Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 24/06/2013, covering the week from the 17th June to the 24th June 2013

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

General weather patterns

During the week of 17th June to 24th June 2013 four weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 18th June and 23th June are presented in the figures below:

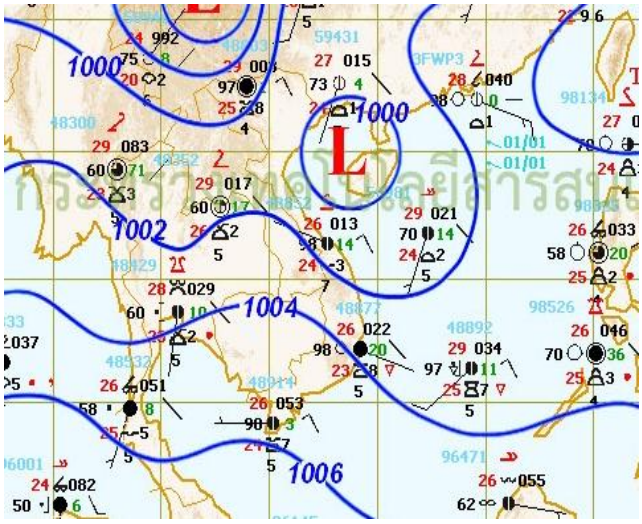


Figure 1: Weather map for 18th June 2013

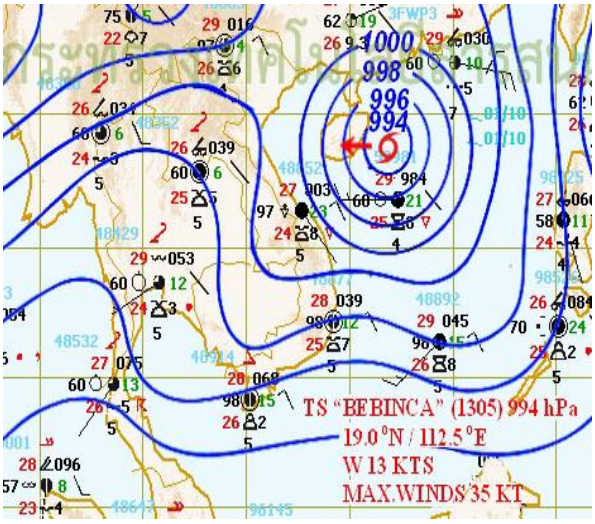


Figure 2: Weather map for 22th June 2013

Moderate South-West (SW) Monsoon

The strong SW monsoon prevailed over Myanmar, Andaman Sea and the Gulf of Thailand, Myanmar, Thailand, Lao PDR, Cambodia and Viet Nam almost whole week. (Figure 1and 2).

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

On 21th – 24th May, 2013 of last week has appeared a Tropical Storm (TS) on the East Sea with name "BEBINCA". On 22th, "BEBINCA" had maximum sustain wind near the center about 64 km/h and move to North-westward with the speed of 24 km/h (figure 2), and on 23th over the Bay of Tonkin, about 300 km East of Hanoi, Vietnam with maximum sustained wind near center about 65 km/h, moving west – northwest –award about 18 km/h. And, on 24th at 7:PM, the BEBINCA struck in to northeastern provinces of Viet Nam. Figure 3 shows a Storm Track, Satellite image and weather chart of TAMBIN and BOLAVEN Typhoons.

Source: http://www.nchmf.gov.vn/web/vi-VN/43/Default.aspx
Weather bulletin notice 23-25 of June 2013 of DOM

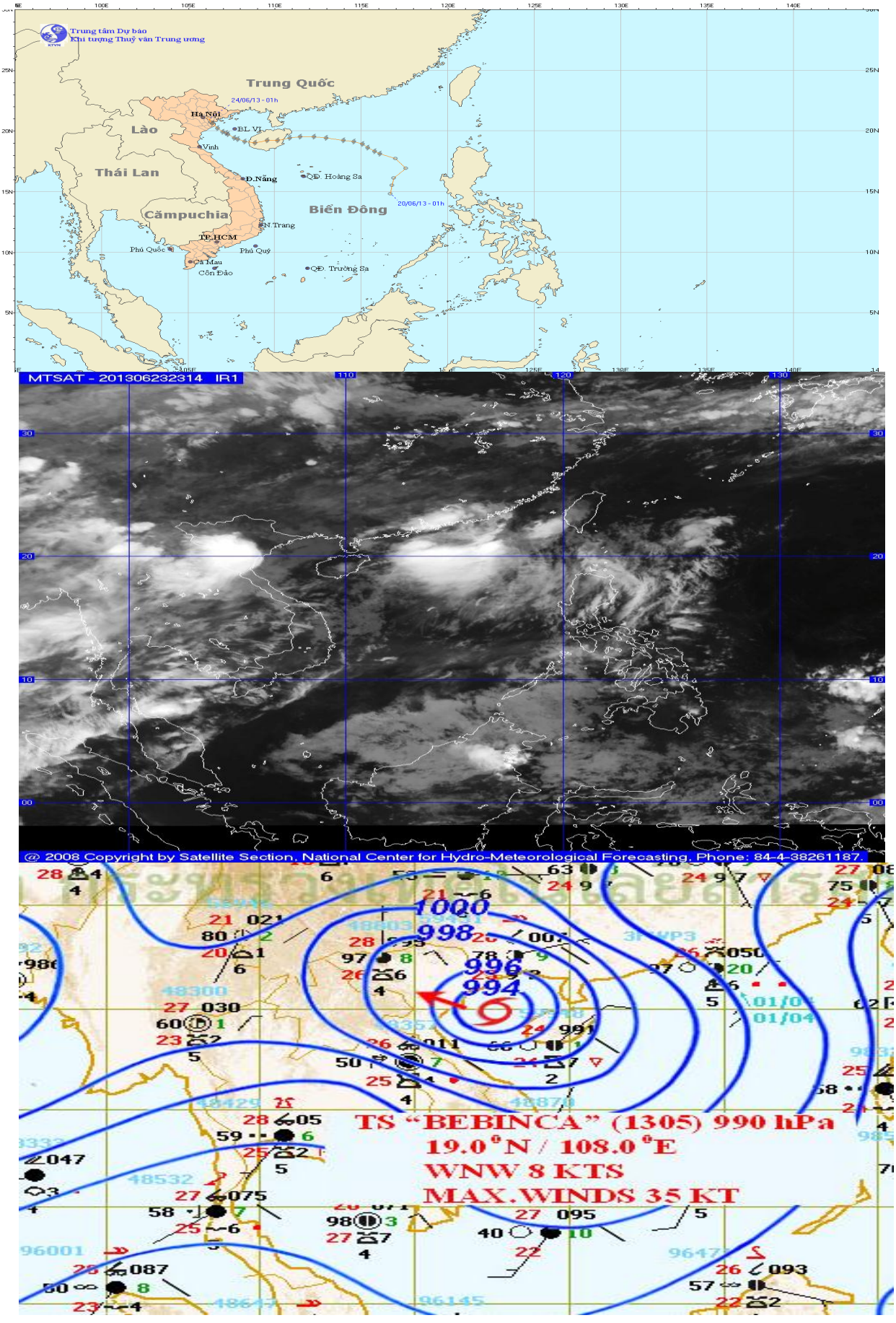


Figure 3: Storm Track, Satellite image and weather chart of TAMBIN and BOLAVEN Typhoons

Over weather situation

The strong SW monsoon prevailed and affected of the Tropical Storm BEBINCA, which caused heavy rainfall in many areas in the North of Lao PDR, Central and North of Vietnam. The precipitation started from 19th in Thai Land, Lao PDR and Cambodia with popular amount of rainfall from 19th to 24th June were recorded at Paksane (236.8 mm), at Nakhon Phanom (110.2mm), at ThanKhet (109.5 mm), Sanavakhet (119.1), Stung treng (117 mm). See Figure 4.

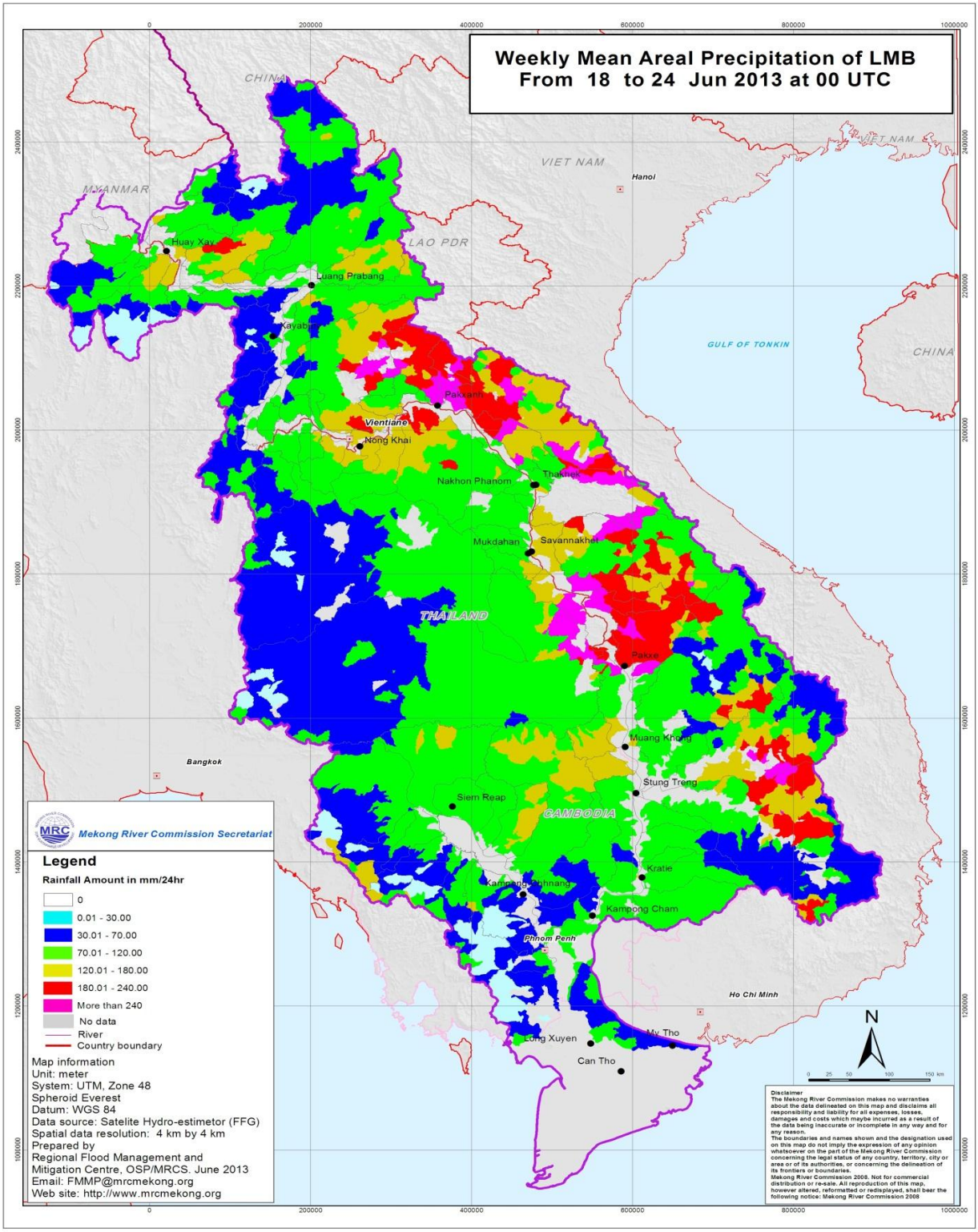


Figure 4: Rainfall distribution over the LMB, covering the week 18th – 24th June, 2013

General behaviour of the Mekong River

During last week, all most water levels at stations in LMB were fluctuated sharply, but still lower than the the long term average during period. Except, at Chau Doc station from 21th to 23th that have the water level higher than the long term average during this period (around 0.2m – 0.4m).

For stations from Chiang Saen and Luang Prabang

In general, the water levels at Chiang Saen and Luang Prabang fluctuated sharply and below the long-term average during last week.

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

Water levels of all stations were fluctuated sharply and below the long-term average during last week. In addition at, the water levels were down more than long-term average during in the l last weekend.

For stations from Thakhet/Nakon Phanom to Pakse

Water levels at Thakhet/Nakon Phanom, Mukdahan, Khong Cham and Pakse, the water level were increased slightly over the last weekend.

For stations from Stung Treng to Kampong Cham

Water levels at these stations were rose during last week below the long-term average for this time of the year.

For stations from Phnom Penh to Koh Khel/Neak Luong

Water levels at these stations fluctuated and have recording water levels that were below the long-term average for this time of the year.

Tan Chau and Chau Doc

At Tan Chau station the water levels that were somewhat below the long-term average for this time of the year, But from mid of last week, the water level at Chau Doc have the water level higher than the long term average during this period (around 0.2m – 0.4m).

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

Flood Situation

- Flood stage or alarm stage:

No alarm stage (where the forecast is expected to reach flood level within three days) was reported anywhere on the mainstream of the Mekong River during the past week. Water levels were still significantly below flood levels (as defined by the national agency) at all forecast stations.

