Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 11/06/2012, covering the week from the 4th June to the 10th June 2012

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

General weather patterns

During the week of the 4th June to 10th June 2012, seven weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 4th June and 10th June bulletins are presented in the figures below:

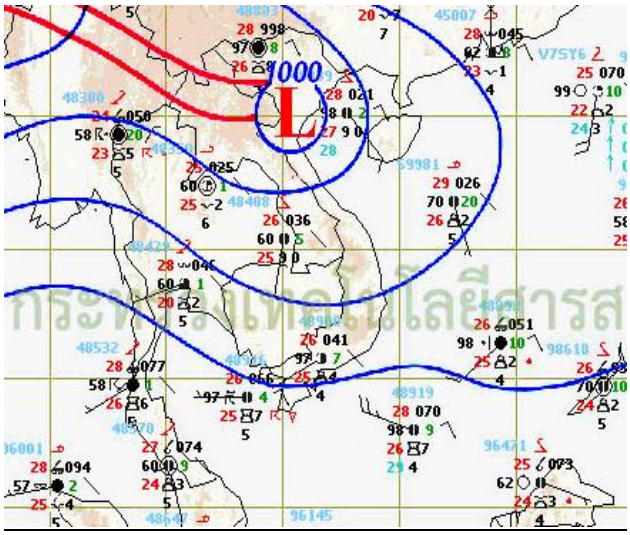


Figure 1: Weather map for 4th June 2012

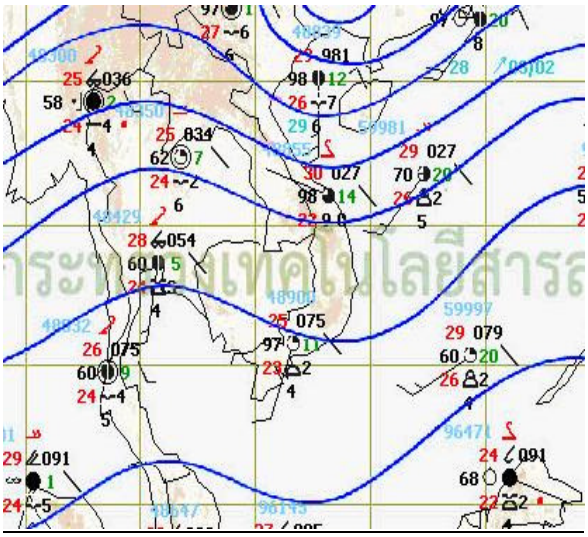


Figure 2: Weather map for 10th June 2012

Moderate South-West (SW) Monsoon

SW monsoon prevailed over Myanmar, Thailand and Indochina Peninsular in whole week (Figure 1and 2).

Inter Tropical Convergence Zone (ITCZ)

Inter Tropical Convergence Zone (ITCZ) laid across the North of Myanmar and the middle of Indochina Peninsular at the surface during the beginning of the week (Figure 1) and the North of Thailand and middle Indochina in the mid of the week.

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

No Tropical Storm (TS) was observed in last week.

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Over weather situation

A normal weather situation lasted during last week. As the result of the appearances of South-westerly wind, ITCZ, scattered thundershower with isolated heavy rain were occurred in the North and the South of Thailand, in the central and the South of Lao PDR and Vietnam, in the Central, the South, and the Northwest of Cambodia in the mid of the week.

General behaviour of the Mekong River

Water levels at most stations along Lower Mekong River were recording levels that are somewhat above or around the long-term average except upper apart stations as Chiang Saen, Luang Prabang and lower part stations as Tan Chau, Chau Doc. Water levels at most stations in the middle and lower reaches were rising while water levels at stations in the upper reach show a rising and falling trend in last week. Regarding to 2 stations in downstream at Tan Chau and Chau Doc, water levels at those 2 stations were fluctuated by tidal with a rising and falling trend during reporting period.

For stations from Chiang Saen to Vientiane/Nong Khai

Water levels at Chiang Saen and Luang Prabang showed a falling trend in last week and were below the long-term average for this time of the year. Water levels at Chiang Khan, Vientiane/Nong Khai were rising in the beginning of the week and then slightly falling towards the end of the week. Three those stations were recording levels that are somewhat above the long-term average for this time of the year.

For stations from Paksane to Pakse

Water levels were more-or-less stable with slightly increasing trend during last week. Most stations were recording levels that are somewhat above the long-term average for this time of the year.

For stations from Stung Treng to Kampong Cham

Water levels were slightly increasing in last week. Most stations are somewhat above the long-term average for this time of the year.

For stations from Phnom Penh to Koh Khel/Neak Luong

Water levels were more or less stable with a slightly rising trend during last week. Most stations were recording levels that are somewhat around the long-term average for this time of the year.

Tan Chau and Chau Doc

Water levels were falling in the beginning of the week, then more-or-less stable till the end of the week. Both stations were recording levels that are somewhat below the long-term average for this time of the year and significantly affected by tidal.

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
04/06		2.55	6.15	5.73	2.48	3.07	5.94	4.61	5.84	4.52	2.47	4.51	3.38	3.83	9.42	4.70	2.57	1.69	2.58	1.66	1.77	0.97	1.02
05/06		2.34	6.16	6.08	2.64	3.16	5.82	4.68	6.04	4.73	2.58	5.01	3.80	4.03	9.76	4.85	2.65	1.58	2.65	1.66	1.82	0.66	0.75
06/06		2.12	5.72	6.54	2.89	3.39	5.96	4.60	5.97	4.71	2.69	5.27	4.08	4.13	10.24	5.21	2.83	1.79	2.77	1.82	1.97	0.45	0.40
07/06		1.94	5.37	6.73	3.22	3.75	5.97	4.51	5.86	4.57	2.76	5.28	4.12	4.35	10.41	5.49	2.92	1.90	2.95	2.04	2.18	0.40	0.21
08/06		1.81	5.00	6.62	3.47	4.12	6.28	4.51	5.75	4.49	2.85	5.14	4.06	4.44	10.73	5.71	3.04	2.05	3.04	2.16	2.31	0.45	0.30
09/06		1.75	4.69	6.59	3.45	4.17	6.94	4.75	6.02	4.63	3.10	5.01	3.89	4.44	10.87	5.92	3.18	2.20	3.09	2.28	2.41	0.56	0.37
10/06		1.83	4.46	6.20	3.39	4.12	7.08	5.38	6.55	5.00	3.38	5.04	3.88	4.31	10.85	6.00	3.32	2.35	3.15	2.30	2.47	0.57	0.41
11/06		1.92	4.22	5.77	3.15	3.94	7.07	5.47	6.66	5.34	3.45	5.32	4.04	4.30	10.72	5.95	3.35	2.38	3.13	2.32	2.44	0.58	0.41
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

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
04/06		34.2	nr	0.4	2.5	3.5	9.5	1.5	0.5	0.2	2.0	3.8	nr	nr	nr	nr	5.7		6.0	27.6	nr	8.7	
05/06		nr	nr	nr	nr	nr	4.0	nr	nr	3.5	10.0	6.0	nr	42.0	nr	nr	nr		nr	nr	nr	0.0	0.3
06/06		10.4	3.4	nr	2.2	nr	nr	nr	0.3	nr	nr	nr	nr	nr	12.0	22.1	1.5		5.9	8.2	nr	3.0	
07/06		nr	nr	9.0	7.1	19.5	nr	9.8	10.5	nr	nr	26.4	nr	nr	40.1	nr	15.6		21.2	2.7	17.3	11.0	
08/06		nr	27.4	25.2	31.1	27.1	59.6	31.3	19.2	19.7	21.6	1.5	nr	nr	14.6	11.2	20.5		0.0	0.0	7.2	4.0	
09/06		0.0	nr	14.0	19.0	0.7	7.6	14.7	31.7	3.3	0.2	11.2	nr	nr	nr	nr	nr		4.5	2.2	nr	1.3	2.8
10/06		4.7	nr	4.5	nr	0.0	0.0	0.4	nr	0.0	nr	1.5	nr	3.5	nr	0.1	nr		0.0	nr	nr	3.8	
11/06		1.50	nr	nr	nr	2.10	0.10	nr	nr	nr	nr	nr	nr	nr	nr	12.10	nr		2.60	3.40	nr	5.10	8.00

