

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

Prepared at: 19/08/2013, covering the week from the 12<sup>th</sup> August to the 19<sup>th</sup> August 2013

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

##### General weather patterns

During the week of 12<sup>th</sup> August to 19<sup>th</sup> August 2013 four weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps of the 13<sup>th</sup> August and 19<sup>th</sup> August are presented in the figures below:

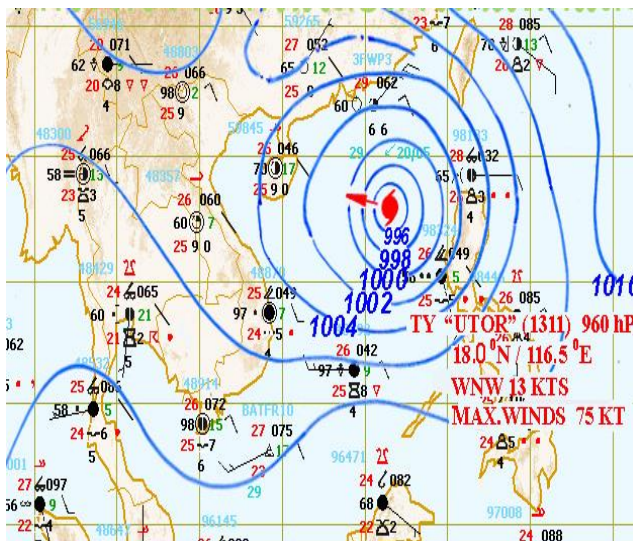


Figure 1: Weather map for 13<sup>th</sup> August 2013

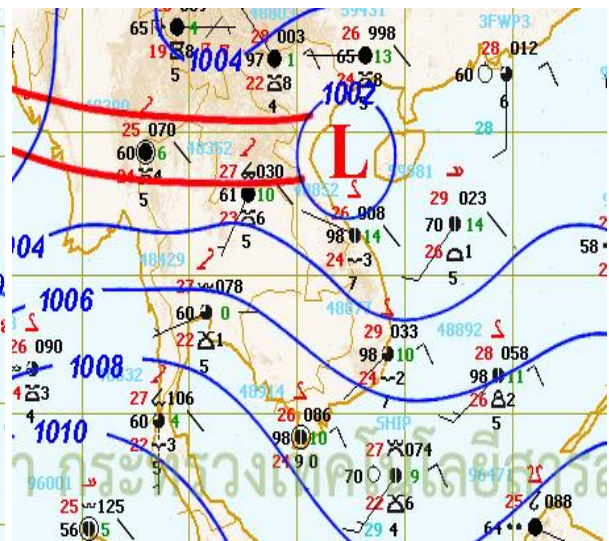


Figure 2: Weather map for 19<sup>th</sup> August 2013

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

The SW monsoon prevailed over Myanmar, Andaman Sea and the Gulf of Thailand, Myanmar, Thailand, Lao PDR, Cambodia and Viet Nam in the last week (figure 1).

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

On August 19, 2013 (01:00 AM GMT +7), the Latitude 0°N to 28°N and the Longitude from 90°E to 125°E, the ITCZ lies across the lower North of Thailand via the lower of Indochina Peninsular connected to the low pressure cell in the Gulf of Tonkin (figure 2)

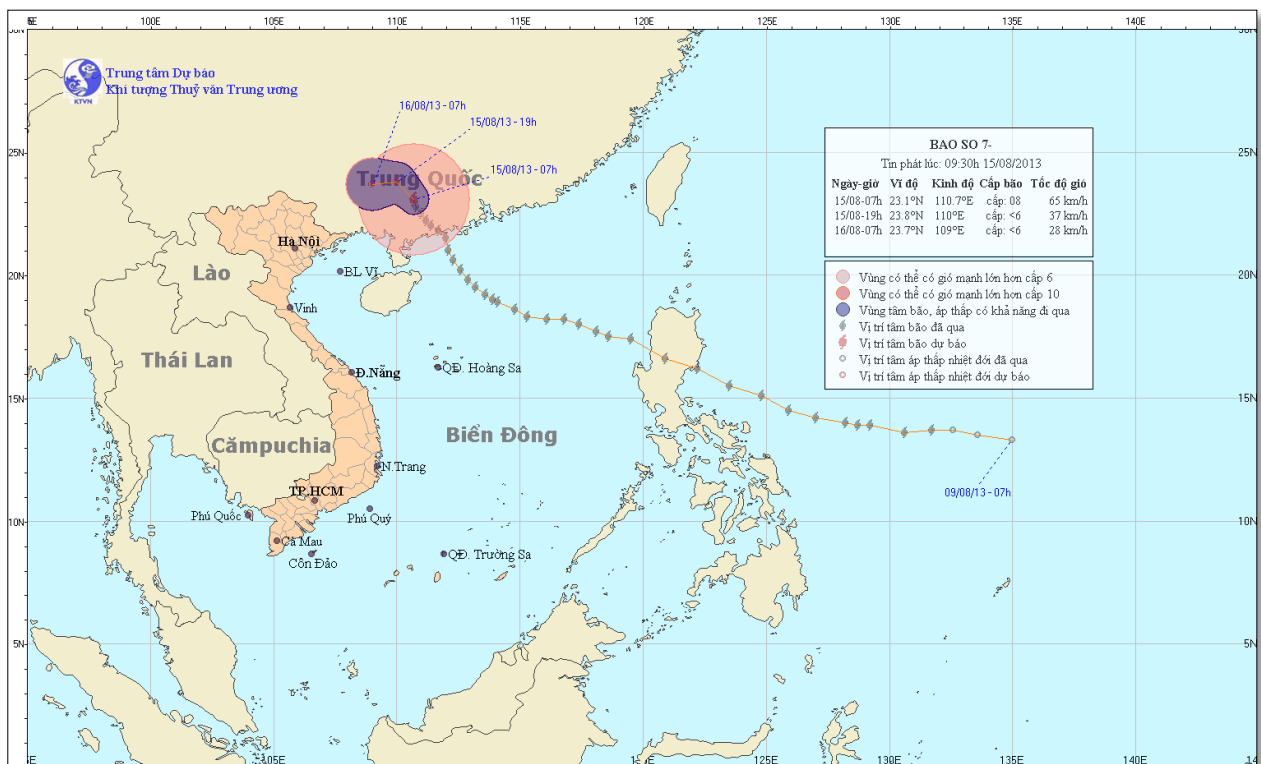
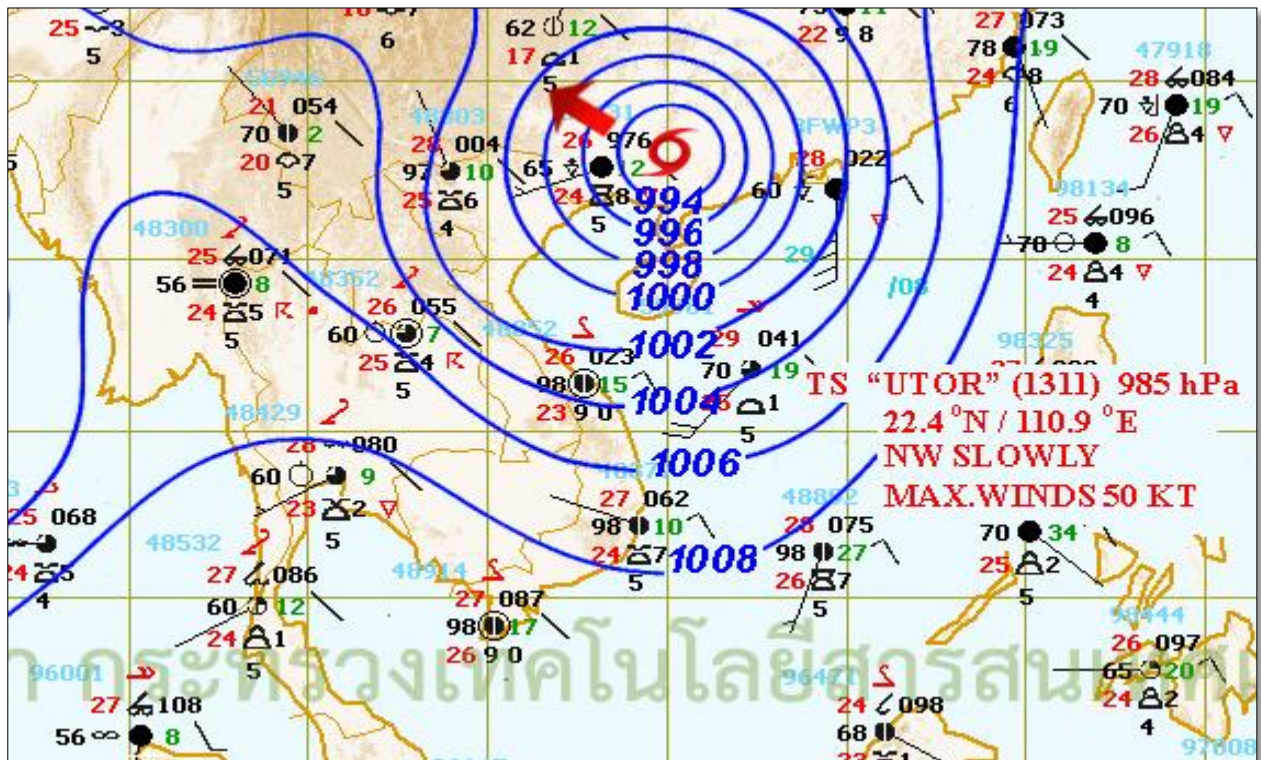
##### Tropical depressions (TD), tropical storms (TS) or typhoons (TY)

