Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 14/06/2010, covering the week from the 7th June to the 14th June 2010

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

General weather patterns

During the week of the 7th June to the 14th June 2010, seven weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 7th June and the 13th June bulletins are presented in the figures below:

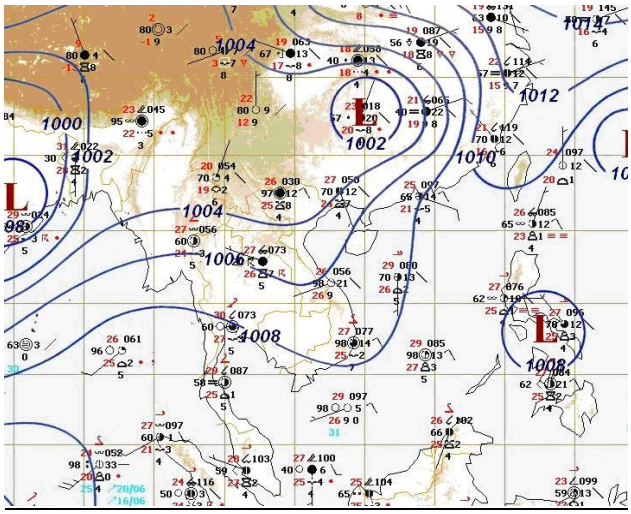


Figure 1: Weather map for 7th June 2010

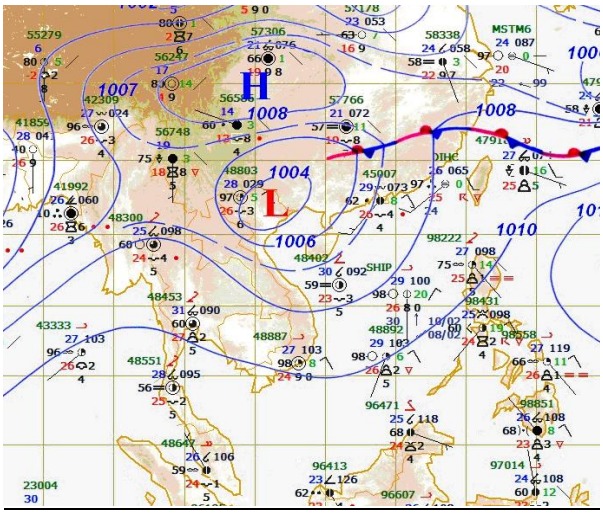


Figure 2: Weather map for 13th June 2010

Weakening South-West (SW) Monsoon

A moderate SW monsoon prevailed over Gulf of Thailand and Indochina Peninsular at the beginning of the week and then began weakening by 12th June (Figure 1).

Inter Tropical Convergence Zone (ITCZ)

No ITCZ was observed in this week.

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

No Tropical Storm (TS) was observed in this 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. From 12th June, a weakening SW monsoon prevailed over Andaman Sea, Gulf of Thailand. A low pressure trough lied across upper part of LMB, Thailand, Lao PDR, Viet Nam, Cambodia and almost stationary. As the result of these phenomena, moderate to heavy rain at the beginning of the week and scattered rain from middle of the week were occurred in upper part of the Lower Mekong Basin, some part of Myanmar, Thailand, Lao PDR, Vietnam and Cambodia.

General behaviour of the Mekong River

Water levels along Lower Mekong River were generally low and most stations were recording levels that are somewhat below long-term average but show a rising trend in upper and middle reaches of LMB during this week. Water levels at stations in lower reach of LMB from Kratie are more or less stable, with a slightly rising trend towards the end of the week in which water levels in downstream at Tan Chau and Chau Doc monitoring stations were fluctuated by tidal.

For stations from Chiang Saen to Chiang Khan

Water levels were rising up till the mid of the week and then falling towards the end of the week. Most stations were recording levels that are somewhat below the long-term average for this time of the year except Chiang Saen.

For stations from Vientiane/Nongkhai to Pakse

Water levels were rising towards the end of the week. Most stations were recording levels that are somewhat below the long-term average for this time of the year.

For stations from Stung Treng to Kampong Cham

Water levels were slightly rising towards the end of the week. Most stations are somewhat below 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, slightly rising towards the end of the week. Most stations were recording levels that are somewhat below the long-term average for this time of the year.

Tan Chau and Chau Doc

Water levels were fluctuated and significantly affected by tidal effects. Both stations were recording levels that are somewhat below the long-term average for this time of the year.

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 Mekong River during the past week. Water levels are still significant 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

2010	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
07/06		3.05	5.14	4.83	1.79	2.53	4.62	1.88	3.18	2.25	1.09	2.45	1.56	2.79	7.53	3.02	1.85	0.85	1.79	1.26	0.91	0.19	0.16
08/06		3.00	5.54	5.08	1.95	2.65	4.63	2.36	3.32	2.41	1.20	2.47	1.53	2.80	7.64	3.06	1.83	0.82	1.79	1.28	0.91	0.45	0.46
09/06		2.88	5.63	5.55	2.13	2.84	4.54	2.59	3.36	2.71	1.24	2.56	1.55	2.82	7.73	3.17	1.86	0.85	1.85	1.48	0.95	0.67	0.70
10/06		2.80	5.43	5.50	2.27	3.02	4.95	2.74	4.00	2.87	1.58	2.79	1.74	2.82	7.73	3.14	1.93	0.94	1.92	1.44	1.04	0.71	0.77
11/06		2.72	5.24	5.79	2.44	3.16	4.93	3.11	4.37	3.03	1.85	2.98	1.92	2.88	7.74	3.25	1.97	0.99	1.97	1.22	1.08	0.68	0.77
12/06		2.57	5.12	5.76	2.67	3.38	4.71	3.18	4.42	3.29	2.10	3.16	2.08	3.00	7.80	3.28	2.04	1.07	2.01	1.12	1.16	0.56	0.67
13/06		2.51	4.82	5.62	2.74	3.53	4.76	3.01	4.26	3.27		3.37	2.25	3.11	8.00	3.38	2.09	1.13	2.07	1.11	1.18	0.38	0.46
14/06		2.48	4.70	5.37	2.62	3.47	4.80	2.89	4.14	3.13		3.50	2.35	3.20	8.20	3.54	2.17	1.22	2.17	1.26	1.27	0.09	0.06
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

2010	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
07/06		0.0	1.4	0.5	19.8	3.0	24.6	7.2	0.8	63.0	66.1	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0
08/06		0.0	0.0	6.7	20.5	13.7	61.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	7.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0
09/06		0.0	0.0	1.1	9.6	8.2	21.9	0.2	0.3	0.0	0.0	0.0	0.0	0.0	46.6	58.3	32.8	0.0	11.0	18.4	17.5	1.9	0.0
10/06		0.0	0.0	7.0	65.8	46.5	79.7	21.7	15.6	19.0	12.7	0.0	7.0	0.0	6.8	51.7	8.4	0.0	16.0	3.1	96.4	10.3	40.0
11/06		0.0	0.0	2.1	0.8	0.7	0.7	0.4	0.0	3.7	32.7	1.0	3.0	0.0	0.0	0.0	0.8	0.0	38.5	7.2	0.0	0.0	0.0
12/06		0.0	0.0	0.0	0.0	14.5	0.2	6.7	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13/06		0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	3.2	0.0	6.3	0.0	0.0
14/06		0.0	0.0	0.0	0.60	0.0	53.3	0.0	0.0	0.0	0.0	37.70	0.0	18.0	2.6	0.0	0.0	0.0	10.5	0.0	0.0	0.0	20.00