- Damage or victims:

No damage or loss of life due to river flooding was recorded anywhere along the Mekong River during the past week.

For more details see the following annex:

- tables and graphs for water level and rainfall for the last week in Annex A
- a graph for accuracy in Annex B
- a table of forecast achievement in Annex B
- tables and graphs for performance in Annex B
- the water level graphs showing the observed water level for the season in Annex C

Annex A: Graphs and Tables

Table

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
17/06	-	2.54	4.43	5.50	2.35	3.10	4.82	3.07	4.49	3.22	2.16	3.45	2.47	3.56	9.50	4.66	2.50	1.62	2.35	1.68	1.64	0.13	0.04
18/06	536.04	2.46	4.17	5.33	2.31	3.05	4.82	2.99	4.41	3.20	2.14	3.49	2.50	3.63	9.60	4.77	2.60	1.72	2.43	1.90	1.73	0.38	0.30
19/06	536.07	2.48	4.36	4.91	2.25	2.97	4.65	2.85	4.08	3.13	2.11	3.47	2.44	3.54	9.63	4.89	2.65	1.76	2.50	1.90	1.78	0.58	0.54
20/06	535.14	2.70	4.41	4.46	2.01	2.81	4.75	2.75	4.00	3.02	2.10	3.40	2.41	3.50	9.44	4.84	2.68	1.79	2.55	1.88	1.82	0.82	0.82
21/06	536.07	2.92	4.42	4.24	1.78	2.52	5.02	2.76	4.03	2.97	2.07	3.35	2.35	3.46	9.45	4.76	2.64	1.76	2.53	1.76	1.79	0.97	1.02
22/06	535.96	2.90	4.43	4.32	1.44	2.25	4.72	3.04	4.34	3.12	2.09	3.37	2.36	3.49	9.51	4.75	2.63	1.74	2.52	1.58	1.81	0.94	1.02
23/06	535.94	2.83	5.04	4.40	1.40	2.18	4.46	3.18	4.43	3.43	2.25	3.70	3.90	3.62	9.48	4.80	2.70	1.82	2.59	1.68	1.86	0.91	1.00
24/06	535.95	2.59	6.11	4.51	1.46	2.21	4.80	4.00	5.38	3.77	2.68	5.31	4.84	3.96	9.61	4.84	2.75	1.86	2.67	1.80	1.95	0.76	0.76
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

A1: observed water levels unit in m

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
17/06	-	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	**nr**	nr	9.6	7.3	4	-	6.8	10.6	22.3	32.1	52
18/06	nr	nr	nr	nr	nr	nr	nr	nr	nr	2.4	nr	nr	**nr**	nr	19.2	8.2	63	-	6.5	3.2	nr	6.1	0.0
19/06	nr	nr	nr	nr	nr	nr	18	0.1	nr	nr	nr	nr	**nr**	33.5	4.2	0.3	0.9	-	nr	0.0	nr	0.0	2.4
20/06	nr	nr	nr	nr	nr	nr	22.4	2.3	3.3	nr	nr	nr	**nr**	8.5	3	nr	0.4	-	nr	5.8	5.3	nr	0.0
21/06	nr	nr	nr	nr	13.5	8.3	20.8	15	31.9	10	nr	2.9	**3.0**	43	27	11.6	4	-	4.7	8.6	nr	7.7	0.9
22/06	nr	nr	nr	13.2	8.9	18.1	10.9	20.9	nr	61.2	59.6	36.7	**46.4**	12	2.6	1.2	nr	-	nr	nr	nr	0.0	1
23/06	nr	nr	nr	nr	21.8	12.9	57.5	47.3	47.6	26.9	56.9	24.2	**18.3**	5.5	10.2	5.8	6.3	-	2.6	3.2	3.2	0.3	6.0
24/06	10.03	6.1	nr	0.8		11.8	107.2	24.6	26.7	3.1	2.6	29.0	**11.6**	14.5	nr	0.6	0.5		5.2	3.8	4.3	0.8	5.5