On August 13 2013 (at 1:00 GMT+7), the Typhoon "UTOR" centered over the East Sea at the Latitude 18°N and Longitude 116.5°E, with the maximum sustained winds about 139 km/h. It was moving West – North westward with the wind speed of 24 km/h. On August 15, 2013, the Typhoon downgraded as Tropical Storm (TS) after made landfall over Guangxi, South of China at the Latitude 22.4°N and Longitude 110.9°E.

Source:

<http://www.nchmf.gov.vn/web>

Weather bulletin notice 14<sup>th</sup> August 2013 of DOM



**Figure 3: Weather chart and Storm track of Typhoon "UTOR"**

Over weather situation

According to the observed of precipitation at station with long mainstream during last week, it was reduced more than previous week. The average precipitation in last week in over LMB was around 30 mm. And the maximum of total of precipitation observed from (12<sup>th</sup> – 19<sup>th</sup> of August in some stations in mainstream was round 80 – 90 mm; at Vientiane (88 mm); at Kratie (85 mm), and at Stung Treng (86 mm) - See figure 4.



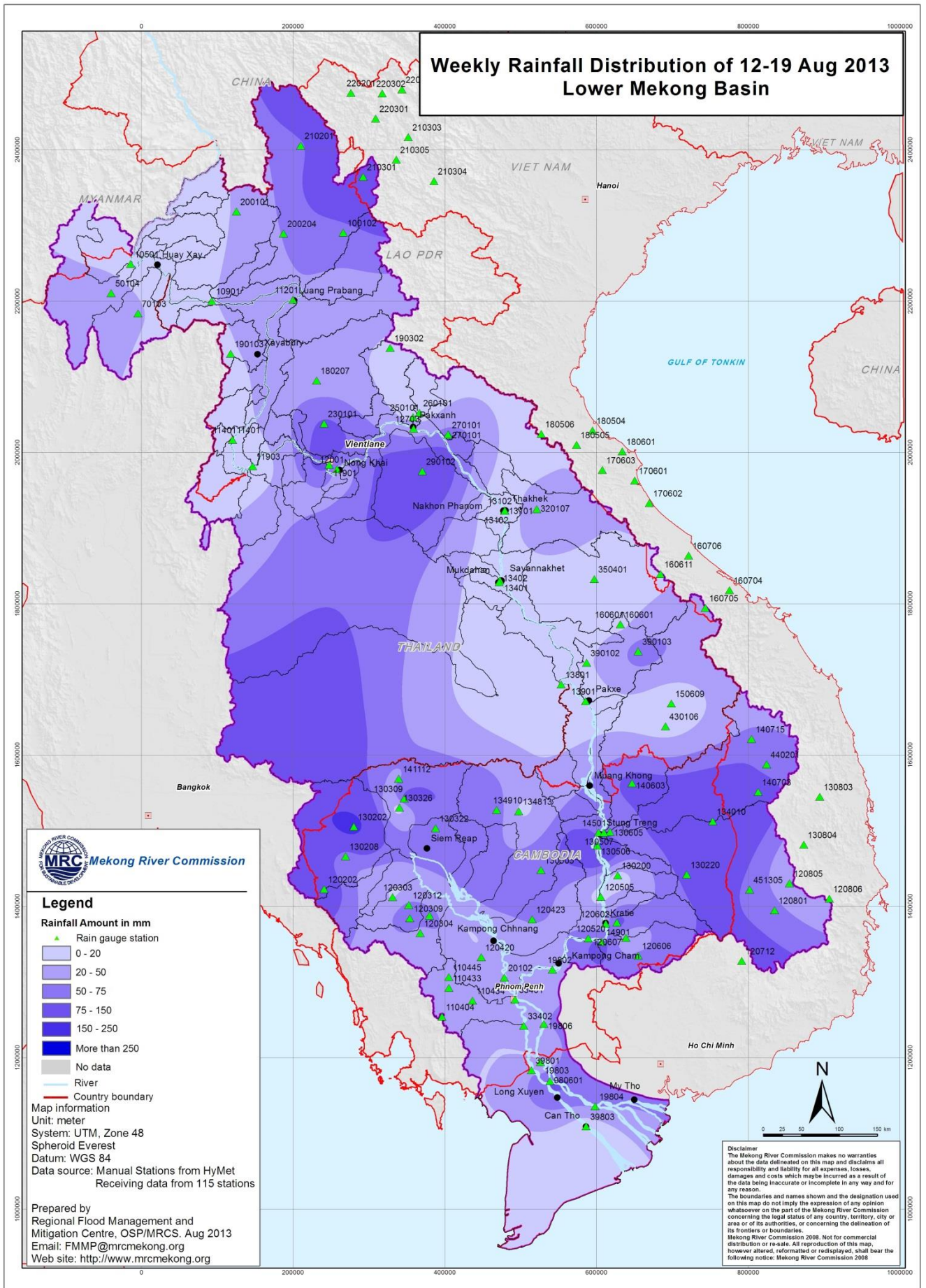


Figure 4: Rainfall distribution over the LMB, covering the week 12<sup>th</sup> August - 19<sup>th</sup> August, 2013

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

During last week, the water levels of most in the stations along the mainstream Mekong River has increased from the first week to mid-week and has been slow in reducing weekend.