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

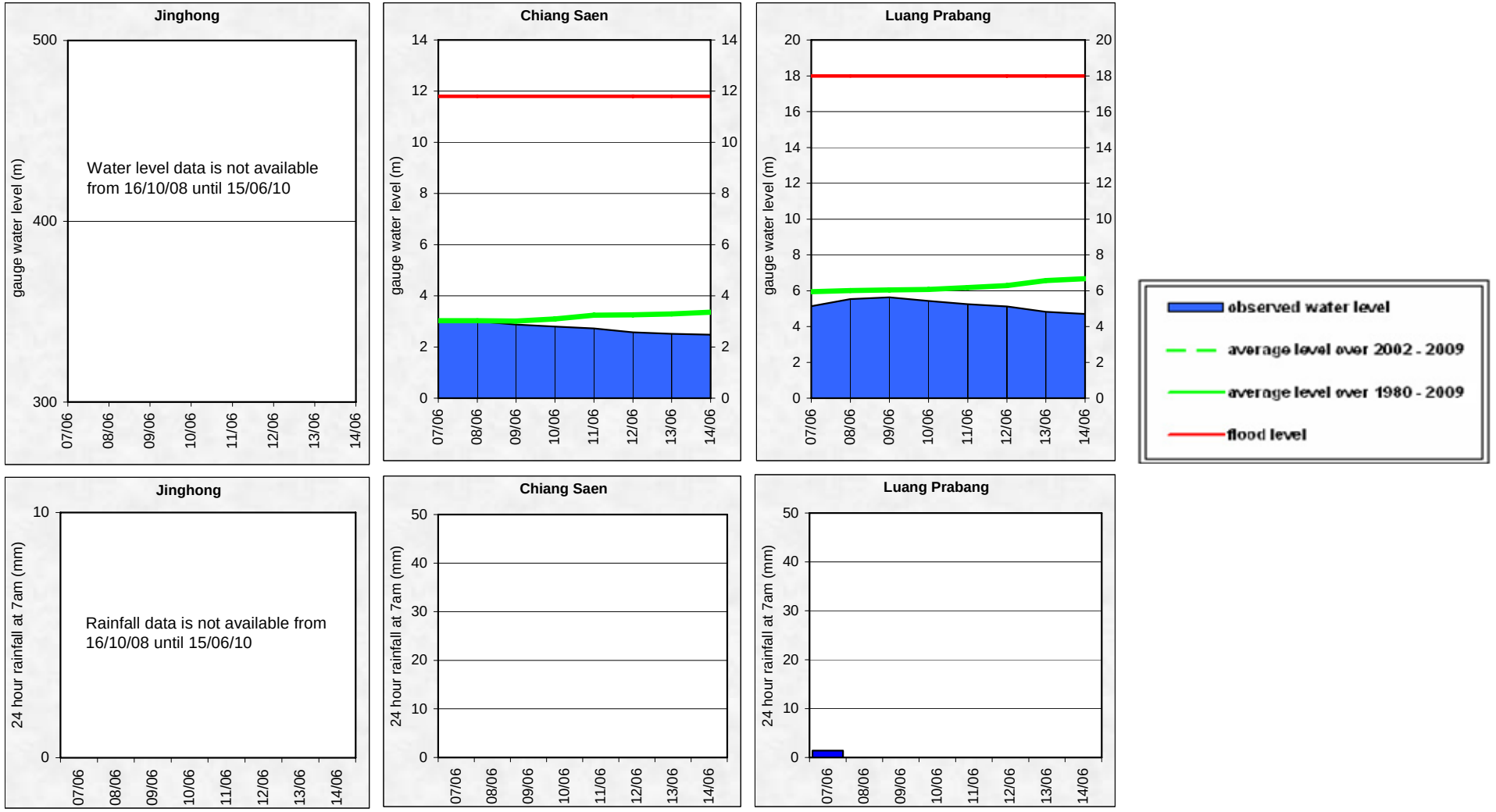


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

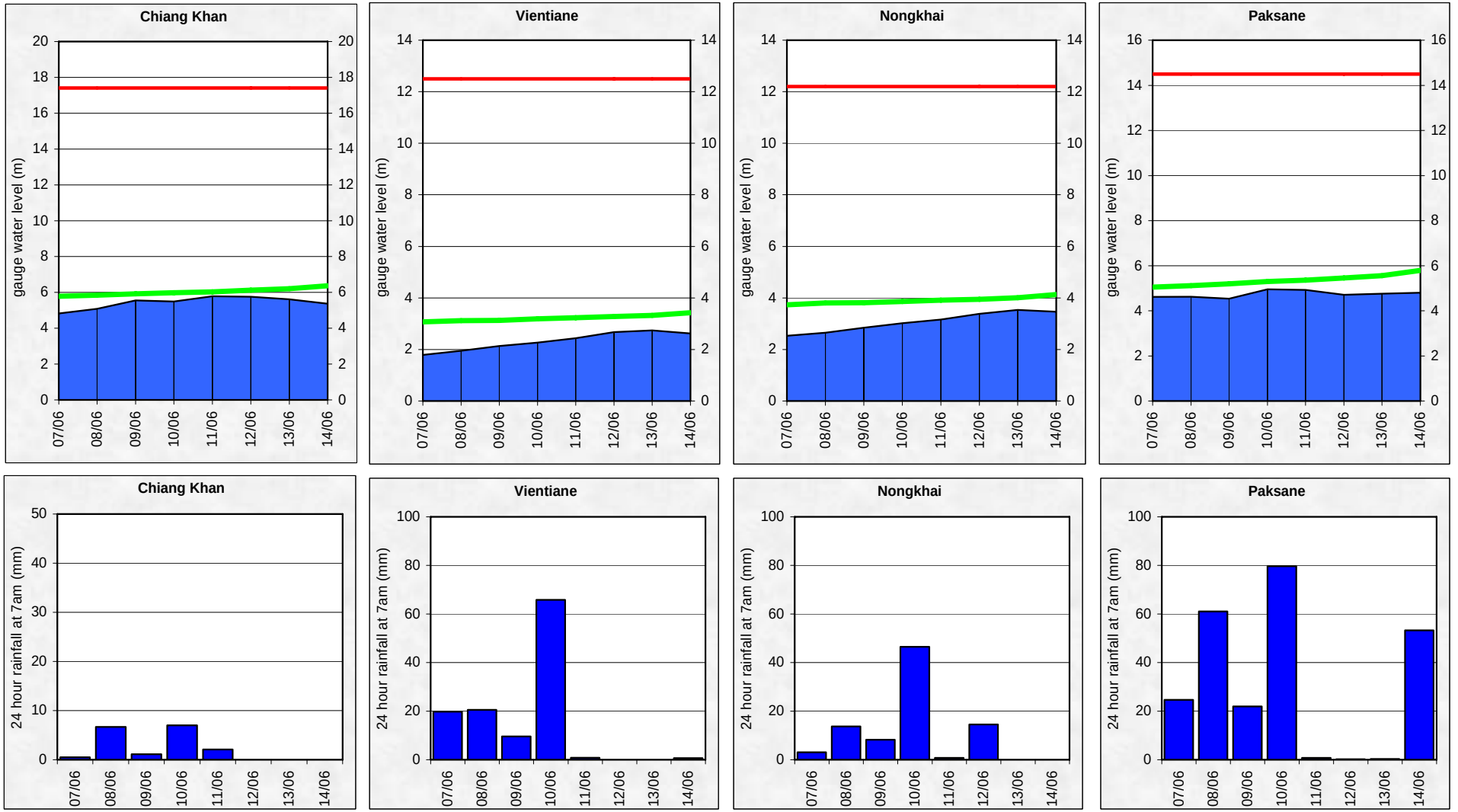


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

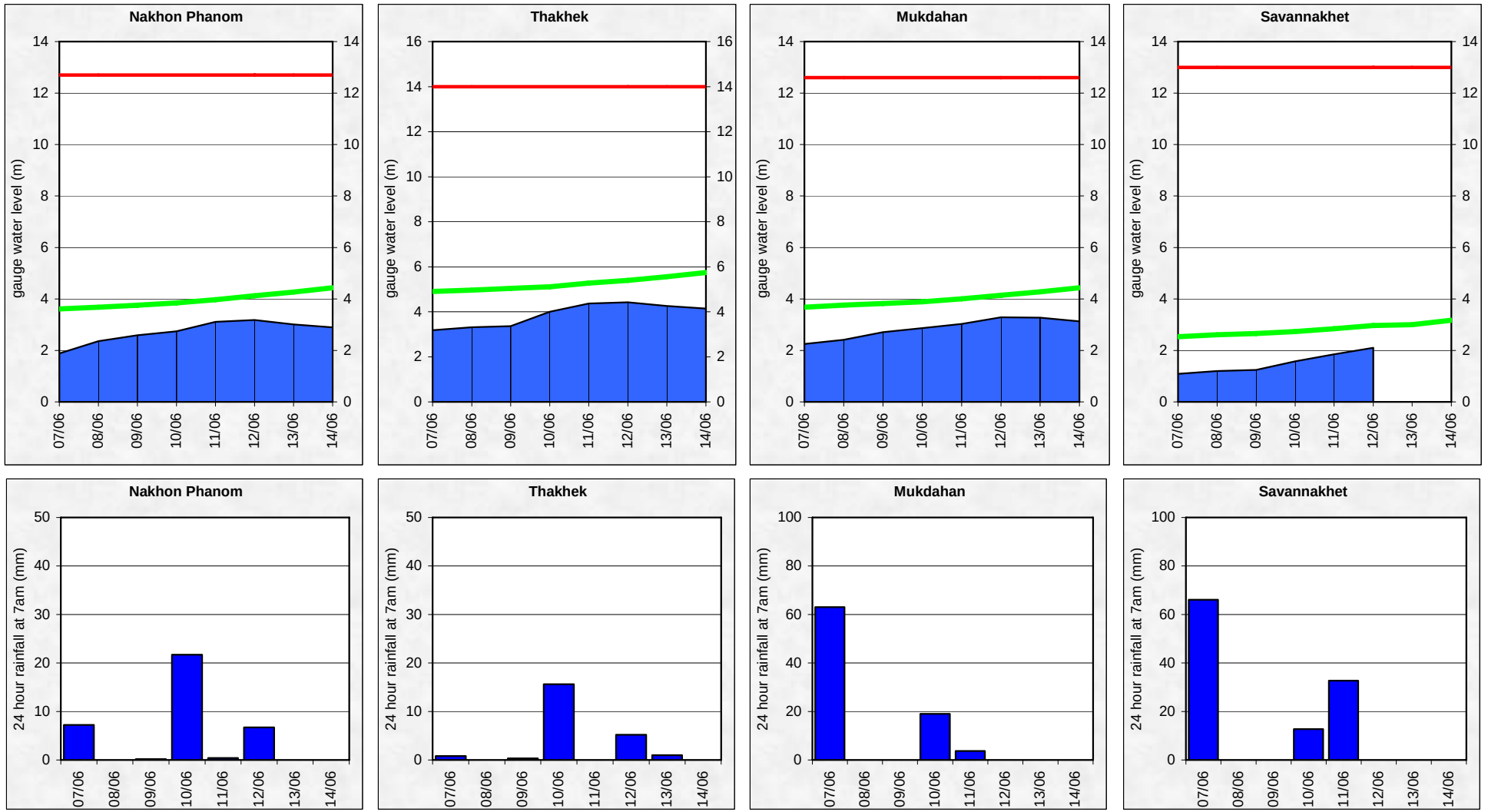


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

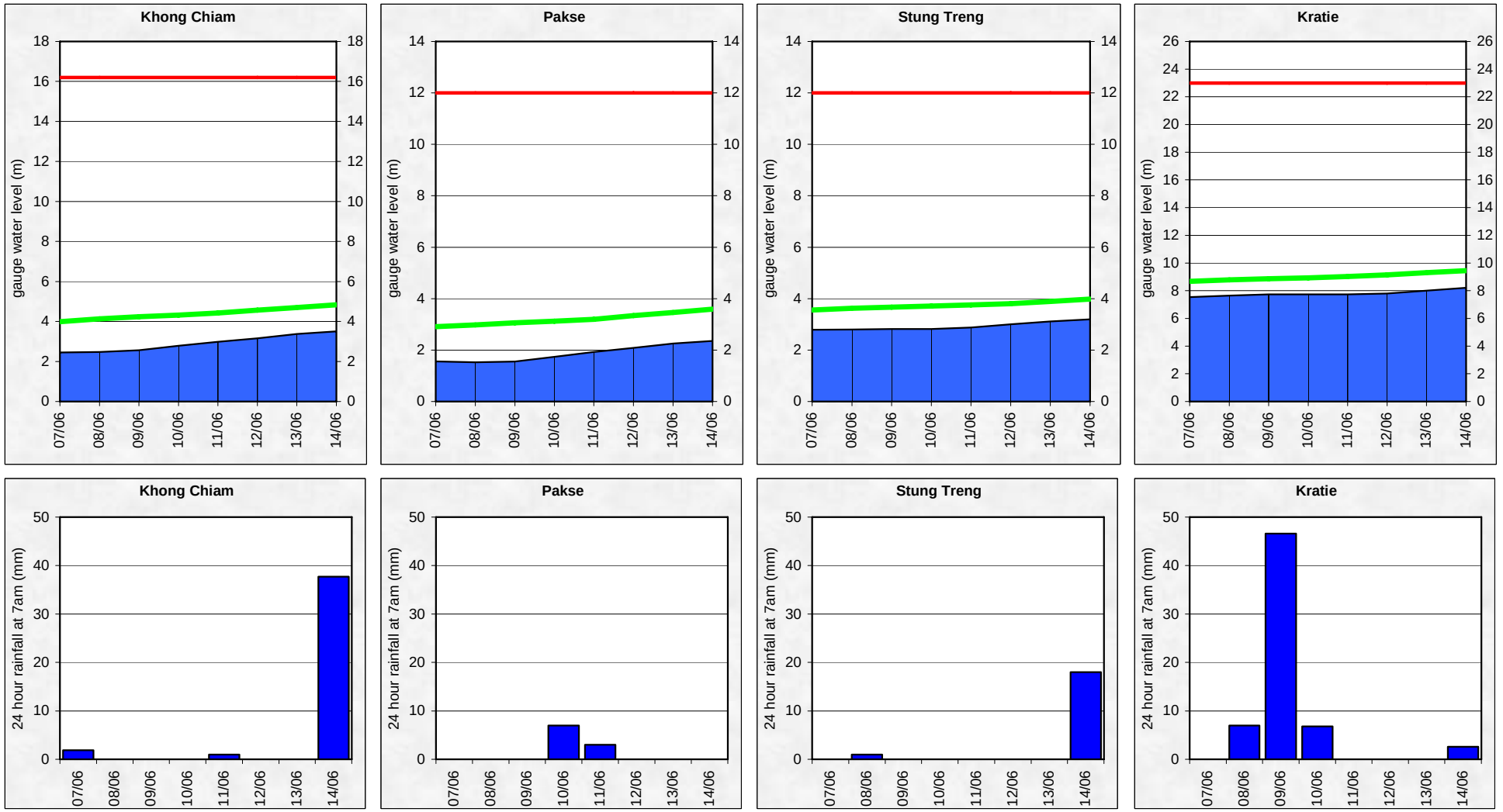


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

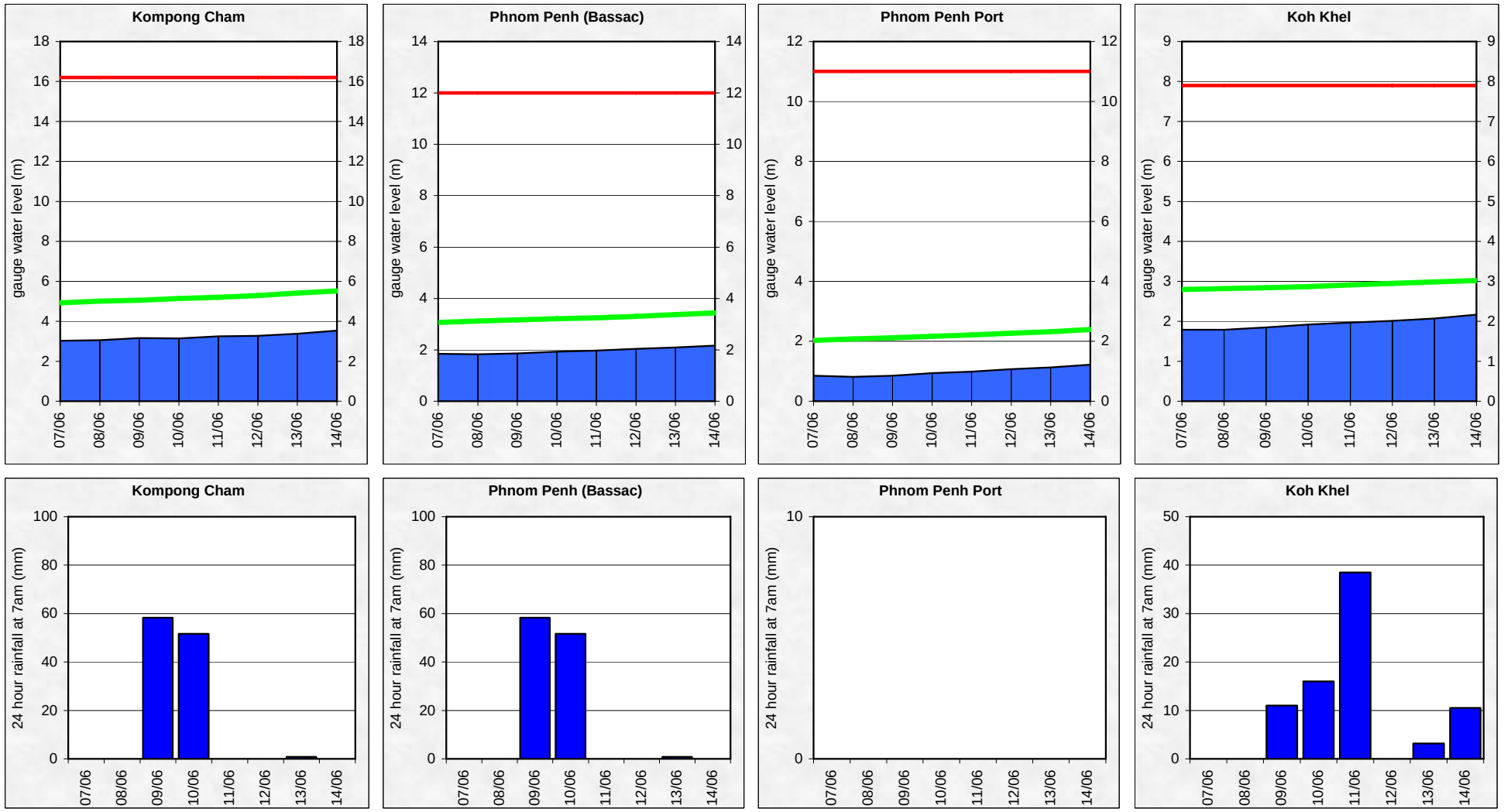
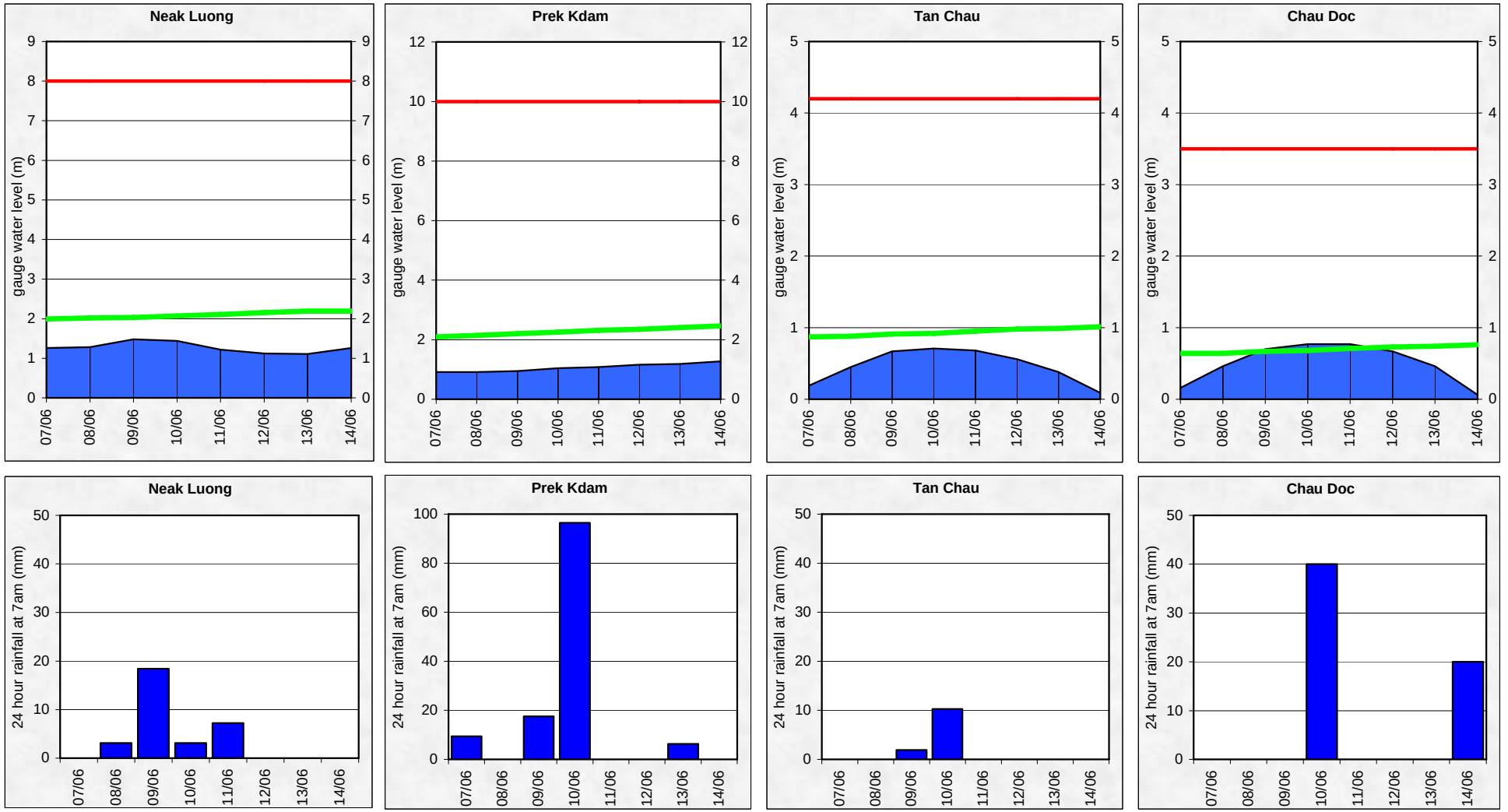


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



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 the known biases in input data, the knowledge of model response and the experience with hydrometeorological conditions of the Mekong River Basin. The information presented as a graph below shows 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 normal pattern. In general the overall accuracy is pretty good for 1-day to 4-day forecasts at stations in upper and middle reaches of LMB from Chiang Khan to Kampong Cham; however the difference for 5-day forecast at Luang Prabang and the accuracies at downstream stations from Neak Luong to Tan Chau/Chau Doc were less accurate than expected.

