

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 30/09/2013, covering the week from the 23rd September to the 30th September 2013

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

General weather patterns

During the week of 23rd September to 30th September 2013 five weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 25th September and 30th September are presented in the figures below:

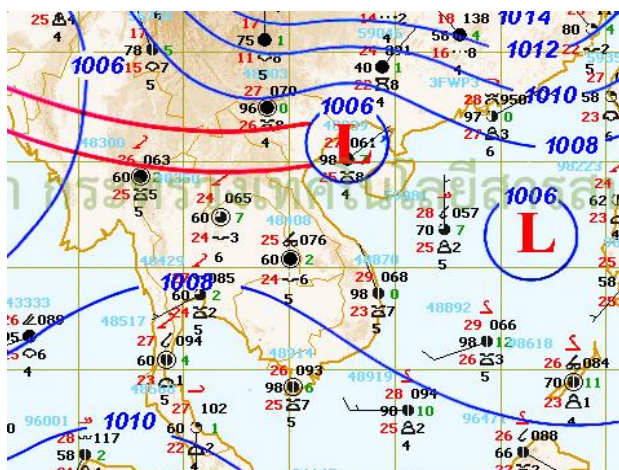


Figure 1: Weather map for 25th September 2013

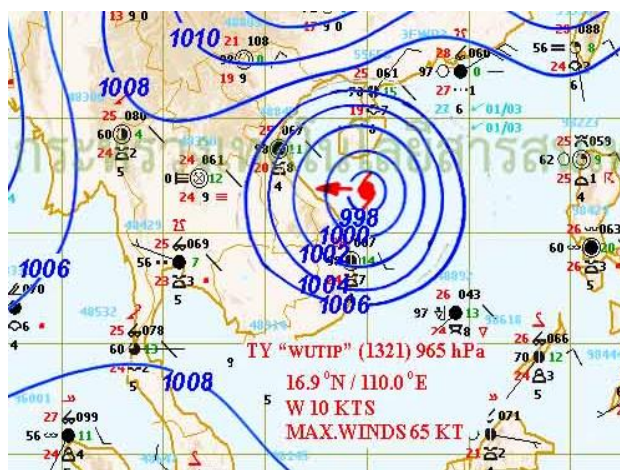


Figure 2: Weather map for 30th September 2013

Moderate South-West (SW) Monsoon

The strong SW monsoon was prevailing over Andaman Sea, the Gulf of Thailand, Thailand and Indochina Peninsular.

Inter Tropical Convergence Zone (ITCZ)

During September 25 – 27, the ITCZ lies across the lower North of Myanmar, the upper North of Thailand, the North of Lao PDR and Vietnam (Figure 1).

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

On the September 23 2013 at 01:00 (GMT +7), the severe Tropical Storm (sTS) "USAGI" was centered at Guangdong, china and downgrade to the tropical depression and it became to the pressure areas.

Beginning on the September 28 2013 at 01: 00 (GMT+7), the latitude from 0⁰N to 28⁰N and the longitude from 90⁰E to 125⁰E, the ITCZ lies across the upper South of Myanmar, the Central of Thailand, the South of Loa PDR and Cambodia connected to the Typhoon (TY) "WUTIP" in the upper South East Sea was centered about 720 km East of the coast areas of Viet Nam with sustained winds about 74km. The TY is still operating and moving West at speed of 19 km/h. Figure 3 shows a Storm Track of sTS "USAGI" and TY "WUTIP".

Source: <http://www.nchmf.gov.vn/web/vi-VN/104/23/19029/Default.aspx>
<http://www.policymic.com/articles/64627/typhoon-usagi-storm-tracker-shows-hong-kong-is-right-in-superstorm-s-path>

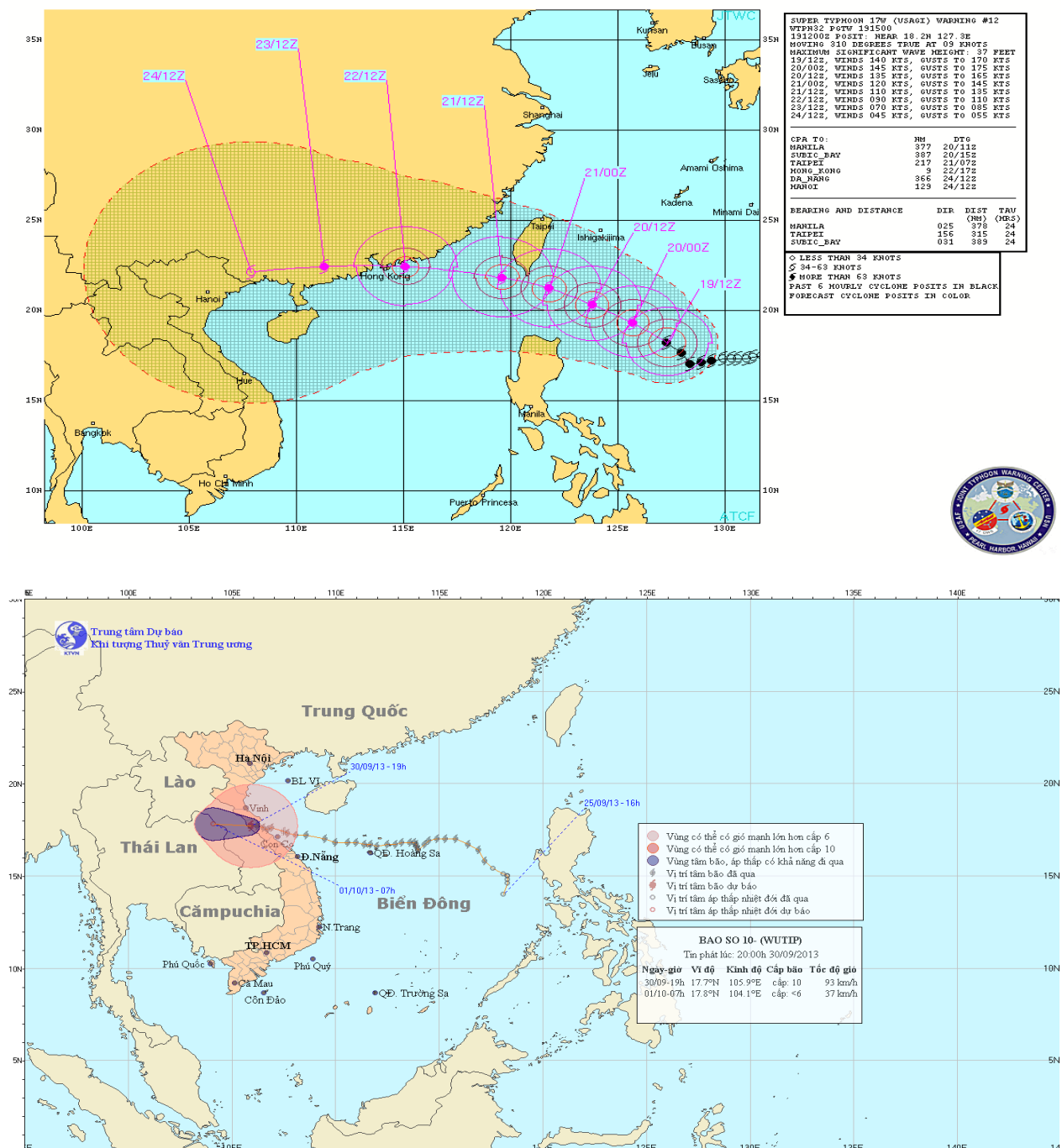


Figure 3: Storm Track of sTS “USAGI” and TY “WUTIP”

