

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 23/07/2012, covering the week from the 16th July to the 22nd July 2012

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

General weather patterns

During the week of the 16th July to 22nd July 2012, four weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 16th July and 20th July bulletins are presented in the figures below:

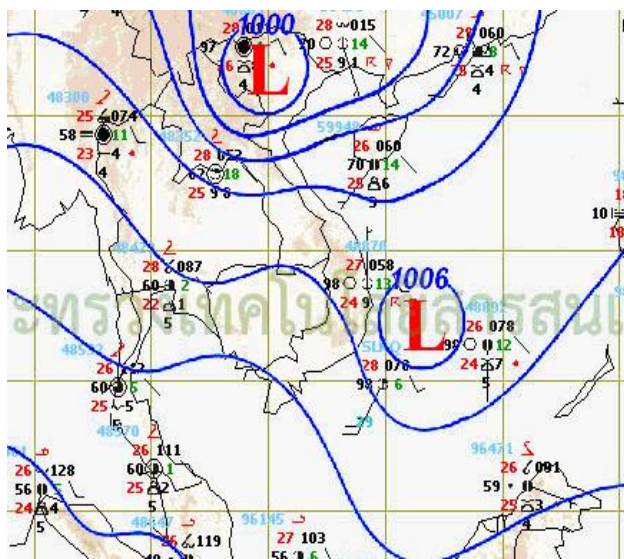


Figure 1: Weather map for 16th July 2012

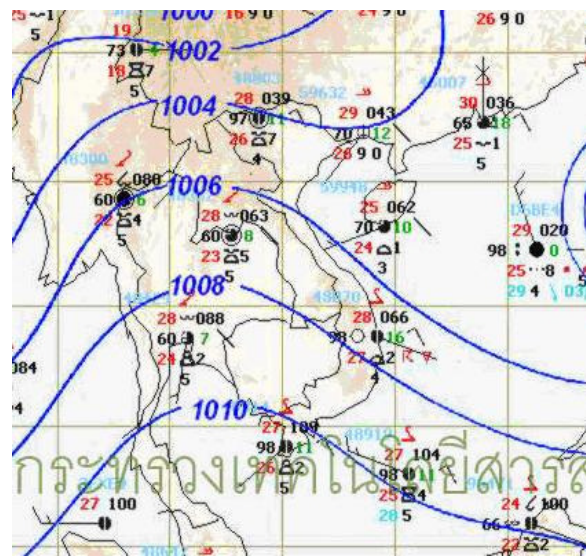


Figure 2: Weather map for 20th July 2012

South-West (SW) Monsoon

Moderate SW monsoon prevailed over Amندا Sea and the Gulf of Thailand and was stationary in the whole last week (Figure 1 and 2).

Inter Tropical Convergence Zone (ITCZ)

No Inter Tropical Convergence Zone (ITCZ) was observed during the week.

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

No Tropical Storm, Typhoon or Tropical Depression has significant affected to the LMB in last 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 in the LMB. As a result of SW monsoon activity during the whole last week, thundershower with heavy rain occurred in the South, Northeast and the Western coast of Thailand, the North and the Central of Lao PDR and Vietnam, in the South, the Southwest, the East and the Central of Cambodia. Figure 3 illustrates rainfall amount distribution over the LMB, covering 17 – 22 July, in which heavy rain mostly occurred in some tributaries in the upper part from Chiang Saen to Paksane.

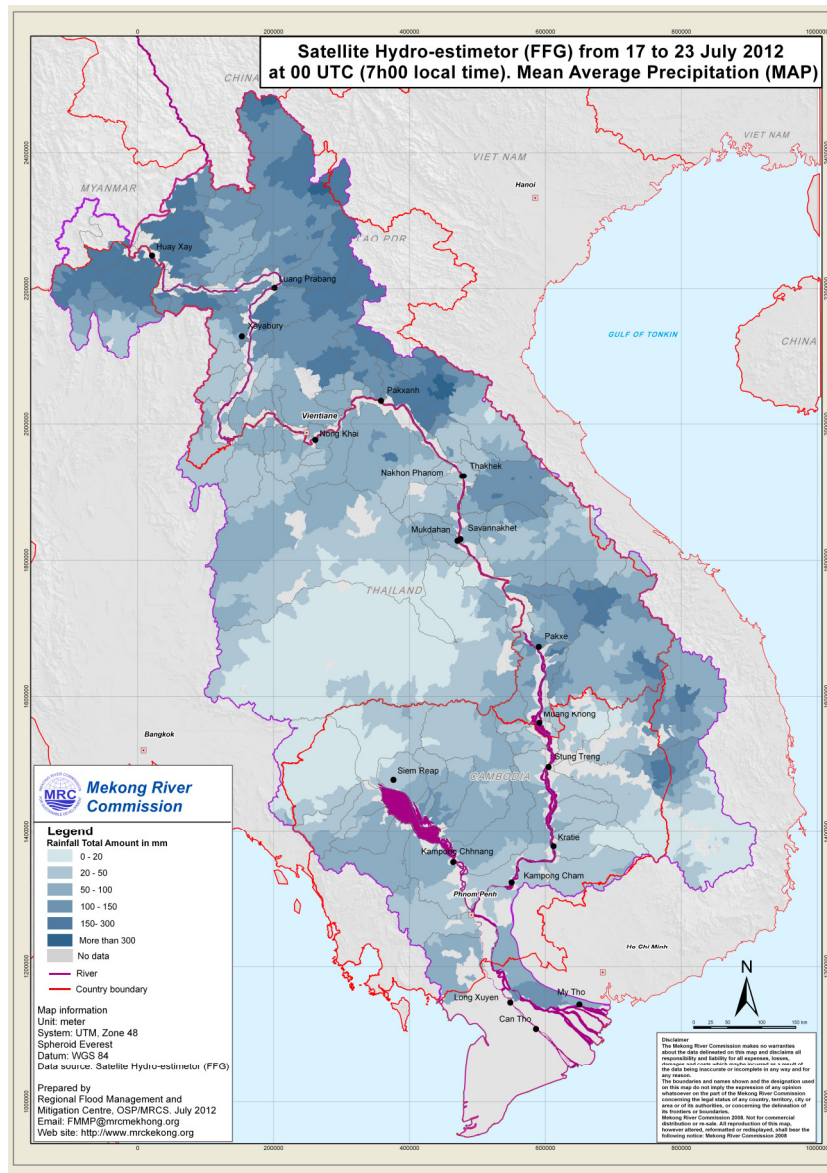


Figure 3: Rainfall distribution over the LMB, from 17th July to 23rd July, 2012

General behaviour of the Mekong River

Most stations along the Mekong river mainstream were recording levels that are below the long-term average during this time of the year. Water levels at stations in the upper part showed a rising and falling trend while water levels at stations in the middle and lower parts were decreasing or more-or-less stable with slightly falling trend in the reporting period.