The above differences due to 2 main factors: (1) poor results of rainfall forecast from Numerical Weather Prediction (NWP), and (2) internal model functionality in forecasting for tidal influence stations especially during the transitional period between dry and wet season.

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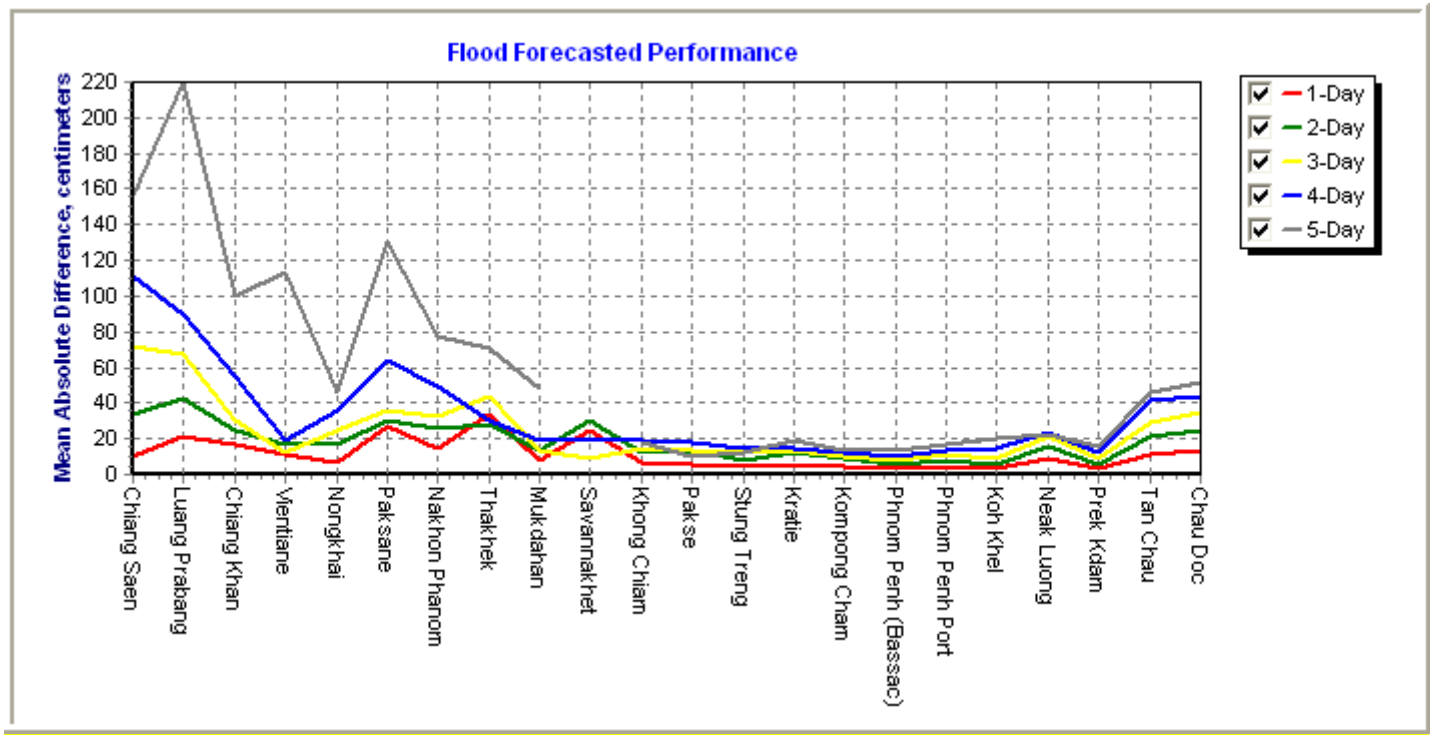
Figure B1: Average flood forecast accuracy along the Mekong mainstream



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	100.0	100.0	66.7	100.0	100.0	83.3	66.7	66.7	100.0	83.3	100.0	100.0	100.0	83.3	83.3	100.0	100.0	100.0	66.7	100.0	66.7	50.0	*87.1*
2-day	100.0	100.0	60.0	80.0	60.0	80.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	40.0	80.0	0.0	20.0	*82.7*
3-day	50.0	100.0	75.0	100.0	75.0	75.0	75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	75.0	50.0	75.0	25.0	50.0	25.0	25.0	*76.1*
4-day	0.0	100.0	66.7	100.0	66.7	66.7	33.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.7	66.7	0.0	100.0	0.0	33.3	*72.7*
5-day	0.0	100.0	50.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	50.0	0.0	*81.8*

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	50	50	25	25	25	25	25	25	25	25	25	25	10	10	10	10	10	10	10	10	10	10
2-day	75	75	25	25	25	25	50	50	50	50	50	50	25	25	25	10	10	10	10	10	10	10
3-day	75	100	50	50	50	50	50	50	50	50	75	75	50	50	25	10	10	10	10	10	10	10
4-day	100	*125*	75	50	50	50	50	50	75	75	75	75	50	50	50	25	25	25	10	25	10	10
5-day	100	*150*	75	75	75	75	75	75	75	75	75	75	50	50	50	25	25	25	10	25	10	10

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 8 days including the current report date

	Flood Forecast: time sent				Arrival time of input data (average)							Missing data (number)						
2010	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	*10:32*	*0*	*-*	*9*	*08:13*	*-*	*08:05*	*08:41*	*09:25*	*08:33*	*07:46*	*0*	*0*	*1*	*253*	*178*	*0*	*67*
month	*10:45*	*0*	*-*	*15*	*08:14*	*-*	*08:26*	*08:31*	*09:01*	*08:28*	*07:48*	*0*	*0*	*13*	*442*	*291*	*11*	*134*
season	*10:45*	*0*	*-*	*15*	*08:14*	*-*	*08:26*	*08:31*	*09:01*	*08:28*	*07:48*	*0*	*0*	*13*	*442*	*291*	*11*	*134*

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.

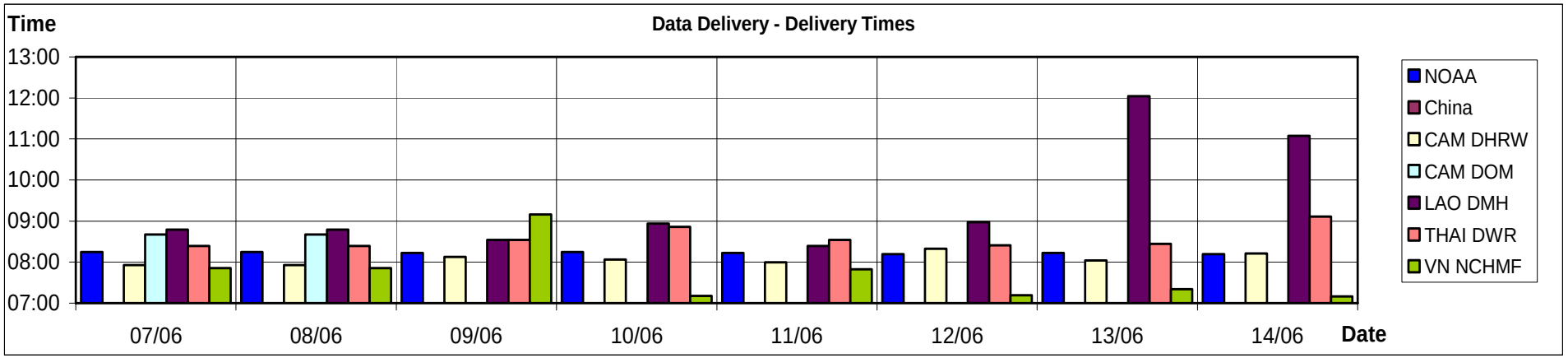


Figure B2: Data delivery times for the past 8 days including the current report date