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Over weather situation

The ITCZ which prevailing across Myanmar, north of Thailand, north of Lao PDR and Viet Nam was active during last week; followed by strong SW monsoon in the second half of last week. As a result, scattered isolated heavy rainfall occurred in many areas in middle reaches of LMB. The amount of rainfall from 23th September to 30th September 2013 were recorded at Khong Chiam (199 mm), Pakse (167 mm), Stung Treng (197 mm) and Kompong Cham (104 mm). See Figure 4 for Weekly Rainfall Distribution covering the week 23rd September – 30th September 2013.

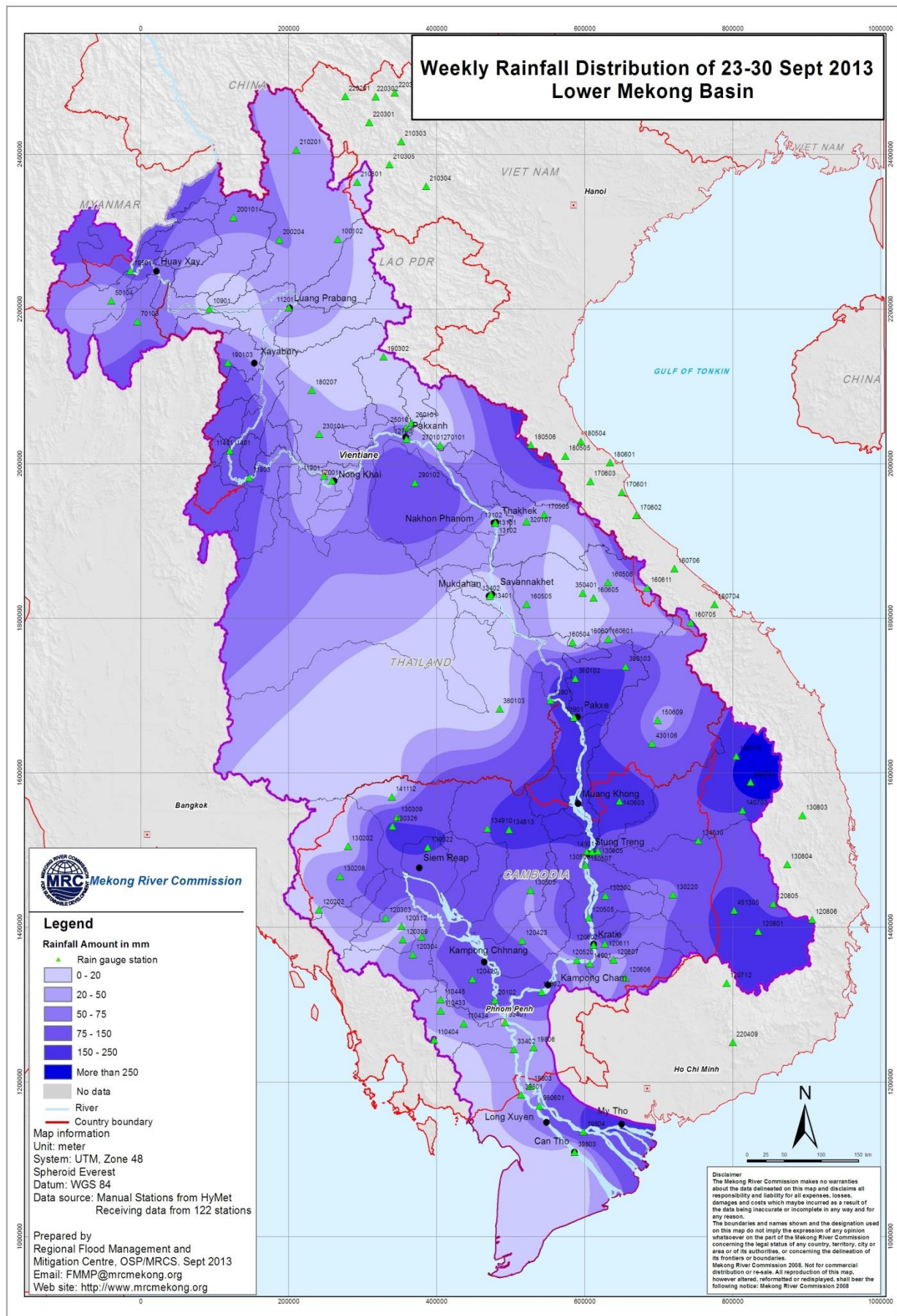


Figure 4: Weekly Rainfall Distribution covering the week 23rd September – 30th September 2013

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 during last week below the long-term average water level (LTA); those water levels of downstream of middle reach of LMB and the lower reach of LMB were about/above LTA for this time of the year.

For stations from Chiang Saen and Luang Prabang

Water levels of these stations were lower than LTA for this time of the year.

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

During the last week, the water level from Chiang Khan to Paksane were lower than LTA

For stations from Thakhet/Nakhon Phanom to Pakse

During the last week, with along the LMB, the water level from Nakhon Phanom to Savannakhet stations were lower than LTA, while the water level from Khong Chiam to Pakse stations slow down and still higher than LTA. Specially, at Pakse station has the highest water level is measured 12.35 m (19h, 23/09) above flood stage level is 0.35 m.

For stations from Stung Treng to Kompong Cham

Water levels at these stations were higher than LTA.

For stations from Phnom Penh to Koh Khel/Neak Luong

Water levels at these stations were higher than LTA.

Tan Chau and Chau Doc

Water levels at these stations were gradually raising up; at Tan Chau station had higher than LTA, while at Chau Doc it still was lower than LTA.

