

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 25/07/2011, covering the week from the 18th to the 24th July 2011

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

General weather patterns

During the week of the 18th to the 24th July 2011, three weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 19th July and the 23rd July bulletins are presented in the figures below:

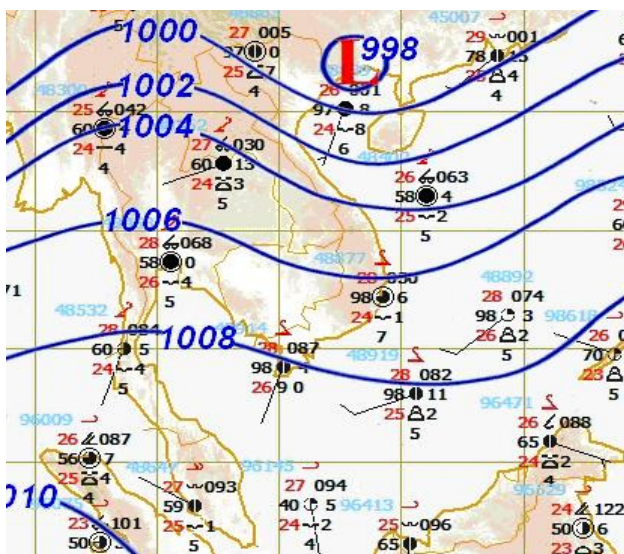


Figure 1: Weather map for 19th July 2011

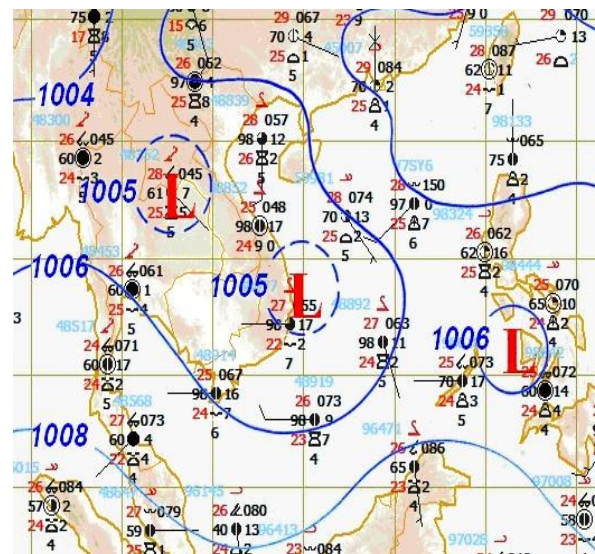


Figure 2: Weather map for 23rd July 2011

Moderate to strong South-West (SW) Monsoon

Moderate SW monsoon during the first half of the week and strong SW monsoon in the end of the week prevailed over Andaman Sea, Thailand, the Gulf of Thailand (Figure 1 and 2).

Inter Tropical Convergence Zone (ITCZ)

No ITCZ was observed in the monitoring period.

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

No TD, TS or TY have significantly influenced the LMB in this week.

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Over weather situation

A normal weather situation lasted during last week. The trough of low pressure and strong SW were observed in the reporting period. Therefore, thundershower and heavy rain occurred in the North of

Thailand, in the North and Central of Lao PDR, Cambodia and Viet Nam as the result of these phenomena. Figure 3 illustrates rainfall amount distribution covering last week.

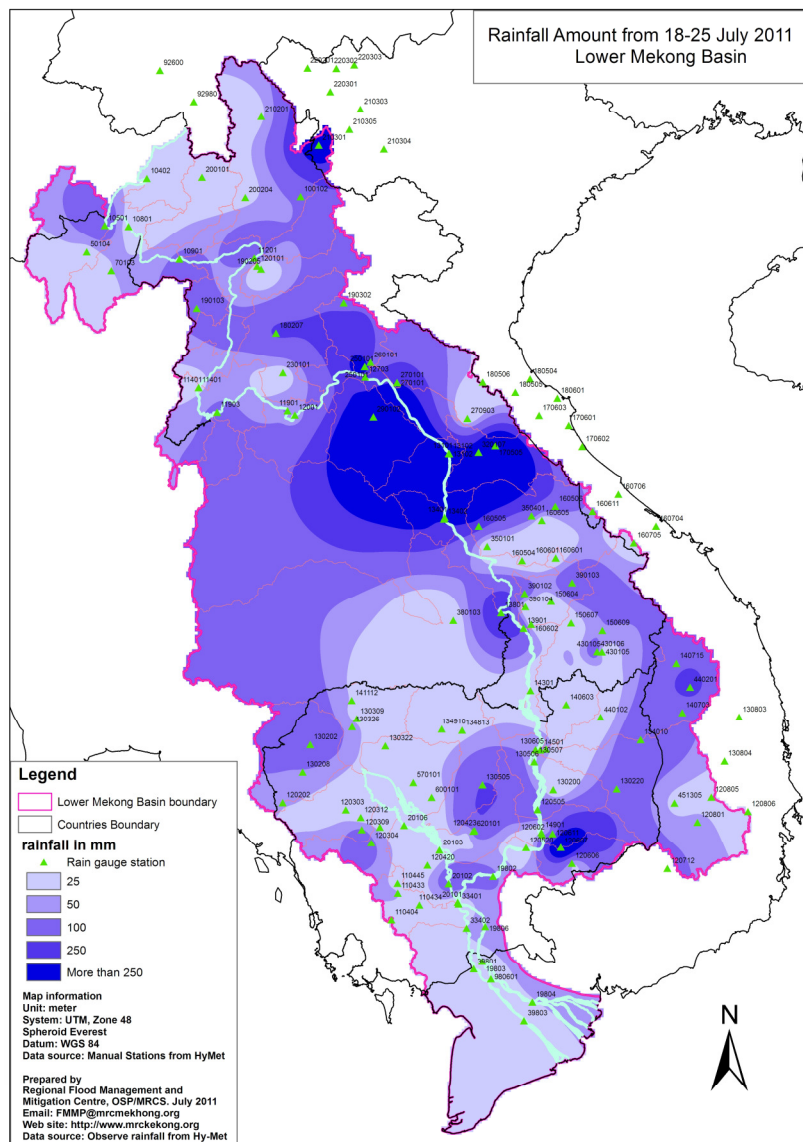


Figure 3: Rainfall distribution over the LMB, covering the week 18 – 24 July, 2011