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

Over the last week, the water level was lower than the long-term average, while the Luang Prabang's water level from 12<sup>th</sup> – 14<sup>th</sup> August was higher than the long – term average, and until to last weekend was lower.

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

During last week, the water lever from Chiang Khan to Vientiane (from 12<sup>th</sup> - 17<sup>th</sup> of August) was higher than the long – term average, and then until to weekend was lower specially, while the water level at Paksane has been reduced, but still higher than long – term average.

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

The water level from Thakhet to Pakse was higher than the long-term average.

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

The last week, the water level at Stung Streng has been fluctuating higher than the long – term average from the first week to 17<sup>th</sup> August and then fell lower than the long – term average. While the water level from Kratie to Kompong Cham was higher than long – term average.

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

Water levels at these stations were as same as the long-term average.

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

The water levels at these stations were a little lower than the long – term average.

**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

	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	
<b>2013</b>																								
12/08	535.33	5.90	12.84	12.30	9.60	10.96	12.88	10.70	11.79	10.52	9.38	11.73	9.67	8.40	18.73	13.11	8.07	7.15	6.79	5.73	6.81	2.58	1.90	
13/08	535.27	5.70	13.03	12.17	9.30	10.70	12.78	10.63	11.70	10.43	9.41	11.75	9.77	8.75	19.02	13.21	8.12	7.26	6.82	5.76	6.87	2.63	1.97	
14/08	535.28	5.37	12.74	12.20	9.28	10.58	12.46	10.45	11.53	10.22	9.09	11.57	9.56	8.98	19.44	13.42	8.20	7.29	6.87	5.84	6.97	2.65	1.99	
15/08	535.30	4.90	12.15	11.96	9.20	10.54	12.32	10.26	11.30	9.98	8.87	11.34	9.45	8.95	19.65	13.60	8.33	7.39	6.93	5.90	7.01	2.70	2.04	
16/08	535.32	4.47	11.47	11.55	8.82	10.26	12.21	10.11	11.12	9.77	8.63	11.08	9.18	8.71	19.55	13.67	8.39	7.44	6.97	5.96	7.09	2.75	2.08	
17/08	535.38	4.21	10.74	11.05	8.37	9.82	11.91	9.91	10.59	9.57	8.46	10.80	8.92	8.30	19.18	13.58	8.40	7.43	6.97	5.95	7.14	2.81	2.18	
18/08	535.35	4.05	10.29	10.52	7.88	9.29	11.62	9.63	10.71	9.30	8.32	10.54	8.66	7.94	18.67	13.33	8.30	7.15	6.91	5.90	7.14	2.84	2.26	
19/08	535.56	4.26	10.03	10.06	7.33	8.68	11.00	9.30	10.32	8.97	7.89	10.19	8.37	7.67	18.20	13.03	8.18	7.03	6.82	5.82	7.08	2.85	2.31	

Table A1: observed water levels

Unit in m

Table A2: observed rainfall

Unit in mm

	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	
<b>2013</b>																								
12/08	2.0	5.4	nr	nr	nr	18.7	11.5	0.2	1.4	1.5	nr	nr	nr	25.0	3.5	17.4	15.3	-	13.9	22.6	13.2	19.2	14.5	
13/08	-	nr	nr	nr	nr	nr	6.2	nr	nr	11.8	nr	nr	nr	22.0	55.5	2.3	20.3	-	21.0	24.4	6.2	nr	24.7	
14/08	-	nr	nr	nr	31.4	9.3	0.2	nr	nr	nr	nr	nr	1.5	29.5	18.0	5.0	nr	-	0.0	0.6	nr	nr	0.2	
15/08	2.0	nr	nr	nr	52.7	10.9	15.4	nr	nr	nr	nr	nr	2.7	3.0	nr	nr	nr	-	nr	nr	nr	nr	0.0	
16/08	14.5	nr	nr	nr	4.0	nr	nr	nr	nr	nr	nr	nr	2.1	4.0	5.0	11.7	nr	-	nr	0.0	nr	nr	4.0	
17/08	2.0	nr	nr	6.4	nr	nr	nr	nr	nr	7.0	5.2	nr	nr	3.0	nr	nr	nr	-	nr	0.0	nr	0.0	nr	
18/08	14.50	nr	46.00	nr	nr	0.60	0.00	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	4.20	nr	nr	
19/08	-	nr	20.60	nr	nr	nr	0.60	0.90	1.30	nr	nr	0.50	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr	

