

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 08/10/2012, covering the week from the 01st October to the 07th October, 2012

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

General weather patterns

During the week of 01st October to the 07th October 2012, seven weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 01st October and the 07th October bulletins are presented in the figures below:

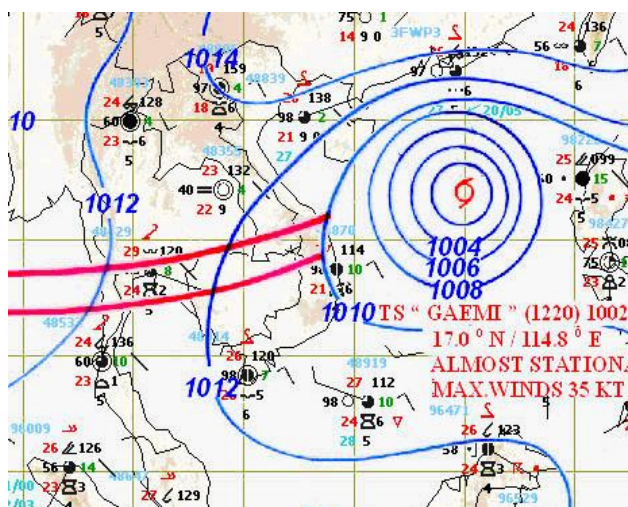


Figure 1: Weather map for 01st October 2012

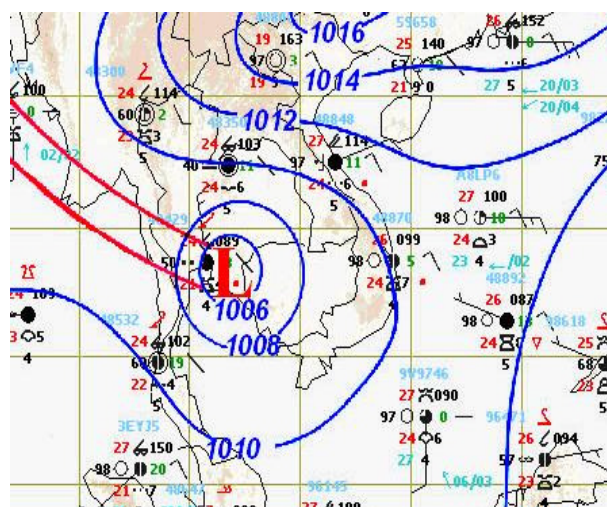


Figure 2: Weather map for 07th October 2012

South-West (SW) Monsoon

Strong to moderate SW monsoon prevailed over Amندا Sea and the Gulf of Thailand and was stationary during last week (Figure 1 and 2).

Inter Tropical Convergence Zone (ITCZ)

Inter Tropical Convergence Zone (ITCZ) was observed in the most of last week (Figure 1 and 2) and laid across Thailand, Lao PDR, Cambodia and Viet Nam.

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

A Tropical depression (TD), which was formed on 30th September 2012 on the South China Sea, upgraded to severe Tropical Storm named **GAEMI** (201220) on 4th October and made landfall over Binh Dinh and Phu Yen provinces in the Central of Viet Nam in the afternoon 6th October. After moving deep into Viet Nam territory, the TS GAEMI downgraded into Tropical Depression in the evening 06th October and became a low pressure until now. Figure 5 presents the recording storm track of TS **GAEMI**.

Figure 3 and 4 illustrate weather maps for the Tropical Storm **GAEMI** before and after landing over the Central of Viet Nam.

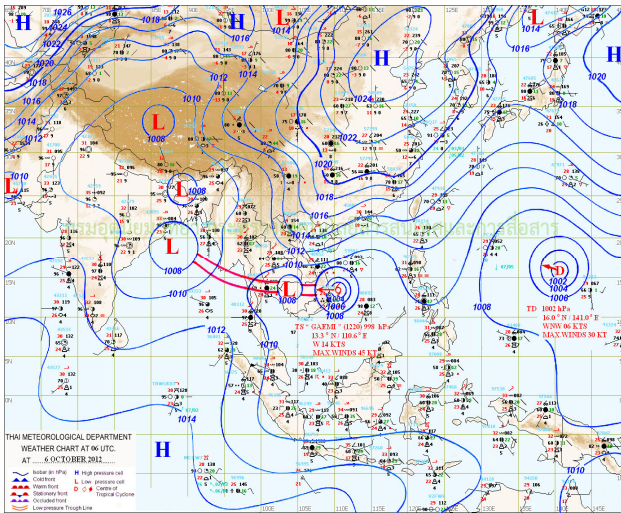


Figure 3: Weather map for GAEMI TS in the afternoon 06 Oct, before landing

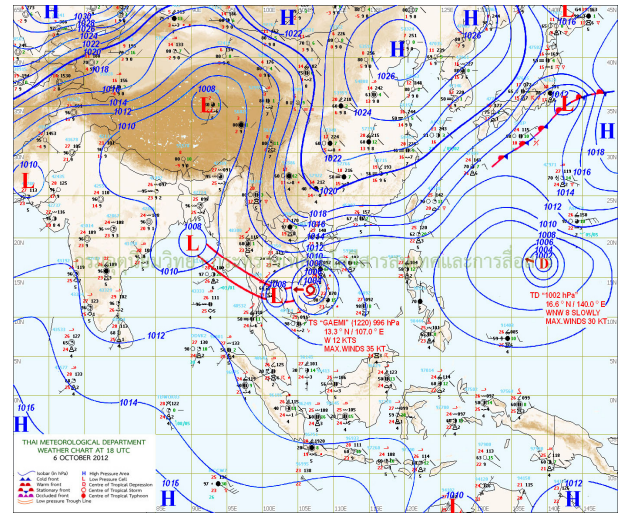


Figure 4: Weather map for GAEMI TS in the evening 06 Oct, after landing

Source: Thai Meteorological Department.