Regarding to 2 stations in downstream at Tan Chau and Chau Doc, water levels at those 2 stations were decreasing and below the long term average in last week.

For stations from Chiang Saen to Vientiane/ Nong Khai

During the monitoring period, water levels at Chiang Saen and Luang Prabang showed a rising trend due to rainfall occurrences in the upper part (Figure 3) while water levels at Chiang Khan, Vientiane/Nong Khai were falling in the most of time in last week and were rising quickly at the end of the week. These stations were recording levels that are below the long-term average for this time of the year.

For stations from Paksane to Pakse

Water levels showed a decreasing trend during last week. These stations were recording levels that are below the long-term average for this time of the year.

For stations from Stung Treng to Kompong Cham

Water levels were more-or-less stable in the first half of the week, then slightly decreasing till the end of the week. These stations were recording levels that are somewhat below the long-term average for this time of the year.

For stations from Phnom Penh to Koh Khel/Neak Luong

Water levels at these stations were more-or-less stable with a slightly falling trend in the reporting period and below the long-term average for this time of the year.

Tan Chau and Chau Doc

Water levels showed a falling trend during last 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

2012	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
16/07	534.73	2.80	6.52	7.18	3.98	4.75	7.40	6.65	7.76	6.55	5.48	7.10	5.59	5.76	14.04	9.07	5.39	4.49	4.84	3.64	4.41	1.61	1.42
17/07	534.74	3.03	6.59	7.10	3.89	4.68	7.18	6.37	7.50	6.36	5.01	7.08	5.54	5.64	13.70	8.78	5.26	4.35	4.73	3.51	4.31	1.54	1.34
18/07	534.74	2.83	6.17	7.00	3.80	4.61	6.94	6.00	7.38	6.06	4.75	6.95	5.49	5.73	13.59	8.57	5.15	4.25	4.62	3.45	4.21	1.44	1.31
19/07	534.74	3.01	6.27	6.92	3.69	4.46	6.80	5.72	6.90	5.74	4.61	6.69	5.25	5.84	13.85	8.60	5.15	4.25	4.60	3.44	4.19	1.34	1.16
20/07	534.74	4.02	7.47	6.63	3.64	4.38	6.64	5.48	6.70	5.49	4.52	6.38	5.10	5.62	13.84	8.76	5.23	4.34	4.67	3.48	4.26	1.26	1.00
21/07	534.73	4.48	7.98	6.62	3.50	4.16	6.56	5.28	6.47	5.29	4.22	6.10	4.82	5.39	13.55	8.64	5.23	4.34	4.68	3.55	4.28	1.20	0.83
22/07	534.73	4.28	8.63	7.38	3.35	4.01	6.34	5.11	6.30	5.12	4.05	5.92	4.60	5.21	13.20	8.37	5.16	4.25	4.61	3.52	4.23	1.17	0.81
23/07	534.73	3.66	8.87	8.05	4.00	4.45	6.16	4.87	6.06	4.93	3.82	5.71	4.45	5.06	12.84	8.11	5.08	4.20	4.54	3.45	4.16	1.12	0.77
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

2012	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
16/07	4.00	4.50	nr	nr	nr	nr	nr	1.00	2.20	6.30	3.60	nr	nr	nr	nr	1.00	nr		nr	nr	nr	3.30	
17/07	20.0	5.5	nr	nr	nr	nr	nr	2.0	3.3	11.0	12.8	nr	nr	22.0	nr	nr	nr		14.3	16.8	nr	0.0	
18/07	19.0	17.4	2.4	nr	2.0	1.1	2.2	nr	4.7	nr	nr	nr	nr	33.0	70.0	12.8	10.4		7.2	59.2	7.3		
19/07	8.0	18.9	15.8	nr	nr	nr	40.2	44.6	33.7	nr	nr	1.7	nr	5.0	3.4	9.8	10.7		19.3	41.2	nr	5.1	26.1
20/07	19.0	34.0	13.6	0.4	3.3	nr	3.9	0.5	13.1	13.8	nr	nr	nr	2.0	2.2	0.3	nr		4.9	1.2	5.4	nr	
21/07	0.0	1.5	3.0	4.4	nr	nr	1.3	nr	nr	nr	nr	nr	nr	nr	17.0	0.0	50.3		1.2	14.8	5.2	34.0	3.0
22/07	0.0	11.4	nr	nr	nr	nr	nr	0.8	0.5	nr	nr	15.4	nr	4.0	5.0	8.2	nr		nr	nr	nr	32.2	1.0
23/07	8.00	8.70	nr	nr	nr	nr	6.00	0.50	0.50	nr	nr	nr		nr	nr	nr	nr		nr	nr	nr	nr	

