

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

Prepared at: 07/10/2013, covering the week from the 30<sup>th</sup> September to the 07<sup>th</sup> October 2013

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

#### General weather patterns

During the week of 30<sup>th</sup> September to 07<sup>th</sup> October 2013 seven weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 25<sup>th</sup> September and 30<sup>th</sup> September are presented in the figures below:

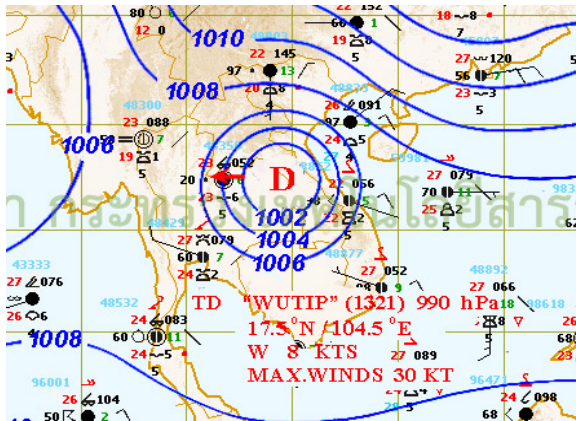


Figure 1: Weather map for 01<sup>st</sup> October 2013

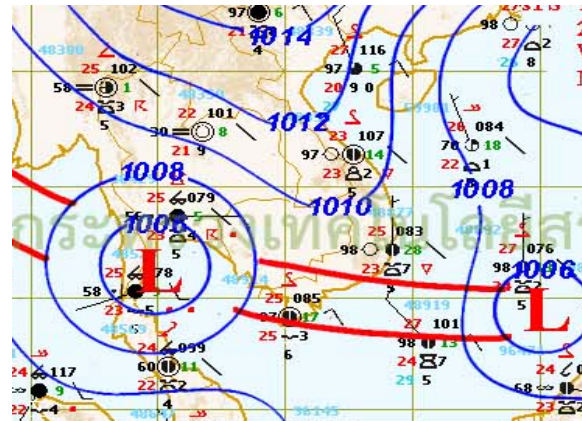


Figure 2: Weather map for 07<sup>th</sup> October 2013

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

No active monsoon was reported during last week.

#### Inter Tropical Convergence Zone (ITCZ)

The ITCZ was active after TD "WUTIP" dissipated to low pressure area. It laid across the Southeast of Myanmar, the central part of Thailand, the North of Cambodia and upper South of Vietnam at the beginning and moved downward to the Southeast of Myanmar, the South of Thailand, Cambodia and Vietnam at the end of last week (Figure 1 and 2).

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

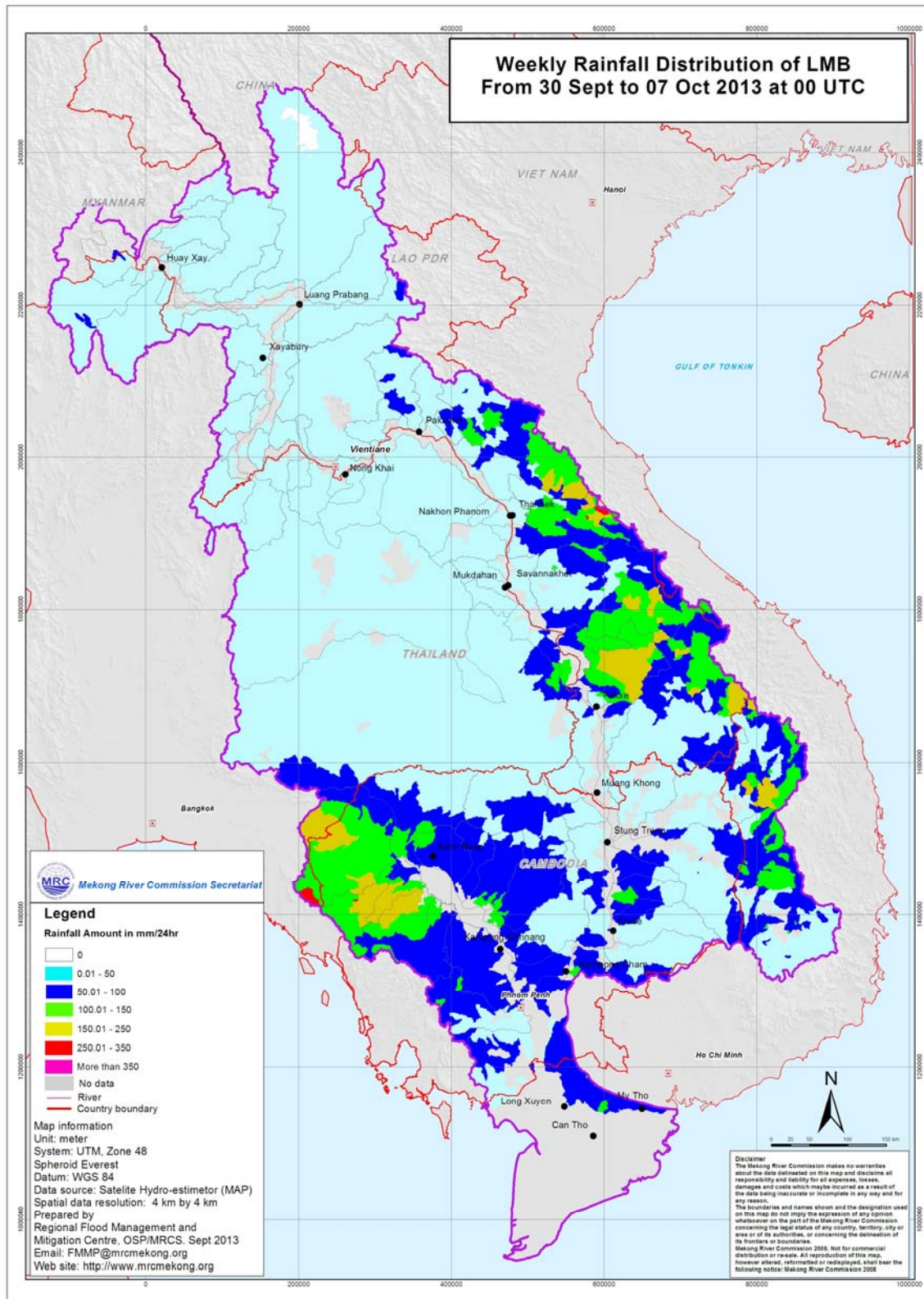
On the 30<sup>th</sup> September 2013, Typhoon (TY) "WUTIP" downgraded to Tropical Depression (TD) over the central part of Lao PDR and moved West to Northeast of Thailand before dissipating as low pressure area. This took about 2-3 days from the beginning of last week.

#### Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

#### Over weather situation

The TD happened at beginning of last week followed by the ITCZ, that prevailing across the Southeast of Myanmar, the South of Thailand, Cambodia and Vietnam, for the rest of last week. As a result, scattered isolated heavy rainfall occurred in many areas in middle reaches of LMB. The amount of rainfall from 30<sup>th</sup> September to 07<sup>th</sup> October 2013 was recorded at Stung Treng 91 mm (with a one day maximum was 32 mm), Kratie 92.5 mm (with a one day maximum was 37.5 mm), Kompong Cham 109.2 mm (with a one day maximum was 50.4 mm), Koh Khel 84.1 mm (with a one day maximum was 21.5 mm) and Prek Kdam 95.1 mm (with a one day maximum was 49.5 mm). See Figure 3 for Weekly Rainfall Distribution of LMB covering the week 30<sup>th</sup> September to 07<sup>th</sup> October 2013.



**Figure 3: Weekly Rainfall Distribution of LMB covering the week 30<sup>th</sup> September – 07<sup>th</sup> October 2013**

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

During last week water levels at most stations in upper and middle reaches of LMB recessed below the long-term average water level (LTA), except in Khong Chiam and Pakse which were above LTA; the water levels of the lower reach of LMB were recessing above LTA.

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

Water levels of these stations were recessing during last week lower than the LTA.

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

Water levels of these stations recessing during last week remain lower than the LTA.

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

During the last week water levels of these stations rose up at the first half of last week then recessed at the end of last week below the LTA, except Khong Chiam and Pakse that were above the LTA.

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

Water levels at these stations recessing during last week were higher than the LTA.

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

Water levels at these stations were slowly recessing above the LTA.

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

Water levels at these stations rose up at the first half of last week then slowly recessed at the end of last week

**Note:** For areas between forecast stations, please refer to the nearest forecast station.

### **Flood Situation**

Flood stage or alarm stage:

During the last week, water levels of some station along the Mekong have risen up to and above the alarm level, at Kompong Cham, Koh Khel, Neak Luong, Tan Chau and Chau Doc monitoring stations.

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
30/09	535.28	3.94	9.10	9.32	6.35	7.34	8.80	6.68	7.84	6.64	5.58	9.91	8.31	10.22	22.03	15.80	10.26	9.40	7.77	7.60	9.22	4.12	3.36
01/10	535.41	3.76	9.15	9.12	6.18	7.06	8.73	6.78	7.95	6.63	5.57	9.51	7.90	9.76	21.55	15.58	10.26	9.40	7.77	7.62	9.25	4.21	3.49
02/10	535.41	3.49	8.95	9.08	6.00	6.87	8.67	6.85	8.02	6.81	5.75	9.47	7.74	9.20	21.00	15.34	10.25	9.39	7.76	7.62	9.24	4.31	3.59
03/10	535.41	3.38	8.63	9.10	5.95	6.78	8.52	6.99	8.15	7.03	5.97	9.87	8.20	8.73	20.47	15.02	10.17	9.30	7.74	7.58	9.22	4.33	3.65
04/10	535.41	3.34	8.24	8.90	5.90	6.72	8.40	6.87	8.04	7.00	5.93	10.01	8.21	8.53	19.95	14.78	10.15	9.28	7.72	7.65	9.22	4.31	3.69
05/10	535.30	3.30	7.90	8.67	5.70	6.53	8.20	6.82	7.99	6.90	5.84	10.04	8.22	8.81	19.94	14.50	10.06	9.11	7.69	7.48	9.19	4.27	3.69
06/10	535.30	3.26	7.72	8.29	5.70	6.36	7.95	6.40	7.56	6.62	5.75	9.45	8.11	8.81	20.00	14.45	10.06	9.11	7.69	7.44	9.22	4.24	3.72
07/10	535.29	3.36	7.60	8.01	5.10	5.88	7.65	6.07	7.20	6.24	5.18	9.39	7.80	8.60	19.89	14.38	10.06	9.11	7.68	7.41	9.23	4.22	3.70

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
30/09	0.0	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	50.4	0.2	-	21.5	nr	16.3	14.8	17.4
01/10	0.0	0.0	6.6	12.2	5.3	15.2	6.5	50.3	52.1	38.3	37.8	0.0	nr	nr	nr	nr	7.7	-	15.7	7.4	49.5	13.8	1.0
02/10	0.5	0.0	nr	9.8	nr	1.0	2.5	2.2	2.3	1.8	1.8	5.8	nr	32.0	2.5	nr	nr	-	15.6	6.2	nr	4.3	21.0
03/10	0.0	0.0	nr	2.1	nr	0.0	nr	0.8	0.7	0.0	nr	1.0	nr	16.0	18.0	7.6	3.1	-	9.5	7.4	2.4	nr	0.0
04/10	0.0	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	16.5	37.5	11.9	7.2	-	18.4	0.0	nr	0.0	-
05/10	0.0	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	6.4	nr	21.0	10.0	16.3	2.4	-	0.0	2.7	nr	1.1	0.7
06/10	8.00	25.4	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	-	0.0	14.4	0.8	-	3.2	-	14.5	5.3	10.4
07/10	7.00	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	4.5	nr	5.5	24.5	8.6	22.2	-	0.2	3.6	12.4	8.0	12.2