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

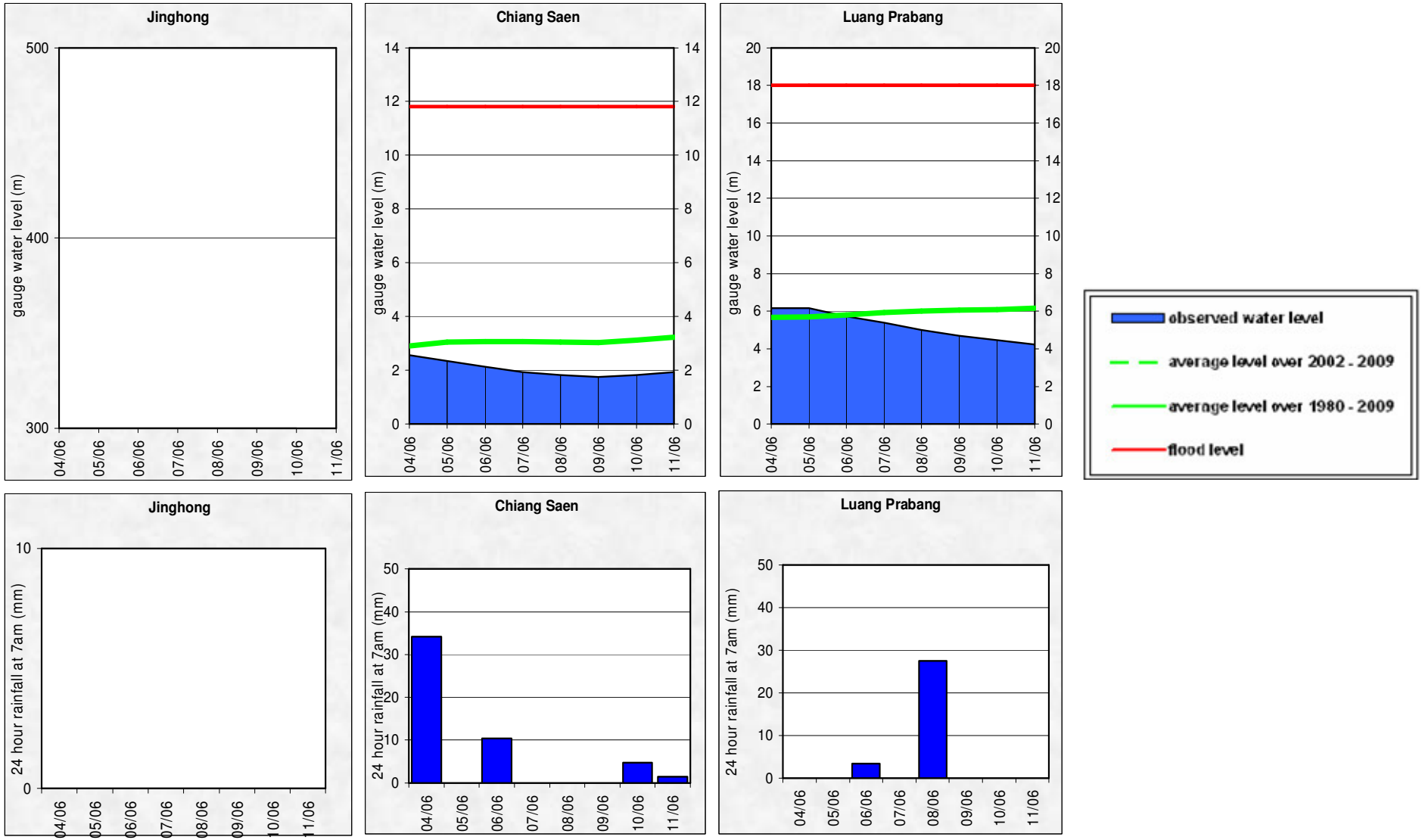


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

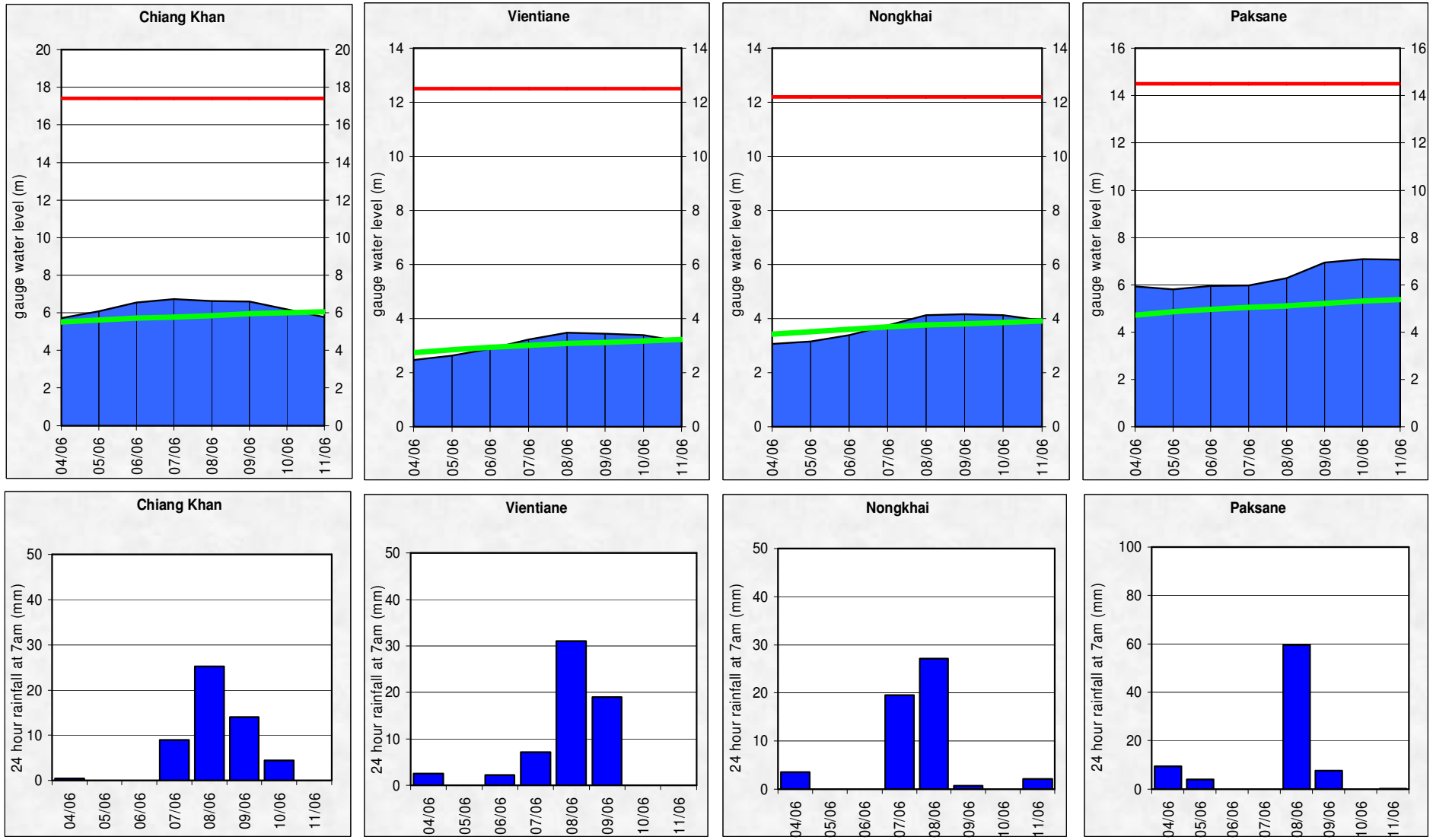


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

