

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 17/09/2012, covering the week from the 10th September to the 16th September 2012

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

General weather patterns

During the week of 10th September to 16th September 2012, six weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 11th September to the 16th September bulletins are presented in the figures below:

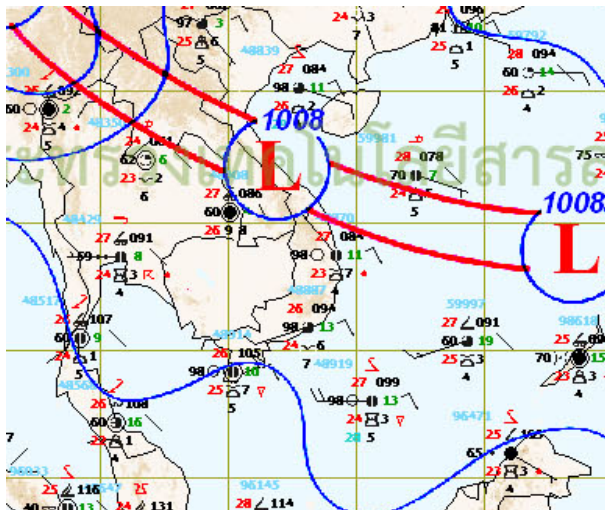


Figure 1: Weather map for 11th September 2012

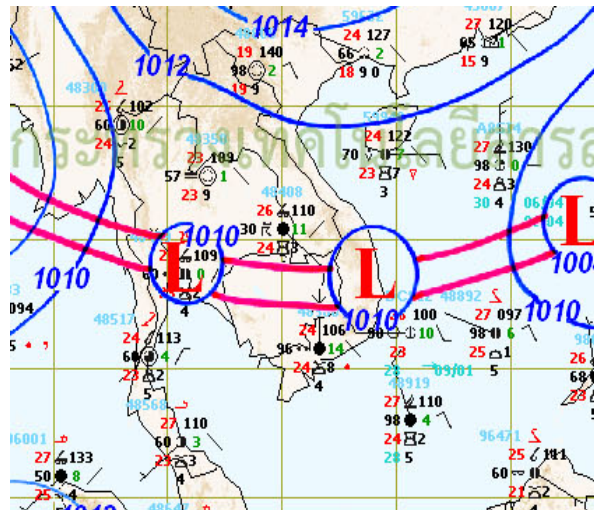


Figure 2: Weather map for 16th September 2012

South-West (SW) Monsoon

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

Inter Tropical Convergence Zone (ITCZ)

Inter Tropical Convergence Zone (ITCZ) was observed in the beginning and till the end of last week (Figure 1 and 2). It laid across Myanmar, the Northeast of Thailand, the South of Lao PDR, Cambodia and middle of Viet Nam at beginning of the week then shift downward to the upper South of Thailand, and South of Viet Nam at the end of the week.

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

During last week, none of Tropical depressions (TD), tropical storms (TS) or typhoons (TY) has been observed.

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Overall weather situation

A normal weather situation was observed during last week. As a result of ITCZ and SW monsoon activity, heavy rain occurred in the North of Myanmar; in the North and East of Thailand; in the South

of Lao PDR and Vietnam; in the Northwest of Cambodia. Figure 3 illustrates rainfall amount distribution over the LMB, covering 11 September - 17 September 2012, in which heavy rain was observed in the upper part of the LMB, from Chiang Sean to Chiang Khan, some tributaries in the middle part of LMB at Khong Chiam and in the lower part at Kratie and Kompong Cham.