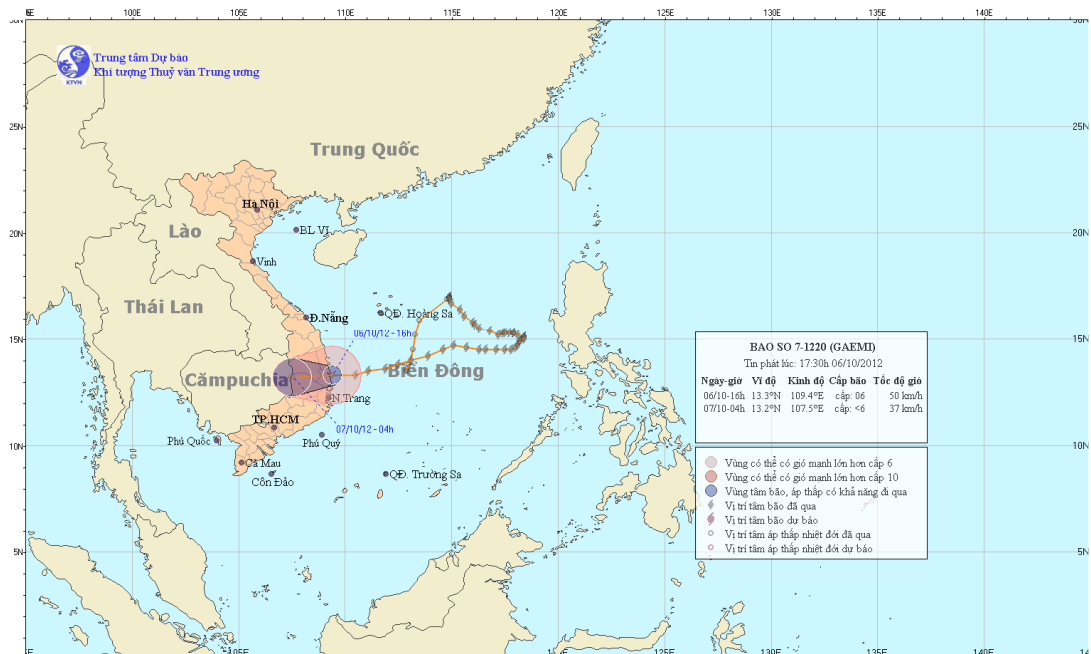


Figure 5: GAEMI Storm track

Source: Viet Nam National Centre for Hydro-Meteorological Forecasting.

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Overall weather situation

A severe weather situation was observed during the 4th and the 7th October. As a result of Tropical Storm **GAEMI**, ITCZ appearance and SW monsoon activity, heavy rain occurred in the Northeast, in the East and Central of Thailand; in the South and Central of Lao-PDR and Vietnam; in the East, the North, the Northeast and Northwest of Cambodia during last week. Figure 6 illustrates rainfall amount distribution over the LMB covering last week, in which heavy rain concentrated in left bank tributaries in Lao PDR of Pakse and the lower part of the LMB from Trung Treng to Neak Luong, their tributaries and Tonle Sap area.

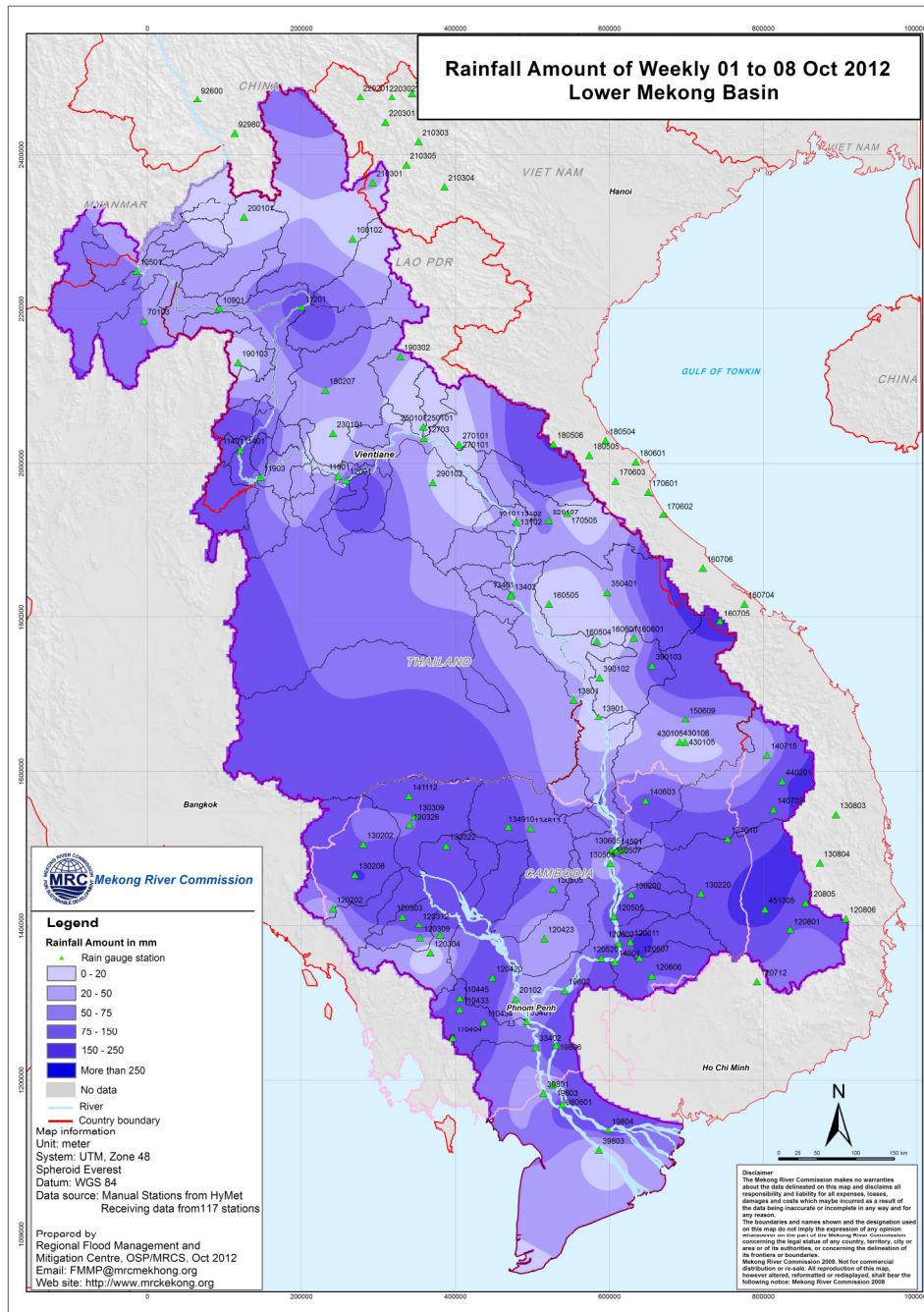


Figure 6: Rainfall distribution over the LMB covering last week

General behaviour of the Mekong River

Water levels of all stations in LMB were below the long-term average for this time of the year during the monitoring period. Water levels at stations in the upper reach showed a falling and rising trend in last week while water levels at middle and lower reaches were decreasing or more-or-less stable during reporting period.