General behaviour of the Mekong River

Water levels at most stations along the Mekong River were somewhat above the long-term average except Chiang Saen, Tan Chau and Chau Doc, where were recording levels that are somewhat below the long-term average for this time of the year. Water levels at all station in the mainstream show a rising trend during the monitoring period. Regarding to two stations in downstream at Tan Chau and Chau Doc, water levels at those two stations were increasing toward the end of the week and significant influenced by tidal.

For stations from Chiang Saen to Paksane

Water level at Chiang Saen was slightly increasing in the first half of the week, then more-or-less stable till the end of the week and somewhat below the long term average. Water levels at stations from Luang Prabang to Paksane were somewhat above the long-term average for this time of the year and showed a rising trend during the reporting period.

For stations Thakhek/Nakon Phanom to Pakse

Water levels at these stations were slightly rising toward the end of the week. All of these stations were recording levels that were above the long-term average for this time of the year.

For stations from Strung treng to Kompong Cham

Water levels show a rising trend in the monitoring period. These stations were recording levels that are above the long-term average for this time of the year.

For stations from Phnom Penh Port/ Phnom Penh Bassac to Koh Khel/Neak Luong

Water levels were rising till the end of the week. Water levels of these stations were above the long-term average for this time of the year.

Tan Chau and Chau Doc

Water levels were slightly rising from the beginning to the end of the week. Both stations were recording levels that are below the long-term average for this time of the year and significantly affected by tidal.

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 past week. Water levels are 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 past week.

For more details see the following annex:

- 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

2011	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
18/07	536.83	5.05	9.73	9.67	6.33	7.49	10.08	9.32	10.33	9.20	8.41	9.68	7.74	6.90	15.91	10.48	6.30	5.37	5.52	4.26	5.22	1.62	1.12
19/07	537.20	5.02	10.38	9.63	6.52	7.80	10.24	9.20	10.27	9.12	8.36	10.03	8.16	7.08	15.99	10.43	6.29	5.36	5.48	4.27	5.21	1.62	1.12
20/07		5.08	10.72	9.91	6.52	7.78	10.28	9.19	10.25	9.03	8.30	10.04	8.22	7.29	16.31	10.58	6.34	5.41	5.51	4.28	5.27	1.64	1.13
21/07	538.15	5.47	11.24	10.31	6.85	8.02	10.53	9.47	10.50	9.23	8.50	9.96	8.21	7.44	16.68	10.87	6.45	5.54	5.62	4.37	5.37	1.68	1.14
22/07	537.62	5.83	11.91	10.64	7.37	8.44	10.57	9.49	10.55	9.50	8.65	10.28	8.44	7.51	16.90	11.11	6.63	5.74	5.74	4.48	5.49	1.74	1.17
23/07	536.94	5.92	11.94	11.04	7.76	8.86	10.91	9.45	10.51	9.51	8.75	10.70	8.80	7.63	16.96	11.22	6.72	5.83	5.82	4.54	5.59	1.77	1.19
24/07	536.92	5.82	12.50	11.20	8.20	9.27	11.24	9.65	10.70	9.58	8.77	10.75	8.86	7.77	17.21	11.36	6.80	5.94	5.86	4.60	5.65	1.85	1.28
25/07	537.62	5.77	13.26	11.57	8.40	9.53	11.33	9.80	10.84	9.70	8.79	10.80	8.90	7.81	17.39	11.53	6.95	6.08	5.94	4.70	5.74	1.93	1.38
Flood level		11.80	18.00	17.40	12.50	12.20	14.50	12.70	14.00	12.60	13.00	16.20	12.00	12.00	23.00	16.20	12.00	11.00	7.90	8.00	10.00	4.20	3.50

Table A2: observed rainfall

Unit in mm

2011	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
18/07	1.0	3.90	30.4	5.1	nr	4.0	5.9	41.1	31.9	1.3	81.2	2.6	nr	1.8	8.4	nr	nr		nr	0.0	nr	0.0	nr
19/07	23.0	16.1	2.4	1.4	nr	1.7	3.1	57.7	49.6	nr	0.4	23.0	13.0	nr	nr	nr	nr		6.5	1.2	nr	nr	nr
20/07	0.0	27.1	25.4	6.0	nr	nr	15.9	7.8	4.7	nr	nr	18.5	25.2	13.0	nr	nr	nr		6.0	10.4	nr	nr	nr
21/07	0.7	6.1	7.8	1.6	nr	2.8	8.1	40.8	40.2	66.5	61.7	31.5	9.6	16.5	nr	nr	nr		nr	nr	nr	0.0	nr
22/07	0.0	0.6	1.2	4.4	6.9	18.4	4.1	39.0	38.7	63.7	46.0	7.6	37.2	nr	1.6	26.8	nr		5.8	0.9	nr	4.1	6.0
23/07	0.0	nr	nr	0.6	3.5	2.5	66.1	4.5	5.6	5.4	16.0	1.1	nr	nr	nr	nr	2.3		7.0	20.8	20.5	1.7	5.0
24/07	13.0	31.4	14.0	41.4	nr	0.5	nr	1.7	6.4	1.6	0.6	47.3	1.5	nr	nr	14.1	nr		nr	nr	nr	nr	nr
25/07	1.0	1.10		0.8	14.0	8.7	3.4	nr	nr	5.0	7.2	11.8	9.5	8.5	nr	14.7	8.6		0.9	2.8	52.40	5.8	0.60

