

### Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 23/06/2014, covering the week from the 16<sup>th</sup> to 23<sup>rd</sup> of June 2014

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

##### General weather patterns

During the week of 16<sup>th</sup> June to 23<sup>rd</sup> June 2014 three weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps of the 16<sup>th</sup> and 20<sup>th</sup> of June 2014 are presented in the figures 1&2 below:

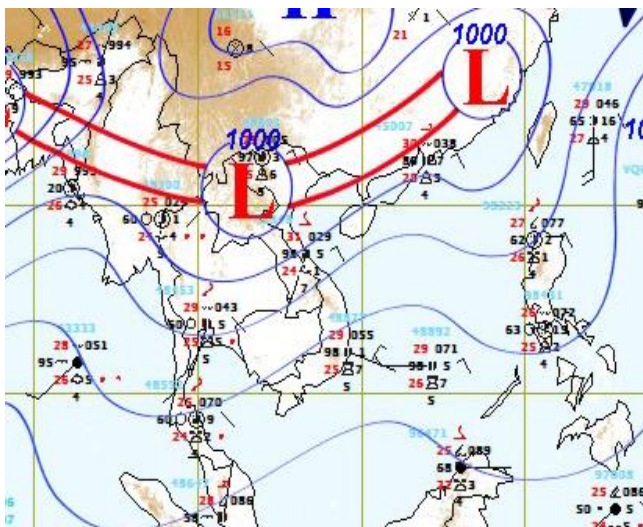


Figure 1: Weather map for 16<sup>th</sup> June 2014

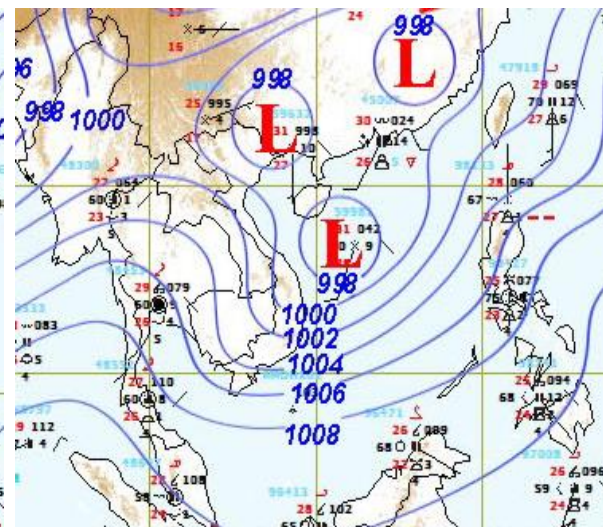


Figure 2: Weather map for 20<sup>th</sup> June 2014

##### Moderate South-West (SW) Monsoon

The Southwest Monsoon Southwest monsoon prevails over Myanmar, the Andaman Sea, the Gulf of Thailand, Thailand and Indochina Peninsular (Figure 2).

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

No TD, TS or TY have significant influenced the LMB during the last week.

##### Inter Tropical Convergence Zone (ITCZ)

The ITCZ lies across the middle of Myanmar, the upper Northeast of Thailand, the North of Lao PDR and Viet Nam

##### Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

##### Over weather situation

During the last week, the weather is influenced by ITCZ, trough of low pressure and Southwest Monsoon prevails over Myanmar, the Andaman Sea, the Gulf of Thailand, Thailand and Indochina Peninsular. Therefore, there are heavy rains at the middle of the Mekong River Basin; the accumulated total rainfall was occurred in the last week at Paksane (350 mm), Nakhon Phanom (245.5 mm), Thakhek (330.3 mm). See Table A2. Figure 3 shows weekly rainfall distribution over the LMB from 16<sup>th</sup>-23<sup>rd</sup> June 2014.

