Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 04/11/2013, covering the week from the 28th October to the 04th November 2013

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

General weather patterns

During the week of 28th October to 04th November 2013 three weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 28th October and 29th October are presented in the figures below:

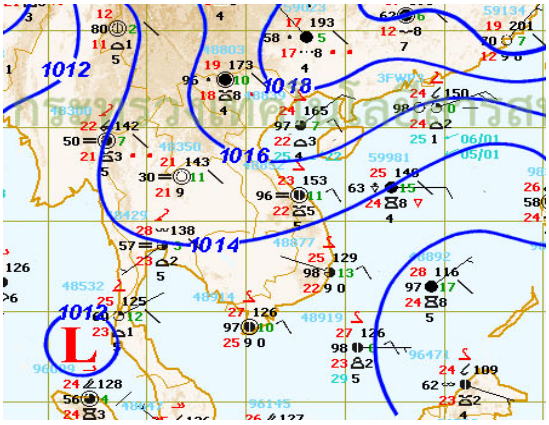


Figure 1: Weather map for 28th October 2013

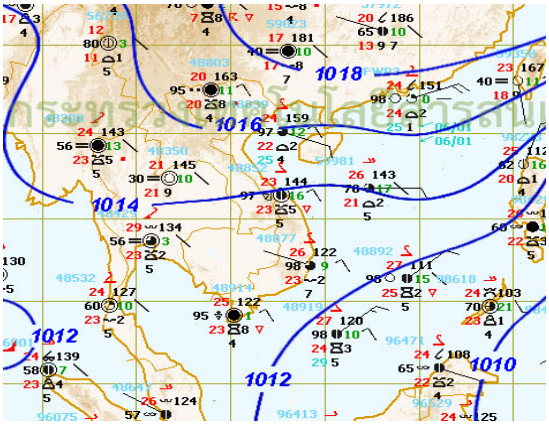


Figure 2: Weather map for 29th October 2013

Moderate South-West (SW) Monsoon

No active monsoon was reported during last week.

Inter Tropical Convergence Zone (ITCZ)
No ITCZ was reported during last week.

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

No TD, TS or TY was reported during last week.

Other weather phenomena that affect the discharge

The ridge of high pressure from China lies across Myanmar, Thailand, Lao PDR, Cambodia and Viet Nam during last week and supress rainfall in LMB.

Over weather situation

The ridge of high pressure from China lies across Myanmar, Thailand, Lao PDR, Cambodia and Viet Nam during last week and supress rainfall in LMB The amount of rainfall from 28th October to 04th November 2013 was very low and recorded at Chiang Saen 6.5 mm (with a one day maximum of 6.5 mm), Khong Chiam 1 mm (with a one day maximum of 1 mm), Phnom Penh (Bassac) 7.4 mm (with a one day maximum of 7.4 mm), Koh Khel 27.6 mm (with a one day maximum of 27.6 mm), Tan Chau 8.5 mm (with a one day maximum of 5.3 mm) and Chau Doc 12.3 mm (with a one day maximum of 11 mm). See Figure 3 for Weekly Rainfall Distribution covering the week 28th October to 04th November 2013 of LMB.

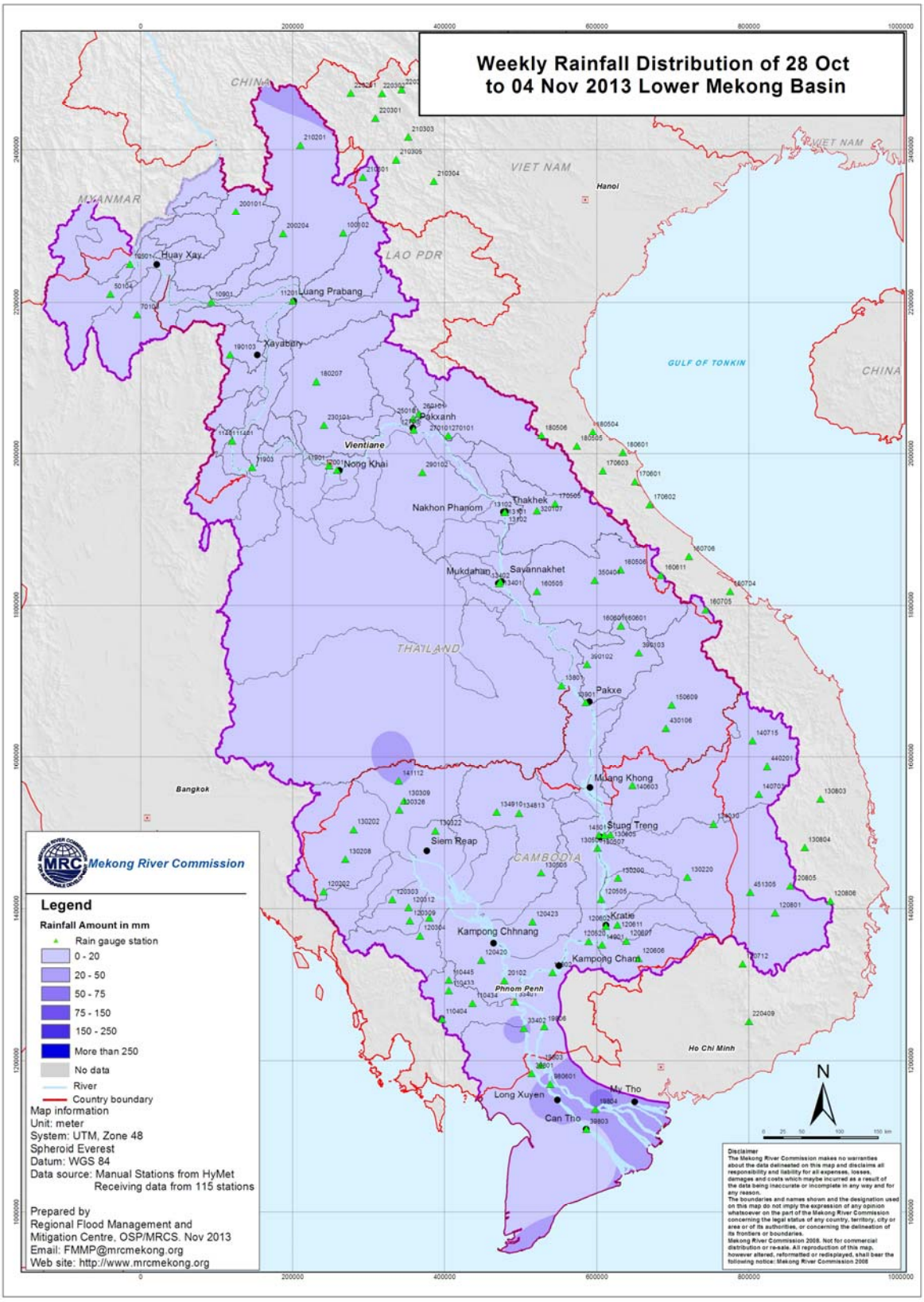


Figure 3: Weekly Rainfall Distribution covering the week 28th October to 04th November 2013 of LMB

General behaviour of the Mekong River

During last week water levels at most stations in the upper and middle reaches of LMB, started above the long-term average water level (LTA), recessed at the beginning of the week then rose up at middle of last week before recessed for the rest of last week above LTA. The water levels of the lower reach of LMB were recessing above LTA during last week.

For stations from Chiang Saen and Luang Prabang

Water level at Chiang Saen was slowly recessing at the beginning of last week above LTA then rose up in the middle of last week and finally recess at the end of the week, while water level at Luang Prabang was recessing above LTA during the first half of the week then rose up for the rest of last week.

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

Water levels of these stations recessed at the beginning of last week above LTA then rose up at the end of last week, except Paksane that water level rose up till mid of last week before recessed for the rest of last week above LTA.

For stations from Thakhet/Nakhon Phanom to Pakse

Water levels of these stations were below or about the LTA at the beginning of last week then rose up till middle of last week before recessed for the rest of last week above LTA.

For stations from Stung Treng to Kompong Cham

Water levels of these stations shown recessing trend and were above LTA during last week.

For stations from Phnom Penh to Koh Khel/Neak Luong

Water levels of these stations shown recessing trend and were above LTA during last week.

Tan Chau and Chau Doc

Water levels of these stations shown recessing trend and were about LTA during last week, except Chau Doc that was below 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, water level at Chau Doc monitoring station was still above the alarm level.

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
28/10	536.69	4.65	9.56	9.70	6.25	7.05	6.20	4.15	5.25	4.12	3.02	6.05	4.73	5.48	13.94	10.36	8.79	7.86	7.10	6.52	8.71	3.62	3.31
29/10	536.02	4.55	9.02	9.49	6.28	7.18	6.05	4.67	5.65	4.34	3.22	5.92	4.60	5.32	13.63	10.10	8.55	7.65	7.03	6.44	8.62	3.54	3.24
30/10	536.62	4.56	8.68	9.13	6.07	6.98	7.96	5.17	6.38	4.79	3.70	5.99	4.60	5.19	13.33	9.87	8.49	7.60	6.94	6.32	8.54	3.48	3.20
31/10	537.01	4.83	8.54	8.74	5.75	6.60	8.80	5.35	6.57	5.11	3.99	6.29	4.81	5.16	13.08	9.65	8.36	7.48	6.87	6.22	8.46	3.43	3.15
01/11	-	5.02	8.56	8.48	5.40	6.22	8.46	5.33	6.54	5.21	4.14	6.56	5.04	5.20	12.97	9.50	8.25	7.37	6.79	6.11	8.37	3.37	3.12
02/11	-	4.91	8.84	8.36	5.16	5.92	8.18	5.13	6.35	5.11	4.00	6.70	5.20	5.29	13.01	9.42	8.15	7.25	6.74	6.02	8.29	3.33	3.09
03/11	-	4.74	8.99	8.43	5.05	5.75	7.90	4.89	6.10	4.91	3.82	6.66	5.19	5.33	13.12	9.45	8.11	7.18	6.70	5.97	8.24	3.28	3.04
04/11	-	4.63	8.82	8.63	5.13	5.79	7.78	4.67	5.89	4.69	3.61	6.51	5.08	5.36	13.20	9.46	8.09	7.16	6.68	5.92	8.19	3.24	3.01

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
28/10	14.0	6.5	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	0.0	0.2
29/10	3.5	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	-
30/10	0.0	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	3.2	11.0
31/10	1.5	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	7.4	-	27.6	nr	nr	5.3	0.8
01/11	-	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	1.0	nr	nr	nr	nr	nr	-	0.0	nr	nr	nr	0.0
02/11	-	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	0.3
03/11	-	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	0.0
04/11	-	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr

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

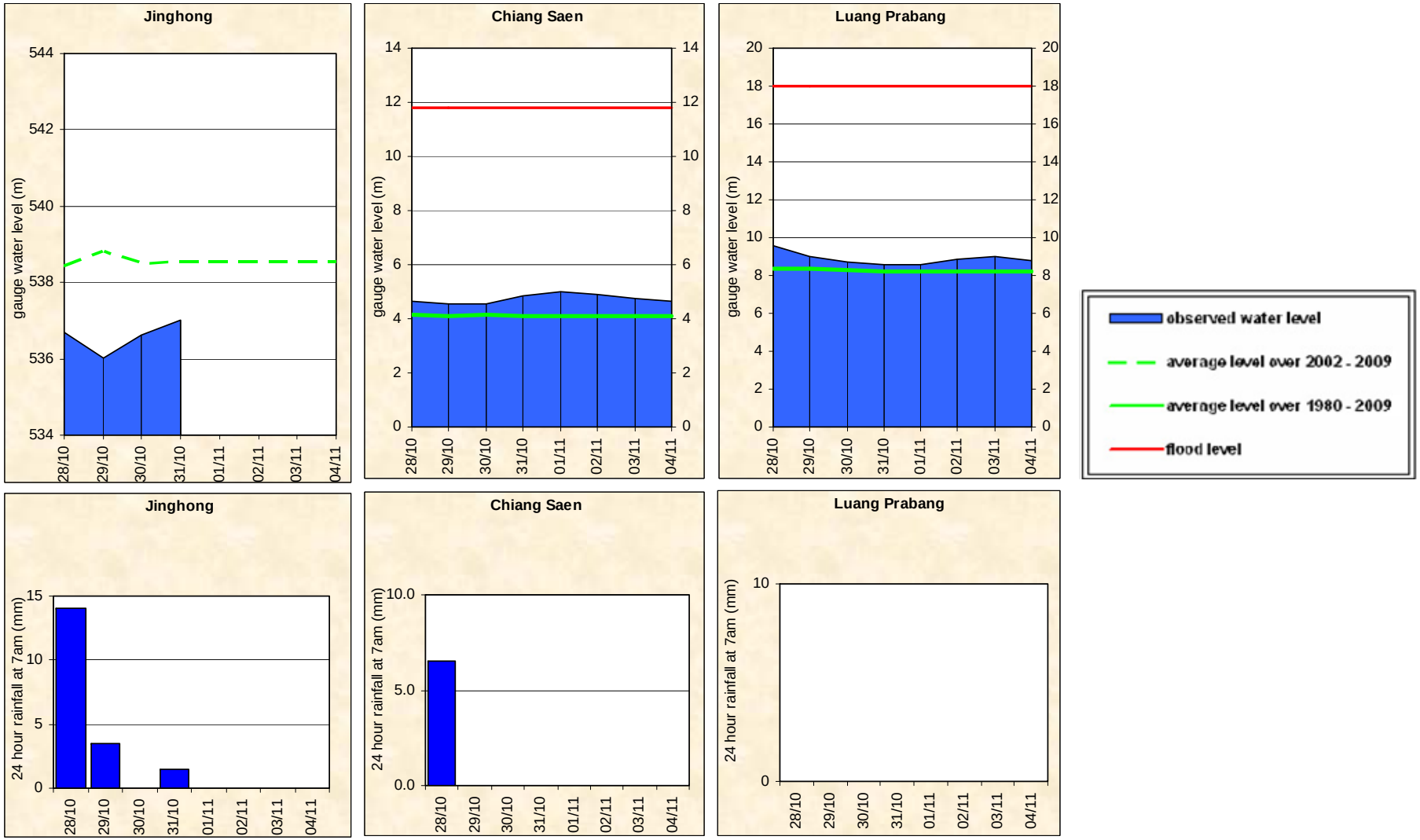


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

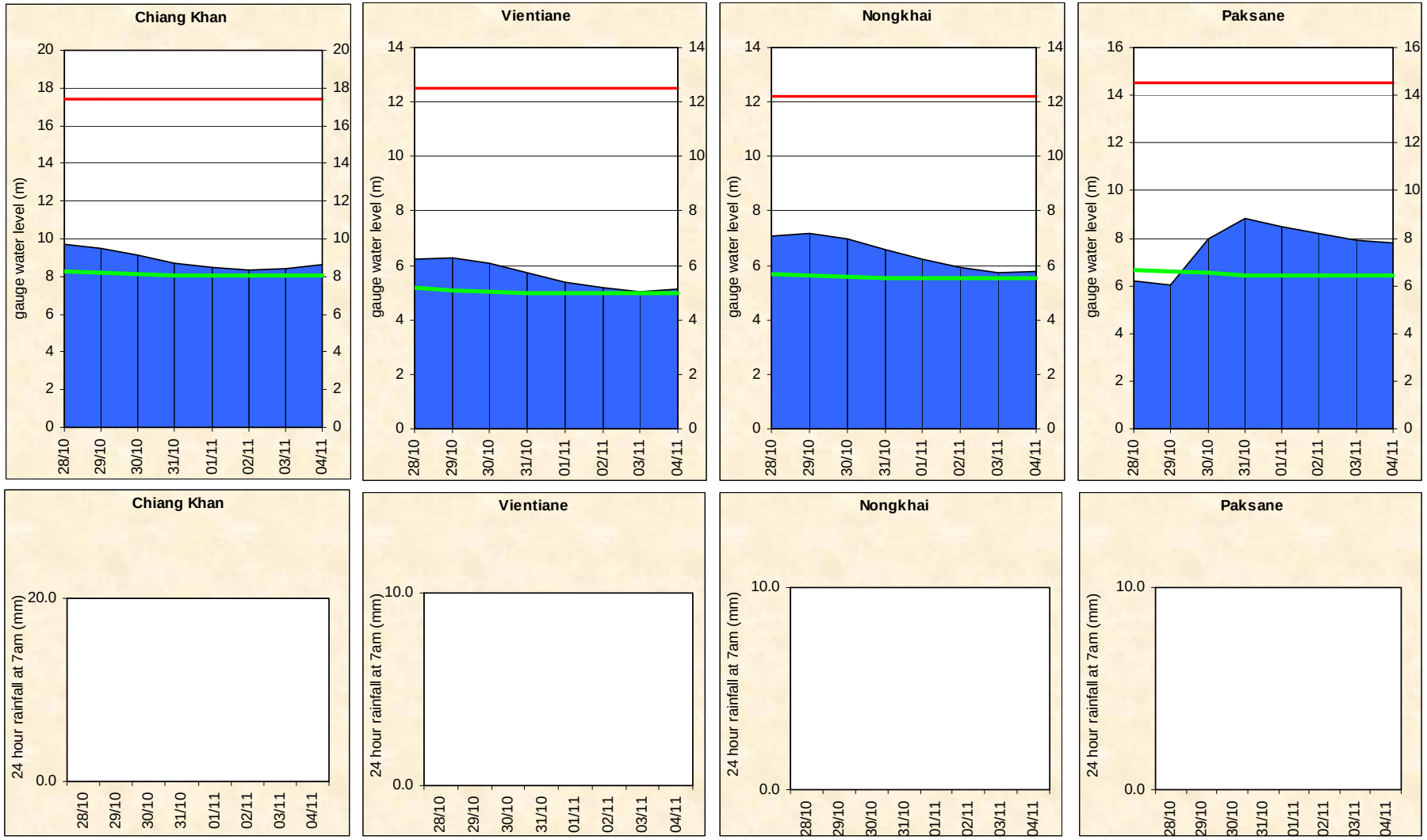


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

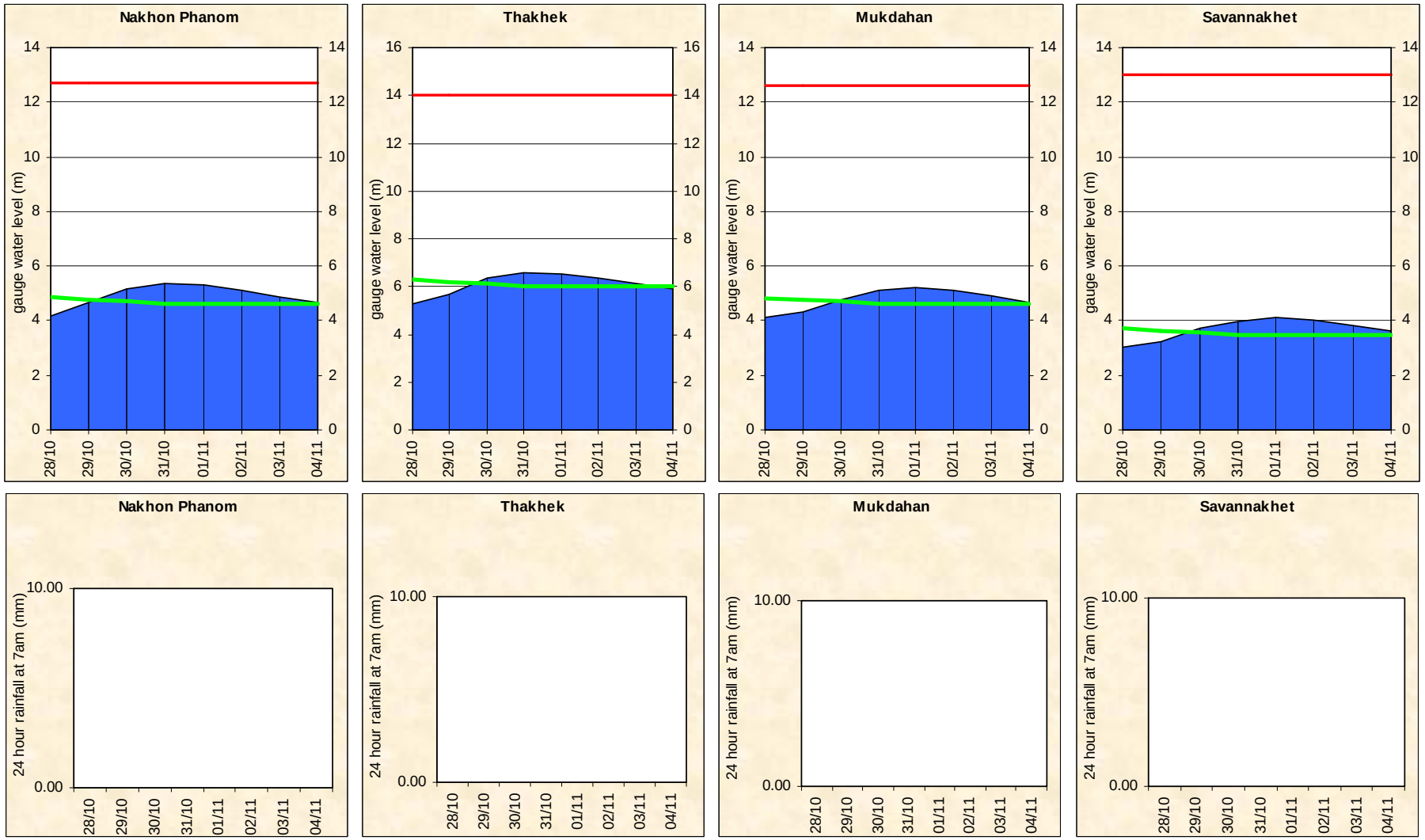


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

