

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

Prepared at: 09/09/2013, covering the week from the 02<sup>nd</sup> September to the 09<sup>th</sup> September 2013

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

#### General weather patterns

During the week of 02<sup>nd</sup> September to 09<sup>th</sup> September 2013 five weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 02<sup>nd</sup> September and 08<sup>th</sup> September are presented in the figures below:

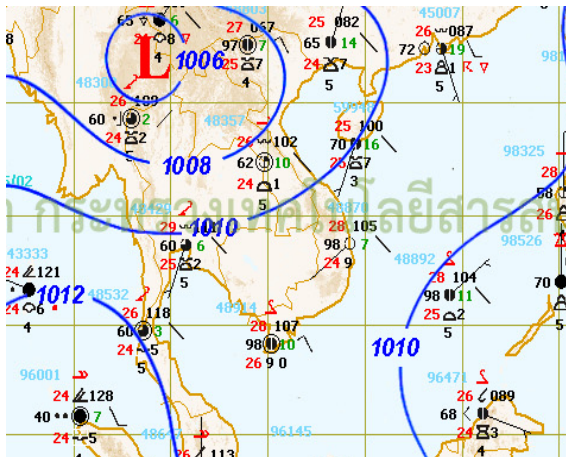


Figure 1: Weather map for 02<sup>nd</sup> September 2013



Figure 2: Weather map for 08<sup>th</sup> September 2013

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

Weak SW monsoon prevailed over Myanmar, Thailand and Indochina Peninsular during first half of last week (Figure 1 and 2).

#### Inter Tropical Convergence Zone (ITCZ)

ITCZ was laid across Myanmar, north of Thailand, Lao PDR and Viet Nam at the beginning and rotated clockwise to north of Thailand, south of Lao PDR and Viet Nam at ending of last week of monitoring period.

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

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

#### Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

#### Over weather situation

ITCZ which prevailing across Myanmar, north of Thailand, whole of Lao PDR and Viet Nam was active during last week and followed by weak SW monsoon in the first half last week. As a result, scattered isolated heavy rainfall occurred in many areas in LMB. The amount of rainfall from 02<sup>nd</sup> September to the 09<sup>th</sup> September 2013 were recorded at Chiang Saen (123.4 mm with one day maximum was 53 mm), Luang Prabang (199.9 mm with one day maximum was 97 mm), Paksane (186.8 mm with one day

maximum was 56 mm) and Stung Treng (153 mm with one day maximum was 61 mm). See Figure 3 for Weekly Rainfall Distribution covering the week 02<sup>nd</sup> September – 09<sup>th</sup> September 2013.

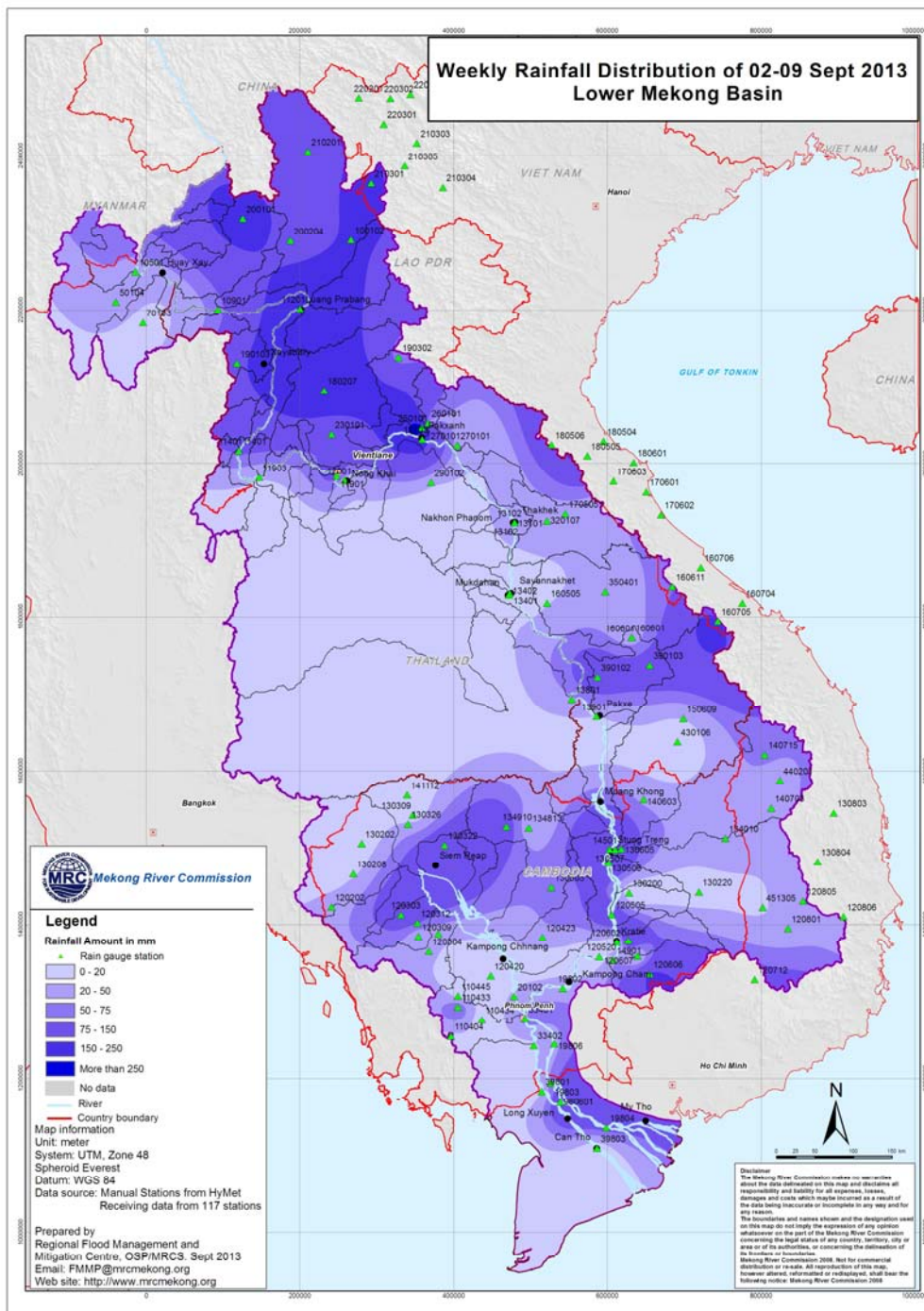


Figure 3: Weekly Rainfall Distribution covering the week 02<sup>nd</sup> September – 09<sup>th</sup> September 2013

