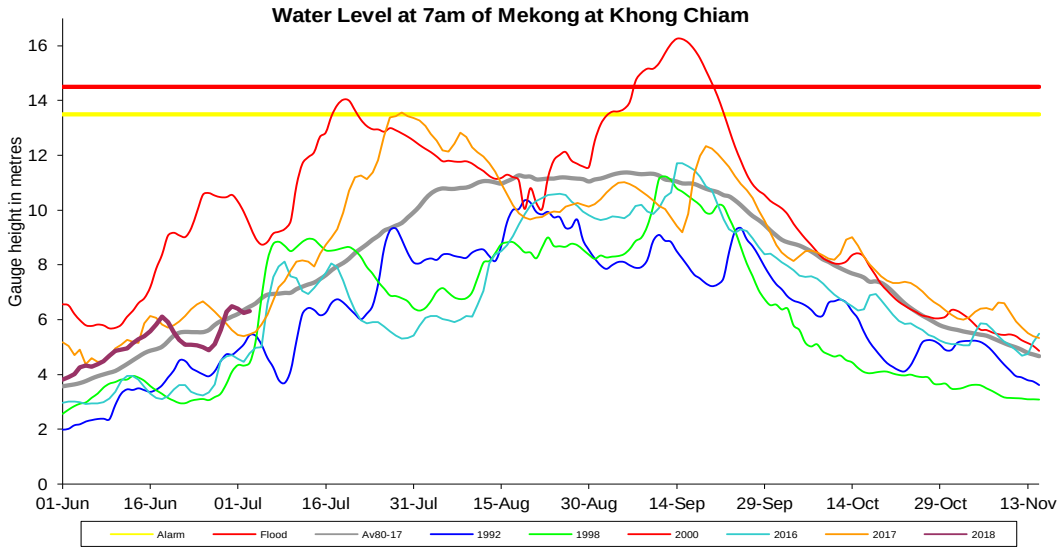

Water Level at 7am of Mekong at Paksane
Gauge height in metres
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

