Mekong River Commission
Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 10/07/2018, covering the week from the 02nd to 09th July 2018

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

General weather patterns

During the week of 2nd to 9th July 2018, the weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps of the 2nd and – 07th July 2018 based on Thai Meteorological Department (TMD) are presented in Figures 1 & 2 below:
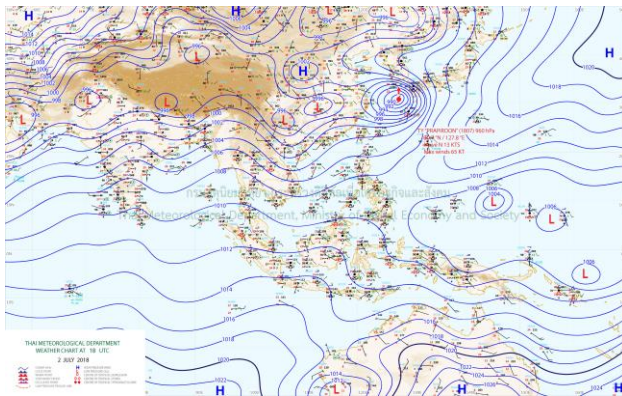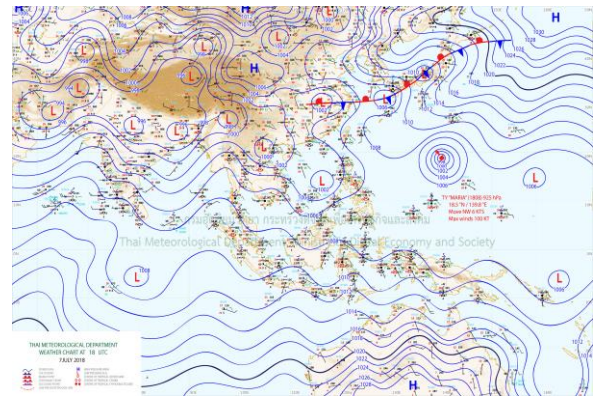

Figure 1: Weather map for 2nd July 2018   **Figure 2: Weather map for 07th July 2018**

Moderate South-West (SW) Monsoon

From June to July, usually, isolated to scattered rain throughout the week with heavy rainfall in some areas at the middle part of 3S area 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. 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, there was rainfall between Vientiane and Paksane catchment areas and at the 3S area as well. The weekly rainfall distribution is shown in **Figure 3**.
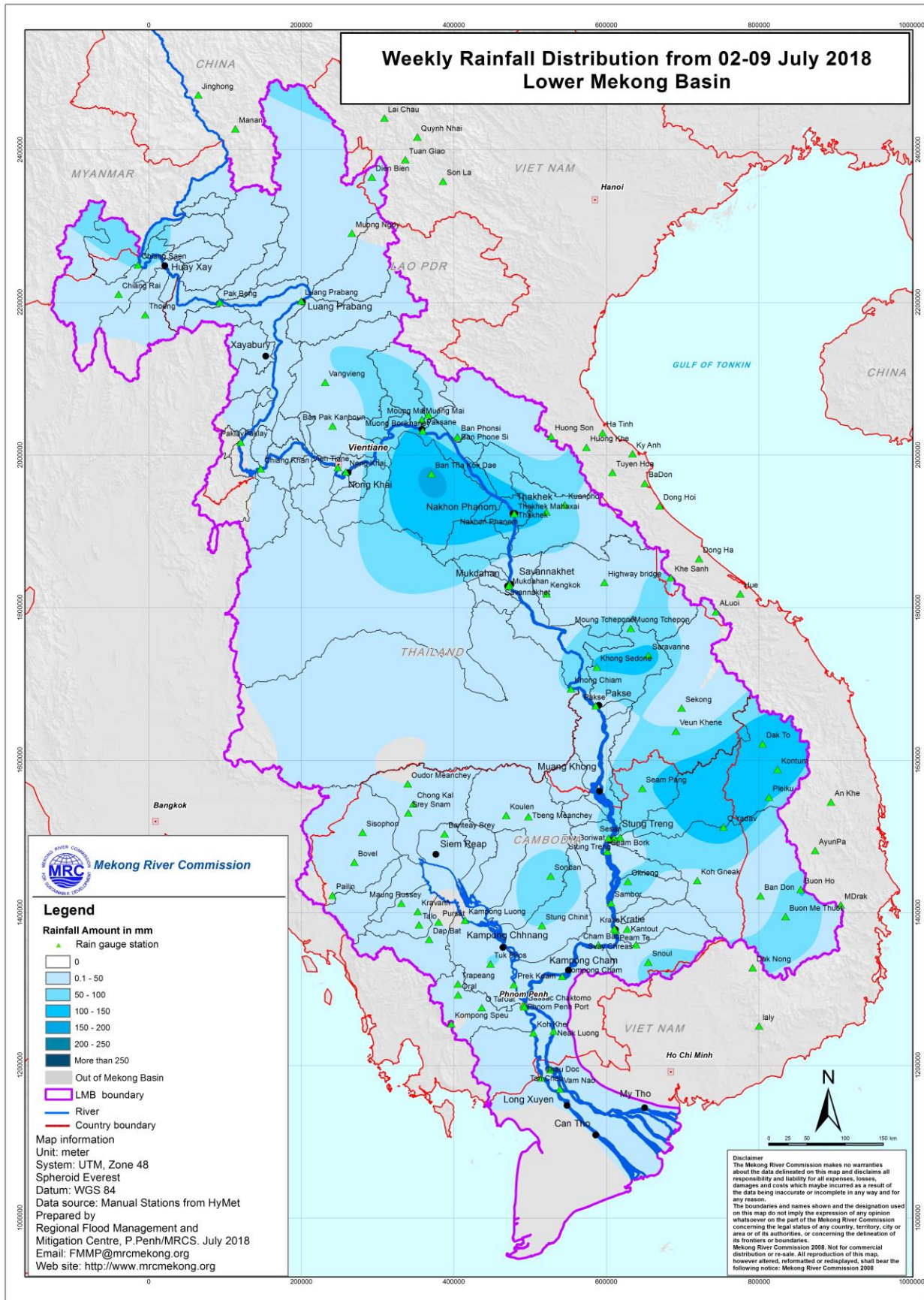
Figure 3: Weekly Rainfall Distribution over the LMB from 02nd – 09th July 2018