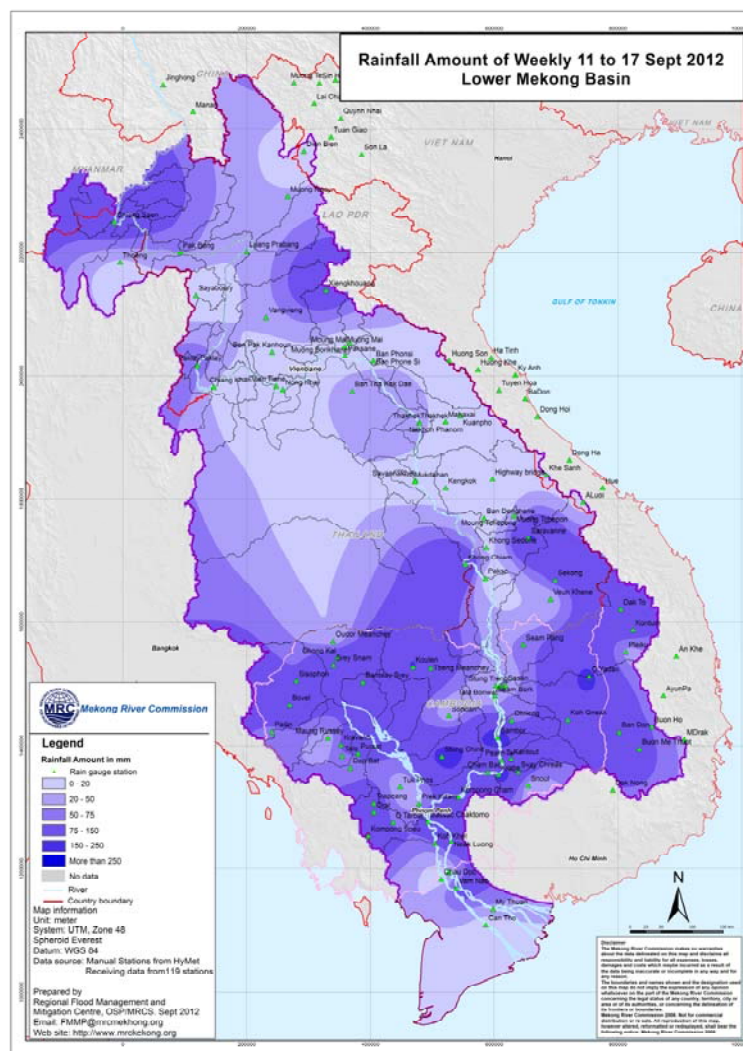


Figure 3 : Rainfall distribution over the LMB, from the 11th September to 17th September 2012

General behaviour of the Mekong River

Except at Kratie station, the water levels of all stations in LMB were fluctuated below the long-term average for this time of the year during the reporting period. Water levels at stations in the upper reach raised in the first half of the week and recessed till the end of the week, while water levels in middle and lower reached recessed in the first half and raised till the end of the week below the long-term average for this time of the year except Kratie that was above the long-term average.

Regarding to 2 stations in downstream at Tan Chau and Chau Doc, water levels at those 2 stations showed a small rising trend at the beginning of last week and then were more-or-less stable during the rest of last week. These stations were recording levels that are far below the long-term average for this time of the year.

For stations from Chiang Saen to Paksane

Water level at Chiang Saen till Luang Prabang raised in the first half of the week and recessed till the end of the week while the rest were recessing in the first half of the week and rising at the end of the week during the monitoring period. All water levels were below the long-term average for this time of the year.

For stations from Nakon Phanom/ Thakhek to Pakse

All water levels were recessing during last week below the long-term average for this time of the year.

For stations from Strung Treng to Kompong Cham

Water level at Strung Treng to Kompong Cham were rising at the beginning and recessing at the end of reporting period as a result of influences of ITCZ appearances during last week.

These stations were recording levels that were below the long-term average for this time of the year at the end of last week except Kratie, where was above the long-term average.

For stations from Phnom Penh to Koh Khel. Neak Luong

Water levels at these stations were rising during last week. These stations were recording levels that were below the long-term average for this time of the year.

Tan Chau and Chau Doc

Water levels were rising during last week. Both stations were recording levels that were below the long-term average for this time of the year and significantly affected by tidal effects.

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
10/09	536.95	4.82	10.08	10.48	7.62	8.66	10.59	8.69	9.75	8.47	7.38	10.15	8.34	7.83	18.30	12.90	8.18	7.26	6.78	5.78	7.16	2.72	2.16
11/09	536.96	4.86	10.40	10.22	7.65	8.74	10.52	8.60	9.70	8.40	7.30	10.08	8.33	7.76	18.19	12.78	8.14	7.26	6.76	5.76	7.18	2.73	2.28
12/09	536.70	5.14	10.42	10.15	7.29	8.42	10.16	8.42	9.53	8.20	7.00	10.02	8.28	7.86	18.15	12.71	8.13	7.25	6.74	5.74	7.16	2.78	2.28
13/09	536.72	5.24	10.41	10.16	7.24	8.25	10.07	8.25	9.32	7.98	6.88	9.83	8.17	7.89	18.30	12.73	8.15	7.27	6.74	5.74	7.18	2.81	2.32
14/09	536.61	5.34	10.65	10.08	7.15	8.17	9.87	8.00	9.10	7.77	6.65	9.90	8.40	8.11	18.40	12.78	8.18	7.30	6.76	5.77	7.19	2.87	2.42
15/09	536.66	5.45	11.32	10.30	7.07	8.07	9.70	7.85	9.00	7.57	6.47	9.50	8.02	8.58	18.85	12.97	8.25	7.40	6.80	5.84	7.28	2.90	2.42
16/09	536.79	5.55	11.36	10.74	7.40	8.31	9.55	7.59	8.70	7.34	6.25	9.08	7.52	8.27	19.22	13.27	8.39	7.52	6.89	5.94	7.46	2.96	2.46
17/09	536.70	5.24	11.20	10.82	7.80	8.72	9.66	7.41	8.54	7.11	6.06	8.78	7.20	7.61	18.80	13.27	8.49	7.61	6.94	6.02	7.49	3.00	2.45
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
10/09	0.0	12.0	20.0	6.5	9.2	12.6	17.1	0.0	2.8	1.3	nr	14.9	-	nr	nr	6.4	nr	-	nr	0.0	nr	0.0	-
11/09	0.0	1.8	nr	0.0	nr	0.0	nr	23.1	28.0	3.9	nr	25.6	nr	17.5	103.4	4.0	12.9	-	nr	nr	nr	nr	-
12/09	0.0	0.3	nr	0.0	nr	0.0	2.0	0.0	4.1	0.0	6.8	49.4	nr	17.5	13.0	3.0	45.2	-	32.5	95.8	7.2	4.5	2.0
13/09	10.0	43.7	nr	0.0	nr	0.0	0.2	0.0	nr	0.0	nr	17.1	nr	3.0	18.2	13.8	0.9	-	nr	1.2	6.3	10.3	3.0
14/09	46.0	51.3	21.0	0.5	nr	0.0	nr	4.8	0.3	0.0	nr	40.4	nr	8.0	25.2	29.2	0.3	-	nr	0.0	nr	0.0	-
15/09	1.0	16.2	2.4	3.1	nr	0.0	nr	0.0	nr	0.0	nr	0.0	-	19.0	0.0	27.4	5.4	-	0.8	3.6	4.2	nr	-
16/09	0.0	4.0	nr	9.6	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	2.5	22.2	21.0	37.4	-	37.5	13.2	27.3	6.6	-
17/09	0.0	0.0	2.0	0.0	nr	0.0	nr	0.0	nr	0.0	nr	13.0	nr	1.0	19.4	40.5	-	-	-	1.2	-	4.4	-