Regarding to 2 stations in downstream at Tan Chau and Chau Doc, water levels at those 2 stations were more-or-less stable during last week and far below the long-term average for this time of the year.

For stations from Chiang Saen to Vientiane/ Nong khai

Monday, 08th October 2012

Water level at Chiang Saen showed a falling and rising trend in this week influenced by the water level changes from upper station Jinhong in China. Water levels at stations from Luang Prabang to Vientiane/Nongkhai were decreasing in most of the time during last week and increasing at the end of the week.

These stations were recording levels that were below the long-term average for this time of the year.

For stations from Paksane to Pakse

Water levels at Paksane to Pakse showed a recession trend during the monitoring period. 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 at stations from Strung Treng to Kompong Cham were falling in the first half of the week then rising till the end of the week.

All stations were recording levels that are 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 during last week and below the long-term average for this time of the year.

Tan Chau and Chau Doc

Water levels were more-or-less stable with a slightly decreasing trend during last week. Both stations were recording levels that were far 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
01/10	535.31	4.16	8.68	8.80	5.65	6.45	7.75	5.43	6.63	5.19	4.11	6.37	5.00	6.23	16.06	11.50	8.53	7.66	6.92	6.12	7.76	3.18	2.75
02/10	535.31	3.55	8.59	8.60	5.50	6.28	7.70	5.37	6.55	5.09	4.05	6.20	4.84	5.93	15.52	11.18	8.46	7.60	6.90	6.09	7.73	3.16	2.72
03/10	536.26	3.32	8.34	8.39	5.28	6.05	7.53	5.28	6.45	5.02	3.92	6.13	4.48	5.97	14.98	10.83	8.36	7.50	6.85	6.06	7.67	3.14	2.73
04/10	536.70	3.42	7.91	8.27	5.06	5.81	7.31	5.15	6.35	4.93	3.82	6.03	4.72	6.25	15.25	10.72	8.29	7.42	6.80	6.02	7.59	3.10	2.70
05/10	536.70	3.75	7.69	8.11	4.93	5.66	7.14	5.00	6.20	4.83	3.74	5.92	4.65	6.34	15.44	10.85	8.31	7.44	6.80	6.01	7.61	3.07	2.68
06/10	536.76	4.12	7.87	7.87	4.80	5.54	7.04	4.87	6.05	4.71	3.62	5.83	4.52	6.37	15.44	10.91	8.32	7.45	6.80	6.00	7.63	3.07	2.67
07/10	536.74	4.40	8.08	8.40	4.71	5.38	6.98	4.78	5.98	4.60	3.51	5.72	4.41	6.30	15.93	11.00	8.37	7.50	6.82	6.04	7.67	3.06	2.67
08/10	536.74	4.51	8.52	8.51	5.19	5.75	6.83	4.70	5.89	4.50	3.39	5.68	4.43	6.17	16.02	11.25	8.47	7.61	6.88	6.08	7.74	3.08	2.67

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
01/10	22.0	0.0	-	0.0	nr	0.0	nr	0.1	nr	0.0	nr	0.0	-	nr	2.6	1.5	1.0	-	6.0	12.6	9.3	6.0	-
02/10	6.0	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	15.5	nr	nr	7.5	-	4.5	8.2	nr	1.3	3.0
03/10	1.0	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	1.2	nr	9.0	8.2	14.0	4.5	-	0.5	16.8	nr	18.0	16.0
04/10	1.0	0.6	10.0	nr	nr	nr	0.0	nr	nr	nr	nr	nr	nr	6.5	nr	nr	nr	-	4.5	4.4	nr	0.7	
05/10	1.0	nr	nr	nr	nr	nr	11.8	nr	33.5	40.0	24.2	nr	nr	nr	5.0	2.0	0.2	-	1.3	nr	nr	0.5	12.0
06/10	0.0	24.7	77.2	49.5	3.8	107.5	12.4	3.0	2.9	nr	4.0	8.2	2.3	26.5	25.4	1.8	4.6	-	17.8	0.0	nr	1.0	4.3
07/10	0.0	25.3	nr	7.0	nr	nr	nr	nr	nr	1.3	1.7	9.9	nr	19.0	53.2	43.3	25.5	-	25.8	82.4	14.2	11.8	6.0
08/10	0.0	nr	nr	1.1	nr	nr	nr	0.4	1.3	1.9	2.8	11.0		0.0	nr	4.7	4.4	-	0.0	nr	nr7.4	nr	0.0