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

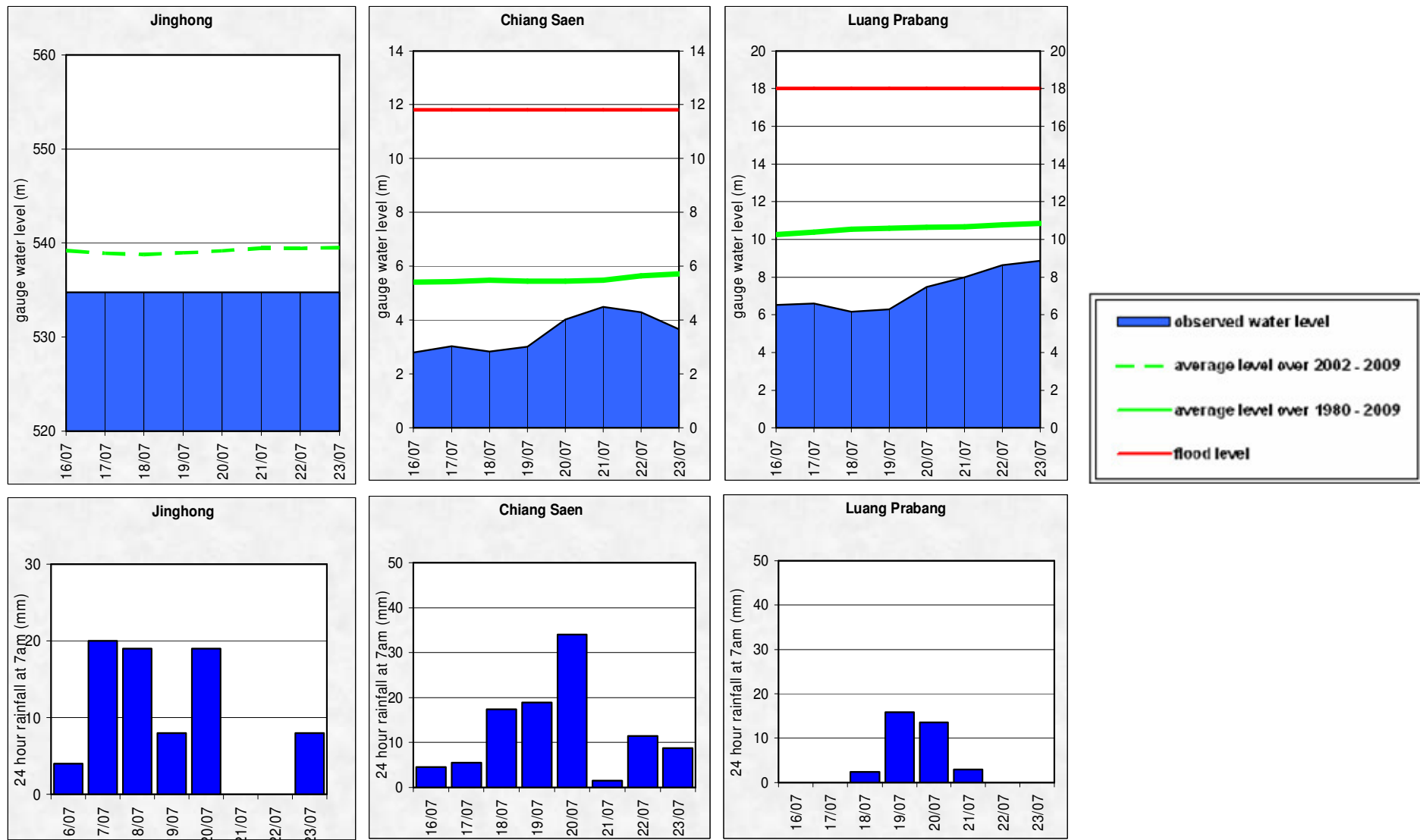


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

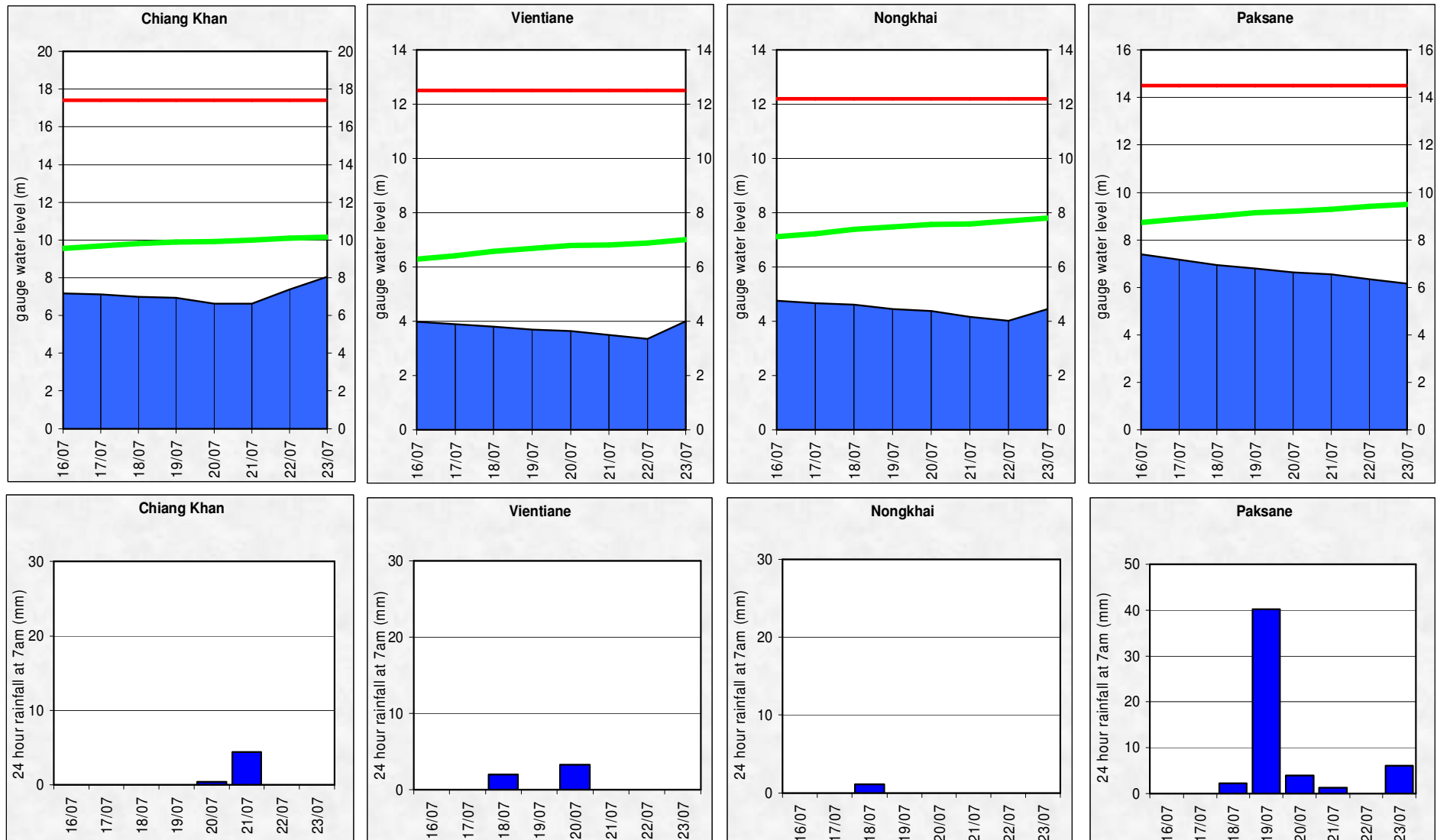