### General behaviour of the Mekong River

During last week, water levels at most stations in upper and some upstream stations of middle reaches of LMB recessed then rose up during last week about/above the long-term average water level (LTA); those water levels of downstream of middle reach of LMB and the lower reach of LMB were recessed during last week

Monday, 09<sup>th</sup> September 2013

below LTA for this time of the year. However, water levels of two stations in downstream at Tan Chau and Chau Doc were less influenced by tidal and recessed below LTA during this period of the year.

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

In general, the water levels at Chiang Saen and Luang Prabang recessed during first half of last week below LTA and rose up quickly above LTA at the end of last week. All stations were recording water levels that were above the LTA for this time of the year.

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

Water levels of all stations recessed during first half of last week below the long-term average water level (LTA) and rose up quickly above LTA at the end of last week. All stations were recording water levels that were above the LTA for this time of the year.

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

Water levels at Thakhet/Nakon Phanom, Mukdahan, Khong Chiam and Pakse recessed during last week below LTA for this time of the year.

***For stations from Stung Treng to Kampong Cham***

Water levels at these stations recessed during last week below LTA for this time of the year. All stations were recording water levels that were below the LTA for this time of the year.

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

Water levels at these stations recessed during last week below LTA for this time of the year. All stations were recording water levels that were below the LTA for this time of the year.

***Tan Chau and Chau Doc***

Water levels at these stations recessed during last week below LTA for this time of the year. All stations were recording water levels that were below the LTA for this time of the year, and that were less affected by the tide.

**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 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 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

2013	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
02/09	535.34	4.99	11.10	11.10	8.35	9.42	11.38	9.51	10.59	9.11	8.02	10.06	8.28	7.70	18.14	12.89	8.29	7.35	6.83	5.87	7.34	2.85	2.33
03/09	535.21	4.74	10.87	10.73	7.94	9.16	11.21	9.40	10.49	9.06	8.00	10.04	8.23	7.66	17.82	12.62	8.23	7.30	6.78	5.83	7.28	2.85	2.34
04/09	535.23	4.58	10.72	10.39	7.50	8.75	11.00	9.22	10.30	8.89	8.00	9.95	8.13	7.54	17.63	12.45	8.19	7.26	6.75	5.80	7.26	2.84	2.34
05/09	535.25	4.42	10.65	10.22	7.24	8.38	10.70	8.98	10.05	8.63	7.57	9.74	7.97	7.34	17.38	12.26	8.15	7.22	6.74	5.78	7.24	2.82	2.30
06/09	535.26	4.41	11.47	10.16	7.00	8.17	10.65	8.87	9.95	8.44	7.38	9.49	7.78	7.21	17.08	12.06	8.13	7.20	6.71	5.78	7.21	2.79	2.27
07/09	535.27	5.23	13.49	10.84	7.24	8.30	10.40	8.83	9.90	8.39	7.33	9.33	7.64	7.13	16.90	11.87	8.12	7.19	6.69	5.76	7.25	2.74	2.25
08/09	535.25	5.91	13.50	12.24	8.40	9.30	10.70	8.70	9.75	8.28	7.28	9.29	7.66	7.11	16.84	11.79	8.13	7.20	6.68	5.78	7.25	2.75	2.22
09/09	535.36	6.02	13.60	12.52	9.52	10.52	11.26	8.70	9.78	8.20	7.12	9.29	7.56	7.09	16.85	11.79	8.15	7.25	6.70	5.81	7.26	2.78	2.25

Table A2: observed rainfall

Unit in mm

2013	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
02/09	0.0	0.0	58.0	0.0	31.2	0.8	11.2	3.6	nr	0.0	nr	20.3	nr	44.0	nr	10.3	nr	-	nr	nr	nr	6.7	4.0
03/09	5.0	0.0	nr	17.5	nr	0.0	43.8	0.0	nr	1.1	nr	0.0	nr	nr	nr	nr	nr	-	nr	0.6	nr	nr	0.0
04/09	2.0	12.8	0.9	0.0	nr	0.0	16.7	0.2	0.0	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	4.0
05/09	0.0	9.5	15.6	1.0	48.6	34.7	56.1	21.5	24.7	2.1	0.8	0.0	nr	nr	nr	5.0	nr	-	1.5	29.2	nr	1.6	1.0
06/09	8.0	53.0	28.2	10.2	4.6	4.2	52.2	1.4	1.4	5.8	5.0	3.0	0.4	12.5	nr	nr	27.5	-	0.4	3.2	nr	0.7	1.0
07/09	45.5	20.3	97.2	38.5	nr	nr	4.8	0.2	0.2	nr	nr	35.0	19.8	61.0	21.5	3.2	6.5	-	0.0	9.6	2.3	0.7	0.0
08/09	19.50	10.2	nr	6.1	nr	11.2	nr	11.2	9.4	nr	nr	-	-	18.0	6.0	0.5	22.1	-	nr	0.0	8.2	12.7	11.0
09/09	0.00	17.6	nr	5.8	0.8	0.8	2.0	1.7	1.4	11.3	nr	25.4	-	17.5	17.0	17.3	2.7	-	14.2	nr	16.4	39.1	-