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

Flood Situation

Flood stage or alarm stage:

During the last week, the Mekong has reached over the flood stage 0.35m at Pakse monitoring station on the 23 September 2013 (12.35 m). And the Mekong has reached alarm stage at Stung Treng, Kratie, Kompong Cham, Koh Khet 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

	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
2013																							
23/09	535.35	3.59	9.12	9.54	6.58	7.58	9.70	8.23	9.32	8.73	7.69	14.04	11.90	11.53	22.30	15.38	9.45	8.44	7.44	6.70	8.31	3.36	2.70
24/09	535.37	3.49	8.80	9.25	6.42	7.40	9.29	7.84	8.94	8.44	7.42	14.01	12.30	11.74	22.43	15.60	9.58	8.68	7.52	6.81	8.46	3.43	2.79
25/09	535.37	3.60	8.76	8.92	6.06	7.07	9.10	7.55	8.68	8.03	7.57	13.28	11.88	11.69	22.62	15.76	9.72	8.90	7.57	6.94	8.57	3.52	2.84
26/09	535.27	3.75	8.86	8.79	5.88	6.76	8.83	7.34	8.49	7.69	6.64	12.44	11.06	11.47	22.66	15.86	9.90	9.08	7.62	7.11	8.72	3.62	2.92
27/09	535.96	3.76	9.03	8.80	5.80	6.67	8.72	7.17	8.30	7.42	6.38	11.85	10.39	11.33	22.69	15.91	9.98	9.14	7.67	7.28	8.87	3.75	3.03
28/09	535.39	3.92	9.13	9.44	5.94	6.70	8.50	6.99	8.14	7.16	6.12	11.10	9.50	11.02	22.64	15.97	10.11	9.28	7.72	7.42	9.01	3.90	3.14
29/09	535.39	4.11	9.11	9.46	6.40	7.22	8.55	6.76	7.90	6.87	5.86	10.48	8.94	10.67	22.40	15.92	10.20	9.42	7.75	7.54	9.13	4.01	3.25
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

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
2013																							
23/09	0.5	nr	nr	nr	nr	nr	nr	nr	0.2	nr	4.4	57.7	7.2	17.0	1.0	1.5	0.0	-	1.8	0.0	4.5	9.0	23.4
24/09	0.0	nr	7.8	nr	nr	16.5	10.5	nr	0.1	nr	nr	35.0	nr	1.0	2.0	0.4	0.0	-	nr	9.2	4.2	0.0	3.2
25/09	0.0	23.5	21.6	16.2	0.8	nr	1.2	0.2	nr	nr	3.7	1.1	nr	3.0	nr	0.2	0.4	-	1.4	6.2	nr	nr	0.0
26/09	0.5	0.0	11.0	7.3	nr	0.0	45.7	33.3	43.7	0.0	nr	26.1	34.9	3.0	6.8	nr	nr	-	nr	nr	nr	nr	-
27/09	0.0	20.9	4.7	57.7	17.5	0.8	0.2	7.3	3.1	0.0	0.8	44.1	124.8	90.0	33.5	3.5	20.4	-	0.5	6.4	24.5	nr	-
28/09	0.0	60.4	nr	9.4	2.4	0.6	0.5	0.0	nr	0.0	nr	3.2	nr	64.5	18.0	33.0	6.9	-	21.8	3.1	47.3	nr	-
29/09	0.0	1.6	nr	0.0	3.8	2.5	nr	0.0	-	0.0	nr	32.0	nr	18.5	6.0	14.8	0.3	-	0.2	1.6	nr	2.2	-
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	17.3