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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 02nd to 09th July 2018 at Chiang Sean station were fluctuated but lower than the LTA, while at Luang Prabang station also water levels were the same situation.

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 Thakhet/Nakon Phanom to Pakse

Compared to their long-term averages (LTAs), water levels at Thakhet to Pakse station were 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 increased above 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 increasing above 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
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
03/07/2018	535.97	3.99	9.28	9.78	6.53	7.52	8.90	6.49	7.62	5.77	6.10	6.31	4.86	5.05	12.29	6.78	3.74	2.78	3.51	2.58	2.87	0.30	0.11
04/07/2018	535.96	3.45	9.03	9.32	6.12	7.12	8.72	6.47	7.60	5.59	6.13	6.44	4.93	5.00	12.26	6.90	3.83	2.87	3.56	2.64	2.89	0.33	0.16
05/07/2018	535.84	3.66	8.28	9.06	5.60	6.66	8.40	6.34	7.49	5.53	6.06	6.47	4.95	5.12	12.28	6.84	3.81	2.85	3.55	2.62	2.84	0.34	0.17
06/07/2018	536.21	3.55	7.92	8.40	5.23	6.32	8.22	6.19	7.34	5.52	5.93	6.41	4.91	5.15	12.32	6.86	3.78	2.78	3.52	2.60	2.81	0.38	0.21
07/07/2018	536.59	3.33	7.00	8.00	4.60	5.70	8.00	6.11	7.28	5.30	5.83	6.29	4.82	5.16	12.47	6.97	3.87	2.87	3.56	2.64	2.96	0.43	0.28
08/07/2018	536.08	3.65	6.82	7.68	4.26	5.21	7.38	6.18	7.33	5.39	5.92	6.26	4.82	5.25	12.50	7.05	3.87	2.91	3.58	2.66	3.01	0.70	0.36
09/07/2018	535.98	3.85	6.49	7.27	3.92	4.84	7.31	6.17	7.31	5.45	5.99	6.45	5.28	5.70	12.87	7.15	3.95	2.99	3.63	2.76	3.02	0.86	0.73

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
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
03/07/2018	0.5	0	nr	0	nr	0	nr	0.7	1.2	0	nr	5.6	11	2	nr	nr	nr	-	37.9	nr	nr	nr	0.7
04/07/2018	0	0	8.6	0	nr	0	nr	6.9	10.1	0	nr	0	5.6	nr	nr	nr	1.5	-	nr	4.2	nr	1.3	2
05/07/2018	0	0	nr	0	nr	0	5.2	2.3	2.2	0	nr	0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr
06/07/2018	2	0	nr	0	nr	1.5	33.4	0	3.5	0	nr	0	nr	nr	nr	1	nr	-	nr	nr	nr	2.2	1.6
07/07/2018	0	16.4	nr	0	4.2	11	13.2	4.5	4.3	0	nr	0	nr	19	19.8	12.6	nr	-	5.1	6.2	nr	1.5	1.3
08/07/2018	1.5	22.3	19.2	0	6.4	6.6	22.7	92.3	81.3	12.5	nr	46.4	nr	58	8.8	3	nr	-	nr	nr	nr	nr	0
09/07/2018	39	14.7	12.6	1.3	nr	0	3.8	22.1	3.8	8.2	nr	3	nr	nr	nr	6.6	32.3	-	5.9	3.3	18.3	nr	nr