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

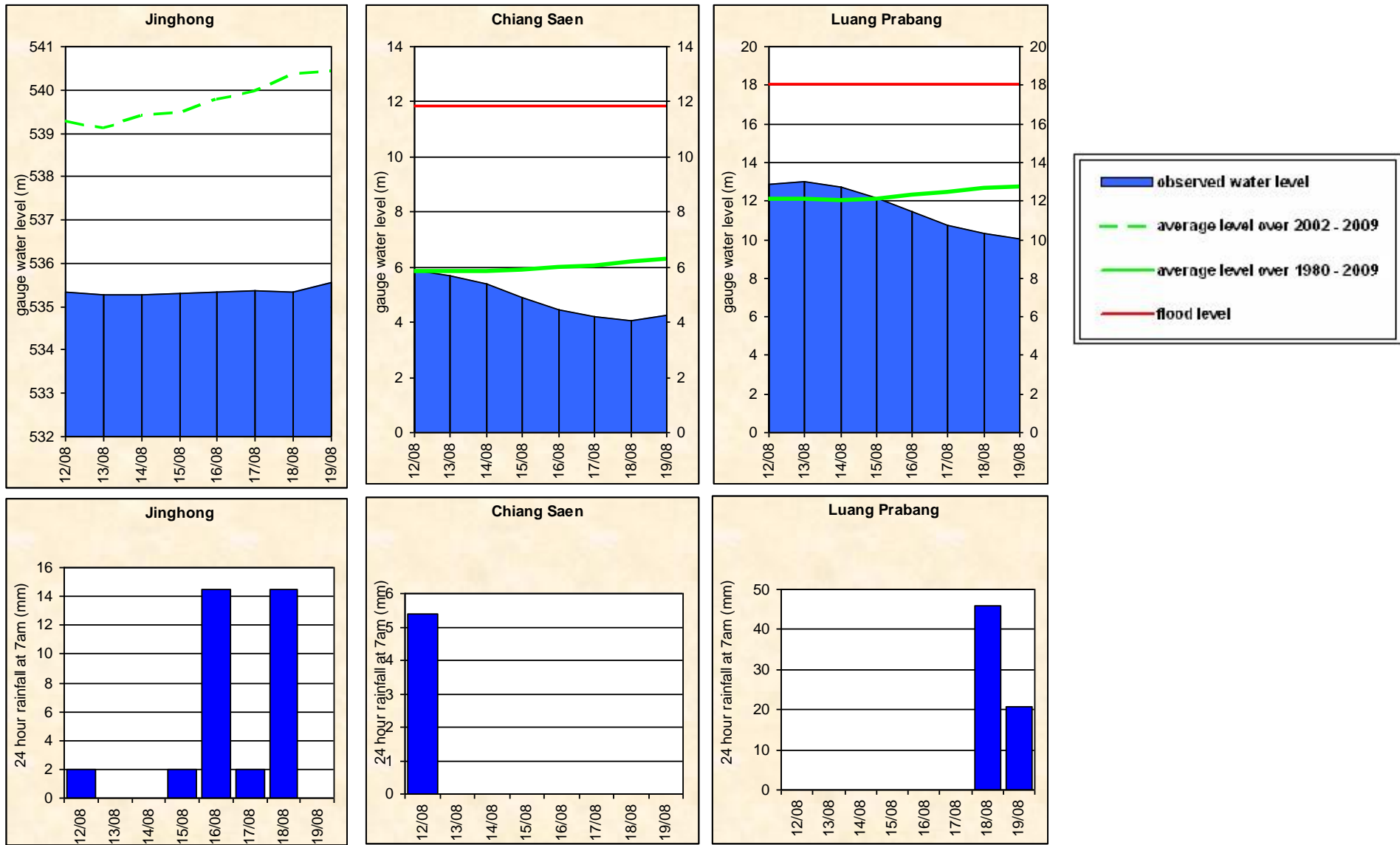


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nong Khai, and Paksane

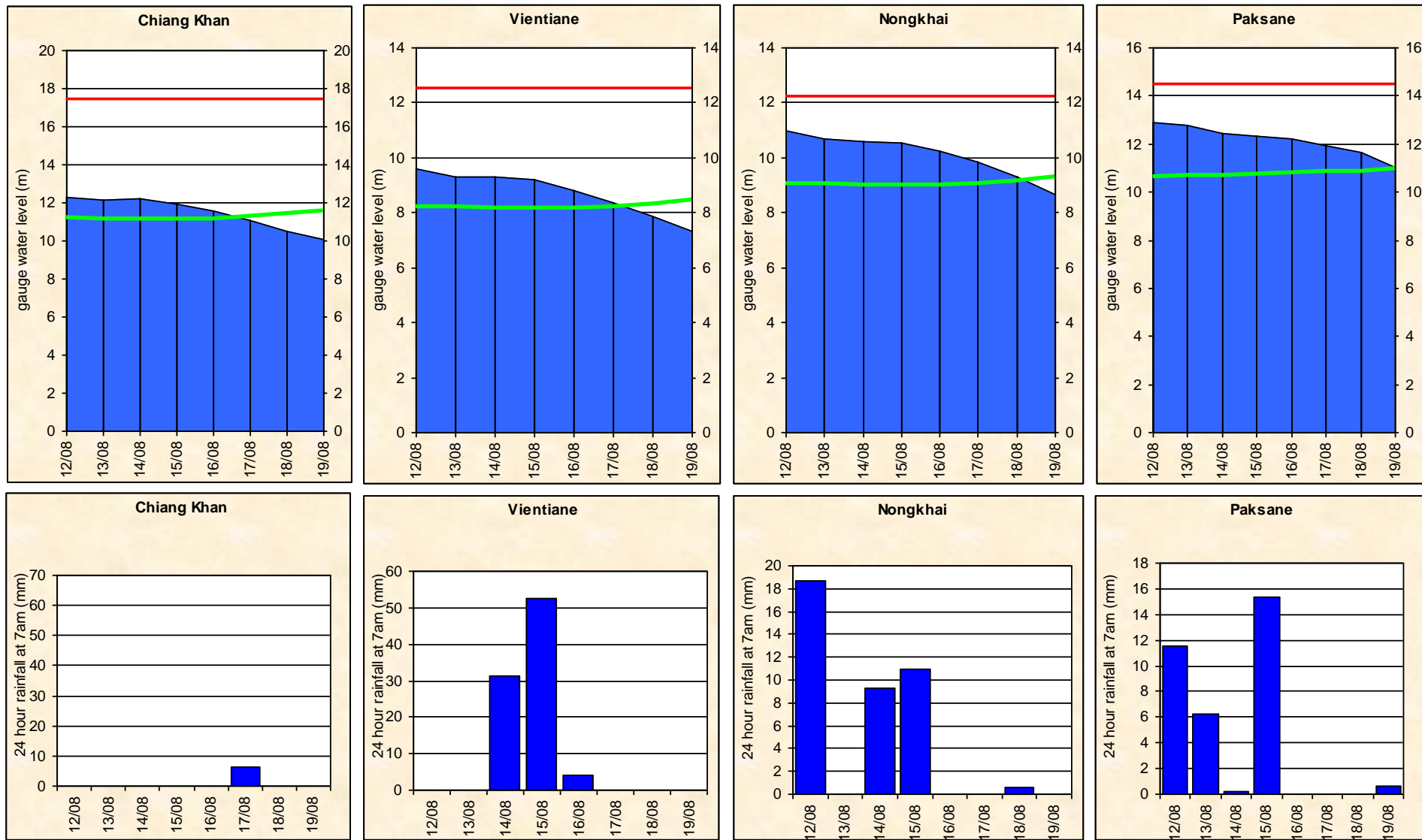


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