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

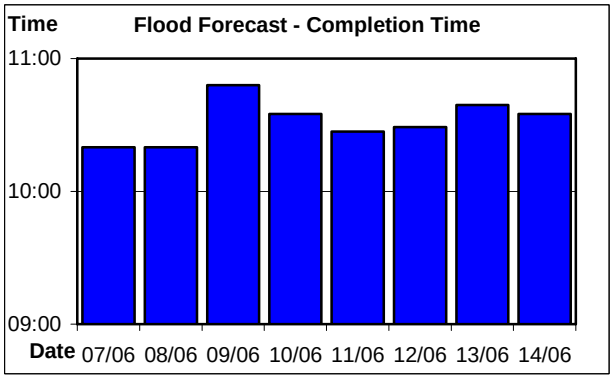


Figure B4: Flood forecast completion time

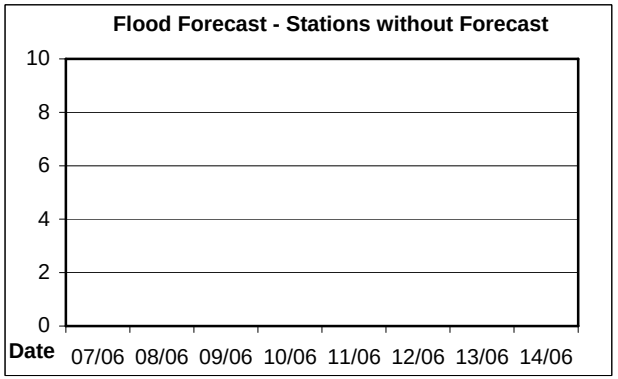


Figure B5: Flood forecast stations without forecast

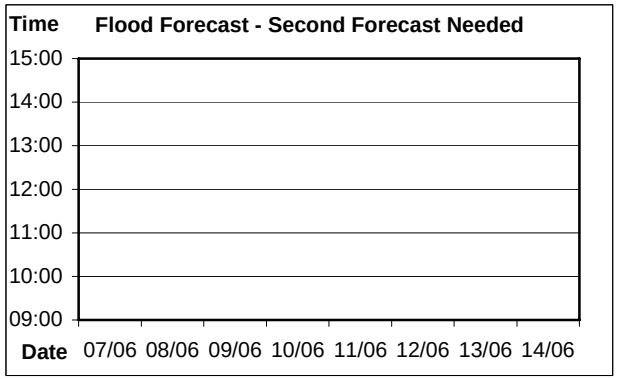


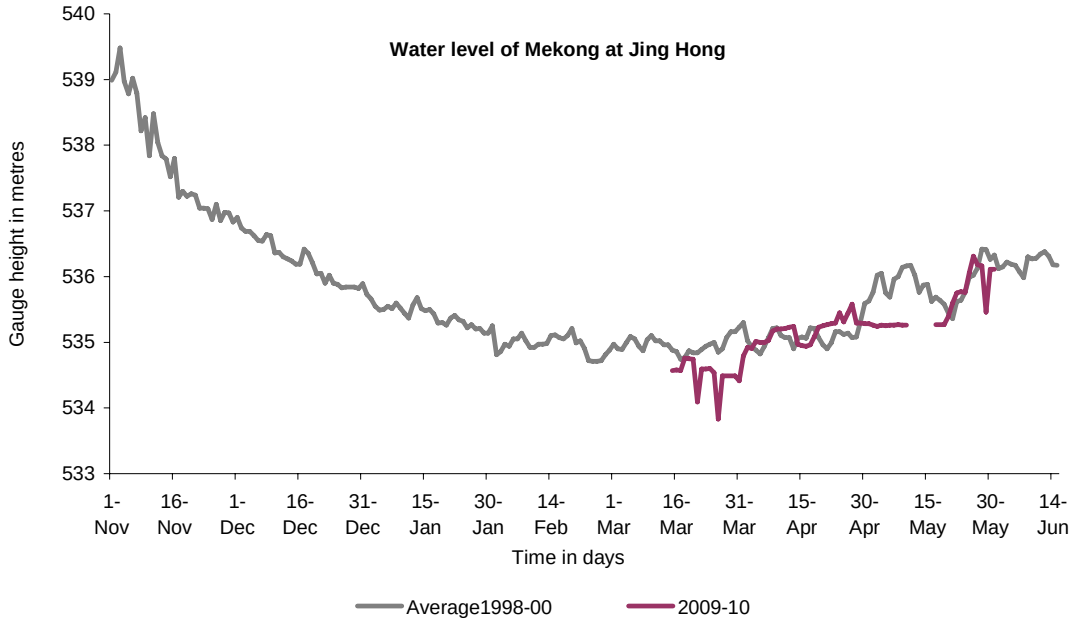
Figure B6: Second forecast needed

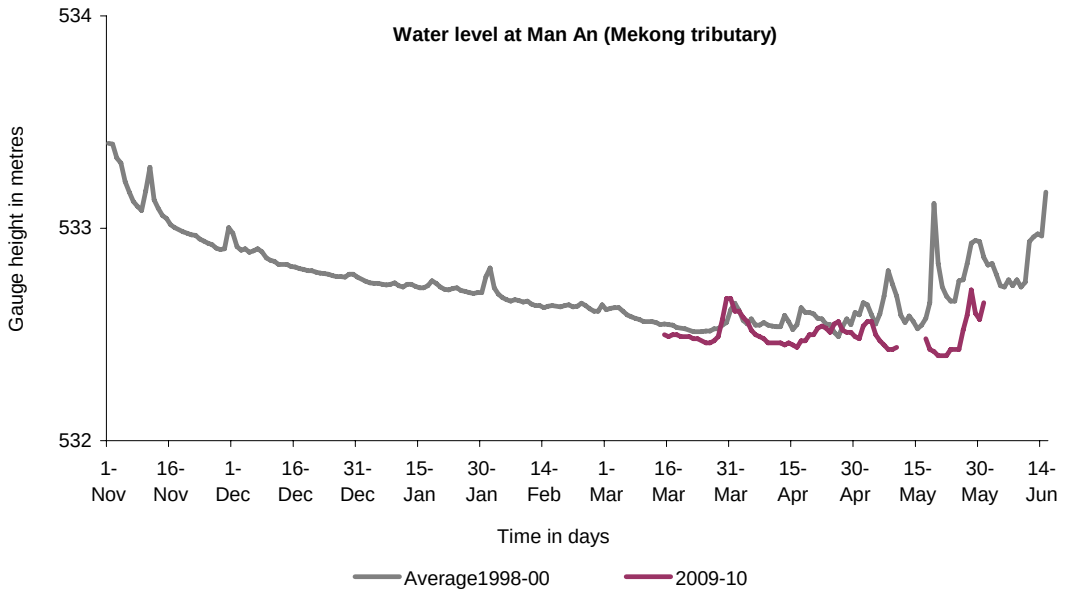
Annex C: Season Water Level Graphs

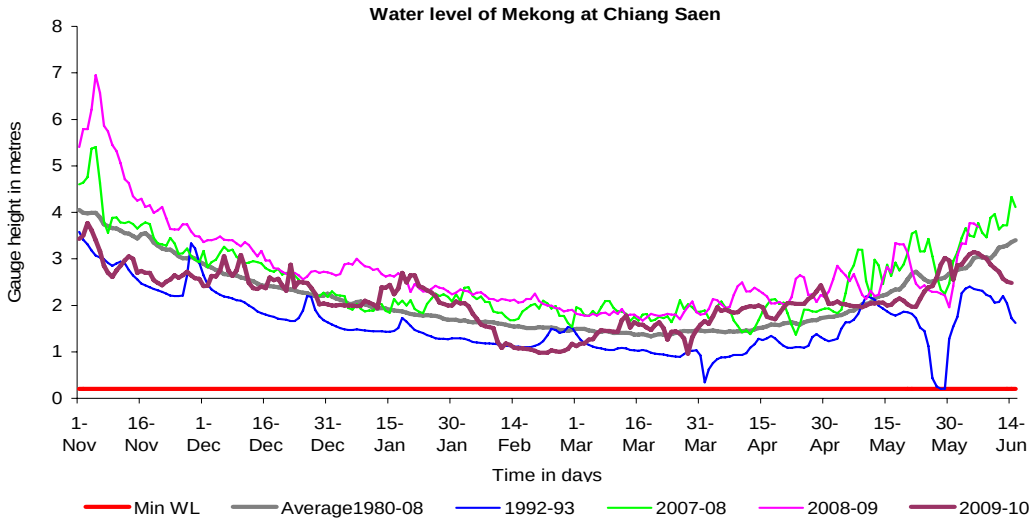
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

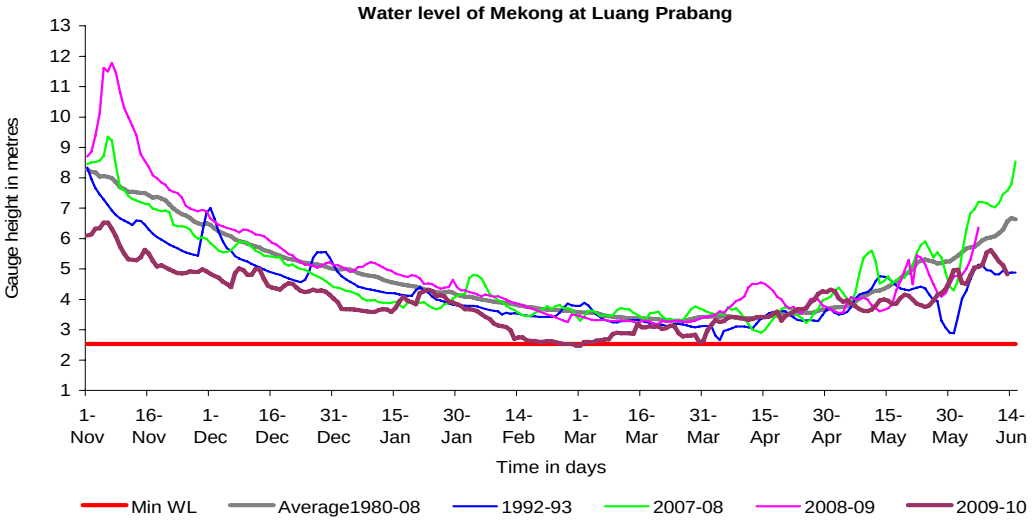
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

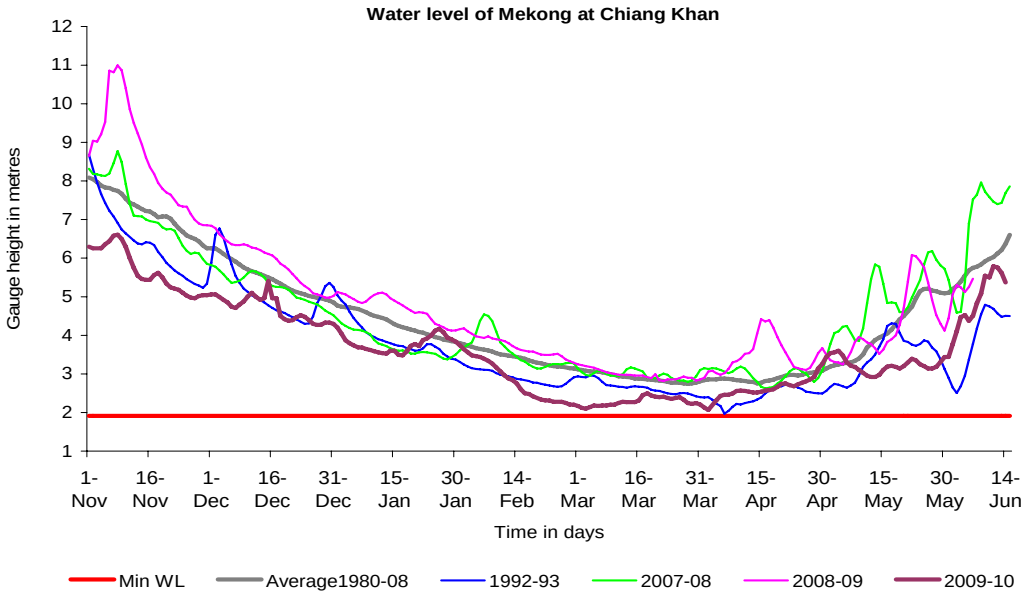
IN DRY SEASON FROM 1 NOVEMBER TO 15 JUNE