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Figure A1: Observed water level and rainfall for Jinghong, Chiang Saen, and Luang Prabang
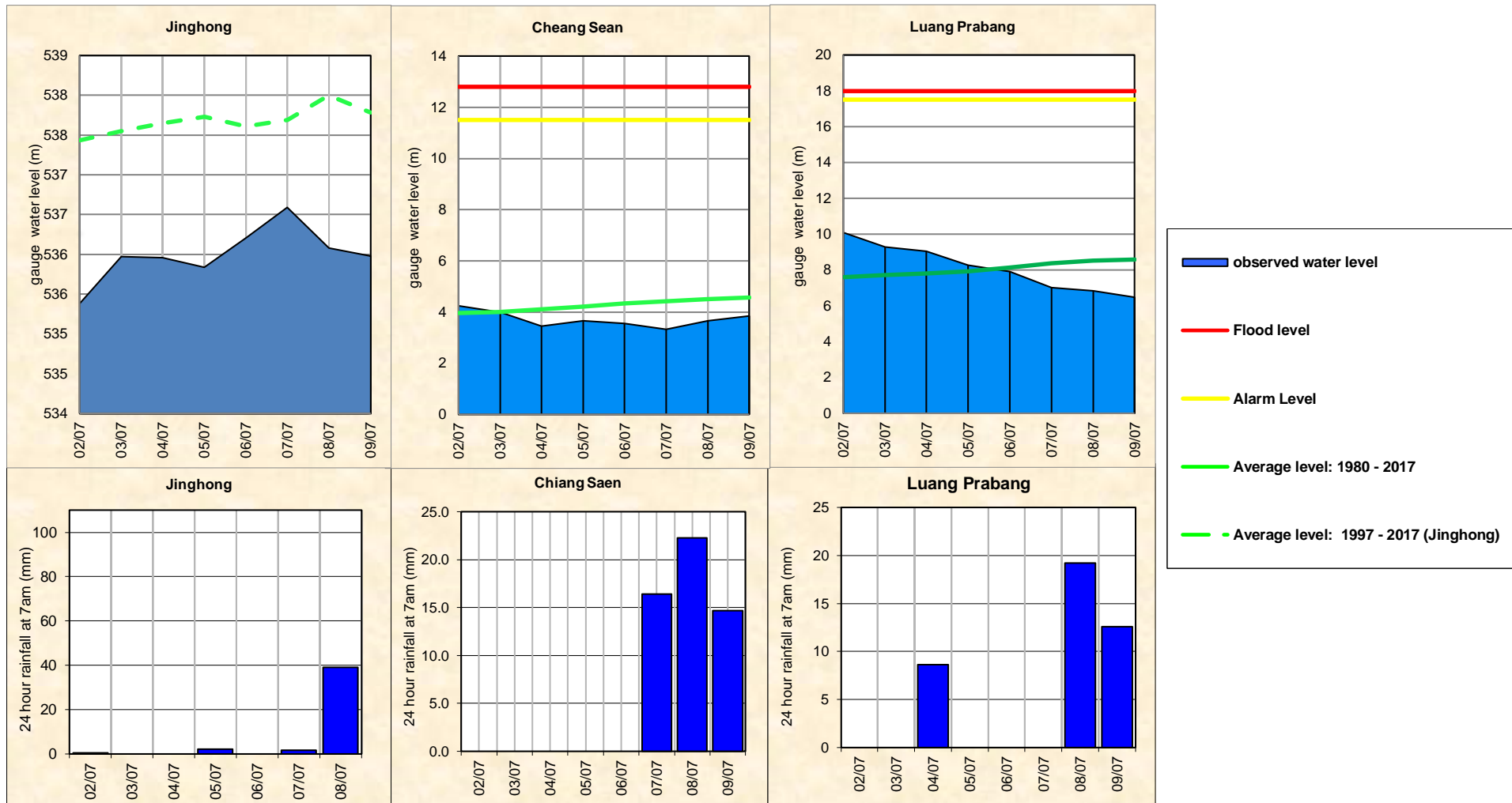
Figure A2: Observed water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane
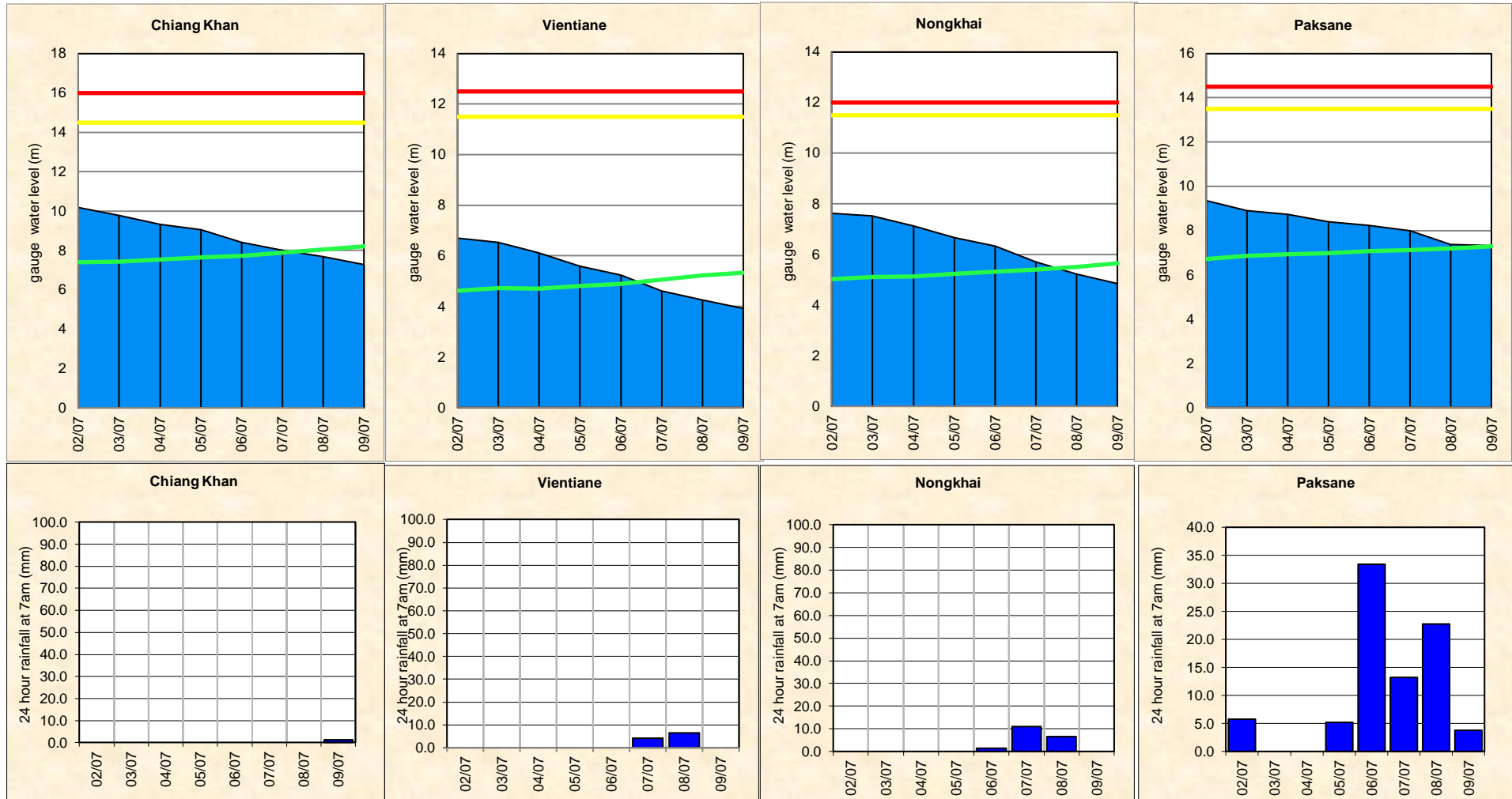
Figure A3: Observed water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet
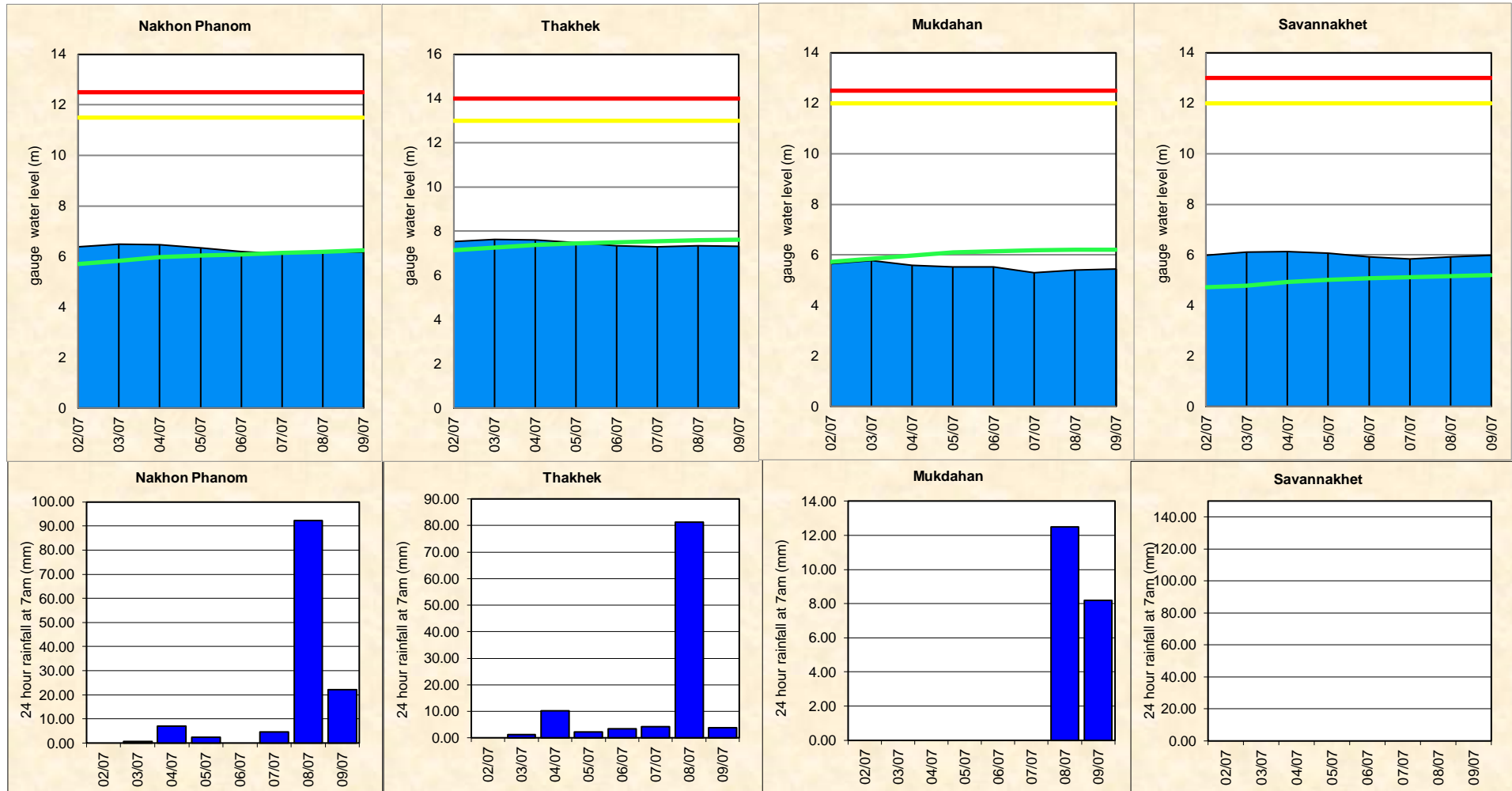
Figure A4: Observed water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie
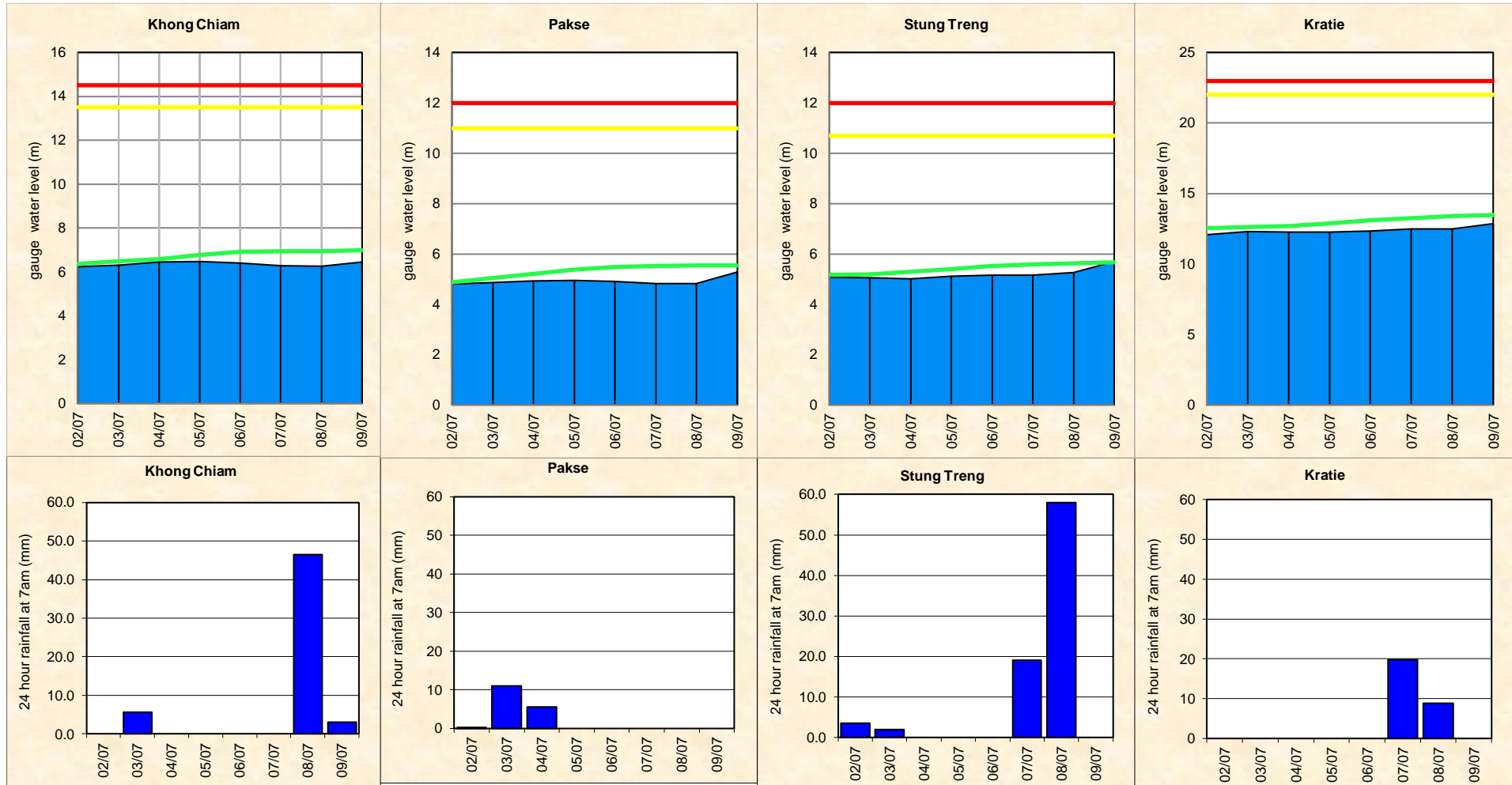
Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel
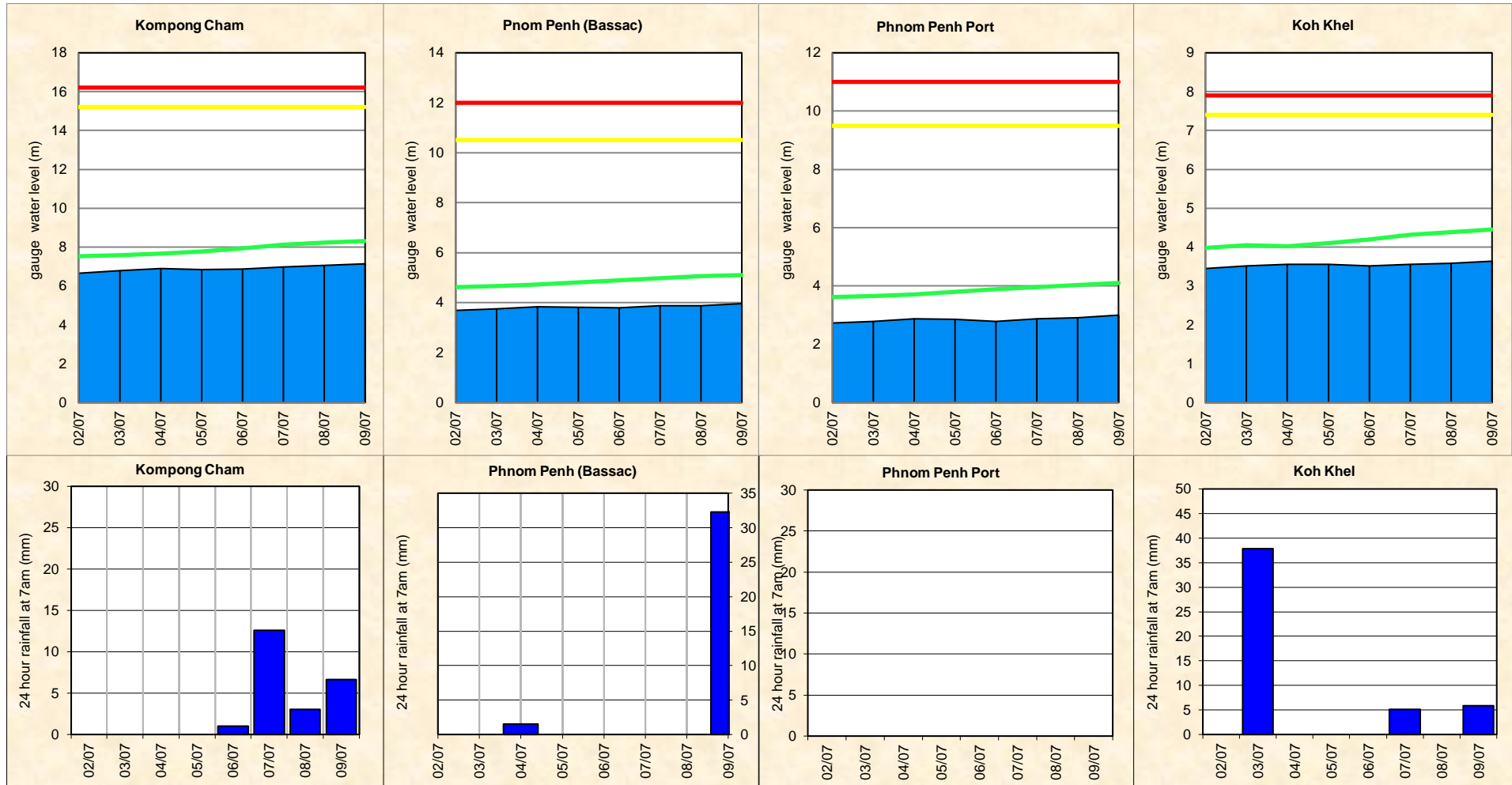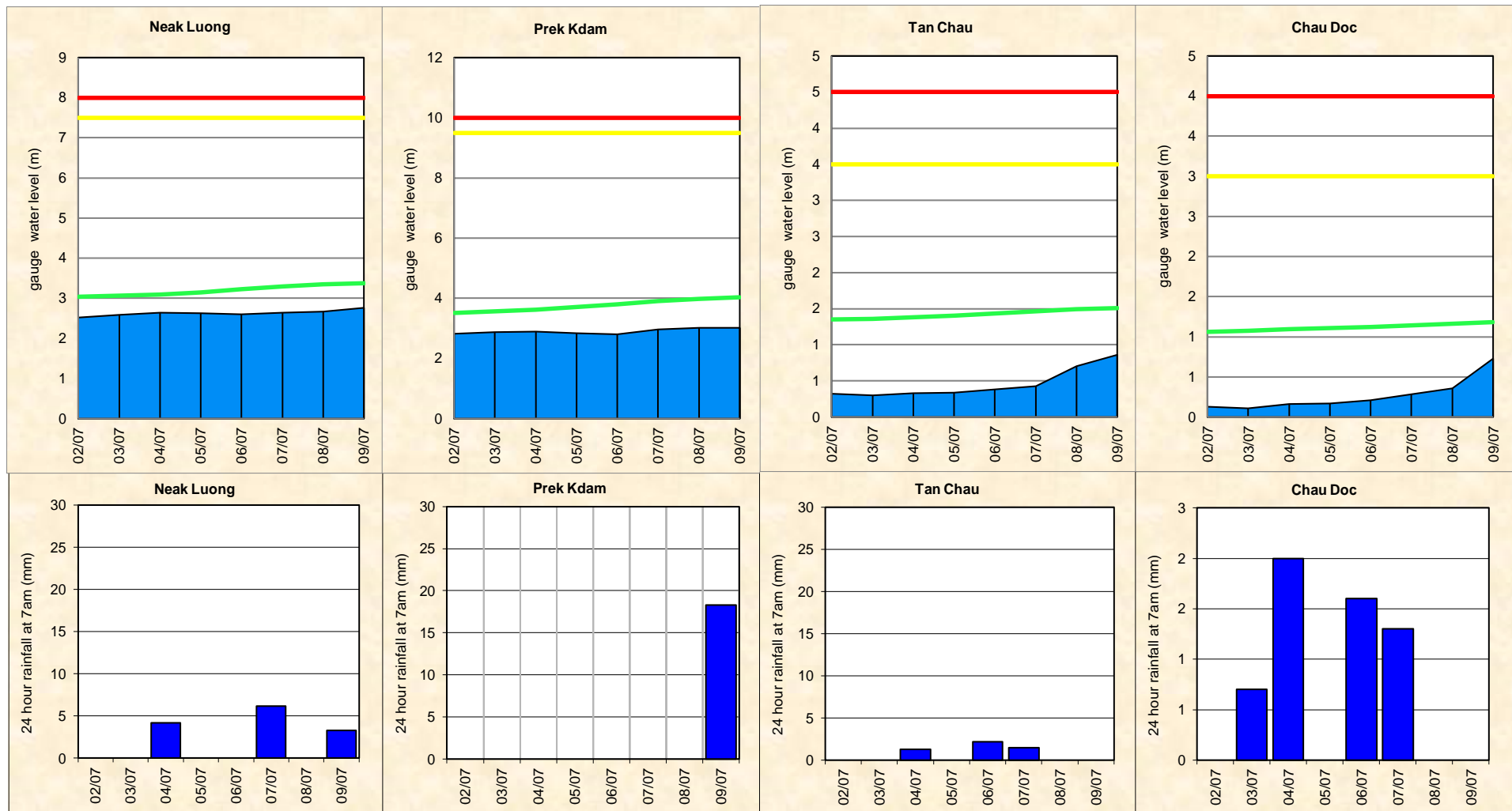
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Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc

