Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 27/08/2012, covering the week from the 20th August to the 26th August 2012

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

General weather patterns

During the week of 20th to 26th August 2012, four weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 21st August to the 25th August bulletins are presented in the figures below:

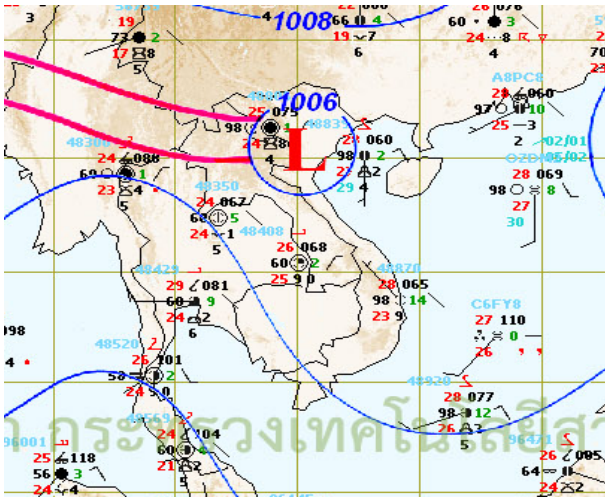


Figure 1: Weather map for 21st August 2012

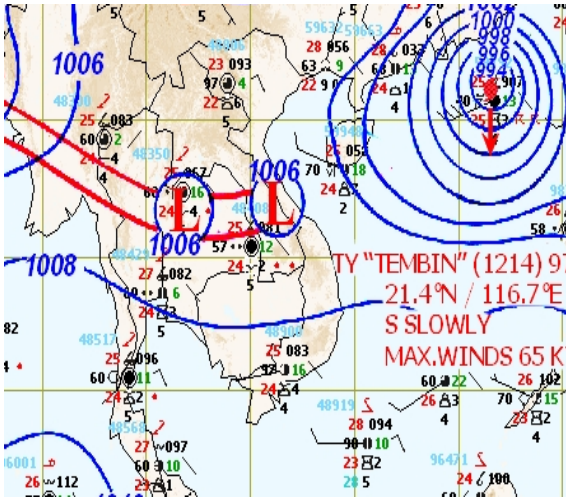


Figure 2: Weather map for 25th August 2012

South-West (SW) Monsoon

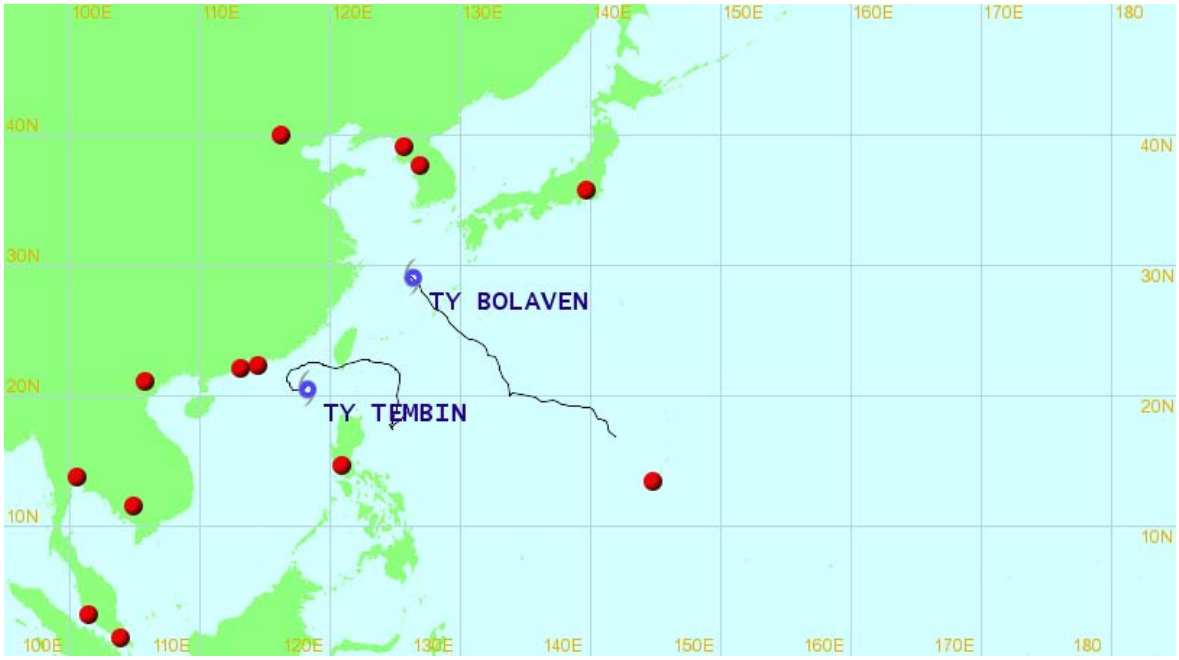
Moderate SW monsoon prevailed over Amanda Sea and the Gulf of Thailand and was stationary in the whole last week (Figure 1and 2).