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

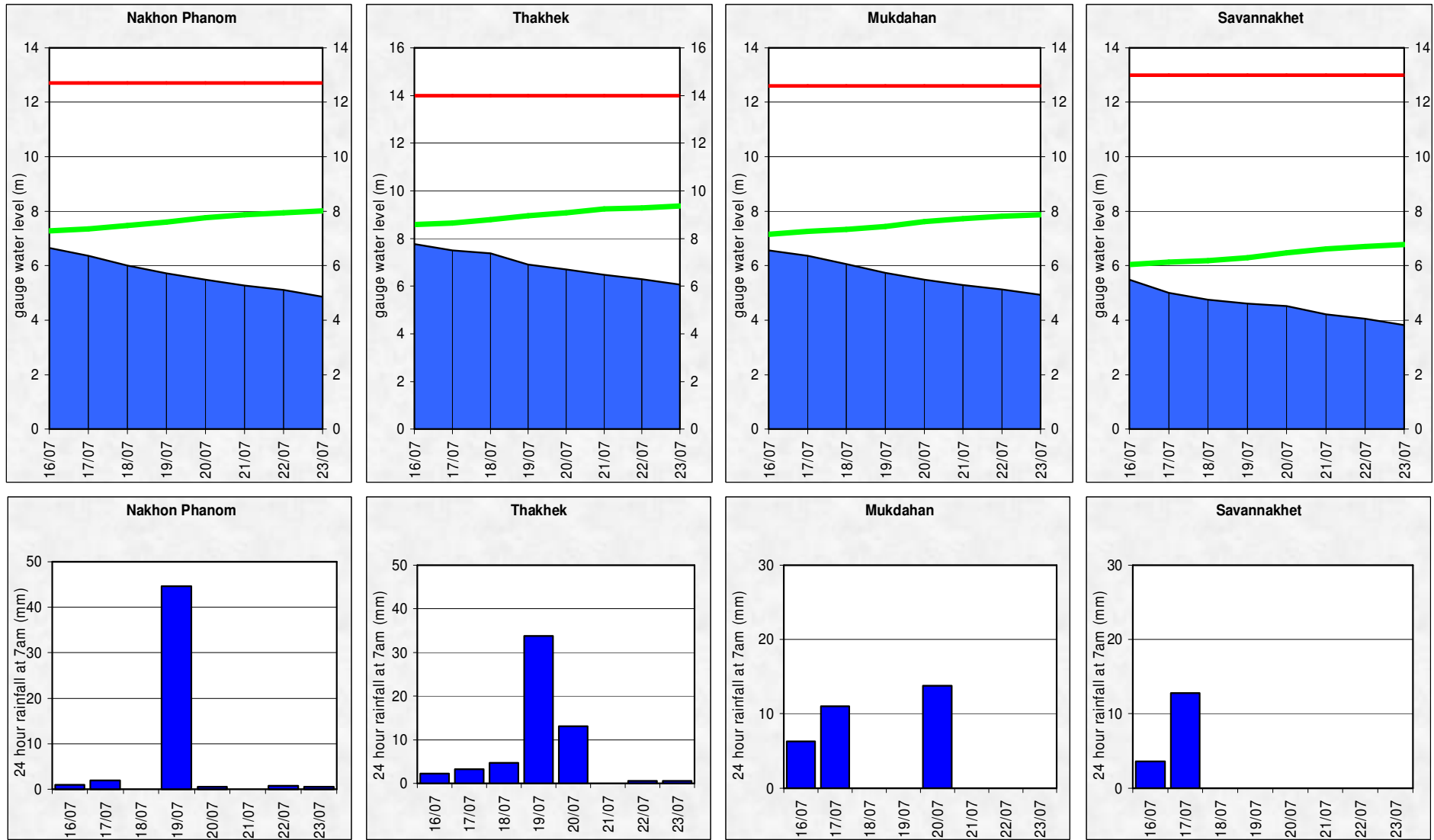


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