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 Khong Chiam to Kompong Cham 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.
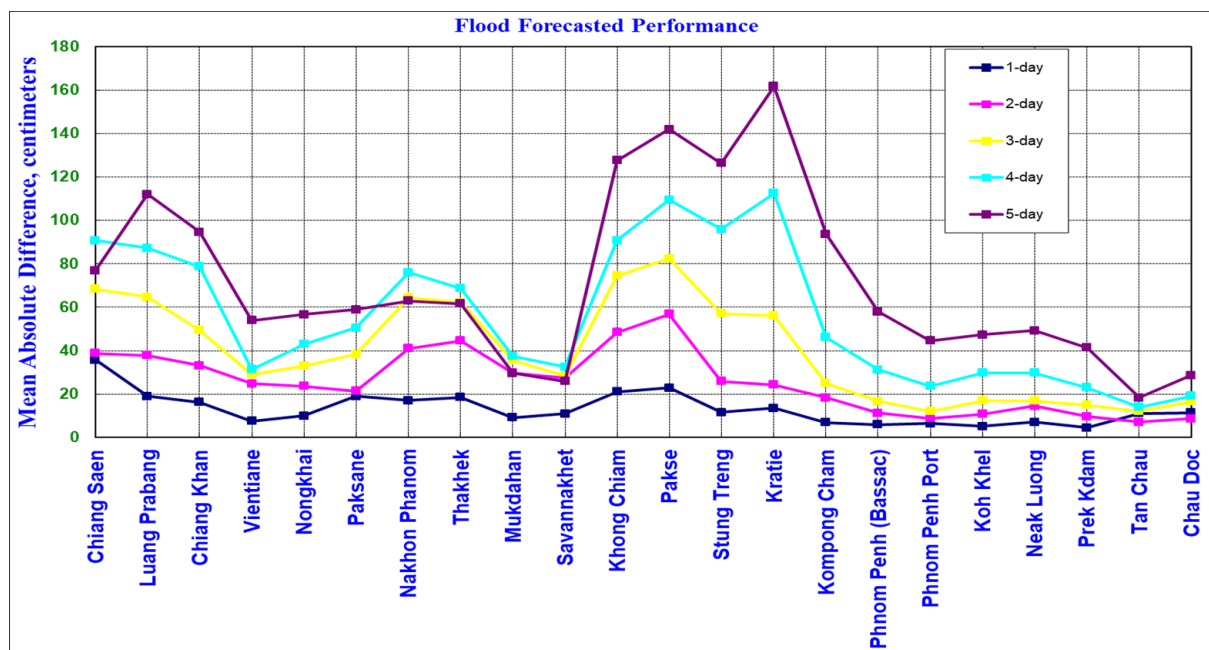