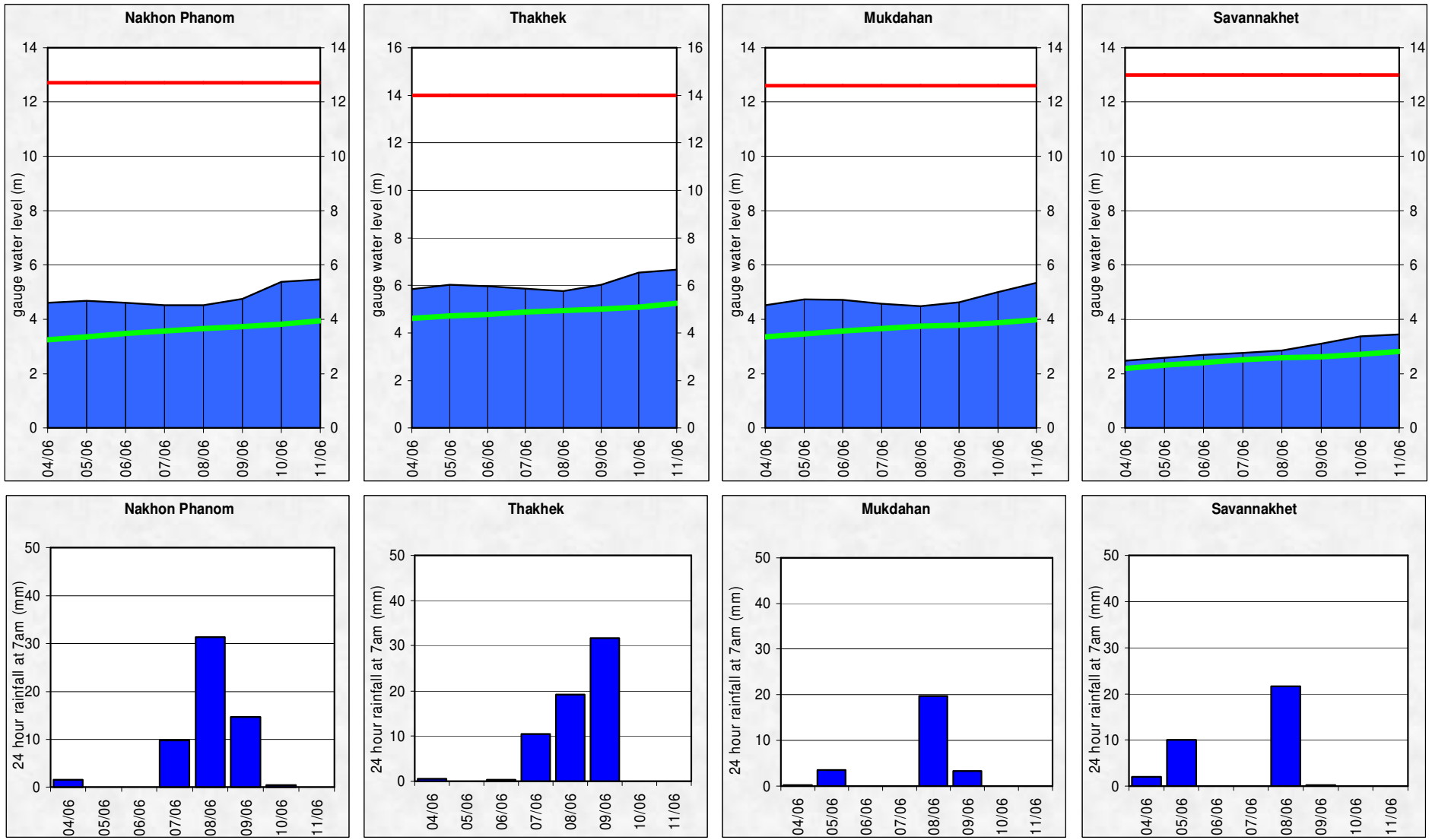


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

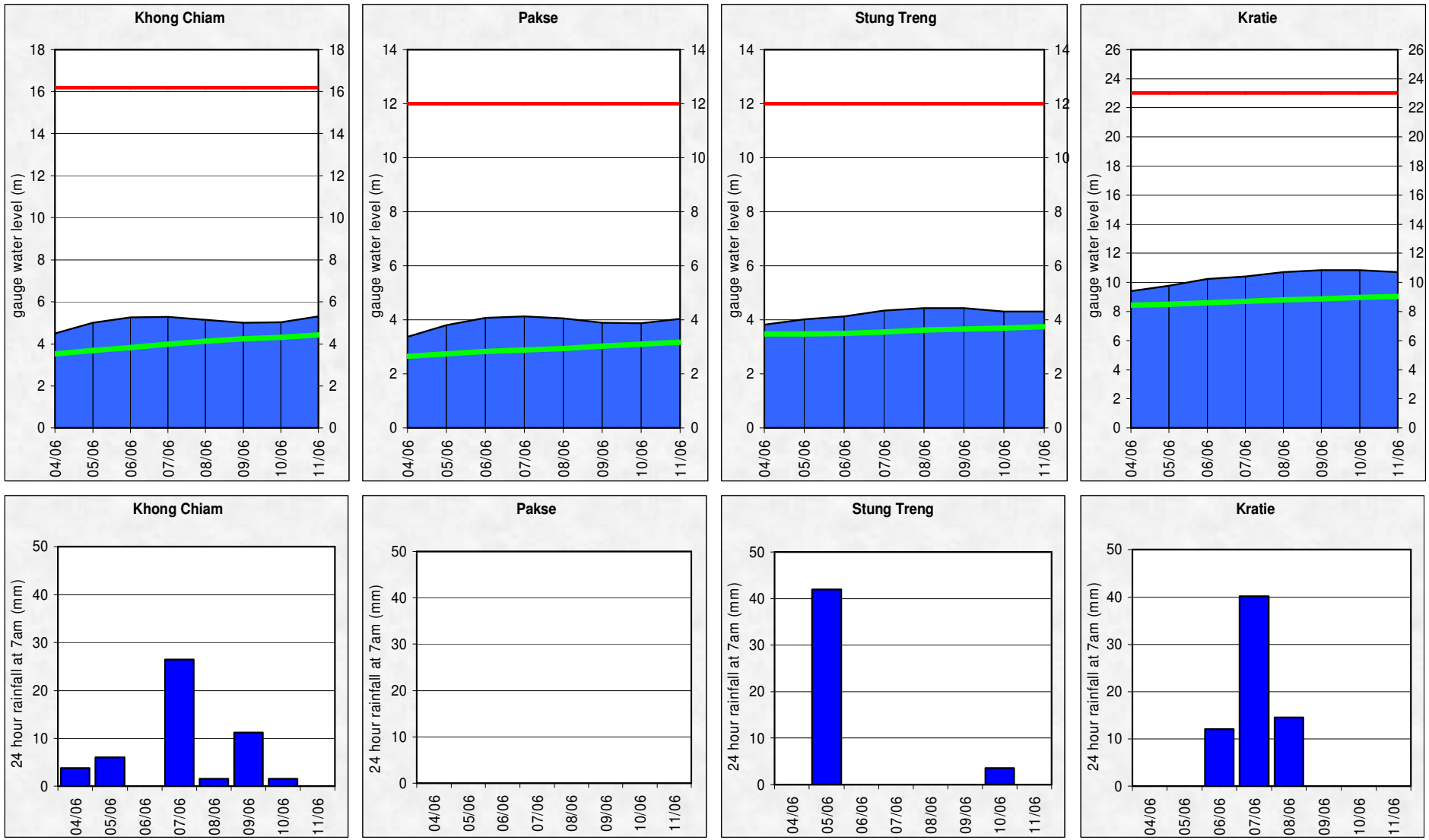


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

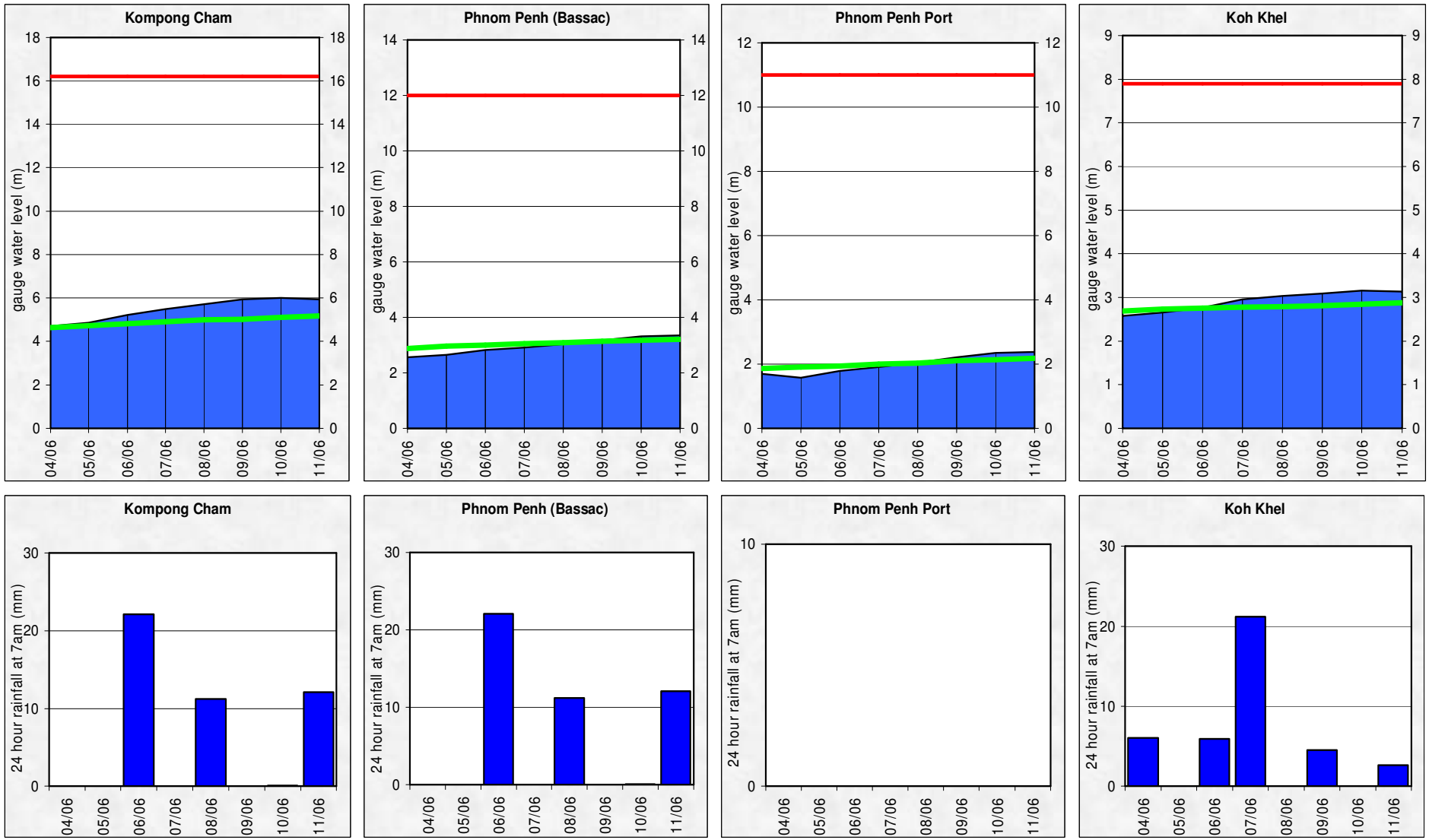
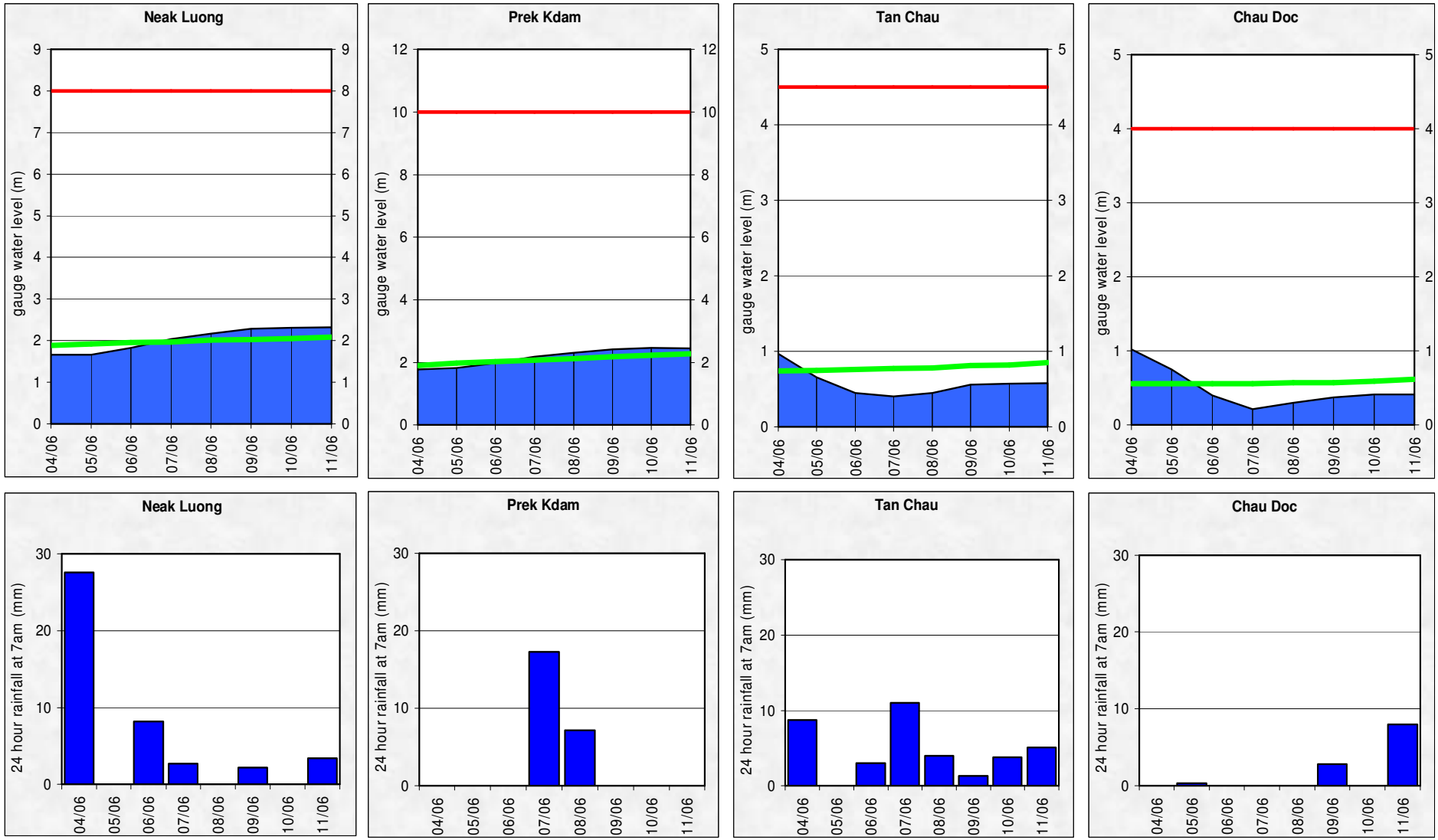