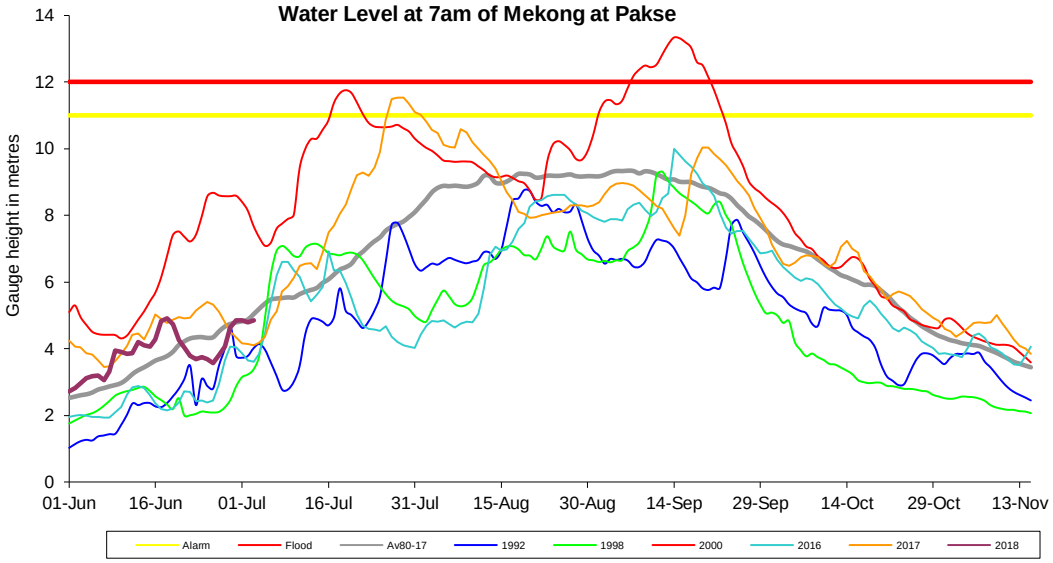

Water Level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

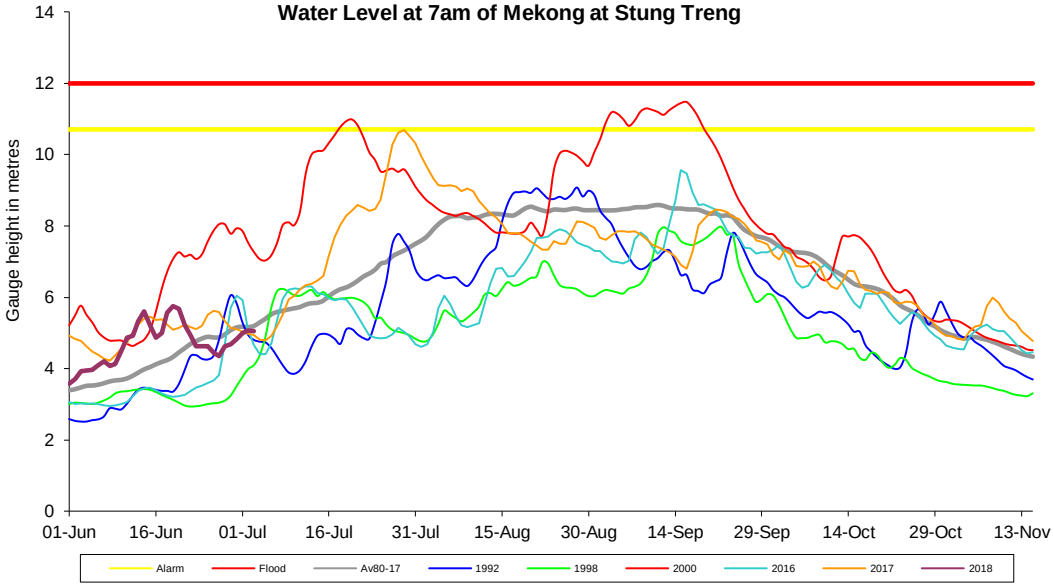

Water Level at 7am of Mekong at Thakhek
Gauge height in metres
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