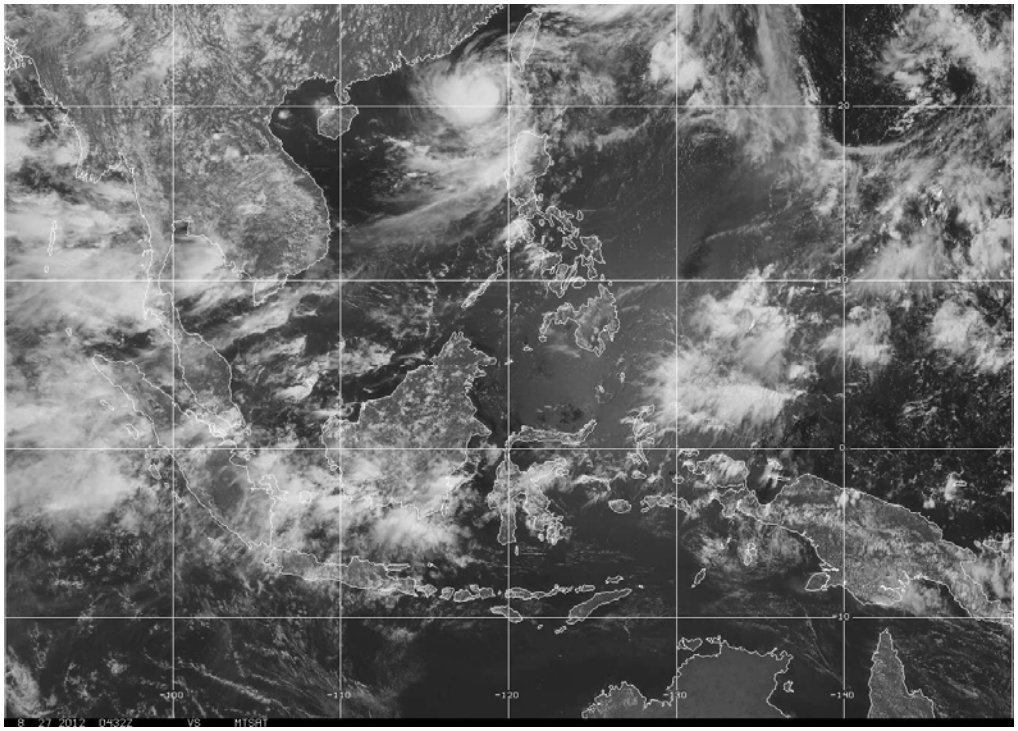
Inter Tropical Convergence Zone (ITCZ)

Inter Tropical Convergence Zone (ITCZ) was observed during last week. It swing from the North to central of Vietnam and Lao PDR during last week.

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

During last week, two Typhoon (TY) named “TEMBIN” (1214) and “BOLAVEN” (1215) were formed in the East of the Philippines on 19th and 20th August 2012, respectively. TEMBIN moved westward to the South of Taiwan while BOLAVEN moved northward to China, Korea and Japan. Figure 3 shows a Storm Track, Satellite image and weather chart of TAMBIN and BOLAVEN Typhoons.