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

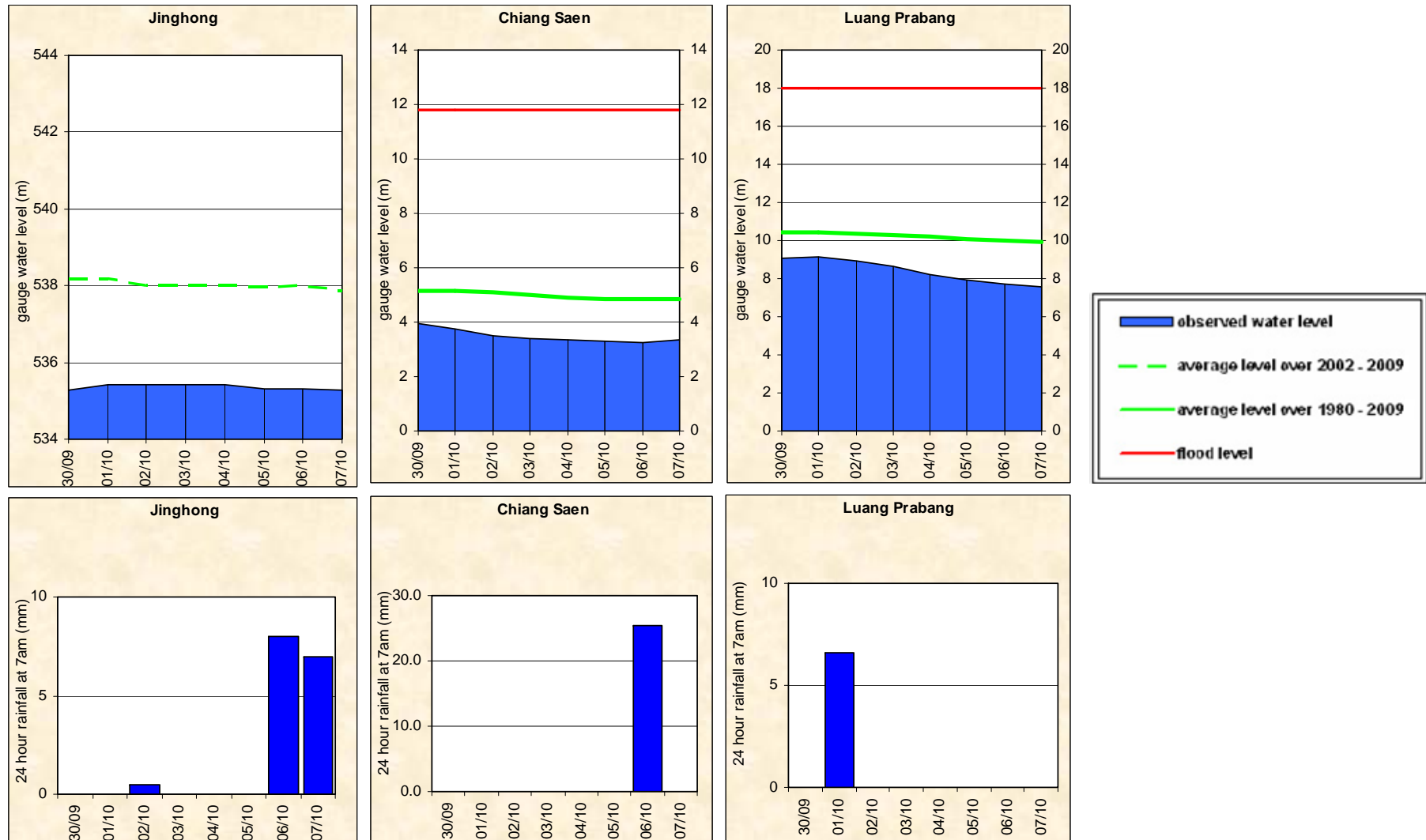


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

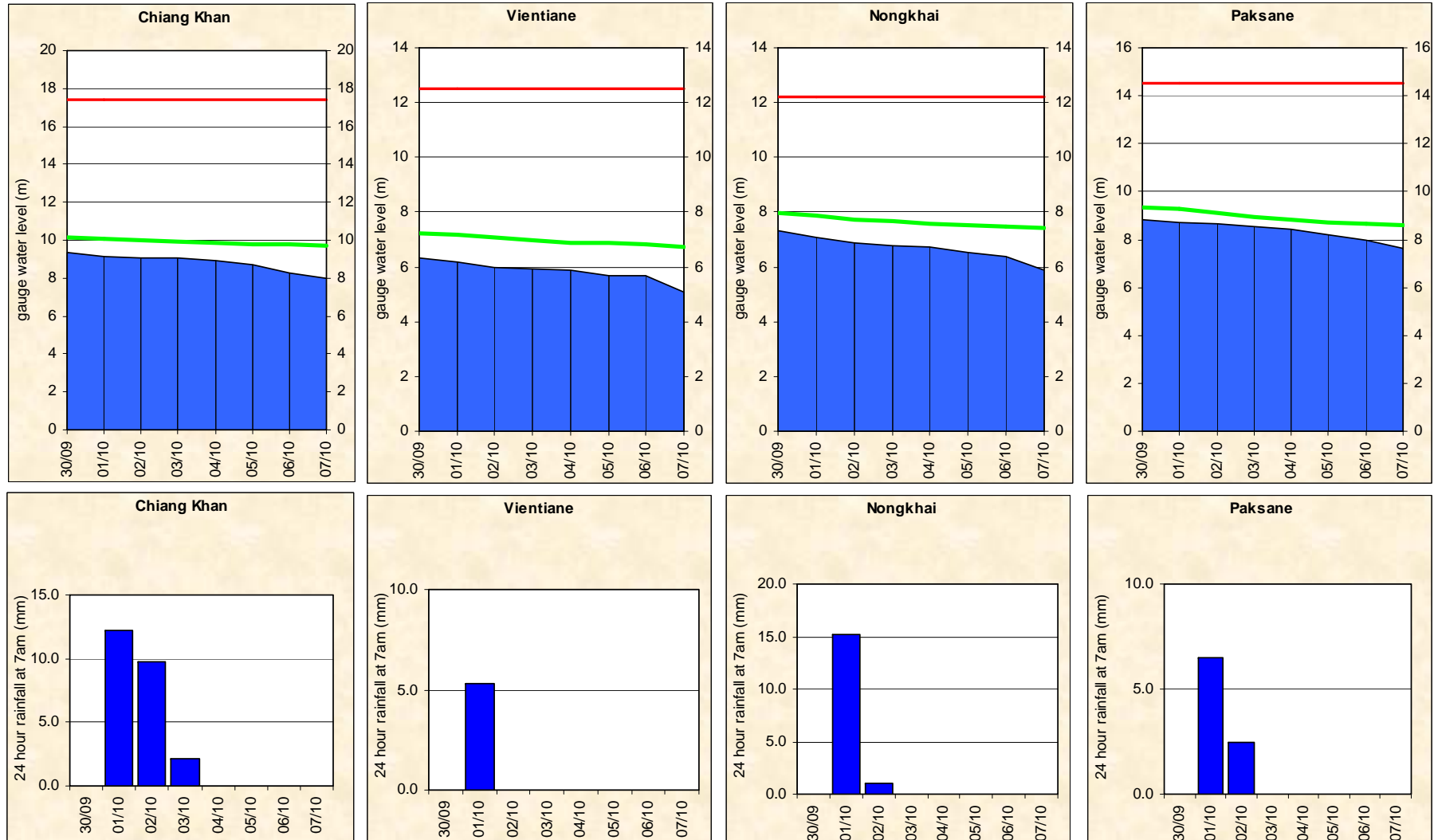