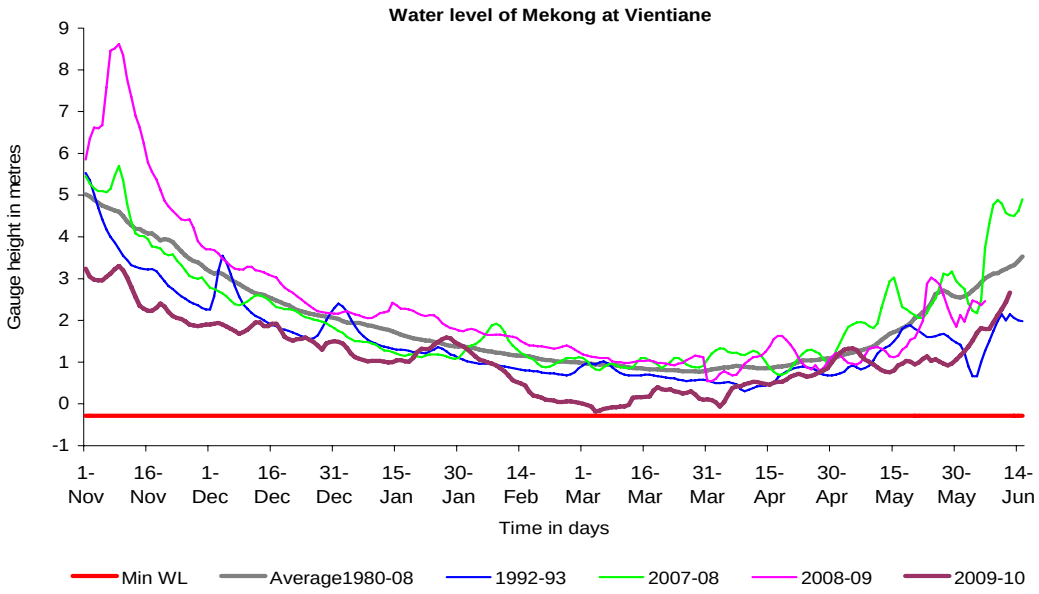


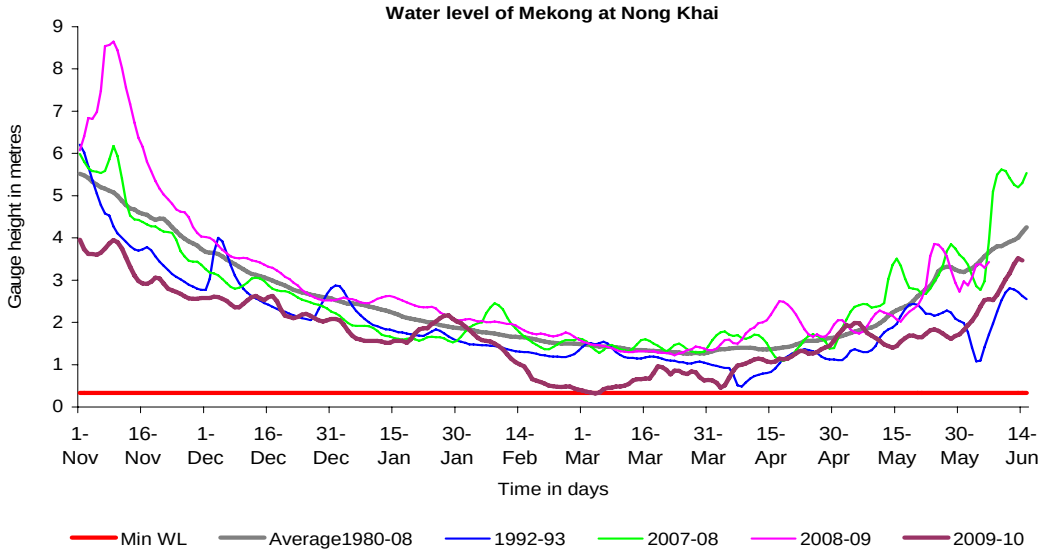


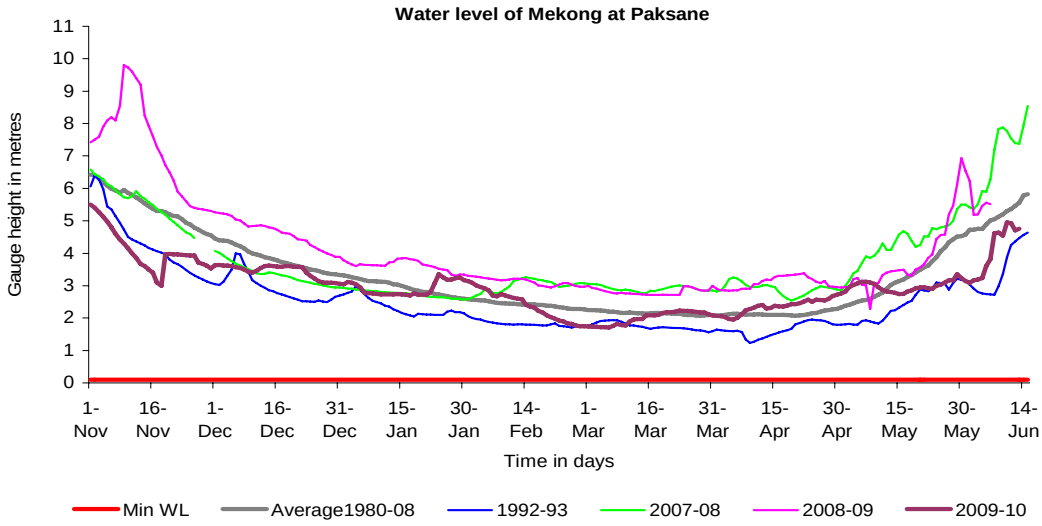

Water level of Mekong at Chiang Saen
Gauge height in metres
0
1
2
3
4
5
6
7
8
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

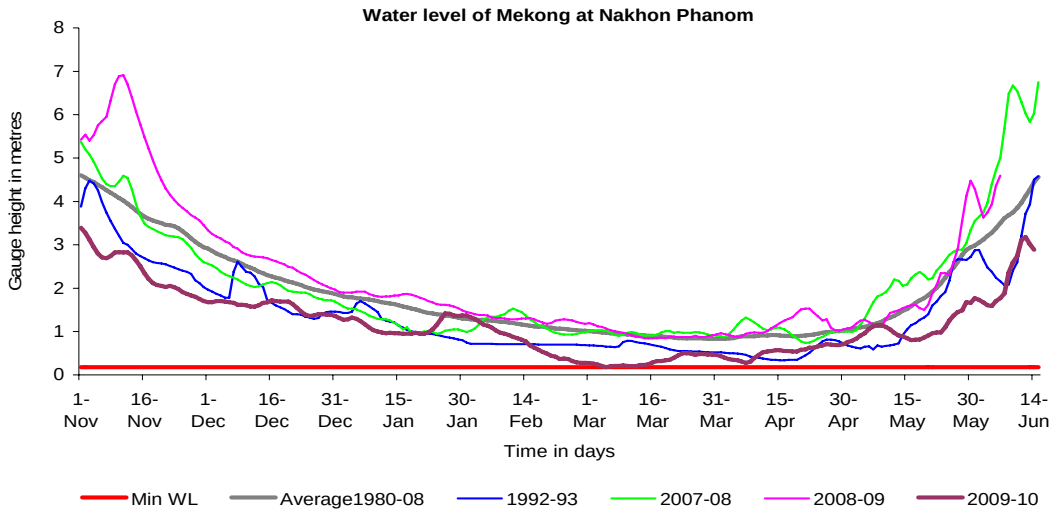

Water level of Mekong at Luang Prabang
Gauge height in metres
1
2
3
4
5
6
7
8
9
10
11
12
13
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

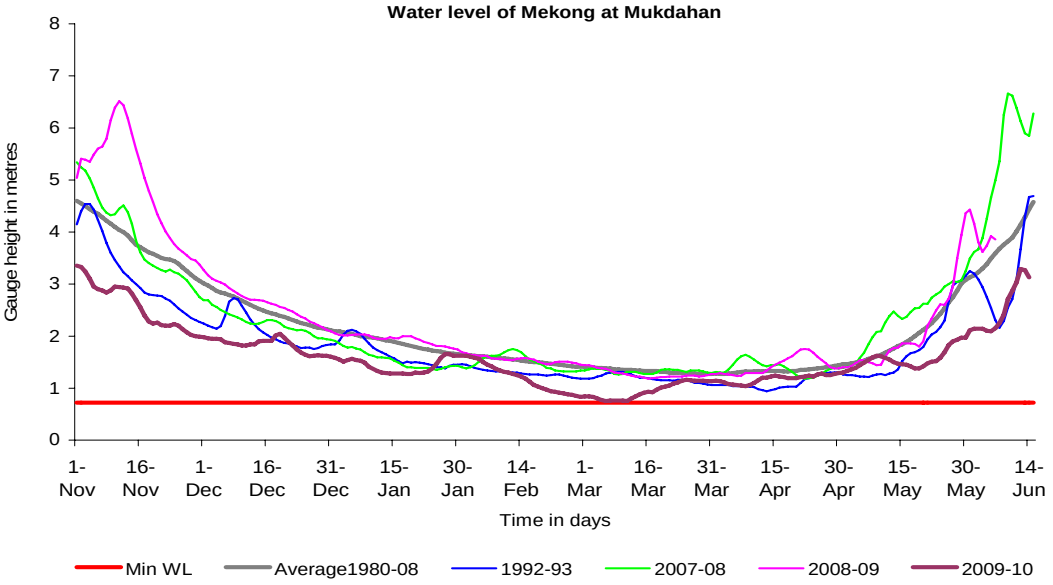

Water level of Mekong at Chiang Khan
Gauge height in metres
1
2
3
4
5
6
7
8
9
10
11
12
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