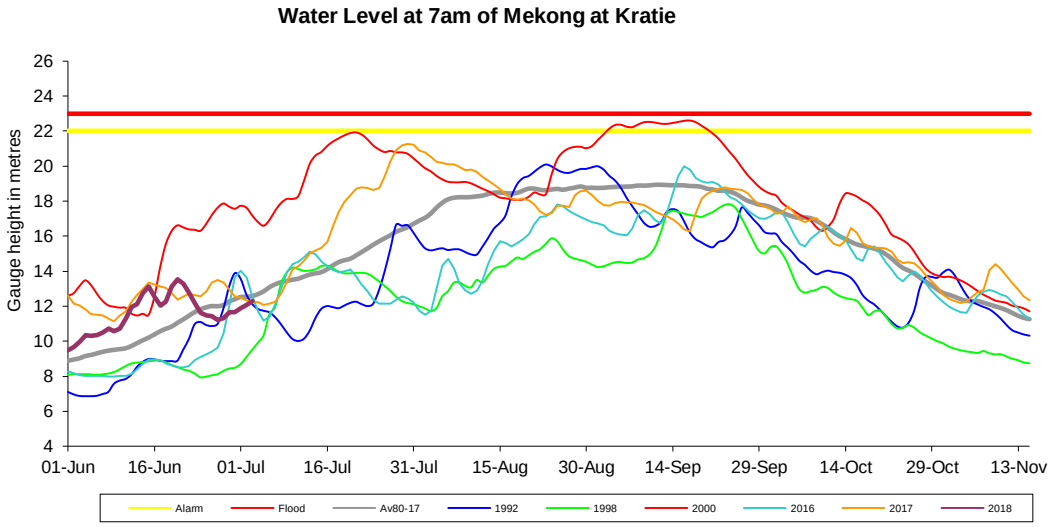

Water Level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

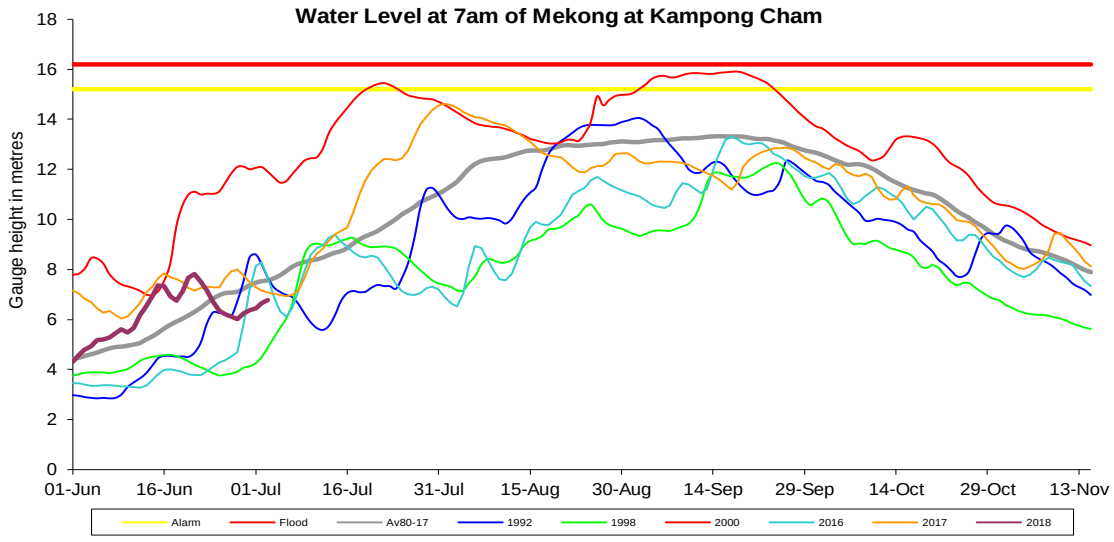

Water Level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

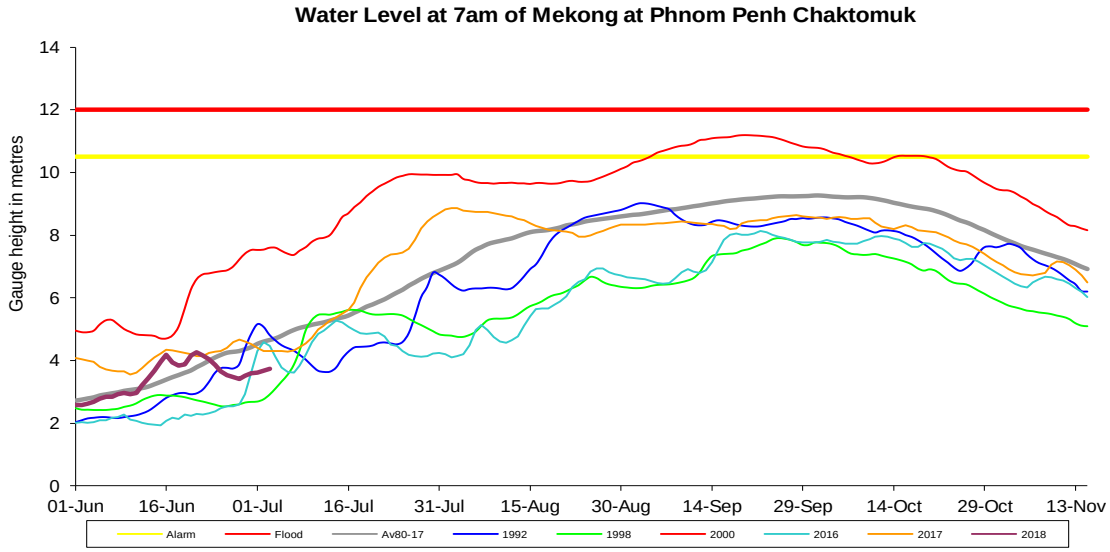

Water Level at 7am of Mekong at Khong Chiam
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