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

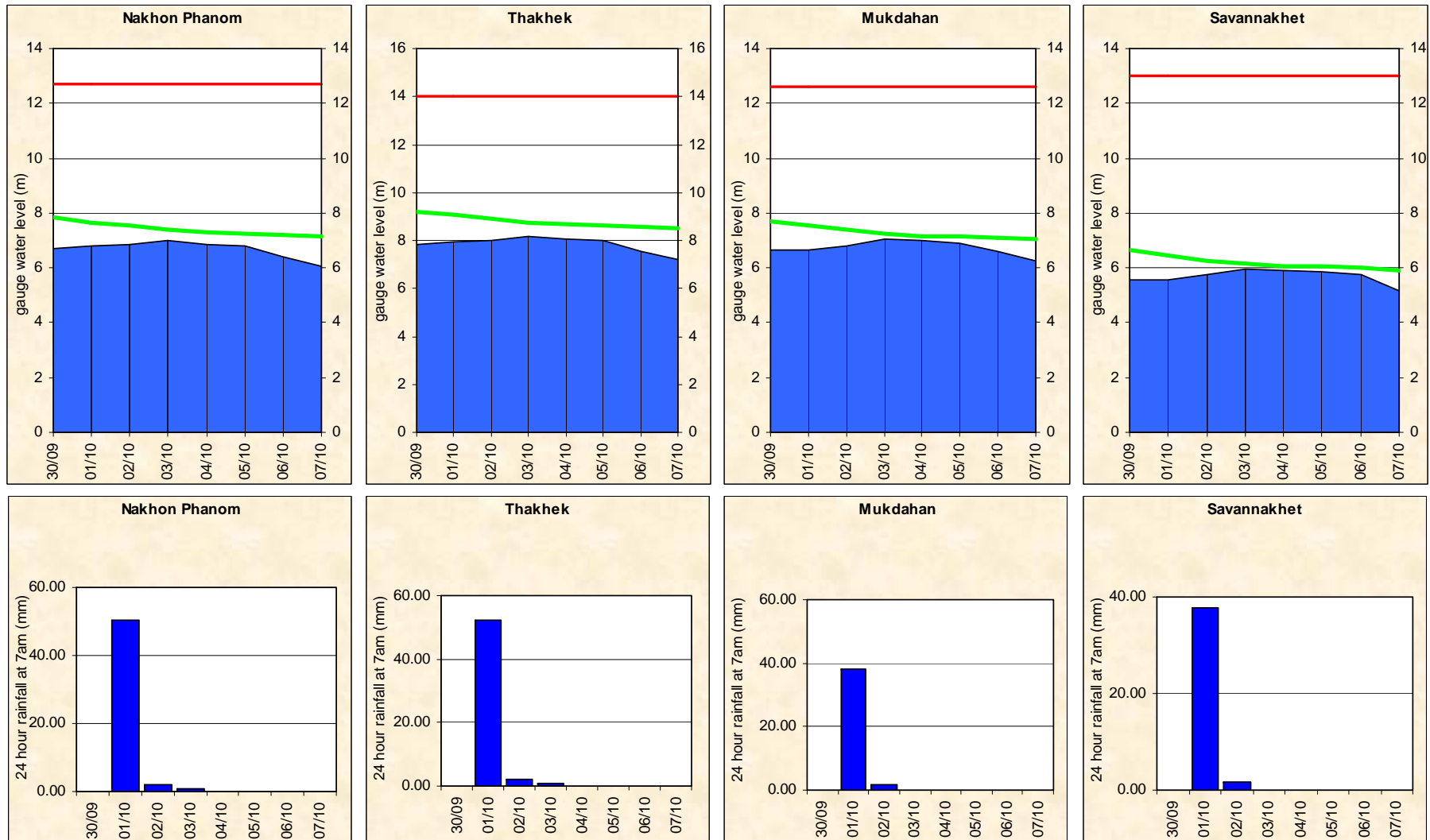


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

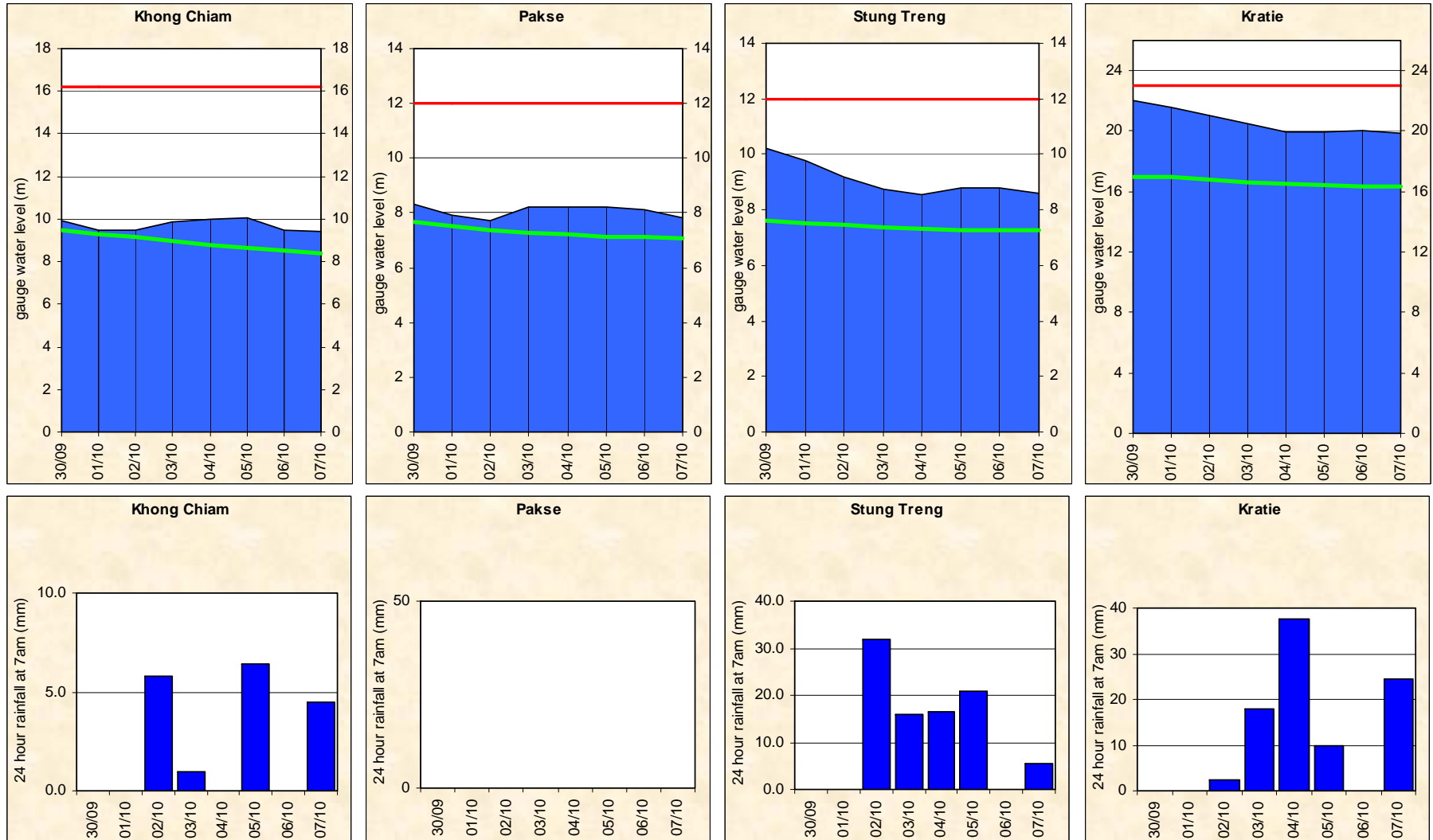




Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