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

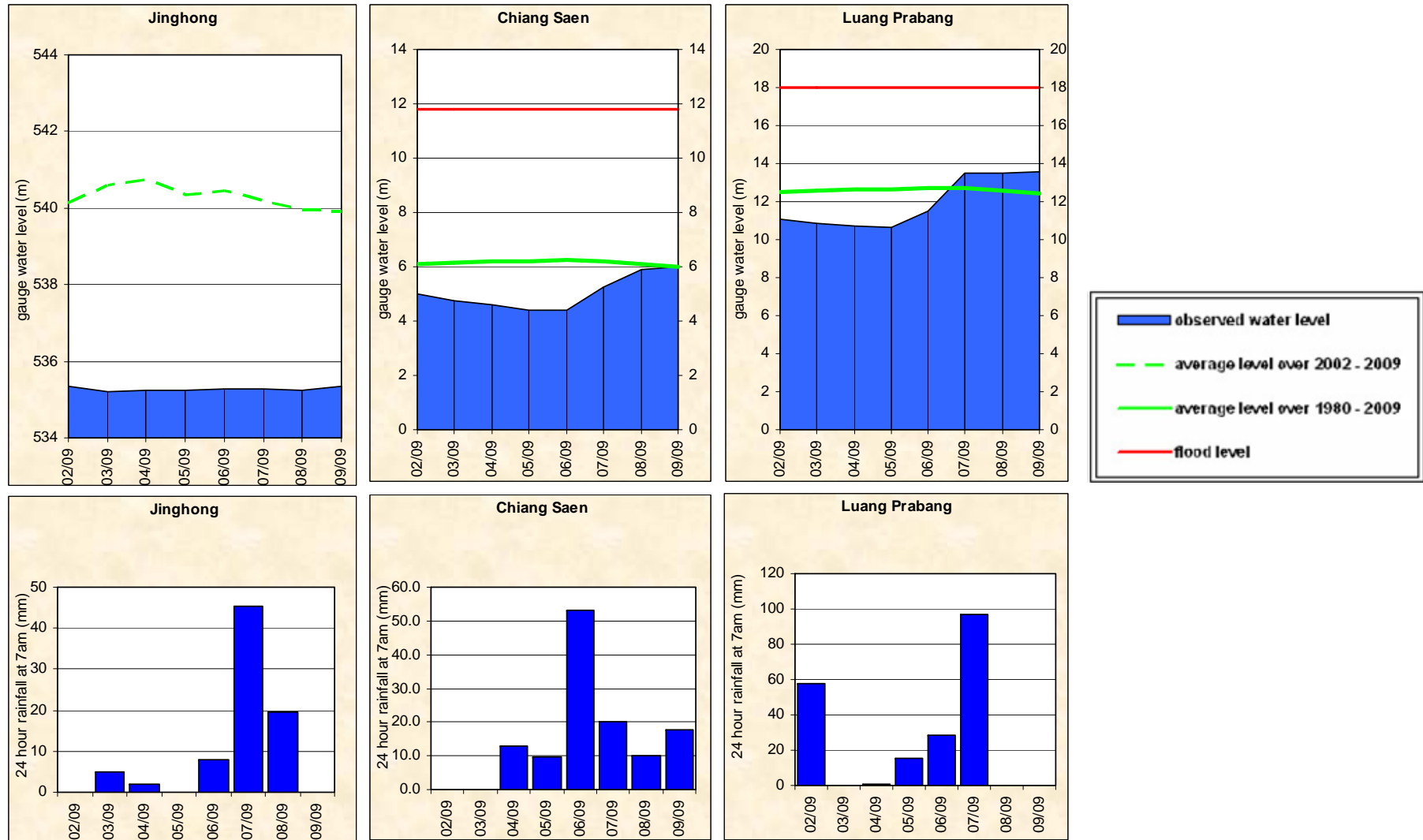


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

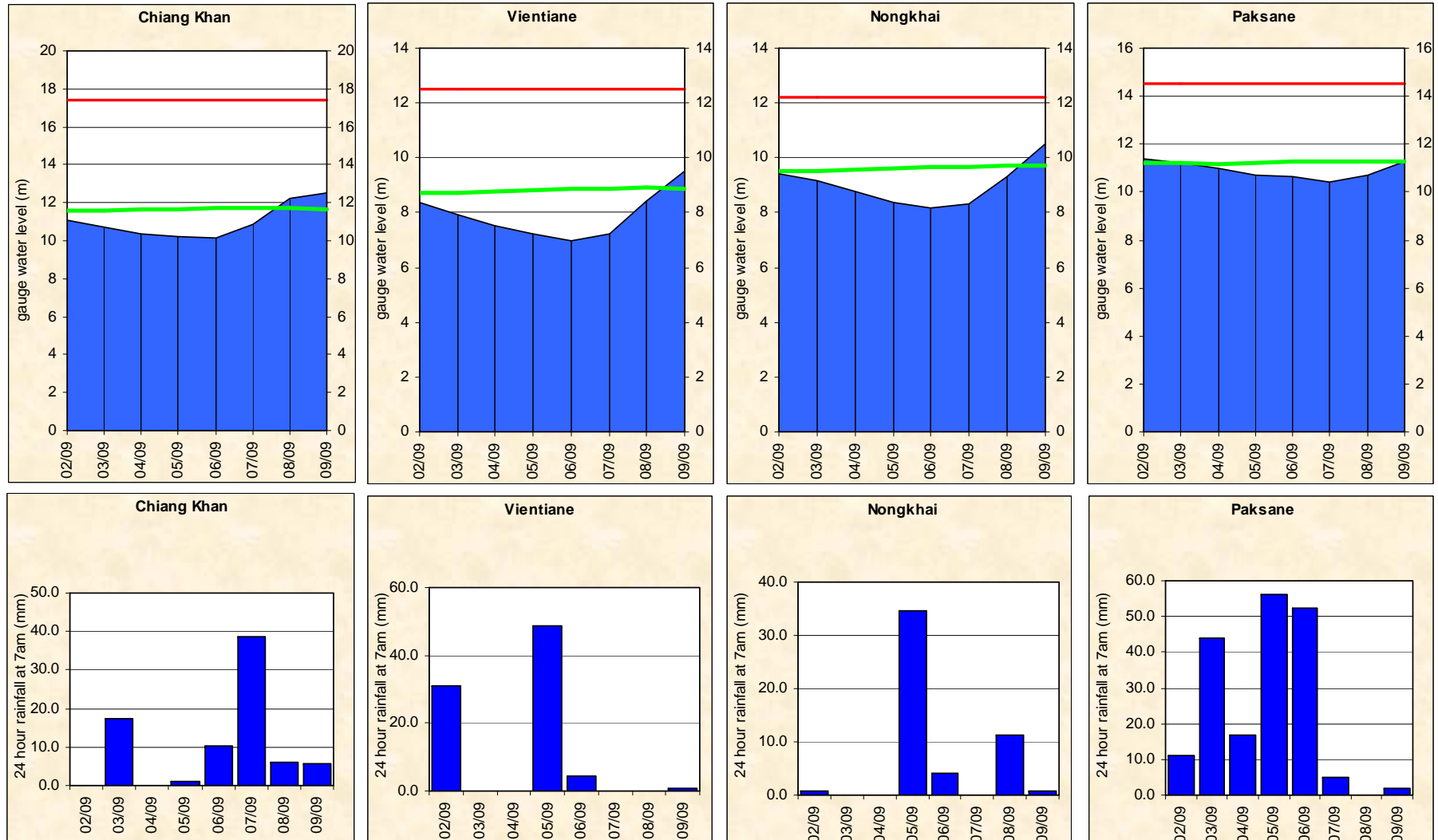




Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

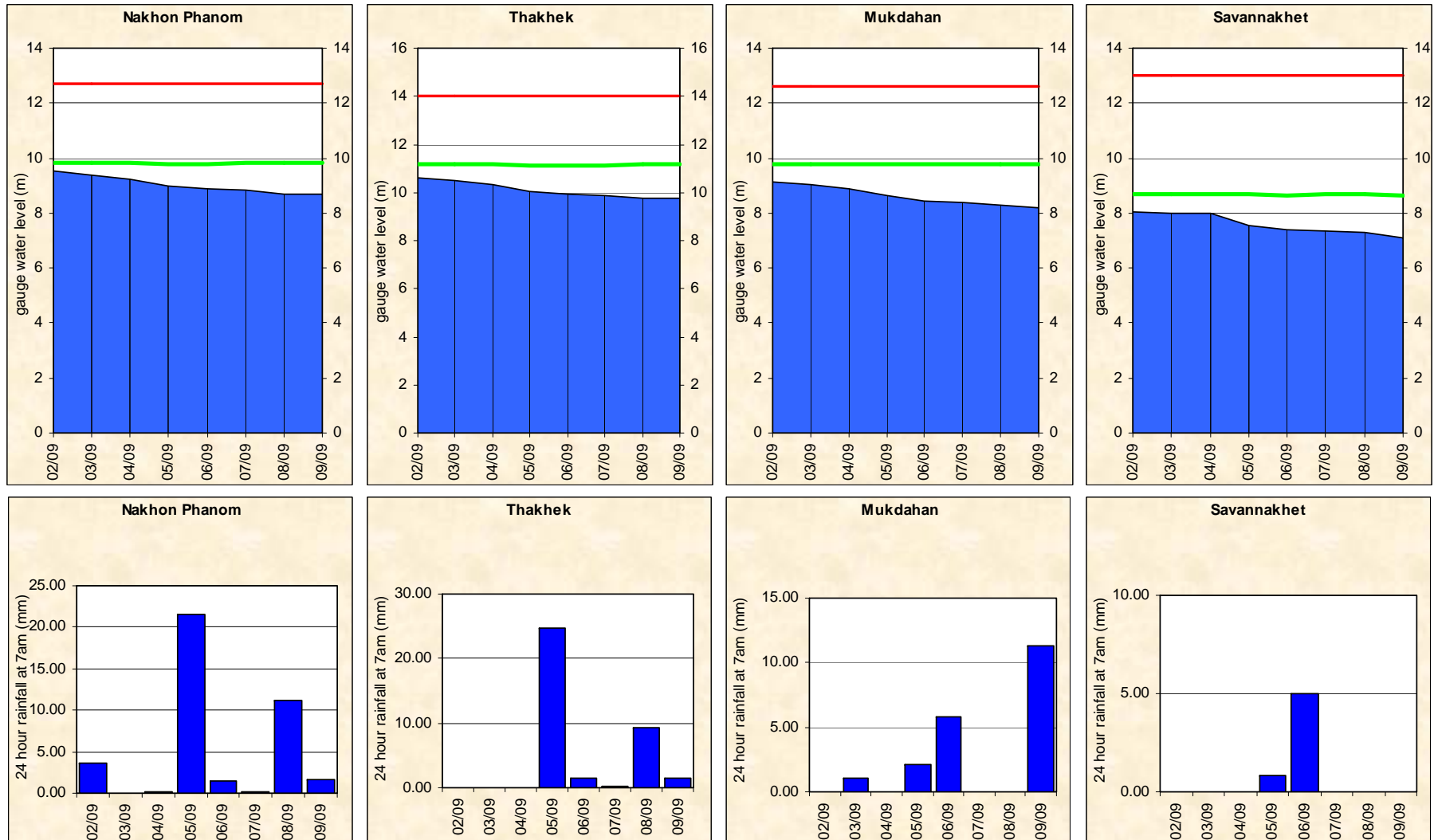