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

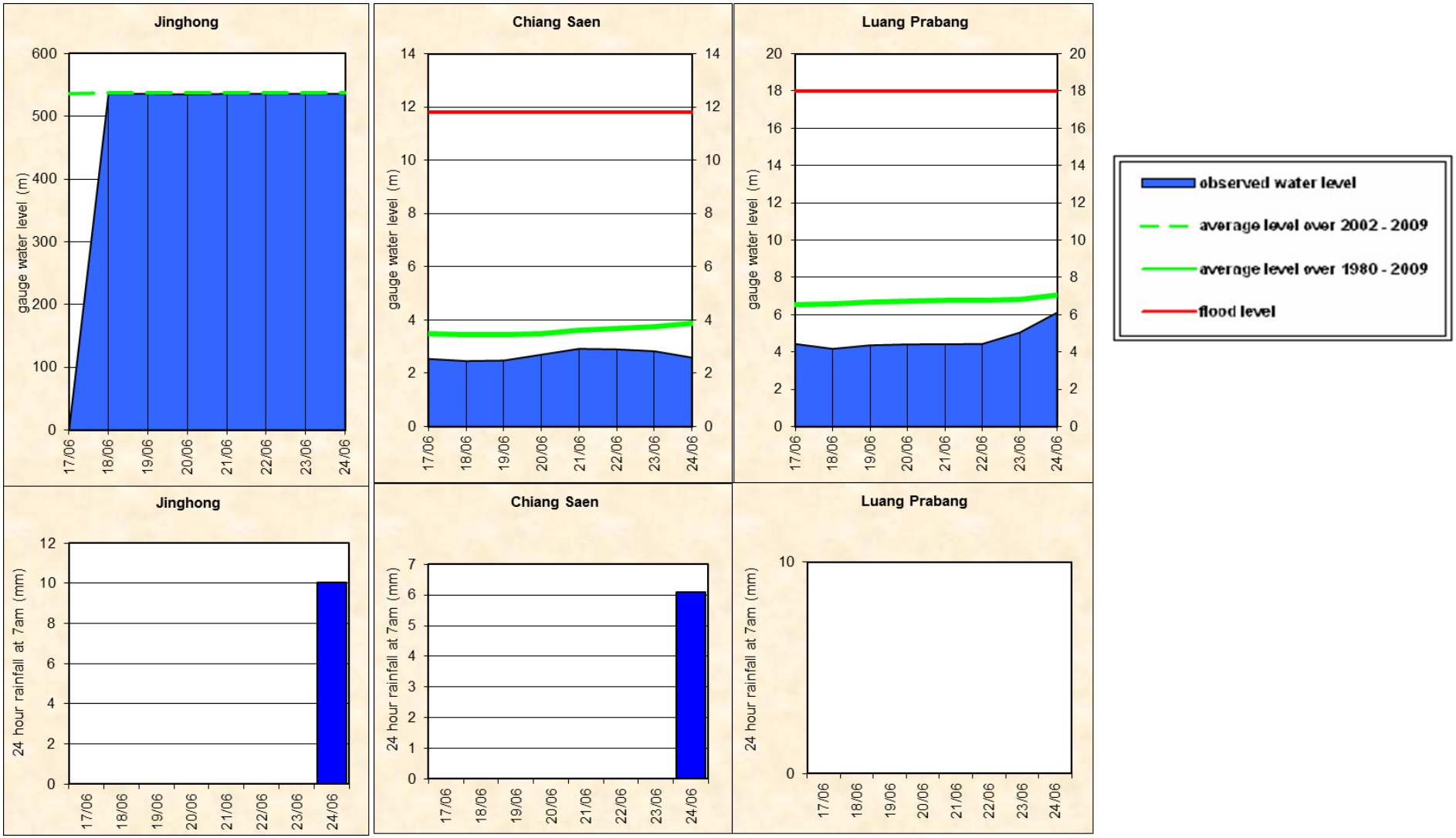


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

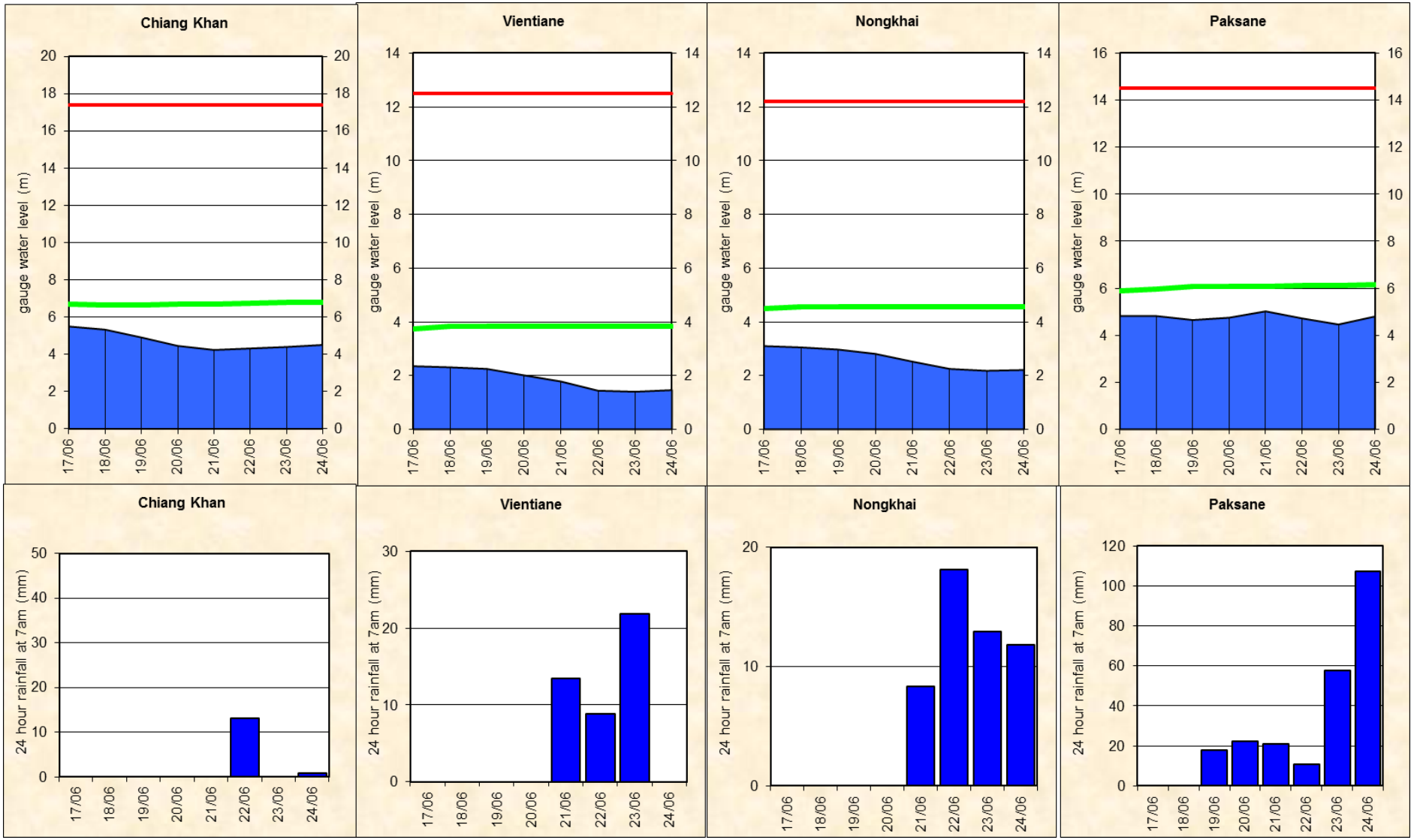


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

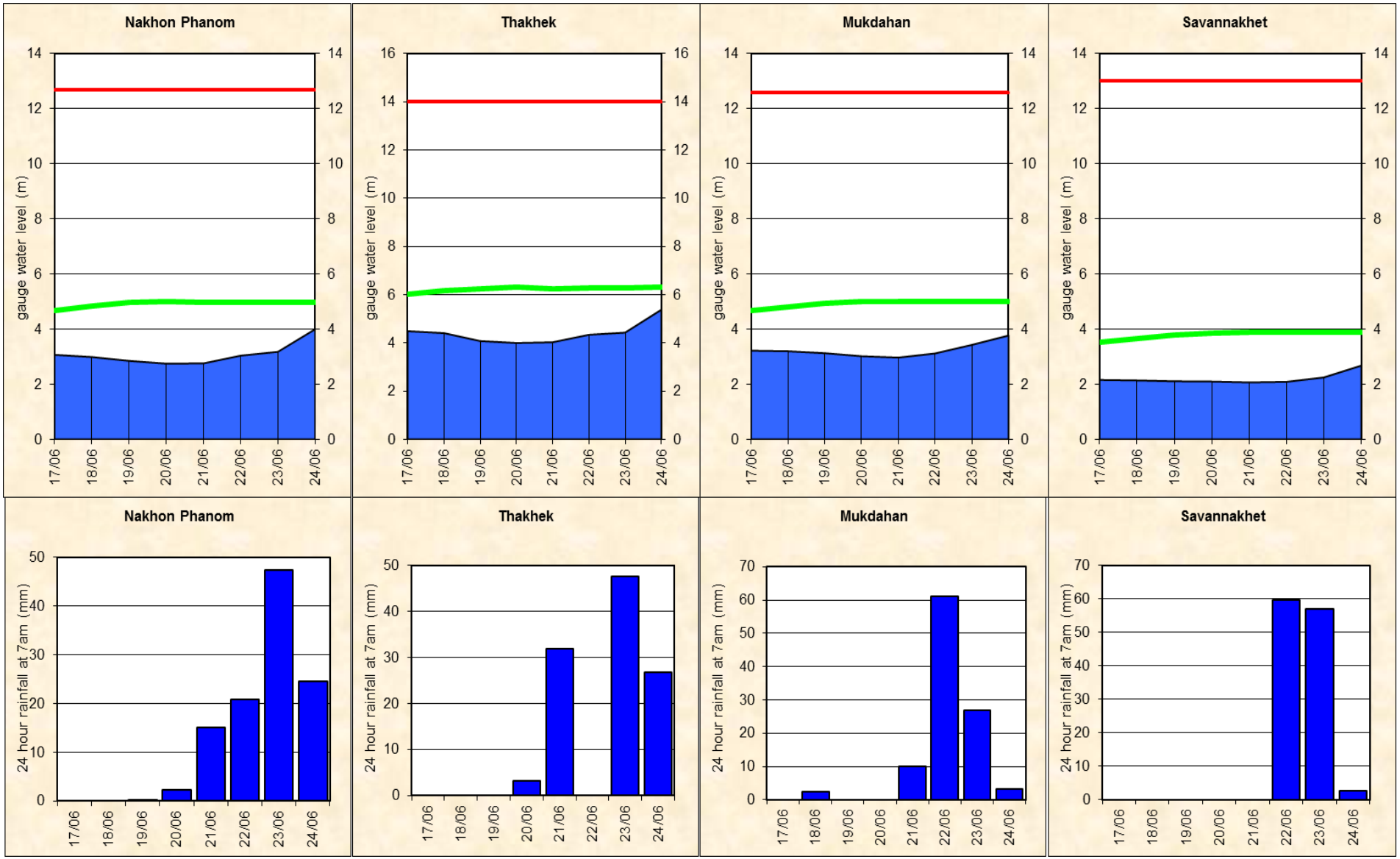


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

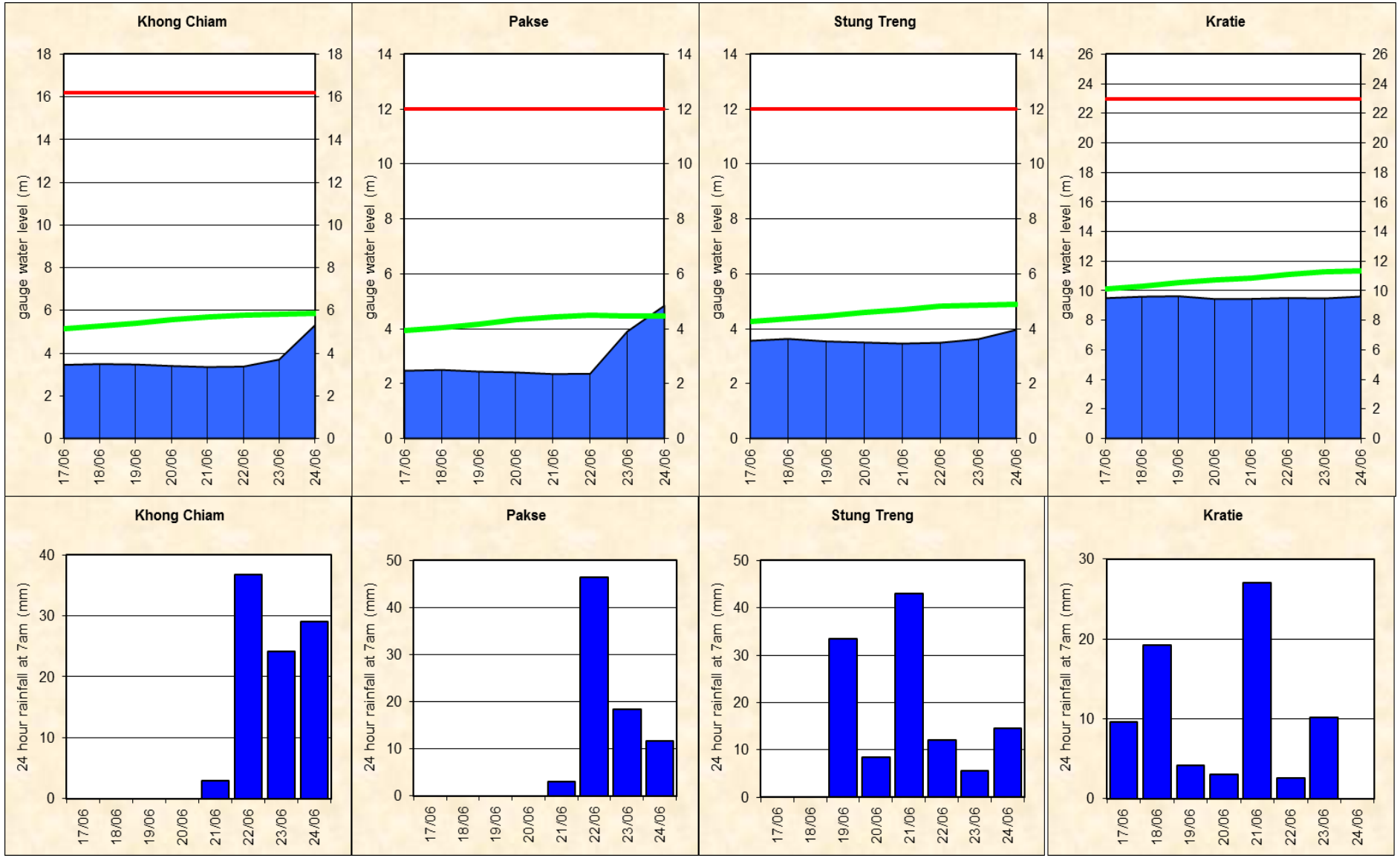


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

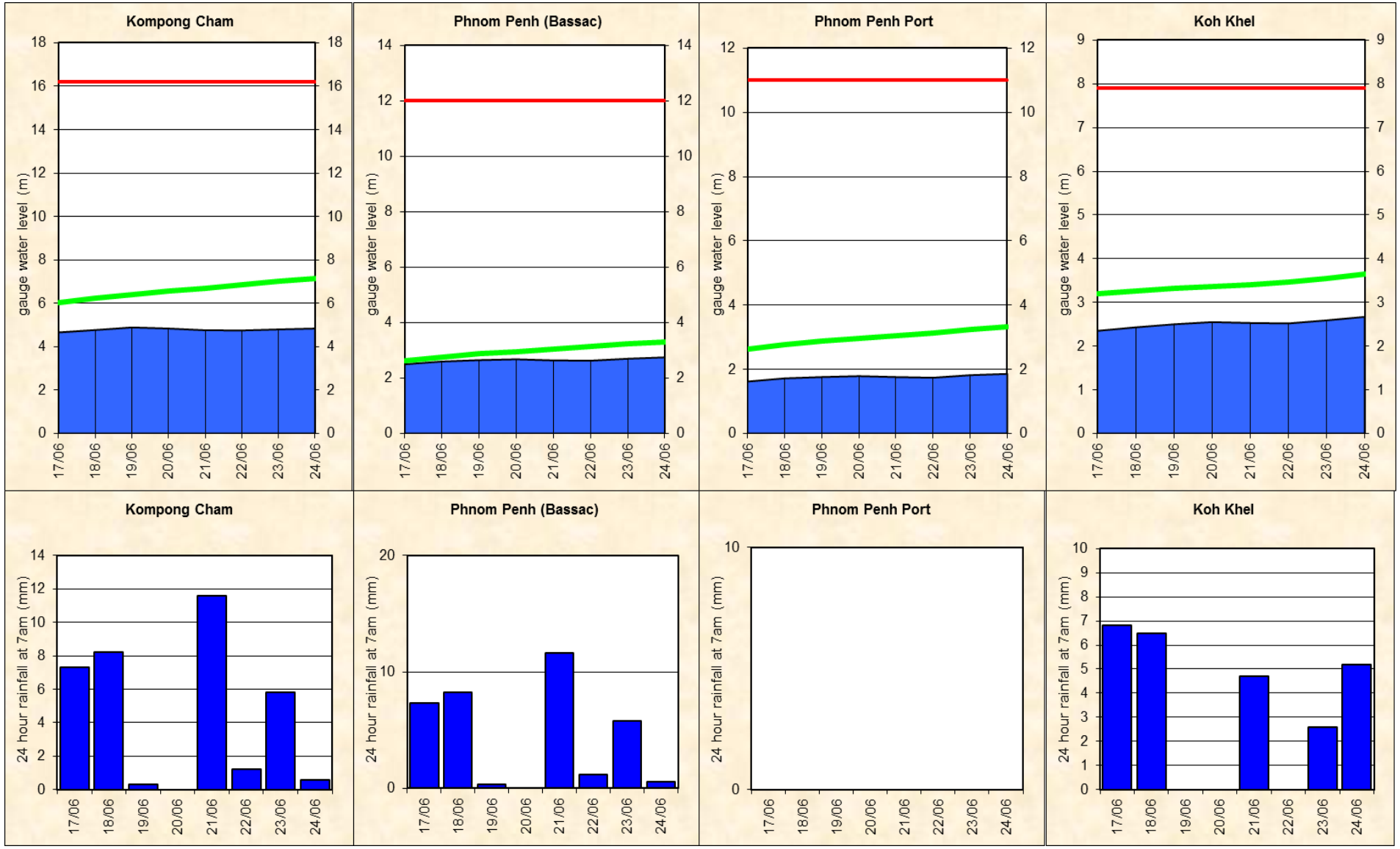
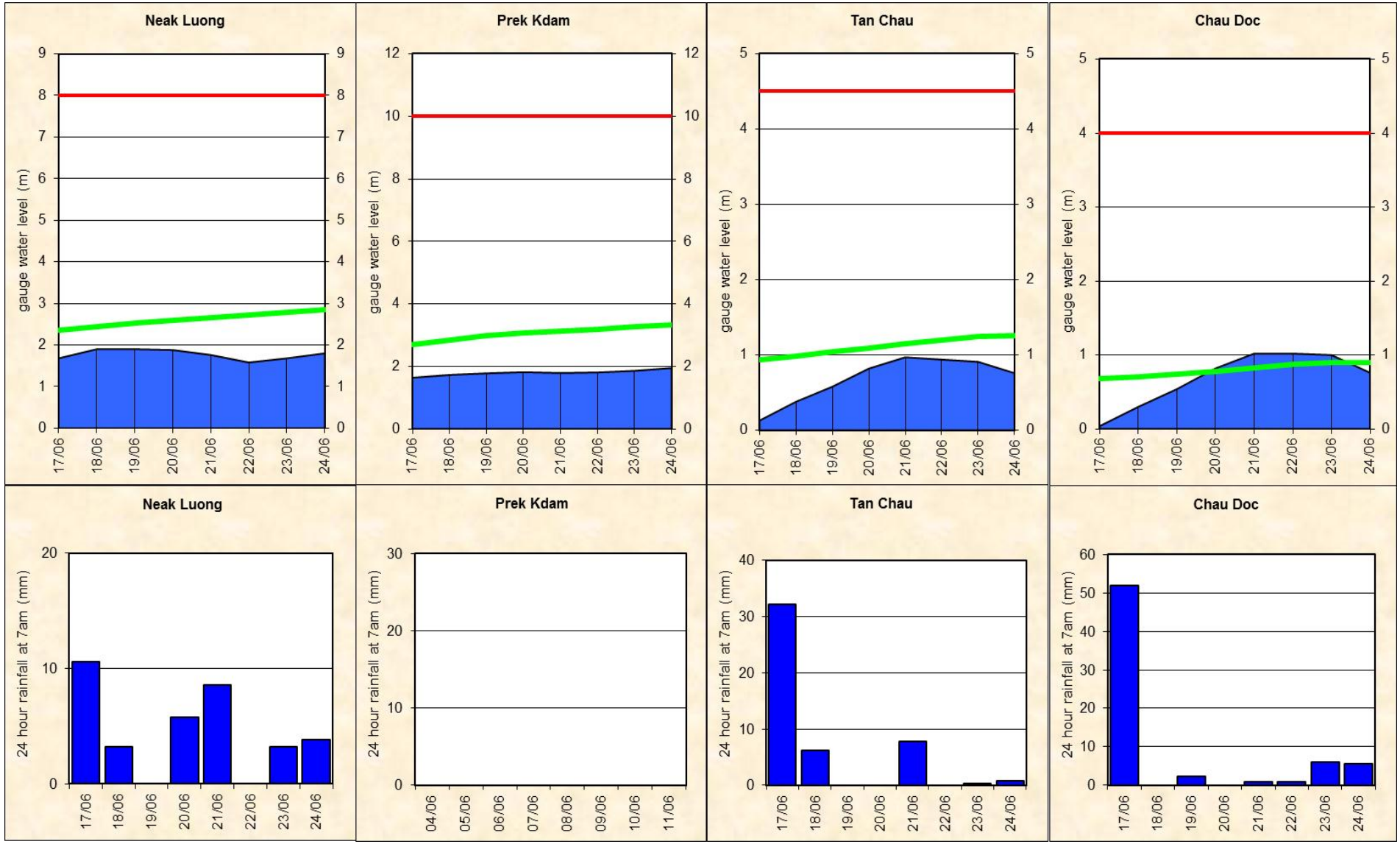


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



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 fairly good for 1-day to 5-day forecast lead time at stations in the upper and middle parts of the LMB. However, the accuracies at Vientian, Nongkhai and Kratie for 2-day to 5-day forecast were less than expected.