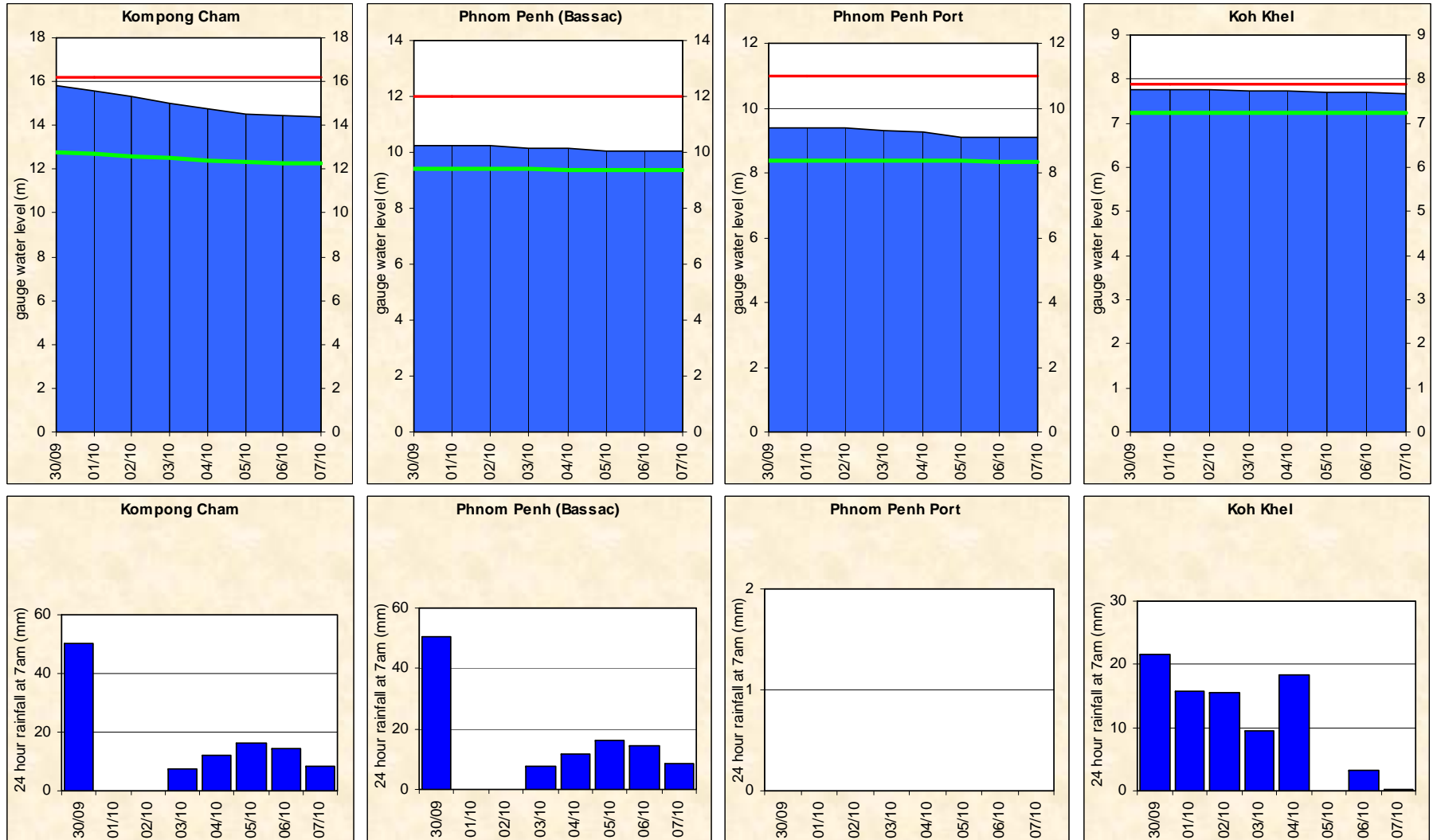
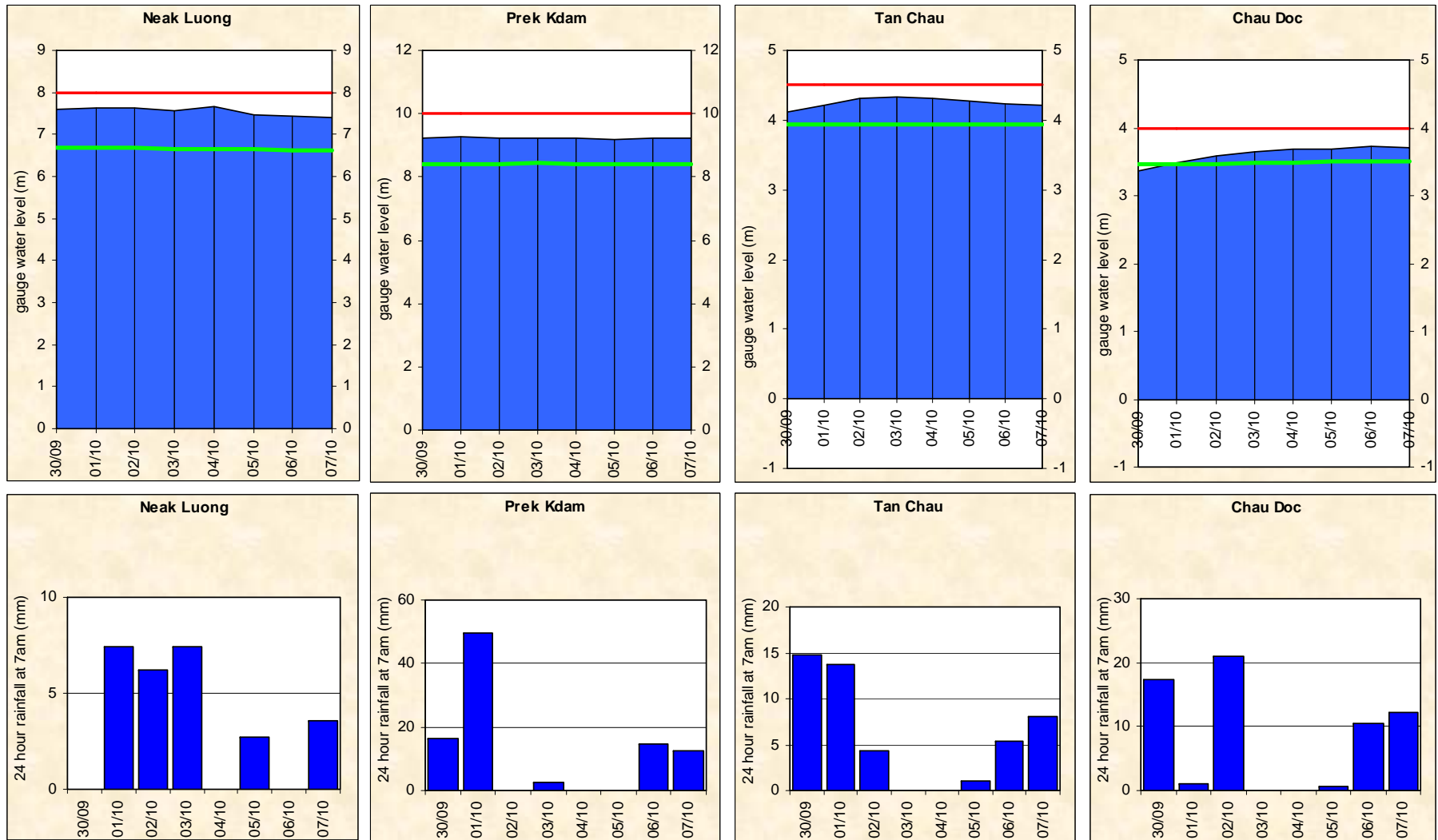


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



**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.

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 Luang Prabang, Paksane, Mukdahan, Savannakhet, Khong Chiam, Pakse and Stung Treng for 4-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.