Figure B1: Average flood forecast accuracy along the Mekong mainstream

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 2-9 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	29	71	86	100	86	57	57	57	86	86	57	57	86	100	100	71	86	71	71	86	71	57	74
2-day	50	83	67	83	67	100	50	33	50	67	33	50	67	100	100	83	100	67	33	100	67	67	69
3-day	40	60	60	100	80	80	40	40	60	80	40	20	20	80	100	80	100	60	60	80	80	80	65
4-day	0	25	50	100	100	100	25	75	75	100	25	25	0	25	100	75	100	25	50	50	75	75	58
5-day	67	33	0	100	100	67	67	67	100	100	0	0	33	0	33	0	33	0	0	67	33	33	42

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 2-9 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	29	71	86	71	57	43	43	43	71	57	29	14	57	43	71	71	86	86	71	100	86	71	62
2-day	83	67	67	50	67	67	33	33	50	50	17	0	50	50	67	67	67	67	17	33	67	67	52
3-day	40	40	60	40	40	20	20	20	60	60	20	0	20	20	100	40	40	40	40	40	60	60	40
4-day	25	25	0	100	50	50	25	25	75	75	25	0	0	0	50	0	50	25	50	50	25	25	34
5-day	67	0	0	33	67	67	33	33	67	67	0	0	0	0	0	0	0	0	0	0	67	33	24

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.

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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