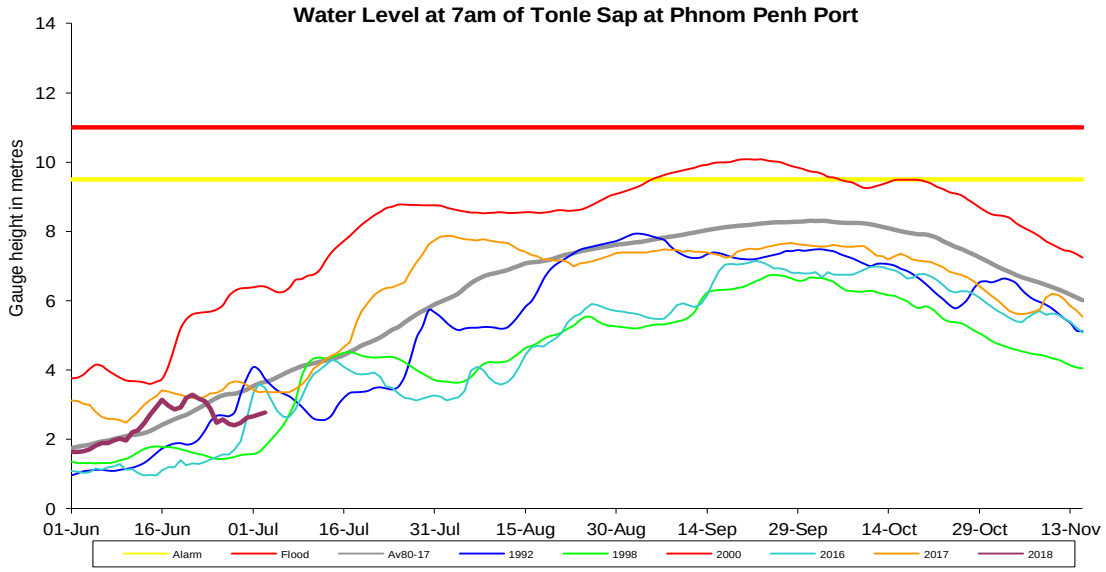

Water Level at 7am of Mekong at Pakse
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

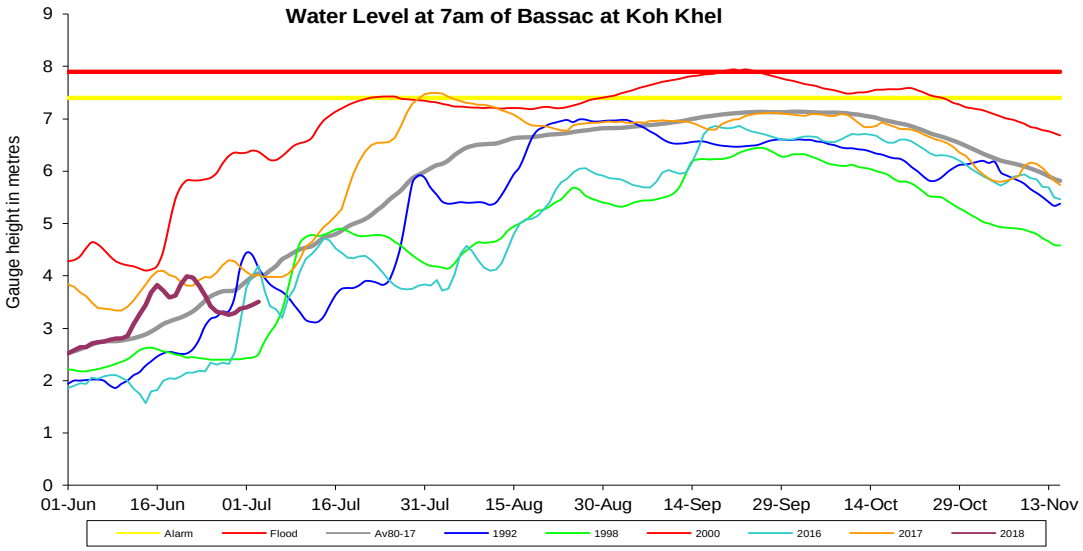

Water Level at 7am of Mekong at Stung Treng
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