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

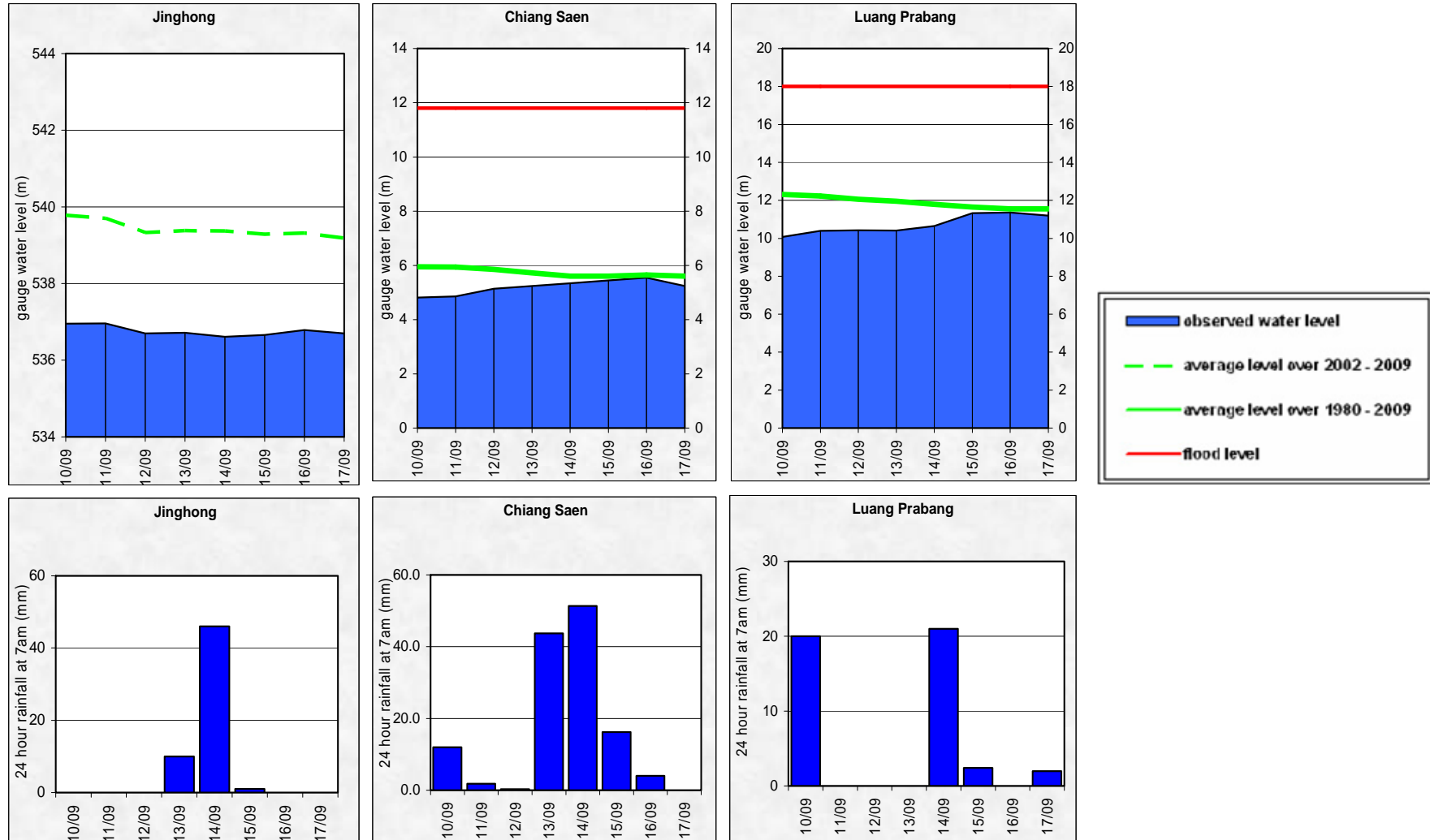


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