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

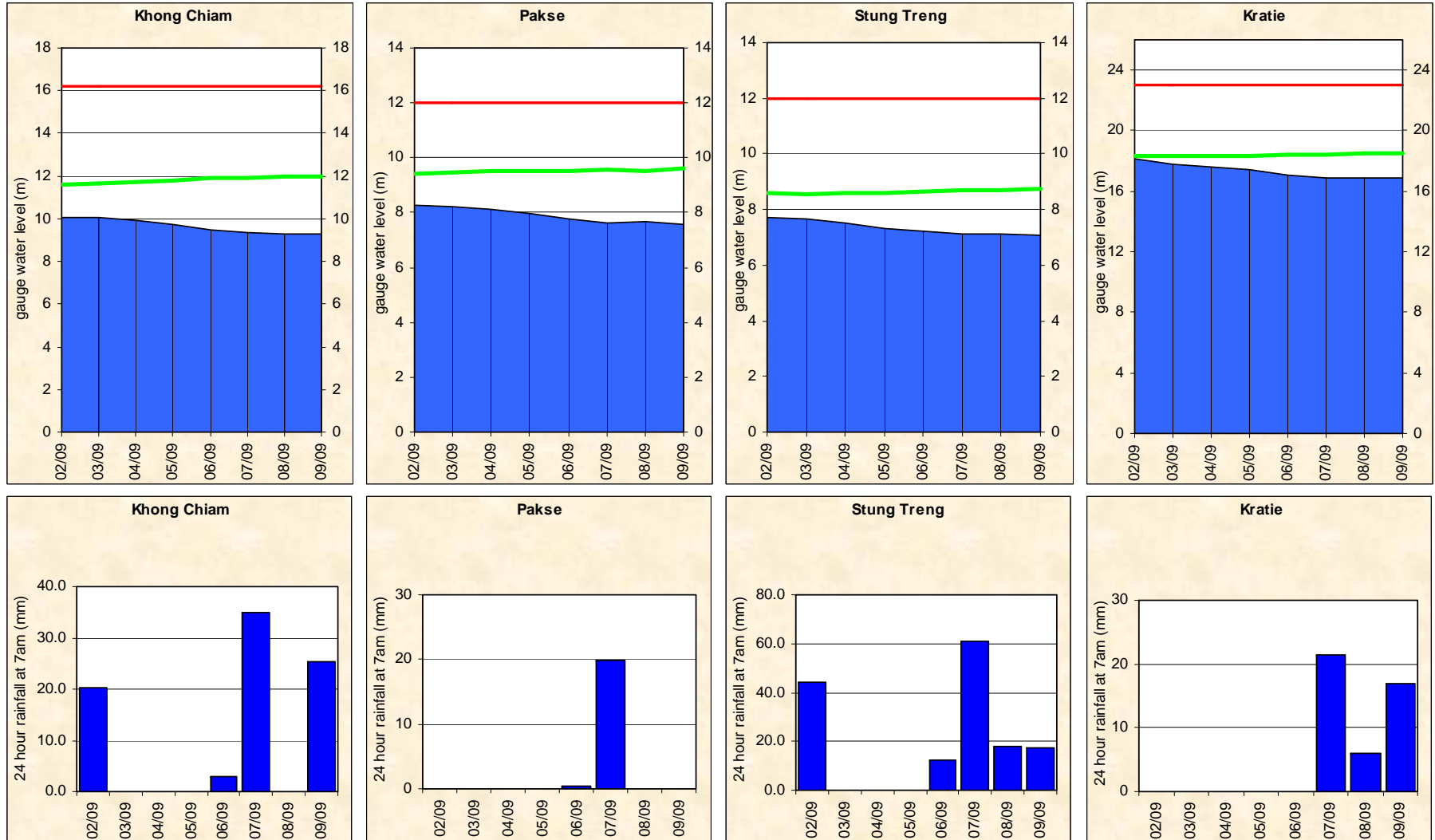




Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

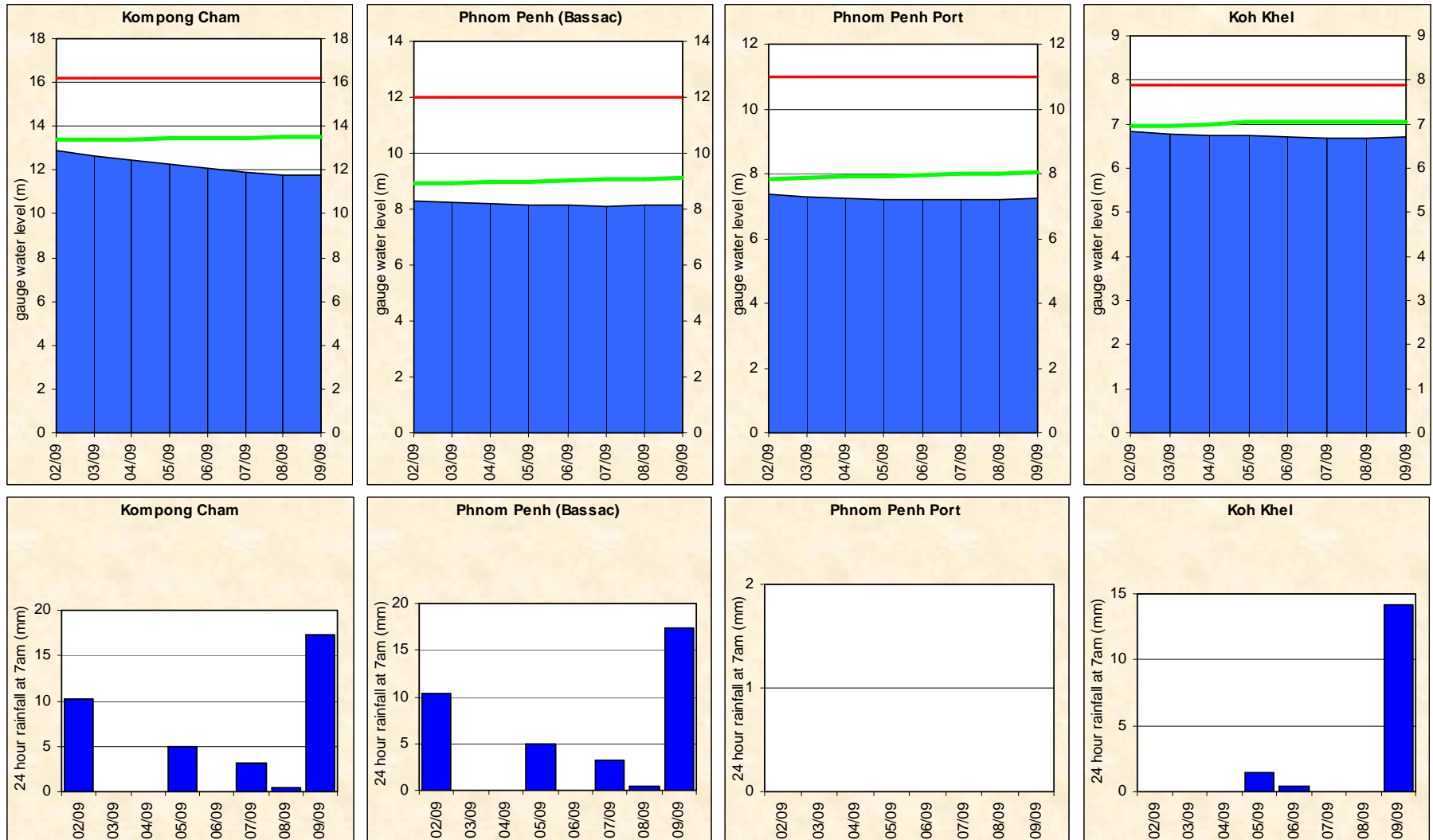
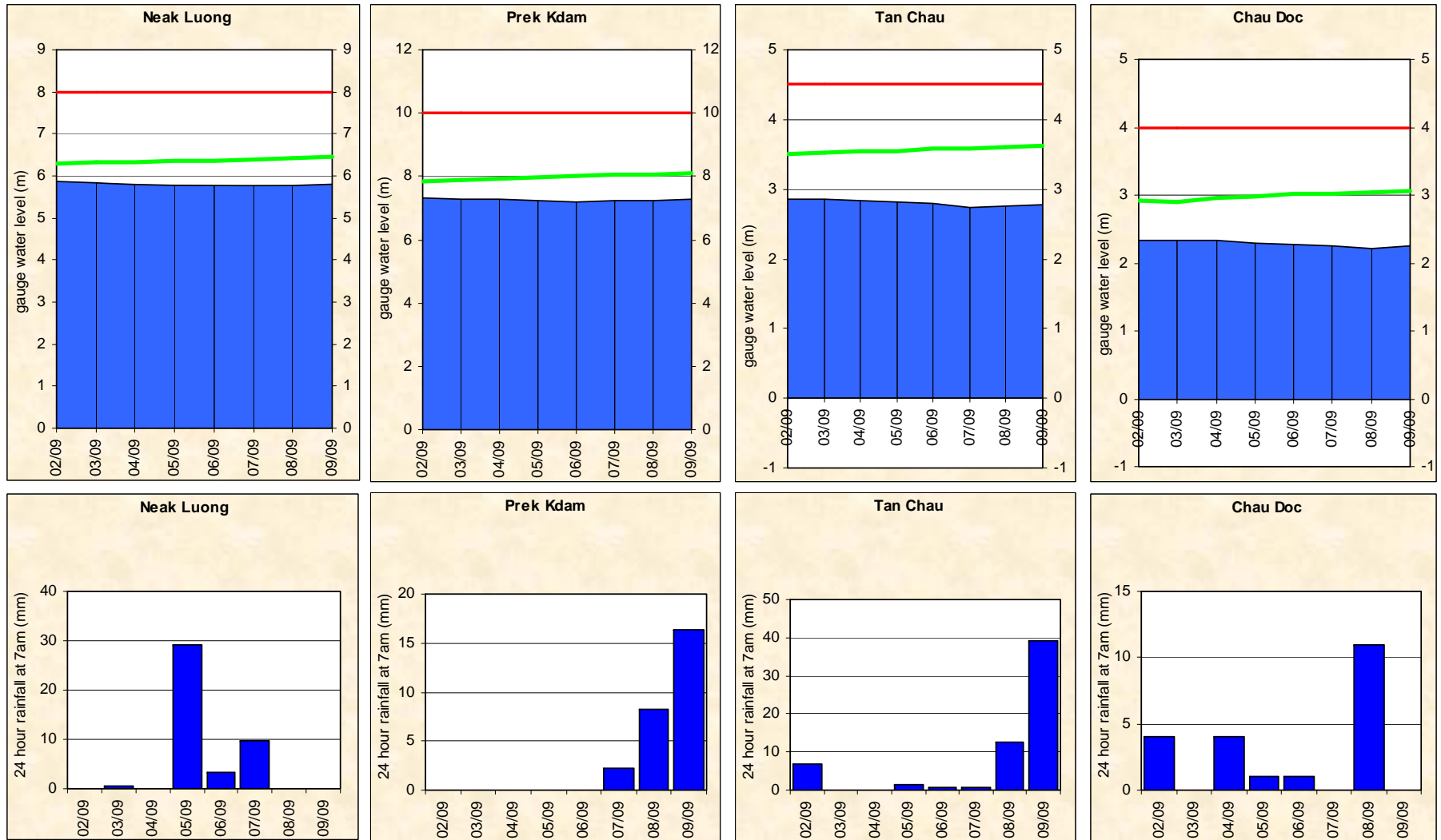


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



## 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 good for 1-day to 5-day forecast lead time at all stations in

LMB. However, the accuracies at Chiang Saen, Luang Prabang and Vientiane for 3-day to 5-day forecast were less than expected.

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; (2) the adjustment by utilizing the practical knowledge and experience of flood forecaster-in-charge; (3) scattered local heavy rainfall induced by ITCZ happened in many tributaries and resulted in rapid rising water levels.