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

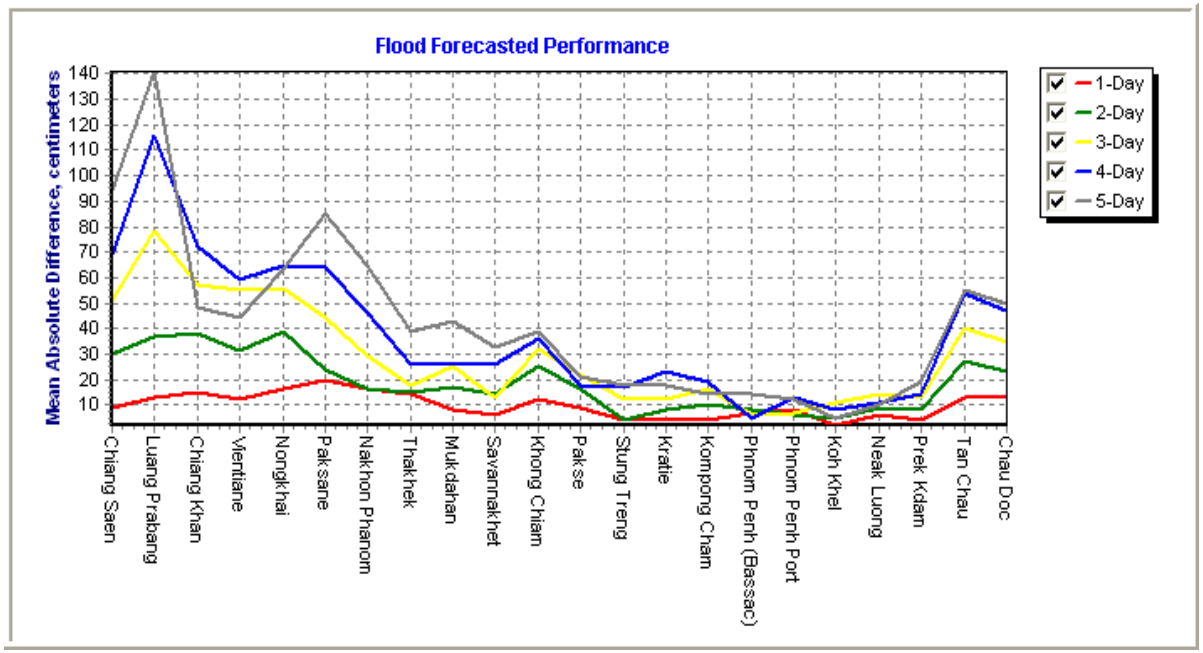
Accuracy

"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 the unusual pattern during early period of flood season, in which the accuracy at tidal affected stations Tan Chau and Chau Doc is less than expected.

In general the overall accuracy is fairly good for 1-day to 4-day forecast lead time at stations in the upper and middle parts of the LMB. However, The less expected accuracy at Luang Prabang and Tan Chau/Chau Doc stations due to two main factors: (1) internal model functionality in forecasting especially during the period of early flood season; for which the parameter adjustment in the model is not possible especially at stations in the upper part and in the Mekong delta which are affected by tidal; (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	85.7	71.4	42.9	28.6	0.0	42.9	28.6	57.1	85.7	42.9	71.4	100.0	100.0	85.7	71.4	85.7	100.0	85.7	100.0	42.9	57.1	***66.9***
2-day	83.3	83.3	83.3	33.3	33.3	66.7	66.7	83.3	66.7	83.3	50.0	83.3	100.0	100.0	100.0	66.7	100.0	100.0	66.7	66.7	16.7	50.0	***72.0***
3-day	20.0	20.0	40.0	20.0	20.0	20.0	40.0	60.0	60.0	100.0	20.0	80.0	100.0	100.0	100.0	80.0	80.0	60.0	60.0	40.0	0.0	20.0	***51.8***
4-day	25.0	0.0	50.0	0.0	0.0	25.0	25.0	50.0	75.0	50.0	25.0	75.0	100.0	75.0	75.0	100.0	50.0	75.0	75.0	25.0	0.0	0.0	***44.3***
5-day	33.3	0.0	66.7	66.7	33.3	0.0	33.3	66.7	66.7	100.0	100.0	100.0	100.0	100.0	100.0	66.7	100.0	100.0	100.0	66.7	0.0	33.3	***65.2***

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)						
2012	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
week	*10:45*	*0*	-	*7*	*07:12*	-	*07:36*	*07:03*	*09:04*	*07:48*	*07:40*	*0*	-	*18*	*251*	*125*	*0*	*103*
month	*10:46*	*0*	-	*10*	*07:12*	-	*07:55*	*07:03*	*09:11*	*07:38*	*07:30*	*0*	-	*55*	*353*	*170*	*1*	*156*
season	*10:46*	*0*	-	*10*	*07:12*	-	*07:55*	*07:03*	*09:11*	*07:38*	*07:30*	*0*	-	*55*	*353*	*170*	*1*	*156*

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.

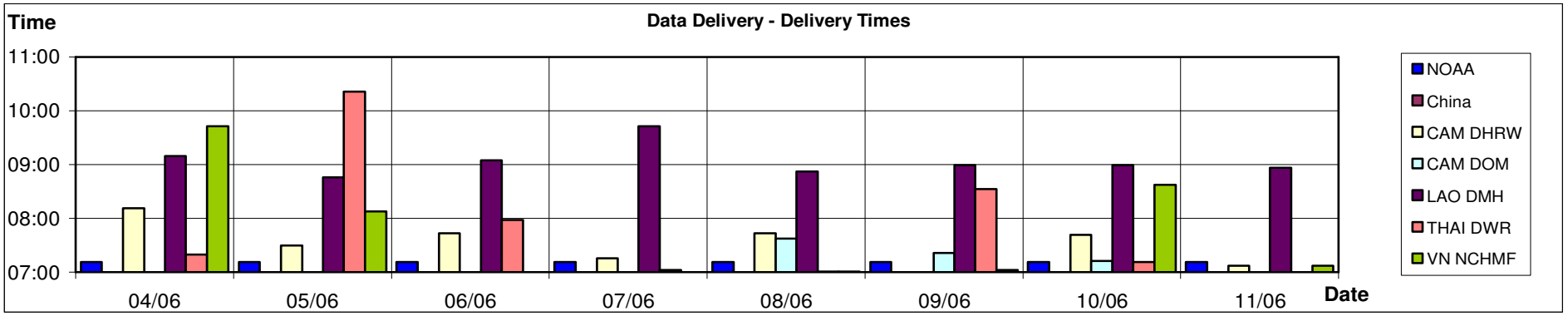


Figure B2: Data delivery times for the past 8 days including the current report date