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

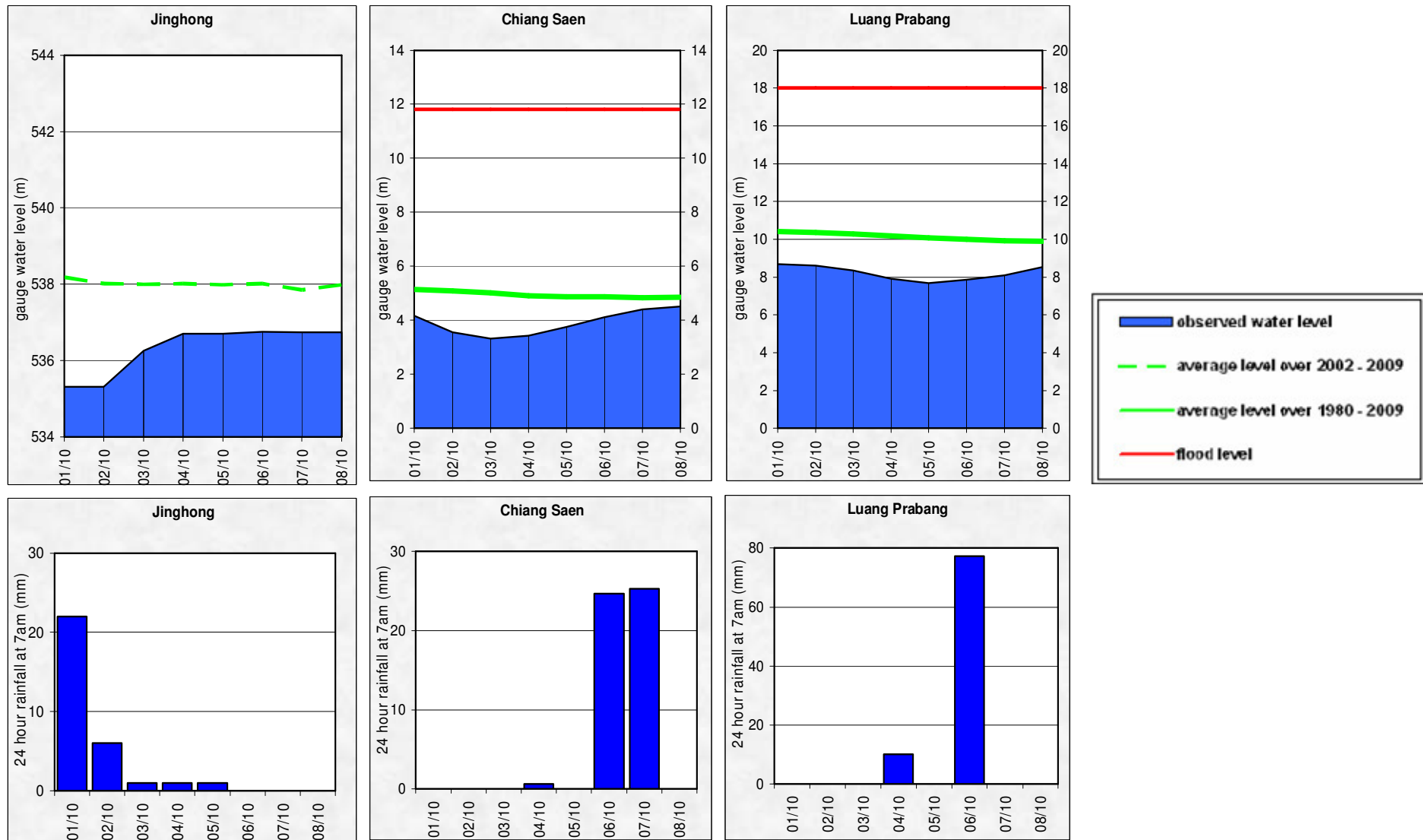


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

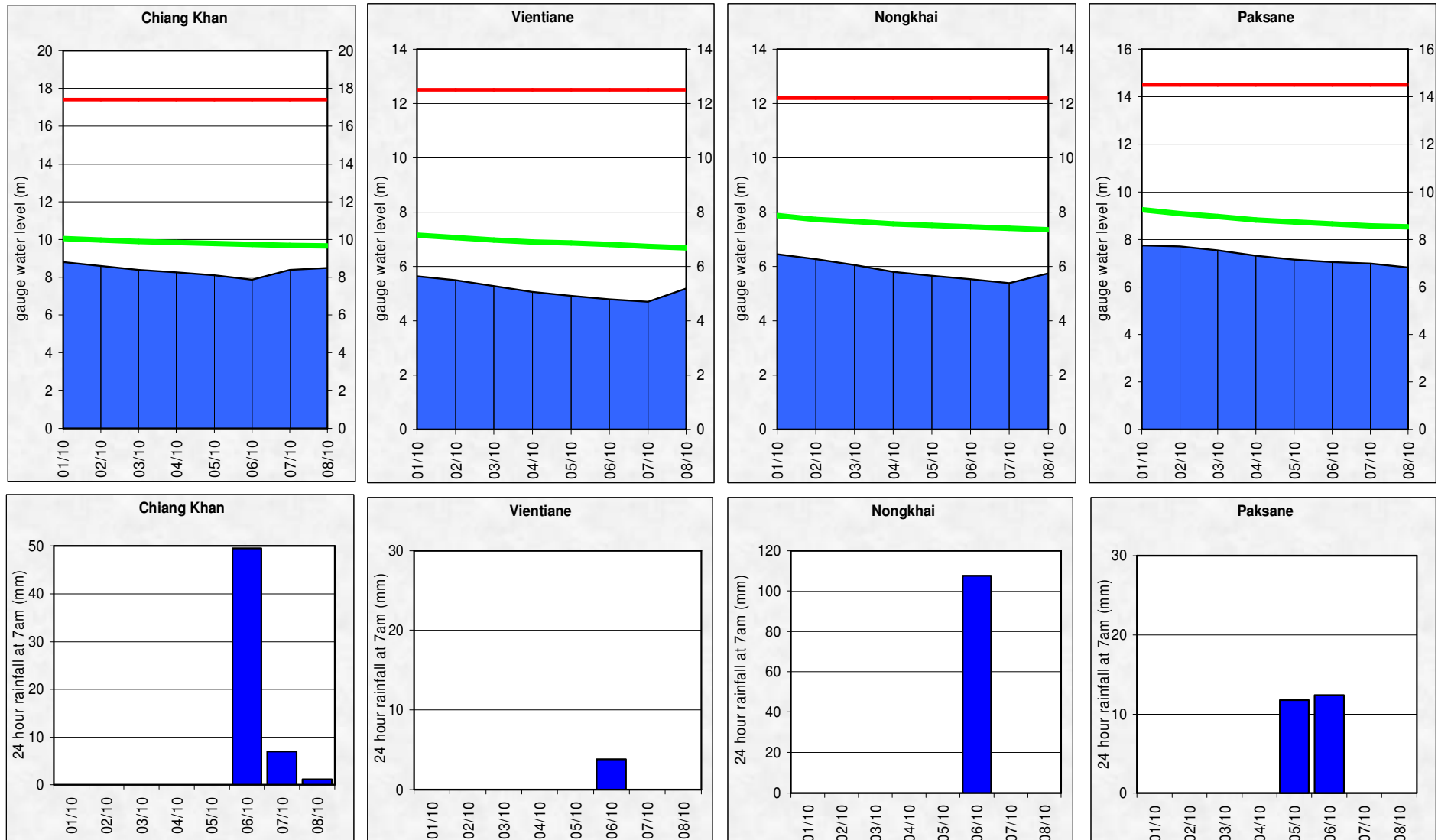