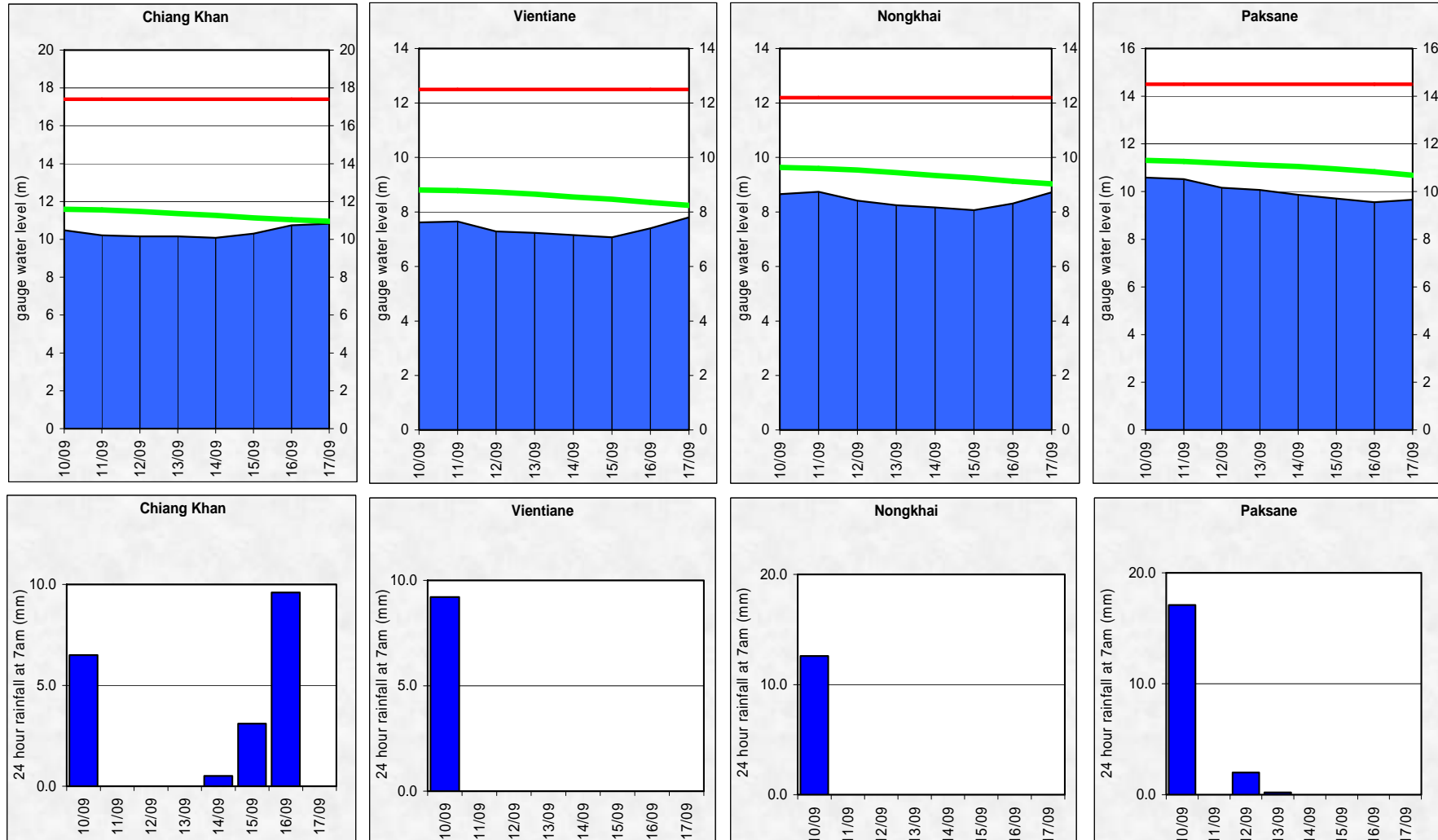


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