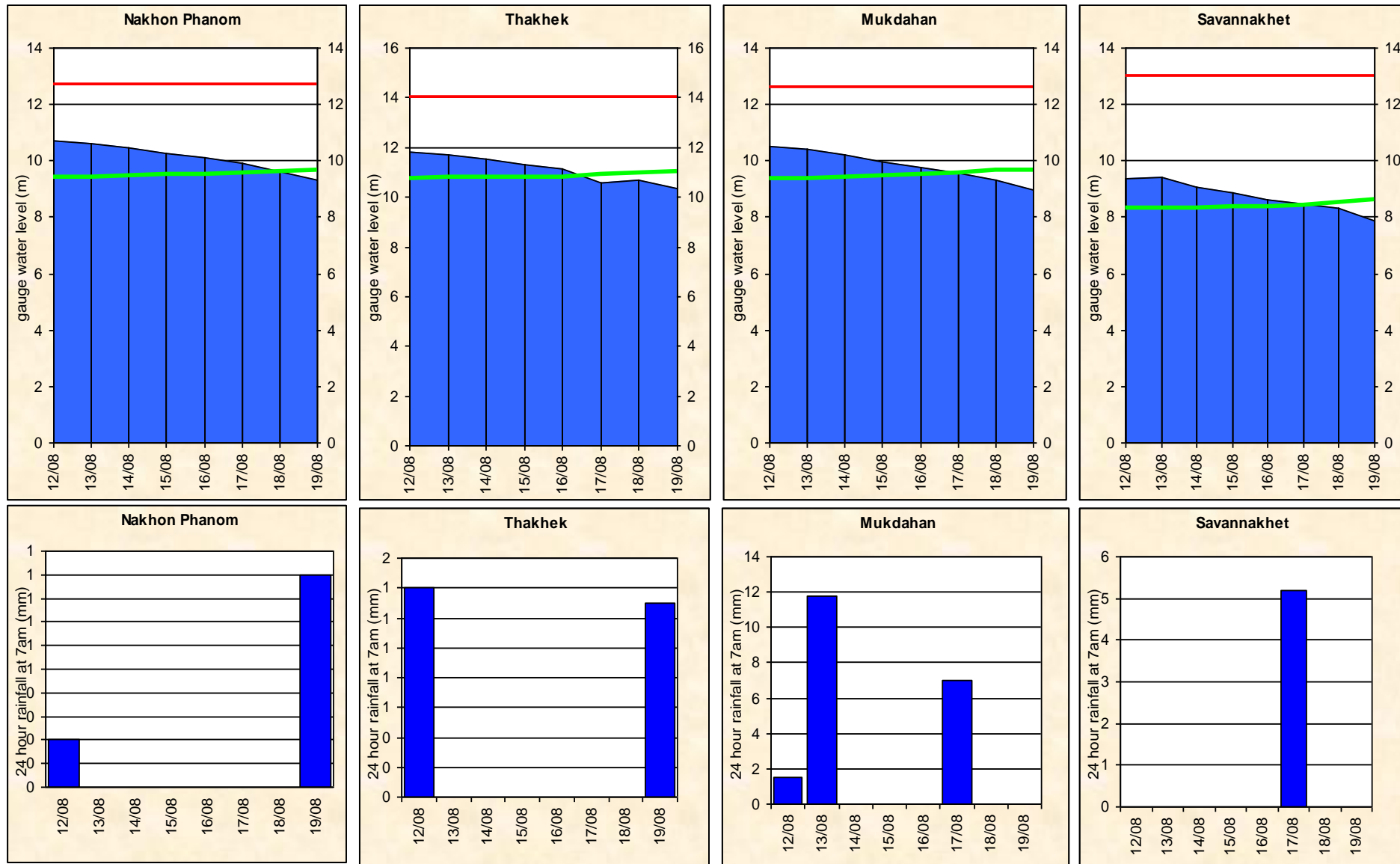




Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

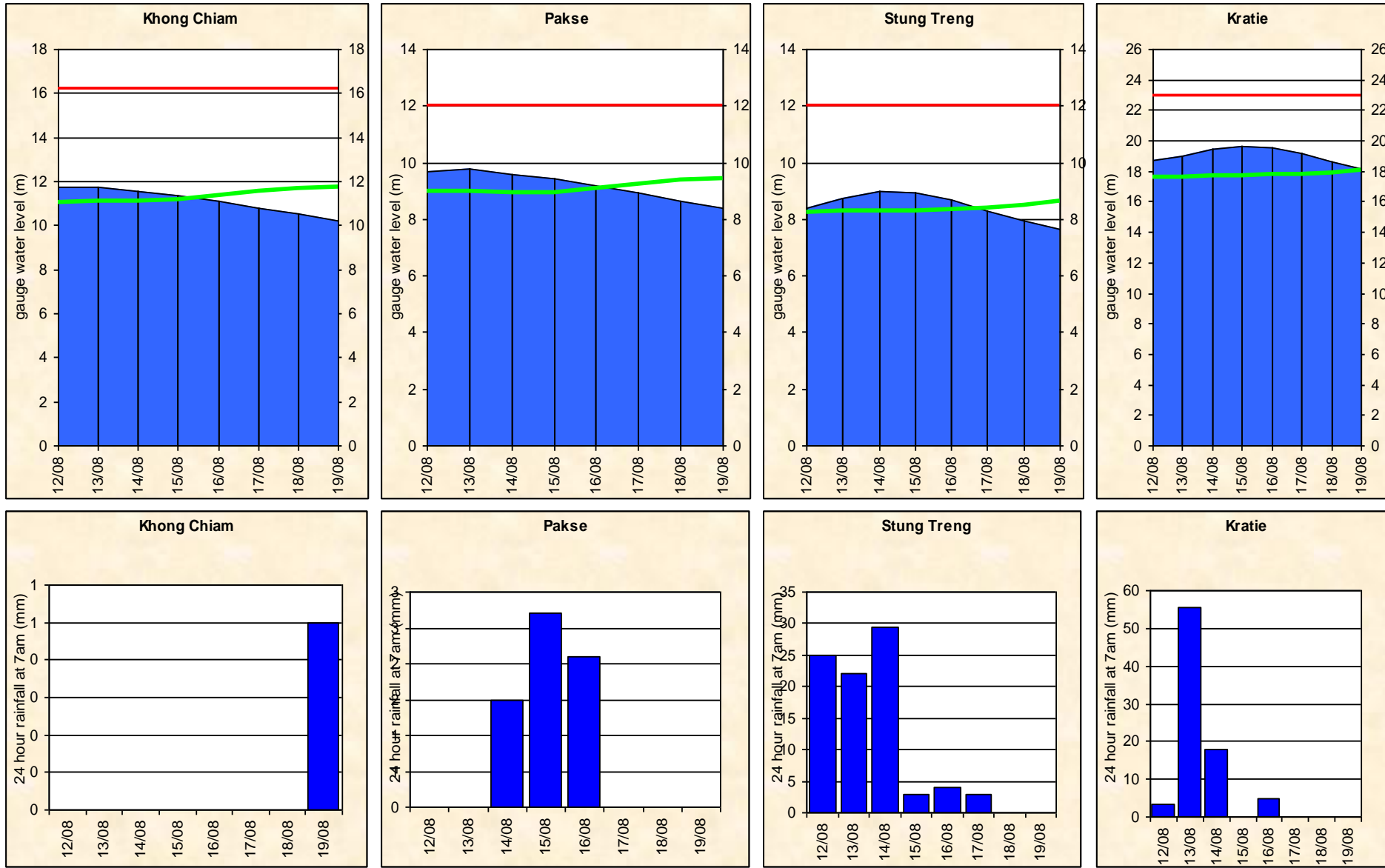


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

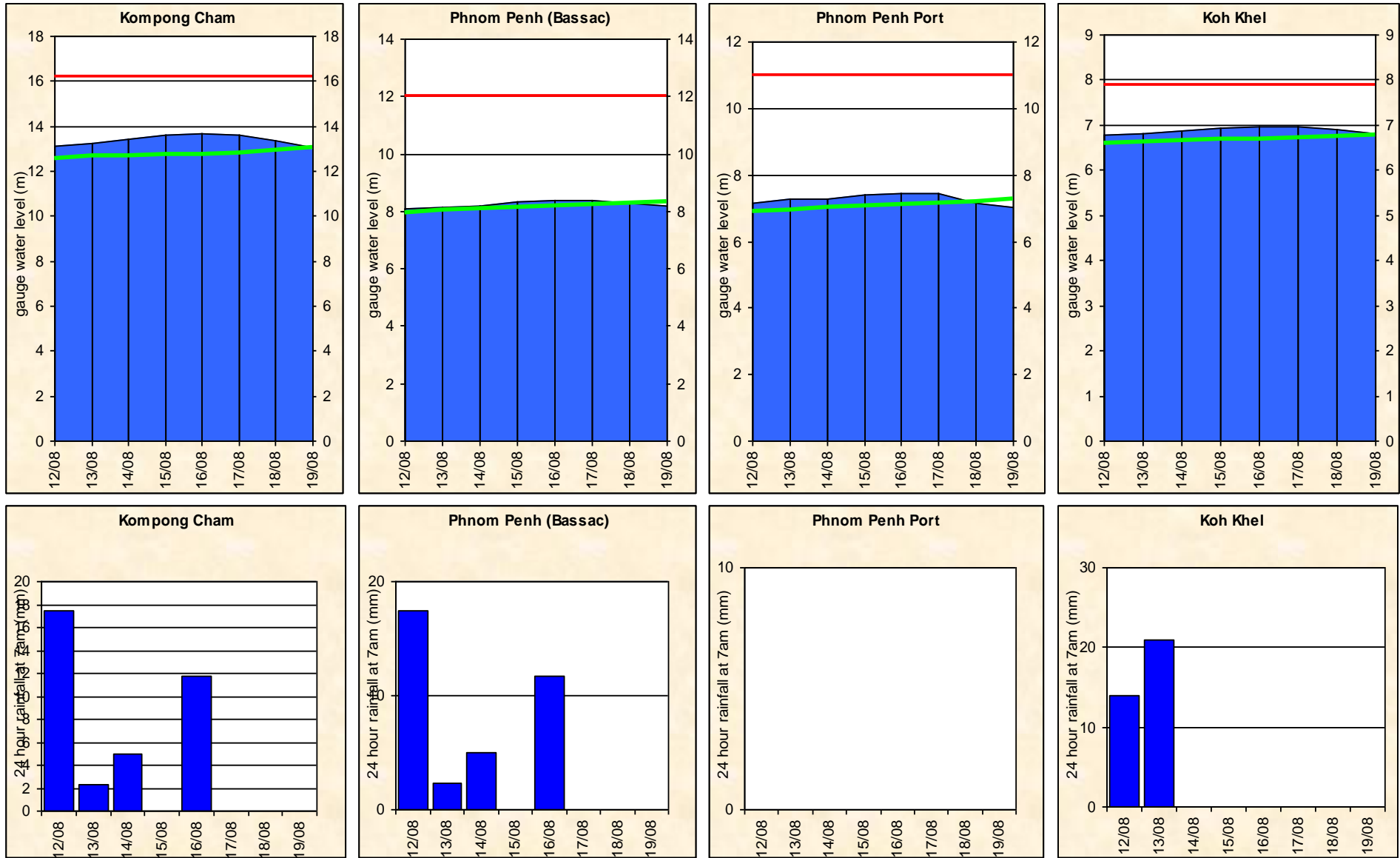
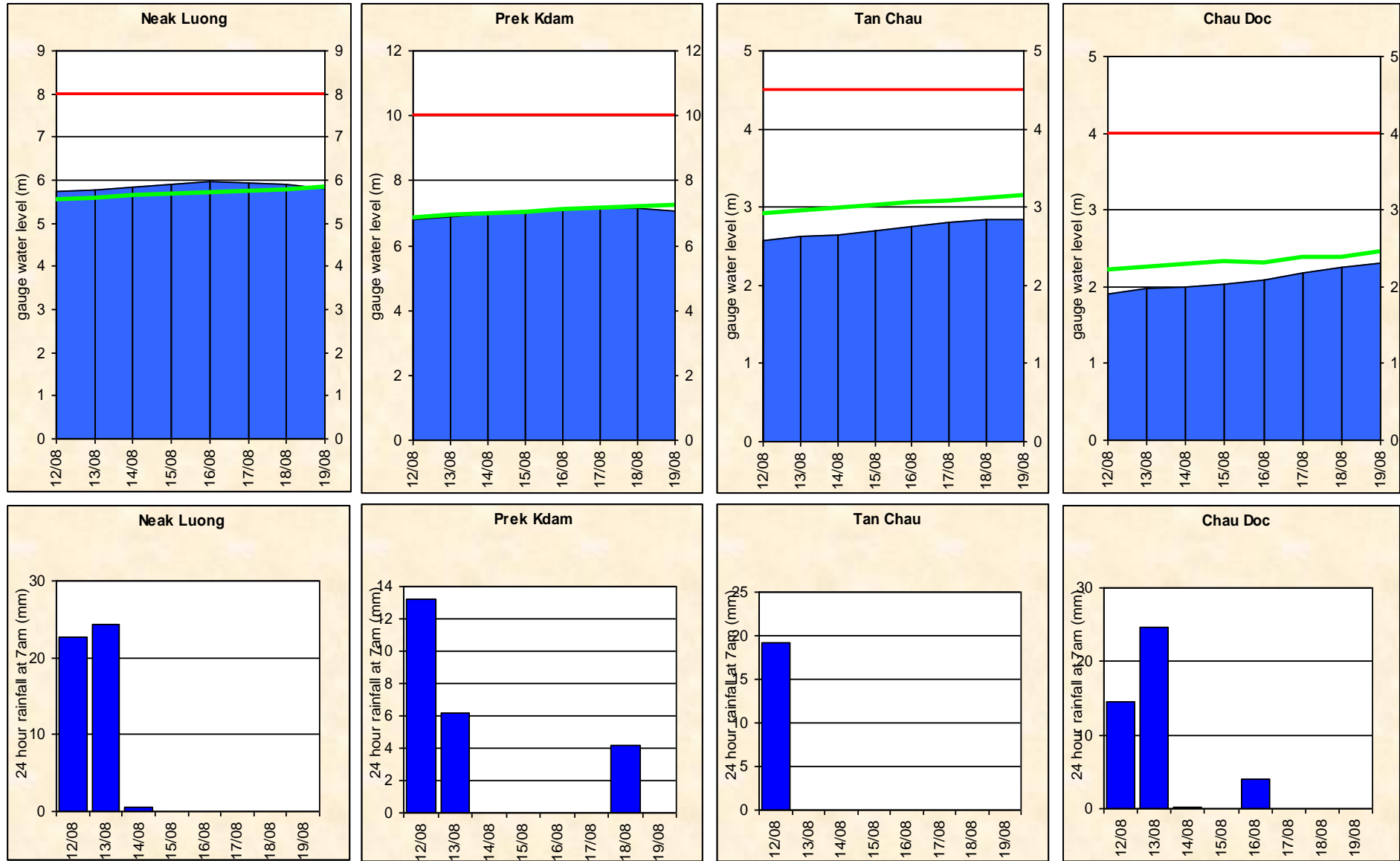


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



## 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 for at Stung Treng, Kratie Vientiane for 4 day to 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; (2) the adjustment by utilizing the practical knowledge and experience of flood forecaster-in-charge.