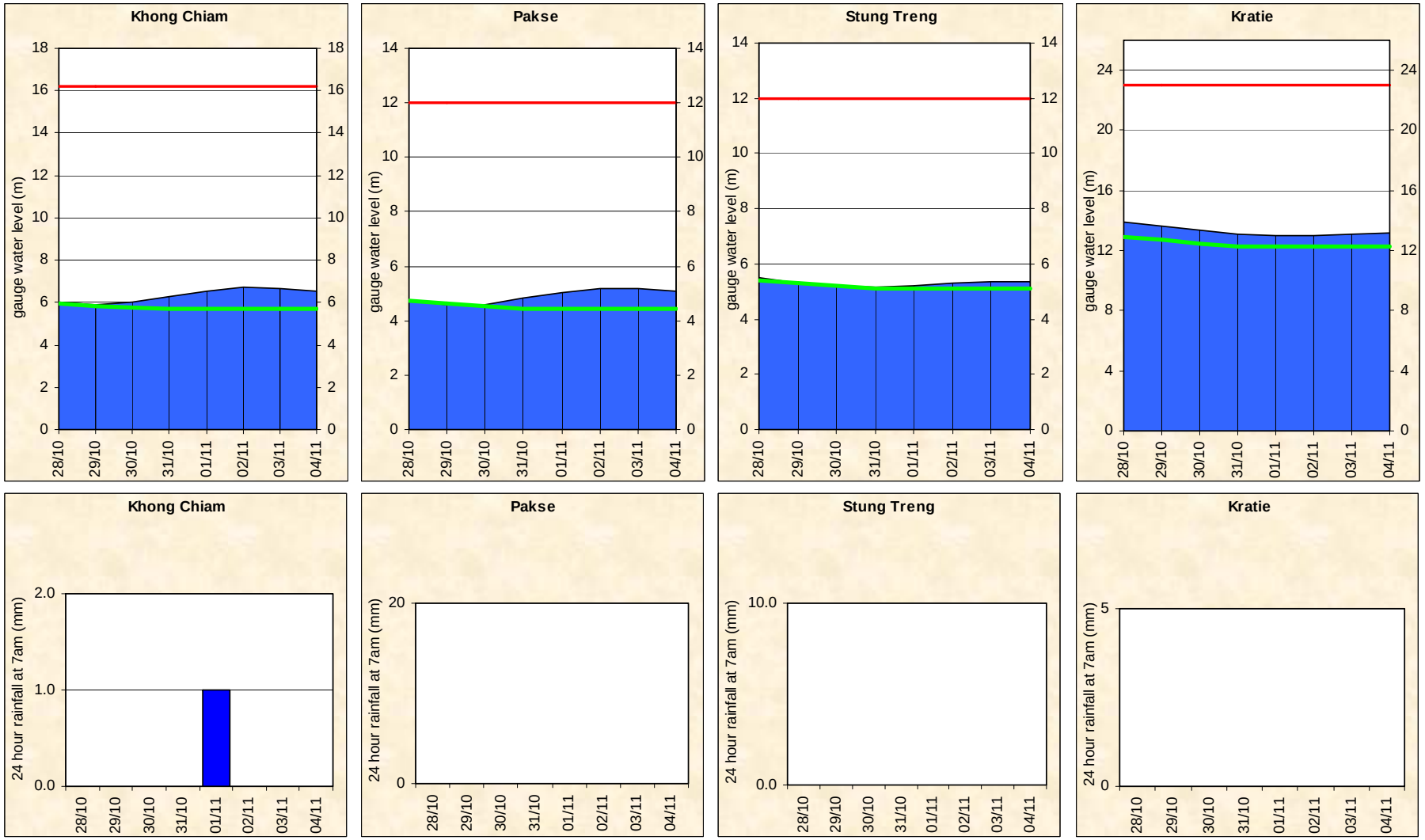


Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

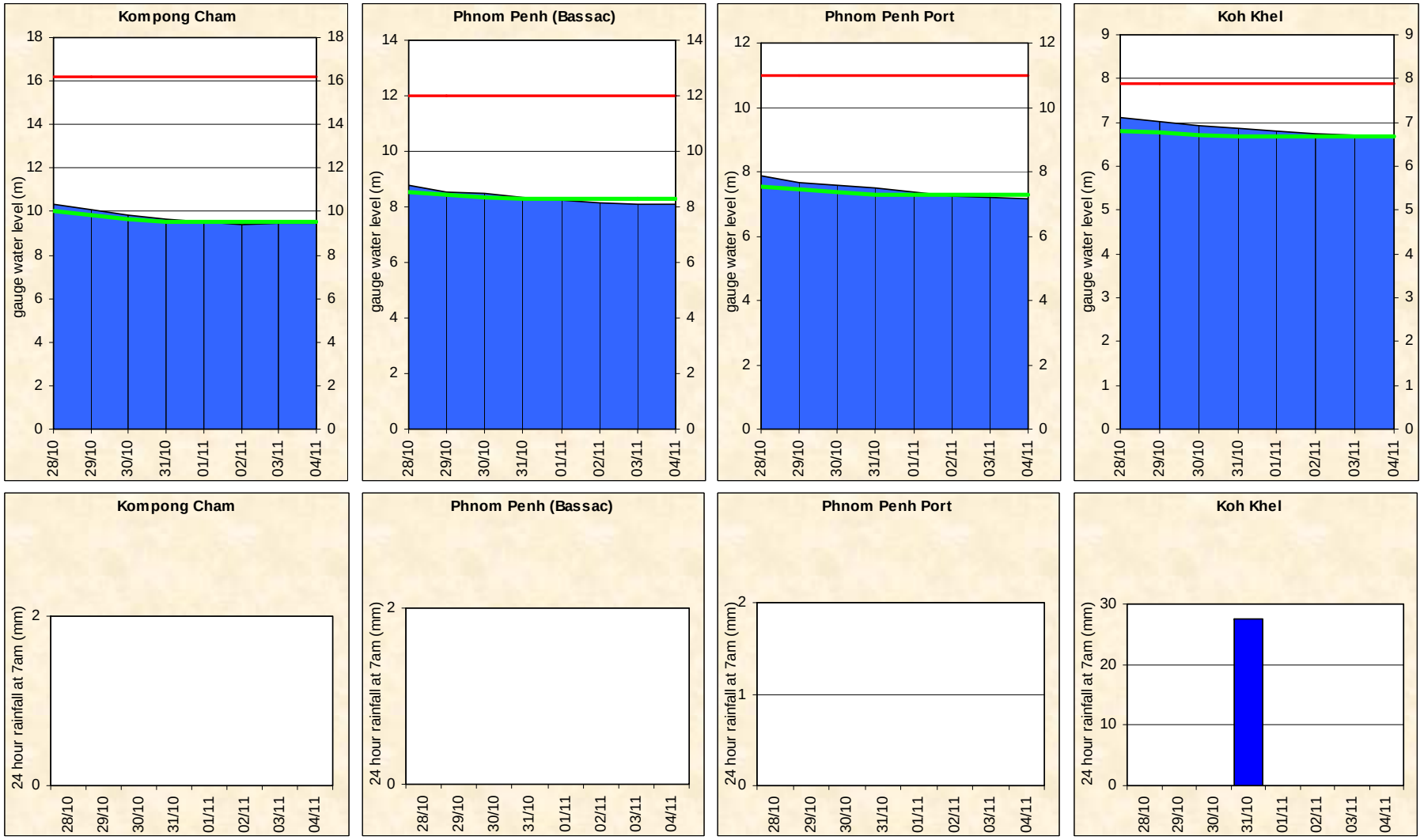
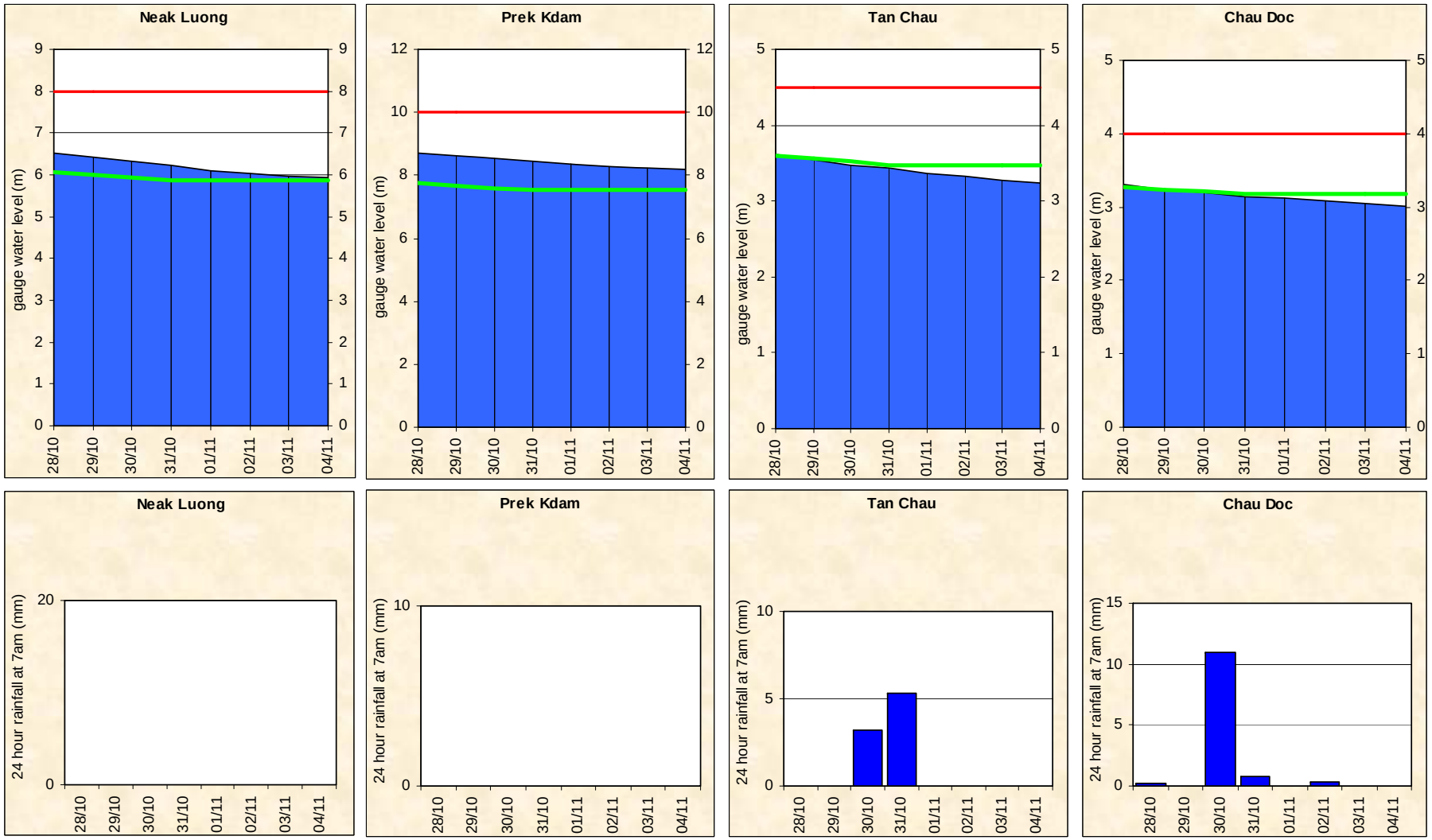


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



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 Vientiane to Pakse for 3-day and 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.