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

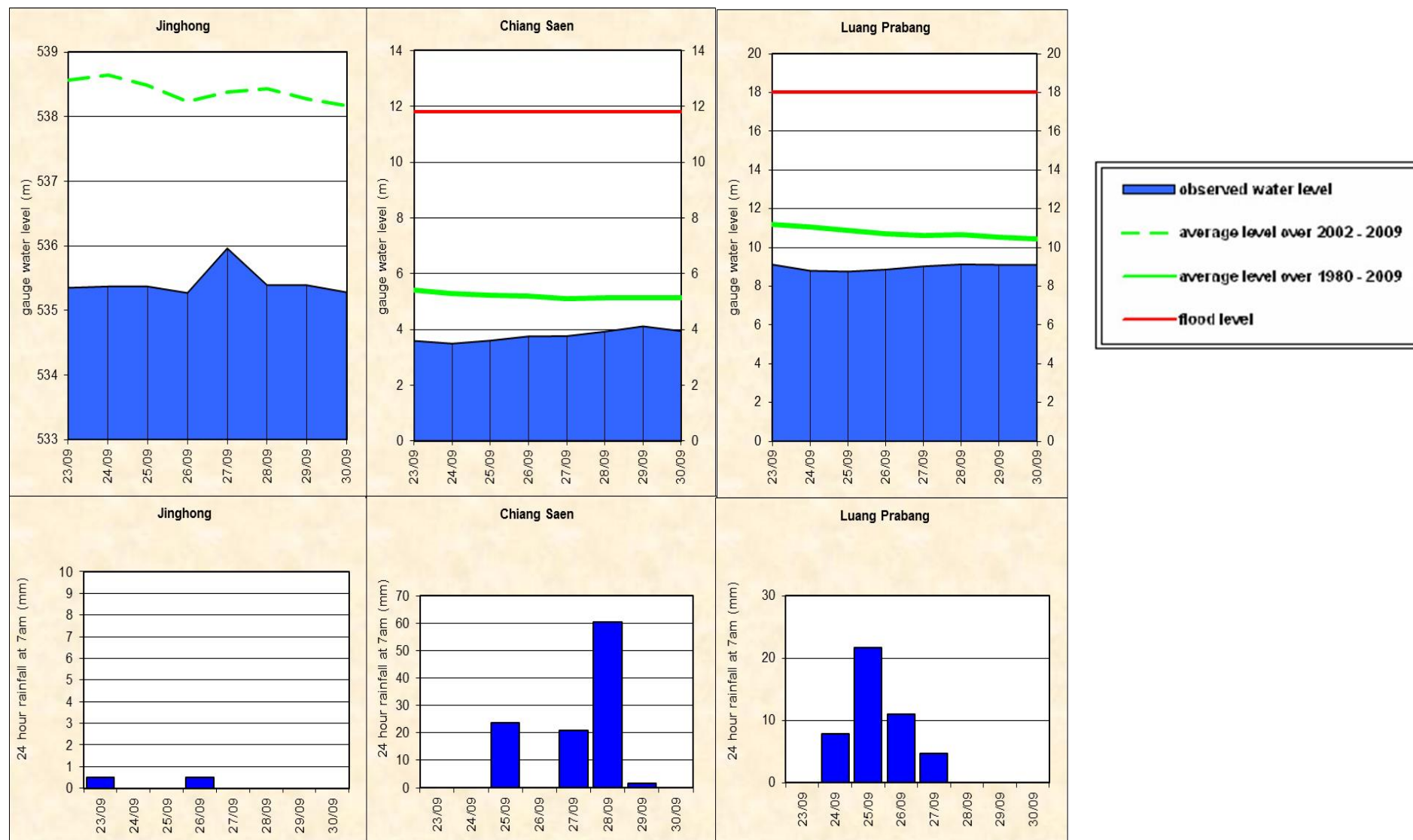


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

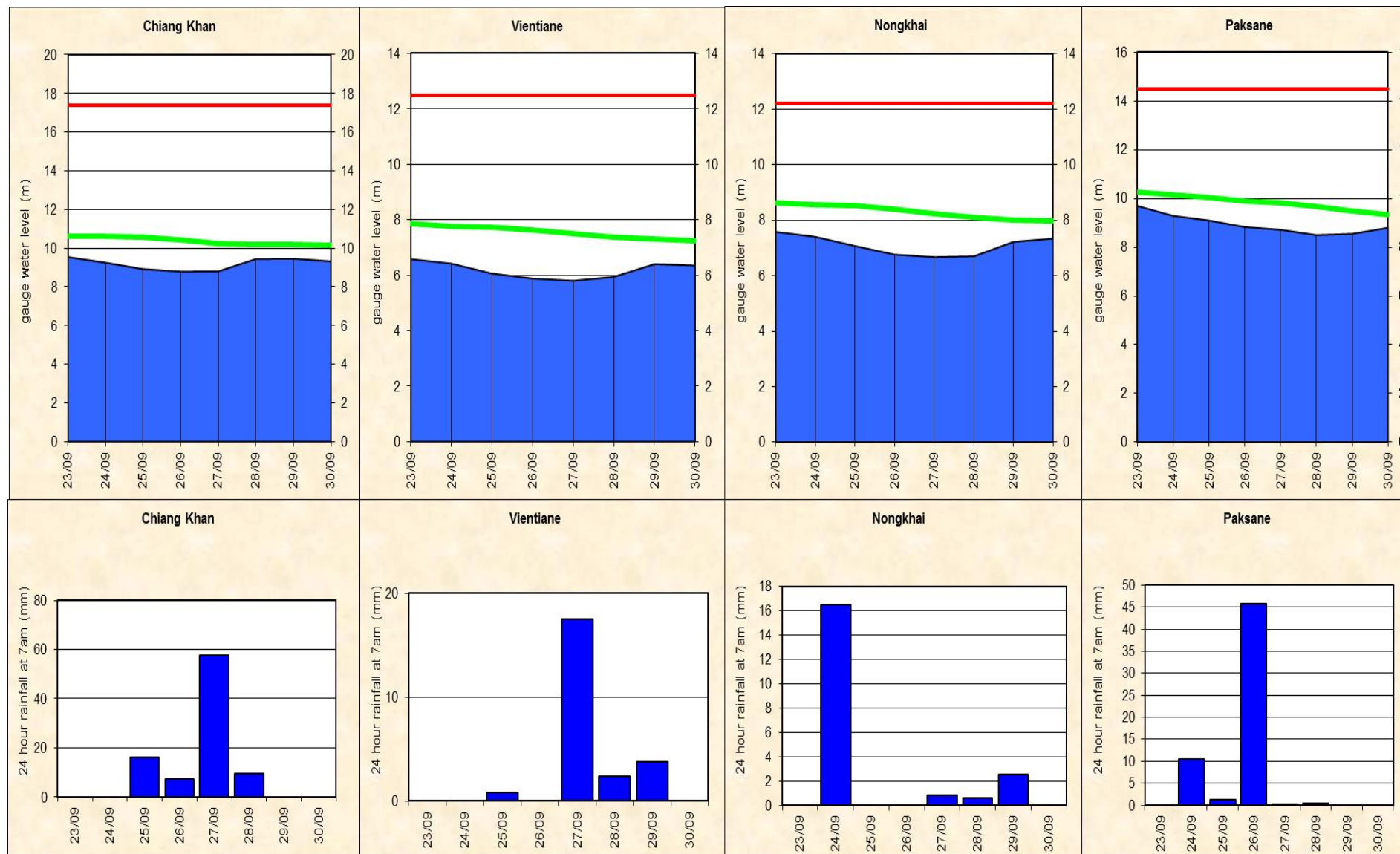