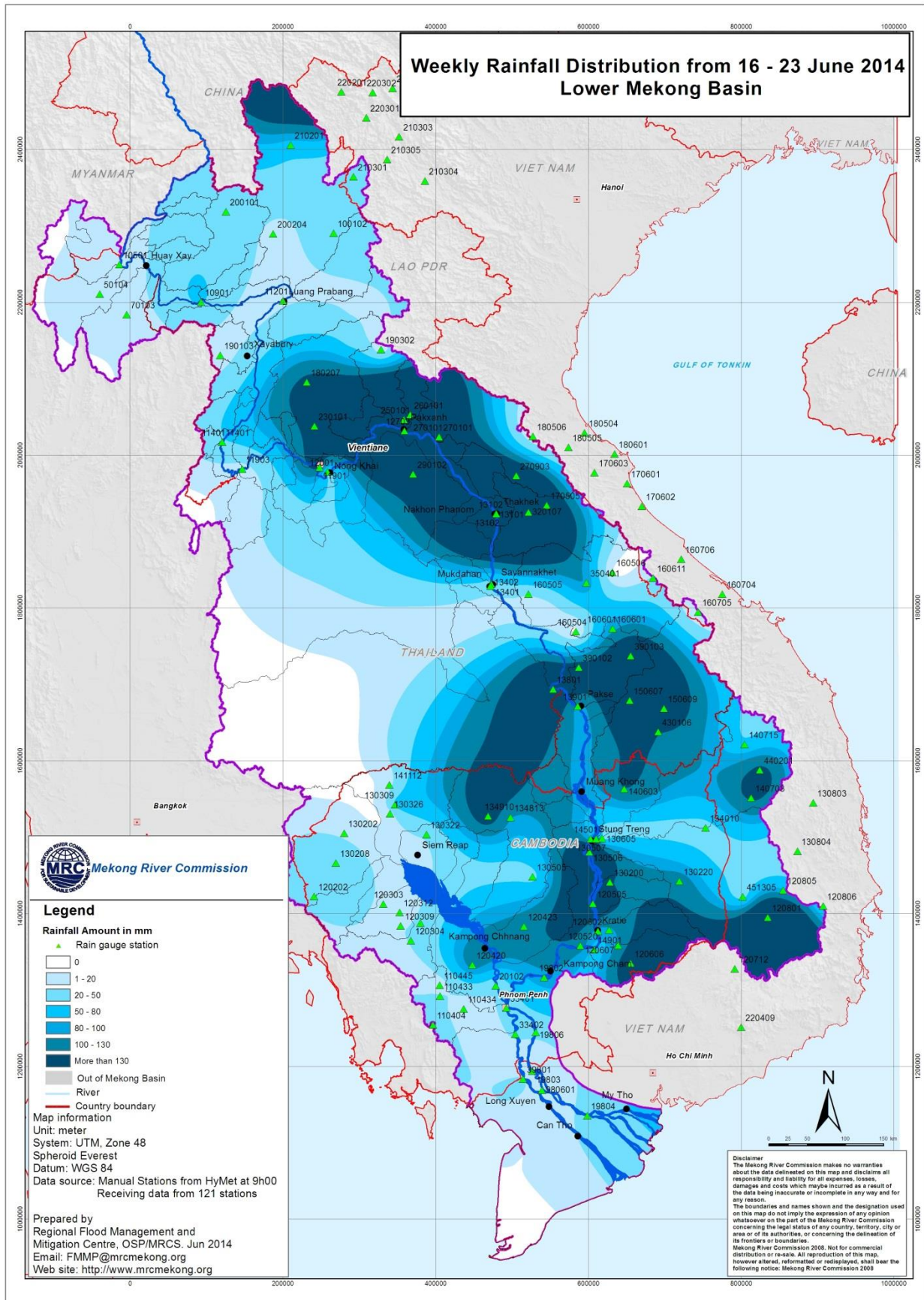


Figure 3: Weekly Rainfall Distribution over the LMB from 16 – 23 June, 2014

### **General behaviour of the Mekong River**

During the last week, the water levels at most stations in the upper and middle reaches were below the Long Time Average (LTA), while some stations from middle to downstream reaches were just or below the LTA. The water level at two stations in downstream Tan Chau and Chau Doc were below the LTA.

#### ***For stations from Chiang Saen and Luang Prabang***

Compared to the long term average (LTA), during the last week the water levels at these stations were below the LTA.

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

Compared to the long term average (LTA), during the last week the water levels at Vientiane, Nong Khai were below LTA, while at Chiang Khan and Paksane were just the LTA.

#### ***For stations from Thakhet/Nakon Phanom to Pakse***

Compared to the long term average (LTA), from the early to mid of last week, the water levels were below the LTA, then just or above the LTA

#### ***For stations from Stung Treng to Kompong Cham***

Compared to the long term average (LTA), during the last week the water levels from Stung Treng to Kratie were just above the LTA, while at Kompong Cham were below the LTA.

#### ***For stations from Phnom Penh to Koh Khel/Neak Luong***

Compared to the long term average (LTA), during the last week the water levels were below the LTA, except in Phnom Penh Bassac was above the LTA.

#### ***Tan Chau and Chau Doc***

Compared to the long term average (LTA), during the last week, the water levels at both stations were below the LTA.

**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 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

2014	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
16/06	536.72	3.47	5.85	6.14	2.40	3.02	5.00	3.48	4.83	4.14	2.72	4.75	3.59	4.28	10.55	5.42	2.97	2.03	2.88	2.04	2.08	0.29	0.17
17/06	536.34	3.46	5.93	6.29	2.65	3.28	4.92	3.56	4.85	4.18	2.98	4.70	3.58	4.37	10.66	5.62	3.14	2.15	3.01	2.17	2.24	0.39	0.26
18/06	536.01	3.43	6.06	6.37	2.88	3.56	5.10	3.64	5.00	4.17	3.15	4.67	3.57	4.45	10.90	5.77	3.24	2.25	3.08	2.28	2.31	0.48	0.38
19/06	536.02	3.23	6.08	6.44	3.10	3.67	5.92	4.38	5.64	4.42	3.15	4.72	3.60	4.62	11.12	5.97	3.32	2.33	3.12	2.36	2.39	0.55	0.42
20/06	535.97	2.90	6.03	6.48	3.16	3.77	6.00	5.06	6.29	4.97	3.45	4.76	3.65	4.59	11.33	6.13	3.36	2.37	3.13	2.38	2.43	0.59	0.42
21/06	535.66	2.80	5.96	6.50	3.16	3.80	5.80	5.02	6.29	5.22	3.57	5.21	3.96	4.54	11.34	6.24	3.42	2.43	3.13	2.38	2.48	0.64	0.48
22/06	535.71	2.73	5.60	6.41	3.14	3.77	5.60	4.68	5.85	5.02	3.64	5.88	4.63	4.60	11.33	6.26	3.40	2.45	3.18	2.35	2.48	0.73	0.60
23/06	536.07	2.51	5.30	6.31	3.12	3.72	5.58	4.52	5.77	4.79	3.72	6.13	5.32	5.19	11.60	6.30	3.42	2.47	3.19	2.32	2.51	0.93	0.90