100E
110E
120E
130E
140E
150E
160E
170E
180
40N
30N
20N
10N
TY BOLAVEN
TY TEMBIN



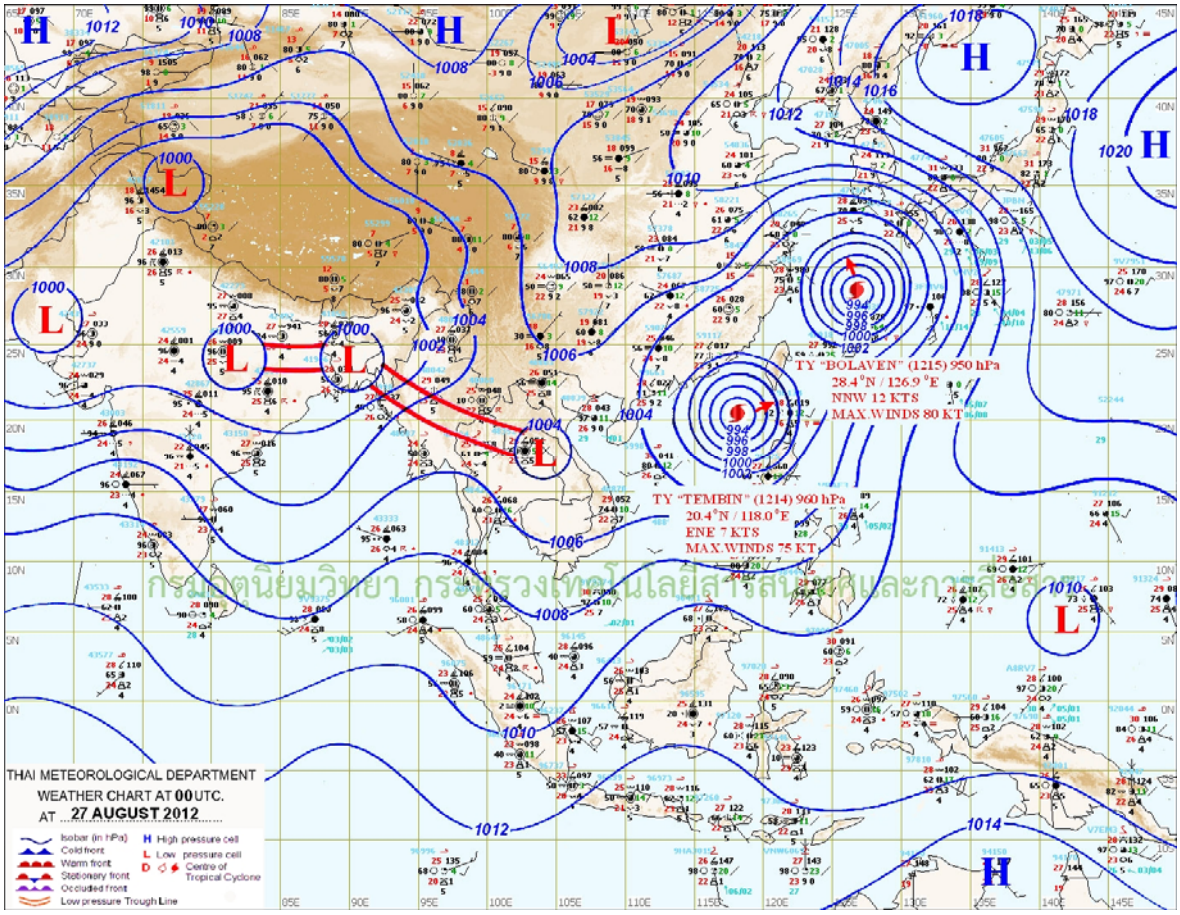


Figure 3: Storm Track, Satellite image and weather chart of TAMBIN and BOLAVEN Typhoons

Source: http://severe.worldweather.wmo.int/tc/wnp/
http://www.goes.noaa.gov/sohemi/SHGMSVSW.JPG
http://www.tmd.go.th/programs%5Cuploads%5Cmaps%5C2012-08-27_TopChart_07.jpg

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Overall weather situation

A normal weather situation lasted during last week in the LMB. As a result of ITCZ and SW monsoon activity, scattered thunder shower with heavy rain occurred in the North, Northeast of Thailand, the Central of Lao PDR, the Central and South of Vietnam, in the East of Cambodia. Figure 4 illustrates rainfall amount distribution over the LMB, covering 21 – 27 August 2012, in which heavy rain was observed in some tributaries in the upper part of Luang Prabang, in the middle part of LMB from Paksane to Savannakhet.