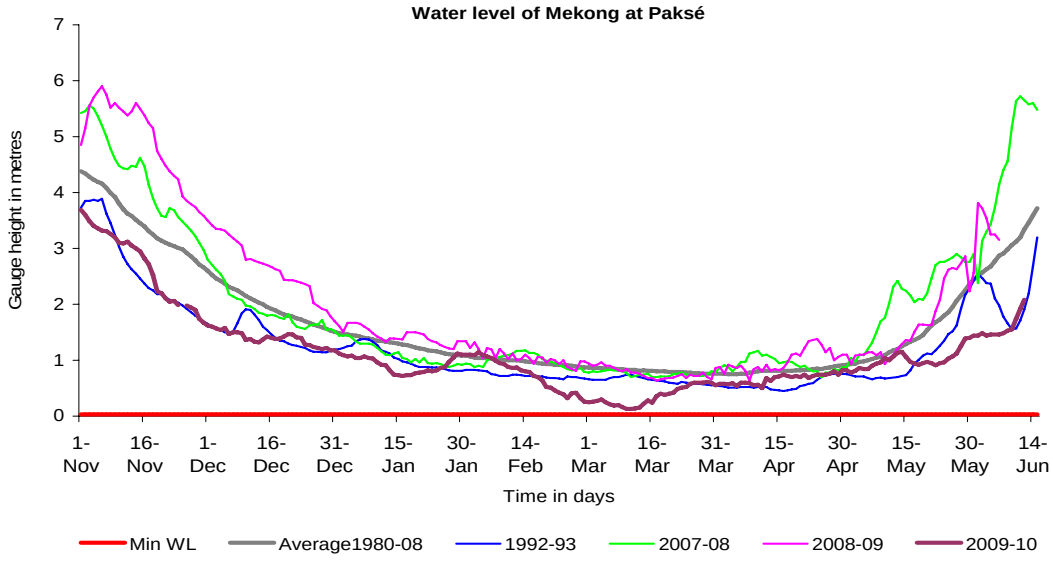

Water level of Mekong at Vientiane
Gauge height in metres
9
8
7
6
5
4
3
2
1
0
-1
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

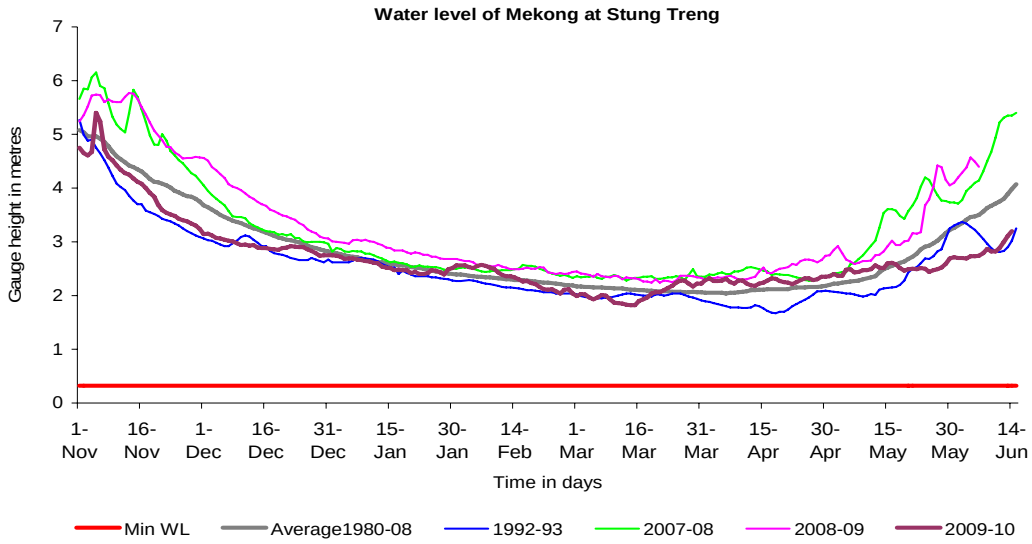

Water level of Mekong at Nong Khai
Gauge height in metres
9
8
7
6
5
4
3
2
1
0
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

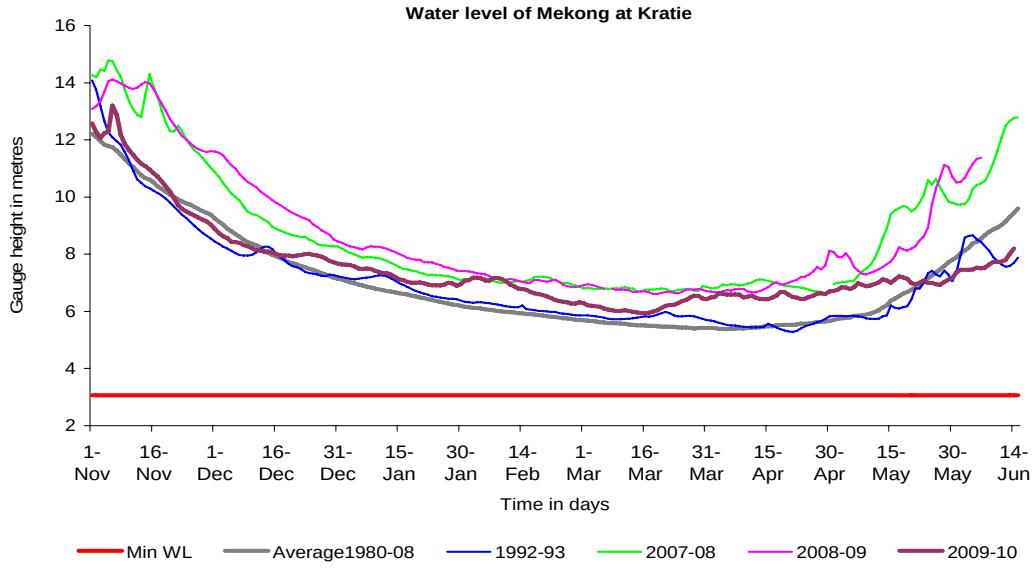

Water level of Mekong at Paksane
Gauge height in metres
11
10
9
8
7
6
5
4
3
2
1
0
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

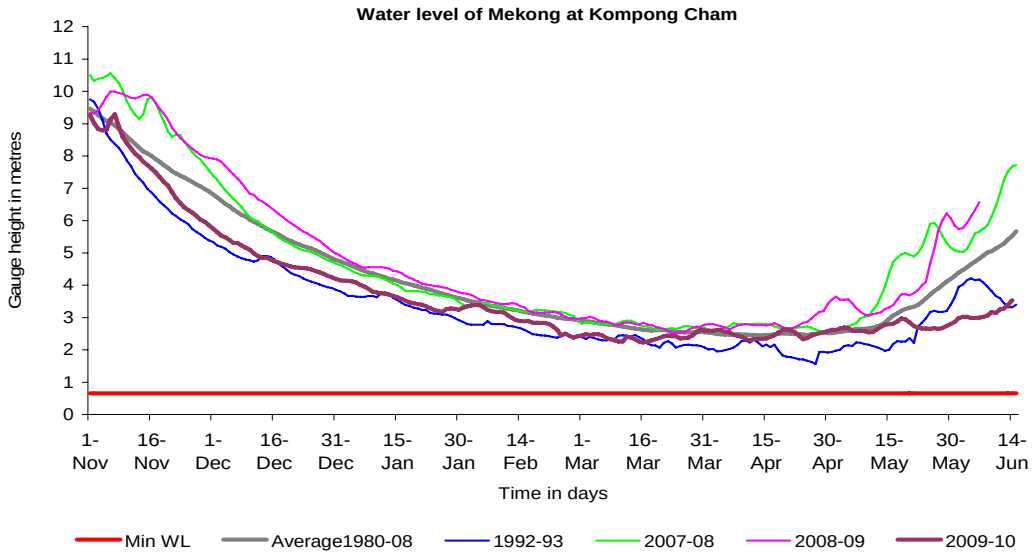

Water level of Mekong at Nakhon Phanom
Gauge height in metres
0
1
2
3
4
5
6
7
8
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

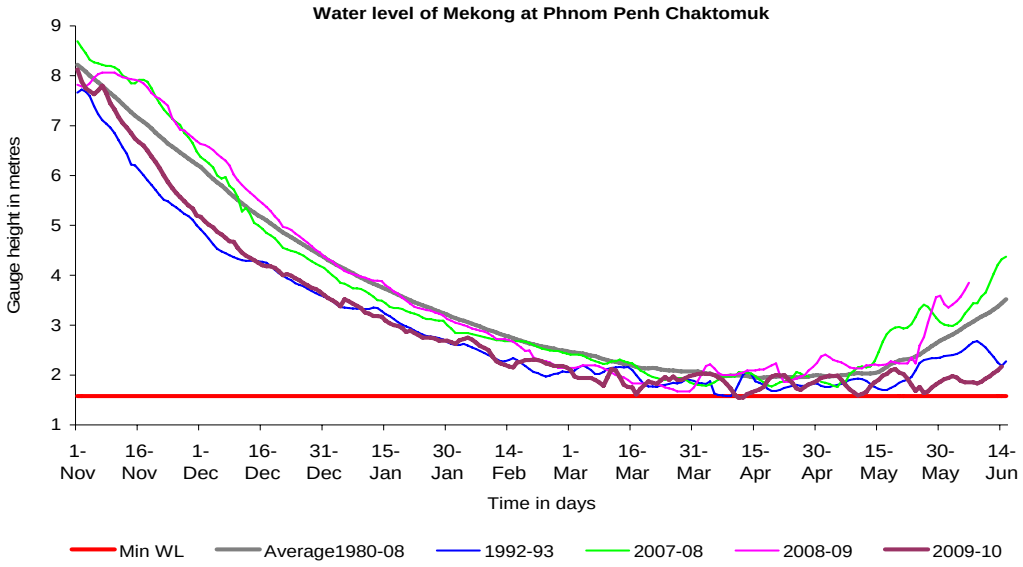

Water level of Mekong at Mukdahan
Gauge height in metres
0
1
2
3
4
5
6
7
8
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