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

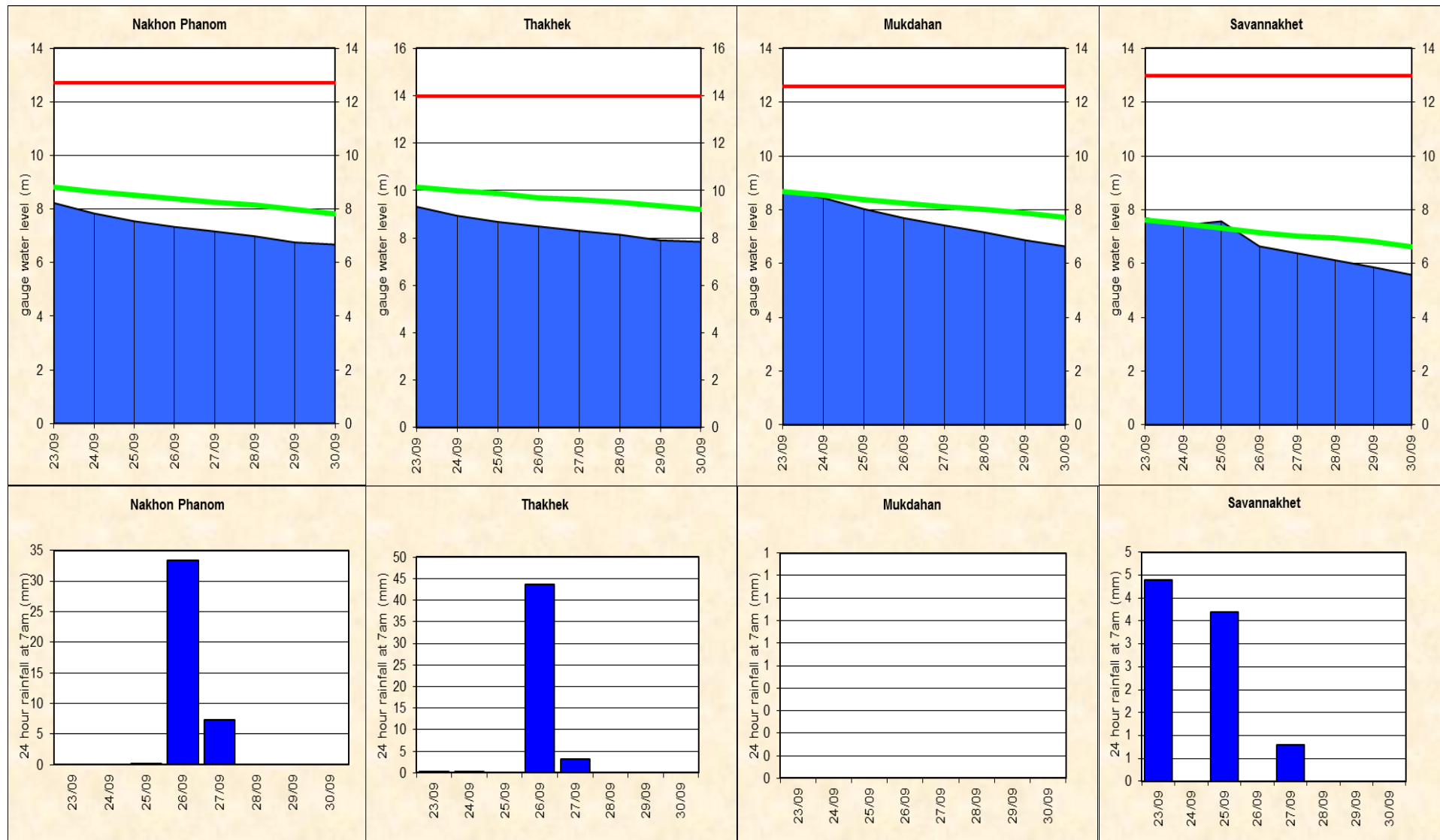


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