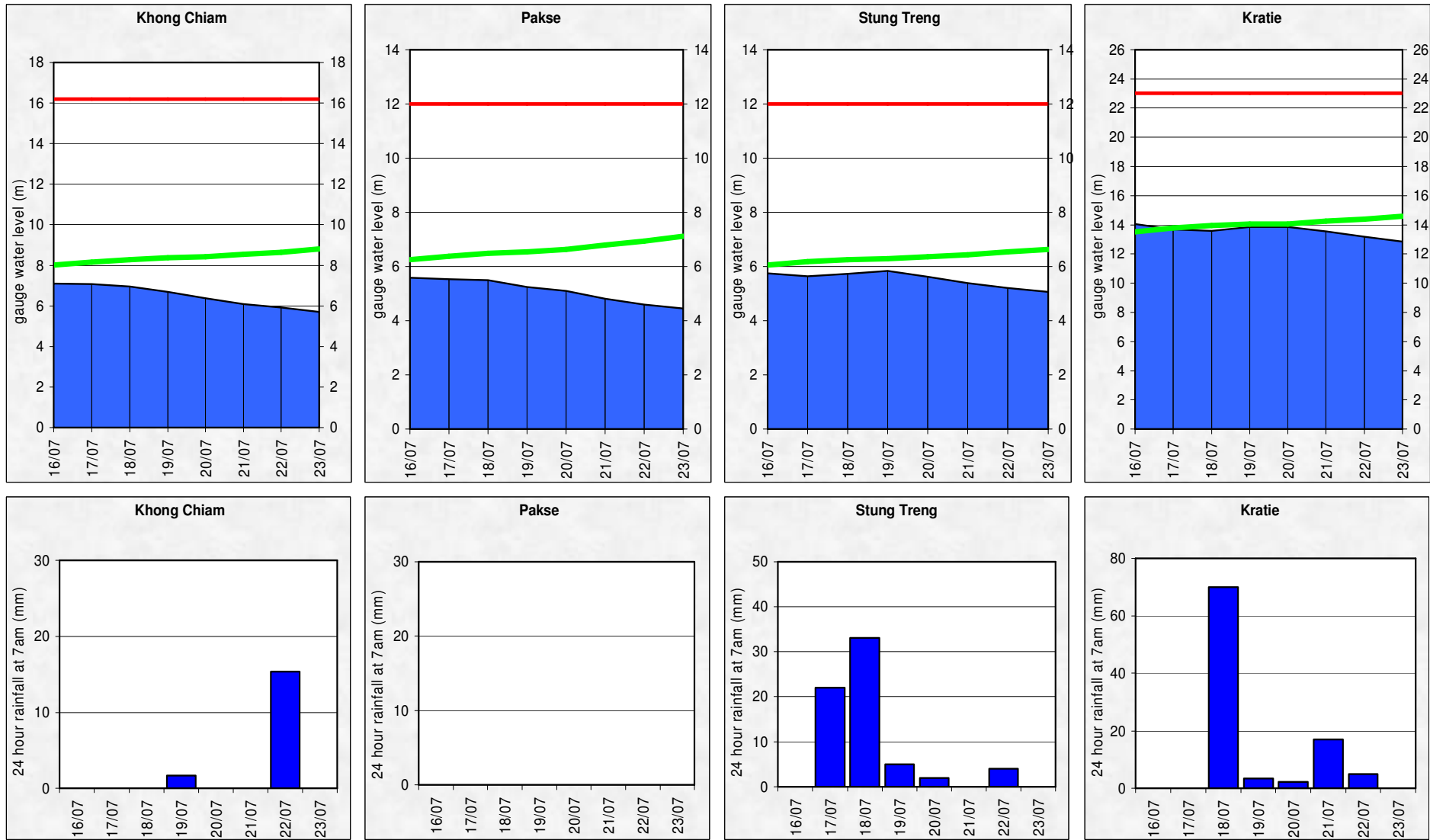


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

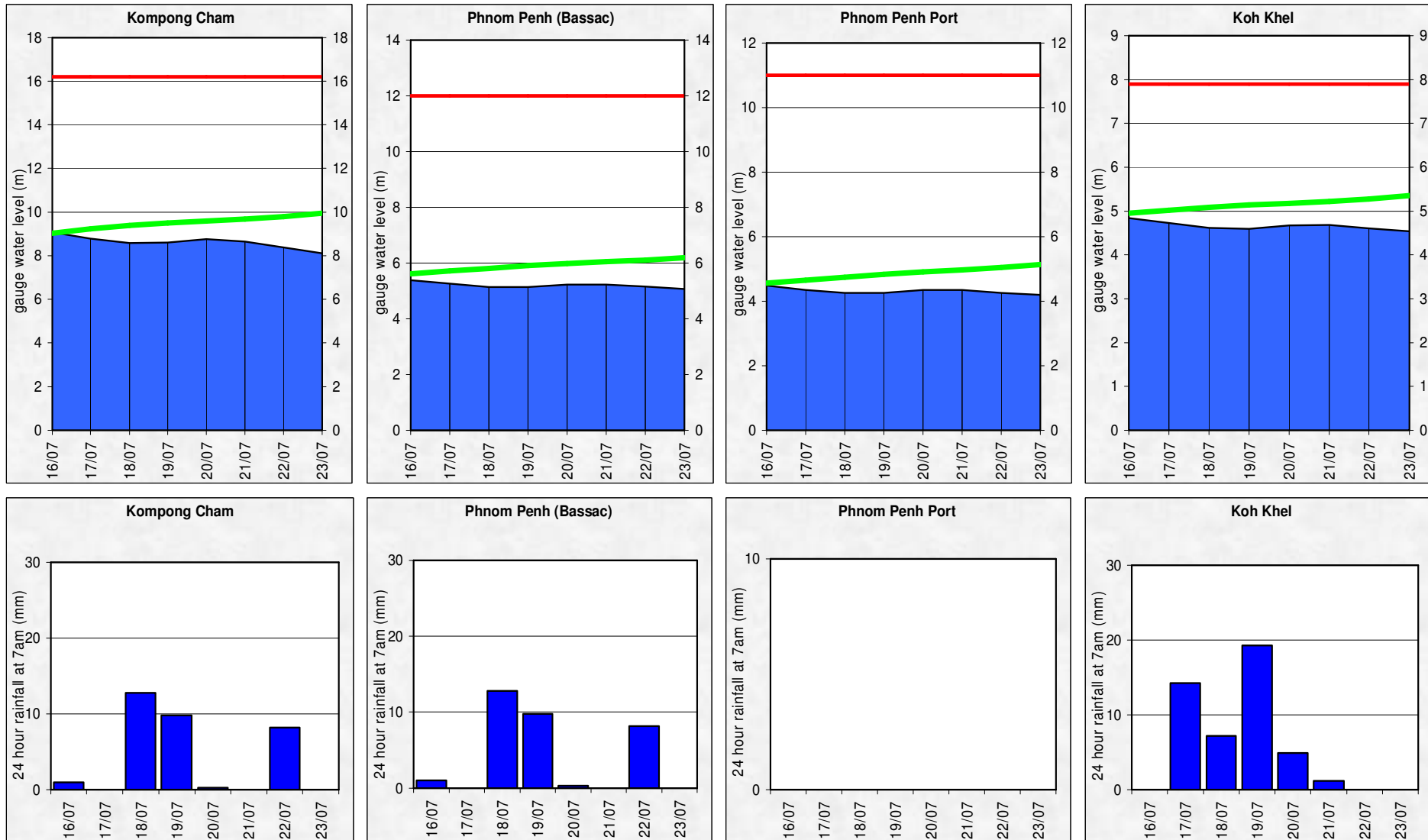
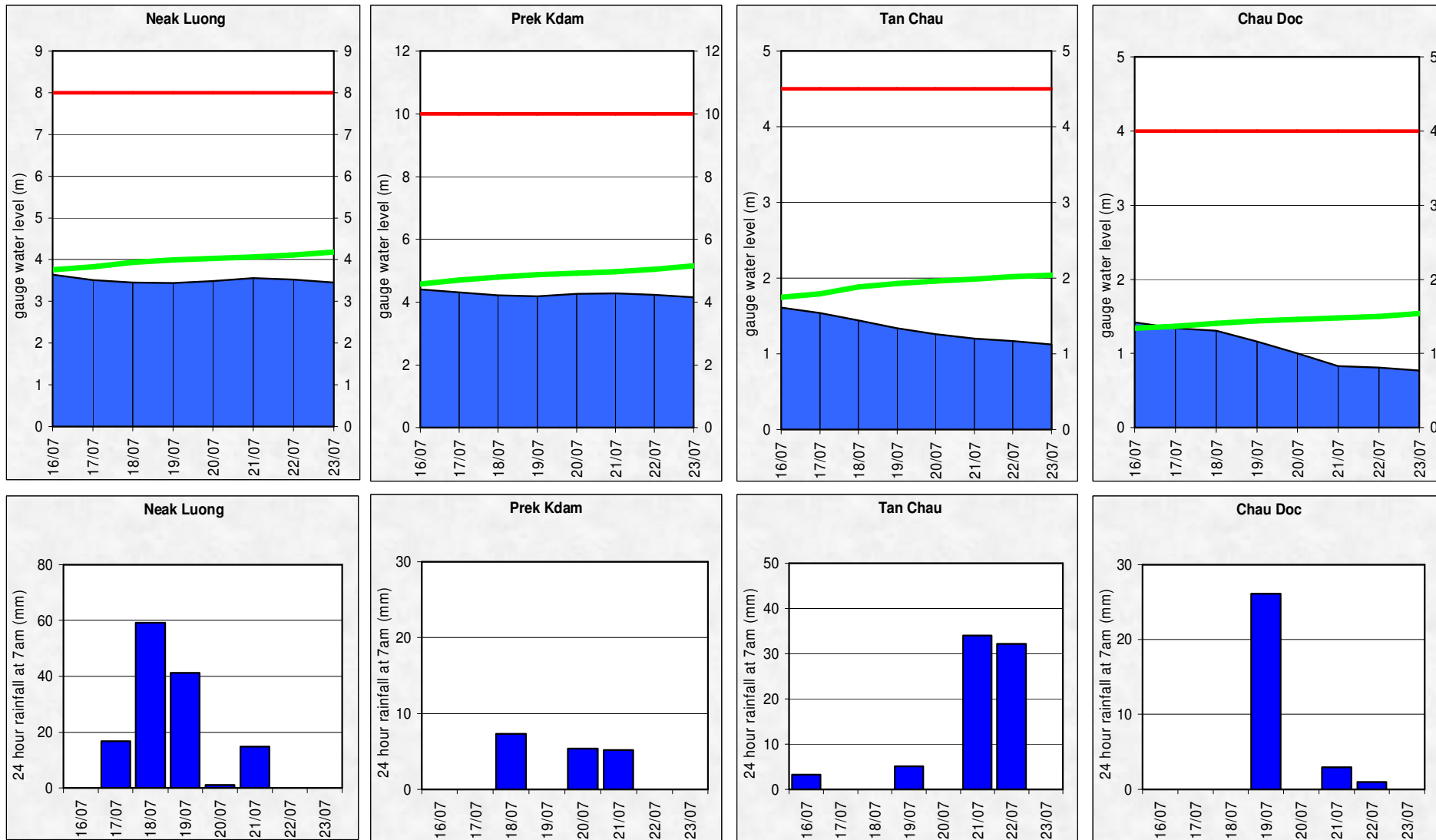