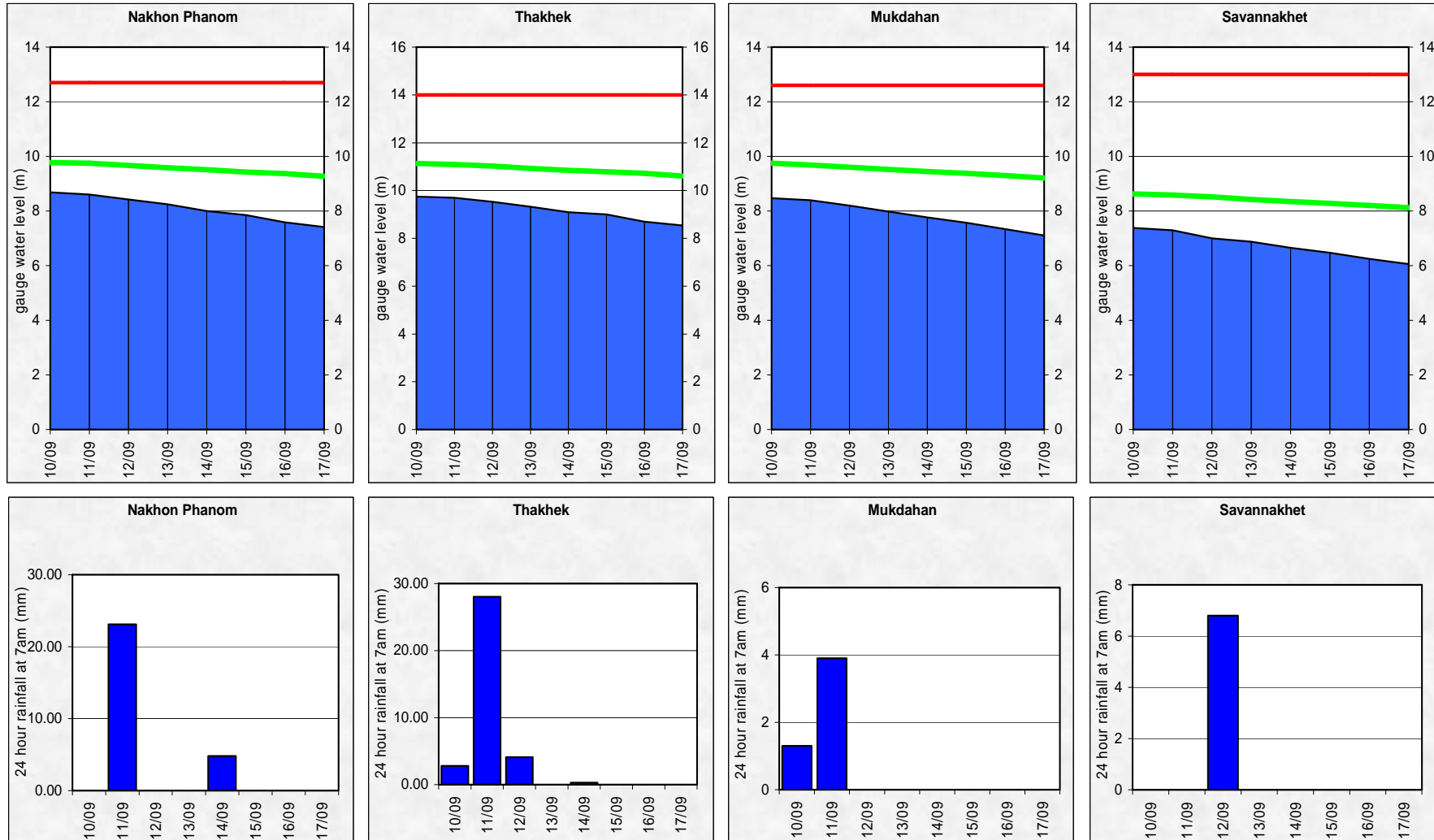


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

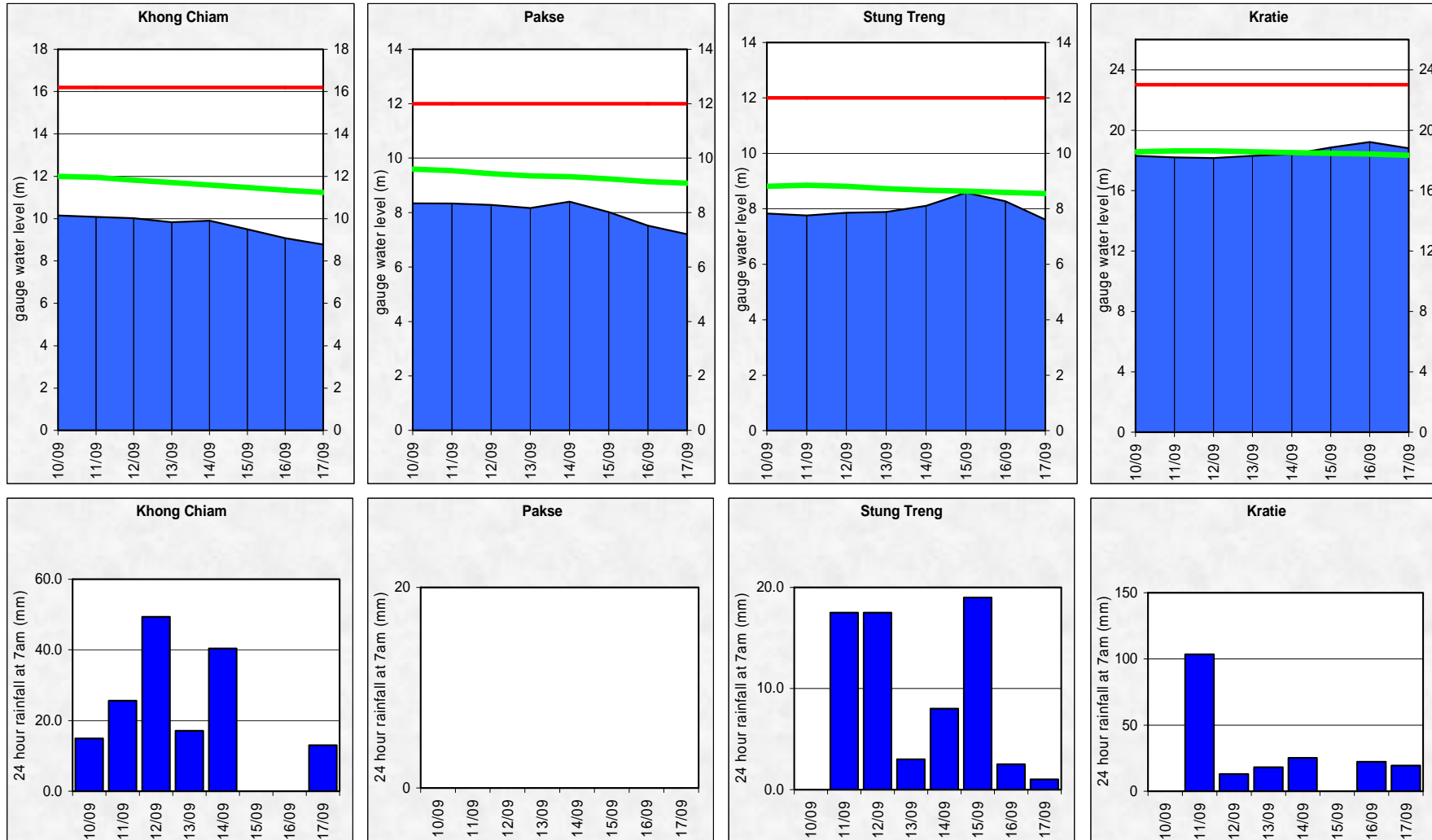