The above differences due to two main factors: (1) internal model functionality in forecasting; for which the parameter adjustment in the model is not possible; (2) the adjustment by utilizing the practical knowledge and experience of flood forecaster-in-charge.

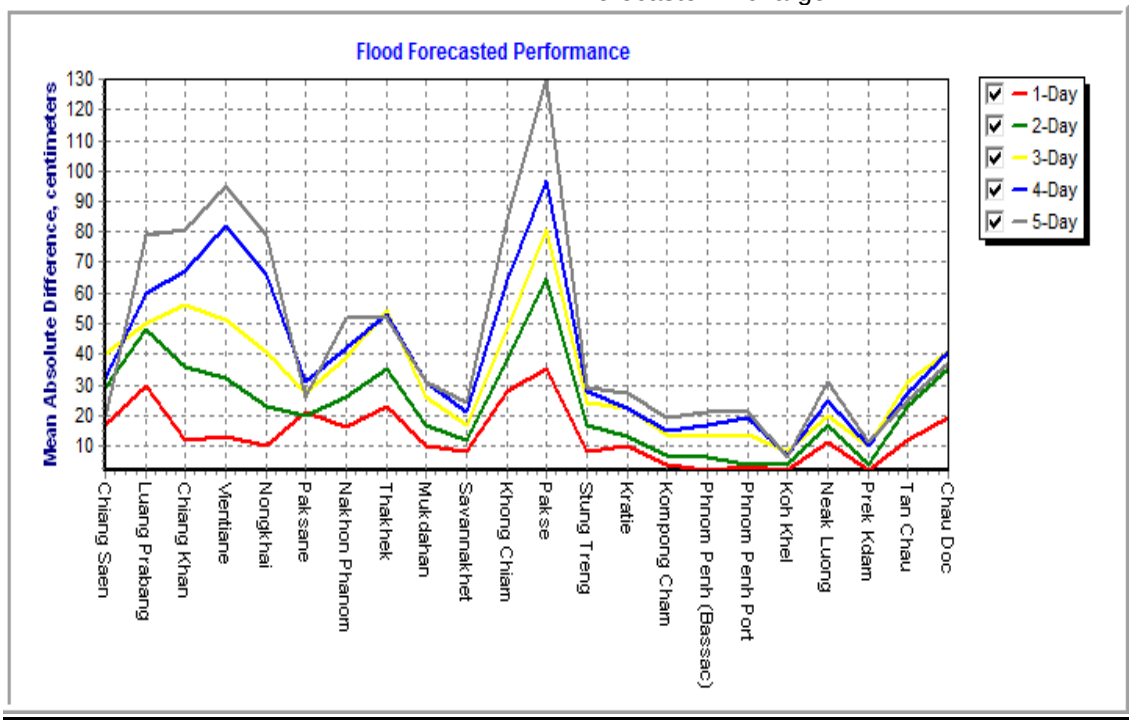


Figure B1: Average flood forecast accuracy along the Mekong mainstream

Forecast Achievement

The forecast achievement indicates the % of days that the forecast at a particular station for a lead-time is successful against a respective benchmark (Table B2).

Table B1: 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	71.4	85.7	57.1	71.4	28.6	71.4	57.1	57.1	85.7	71.4	71.4	57.1	42.9	85.7	100.0	100.0	100.0	42.9	100.0	42.9	28.6	***68.8***
2-day	100.0	83.3	50.0	50.0	66.7	66.7	50.0	33.3	66.7	83.3	66.7	66.7	83.3	83.3	100.0	83.3	100.0	100.0	33.3	100.0	16.7	0.0	***67.4***
3-day	60.0	60.0	40.0	60.0	40.0	20.0	60.0	40.0	60.0	80.0	60.0	60.0	60.0	60.0	100.0	40.0	20.0	80.0	20.0	60.0	20.0	20.0	***50.9***
4-day	100.0	75.0	25.0	50.0	25.0	75.0	75.0	75.0	75.0	100.0	75.0	50.0	100.0	100.0	100.0	25.0	75.0	75.0	50.0	100.0	25.0	0.0	***65.9***
5-day	100.0	33.3	33.3	33.3	0.0	100.0	66.7	66.7	66.7	100.0	66.7	33.3	66.7	100.0	100.0	66.7	66.7	100.0	33.3	100.0	66.7	33.3	***65.2***

Table B2: Benchmarks of success (Indicator of accuracy in mean absolute error)

	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

Unit in cm

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 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	*10:31*	*0*	*-*	*4*	*08:15*	*-*	*07:08*	*06:10*	*09:08*	*06:58*	*06:59*	*0*	*-*	*4*	*12*	*255*	*2*	*17*
month	*10:39*	*3*	*-*	*5*	*08:13*	*-*	*07:24*	*14:31*	*09:10*	*07:20*	*07:28*	*0*	*-*	*25*	*150*	*297*	*0*	*118*
season	*10:39*	*3*	*-*	*5*	*08:14*	*-*	*07:09*	*06:10*	*09:08*	*06:59*	*07:09*	*0*	*-*	*9*	*80*	*339*	*2*	*81*

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.

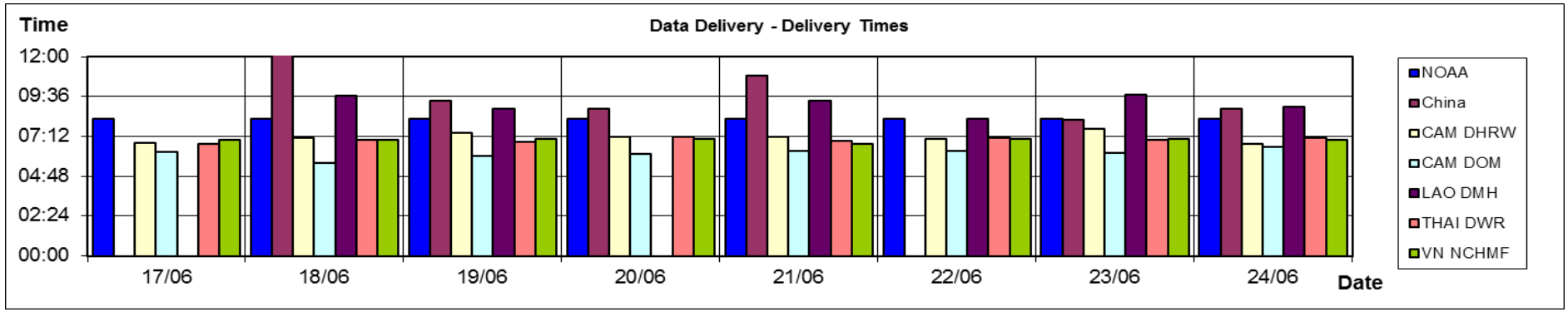


Figure B2: Data delivery times for the past 8 days including the current report date