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

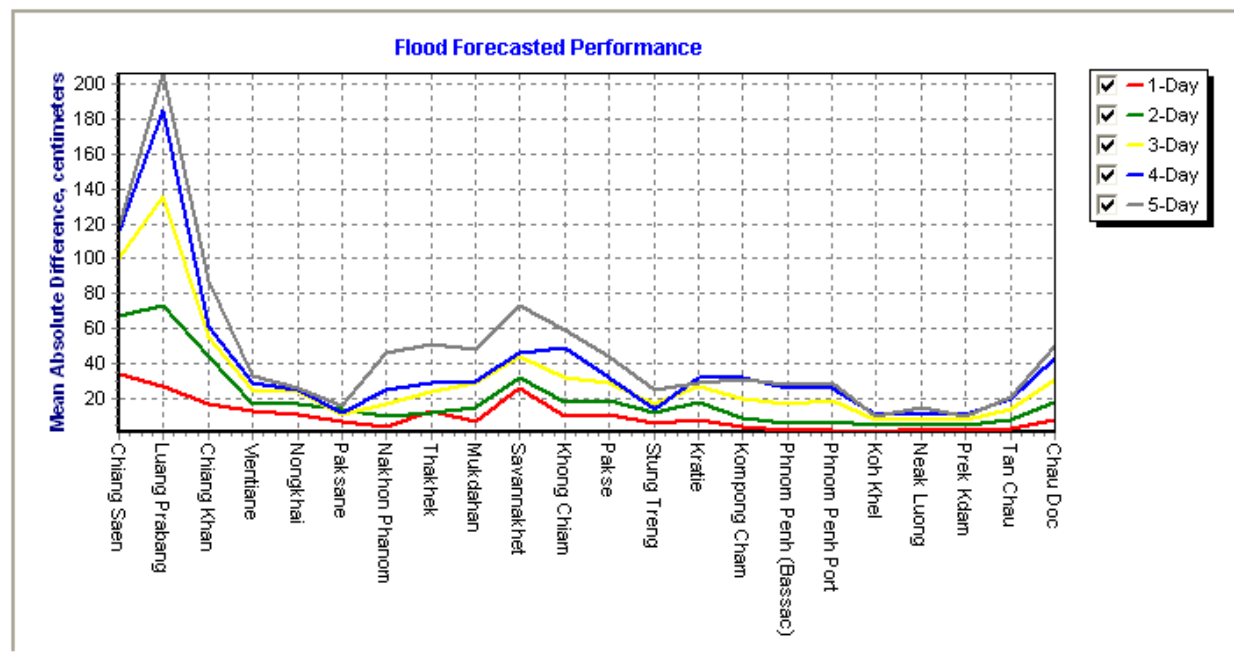
“Accuracy” describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model 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 normal pattern in which the accuracy is better if the forecast lead time is shorter.