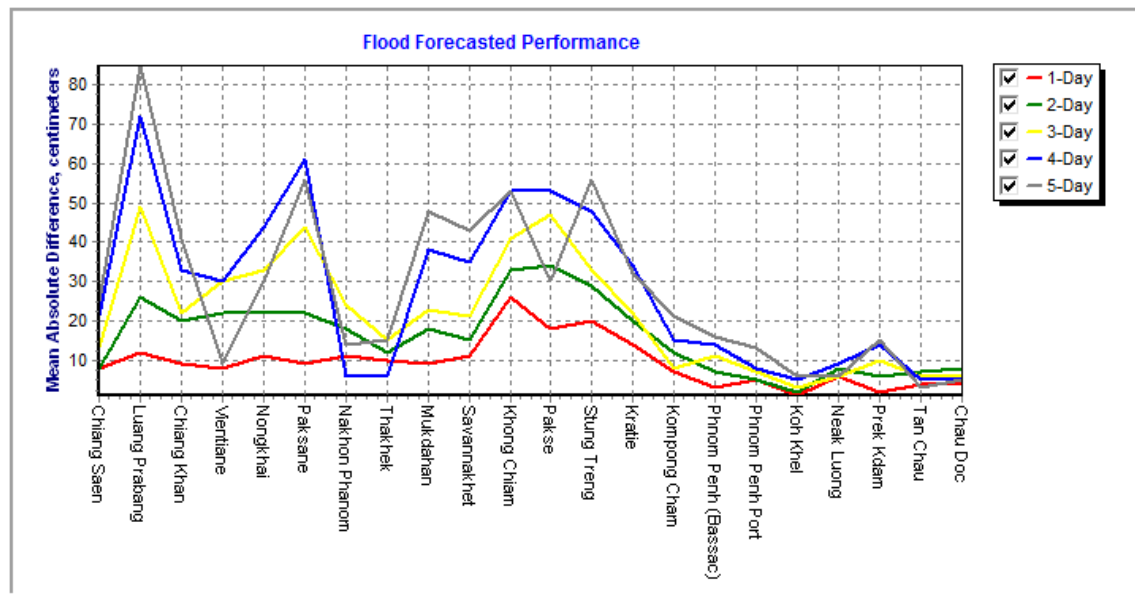


Figure B1: Average flood forecast accuracy along the Mekong mainstream

**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 Khei	Neak Luong	Prek Kdam	Tan Chau	Chau Doc	Average	
1-day	100.0	85.7	85.7	57.1	71.4	57.1	28.6	71.4	71.4	57.1	28.6	42.9	14.3	42.9	71.4	100.0	100.0	100.0	71.4	100.0	100.0	100.0	100.0	70.8
2-day	100.0	100.0	83.3	66.7	66.7	66.7	83.3	100.0	83.3	83.3	33.3	50.0	66.7	66.7	100.0	83.3	100.0	100.0	66.7	83.3	66.7	66.7	66.7	78.0
3-day	100.0	40.0	100.0	40.0	40.0	0.0	80.0	80.0	60.0	80.0	40.0	20.0	60.0	60.0	100.0	60.0	60.0	100.0	80.0	60.0	60.0	80.0	80.0	63.6
4-day	100.0	25.0	75.0	100.0	50.0	25.0	100.0	100.0	75.0	75.0	50.0	75.0	50.0	100.0	100.0	25.0	100.0	100.0	100.0	75.0	100.0	75.0	75.0	76.1
5-day	100.0	33.3	66.7	100.0	100.0	33.3	100.0	100.0	66.7	66.7	66.7	66.7	33.3	66.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	81.8

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 Khei	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

<b>2013</b>	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>	10:22	0	-	8	08:15	08:23	07:18	07:24	08:50	07:58	07:02	8	0	7	240	156	0	21
<i>month</i>	10:19	0	-	22	08:16	08:19	07:17	06:10	08:37	07:29	07:01	8	0	24	534	600	0	109
<i>season</i>	10:24	5	-	74	08:14	08:25	07:12	05:51	08:48	07:30	07:09	24	16	97	1509	3263	29	640

*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.

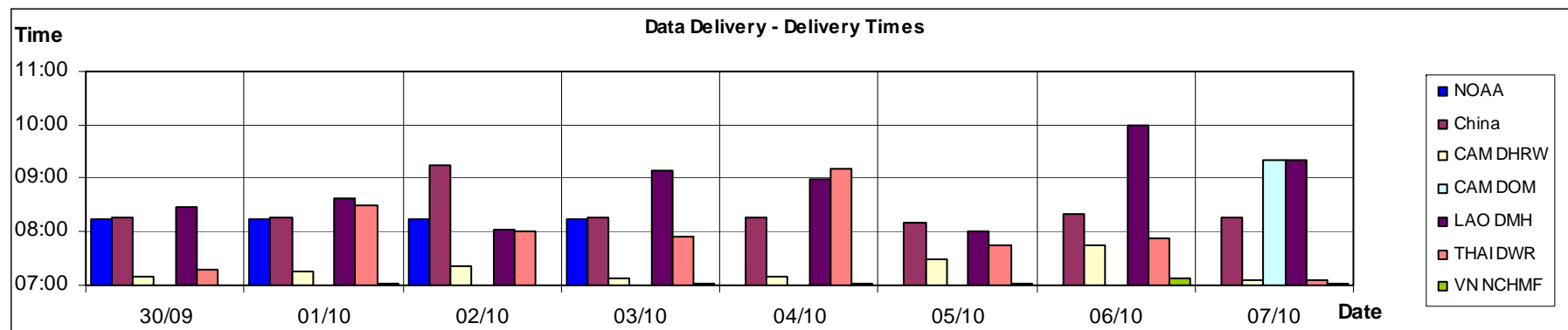


Figure B2: Data delivery times for the past 8 days including the current report date