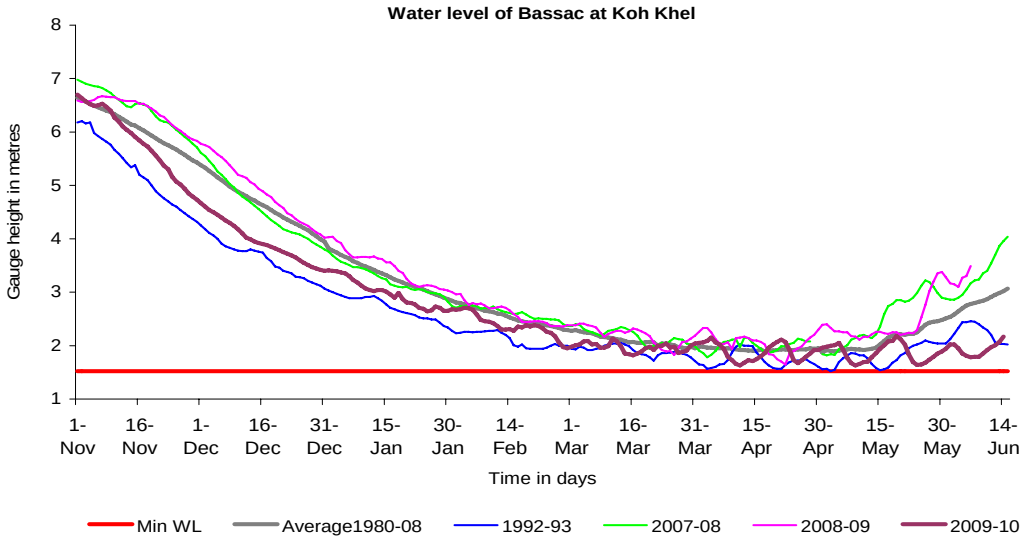

Water level of Mekong at Paksé
Gauge height in metres
0
1
2
3
4
5
6
7
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

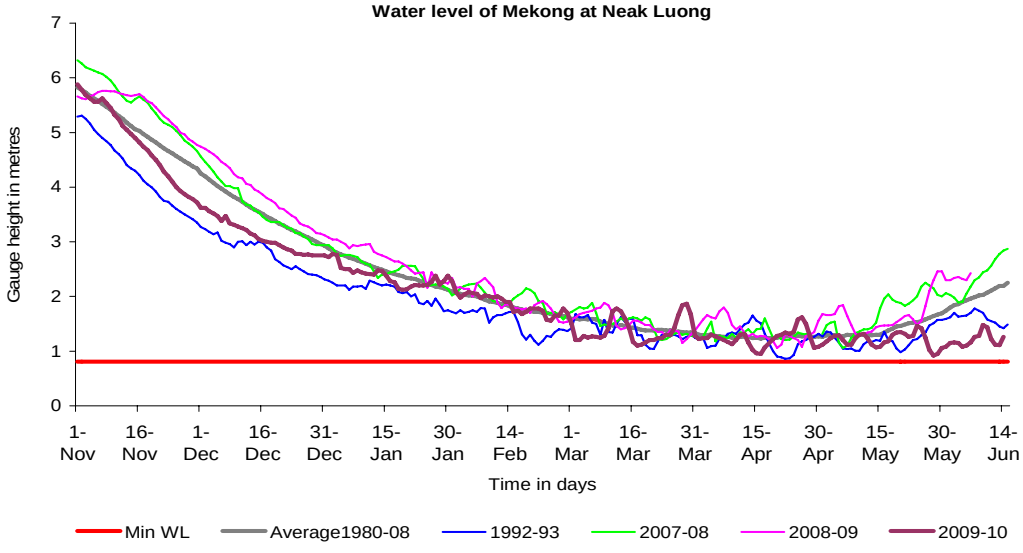

Water level of Mekong at Stung Treng
Gauge height in metres
0
1
2
3
4
5
6
7
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

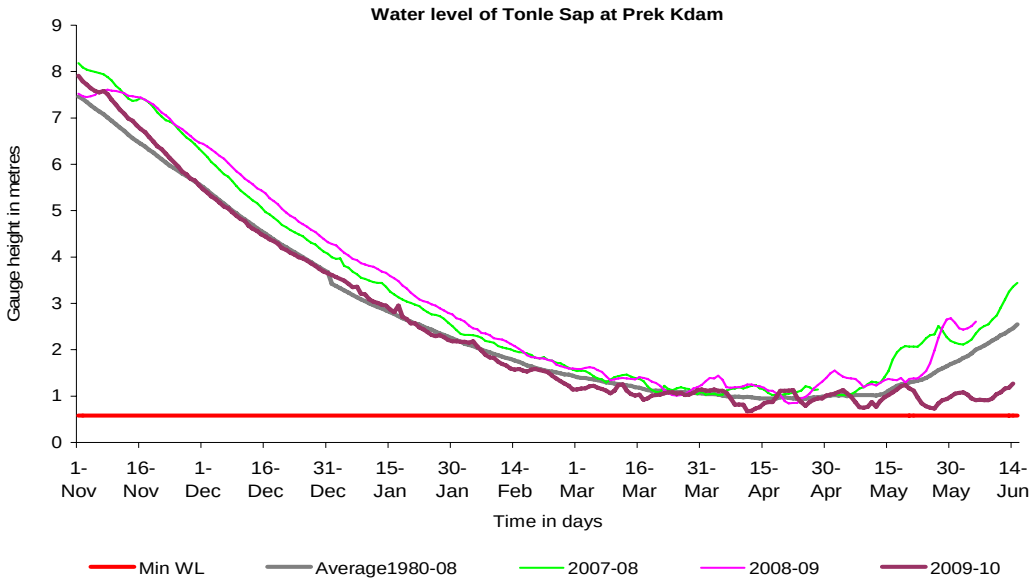

Water level of Mekong at Kratie
Gauge height in metres
2
4
6
8
10
12
14
16
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

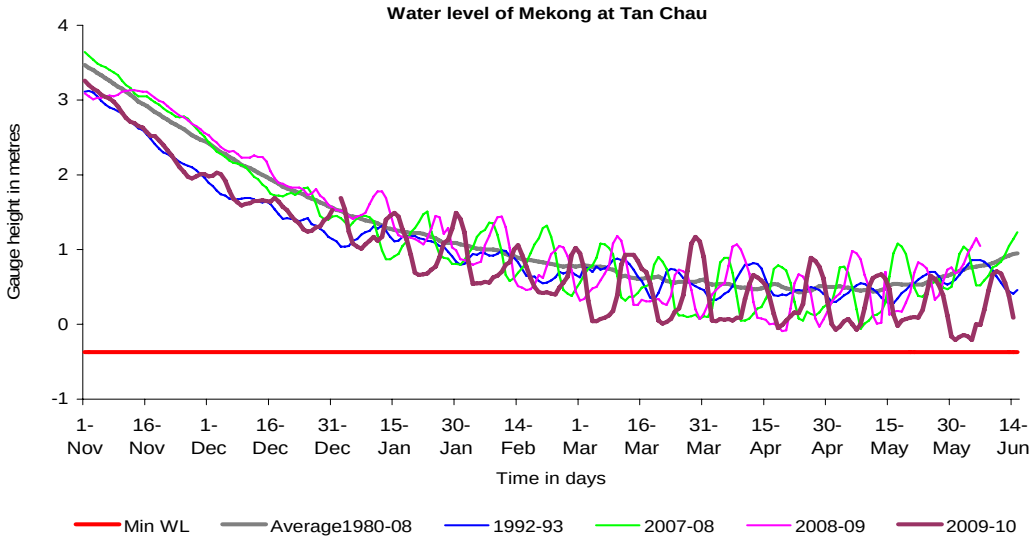

Water level of Mekong at Kompong Cham
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
10
11
12
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10

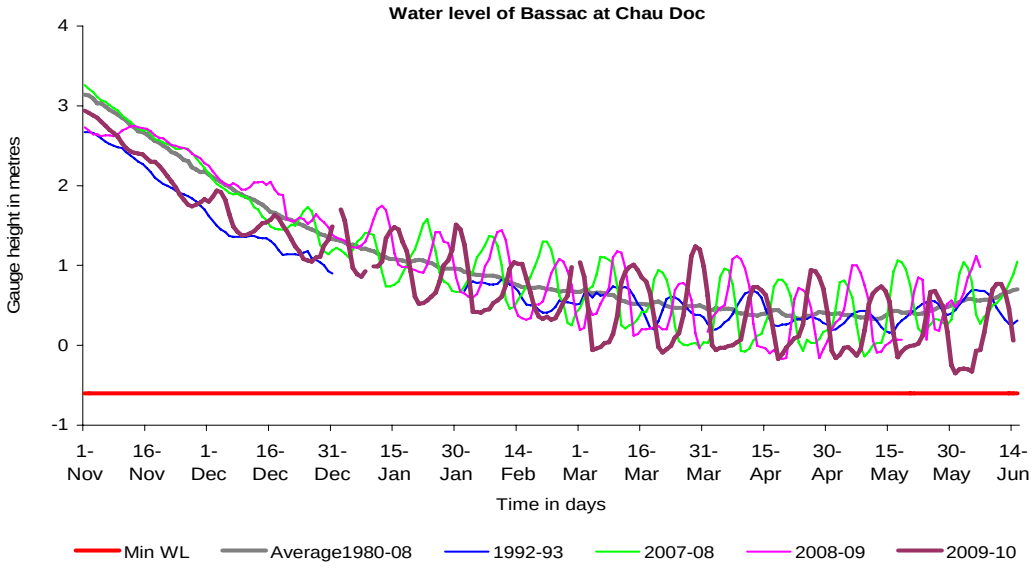

Water level of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
9
8
7
6
5
4
3
2
1
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10


Water level of Bassac at Koh Khel
Gauge height in metres
8
7
6
5
4
3
2
1
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10


Water level of Mekong at Neak Luong
Gauge height in metres
7
6
5
4
3
2
1
0
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10


Water level of Tonle Sap at Prek Kdam
Gauge height in metres
9
8
7
6
5
4
3
2
1
0
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
2007-08
2008-09
2009-10


Water level of Mekong at Tan Chau
Gauge height in metres
4
3
2
1
0
-1
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10


Water level of Bassac at Chau Doc
Gauge height in metres
4
3
2
1
0
-1
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
15-Jan
30-Jan
14-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
Time in days
Min WL
Average1980-08
1992-93
2007-08
2008-09
2009-10