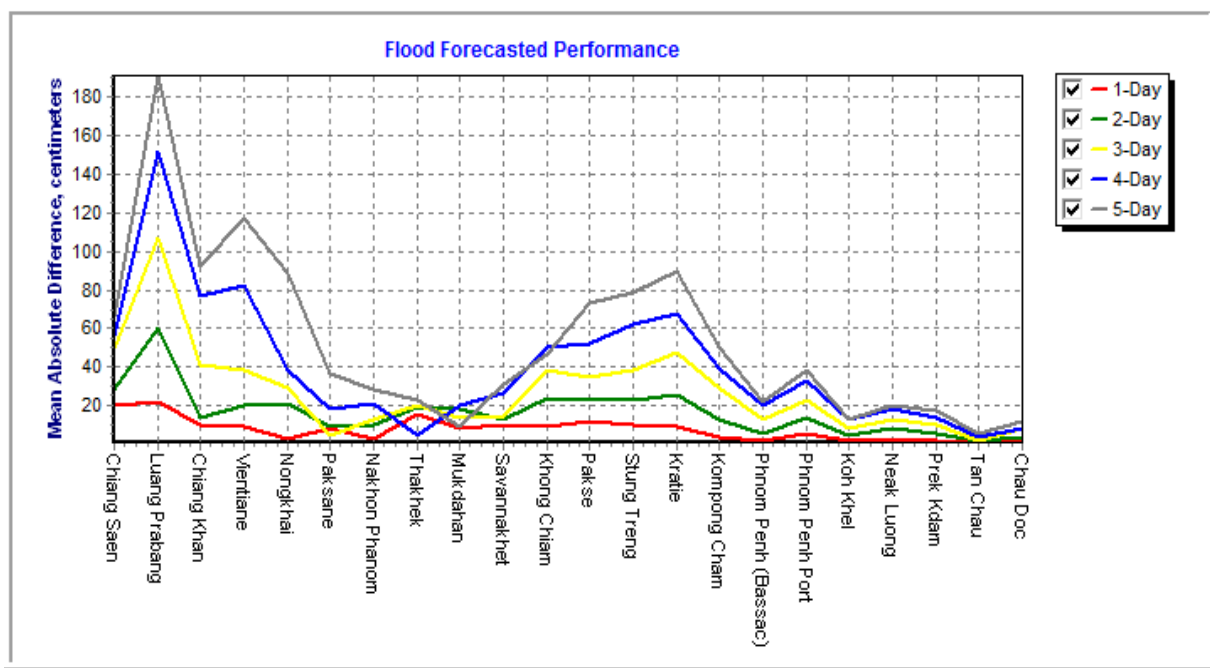


Figure B1: Average flood forecast accuracy along the Mekong mainstream



**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:

	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	71.4	85.7	71.4	100.0	71.4	100.0	71.4	71.4	57.1	71.4	57.1	42.9	57.1	100.0	100.0	85.7	100.0	100.0	100.0	100.0	100.0	100.0	<b>81.2</b>
2-day	83.3	33.3	100.0	66.7	83.3	100.0	100.0	50.0	66.7	100.0	83.3	66.7	66.7	50.0	83.3	66.7	50.0	100.0	83.3	83.3	100.0	83.3	83.3	<b>77.3</b>
3-day	80.0	20.0	60.0	40.0	40.0	100.0	100.0	60.0	80.0	80.0	20.0	60.0	20.0	40.0	40.0	40.0	20.0	60.0	40.0	60.0	100.0	80.0	80.0	<b>56.4</b>
4-day	75.0	0.0	25.0	50.0	75.0	100.0	100.0	100.0	100.0	100.0	75.0	50.0	25.0	25.0	50.0	25.0	50.0	50.0	50.0	100.0	100.0	75.0	75.0	<b>63.6</b>
5-day	33.3	0.0	33.3	0.0	33.3	66.7	66.7	100.0	100.0	100.0	66.7	33.3	0.0	0.0	33.3	66.7	33.3	100.0	66.7	66.7	100.0	100.0	100.0	<b>54.5</b>

Achievement of daily forecast against benchmarks

Unit in %

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>	10:31	2	-	4	08:14	08:17	07:07	05:18	09:06	07:44	07:07	1	0	2	80	149	20	50
<i>month</i>	10:29	5	-	22	08:13	08:16	07:13	05:37	08:55	07:33	07:14	5	5	17	415	1171	22	252
<i>season</i>	10:29	5	-	38	08:13	08:33	07:13	05:55	08:57	07:22	07:11	5	17	69	662	2033	24	420

*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.

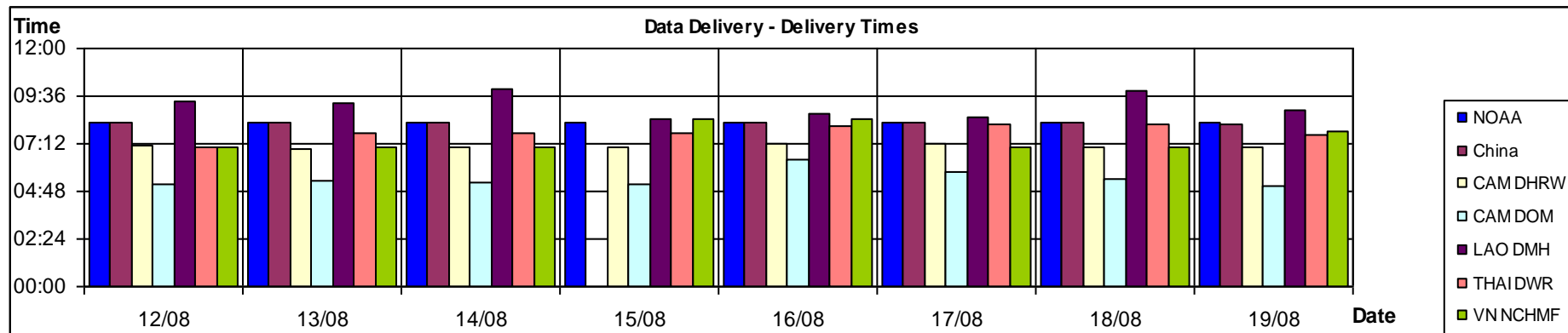


Figure B2: Data delivery times for the past 8 days including the current report date