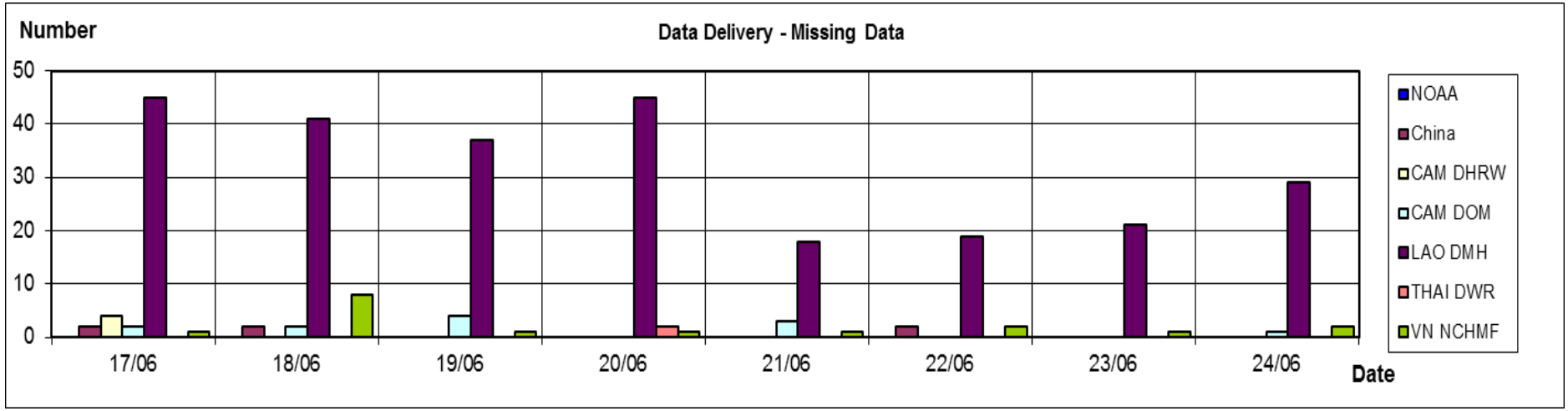


Figure B3: Missing data for the past 8 days including the current report date

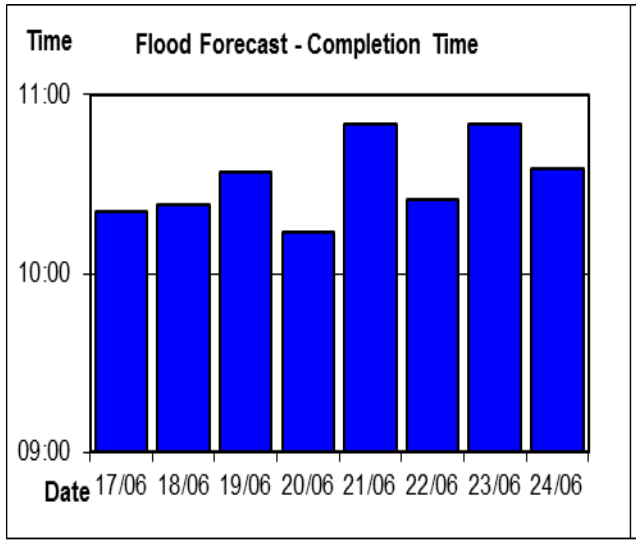


Figure B4: Flood forecast completion time

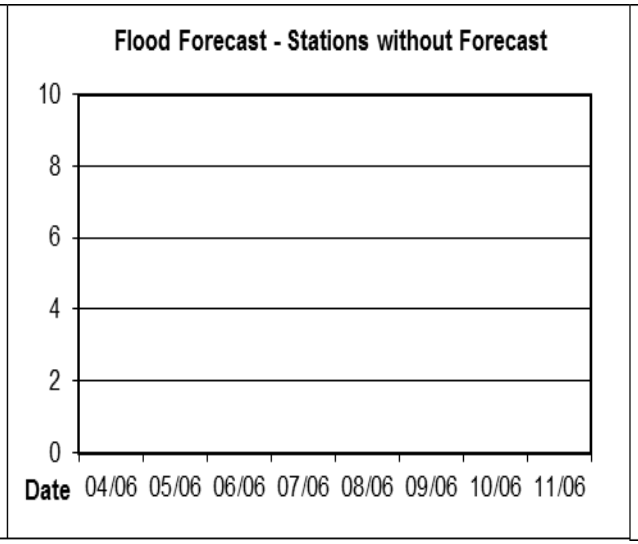


Figure B5: Flood forecast stations without forecast

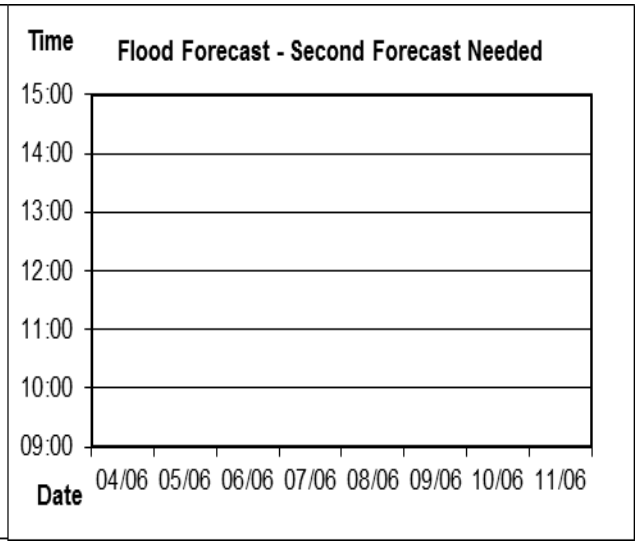


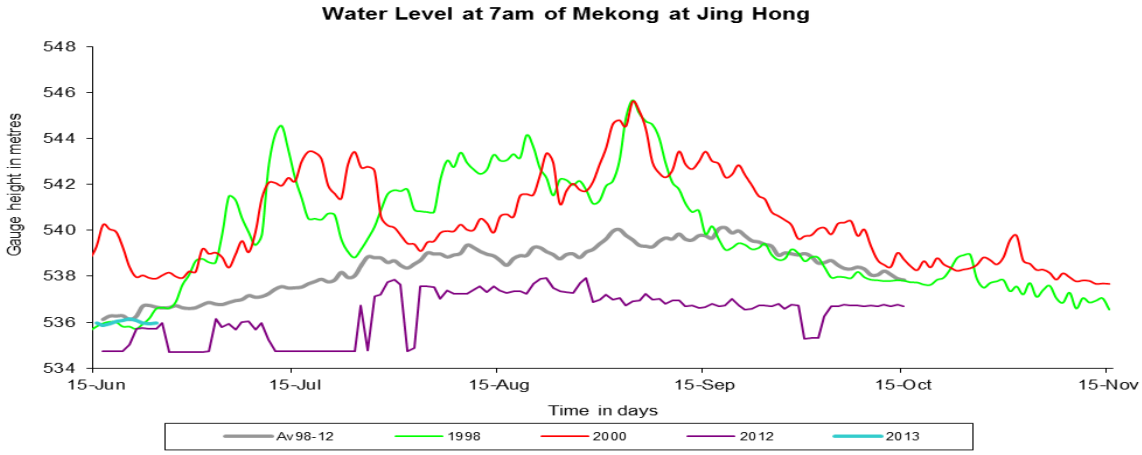
Figure B6: Second forecast needed

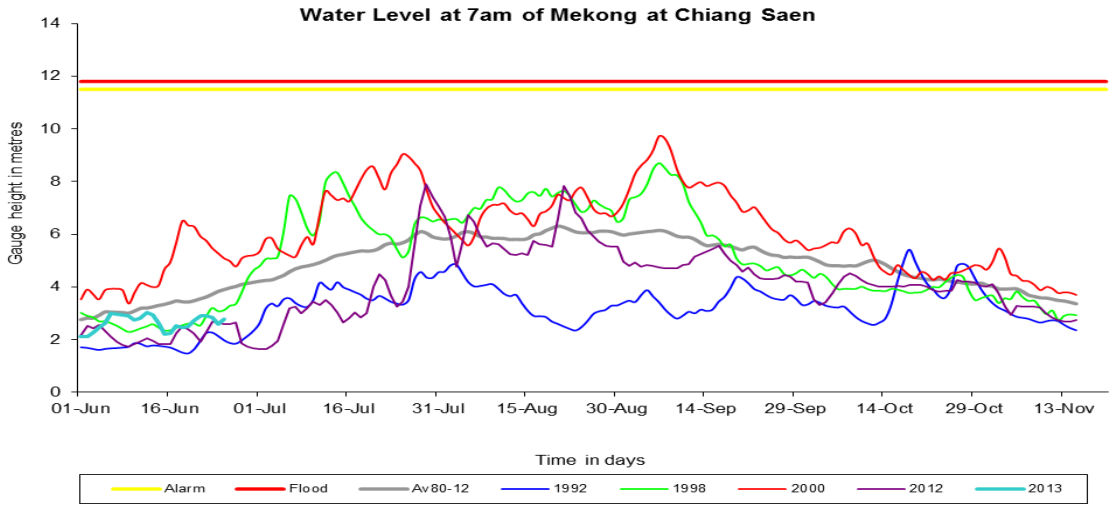
Annex C: Season Water Level Graphs

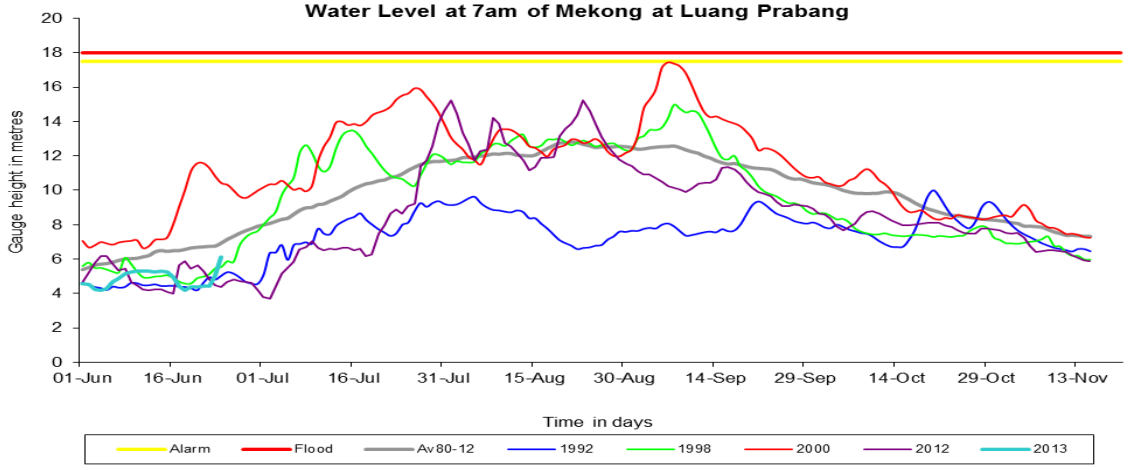
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

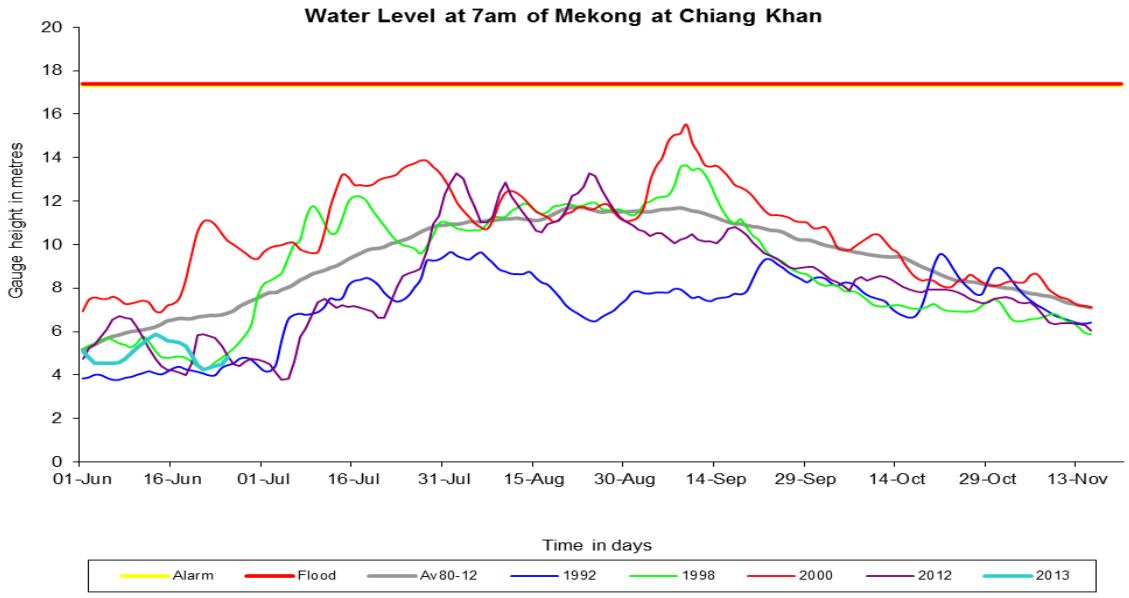
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

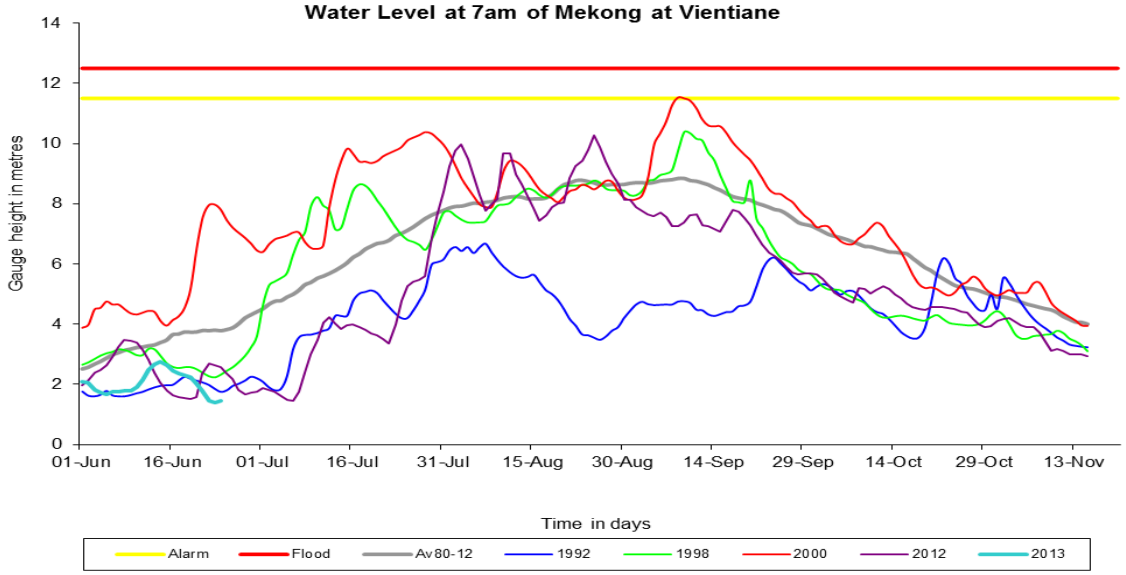
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