Table A2: observed rainfall

Unit in mm

2014	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
16/06	0.0	4.5	nr	0.0	4.6	1.3	28.4	30.1	77.0	0.0	nr	16.0	nr	1.0	13.8	12.8	4.1	nr	5.3	0.6	7.3	14.3	4.0
17/06	0.5	0.6	5.6	2.5	36.4	28.0	91.4	8.2	47.3	10.6	1.2	3.3	nr	15.5	2.5	nr	nr	nr	5.5	0.0	nr	0.0	7.0
18/06	8.0	0.0	4.0	3.0	87.5	8.2	85.4	9.5	8.0	0.0	1.7	25.8	nr	17.5	nr	7.3	0.5	nr	13.5	18.6	nr	0.0	0.0
19/06	0.0	0.0	3.6	4.1	nr	2.4	62.3	1.1	0.4	16.1	17.6	36.5	27.2	nr	nr	11.7	6.5	nr	1.4	0.0	nr	0.0	0.0
20/06	0.0	0.0	nr	0.0	6.2	4.4	0.8	56.6	57.5	0.6	nr	1.0	29.7	2.0	9.0	nr	7.6	nr	nr	nr	nr	0.0	0.0
21/06	0.0	0.0	3.8	3.3	nr	0.0	4.0	14.0	13.0	3.8	8.4	7.2	39.2	2.5	1.5	52.3	0.9	nr	nr	0.0	nr	nr	5.0
22/06	0.0	0.0	nr	0.0	nr	0.0	nr	8.4	9.6	4.8	3.9	58.6	nr	10.0	36.0	2.4	2.1	nr	0.0	6.2	22.5	2.0	0.8
23/06	0.0	0.0	nr	0.0	nr	2.2	77.4	117.5	117.5	6.2	6.4	46.5	nr	80.0	10.0	6.4	9.9	nr	nr	2.2	nr	0.0	3.8