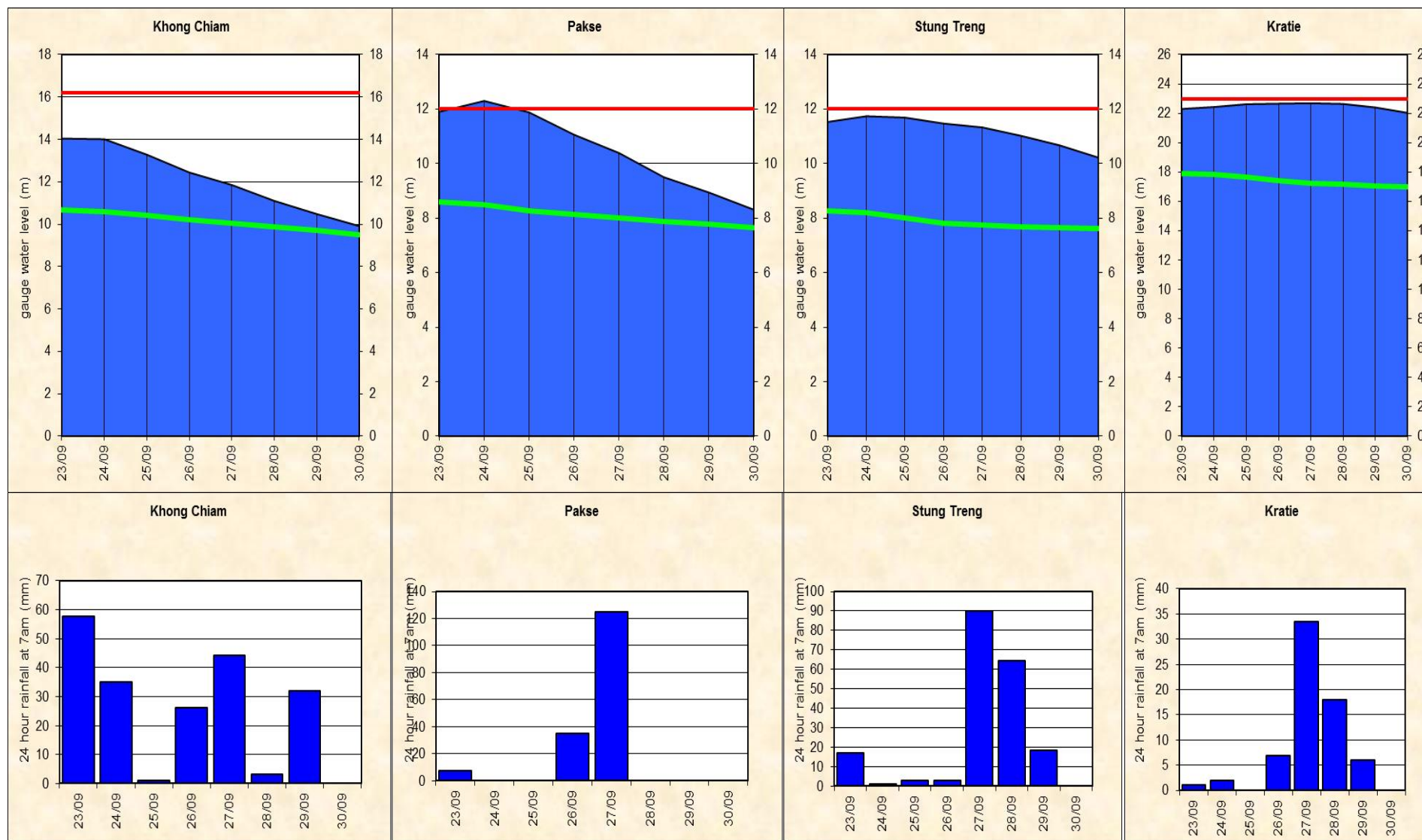


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

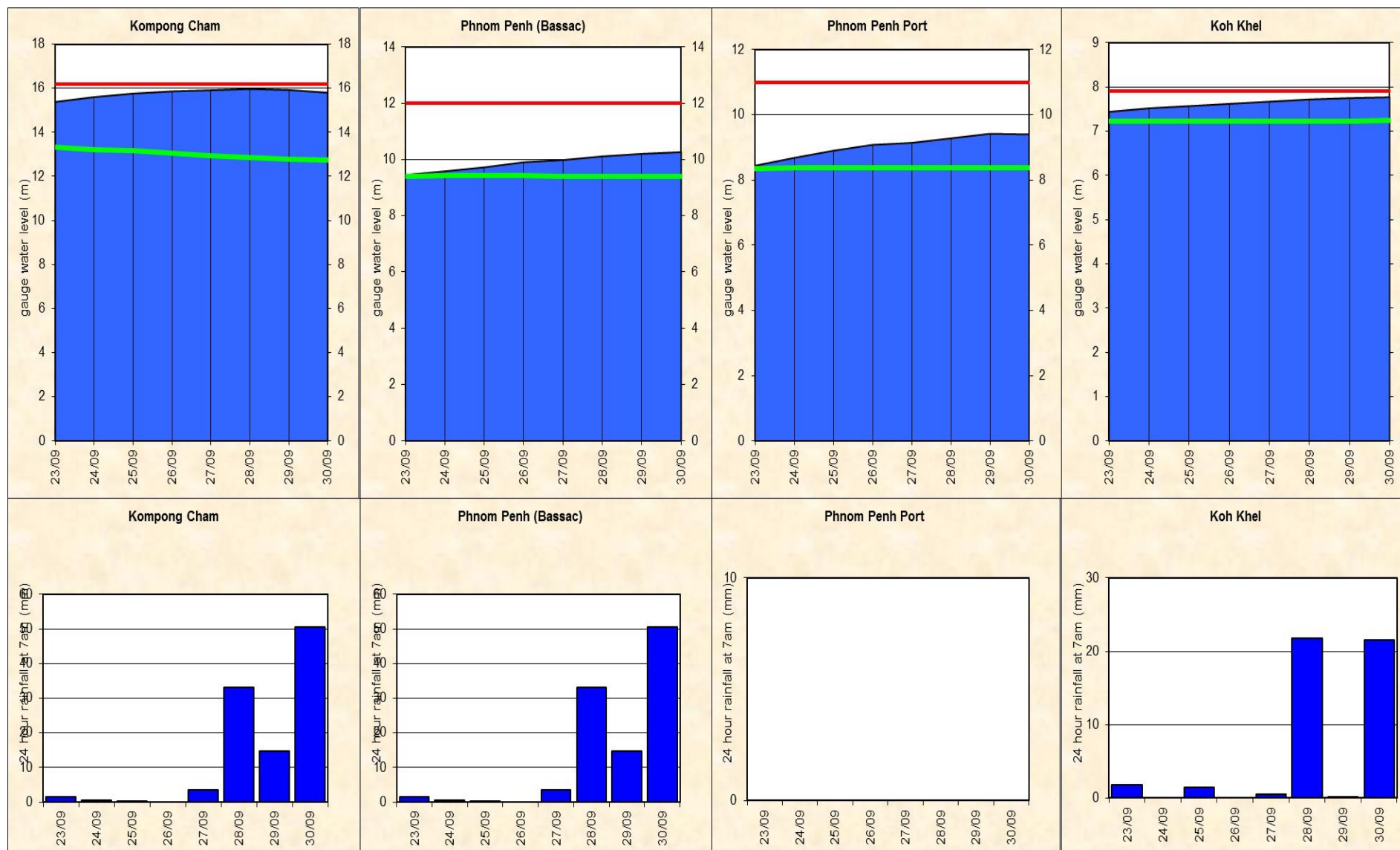
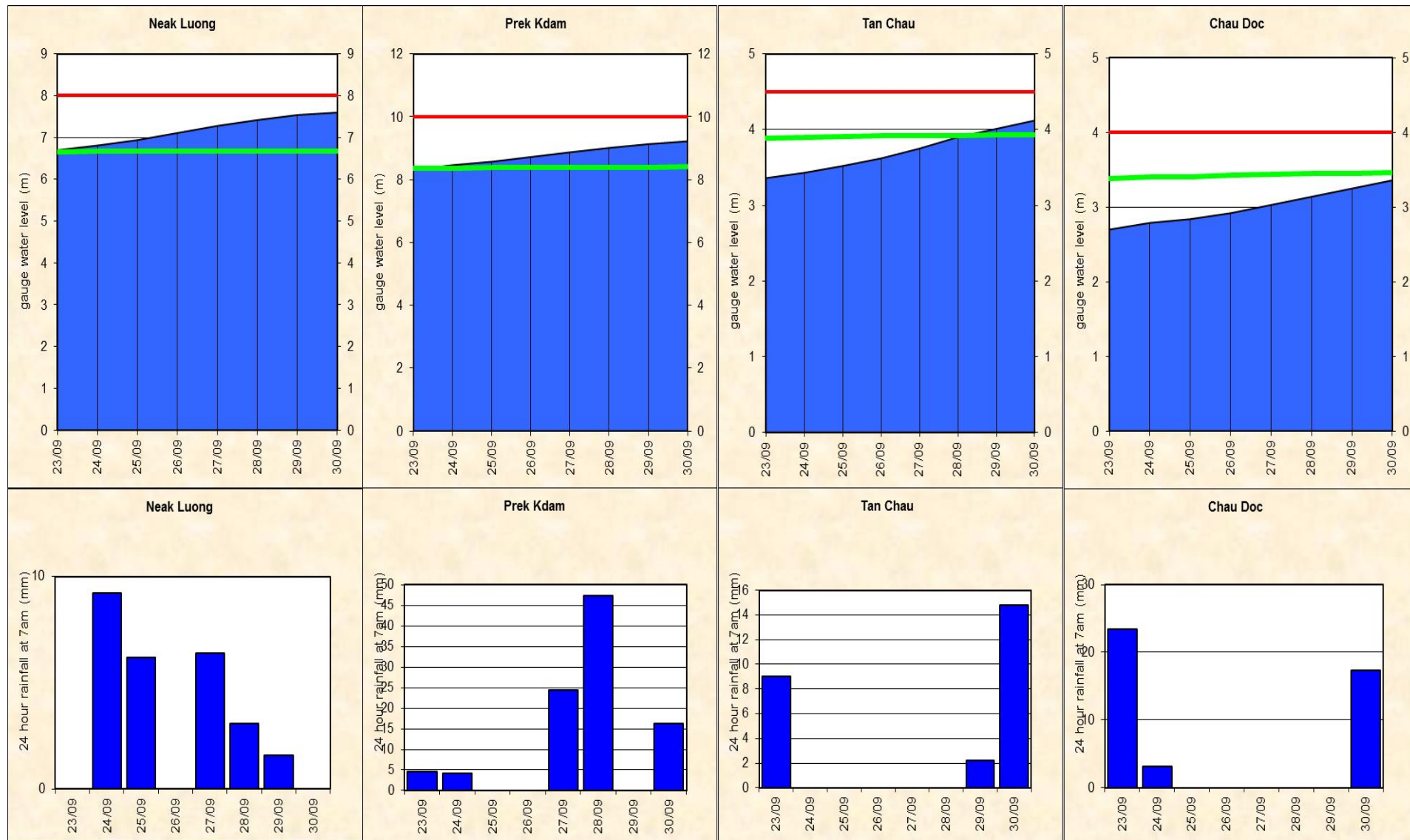