In general, accuracies at most stations for almost forecast lead time are fairly good except at Luang Prabang in the upper reach and Chau Doc in the delta area where their accuracies for 3-day and 5-day forecast lead time were less than expected.

The above differences due to 2 main factors: (1) high variability of rainfall forecast from NWP; (2) internal model functionality in forecasting especially at those stations; for which the parameter adjustment in the model is not possible.

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	57.1	71.4	85.7	85.7	57.1	71.4	100.0	0.0	85.7	28.6	57.1	57.1	71.4	71.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	57.1	75.3
2-day	50.0	33.3	66.7	83.3	83.3	83.3	100.0	83.3	83.3	33.3	66.7	66.7	83.3	66.7	100.0	83.3	83.3	83.3	83.3	83.3	66.7	66.7	33.3	72.7
3-day	20.0	0.0	60.0	60.0	60.0	100.0	80.0	60.0	40.0	20.0	40.0	60.0	80.0	40.0	60.0	20.0	20.0	60.0	60.0	60.0	20.0	0.0	0.0	46.4
4-day	25.0	25.0	25.0	100.0	100.0	100.0	75.0	100.0	75.0	75.0	50.0	75.0	100.0	100.0	100.0	0.0	50.0	75.0	100.0	100.0	0.0	0.0	0.0	65.9
5-day	33.3	0.0	0.0	66.7	66.7	100.0	66.7	33.3	66.7	0.0	33.3	66.7	100.0	66.7	66.7	0.0	33.3	100.0	100.0	100.0	66.7	0.0	0.0	53.0

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	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 5 days including the current report date

2012	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
<i>week</i>	10:27	0	-	4	07:49	08:03	07:17	06:16	08:28	07:11	07:39	0	0	1	13	103	3	142
<i>month</i>	10:32	1	-	17	07:22	07:56	07:19	05:58	08:46	07:10	07:15	1	0	2	86	626	8	427
<i>season</i>	10:37	1	-	32	07:17	08:00	07:25	06:09	08:50	07:22	07:17	1	0	71	548	989	10	712

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.

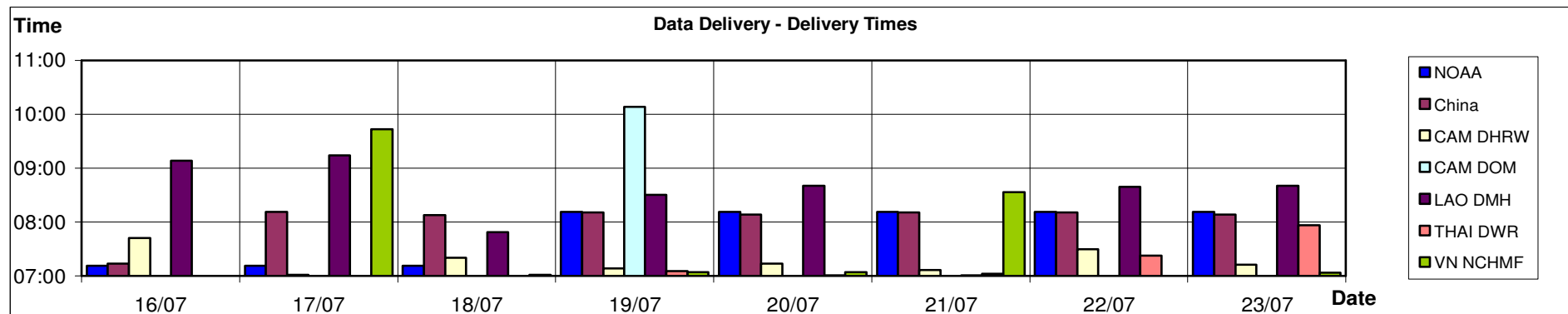


Figure B2: Data delivery times for the past 8 days including the current report date