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

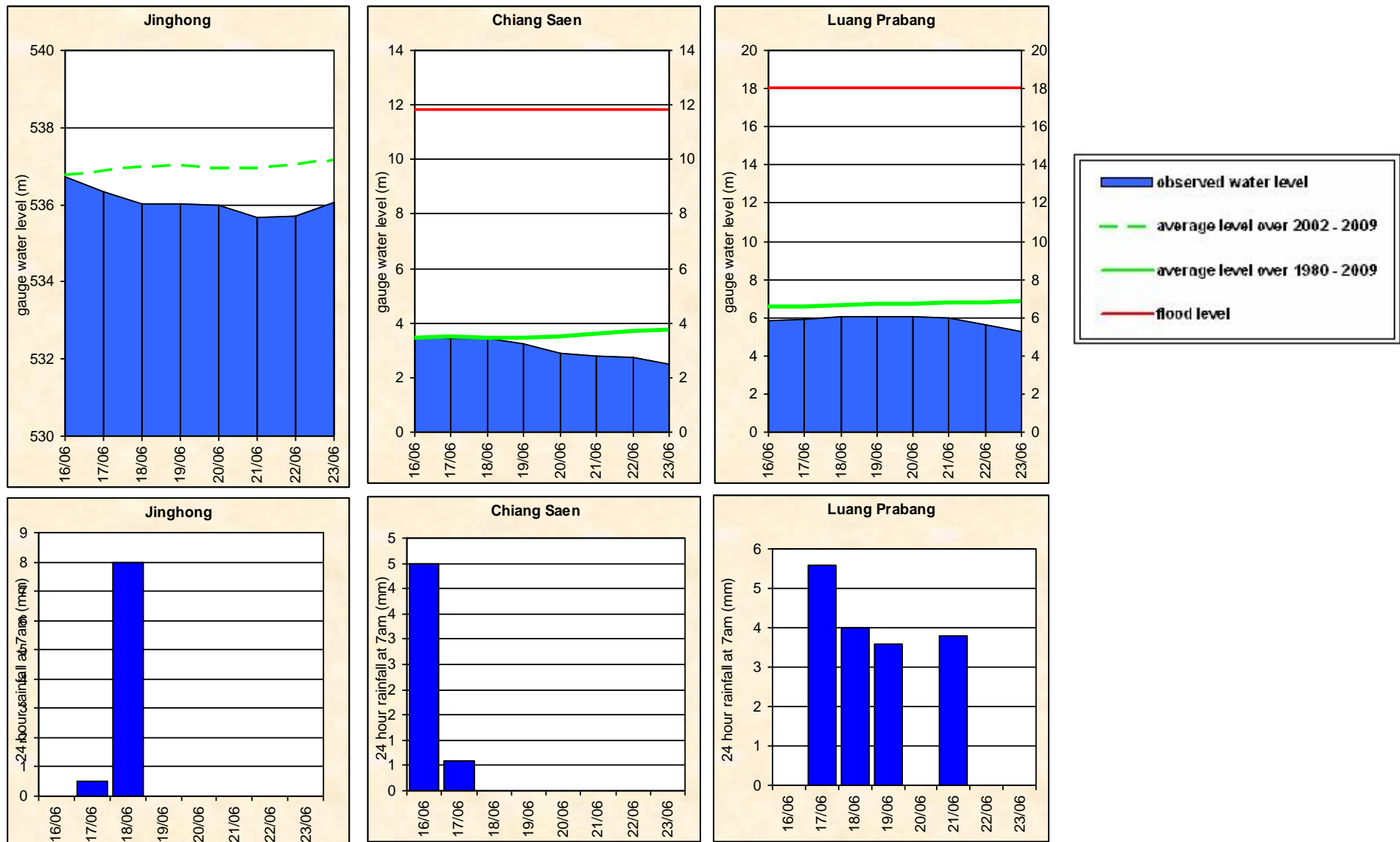


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

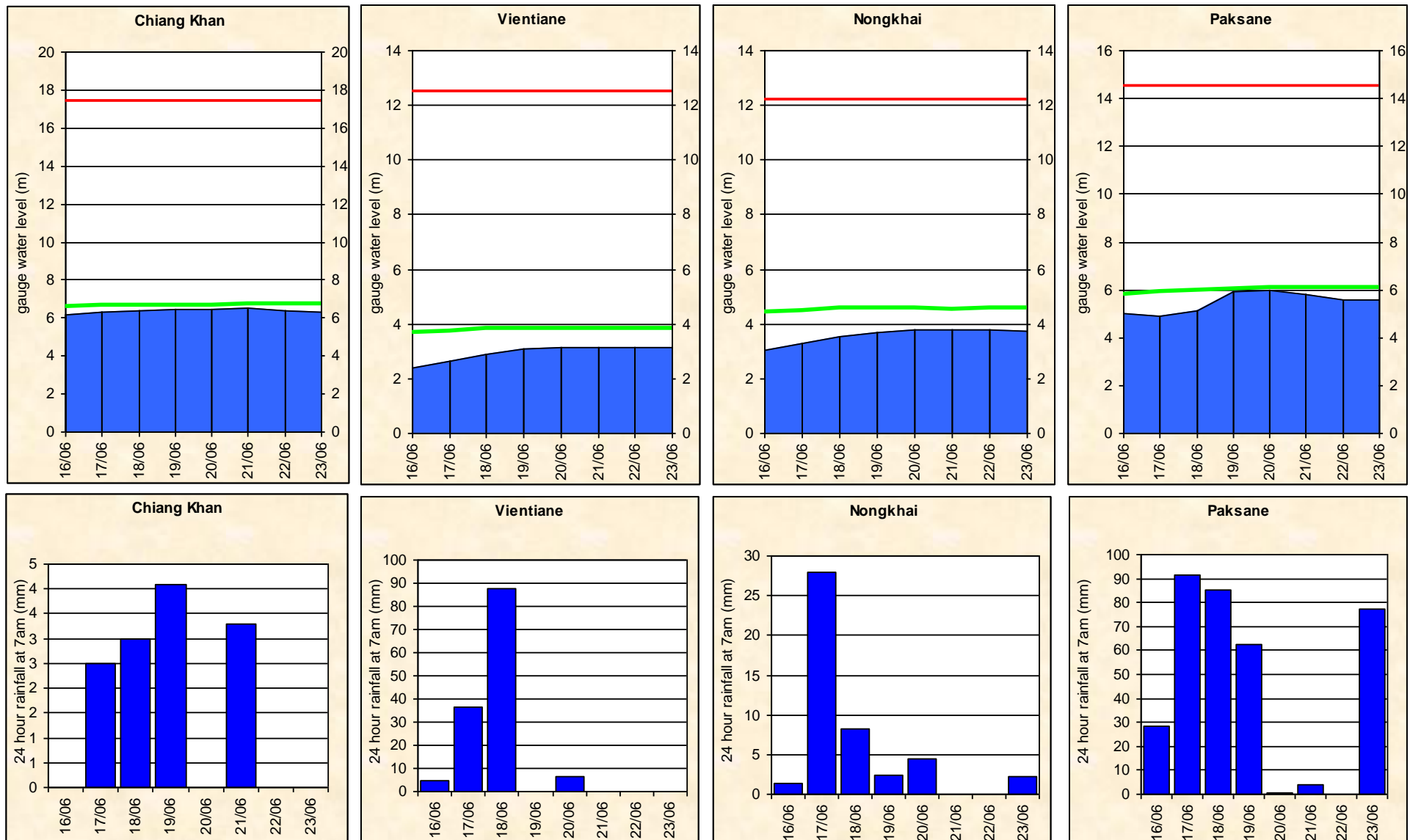


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