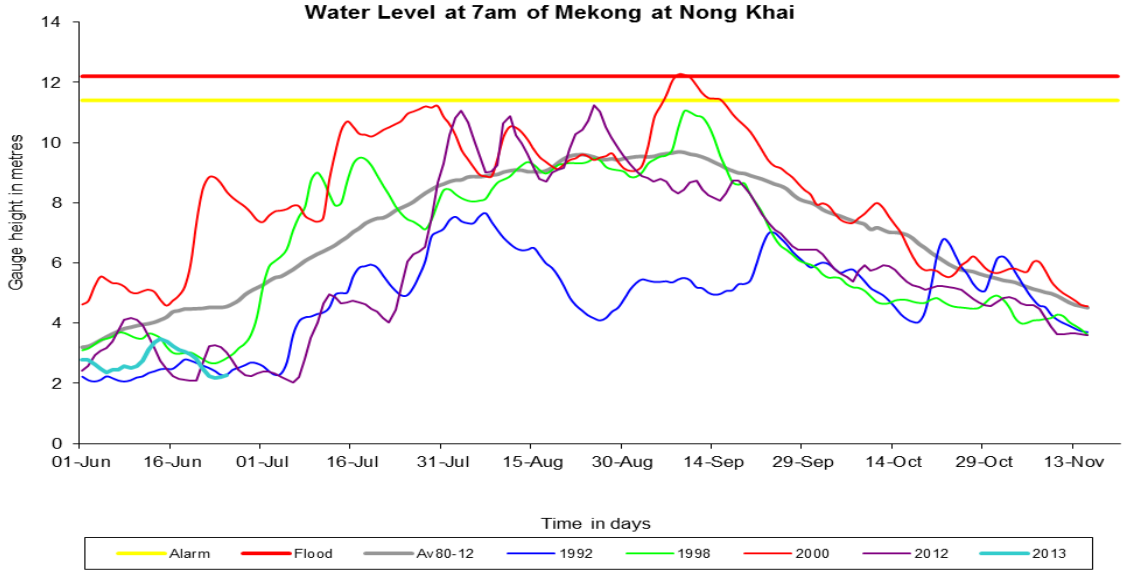


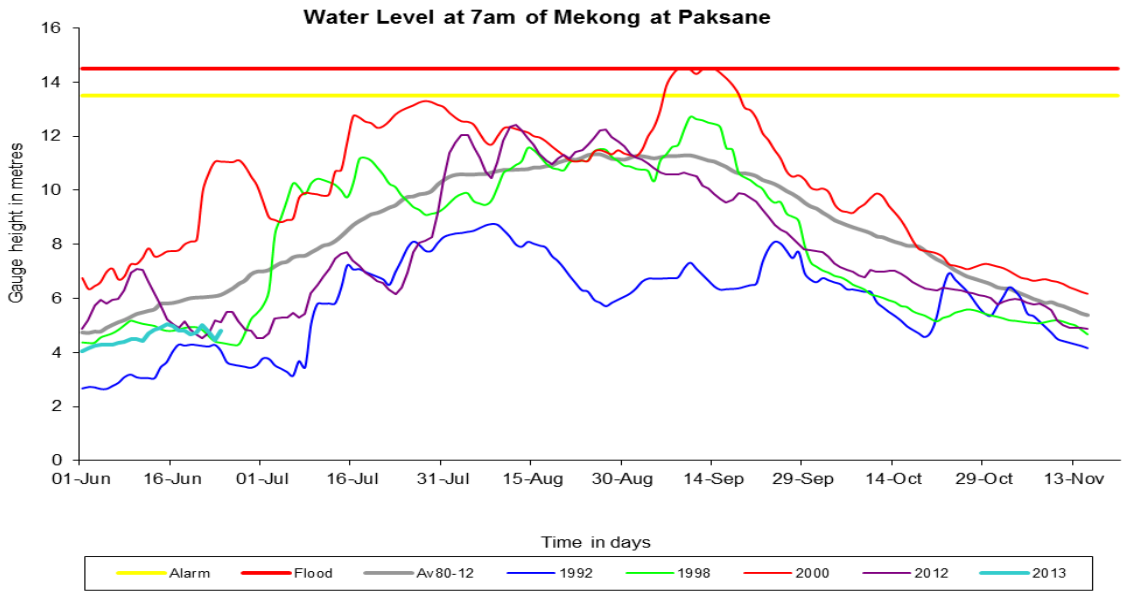


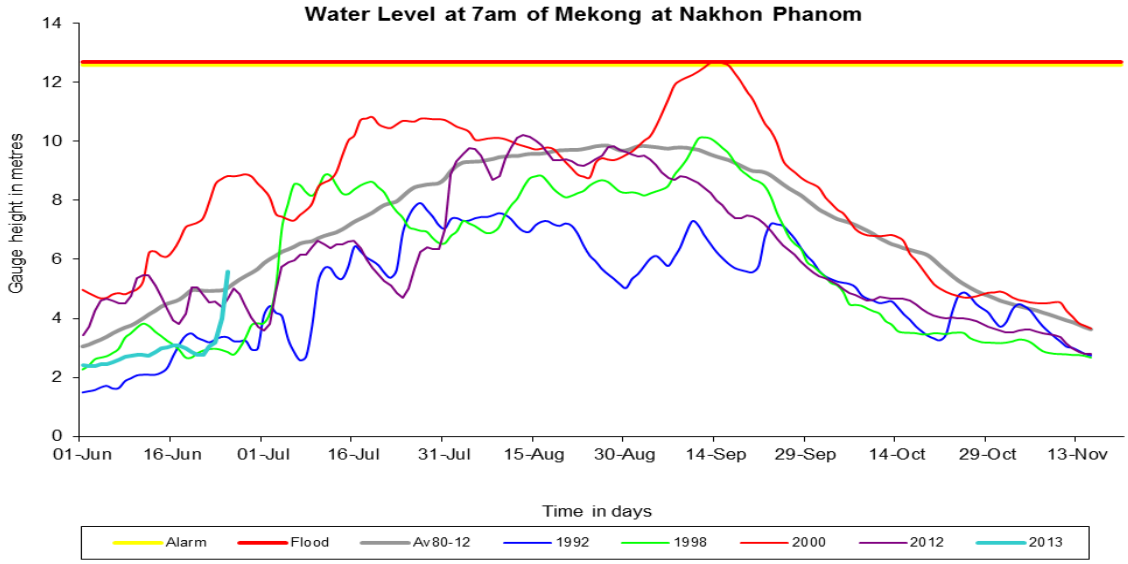


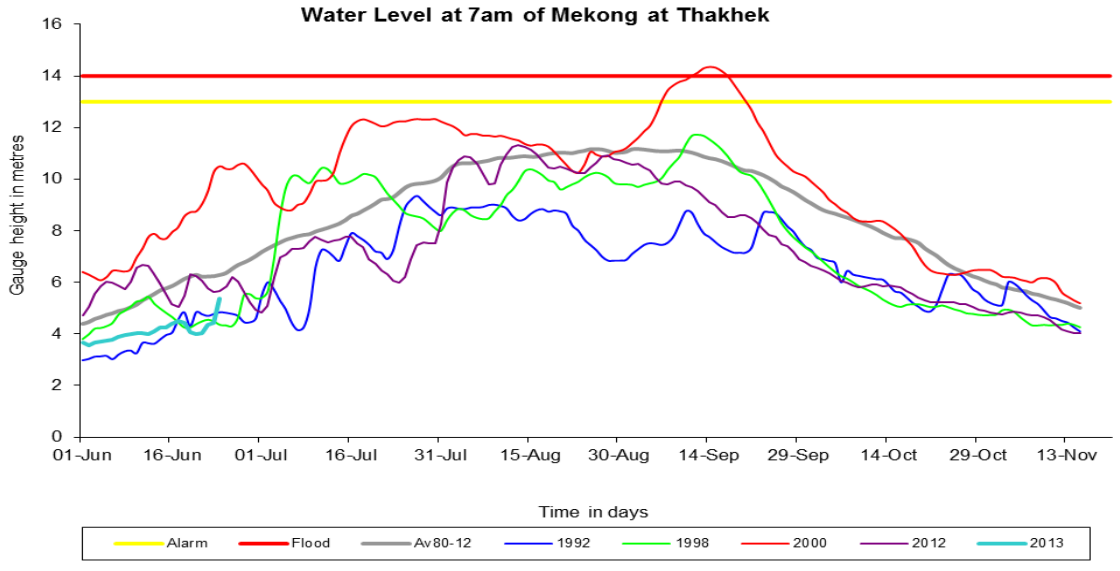

Water Level at 7am of Mekong at Chiang Khan
Gauge height in metres
20
18
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av 80-12
1992
1998
2000
2012
2013

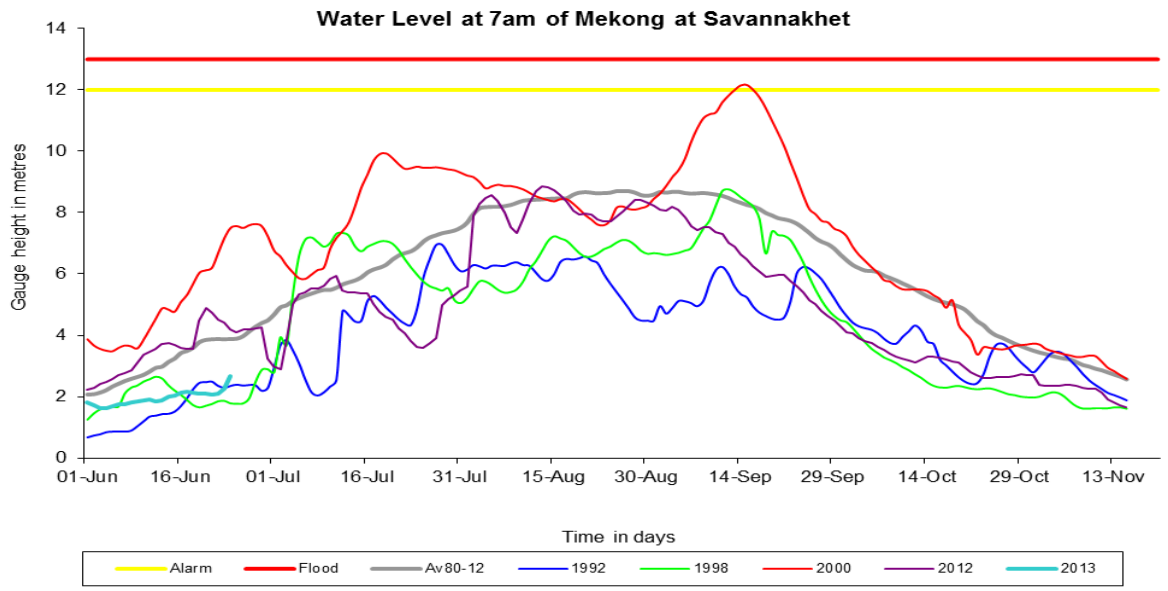

Water Level at 7am of Mekong at Vientiane
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av 80-12
1992
1998
2000
2012
2013

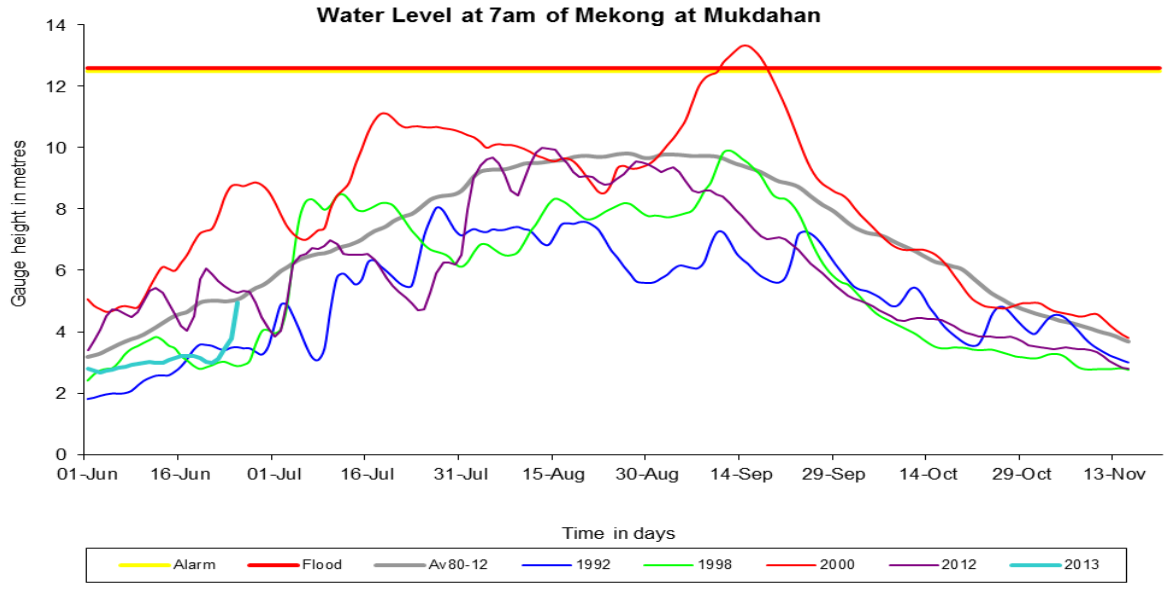

Water Level at 7am of Mekong at Nong Khai
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av 80-12
1992
1998
2000
2012
2013

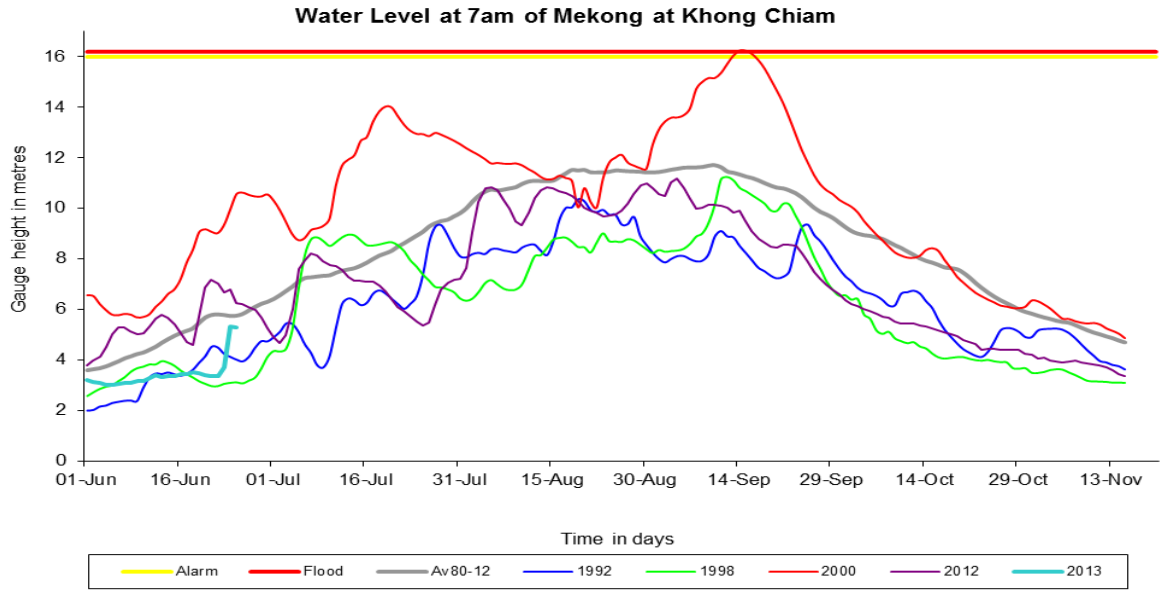

Water Level at 7am of Mekong at Paksane
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