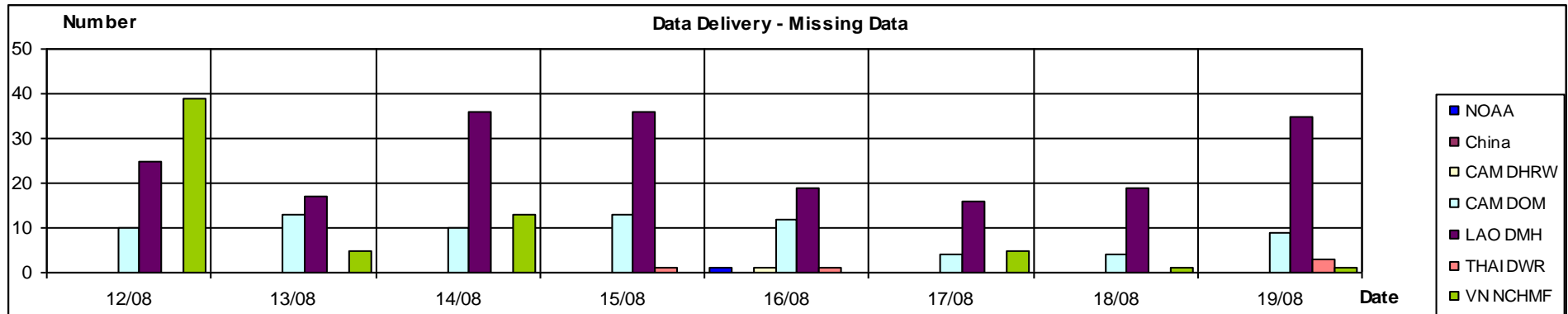


Figure B3: Missing data for the past 8 days including the current report date

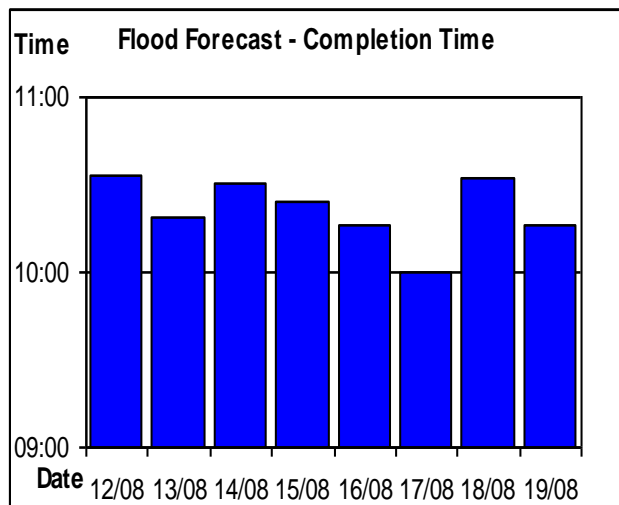


Figure B4: Flood forecast completion time

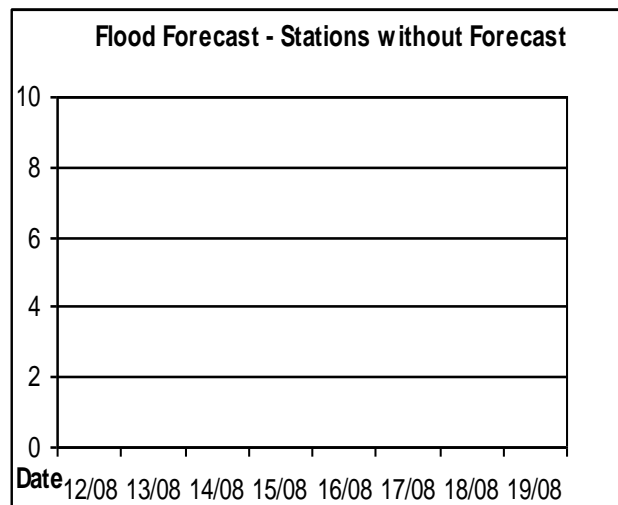


Figure B5: Flood forecast stations without forecast

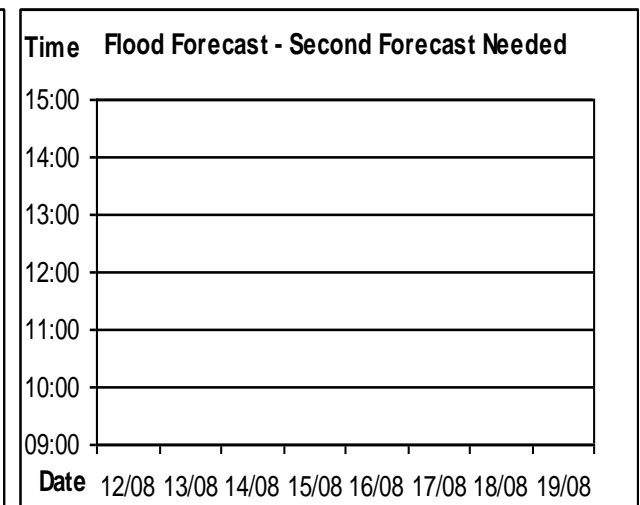


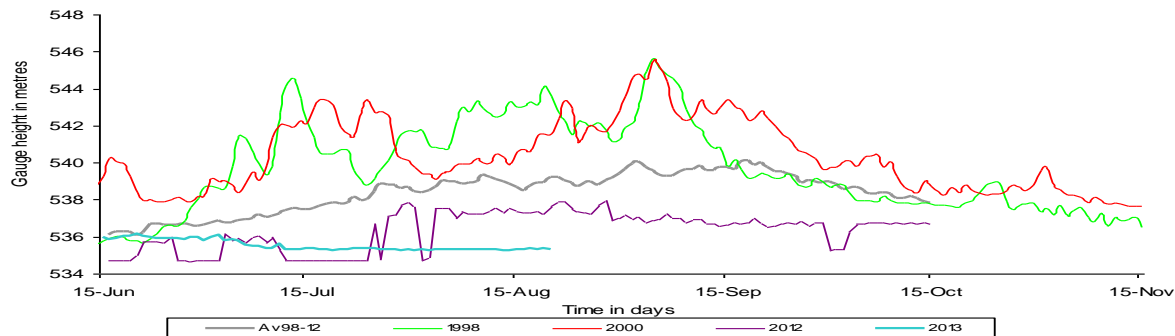
Figure B6: Second forecast needed

## Annex C: Season Water Level Graphs

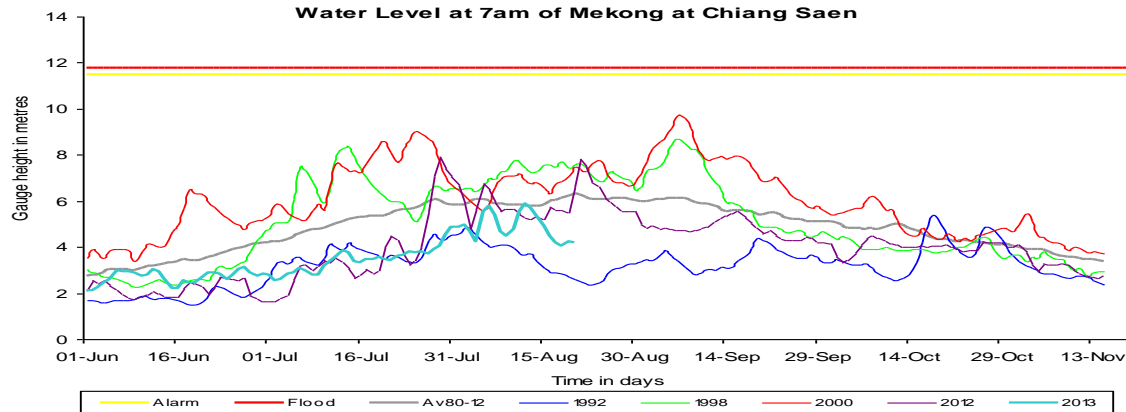
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

### 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**