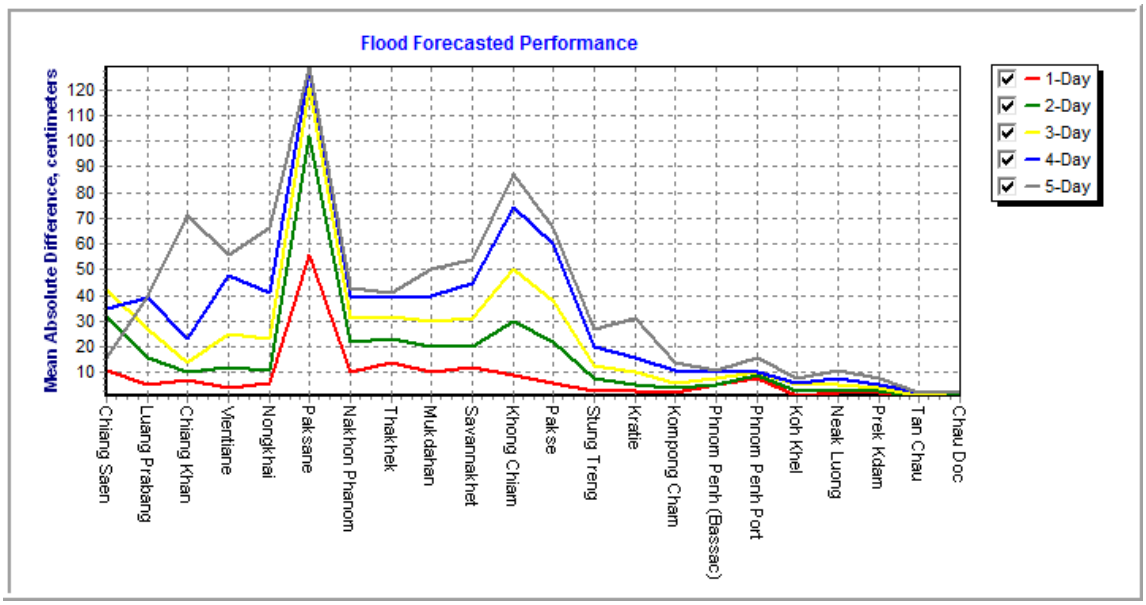


Figure B1: Average flood forecast accuracy along the Mekong mainstream

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 Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc	*Average*
1-day	85.7	100.0	100.0	100.0	85.7	0.0	57.1	57.1	71.4	57.1	57.1	85.7	100.0	100.0	100.0	85.7	71.4	100.0	100.0	100.0	100.0	100.0	***82.5***
2-day	83.3	100.0	100.0	100.0	100.0	16.7	66.7	66.7	66.7	66.7	33.3	66.7	100.0	100.0	100.0	83.3	66.7	100.0	100.0	100.0	100.0	100.0	***82.6***
3-day	60.0	80.0	100.0	40.0	60.0	20.0	40.0	60.0	60.0	60.0	20.0	20.0	100.0	100.0	100.0	80.0	60.0	100.0	100.0	100.0	100.0	100.0	***70.9***
4-day	100.0	75.0	100.0	75.0	50.0	0.0	75.0	75.0	75.0	75.0	25.0	0.0	100.0	100.0	100.0	50.0	100.0	75.0	100.0	100.0	100.0	100.0	***75.0***
5-day	100.0	66.7	33.3	33.3	33.3	0.0	66.7	66.7	66.7	66.7	0.0	33.3	100.0	66.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	***69.7***

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

	Flood Forecast: time sent				Arrival time of input data (average)							Missing data (number)						
2013	FF completed and sent (time)	stations without forecast	FF2 completed and sent (time)	Weather informaition 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
week	*10:12*	*0*	*-*	*3*	*08:23*	*08:22*	*07:10*	*06:23*	*08:49*	*07:08*	*07:01*	*0*	*0*	*0*	*125*	*241*	*0*	*18*
month	*10:15*	*0*	*-*	*24*	*08:18*	*08:17*	*07:08*	*06:28*	*08:51*	*07:12*	*07:08*	*26*	*0*	*4*	*396*	*738*	*2*	*117*
season	*10:22*	*5*	*-*	*96*	*08:14*	*08:24*	*07:11*	*05:56*	*08:48*	*07:27*	*07:09*	*46*	*16*	*101*	*1797*	*3859*	*31*	*742*

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.

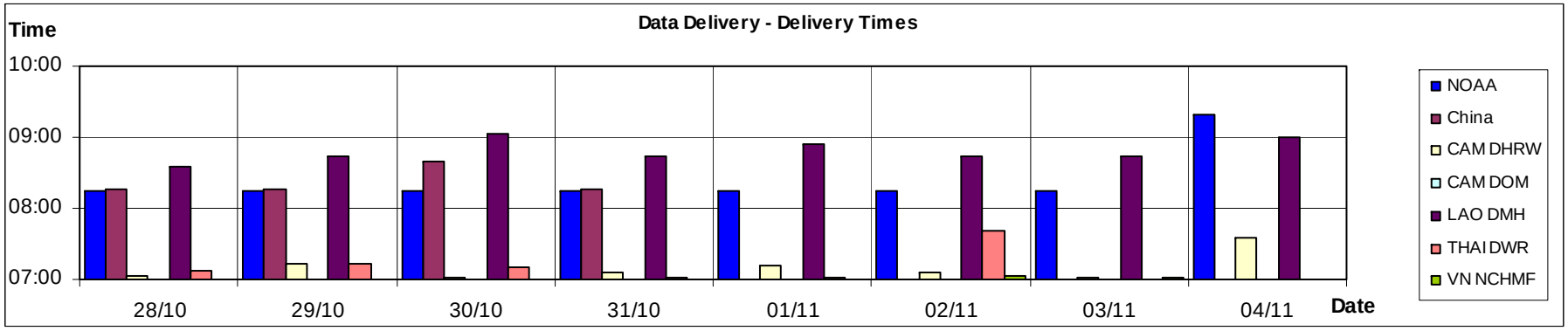


Figure B2: Data delivery times for the past 8 days including the current report date