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

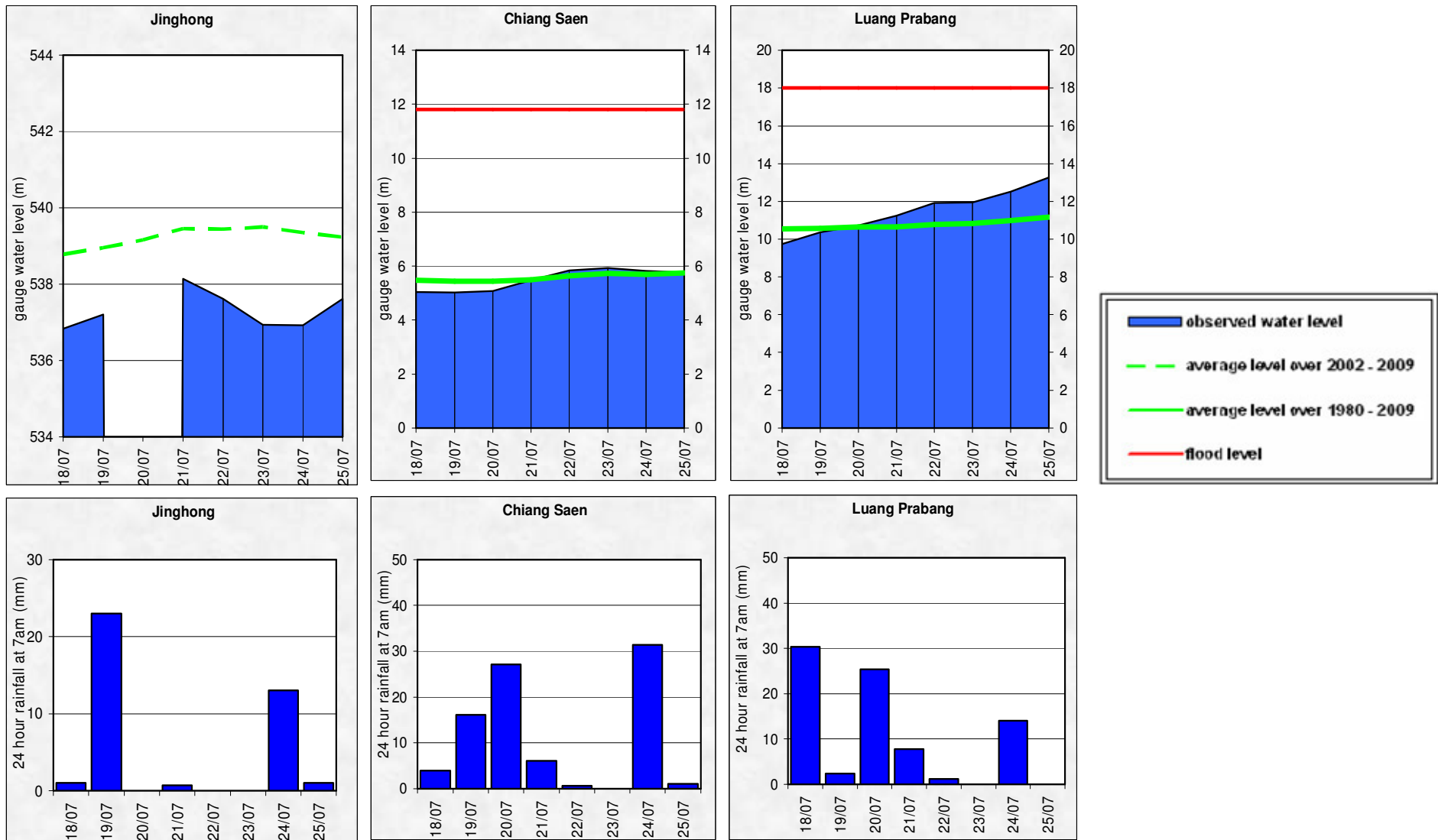


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