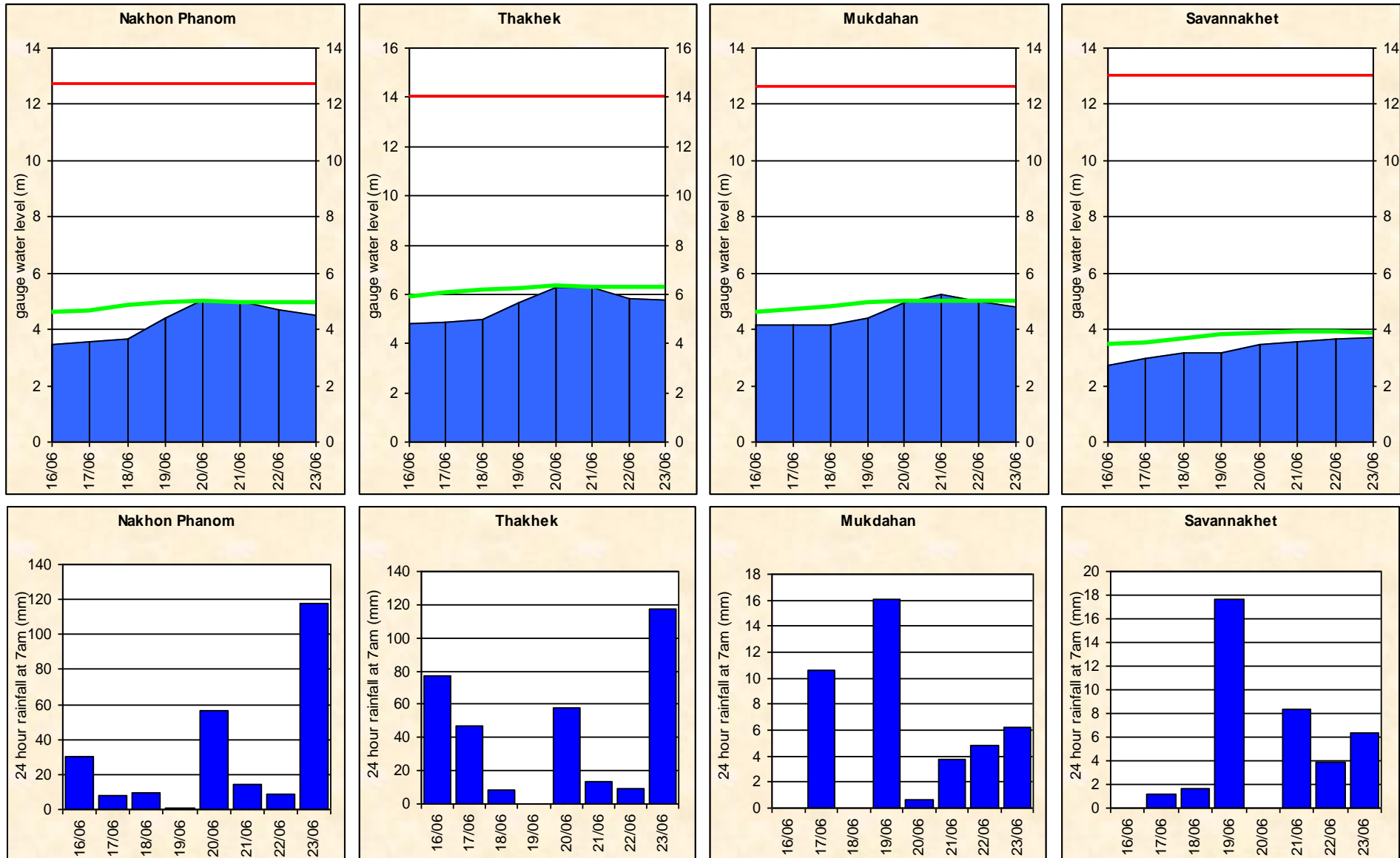


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

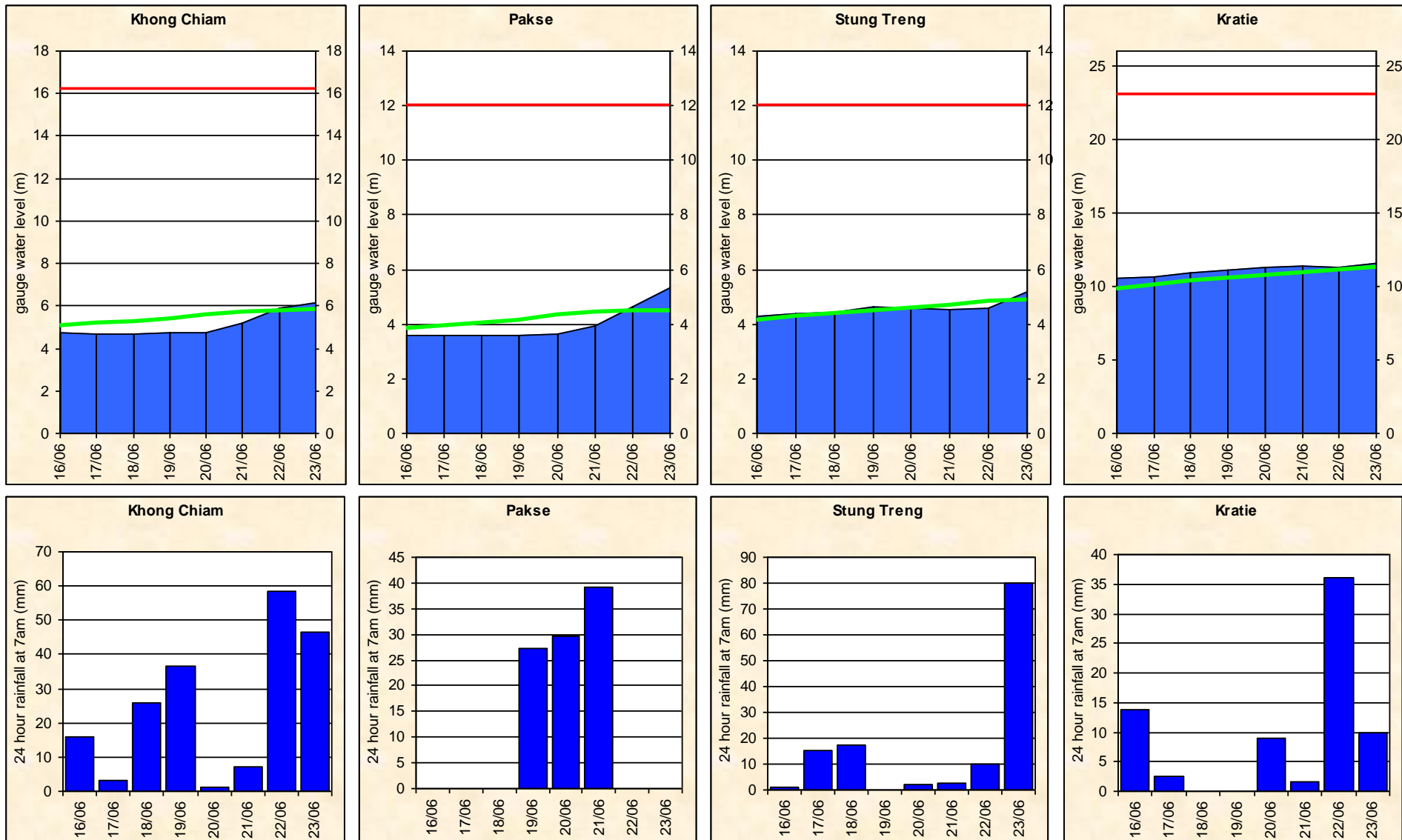




Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

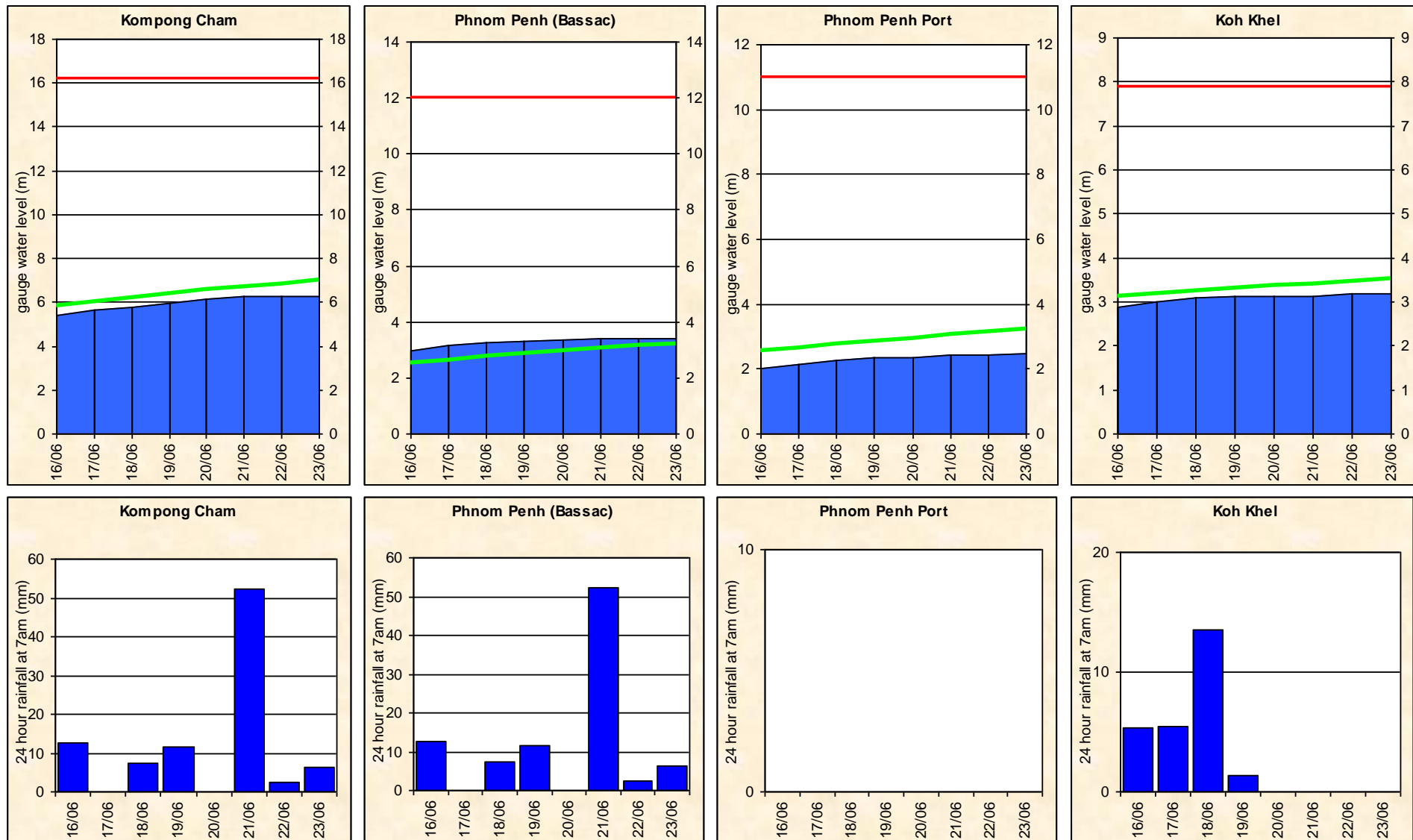
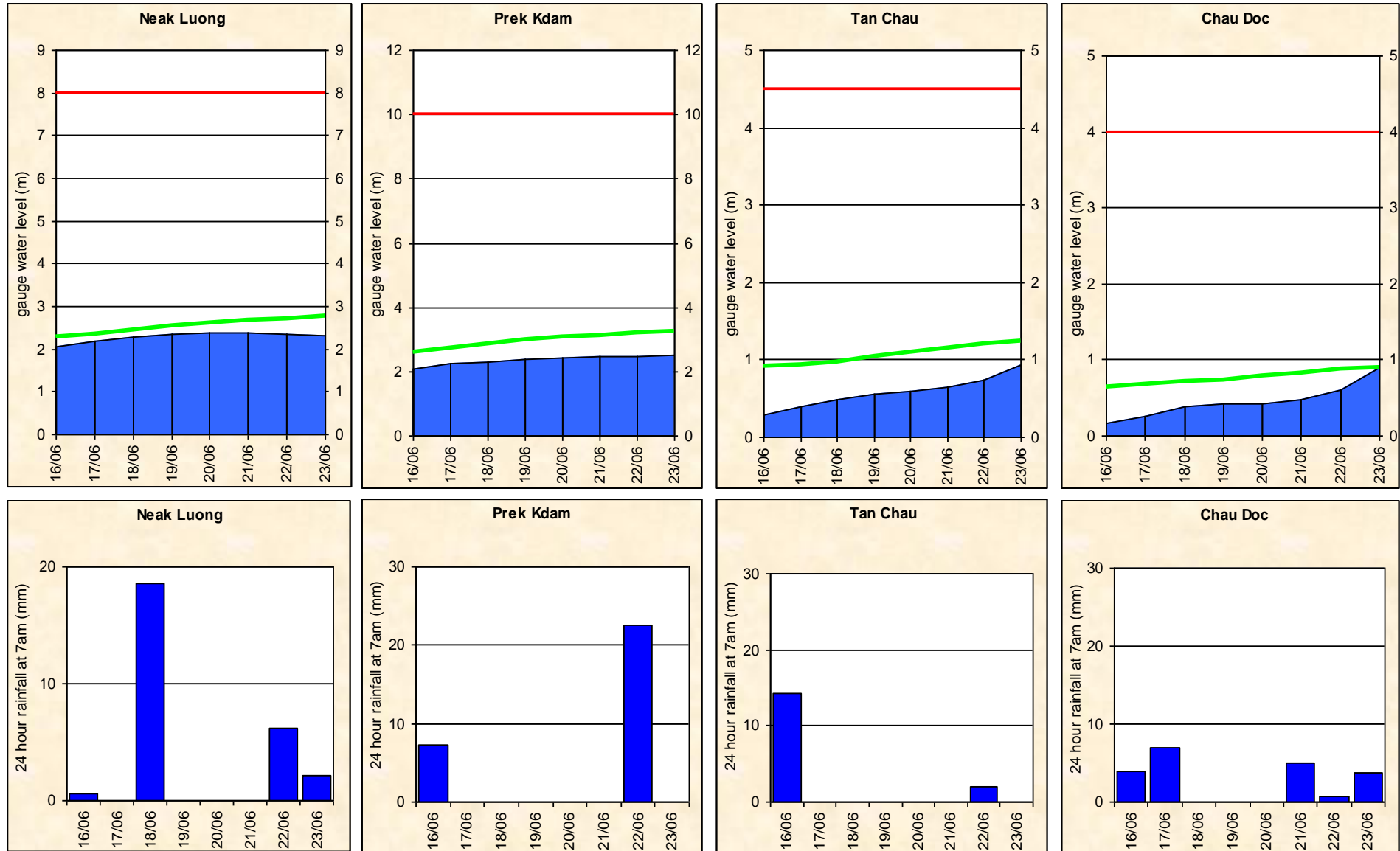


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



## 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.

In general, the overall accuracy is fairly good for 1-day to 2-day forecast lead time at stations in the upper and middle parts of the LMB.