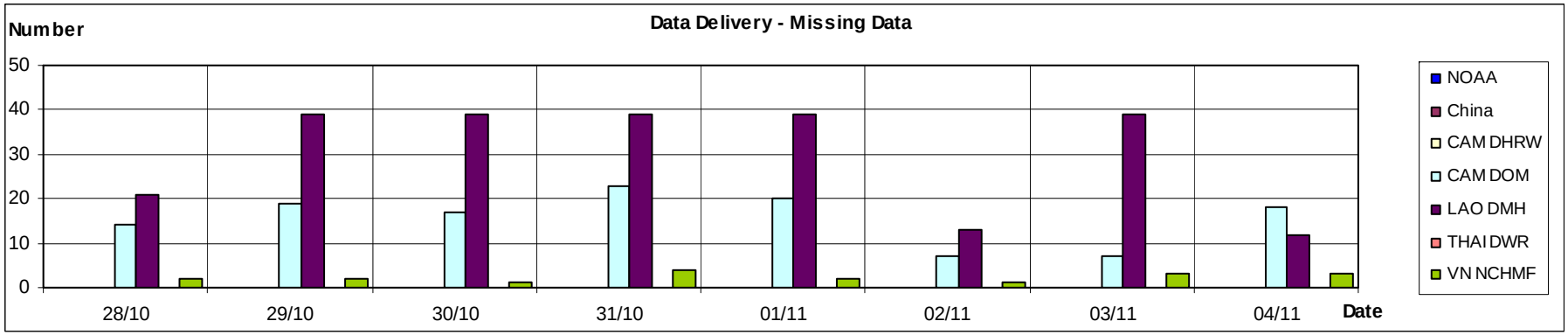


Figure B3: Missing data for the past 8 days including the current report date

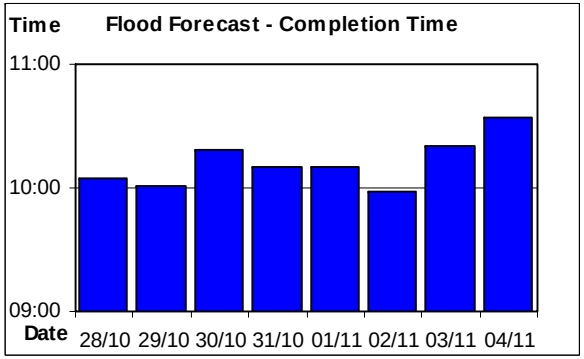


Figure B4: Flood forecast completion time

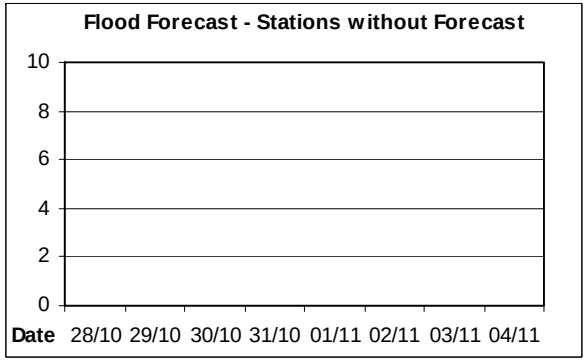


Figure B5: Flood forecast stations without forecast

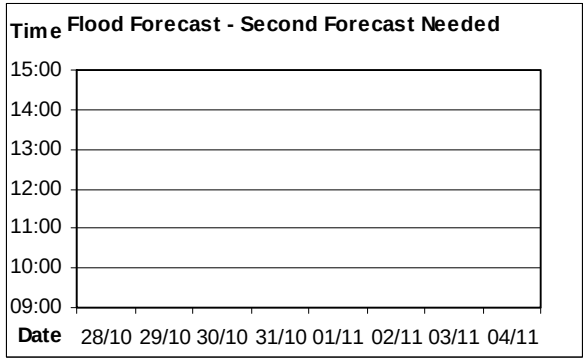


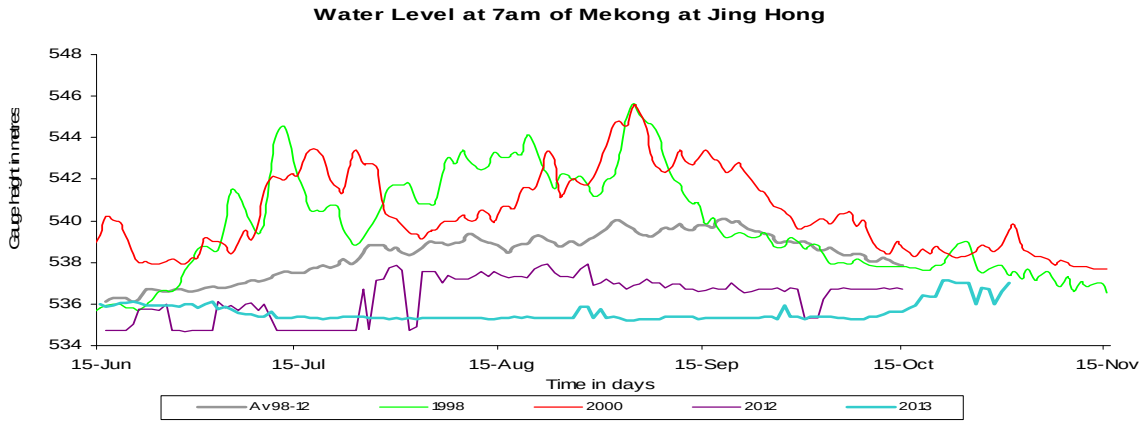
Figure B6: Second forecast needed

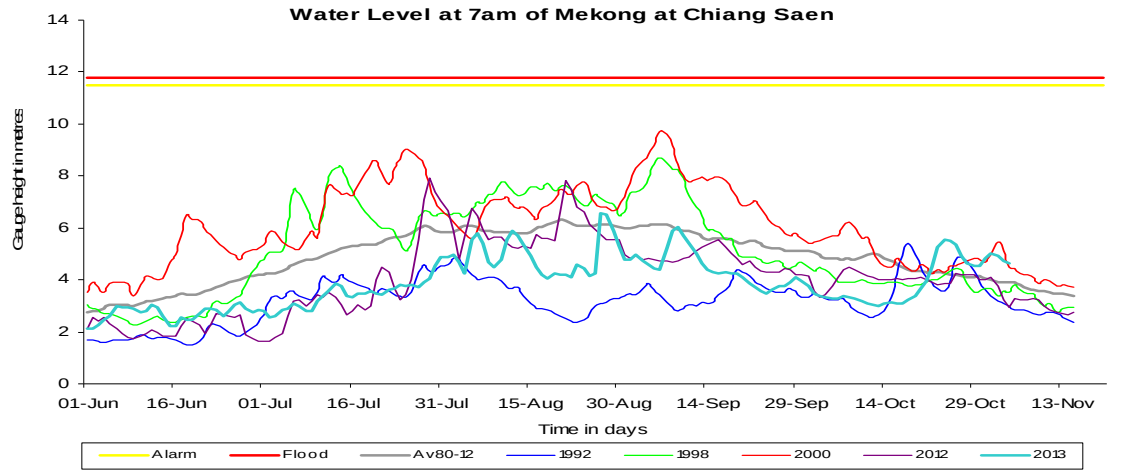
Annex C: Season Water Level Graphs

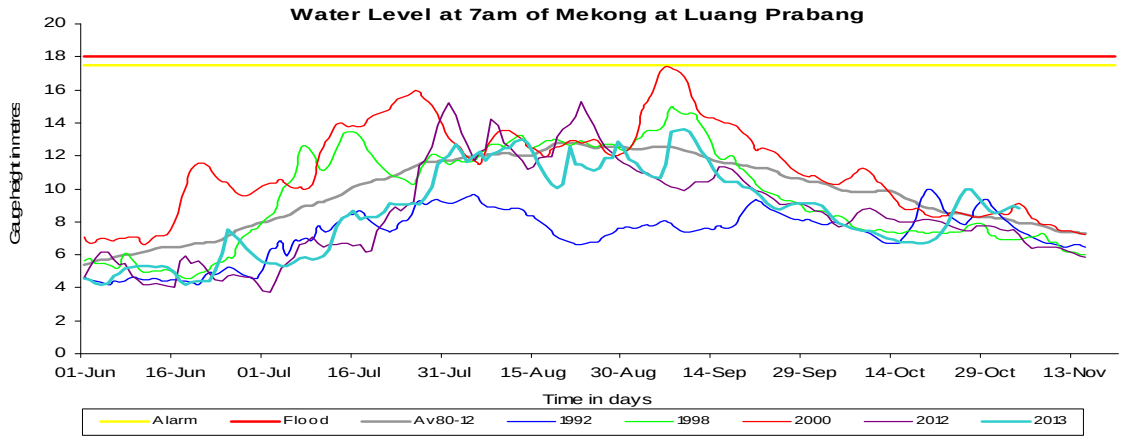
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

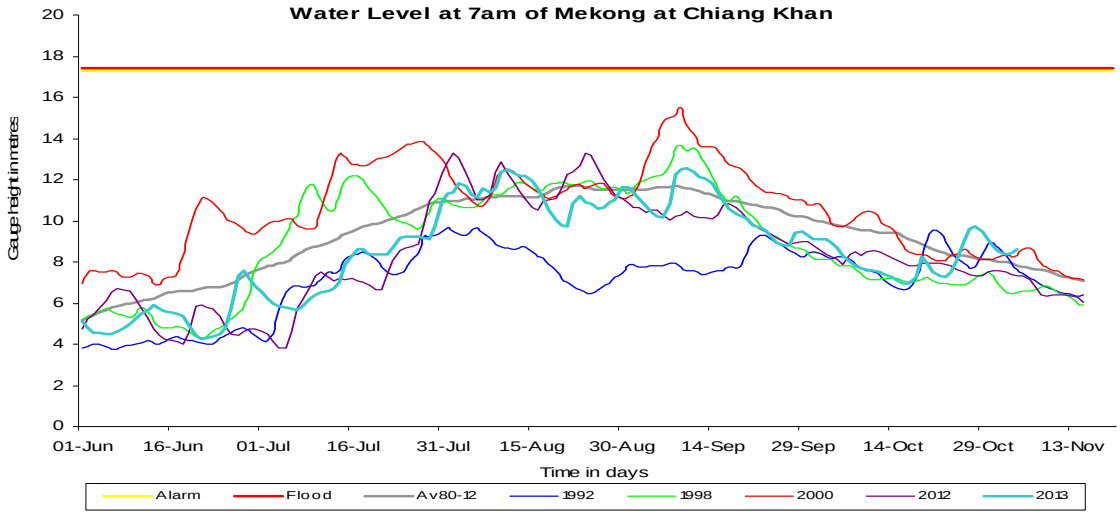
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

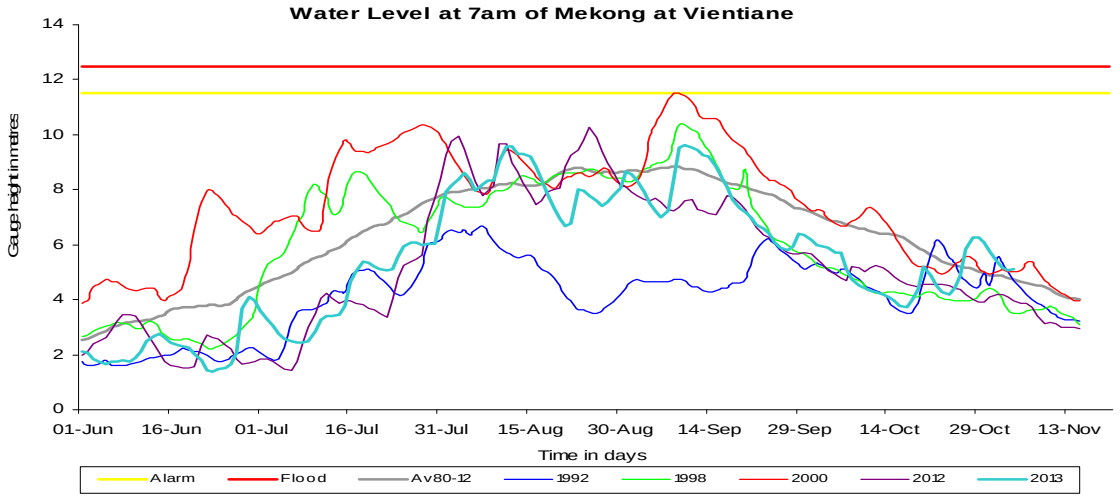
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