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

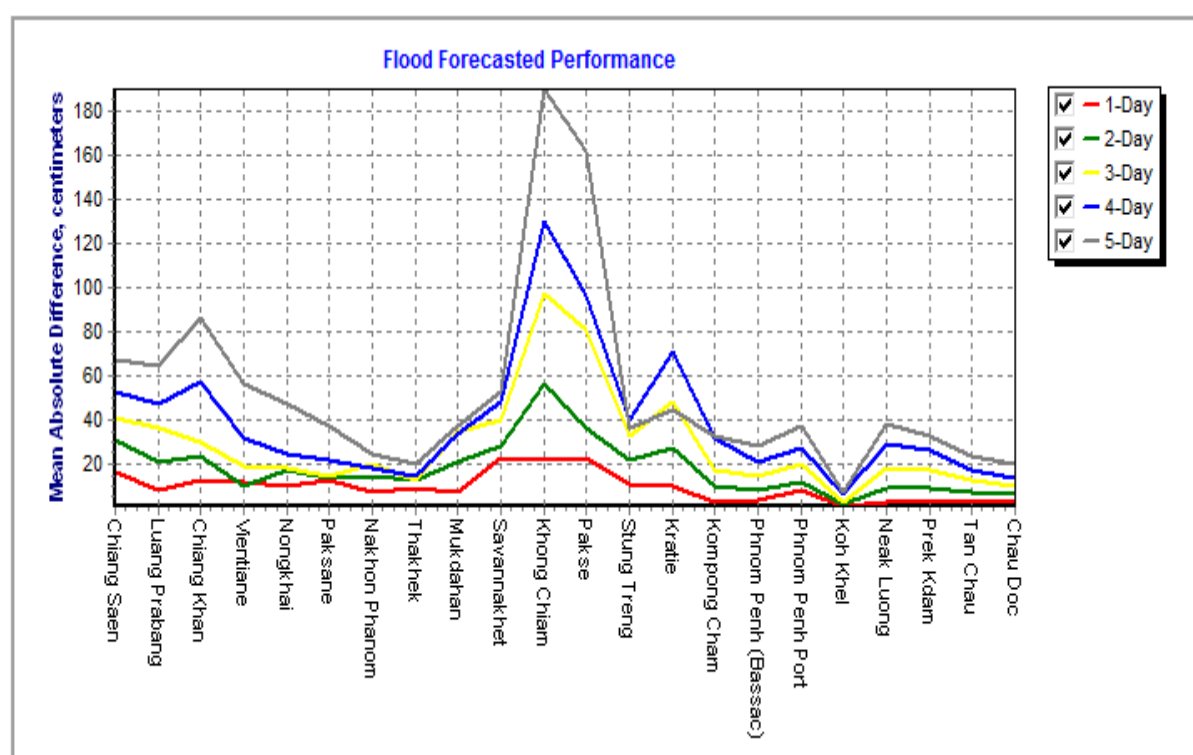
“Accuracy” describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model 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 Khong Chiam, Pakse and Phnom Penh (Bassac) 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	85.7	100.0	71.4	57.1	71.4	57.1	71.4	71.4	71.4	57.1	28.6	28.6	57.1	57.1	100.0	100.0	85.7	100.0	100.0	100.0	100.0	100.0	76.0
2-day	100.0	100.0	100.0	83.3	66.7	83.3	100.0	100.0	50.0	50.0	16.7	50.0	66.7	50.0	100.0	66.7	50.0	100.0	50.0	50.0	83.3	100.0	73.5
3-day	60.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	40.0	20.0	0.0	20.0	40.0	20.0	60.0	0.0	0.0	100.0	0.0	0.0	20.0	40.0	44.5
4-day	100.0	100.0	50.0	75.0	100.0	75.0	100.0	100.0	75.0	75.0	0.0	25.0	50.0	50.0	100.0	0.0	25.0	100.0	25.0	50.0	25.0	25.0	60.2
5-day	66.7	66.7	0.0	33.3	33.3	66.7	66.7	100.0	66.7	66.7	0.0	0.0	66.7	33.3	66.7	33.3	0.0	100.0	0.0	0.0	33.3	66.7	43.9

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
2-day	50	50	50	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	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
5-day	75	75	50	50	50	50	50	50	50	50	50	50	50	50	50	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

	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
2013																		
<i>week</i>	10:33	0	-	7	08:15	08:17	07:25	06:11	08:52	07:31	07:01	0	0	17	113	179	0	49
<i>month</i>	10:14	0	-	20	08:16	08:17	07:13	05:50	08:27	07:28	07:01	3	0	18	413	601	0	111
<i>season</i>	10:24	5	-	67	08:14	08:25	07:11	05:48	08:48	07:28	07:09	13	17	90	1293	3129	29	620

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.

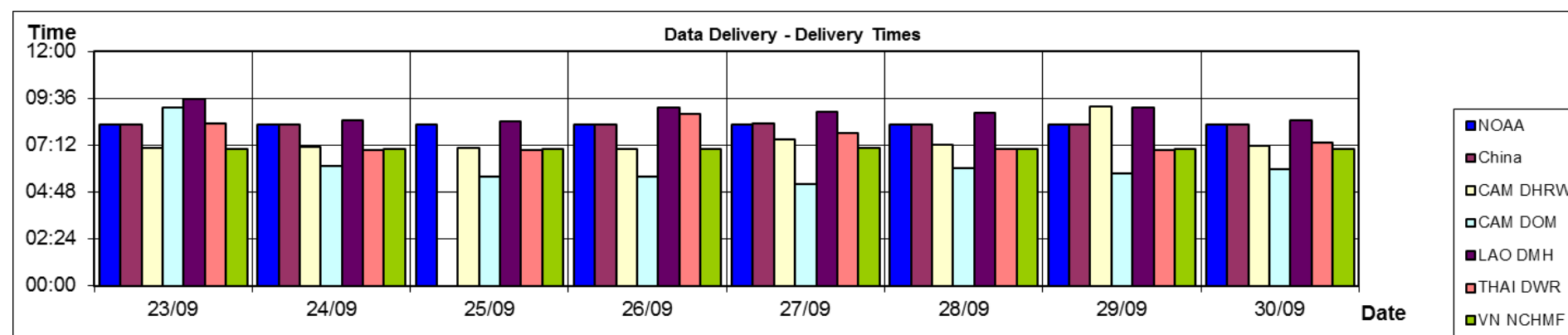


Figure B2: Data delivery times for the past 8 days including the current report date