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

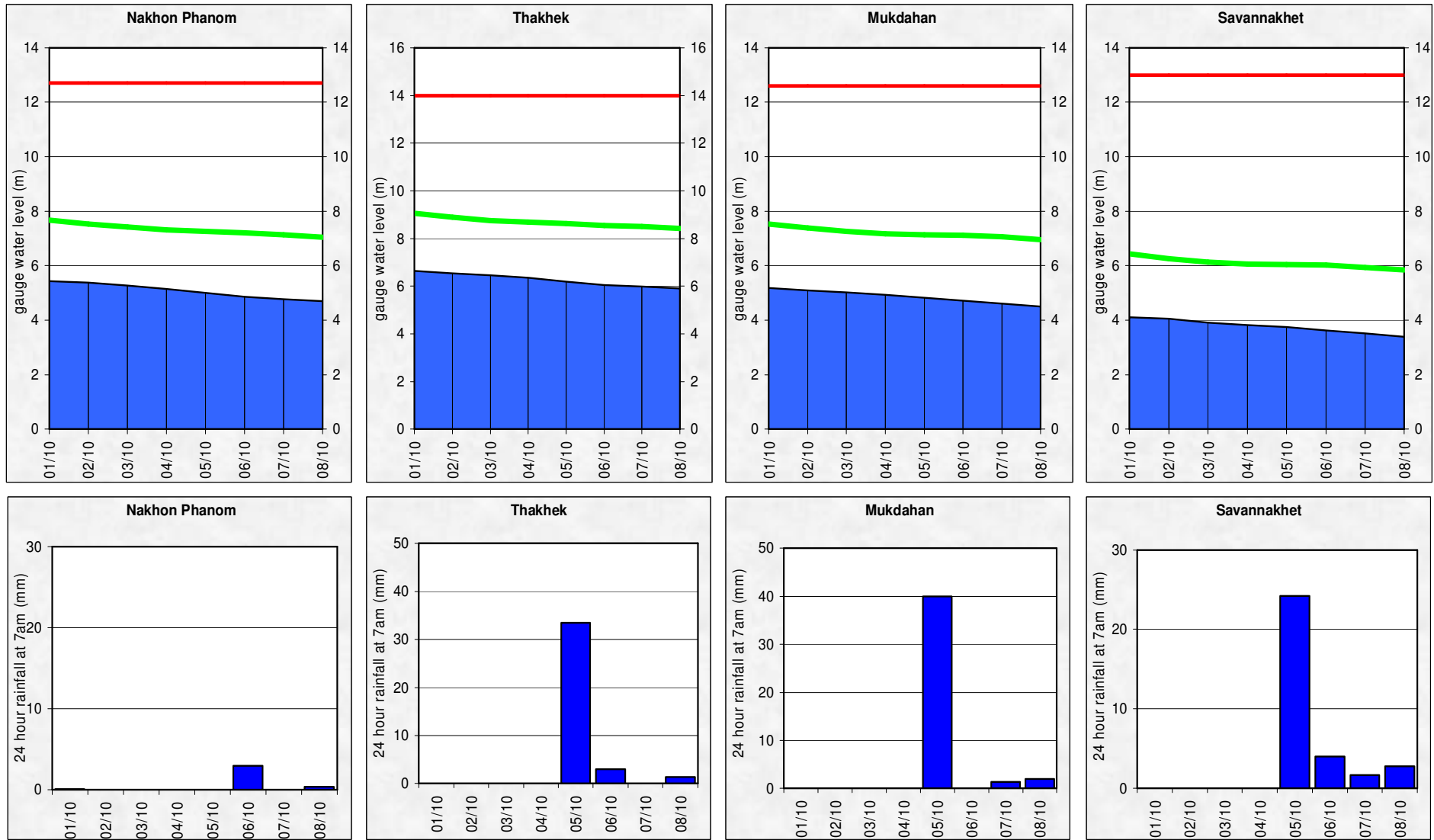


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