2018	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/34	Thailand - DWR/13	Viet Nam - SRHMC/6	Viet Nam - HMS/39
week	10:11	00:00	-	-	08:14	07:10	07:07	07:56	08:22	08:09	07:01	08:10	0	0	0	0	73	0	0	63
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	489	0	2	63
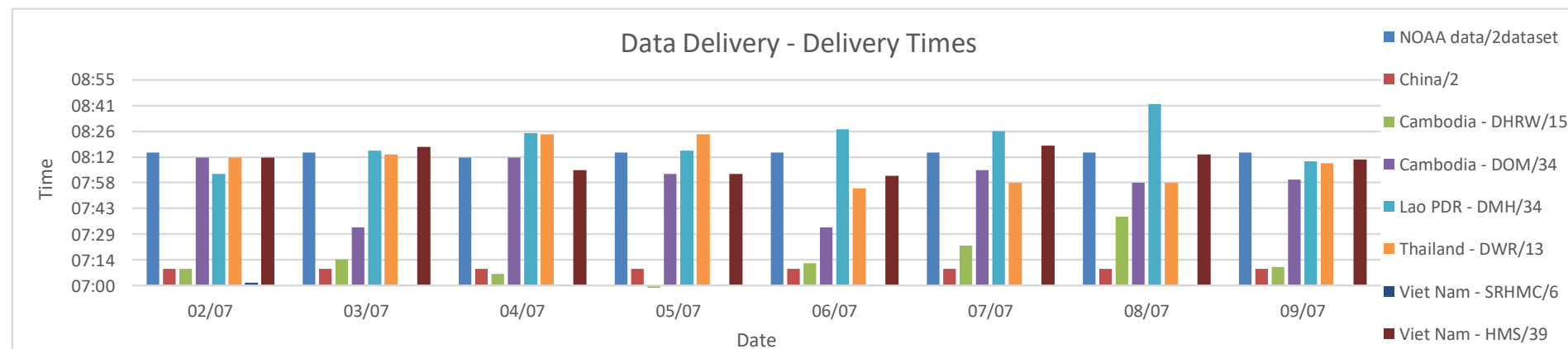
Week is the week for which this report is made; *Month* is actually the last 30 days (or less if the flood season has just begun); *Season* is the current flood season up to the date of this report.

Figure B2: Data delivery times for the past 8 days including the current report date
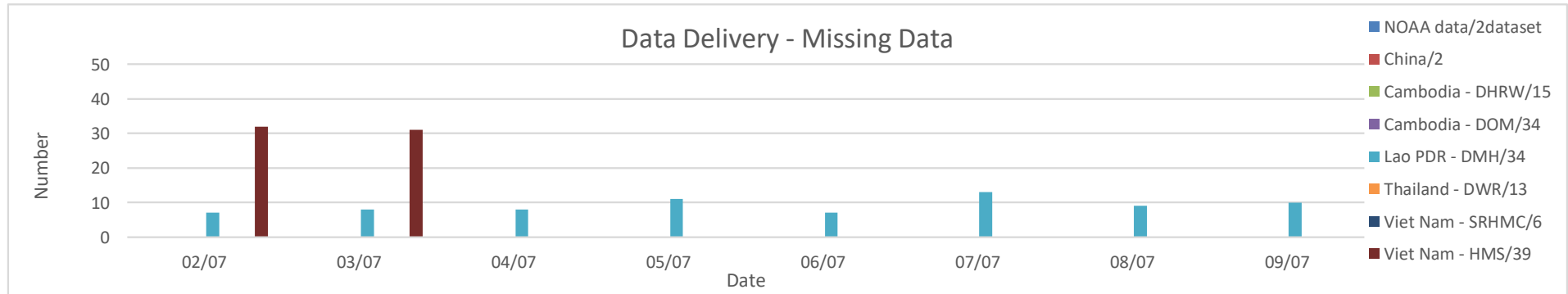
Figure B3: Missing data for the past 8 days including the current report date
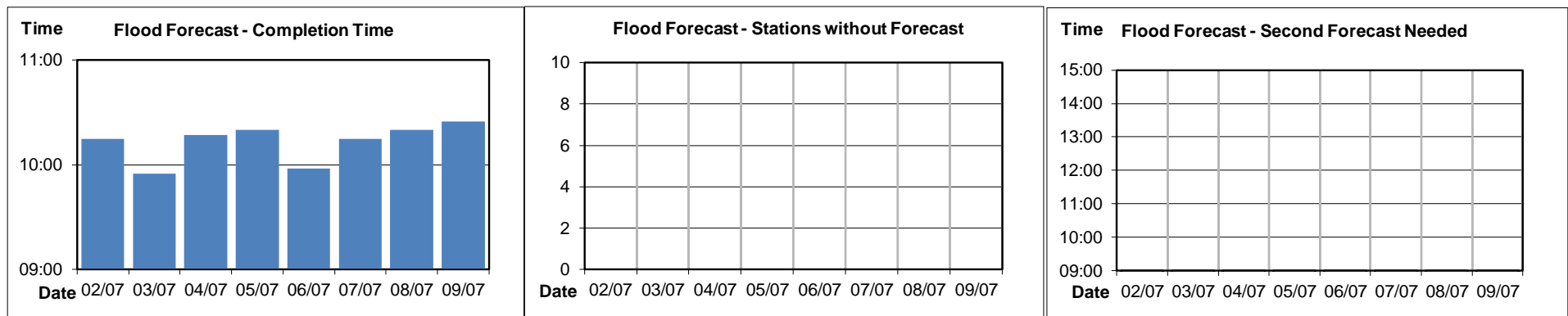
Figure B4: Flood forecast completion time

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 Chiang Saen

Water Level at 7am of Mekong at Luang Prabang

Water Level at 7am of Mekong at Chiang Khan

Water Level at 7am of Mekong at Vientiane

Water Level at 7am of Mekong at Nong Khai

Water Level at 7am of Mekong at Paksane

Water Level at 7am of Mekong at Nakhon Phanom

Water Level at 7am of Mekong at Thakhek

Water Level at 7am of Mekong at Savannakhet

Water Level at 7am of Mekong at Mukdahan

Water Level at 7am of Mekong at Khong Chiam

Water Level at 7am of Mekong at Pakse

Water Level at 7am of Mekong at Stung Treng

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

Water Level at 7am of Bassac at Koh Khel

Water Level at 7am of Mekong at Neak Luong

Water Level at 7am of Tonle Sap at Prek Kdam

Water Level at 7am of Mekong at Tan Chau

Water Level at 7am of Bassac at Chau Doc