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

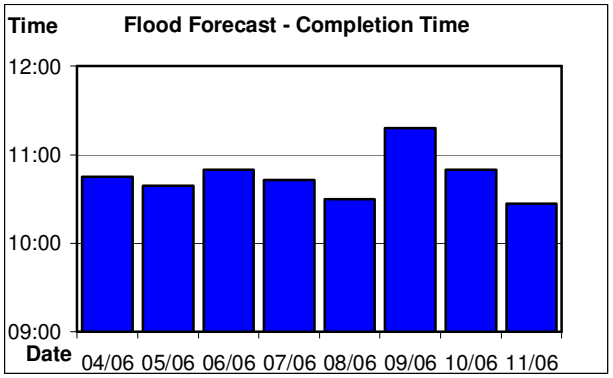


Figure B4: Flood forecast completion time

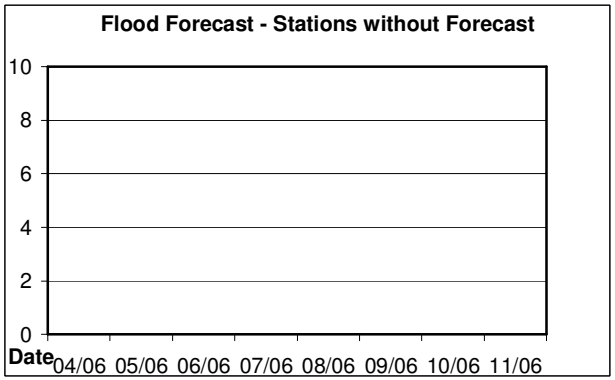


Figure B5: Flood forecast stations without forecast

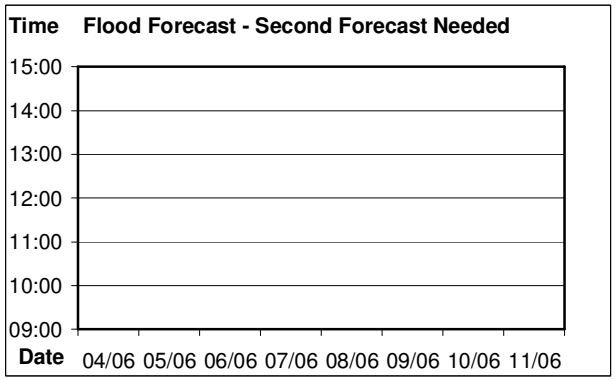


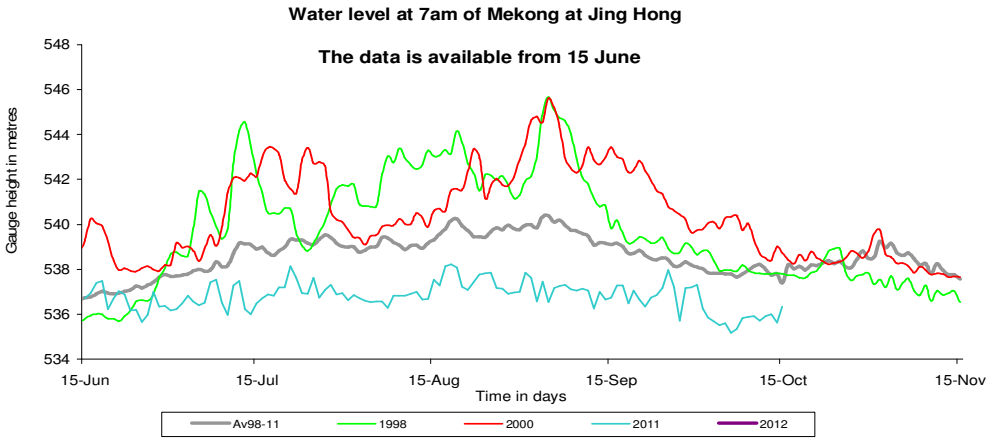
Figure B6: Second forecast needed

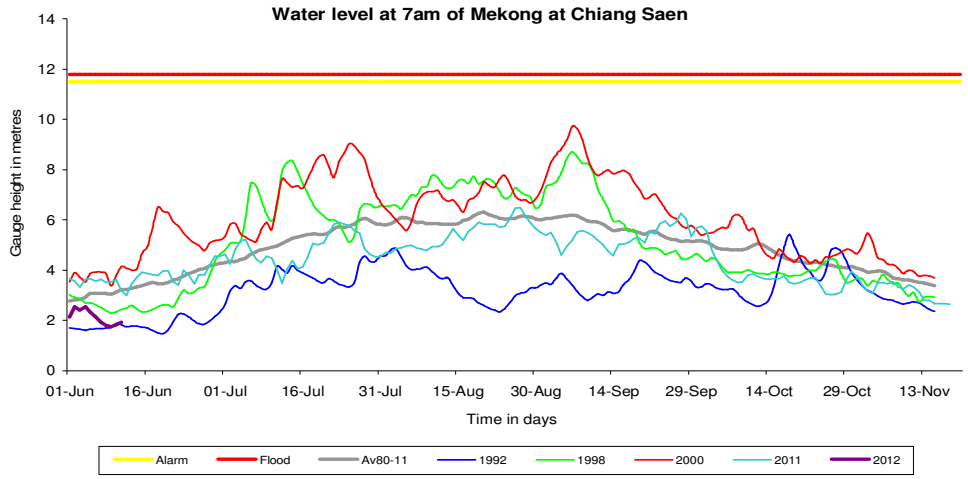
Annex C: Season Water Level Graphs

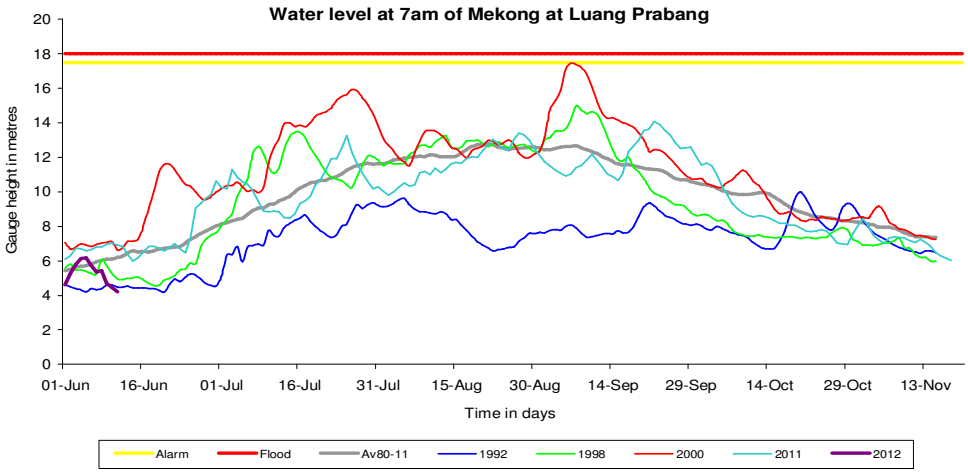
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

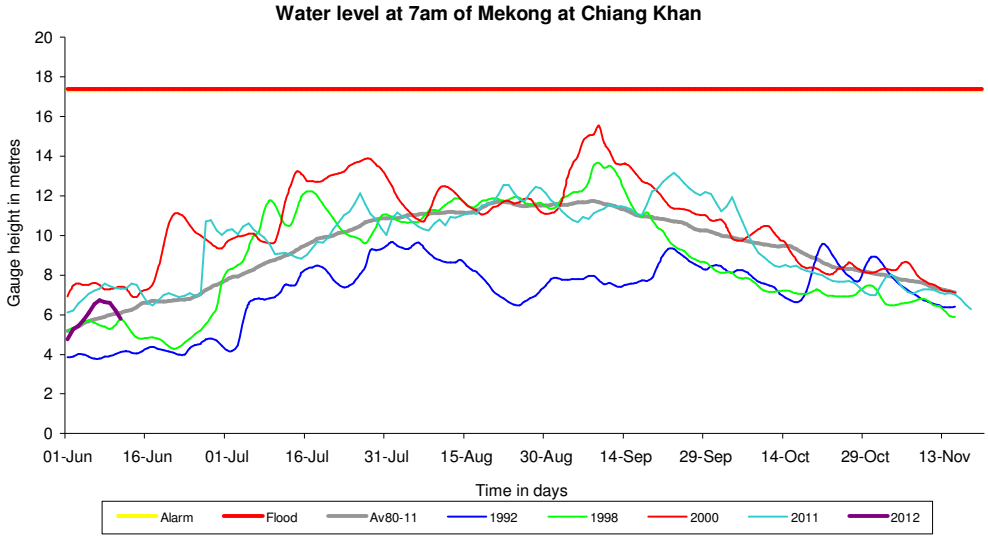
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