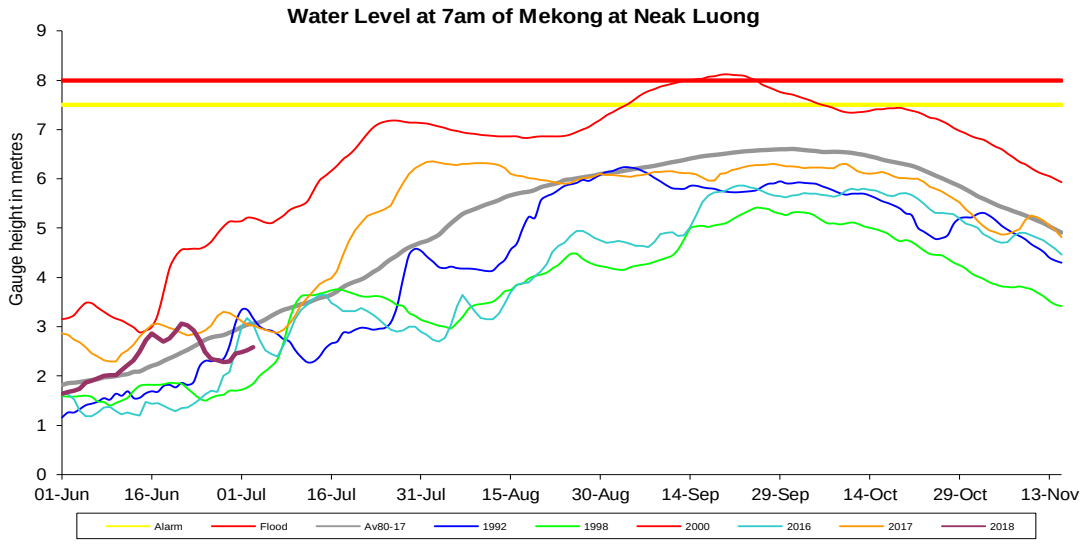

Water Level at 7am of Mekong at Kratie
Gauge height in metres
26
24
22
20
18
16
14
12
10
8
6
4
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

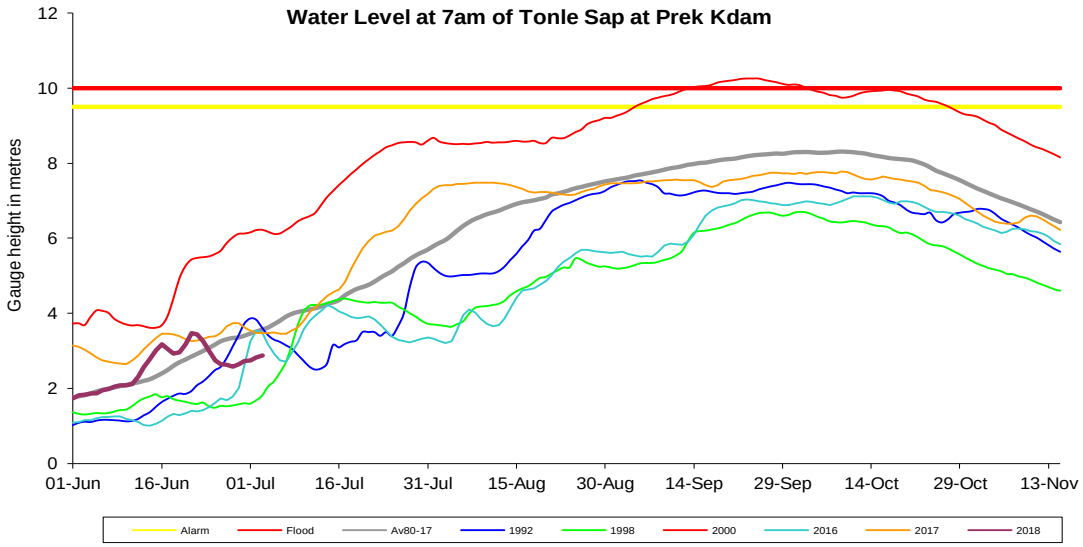

Water Level at 7am of Mekong at Kampong Cham
Gauge height in metres
18
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