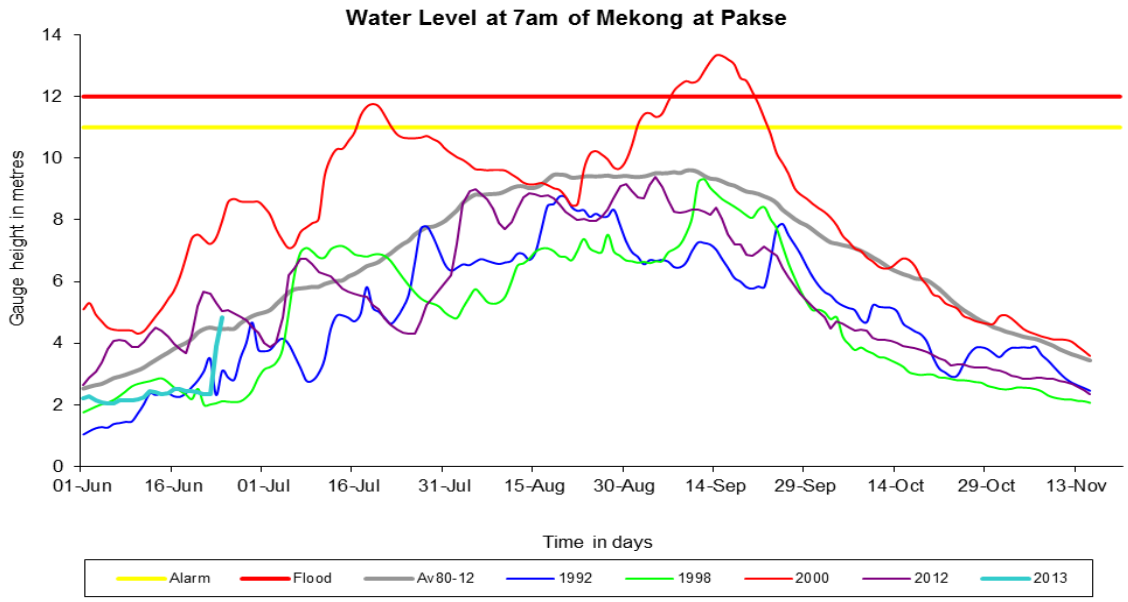

Water Level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

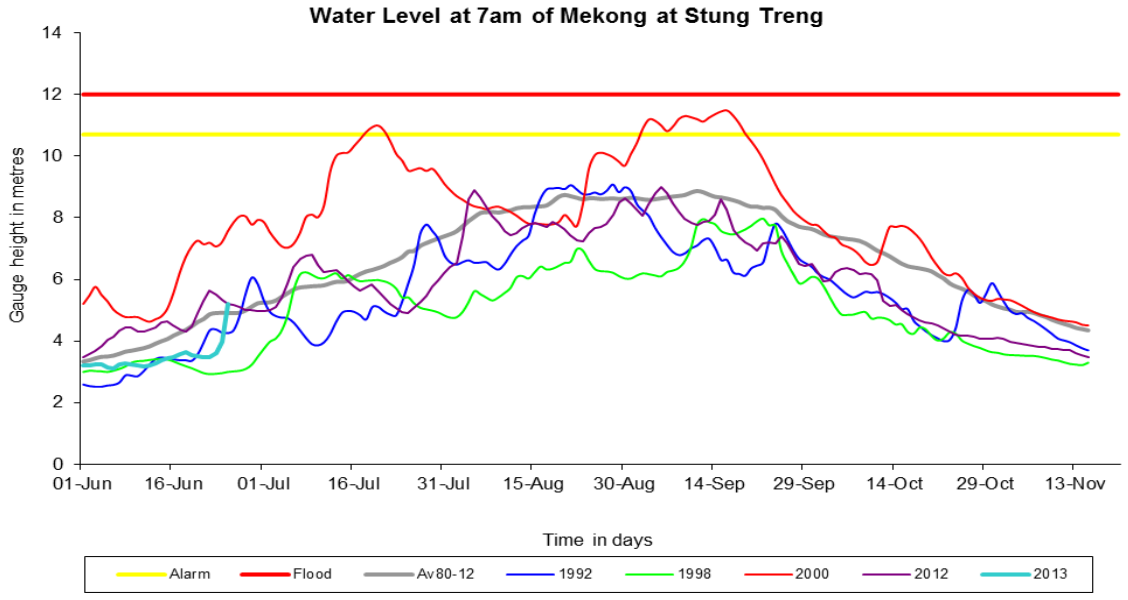

Water Level at 7am of Mekong at Thakhek
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

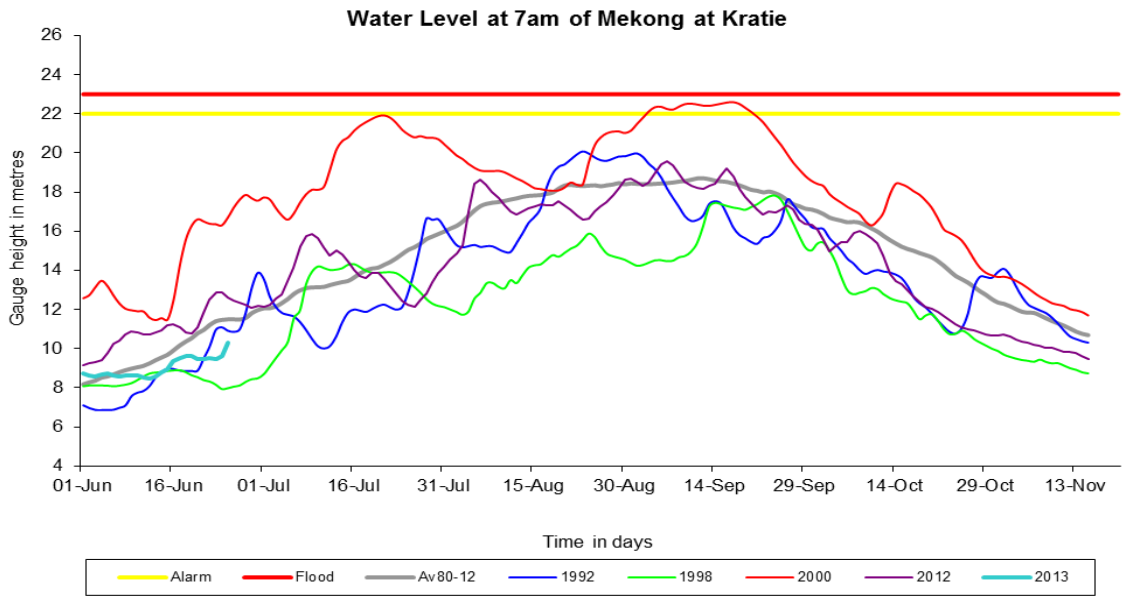

Water Level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

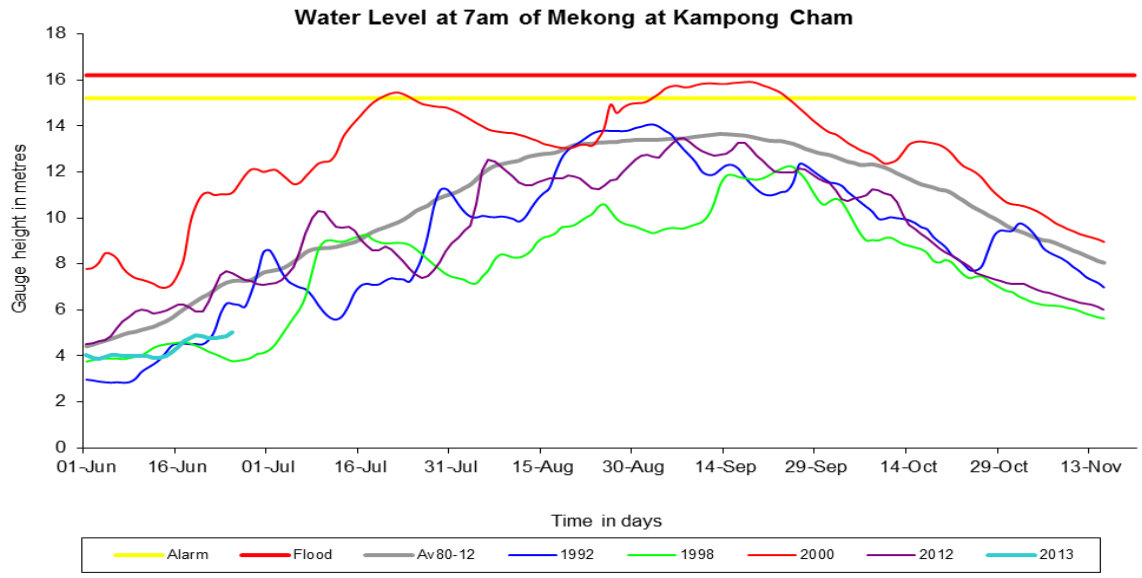

Water Level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

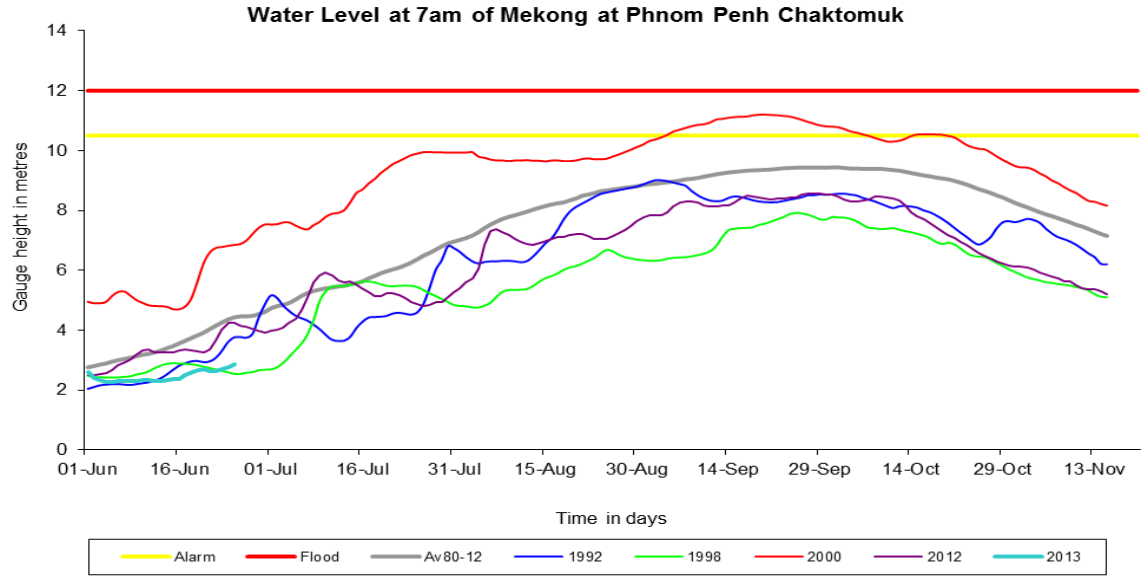

Water Level at 7am of Mekong at Khong Chiam
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

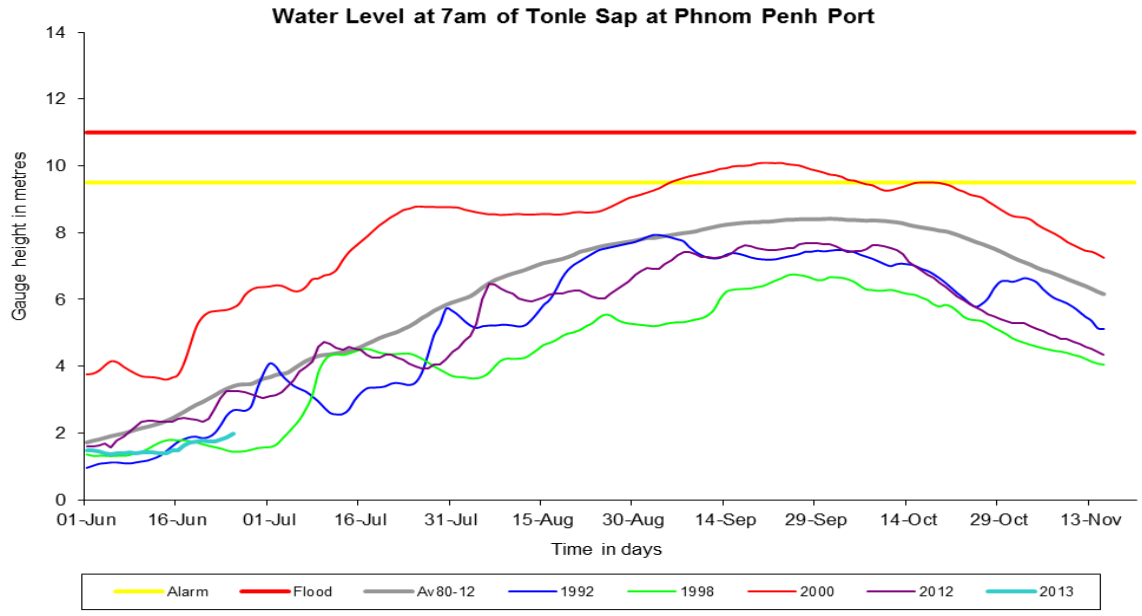

Water Level at 7am of Mekong at Pakse
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