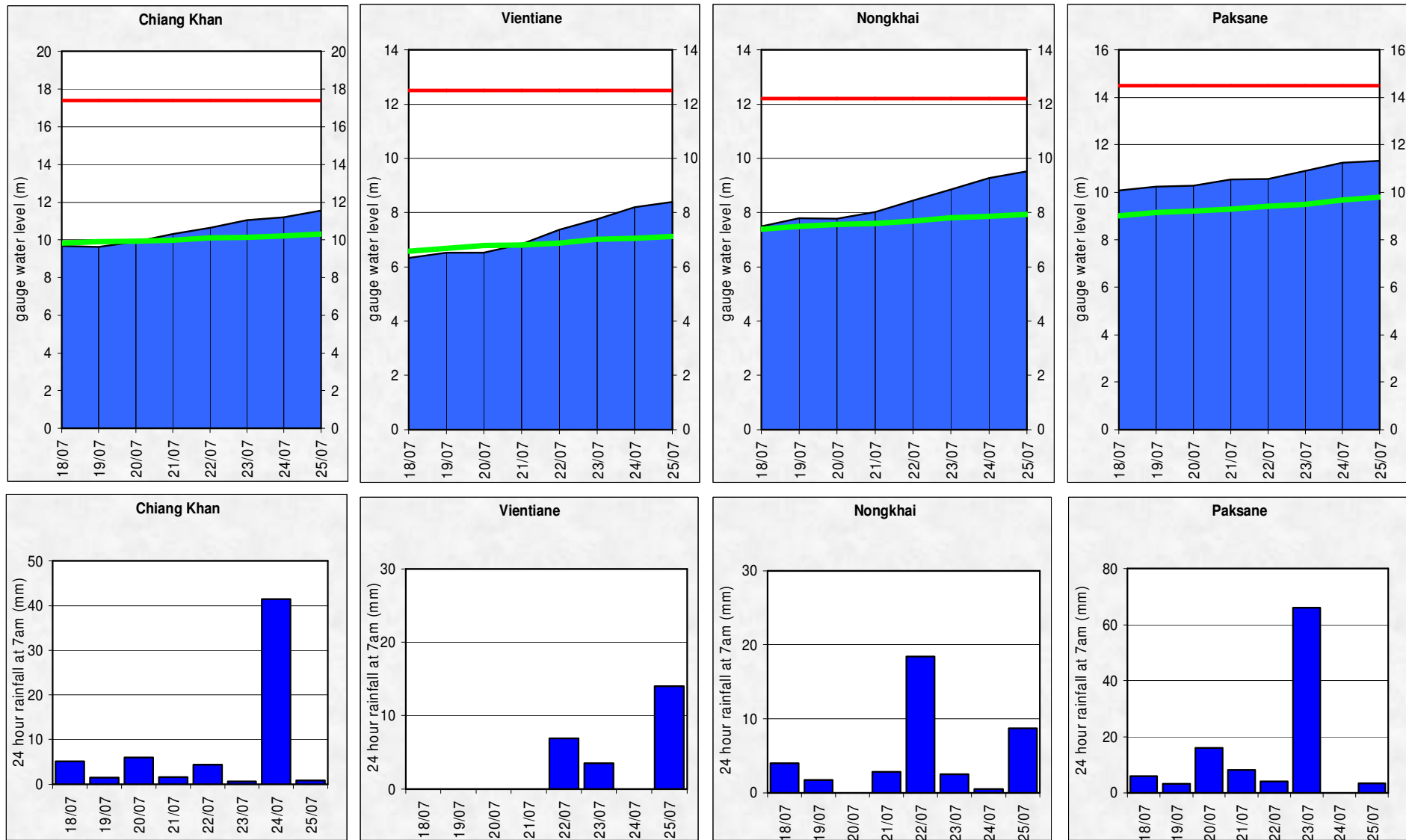


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