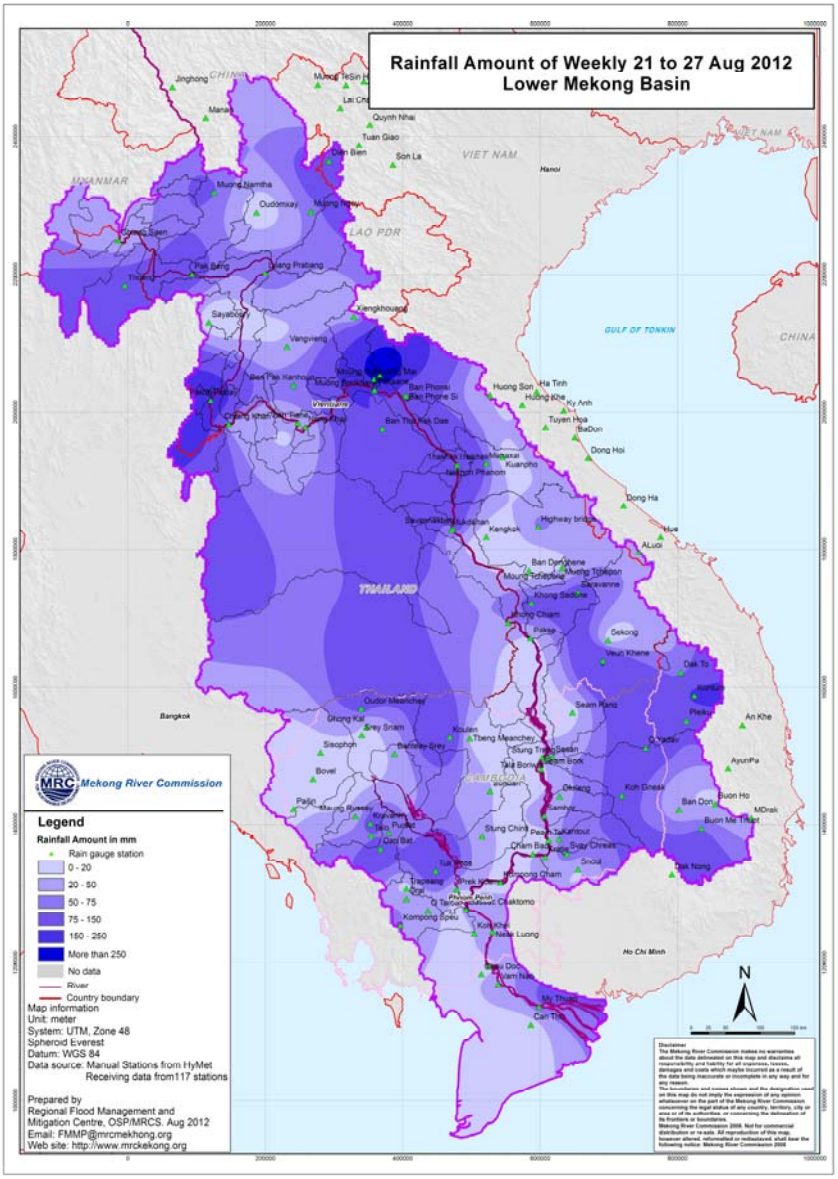


Figure 4: Rainfall distribution over the LMB, from 21st August to the 27th August 2012

General behaviour of the Mekong River

Water levels at Chiang Sean till Nongkhai stations were recessing during last week and were around the long-term average for this time of the year, while those at Paksane till Thakhek were rising during last week above the long-term average for this time of the year by the influence of ITCZ that appeared during the reporting period. The rest were rising during last week below the long-term average for this time of the year.

Regarding to 2 stations in downstream at Tan Chau and Chau Doc, water levels at those 2 stations showed a small rising trend in last week. These stations were recording levels that are below the long-term average for this time of the year.