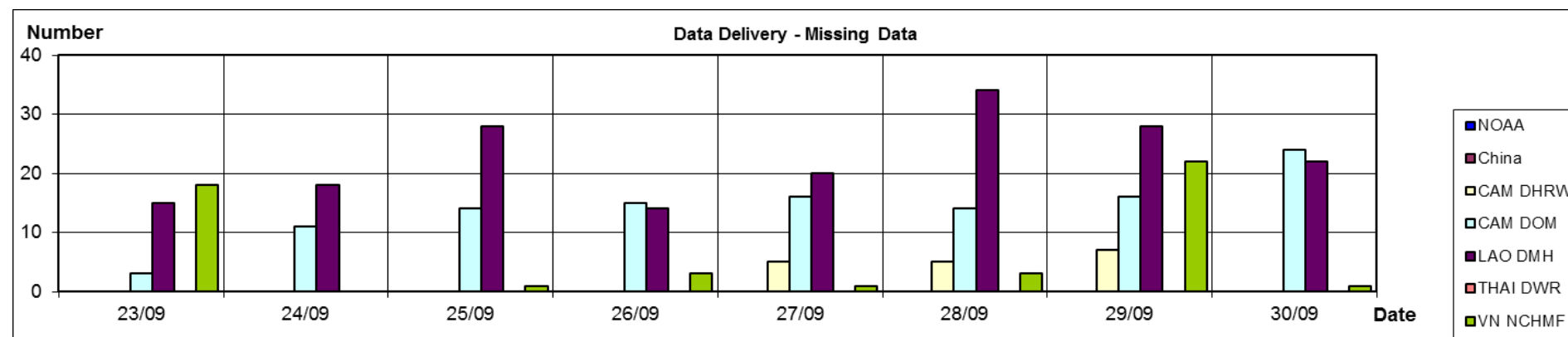


Figure B3: Missing data for the past 8 days including the current report date

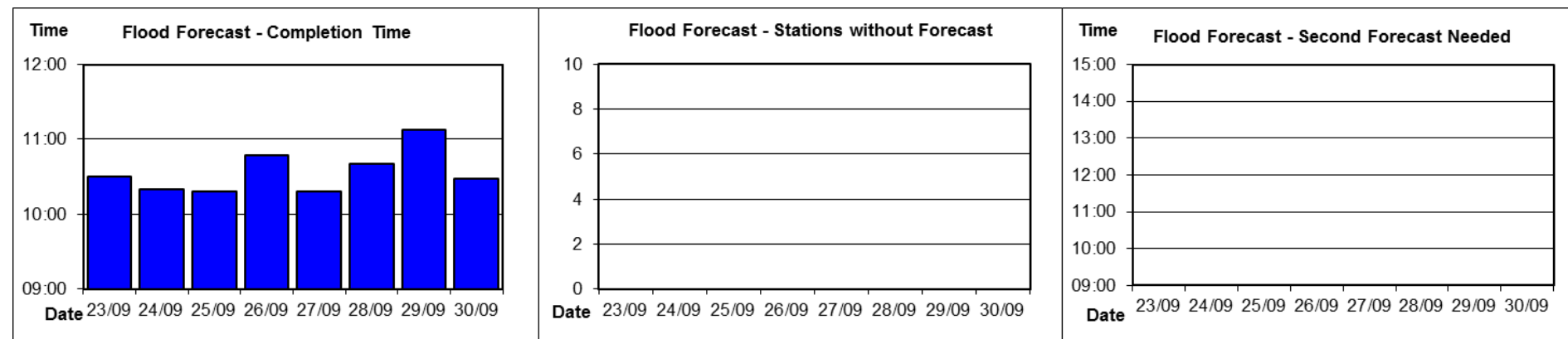


Figure B4: Flood forecast completion time

Figure B5: Flood forecast stations without forecast

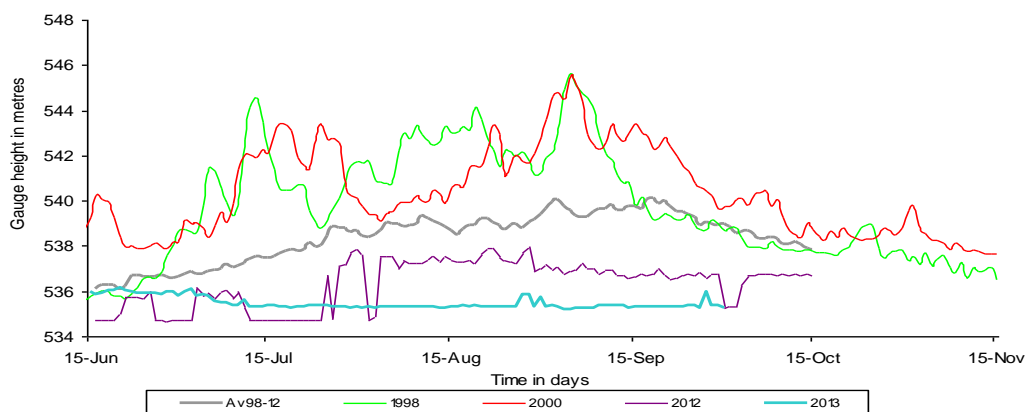
Figure B6: Second forecast needed

Annex C: Season Water Level Graphs

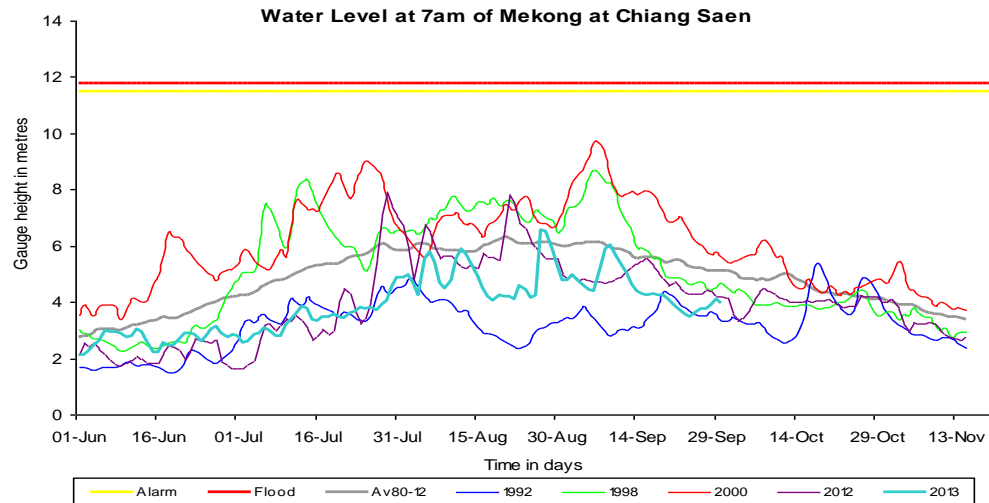
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

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