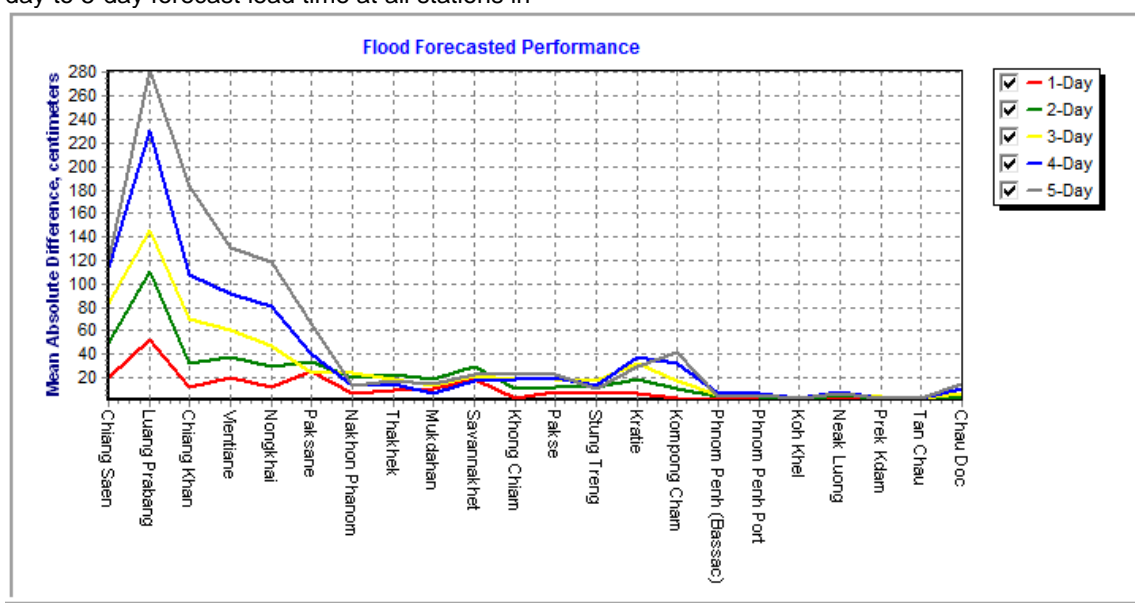


Figure B1: Average flood forecast accuracy along the Mekong mainstream

**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	71.4	42.9	85.7	42.9	57.1	71.4	85.7	57.1	42.9	28.6	100.0	71.4	85.7	85.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	78.6
2-day	50.0	16.7	83.3	50.0	66.7	66.7	83.3	50.0	66.7	50.0	83.3	83.3	100.0	83.3	100.0	100.0	83.3	100.0	100.0	100.0	100.0	100.0	100.0	78.0
3-day	40.0	20.0	40.0	40.0	60.0	80.0	80.0	60.0	100.0	80.0	60.0	80.0	100.0	40.0	60.0	100.0	80.0	100.0	100.0	100.0	100.0	100.0	80.0	72.7
4-day	25.0	0.0	25.0	25.0	50.0	75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	75.0	75.0	75.0	100.0	100.0	100.0	100.0	100.0	100.0	50.0	76.1
5-day	33.3	0.0	0.0	33.3	33.3	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.7	66.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	74.2

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

	Flood Forecast: time sent			Weather information available (number)	Arrival time of input data (average)							Missing data (number)						
	FF completed and sent (time)	stations without forecast	FF2 completed and sent (time)		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
<b>2013</b>																		
<i>week</i>	09:58	0	-	5	08:15	08:17	07:11	05:25	08:09	07:52	07:01	2	0	0	111	145	0	27
<i>month</i>	10:14	0	-	16	08:15	08:16	07:06	05:21	08:37	07:51	07:10	11	0	4	360	695	5	155
<i>season</i>	10:25	5	-	53	08:14	08:27	07:11	05:45	08:51	07:31	07:11	16	16	73	1008	2688	29	536

*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.

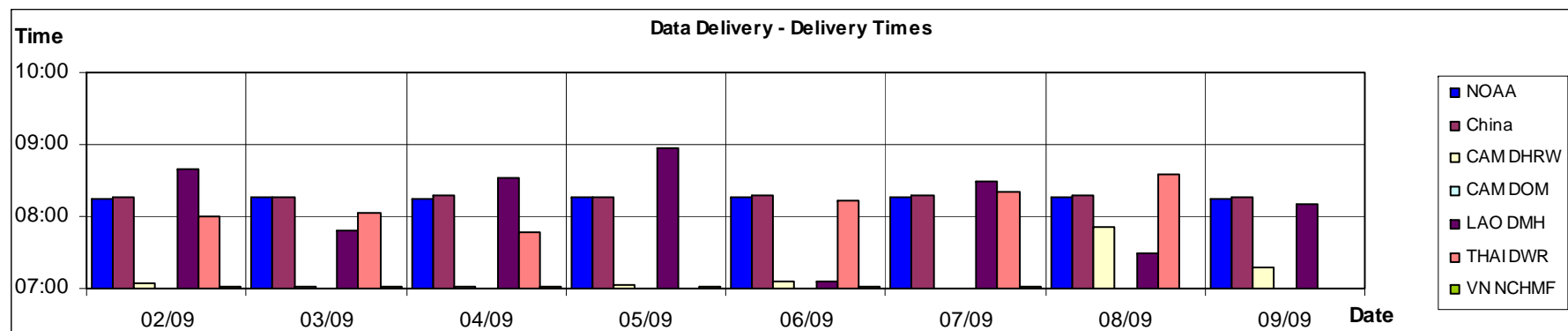


Figure B2: Data delivery times for the past 8 days including the current report date