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

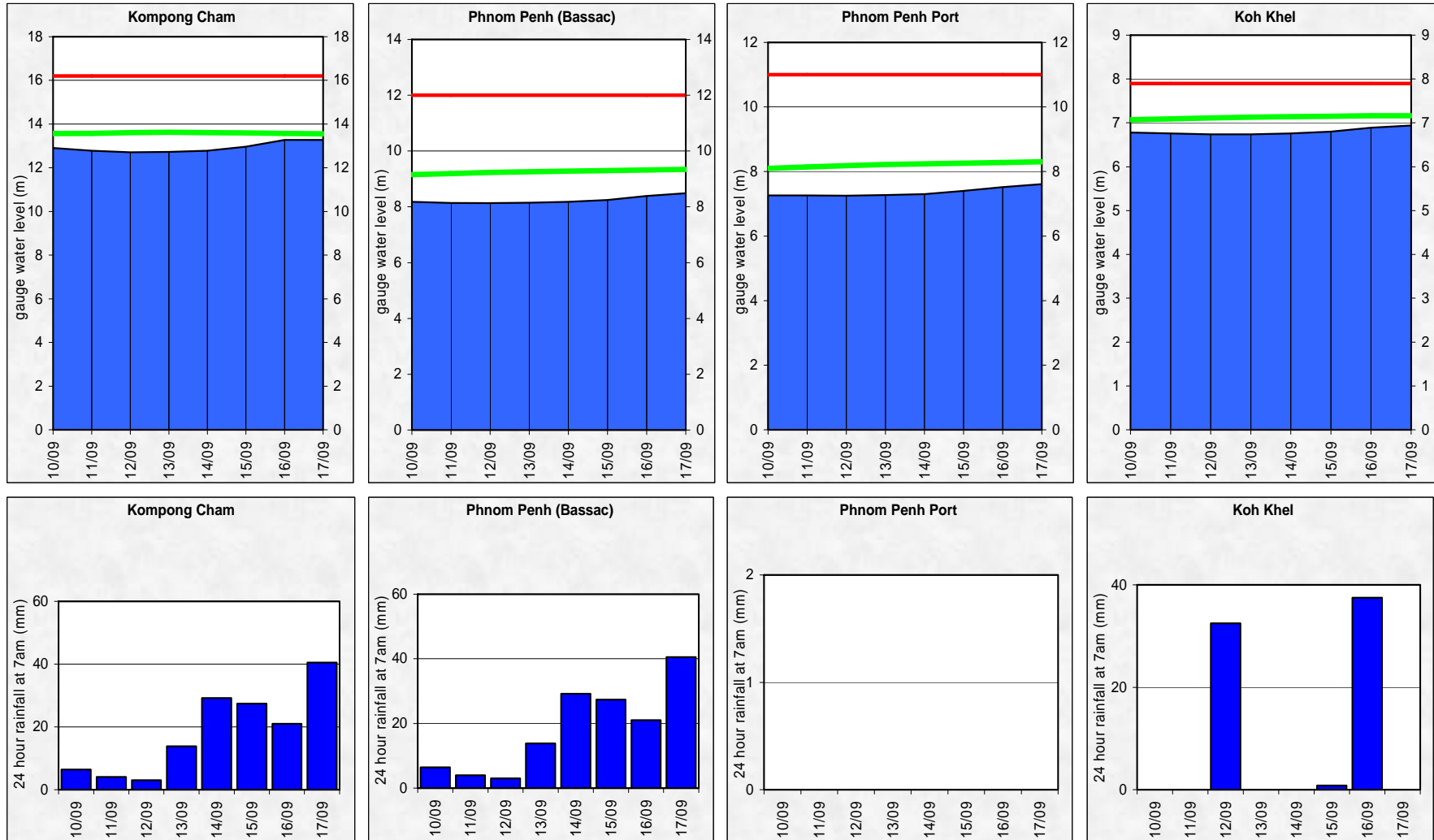
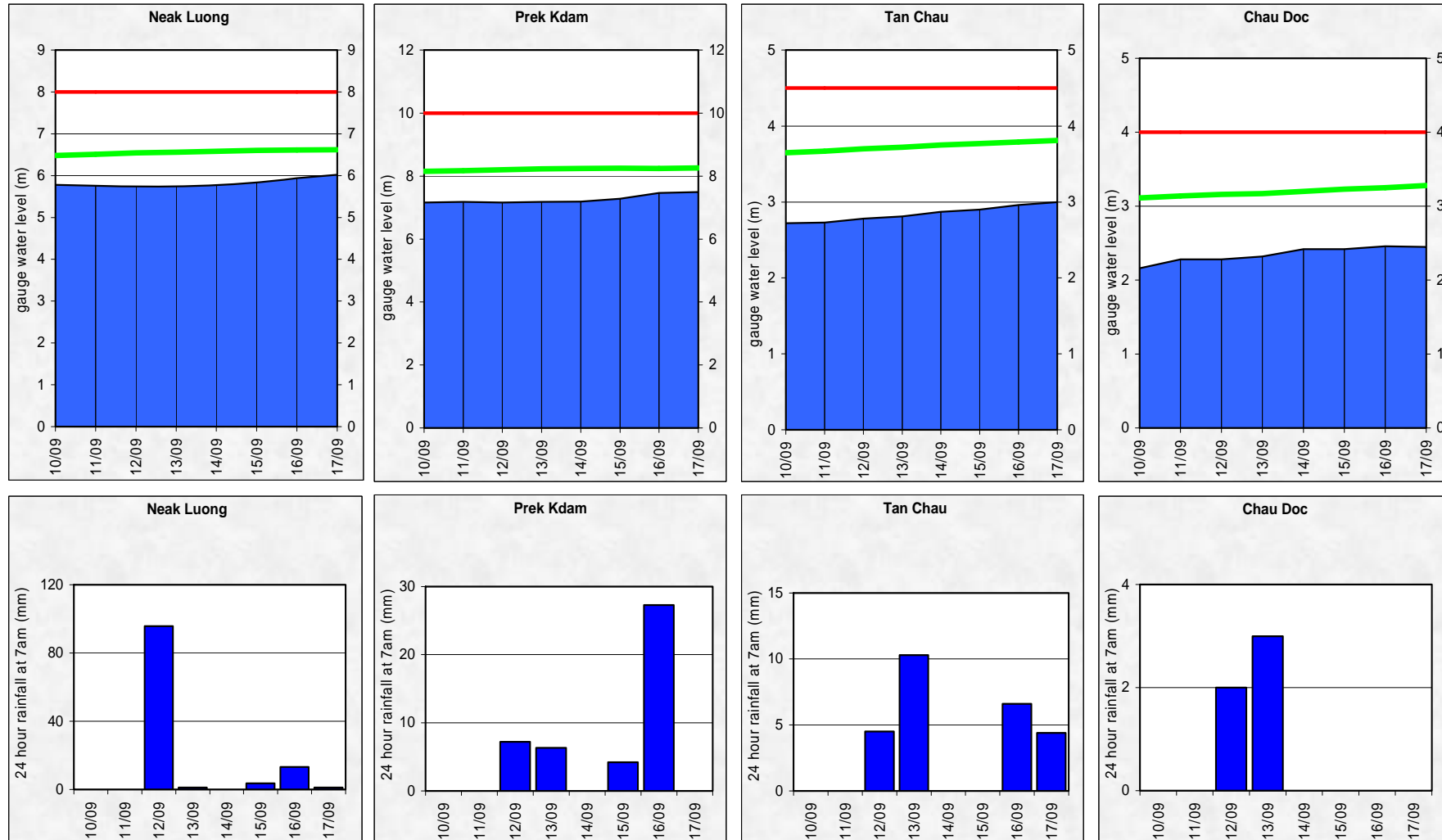