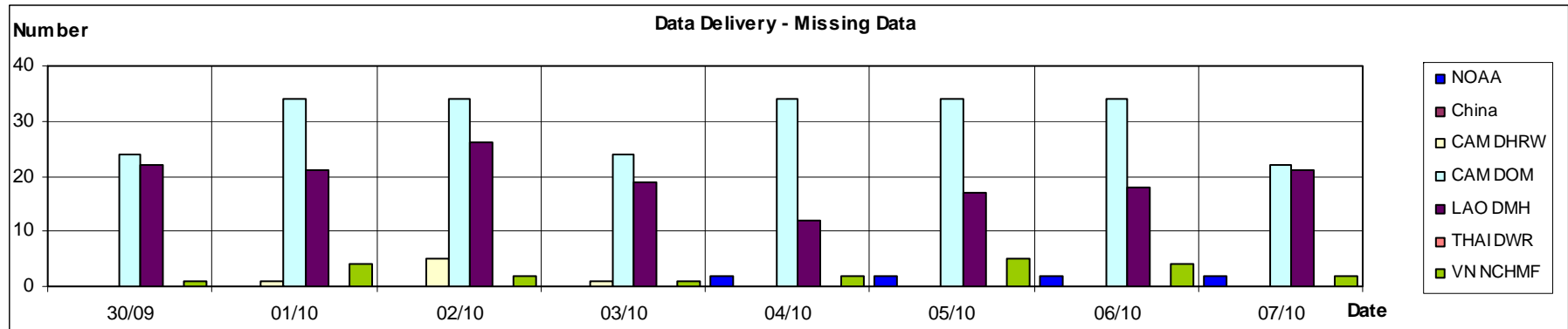


Figure B3: Missing data for the past 8 days including the current report date

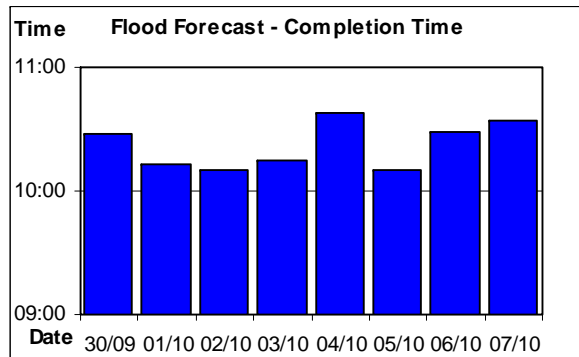


Figure B4: Flood forecast completion time

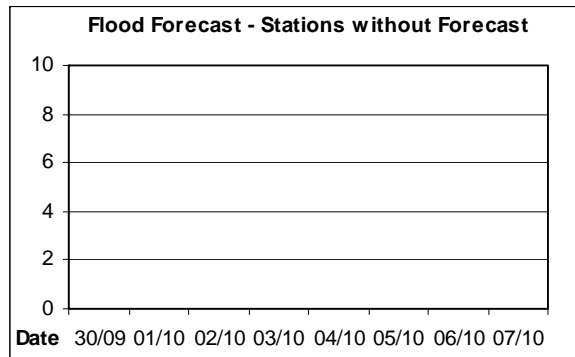


Figure B5: Flood forecast stations without forecast

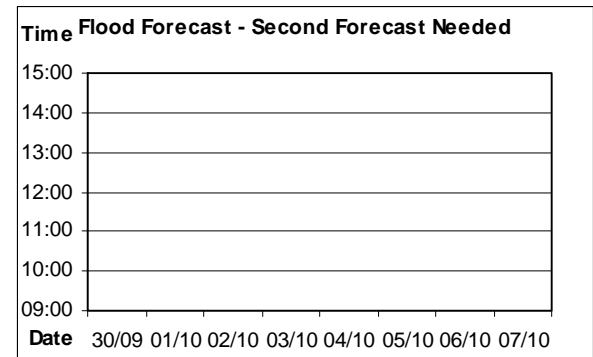


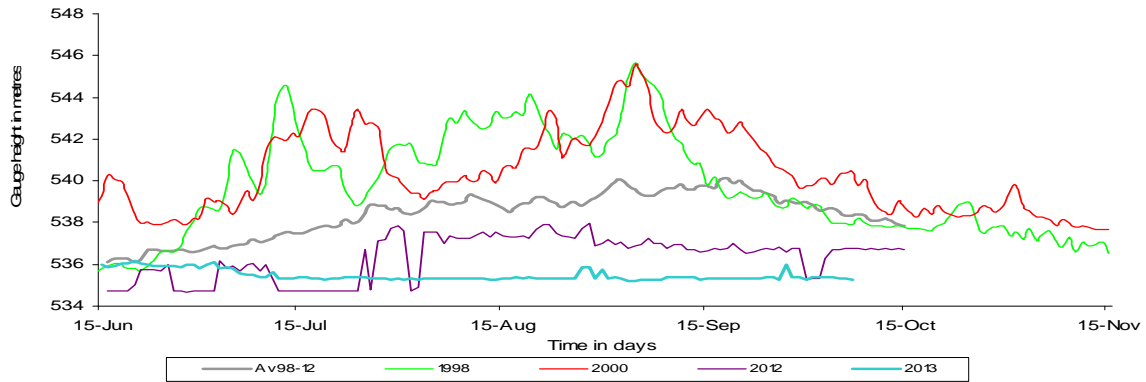
Figure B6: Second forecast needed

**Annex C: Season Water Level Graphs**

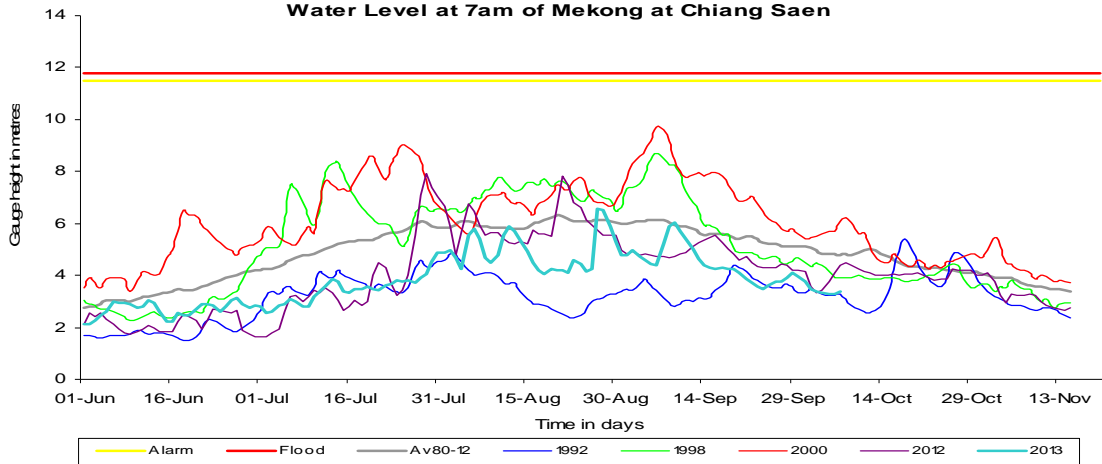
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

**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**