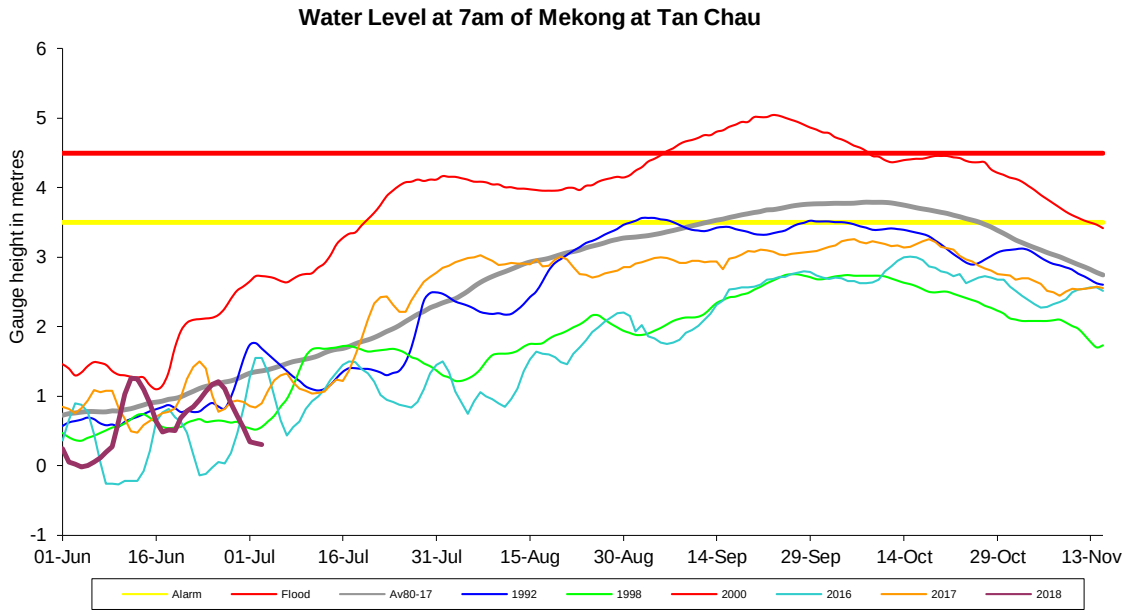

Water Level at 7am of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018

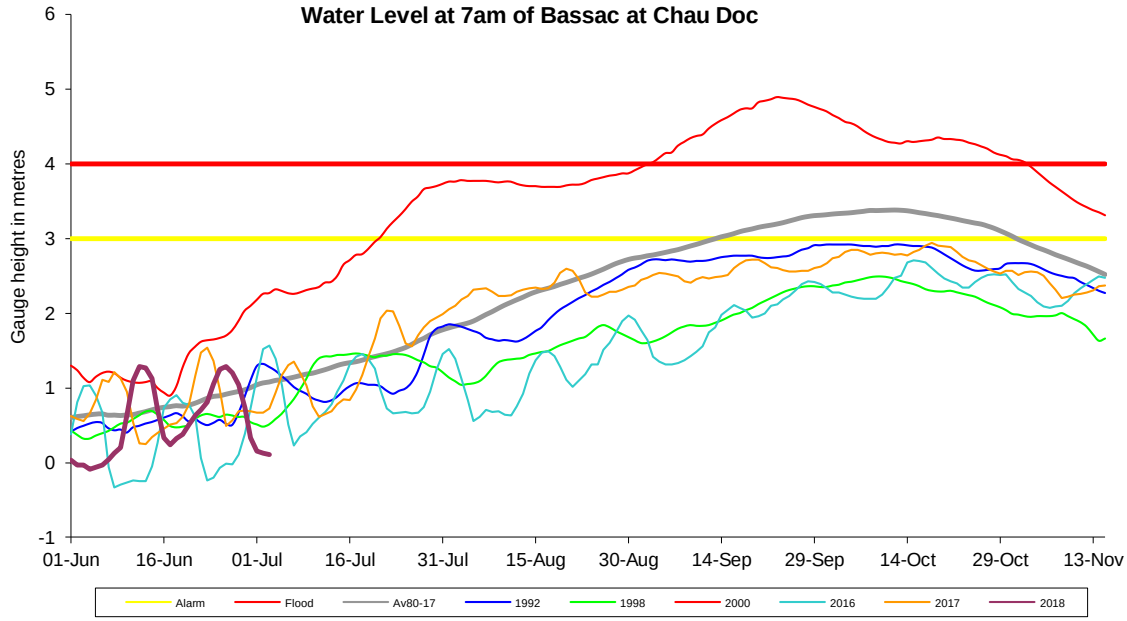

Water Level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018


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
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018


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
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018


Water Level at 7am of Tonle Sap at Prek Kdam
Gauge height in metres
0
2
4
6
8
10
12
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018


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
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018


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
Alarm
Flood
Av80-17
1992
1998
2000
2016
2017
2018