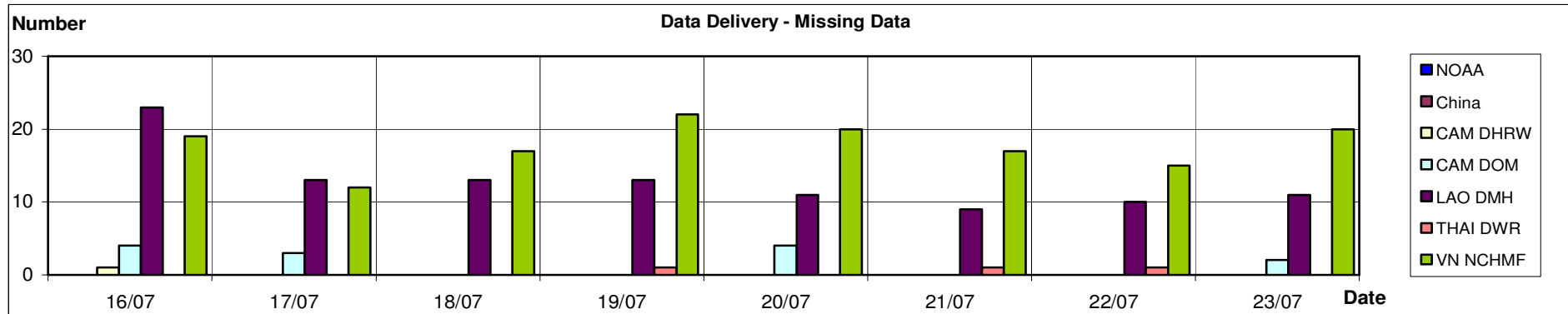


Figure B3: Missing data for the past 8 days including the current report date

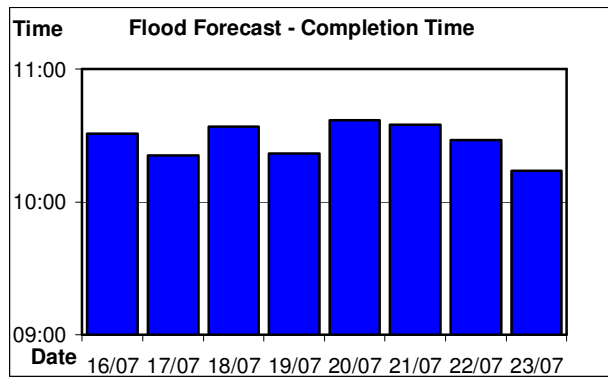


Figure B4: Flood forecast completion time

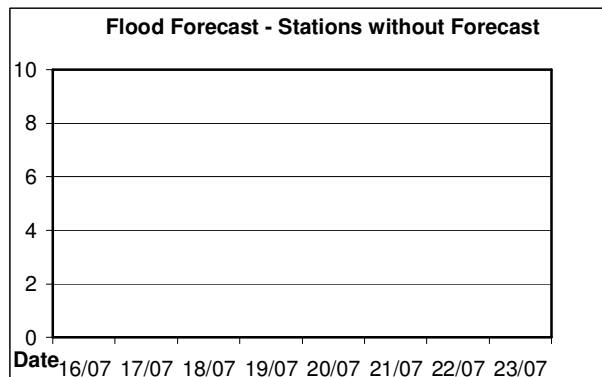


Figure B5: Flood forecast stations without forecast

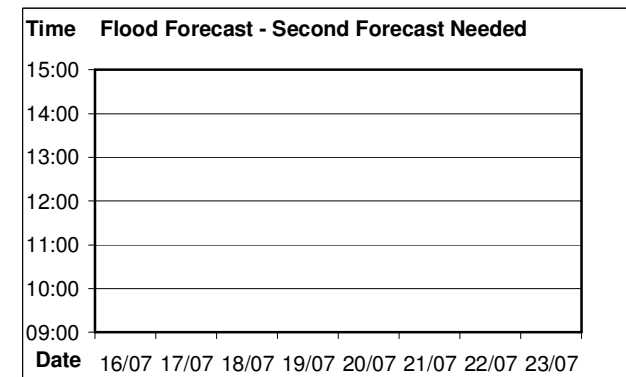
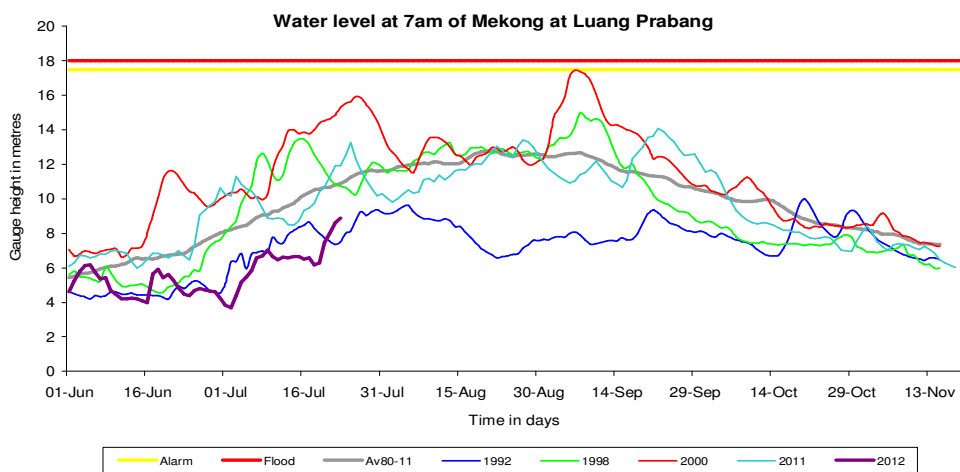
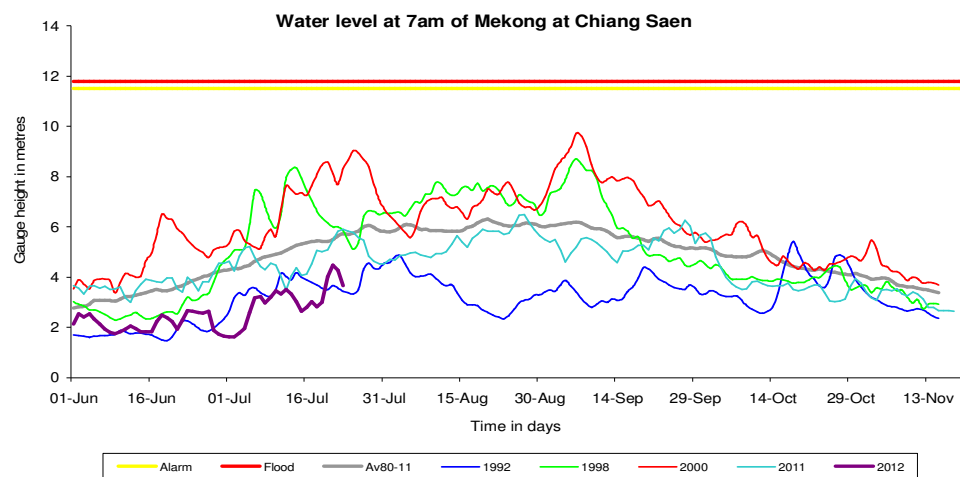
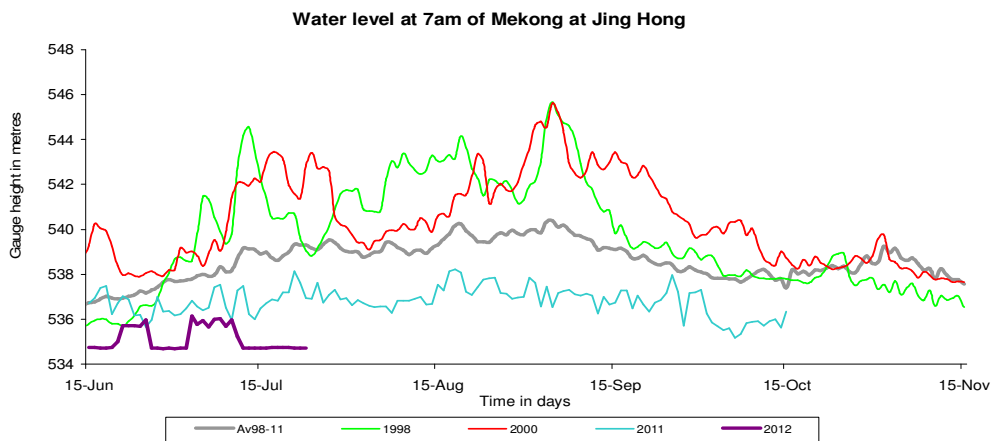


Figure B6: Second forecast needed

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 Khan