For stations from Chiang Saen to Paksane

During the monitoring period, water levels in the mainstream of the Mekong at Chiang Saen till Nongkhai were recessing during last week around the long-term average for this time of the year, while water level

at Paksane were rising above the long-term average for this time of the year due to heavy rain occurrence in their tributaries caused by ITCZ.

For stations from Nakon Phanom/ Thakhek to Pakse

Water levels at Nakon Phanom and Thakhek were stable at the beginning and then rising at the end of last week above the long-term average for this time of the year, while those at Mukdahan till Pakse were rising but below the long-term average for this time of the year.

For stations from Stung Treng to Kompong Cham

Water levels showed rising during last week due to heavy rainfall occurrence in the eastern part of Cambodia. These stations were recording levels that are below the long-term average for this time of the year at the end of last week.

For stations from Phnom Penh to Koh Khel. Neak Luong

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

Tan Chau and Chau Doc

Water levels showed an increasing trend during last week. Both stations were recording levels that are below the long-term average for this time of the year and significantly affected by tidal effects.

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
20/08	537.66	6.62	13.60	11.57	8.05	9.14	11.32	9.41	10.50	9.08	7.98	10.02	8.27	7.62	17.33	11.82	7.22	6.27	6.20	5.05	6.12	2.15	1.62
21/08	537.88	7.83	13.89	12.22	8.86	9.80	11.16	9.34	10.40	9.04	7.93	9.92	8.12	7.43	17.10	11.73	7.22	6.27	6.20	5.05	6.15	2.15	1.59
22/08	537.91	7.47	14.34	12.35	9.24	10.27	11.40	9.21	10.30	8.88	7.78	9.81	8.00	7.25	16.80	11.51	7.13	6.17	6.16	5.05	6.11	2.17	1.63
23/08	537.49	6.83	15.25	12.66	9.42	10.43	11.50	9.18	10.24	8.79	7.70	9.68	8.02	7.23	16.60	11.30	7.05	6.08	6.10	5.00	6.08	2.16	1.67
24/08	537.34	6.59	14.58	13.27	9.80	10.74	11.69	9.26	10.23	8.82	7.72	9.70	7.98	7.50	16.62	11.23	7.03	6.04	6.06	4.97	6.03	2.15	1.68
25/08	537.32	6.15	13.81	13.15	10.28	11.24	11.92	9.38	10.45	8.98	7.86	9.75	7.95	7.65	17.01	11.41	7.03	6.04	6.07	4.98	6.07	2.17	1.70
26/08	537.27	5.93	13.09	12.48	9.89	11.02	12.22	9.52	10.63	9.15	8.02	9.92	8.10	7.69	17.26	11.61	7.16	6.17	6.12	5.02	6.14	2.20	1.75
27/08	537.70	5.73	12.58	12.03	9.40	10.52	12.25	9.81	10.89	9.37	8.23	10.16	8.32	7.80	17.49	11.68	7.24	6.28	6.18	5.06	6.21	2.29	1.87
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

2011	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
20/08	19.0	16.8	1.4	0.0	8.3	0.8	nr	22.2	16.0	14.5	15.2	0.0	nr	nr	nr	8.2	nr	-	nr	nr	12.3	nr	-
21/08	1.0	2.0	nr	0.0	nr	0.8	13.8	4.0	2.0	0.0	0.0	0.0	nr	2.5	16.8	nr	1.7	-	nr	nr	nr	nr	-
22/08	0.0	0.0	2.4	0.0	nr	0.0	nr	3.3	1.8	0.0	1.2	0.0	nr	4.0	nr	1.5	nr	-	nr	3.8	nr	nr	-
23/08	44.0	5.2	40.8	2.3	3.2	3.0	6.8	14.9	24.5	0.0	8.2	4.9	nr	2.0	4.2	nr	20.3	-	18.0	37.8	17.4	2.2	-
24/08	0.0	3.5	nr	3.4	0.0	2.3	0.4	0.2	1.4	0.0	nr	0.0	nr	22.0	nr	nr	nr	-	1.8	0.2	nr	0.0	13.0
25/08	0.0	0.2	12.6	33.4	18.2	14.3	25.6	46.6	52.4	15.1	62.6	17.7	nr	nr	7.4	nr	nr	-	nr	nr	nr	14.5	-
26/08	0.0	14.5	9.2	7.3	7.2	5.2	96.0	10.4	8.8	2.3	10.8	21.6	11.4	nr	4.4	11.8	0.3	-	nr	nr	nr	nr	3.0
27/08	0.0	6.2	nr	2.1	nr	1.6	8.0	70.3	51.9	12.1	36.8	1.7	5.5	31.0	1.8	1.2	nr	-	0.3	5.6	6.2	0.0	-