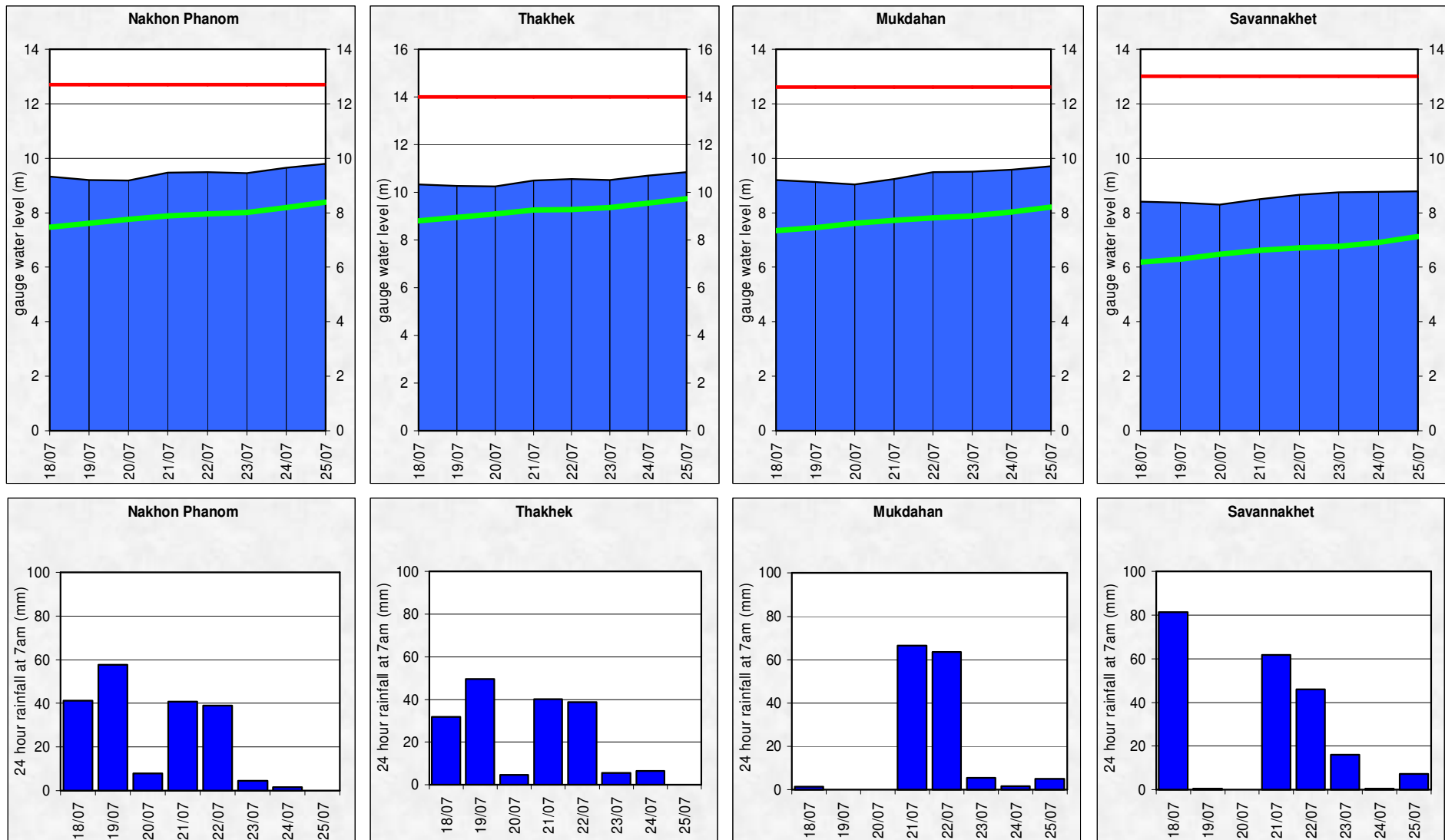


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

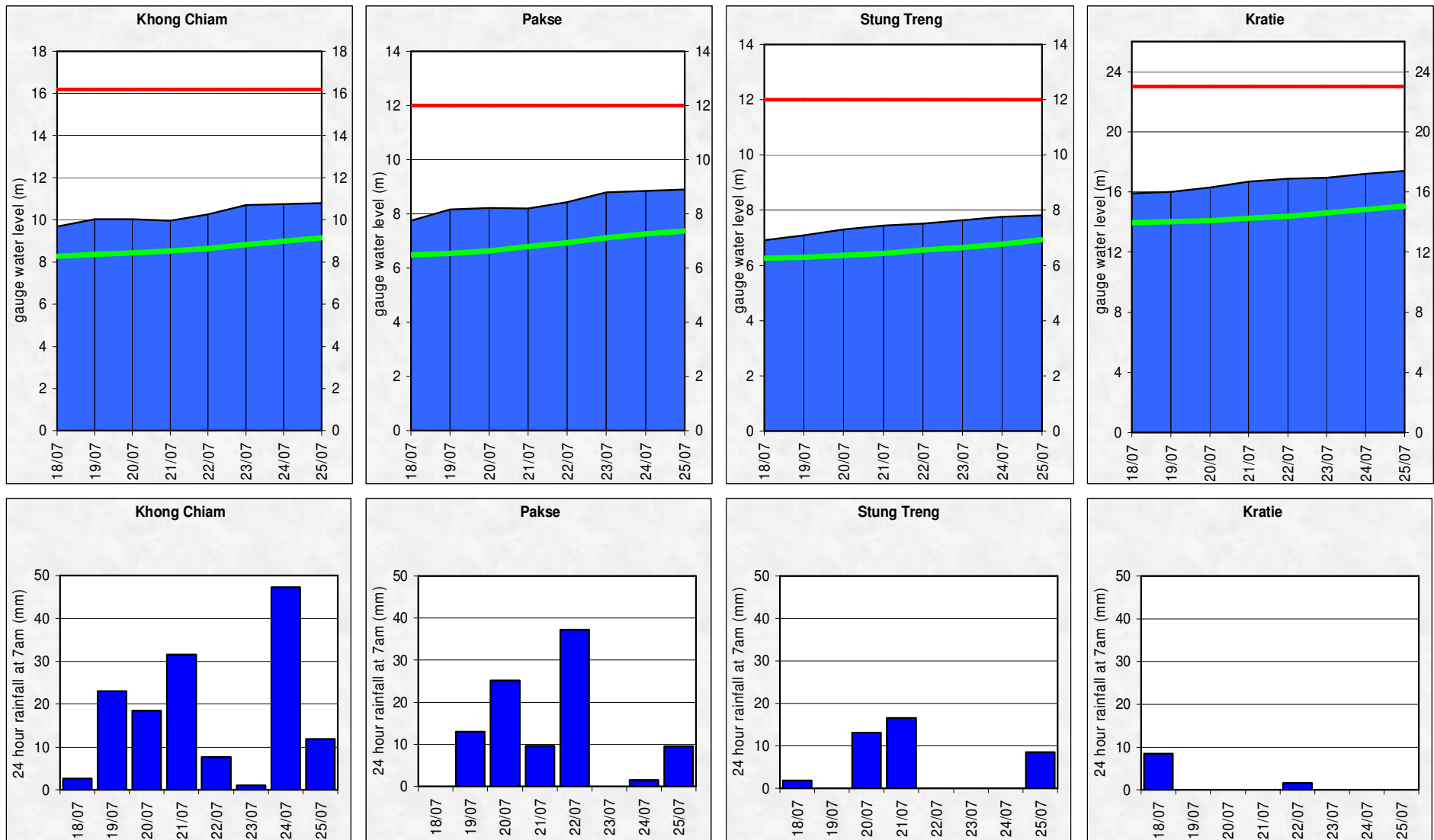


Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

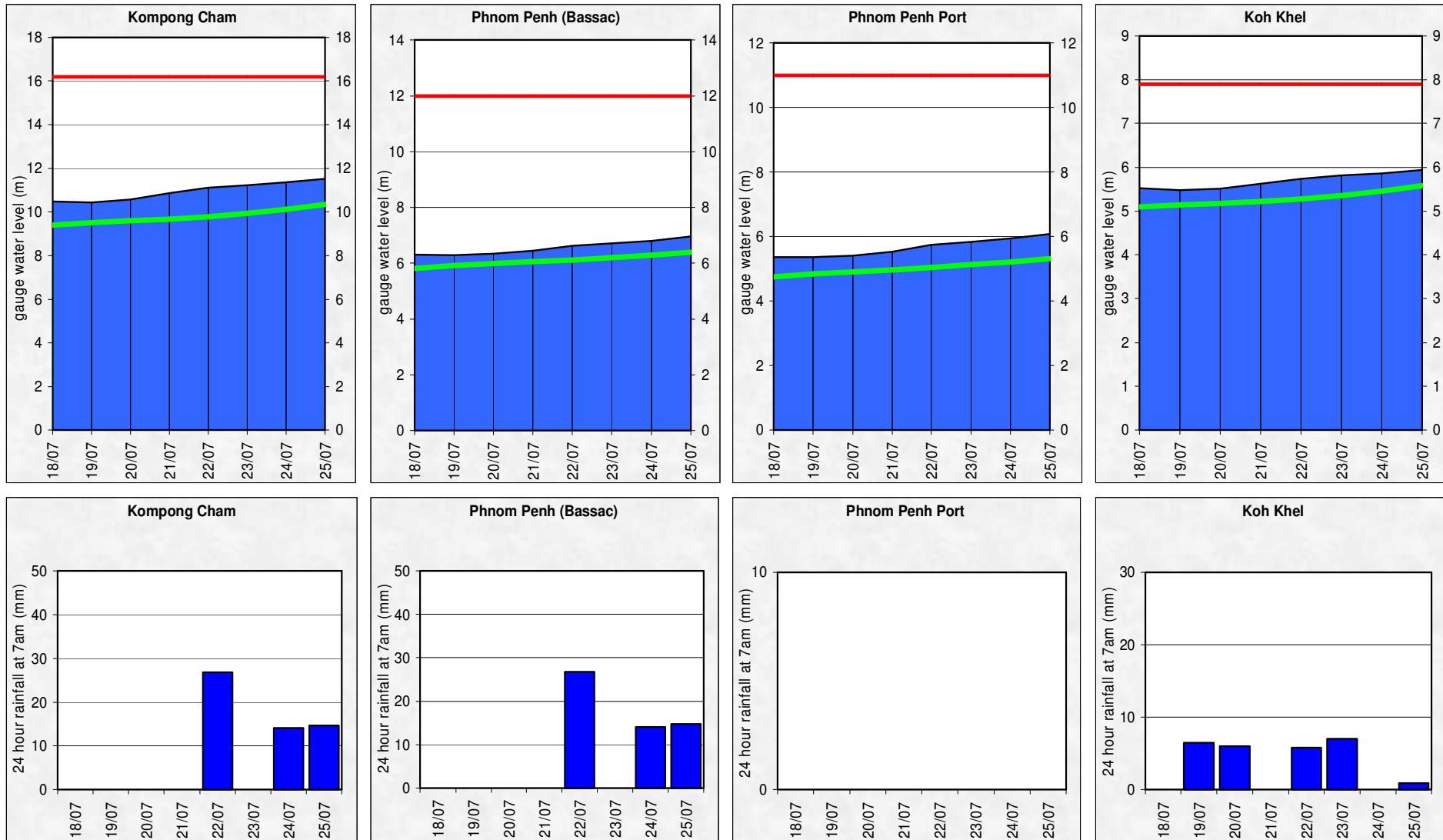
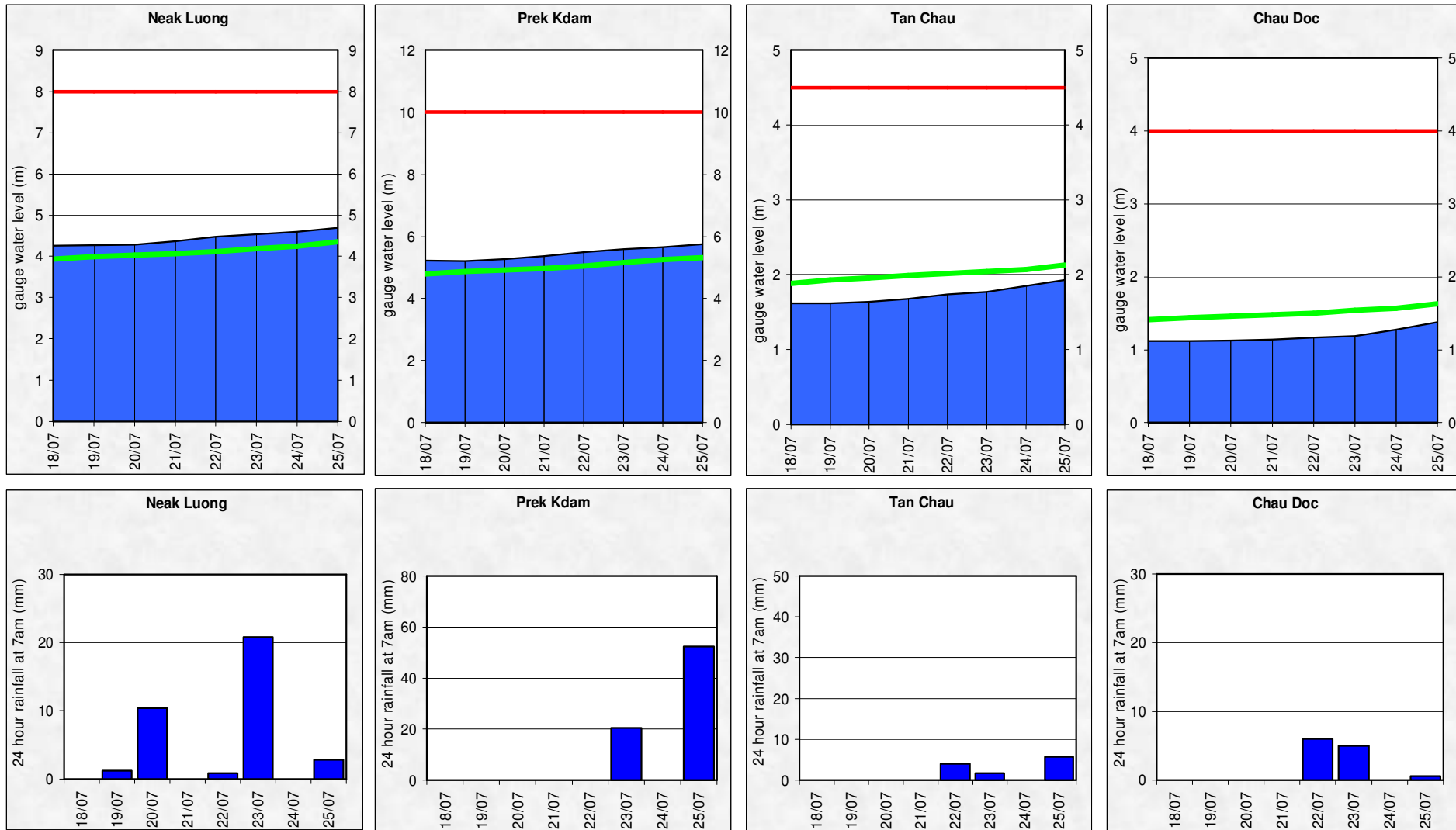