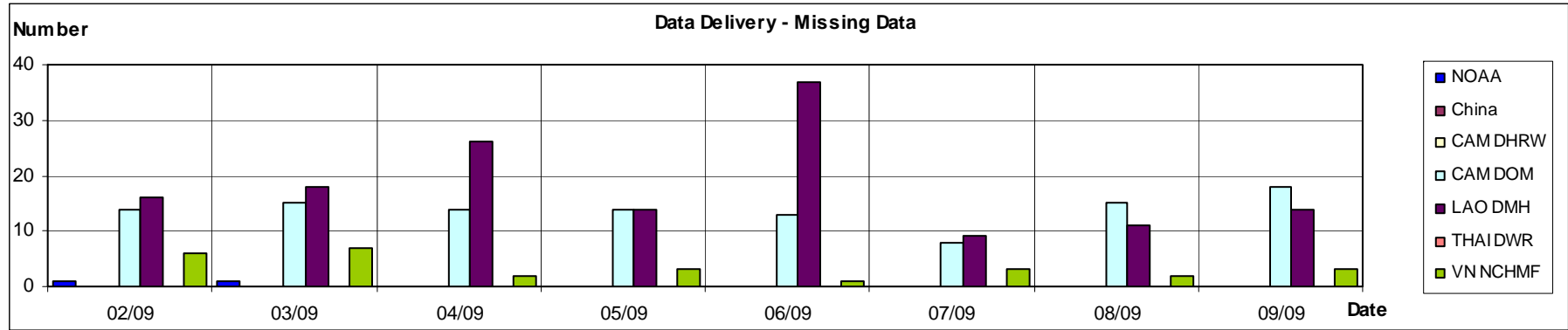


Figure B3: Missing data for the past 8 days including the current report date

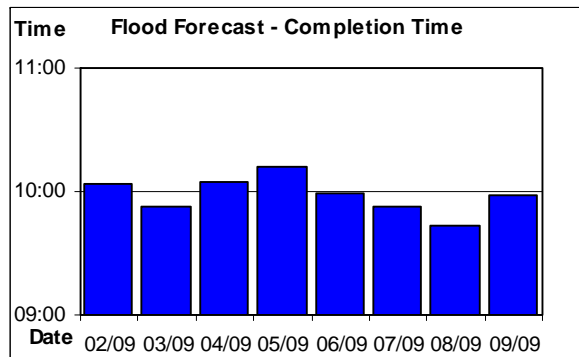


Figure B4: Flood forecast completion time

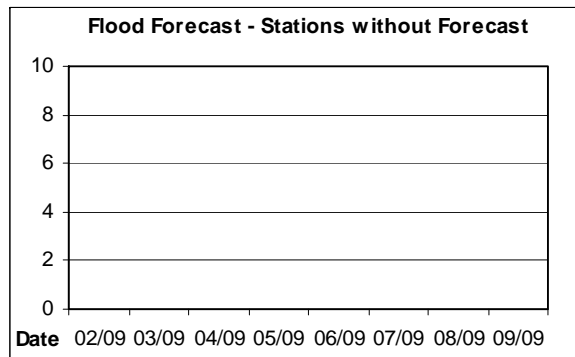


Figure B5: Flood forecast stations without forecast

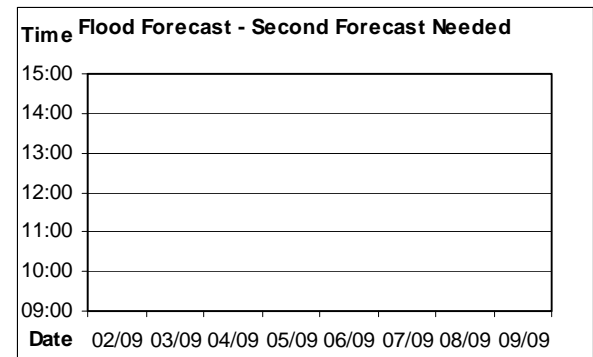


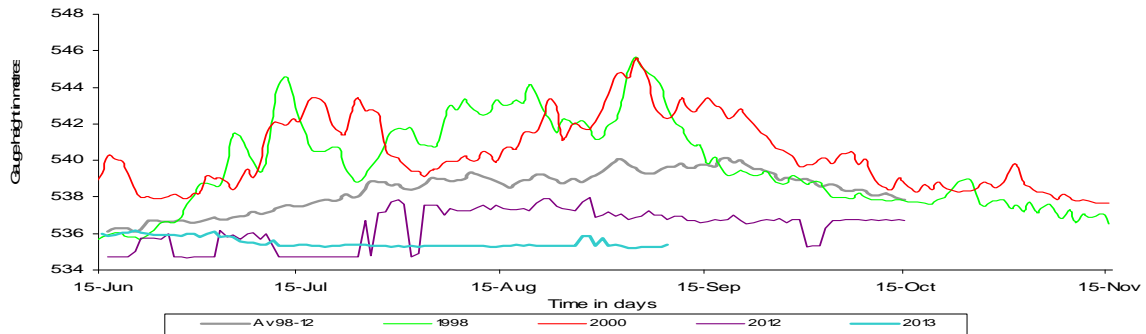
Figure B6: Second forecast needed

## Annex C: Season Water Level Graphs

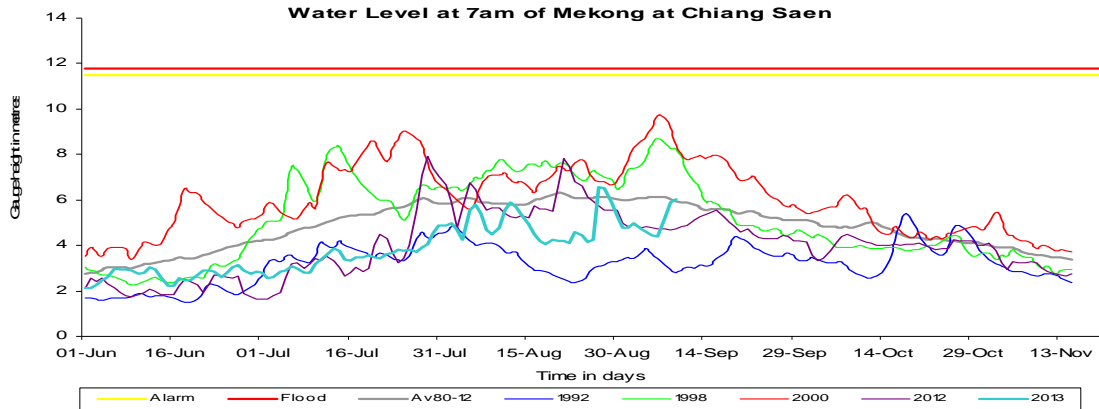
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

### HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

Water Level at 7am of Mekong at Jing Hong



Water Level at 7am of Mekong at Chiang Saen



Water Level at 7am of Mekong at Luang Prabang