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

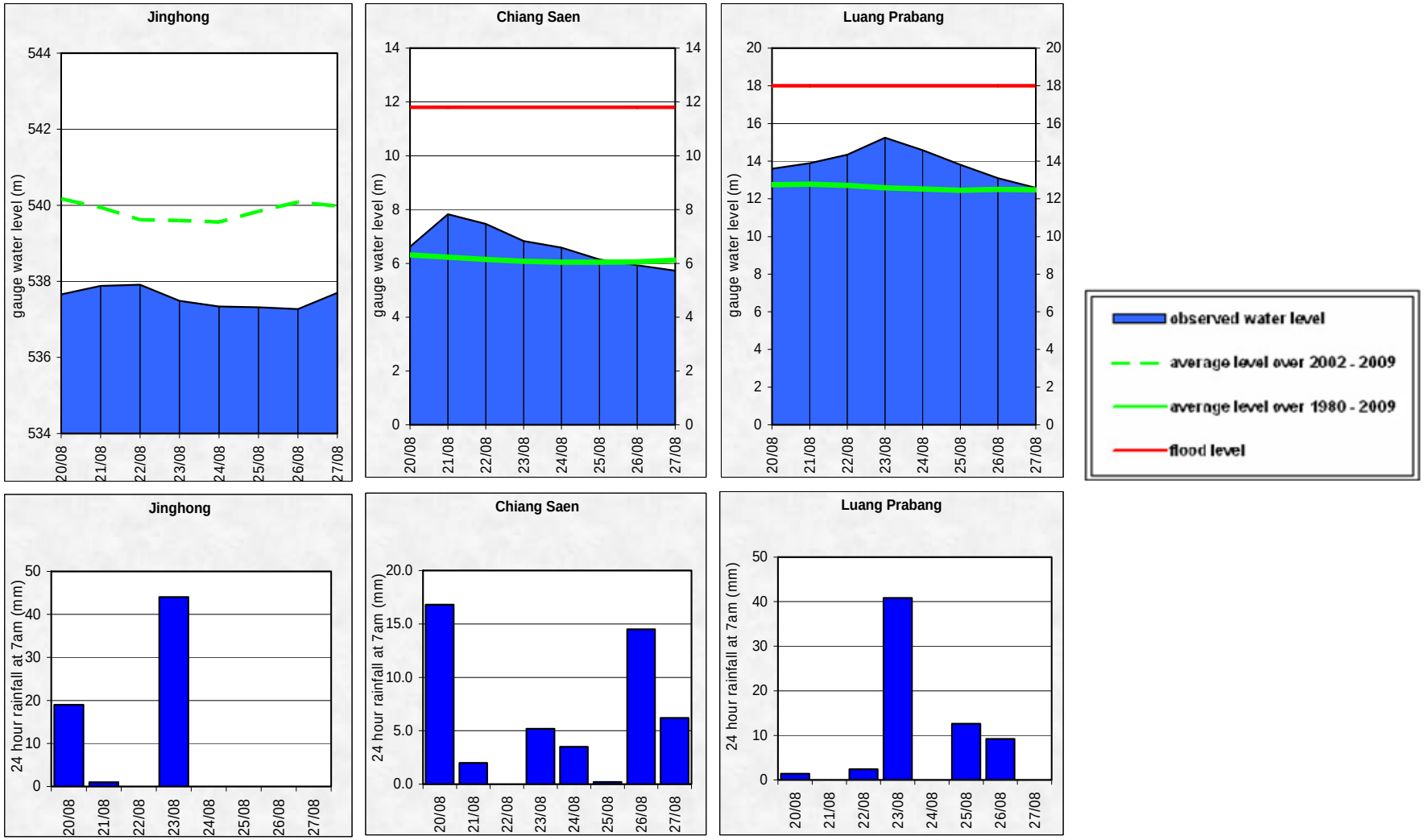