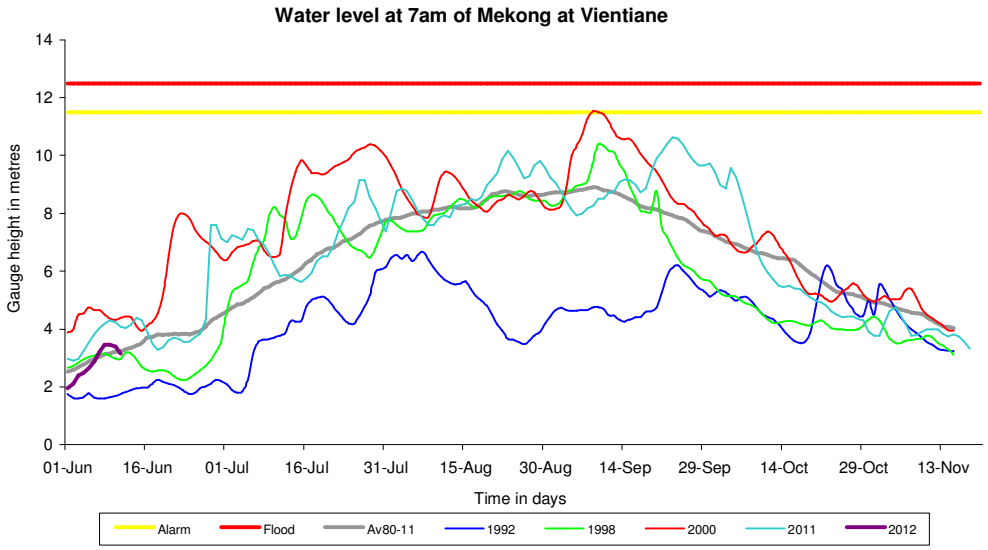


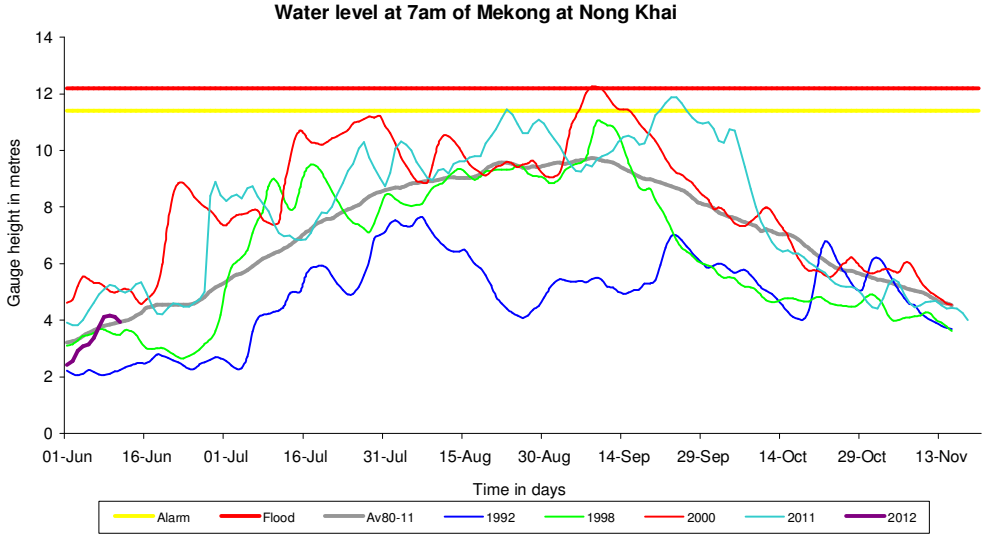


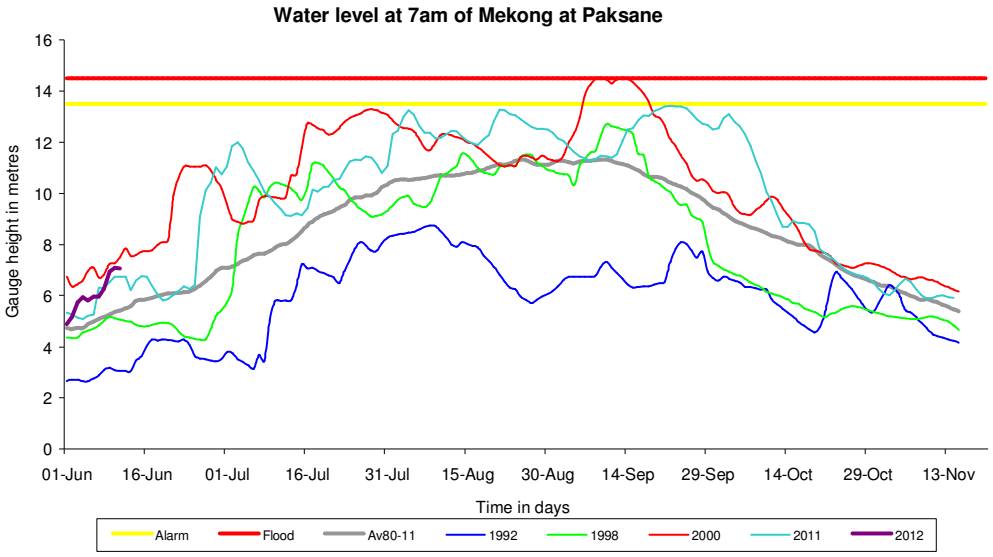


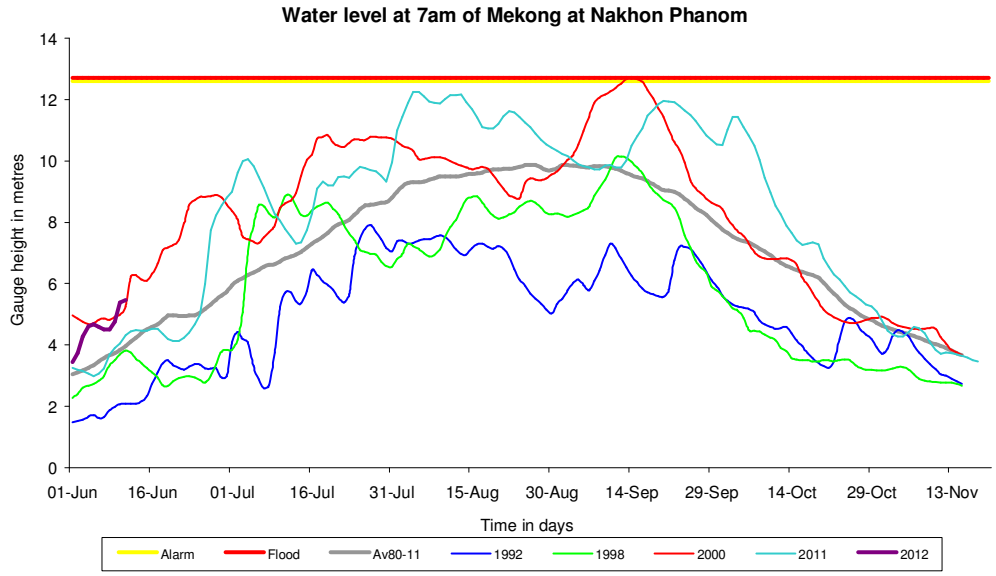
Water level at 7am of Mekong at Chiang Khan

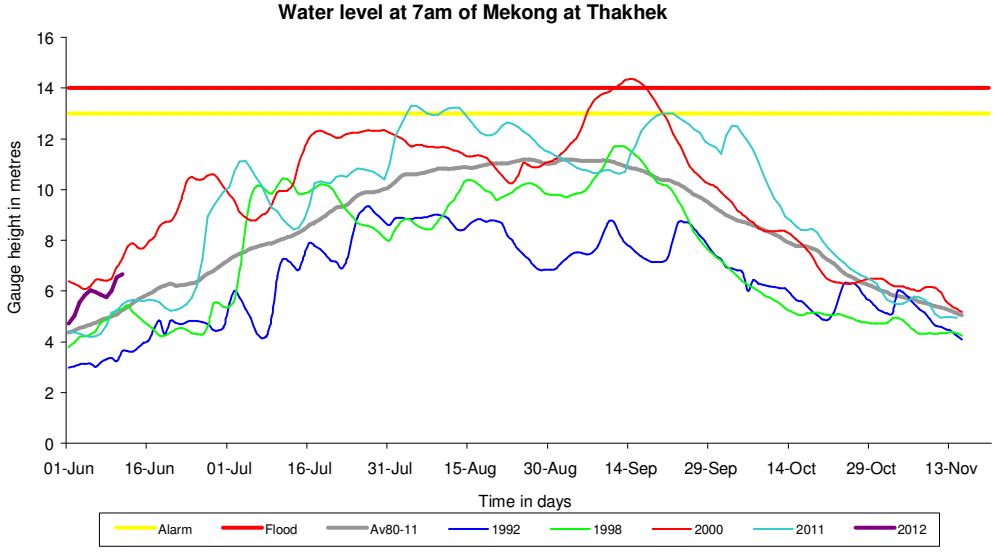

Water level at 7am of Mekong at Chiang Khan
Gauge height in metres
0
2
4
6
8
10
12
14
16
18
20
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

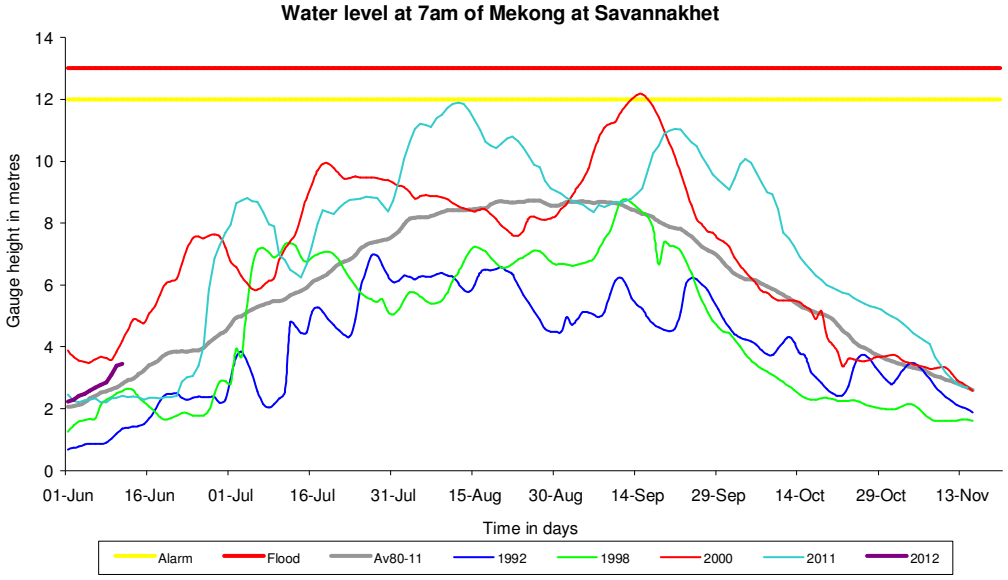

Water level at 7am of Mekong at Vientiane
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

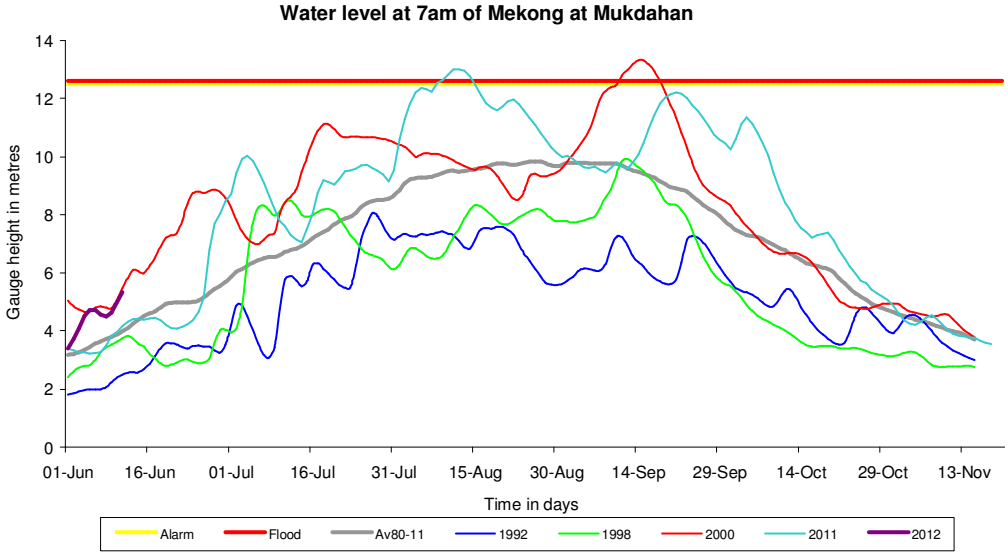

Water level at 7am of Mekong at Nong Khai
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

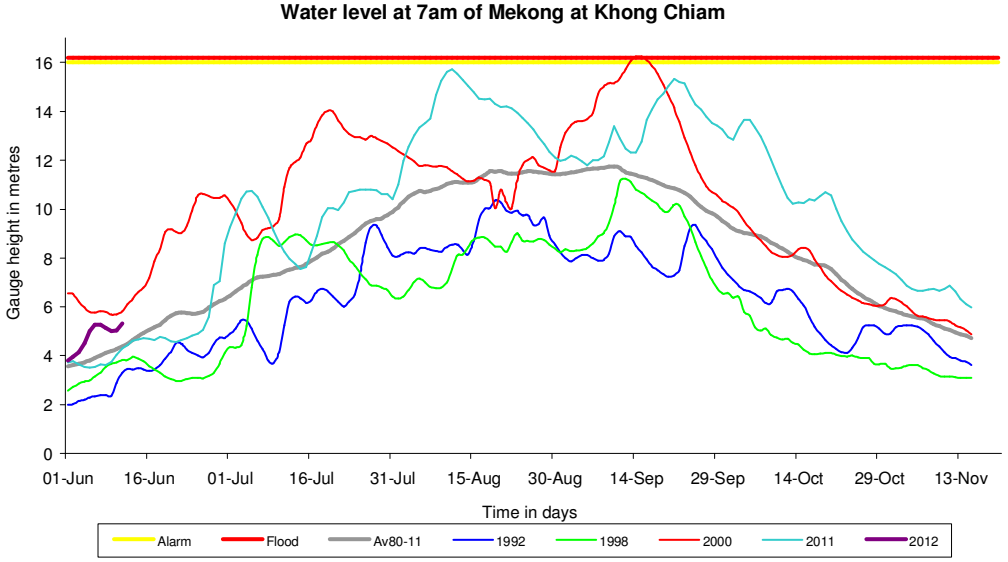

Water level at 7am of Mekong at Paksane
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