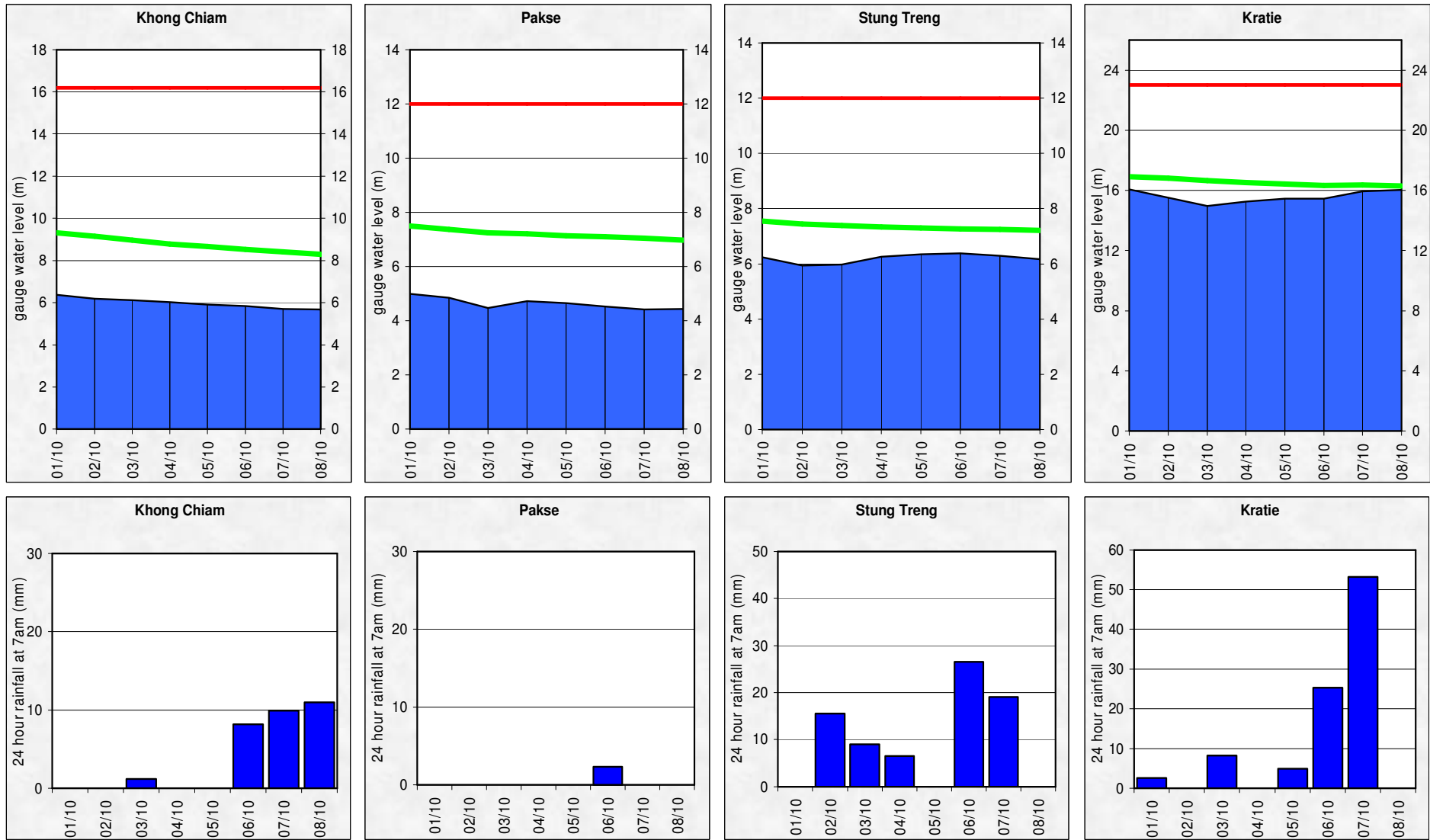


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

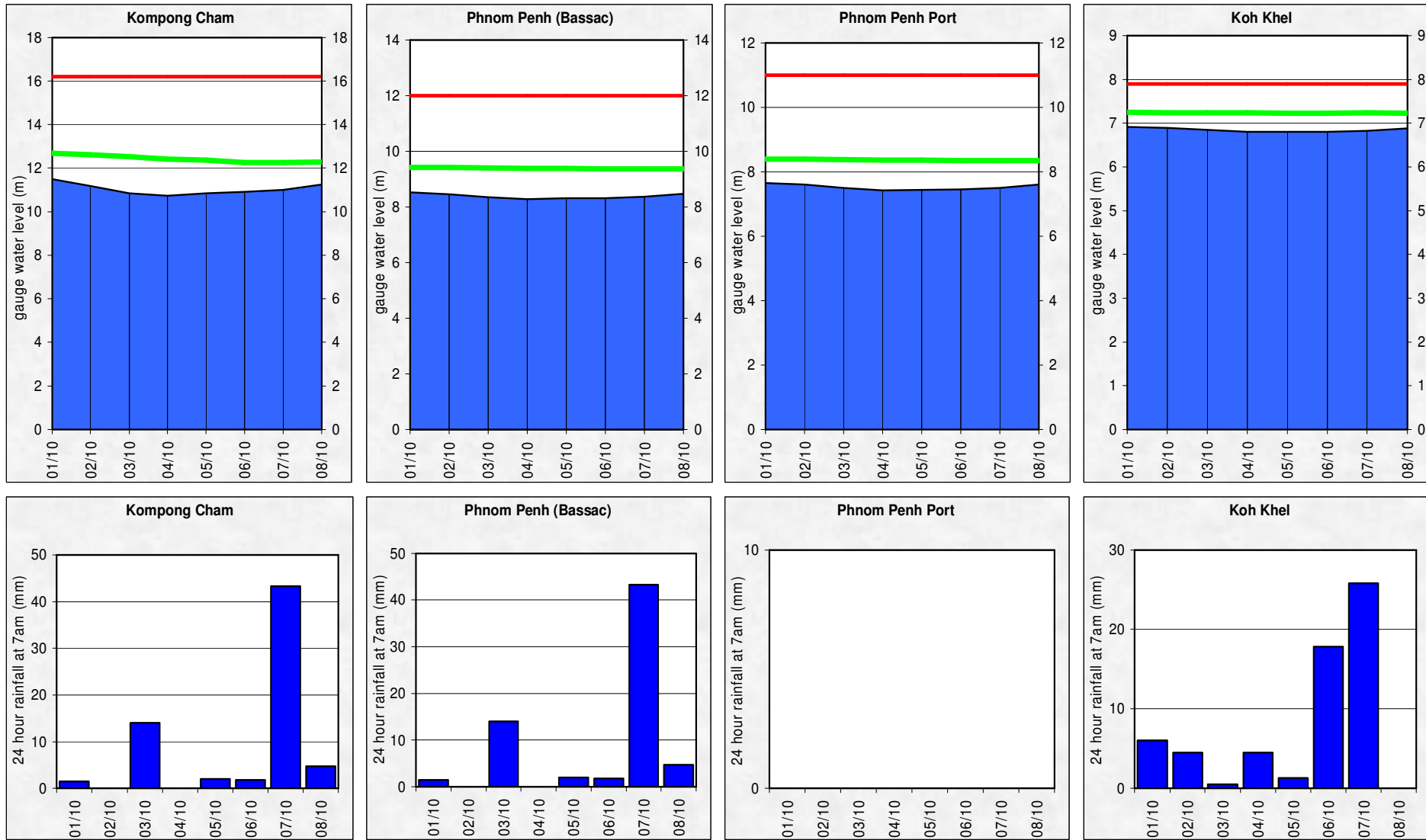
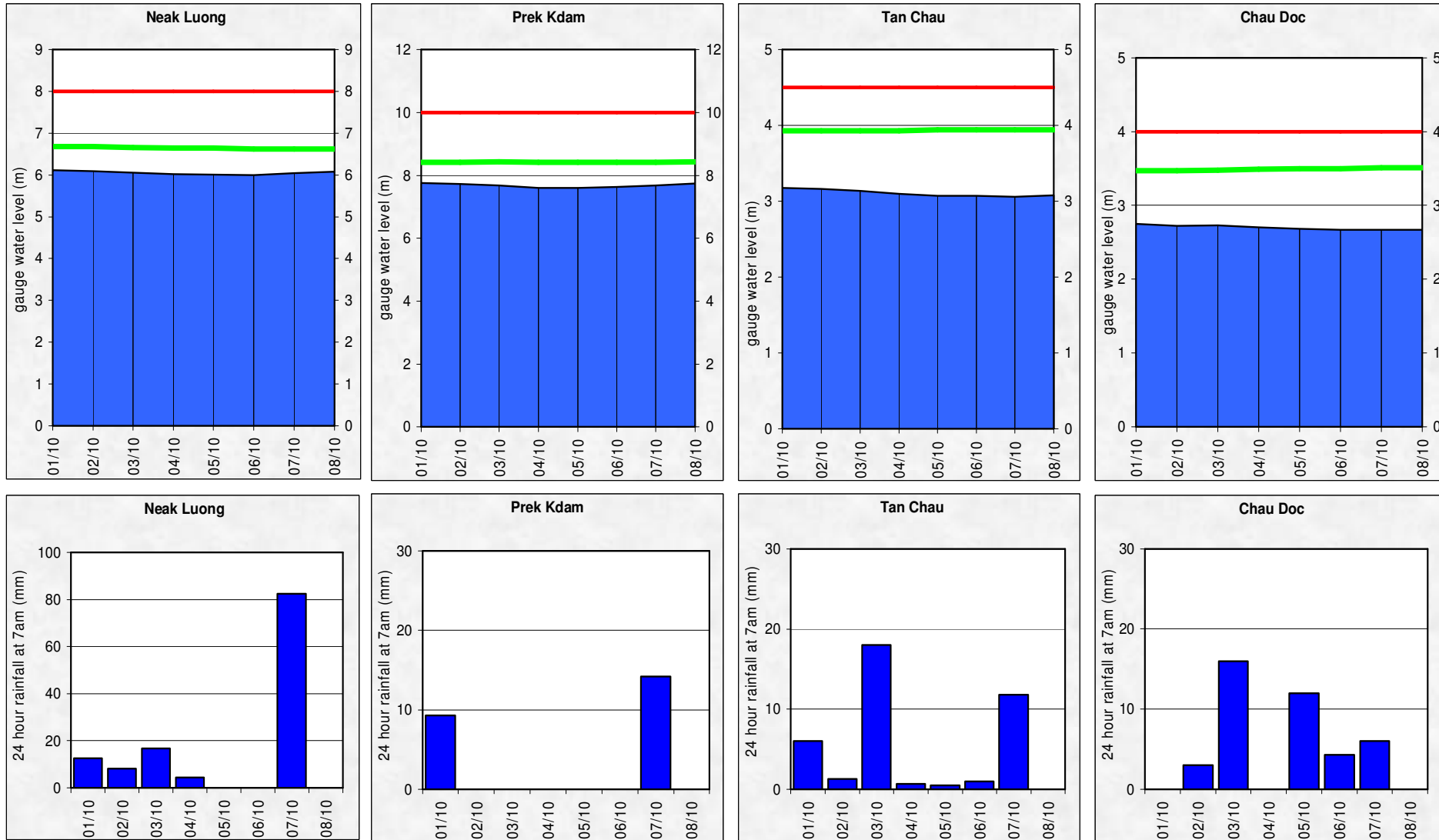