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

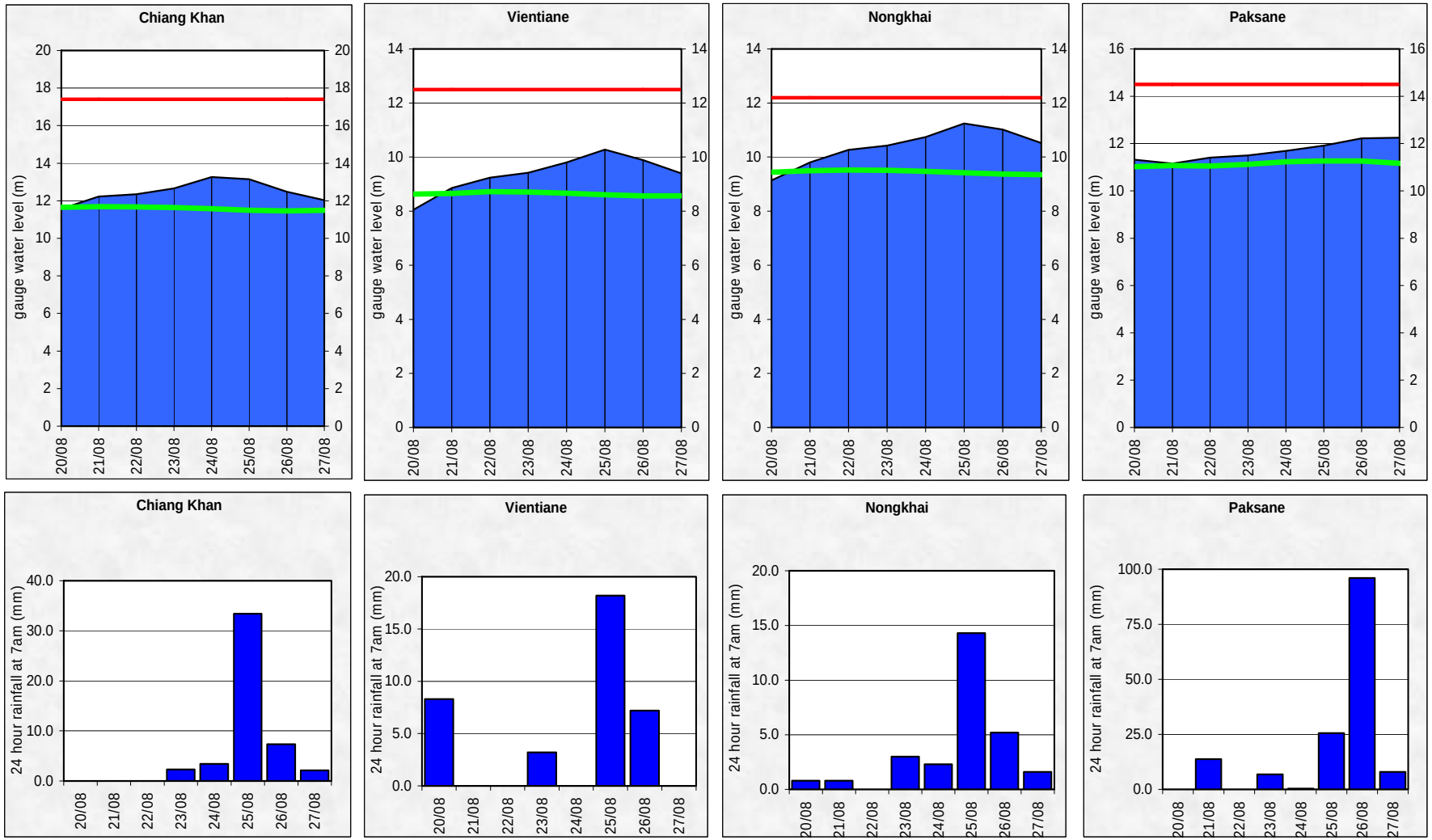


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