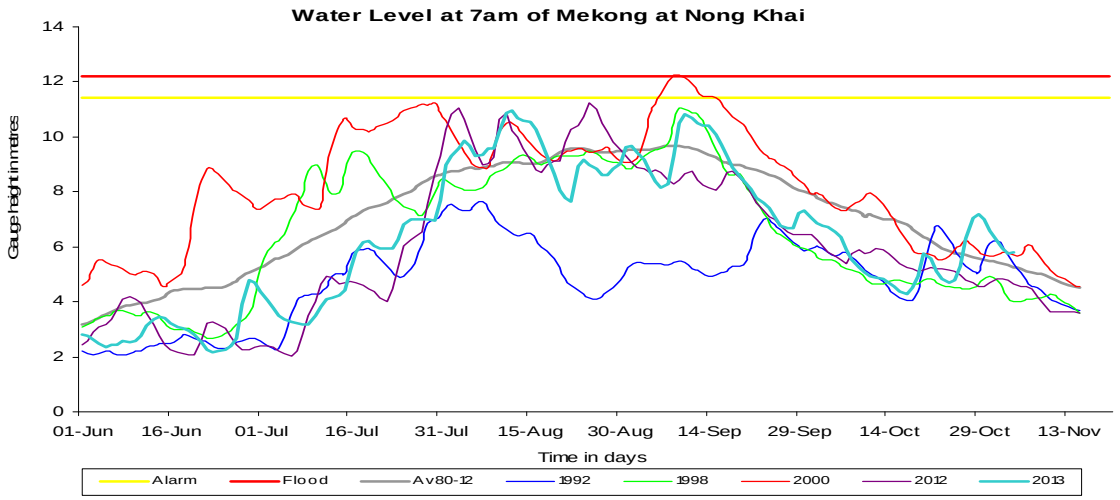







Water Level at 7am of Mekong at Chiang Khan
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Vientiane
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Nong Khai
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
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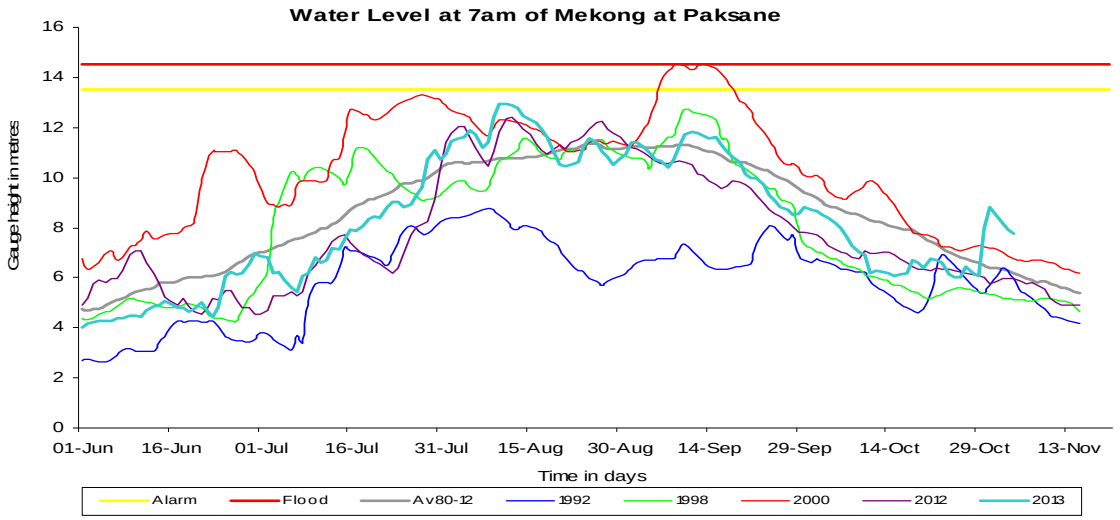
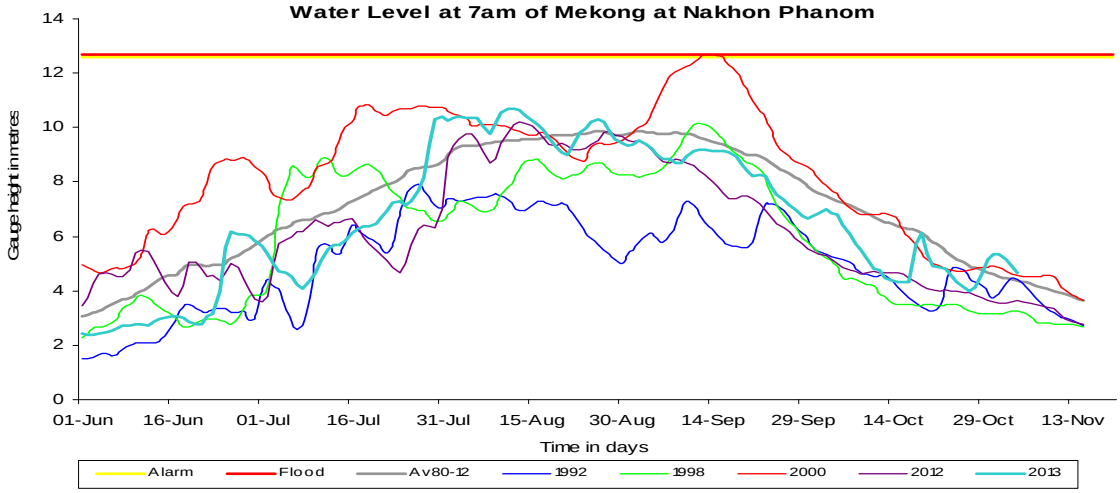
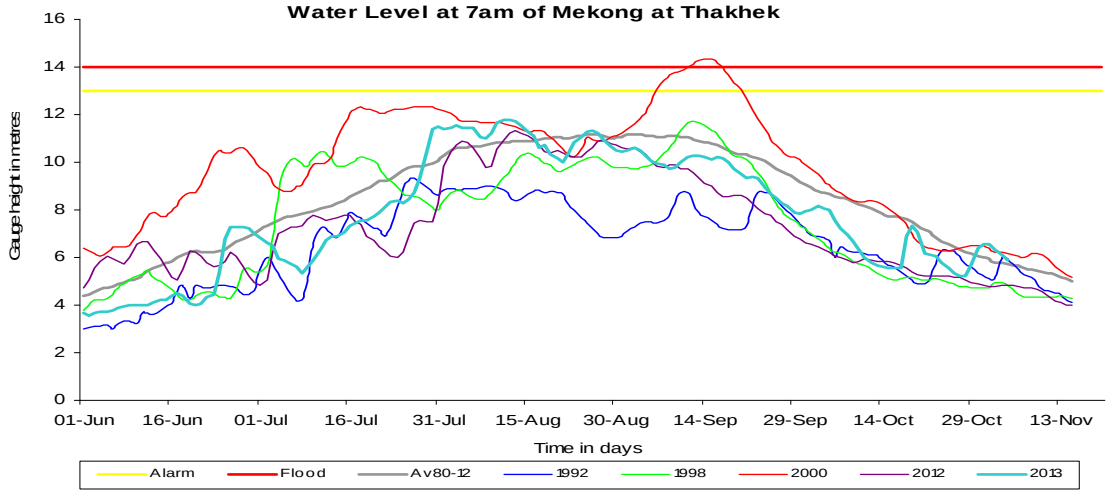
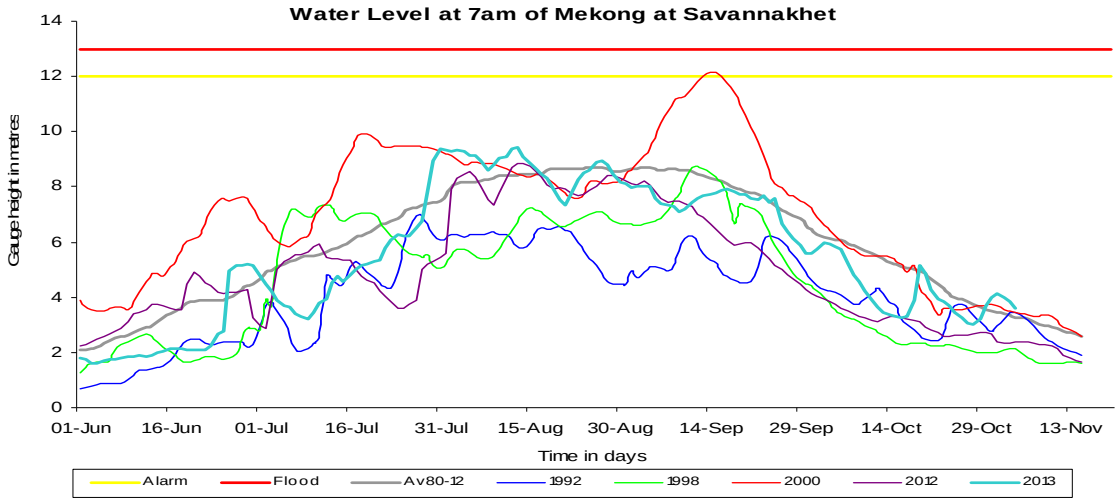
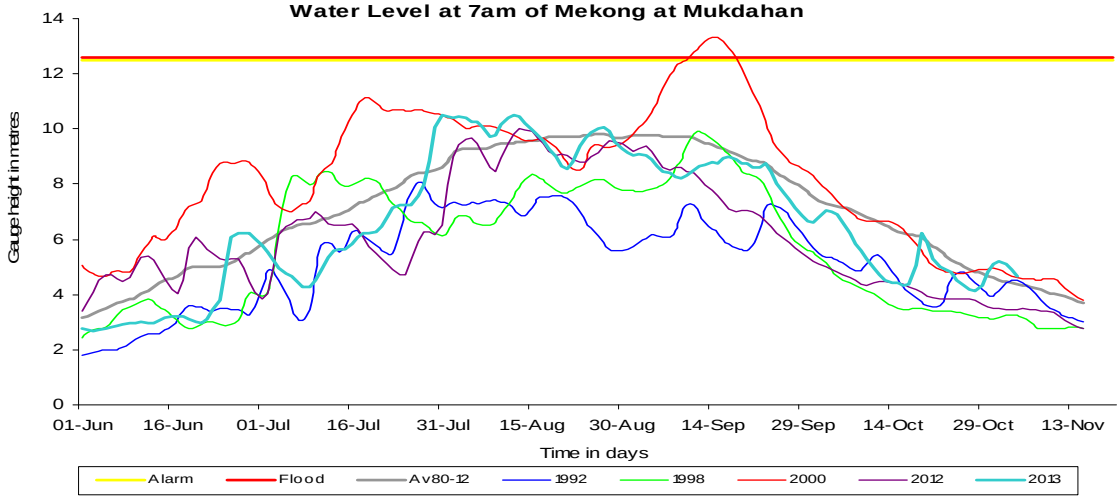
2012
2013

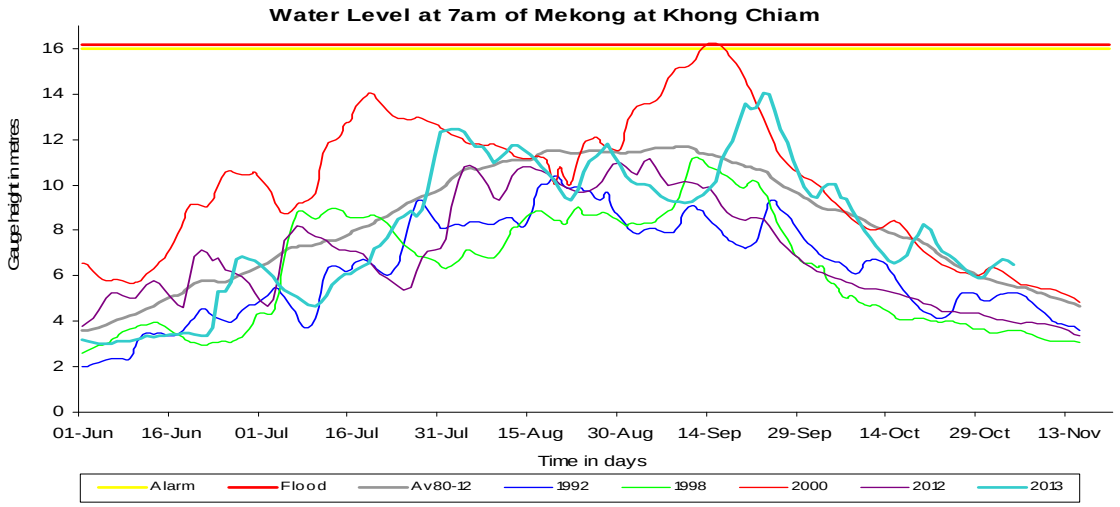

Water Level at 7am of Mekong at Paksane
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