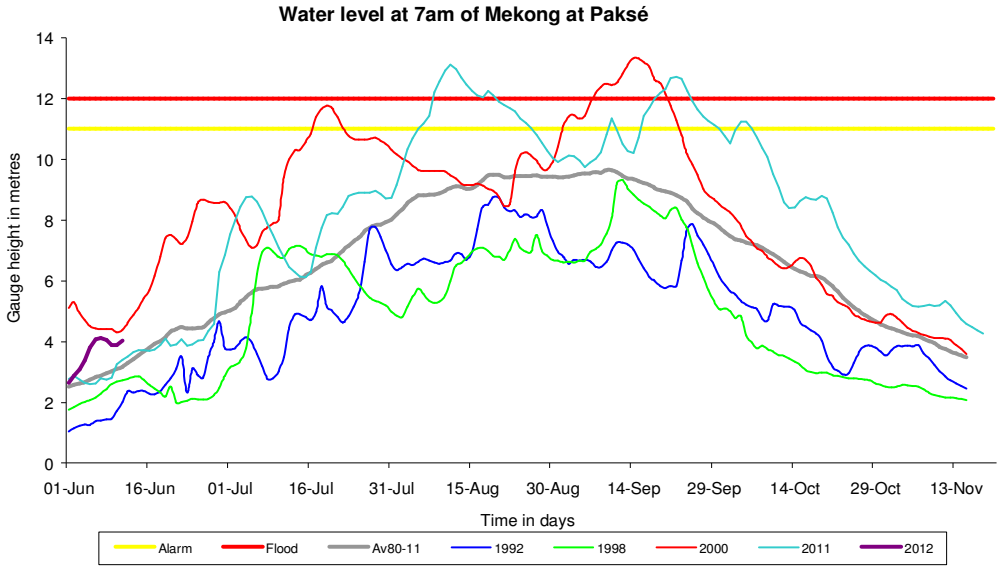

Water level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

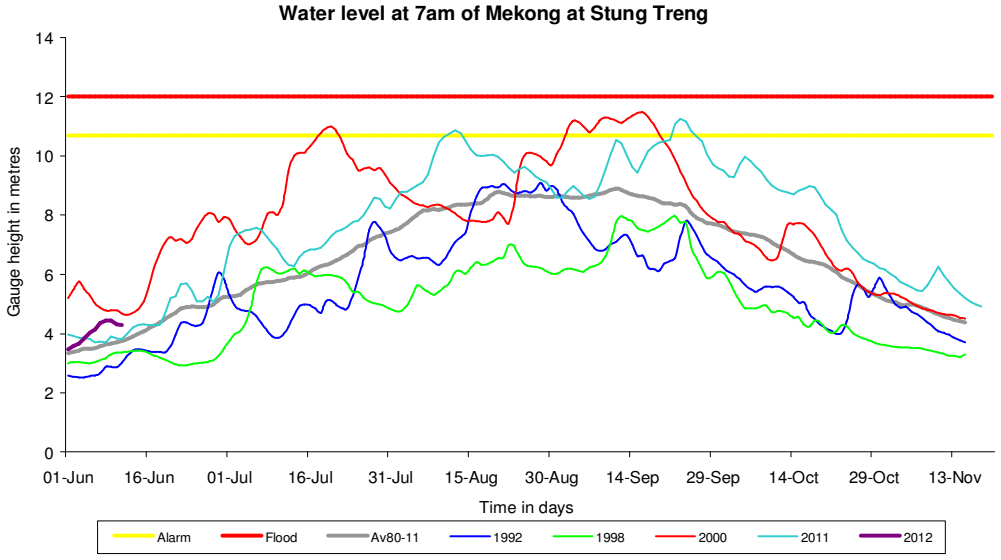

Water level at 7am of Mekong at Thakhek
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

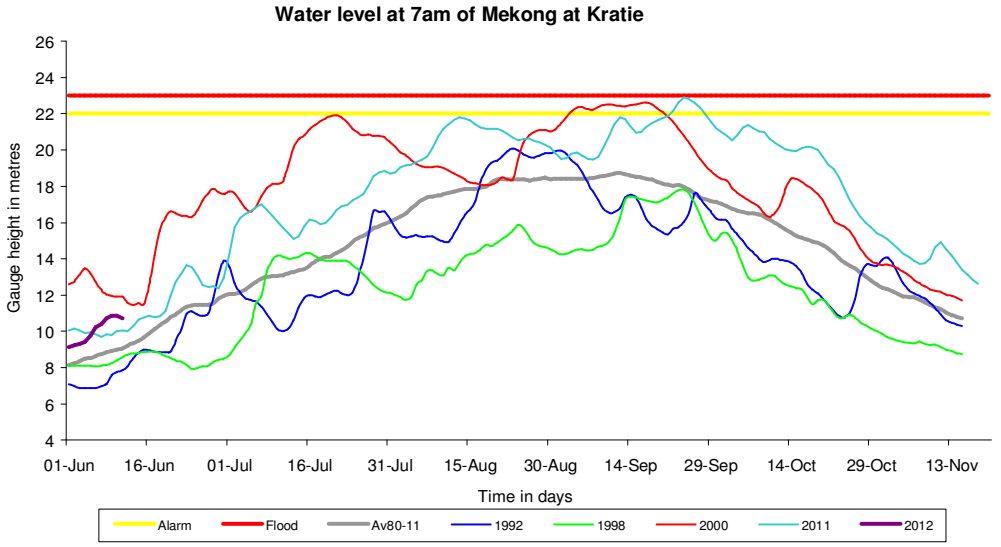

Water level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

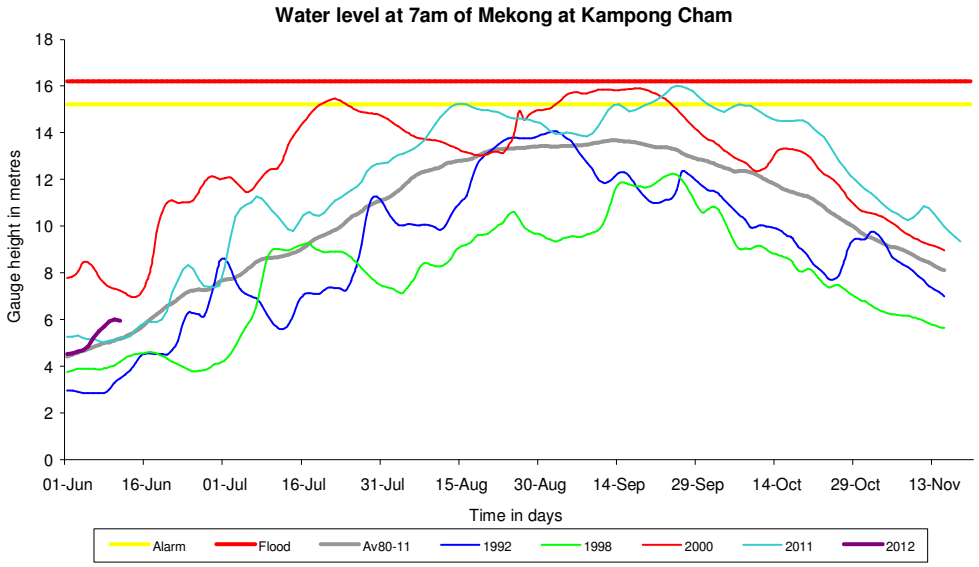

Water level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

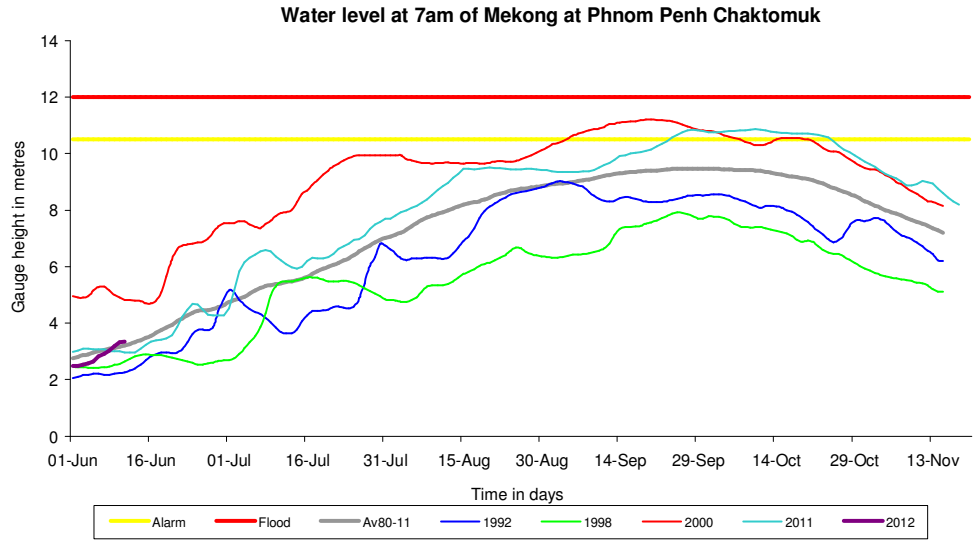

Water level at 7am of Mekong at Khong Chiam
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