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

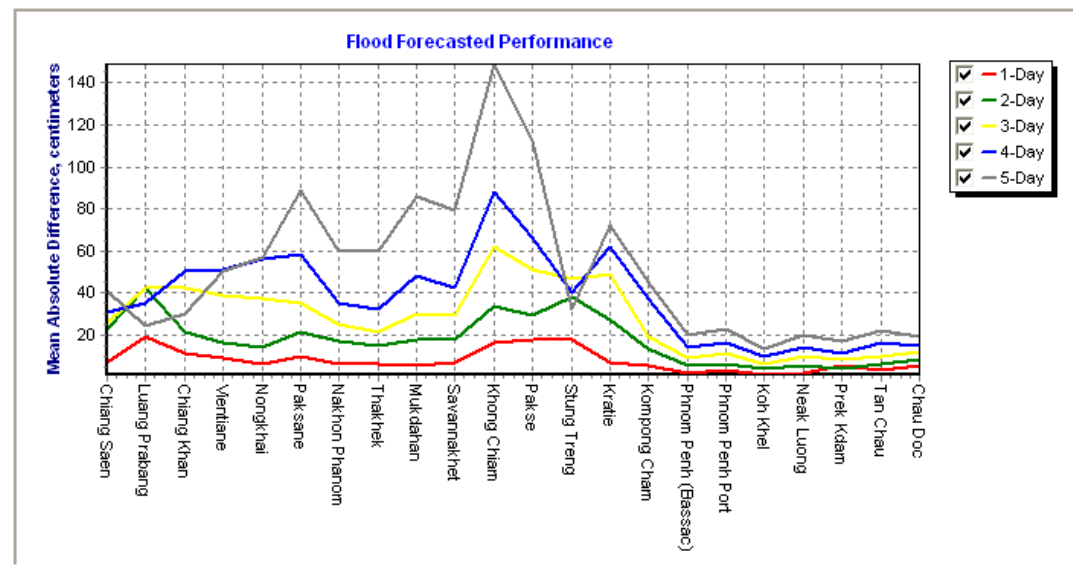
“Accuracy” describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model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

In general, accuracies at most stations along mainstream of Mekong River in the LMB for 1-day to 2-day forecast lead time are quite good. However, accuracies at Khong Chiam, Pakse and at Kratie for 3-day to 5-day forecast lead time were less than expected.