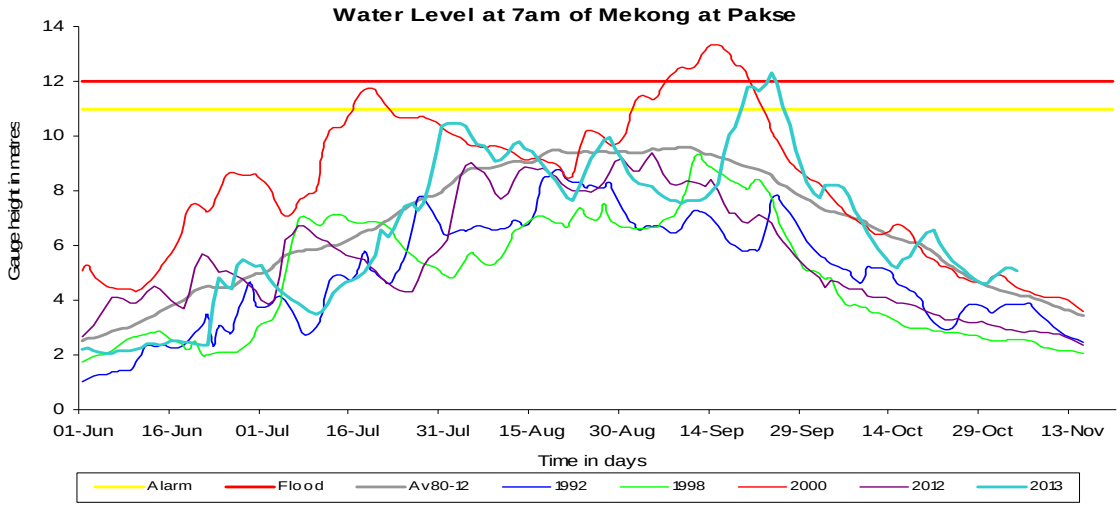

Water Level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

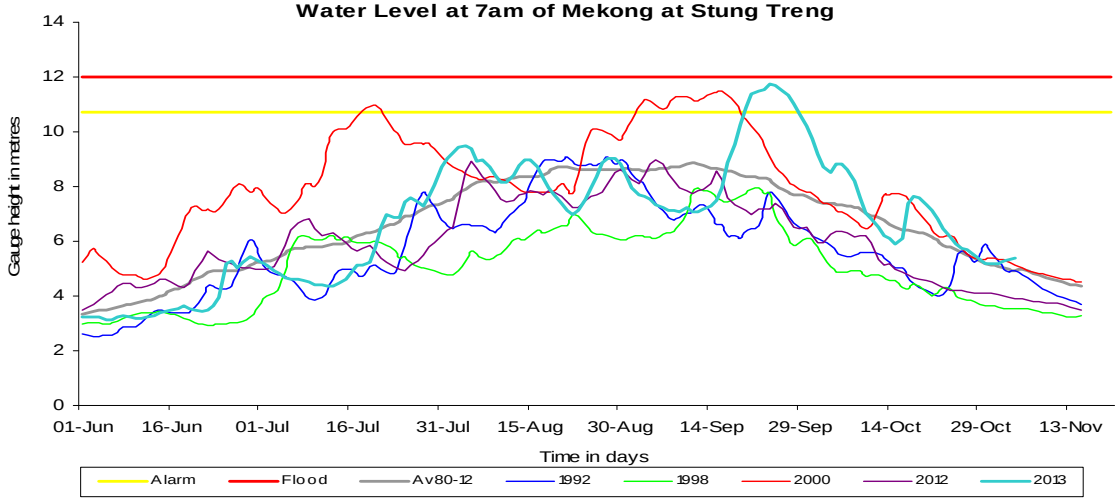

Water Level at 7am of Mekong at Thakhek
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

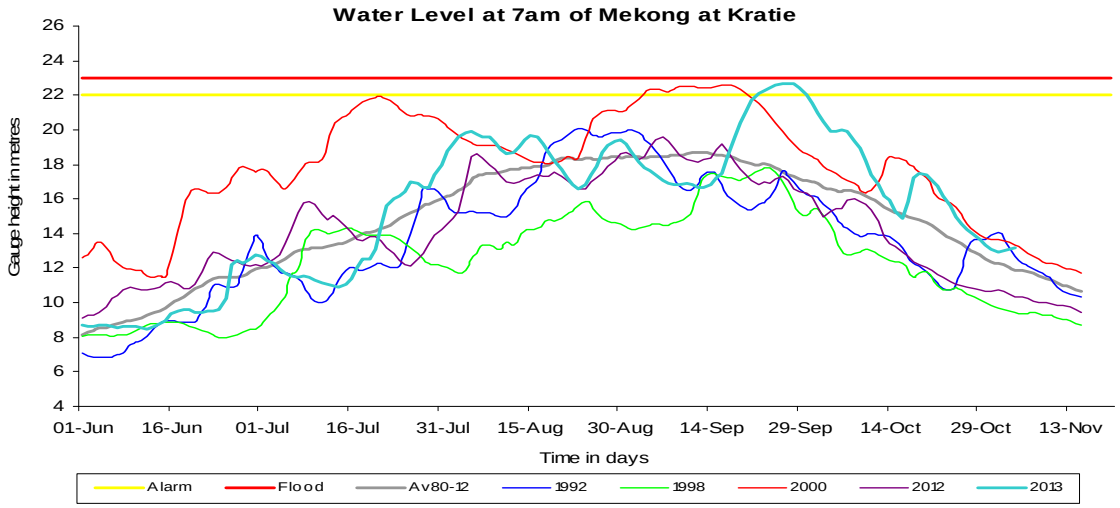

Water Level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

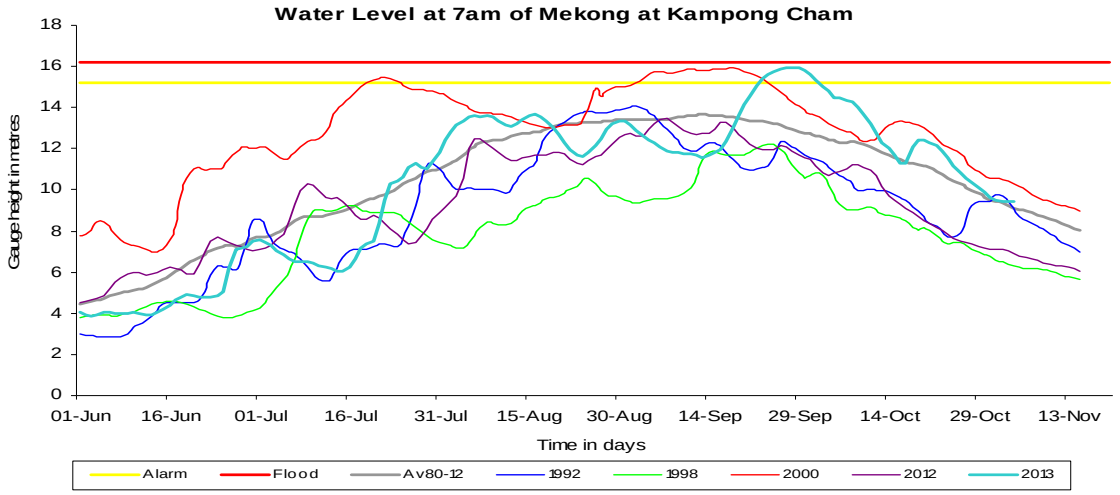

Water Level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

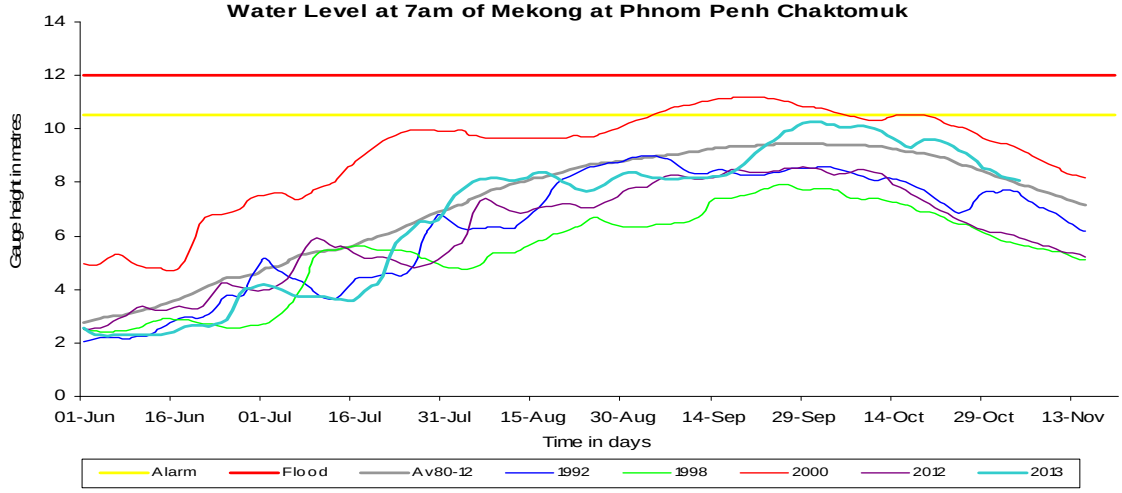

Water Level at 7am of Mekong at Khong Chiam
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

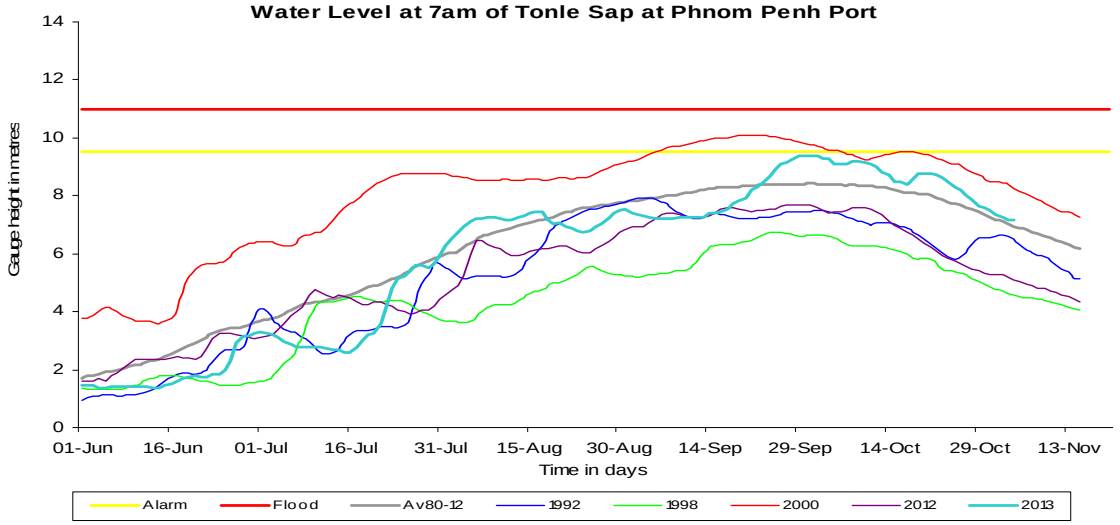

Water Level at 7am of Mekong at Pakse
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