However, the accuracies at upper part stations as Thakhek, Mukdahan, Nakhon Phanom Khong Chiam, Pakse and two tidal affected stations Tan Chau, Chau Doc for 3 – day, 4 – day and 5-day forecast were less than expected.

The above differences due to two 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.

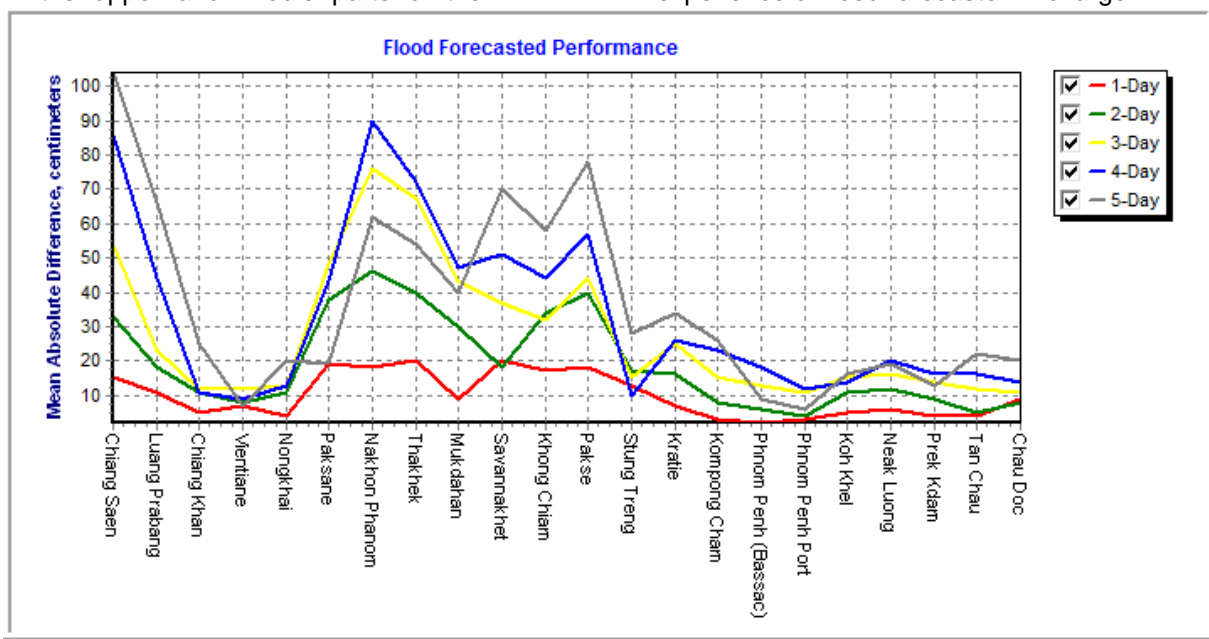


Figure B1: Average flood forecast accuracy along the Mekong mainstream

**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	85.7	100.0	85.7	85.7	42.9	42.9	57.1	71.4	42.9	42.9	28.6	57.1	71.4	100.0	100.0	100.0	85.7	85.7	100.0	85.7	71.4	71.4	<b>74.0</b>
2-day	100.0	83.3	100.0	100.0	100.0	33.3	16.7	33.3	33.3	66.7	50.0	50.0	83.3	83.3	100.0	83.3	83.3	50.0	50.0	50.0	100.0	83.3	83.3	<b>69.7</b>
3-day	20.0	100.0	100.0	100.0	100.0	20.0	0.0	0.0	20.0	20.0	20.0	20.0	80.0	60.0	100.0	80.0	60.0	40.0	20.0	60.0	20.0	60.0	60.0	<b>50.0</b>
4-day	25.0	100.0	100.0	100.0	100.0	75.0	25.0	25.0	50.0	25.0	50.0	25.0	100.0	100.0	100.0	50.0	75.0	25.0	75.0	100.0	25.0	50.0	50.0	<b>63.6</b>
5-day	0.0	66.7	100.0	100.0	100.0	100.0	33.3	66.7	66.7	33.3	33.3	0.0	66.7	100.0	100.0	100.0	100.0	66.7	66.7	100.0	66.7	66.7	66.7	<b>69.7</b>

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

2014	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
week	10:24	0	-	4	07:52	-	07:08	07:12	08:12	07:49	07:18	0	-	15	36	175	0	41
month	10:23	0	-	4	08:03	-	07:08	07:16	08:17	07:27	07:11	0	-	36	44	473	0	81
season	10:23	0	-	11	08:03	-	07:08	07:16	08:17	07:27	07:11	0	-	36	44	473	0	81

*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.