The above differences due to 2 main factors: (1) high variability of the forecast rainfall NWP when critical weather appearances as ITCZ; (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	85.7	71.4	100.0	71.4	85.7	57.1	85.7	85.7	85.7	57.1	42.9	28.6	28.6	85.7	85.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	79.9
2-day	100.0	66.7	83.3	83.3	83.3	50.0	66.7	66.7	66.7	66.7	33.3	50.0	50.0	50.0	100.0	83.3	83.3	100.0	100.0	83.3	100.0	100.0	66.7	74.2
3-day	100.0	40.0	60.0	20.0	40.0	40.0	40.0	60.0	40.0	40.0	0.0	20.0	20.0	40.0	80.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	20.0	46.4
4-day	100.0	100.0	50.0	25.0	25.0	50.0	75.0	75.0	50.0	50.0	0.0	25.0	75.0	25.0	100.0	25.0	100.0	50.0	100.0	100.0	0.0	25.0	55.7	
5-day	100.0	100.0	66.7	66.7	33.3	33.3	33.3	33.3	0.0	33.3	0.0	0.0	100.0	33.3	66.7	66.7	66.7	100.0	100.0	100.0	66.7	66.7	57.6	

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			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
2012																		
<i>week</i>	10:26	0	-	6	08:12	08:13	07:21	06:16	08:44	07:33	07:03	0	0	13	25	164	2	194
<i>month</i>	10:23	0	-	20	08:12	08:11	07:17	06:14	08:45	07:26	07:06	0	1	27	100	522	7	507
<i>season</i>	10:33	1	-	66	07:45	-	07:20	06:10	08:48	07:24	07:19	10	1	106	729	1910	20	1535

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.

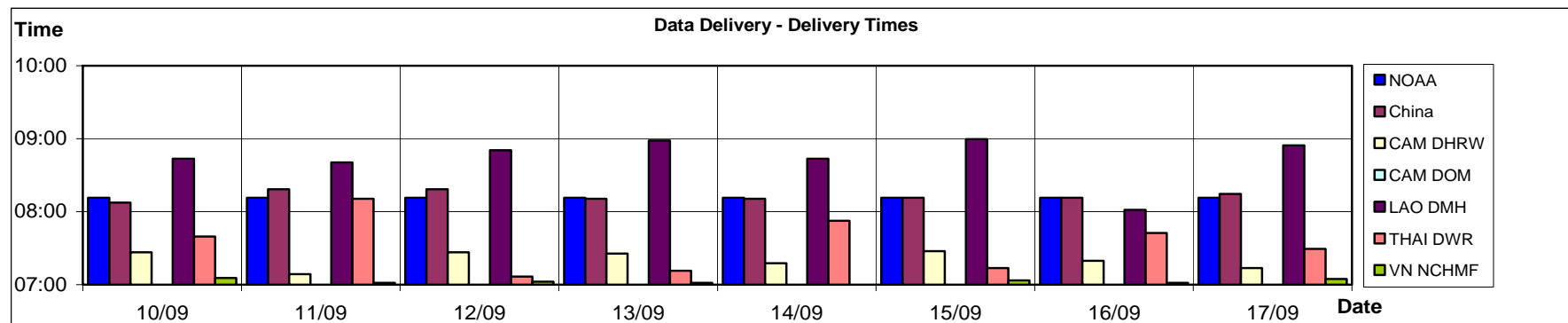


Figure B2: Data delivery times for the past 8 days including the current report date



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

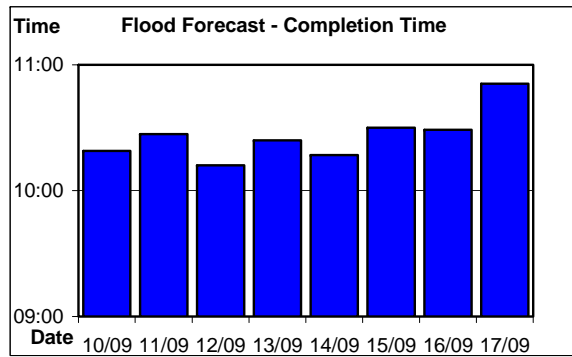


Figure B4: Flood forecast completion time

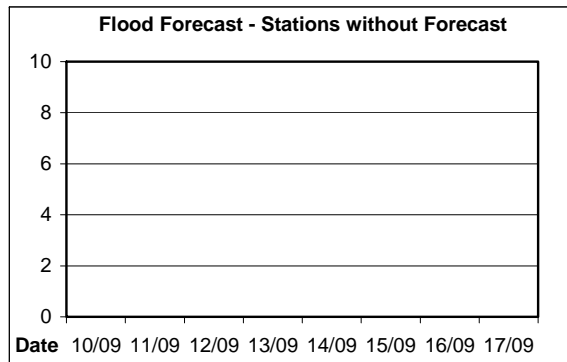


Figure B5: Flood forecast stations without forecast

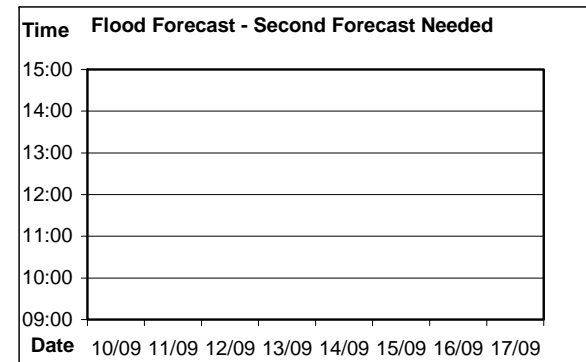


Figure B6: Second forecast needed

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