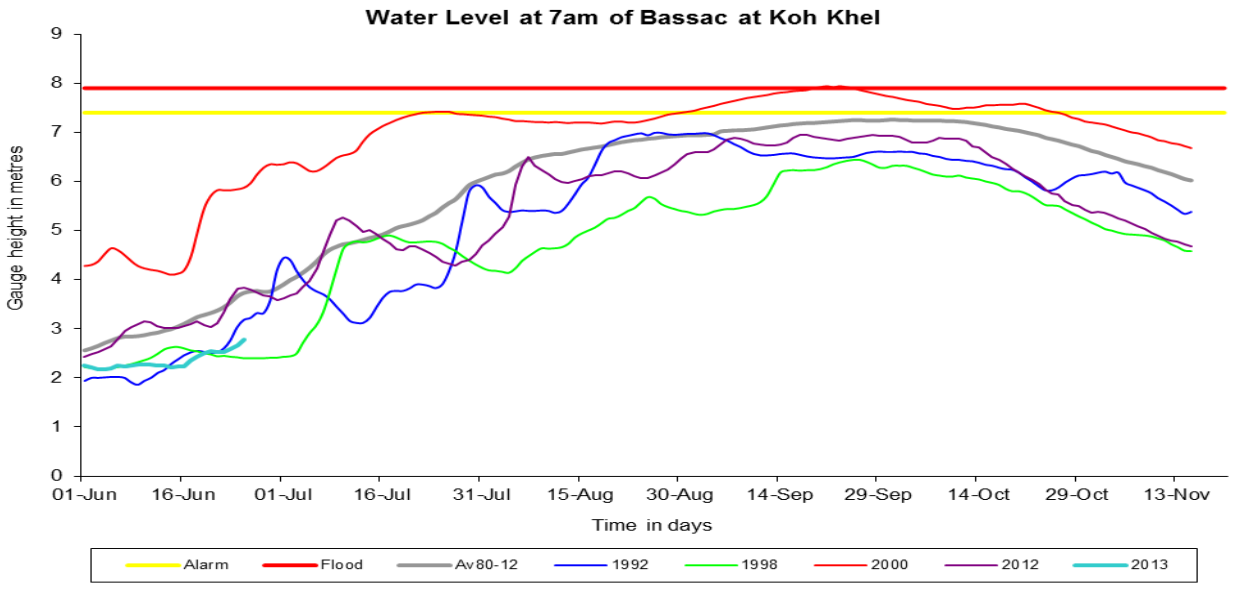

Water Level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

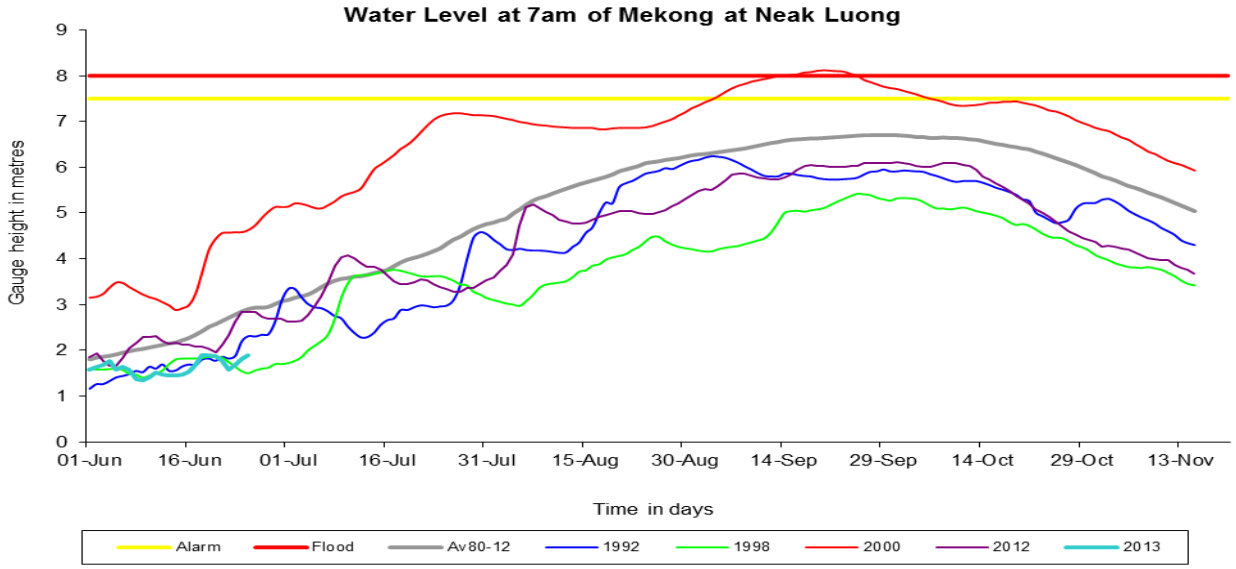

Water Level at 7am of Mekong at Kratie
Gauge height in metres
4
6
8
10
12
14
16
18
20
22
24
26
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

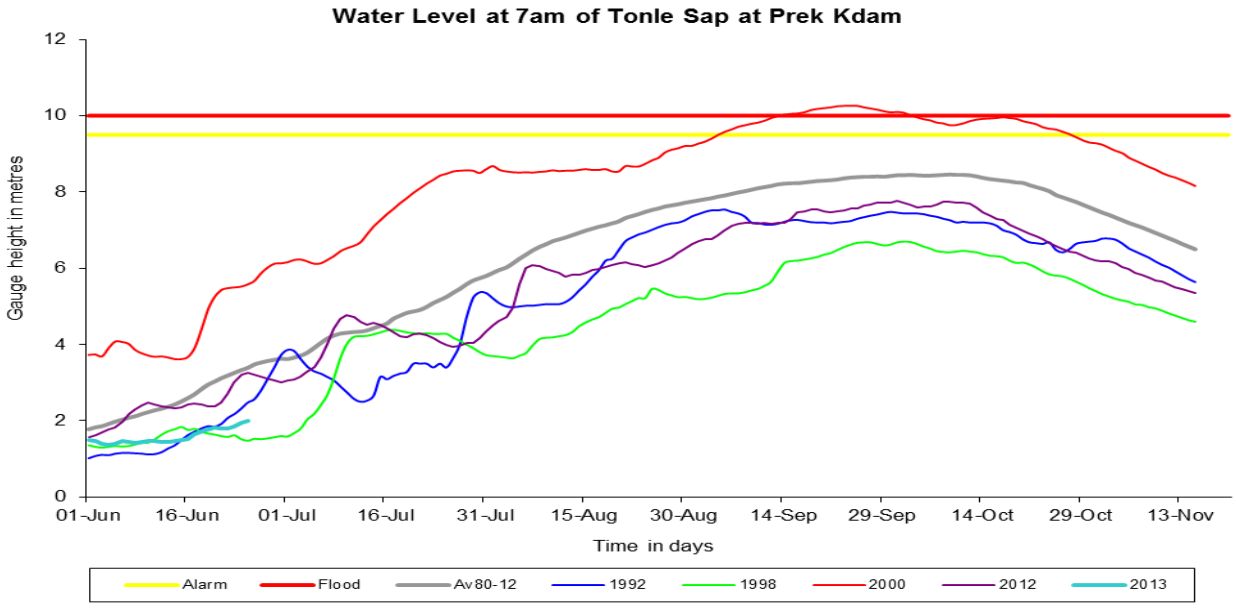

Water Level at 7am of Mekong at Kampong Cham
Gauge height in metres
0
2
4
6
8
10
12
14
16
18
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

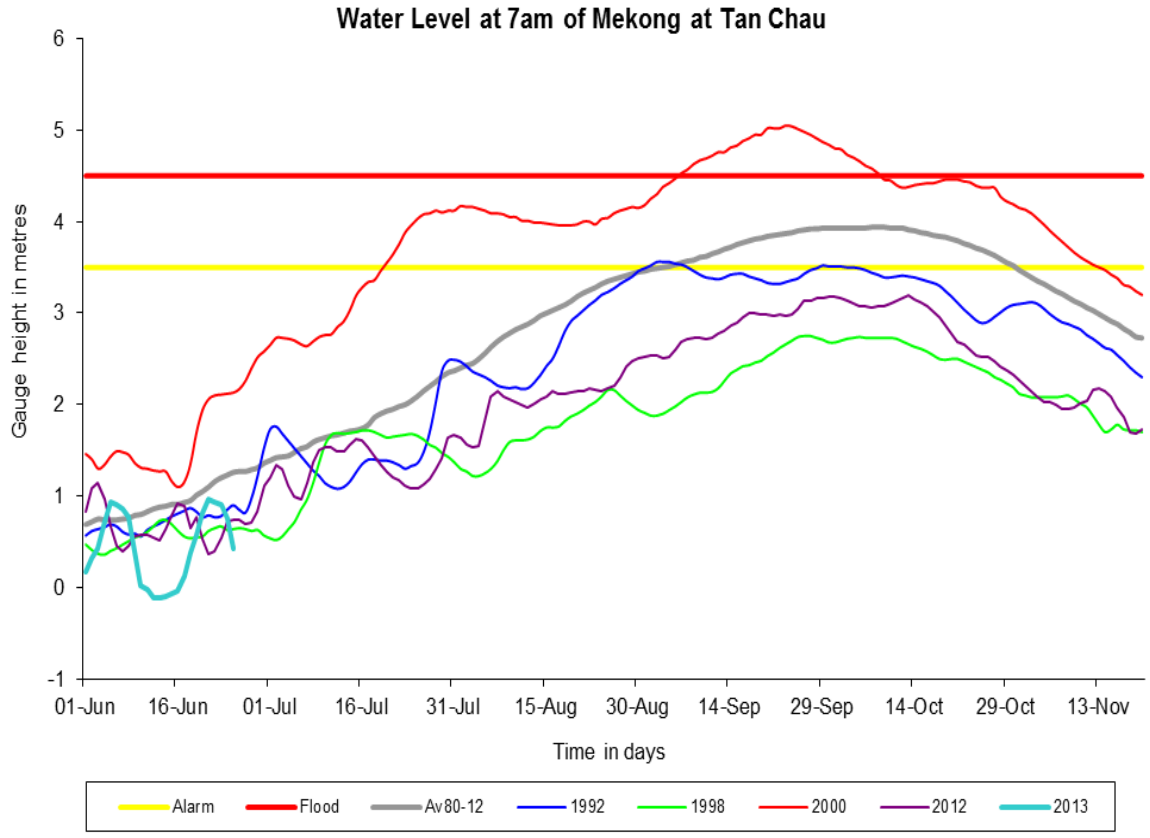

Water Level at 7am of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

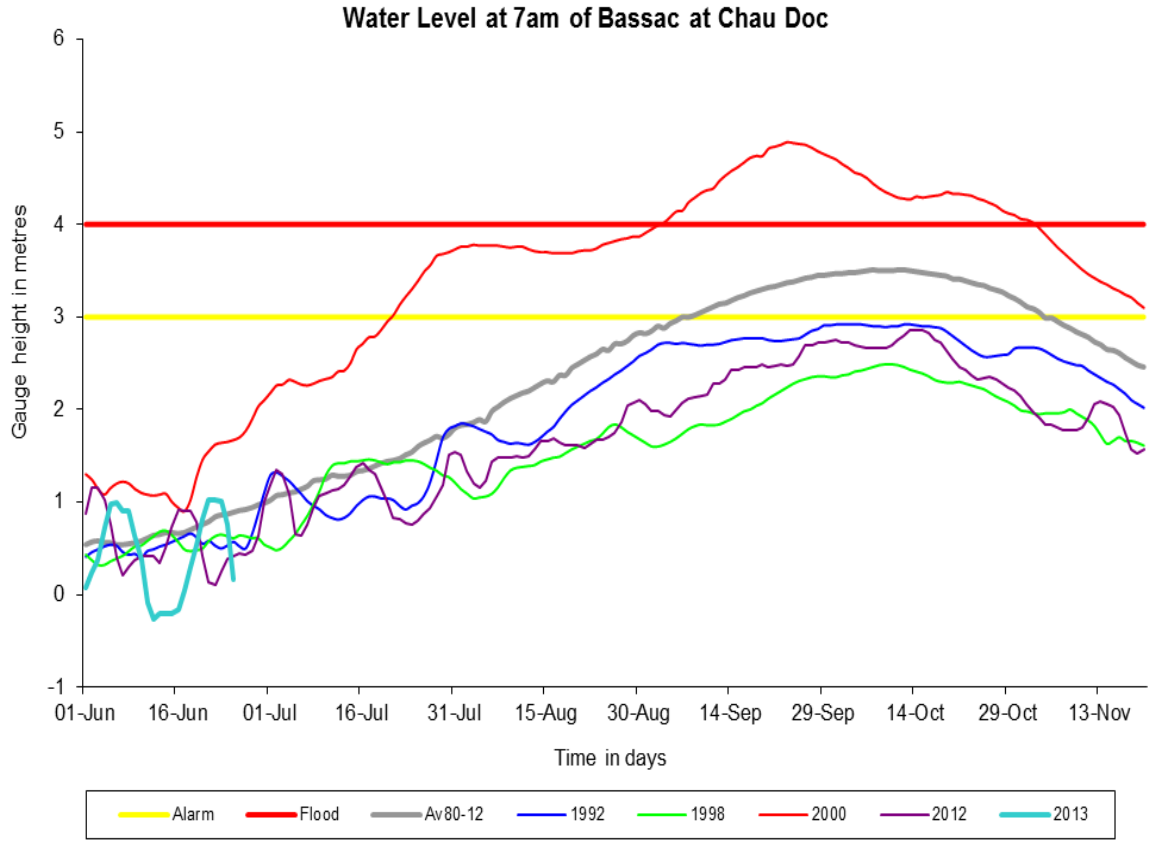

Water Level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


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