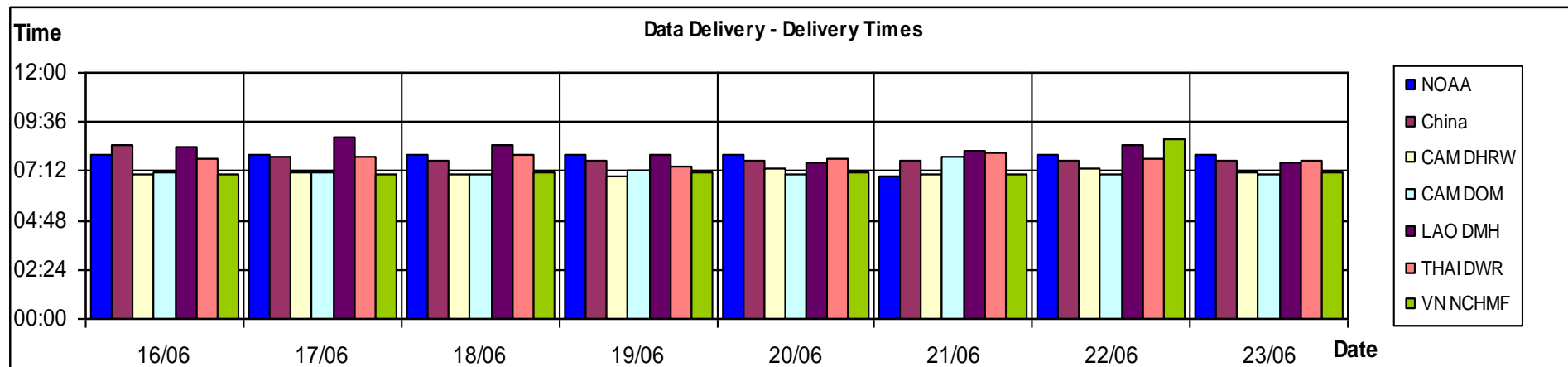




Figure B2: Data delivery times for the past 8 days including the current report date

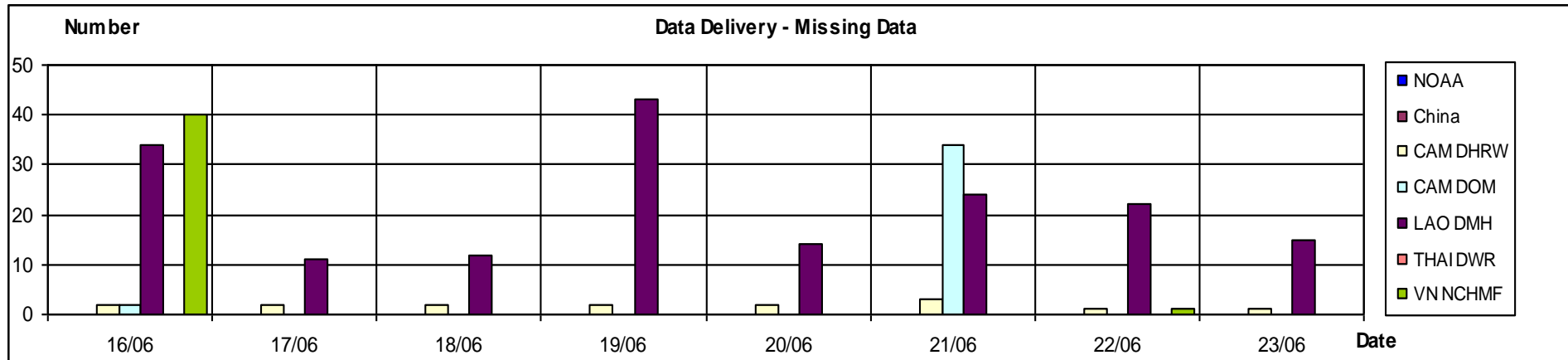


Figure B3: Missing data for the past 8 days including the current report date

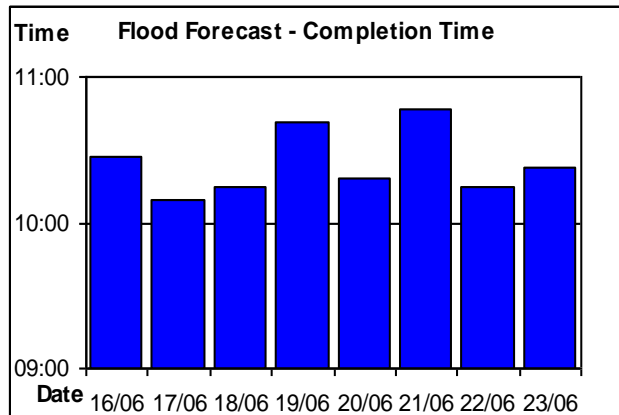


Figure B4: Flood forecast completion time

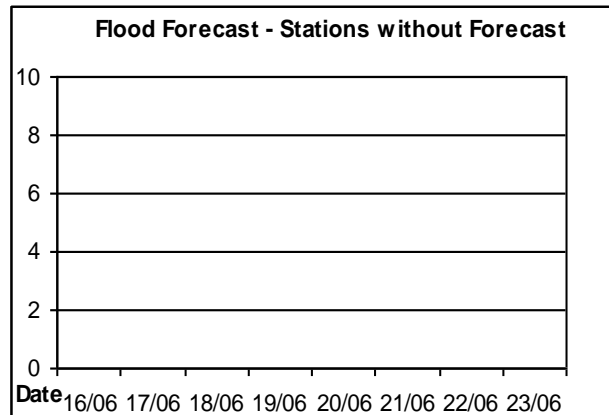


Figure B5: Flood forecast stations without forecast

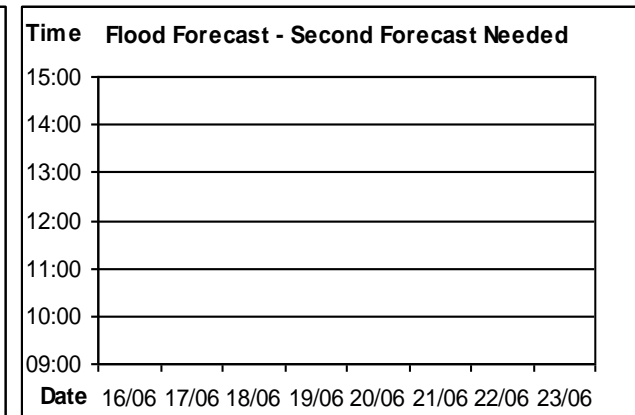


Figure B6: Second forecast needed

## 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