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

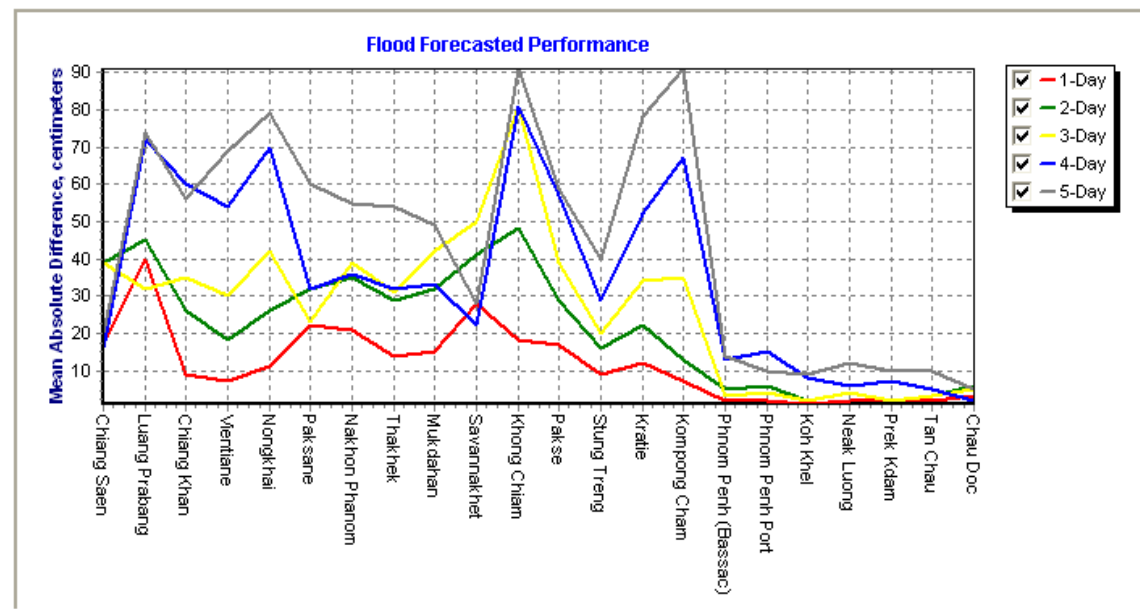
Accuracy

“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.

The graph of average difference between forecast and actual water levels for the past week shows the abnormal pattern, in which the accuracies at stations in the upper reach of LMB were better than in middle reach. In general, the overall accuracy is fairly good for 1-day to 3-day forecast lead time; however accuracies at Khong Chiam and Kompong Cham for 4-day and 5-day forecast were less than expected.

The above differences are due to two main factors: (1) by internal model functionality in forecasting for middle reach of the LMB especially at these stations, for which the parameter adjustment in the model is not possible; (2) the uncertainty of rainfall forecast from Numerical Weather Prediction model (NOAA).

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: Achievement of daily forecast against benchmarks

unit in %

	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	85.7	42.9	85.7	71.4	42.9	14.3	28.6	42.9	42.9	14.3	28.6	14.3	71.4	57.1	85.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	64.9
2-day	66.7	66.7	100.0	83.3	66.7	16.7	16.7	33.3	50.0	16.7	16.7	50.0	66.7	66.7	83.3	83.3	66.7	100.0	100.0	100.0	100.0	100.0	83.3	100.0	65.2
3-day	60.0	80.0	80.0	40.0	40.0	80.0	20.0	40.0	40.0	40.0	0.0	40.0	80.0	40.0	80.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.4
4-day	100.0	50.0	25.0	50.0	25.0	75.0	75.0	75.0	75.0	100.0	0.0	50.0	100.0	75.0	75.0	25.0	100.0	75.0	100.0	100.0	100.0	100.0	100.0	100.0	70.5
5-day	100.0	33.3	33.3	33.3	33.3	33.3	66.7	33.3	66.7	100.0	33.3	66.7	100.0	0.0	33.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.7

Table B2: Benchmarks of success (Indicator of accuracy in mean absolute error)

Unit in cm

	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	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	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 5 days including the current report date

	Flood Forecast: time sent				Arrival time of input data (average)							Missing data (number)						
	FF completed and sent (time)	stations without forecast	FF2 completed and sent (time)	Weather information available (number)	NOAA data	China	Cambodia - DHRW	Cambodia - DOM	Lao PDR - DMH	Thailand - DWR	Viet Nam - NCHMF	NOAA data	China	Cambodia - DHRW	Cambodia - DOM	Lao PDR - DMH	Thailand - DWR	Viet Nam - NCHMF
2011																		
<i>week</i>	10:33	0	-	3	08:12	08:03	07:39	06:04	08:58	07:46	07:05	0	4	0	38	133	1	28
<i>month</i>	10:35	0	-	15	08:12	07:45	07:33	06:26	09:05	07:43	07:12	1	14	6	294	514	4	134
<i>season</i>	10:23	1	-	38	08:12	08:30	07:32	06:11	09:04	07:52	07:13	1	16	35	656	1043	16	309

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.