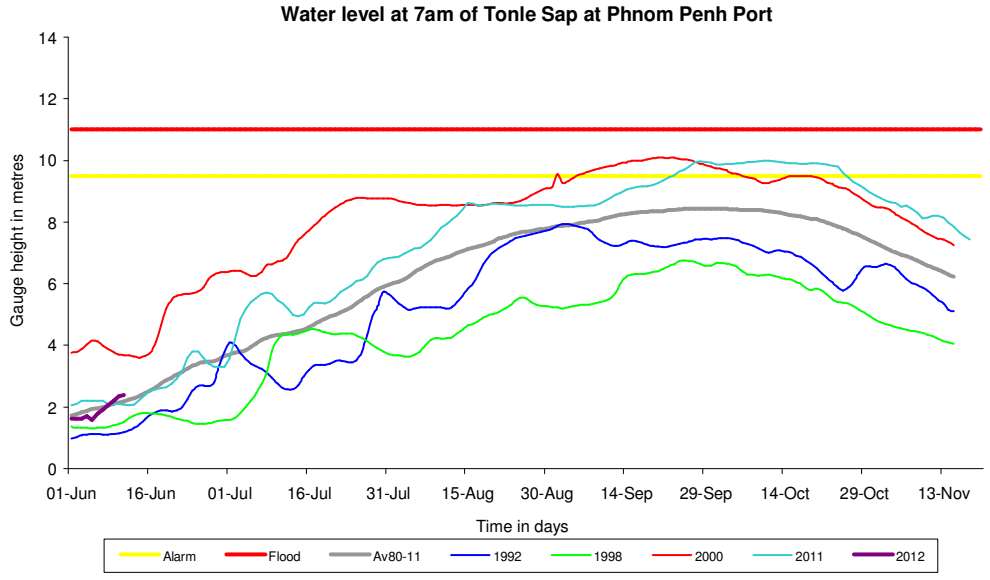

Water level at 7am of Mekong at Paksé
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

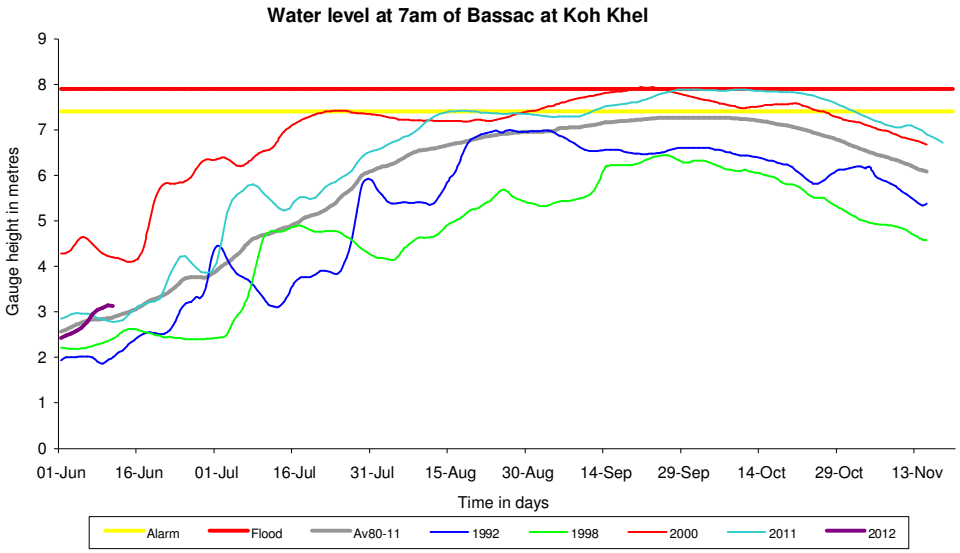

Water level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

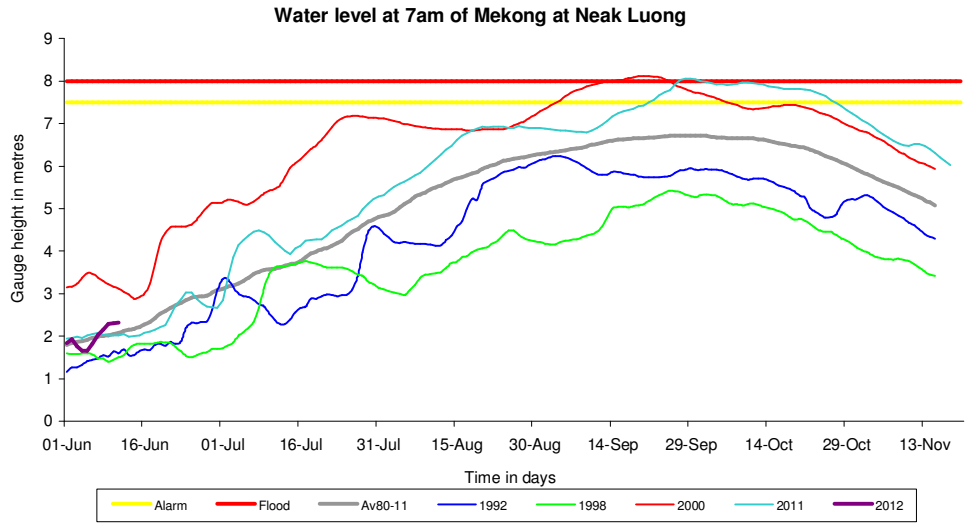

Water level at 7am of Mekong at Kratie
Gauge height in metres
4
6
8
10
12
14
16
18
20
22
24
26
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

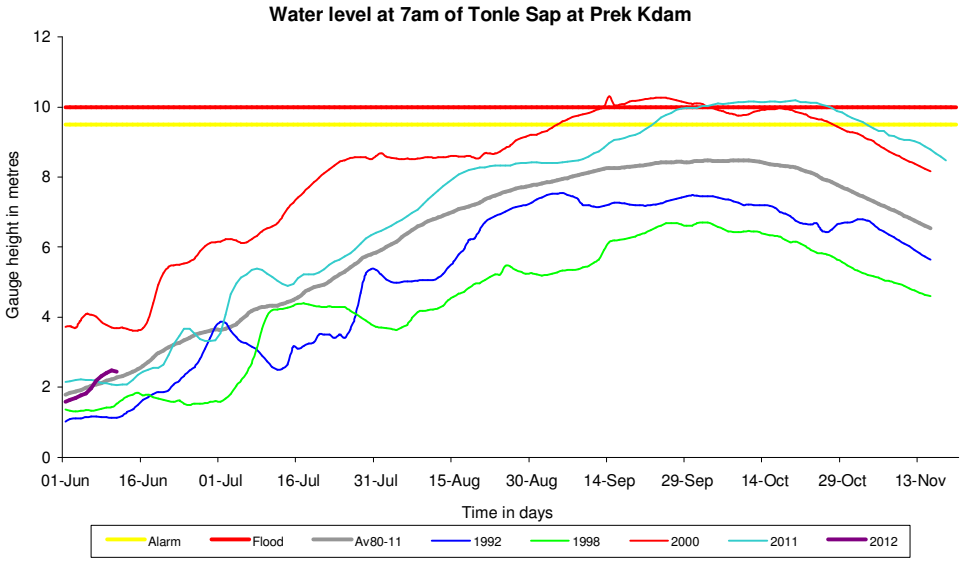

Water level at 7am of Mekong at Kampong Cham
Gauge height in metres
0
2
4
6
8
10
12
14
16
18
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

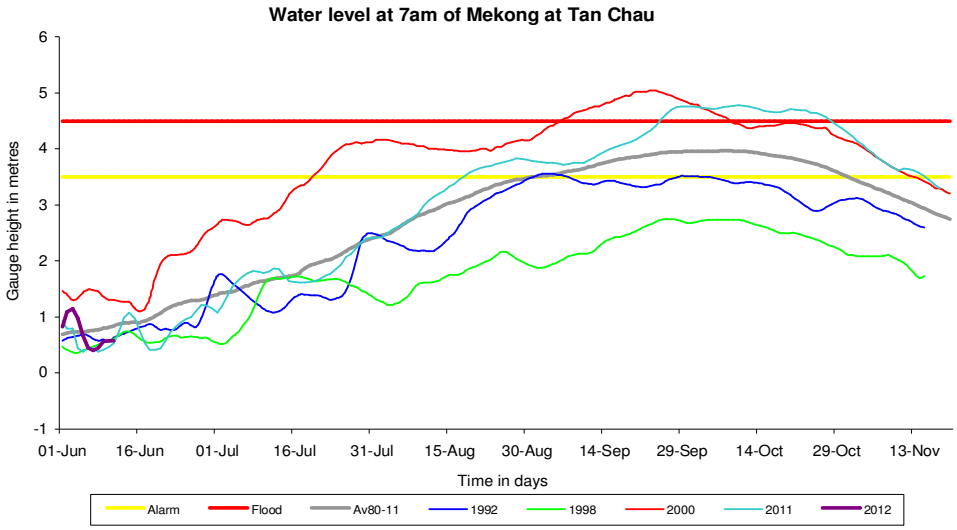

Water level at 7am of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

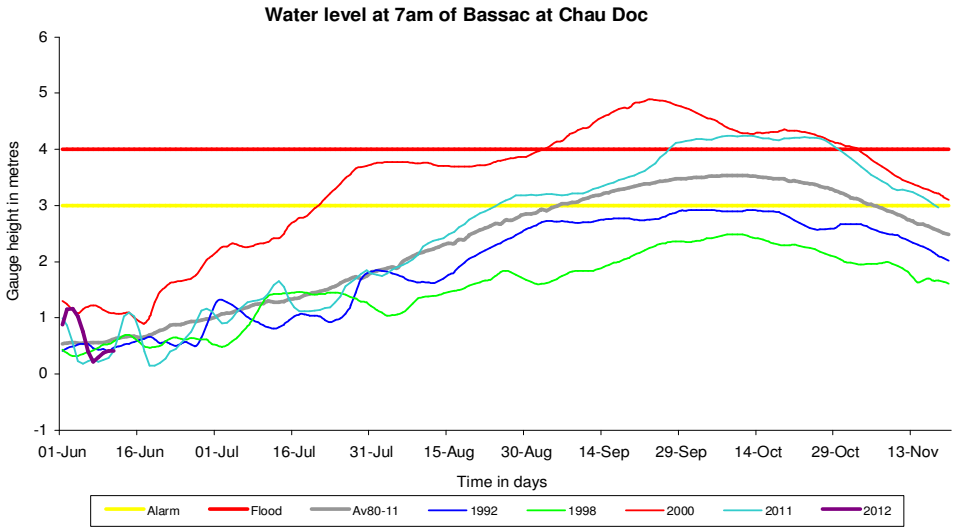

Water level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012


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
Av80-11
1992
1998
2000
2011
2012


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
Av80-11
1992
1998
2000
2011
2012


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
Av80-11
1992
1998
2000
2011
2012


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
Av80-11
1992
1998
2000
2011
2012


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
Av80-11
1992
1998
2000
2011
2012