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

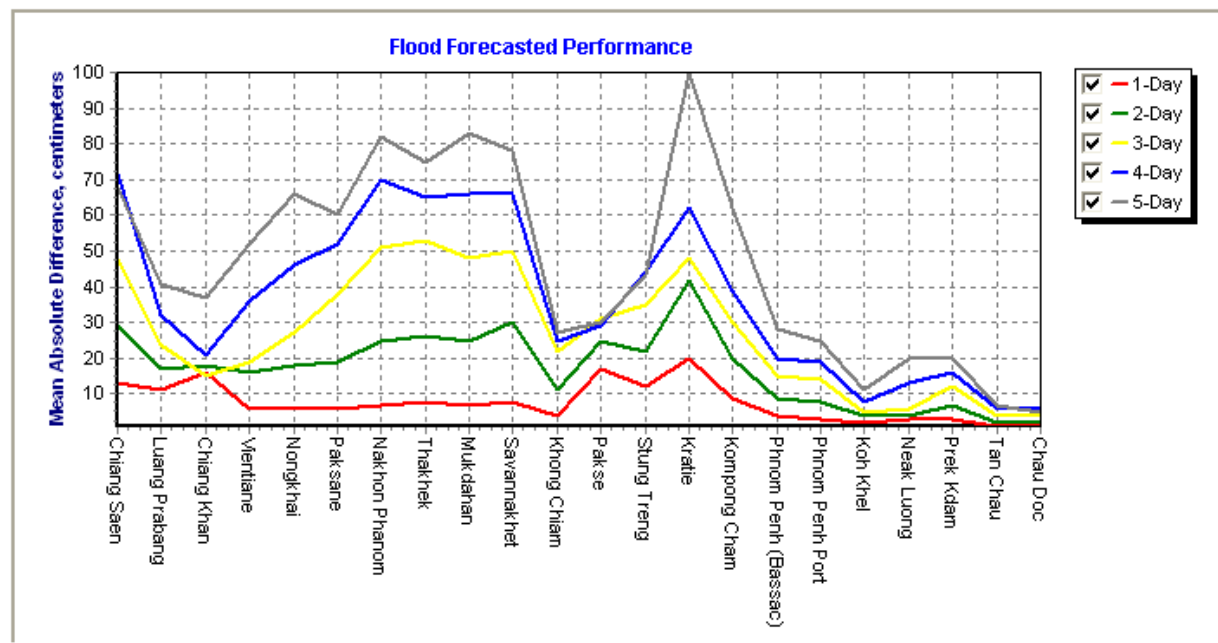
“Accuracy” describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model 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 an abnormal pattern in which accuracies at stations in the upper part is better than that at stations in the middle part of the LMB.

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

The above differences due to 2 main factors: (1) very high variability of the forecast rainfall NWP when influences of storm GAEMI, ITCZ and SW monsoon to the LMB; (2) internal model functionality in forecasting 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	85.7	85.7	85.7	85.7	71.4	71.4	85.7	71.4	71.4	100.0	57.1	57.1	42.9	71.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	83.1
2-day	66.7	100.0	100.0	66.7	83.3	50.0	50.0	50.0	50.0	50.0	100.0	50.0	83.3	16.7	66.7	50.0	66.7	100.0	100.0	83.3	100.0	100.0	100.0	72.0
3-day	40.0	80.0	100.0	60.0	60.0	40.0	40.0	40.0	60.0	40.0	80.0	60.0	40.0	0.0	40.0	20.0	0.0	100.0	80.0	40.0	100.0	100.0	100.0	55.5
4-day	25.0	75.0	100.0	75.0	75.0	50.0	50.0	50.0	50.0	50.0	75.0	75.0	75.0	50.0	50.0	25.0	75.0	75.0	100.0	100.0	100.0	100.0	100.0	68.2
5-day	33.3	66.7	66.7	33.3	0.0	66.7	0.0	0.0	33.3	33.3	100.0	100.0	66.7	33.3	33.3	33.3	33.3	100.0	66.7	66.7	100.0	100.0	100.0	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	25	10	10	10	10	10	10	10
3-day	50	50	50	25	25	25	25	25	25	25	25	25	25	25	25	25	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				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
2012																		
<i>week</i>	10:32	0	-	8	08:12	08:12	07:17	06:12	08:49	07:26	07:00	0	0	1	24	128	4	108
<i>month</i>	10:28	0	-	26	08:12	08:12	07:18	06:17	08:48	07:27	07:03	0	2	30	108	572	15	598
<i>season</i>	10:32	1	-	86	07:49	08:08	07:20	06:12	08:48	07:24	07:16	10	3	123	807	2297	33	1917

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.