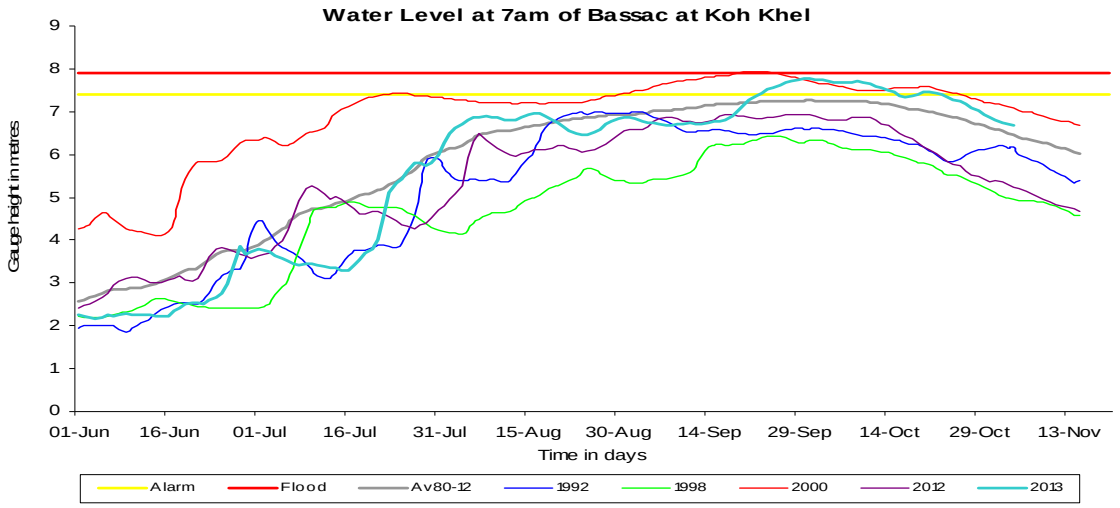

Water Level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

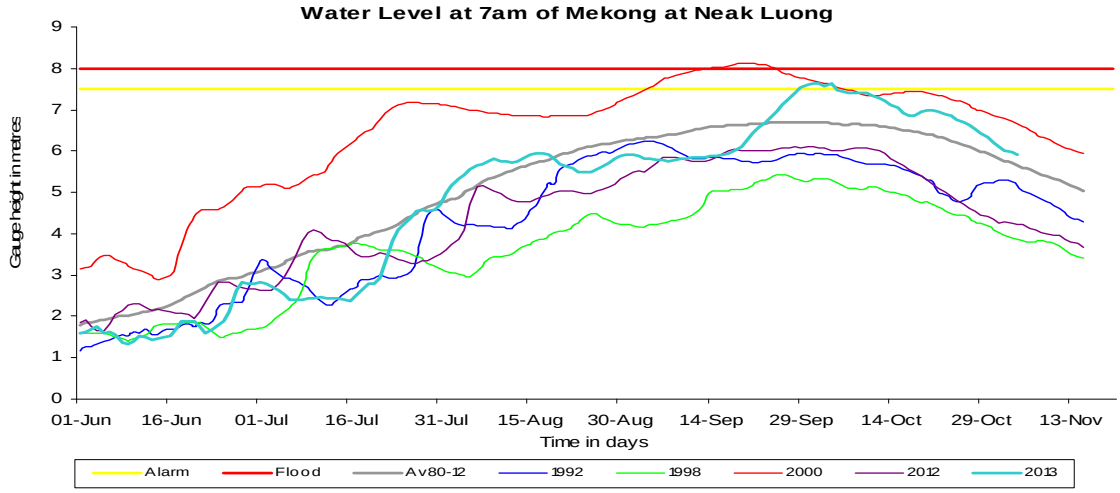

Water Level at 7am of Mekong at Kratie
Gauge height in metres
4
6
8
10
12
14
16
18
20
22
24
26
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

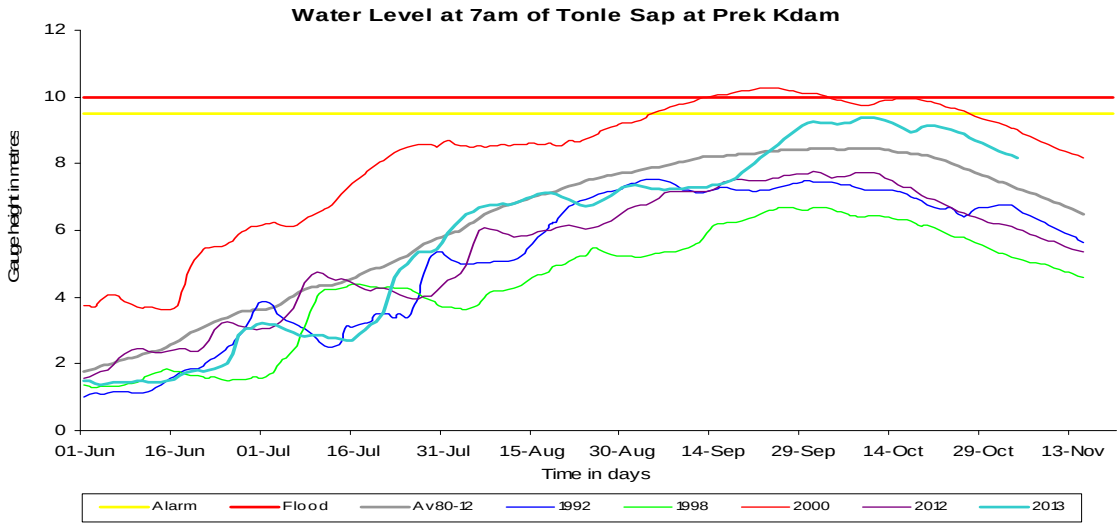

Water Level at 7am of Mekong at Kampong Cham
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

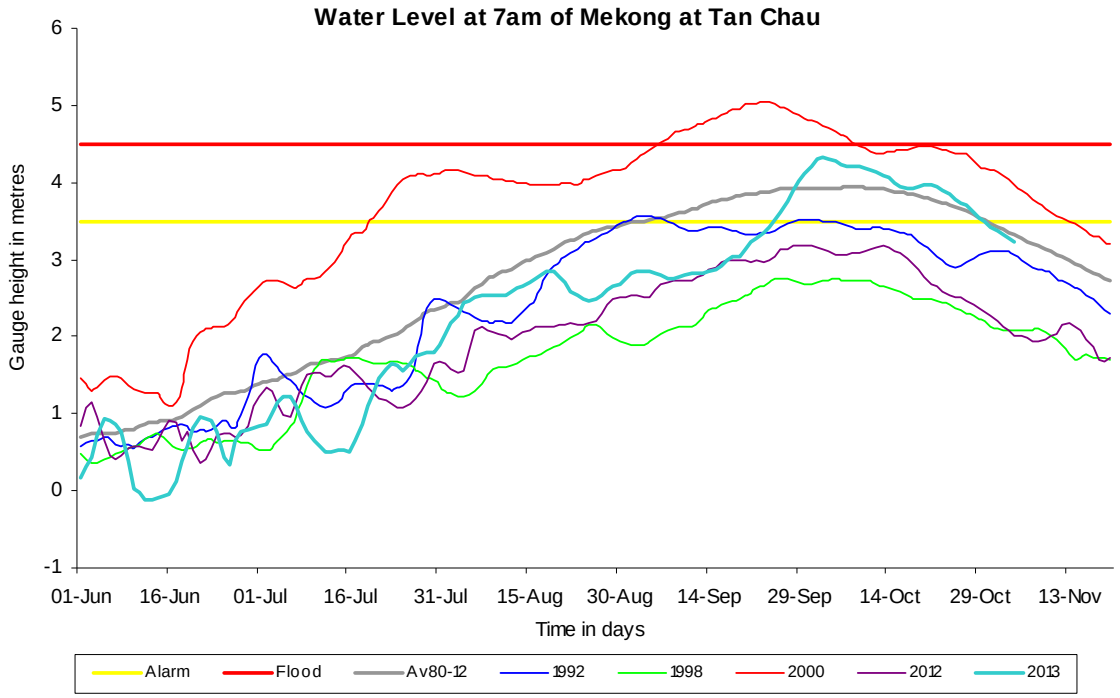

Water Level at 7am of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

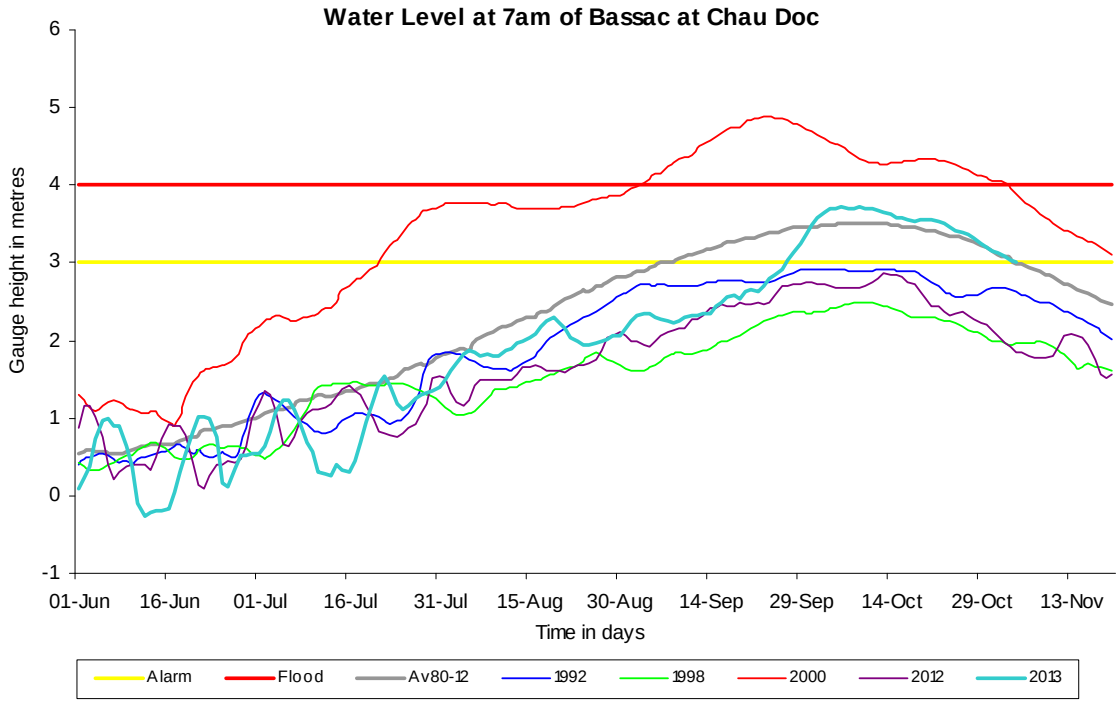

Water Level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Bassac at Koh Khel
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Neak Luong
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Tonle Sap at Prek Kdam
Gauge height in metres
0
2
4
6
8
10
12
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Tan Chau
Gauge height in metres
6
5
4
3
2
1
0
-1
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Bassac at Chau Doc
Gauge height in metres
6
5
4
3
2
1
0
-1
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013