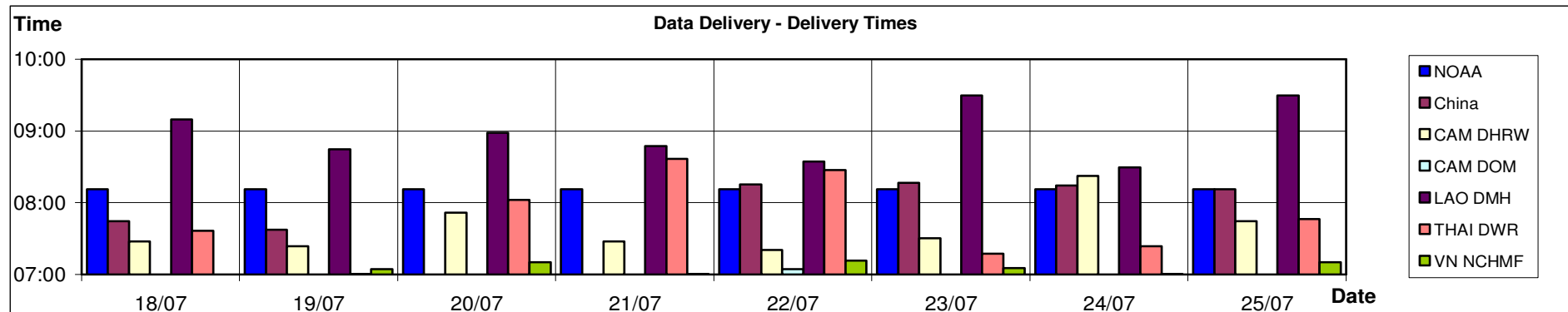


Figure B2: Data delivery times for the past 8 days including the current report date

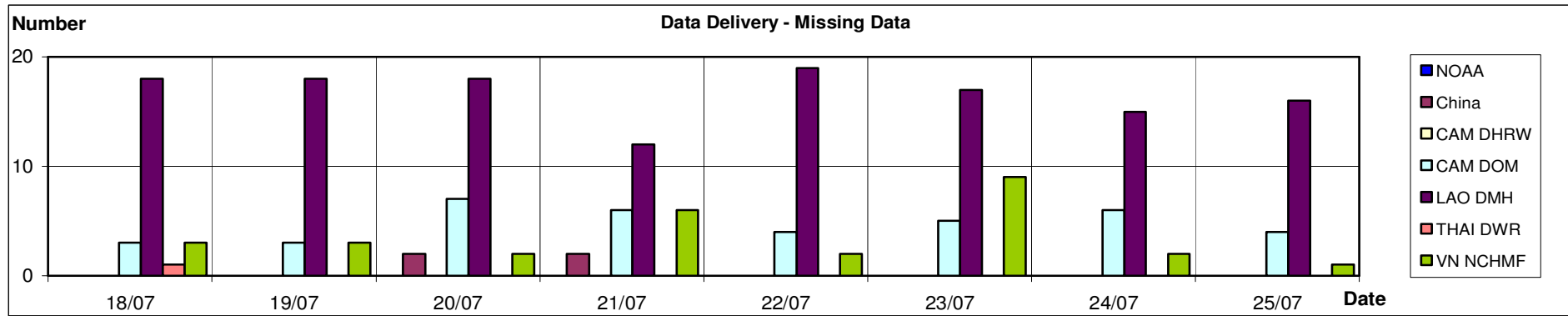


Figure B3: Missing data for the past 8 days including the current report date

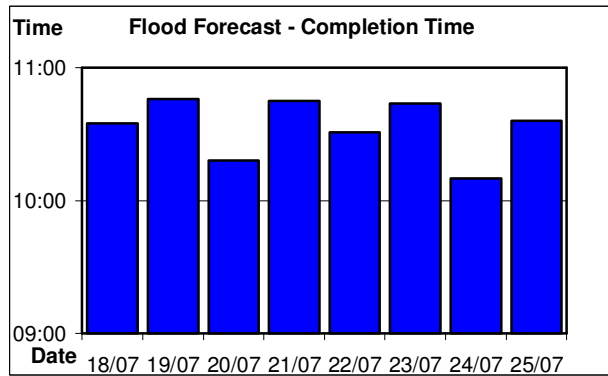


Figure B4: Flood forecast completion time

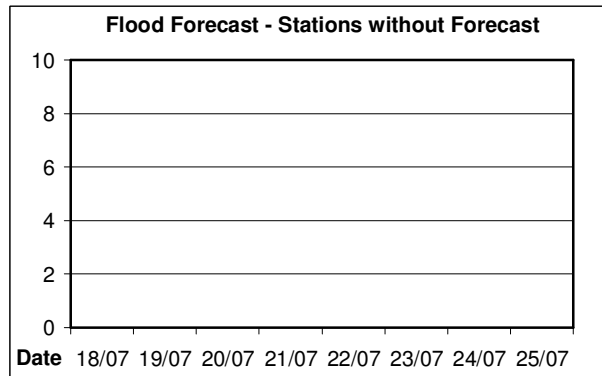


Figure B5: Flood forecast stations without forecast

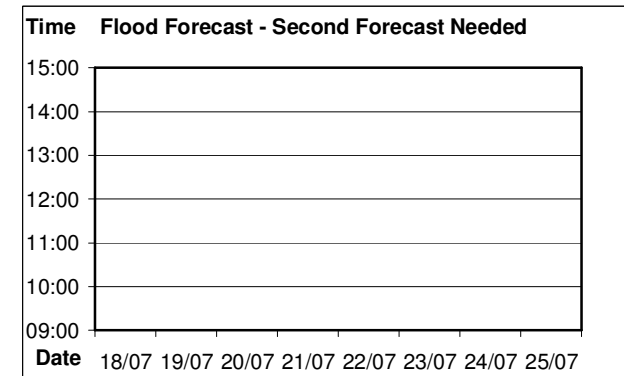


Figure B6: Second forecast needed

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