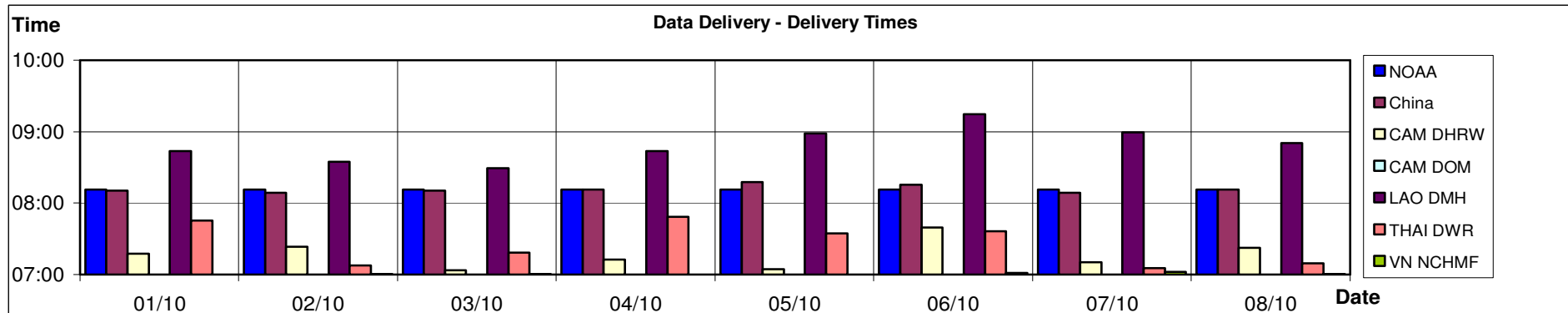


Figure B2: Data delivery times for the past 8 days including the current report date

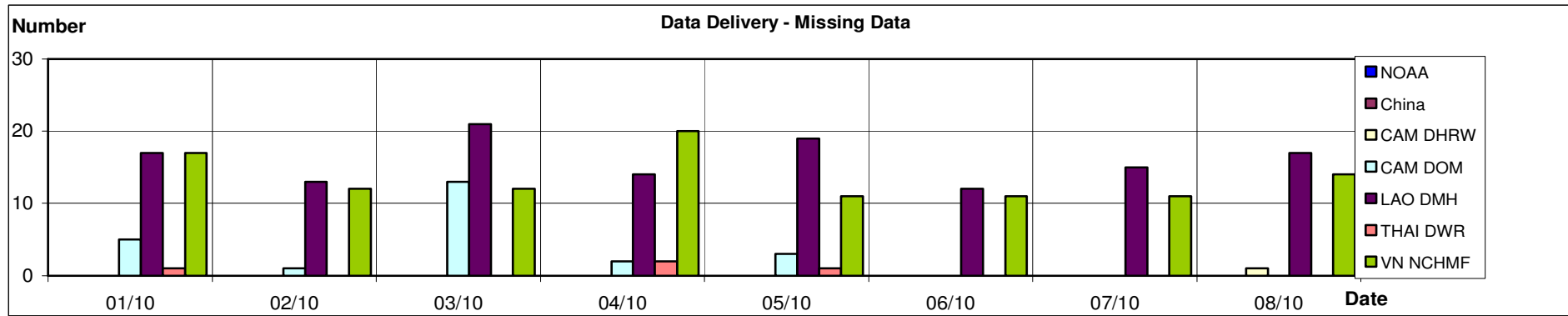


Figure B3: Missing data for the past 8 days including the current report date

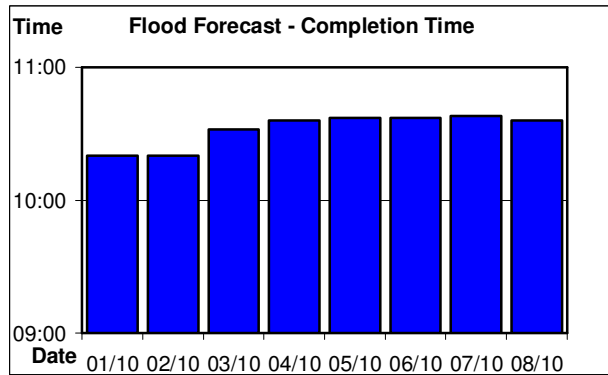


Figure B4: Flood forecast completion time

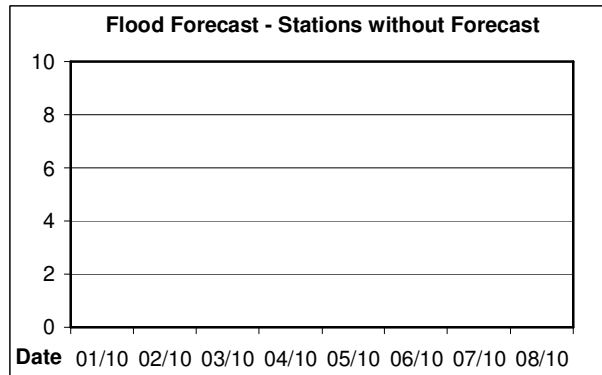


Figure B5: Flood forecast stations without forecast

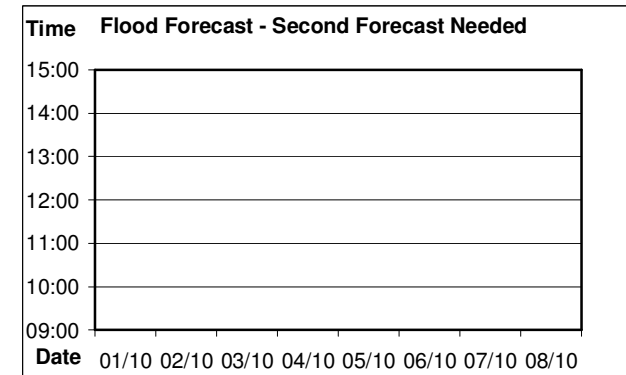


Figure B6: Second forecast needed

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