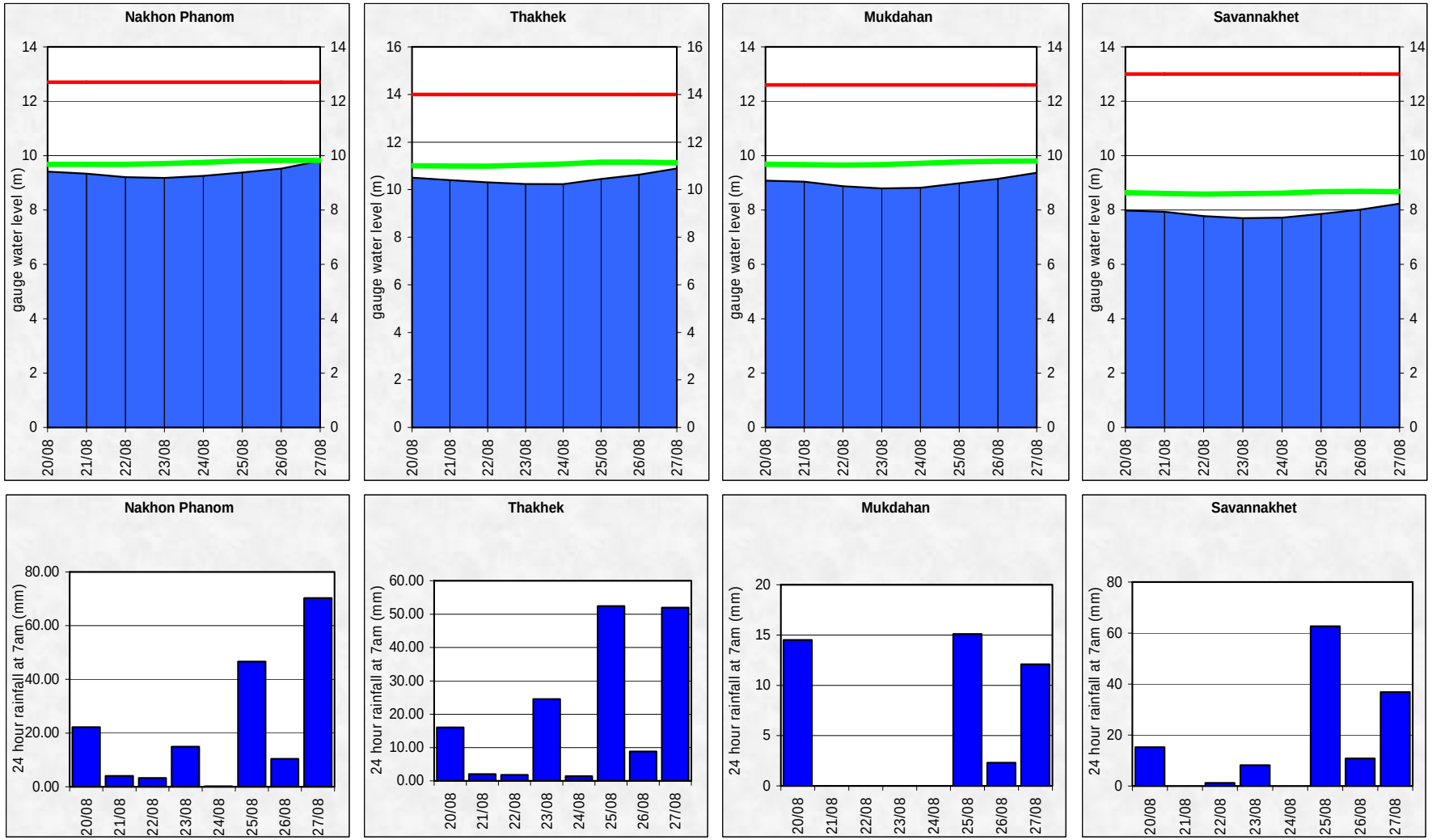


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

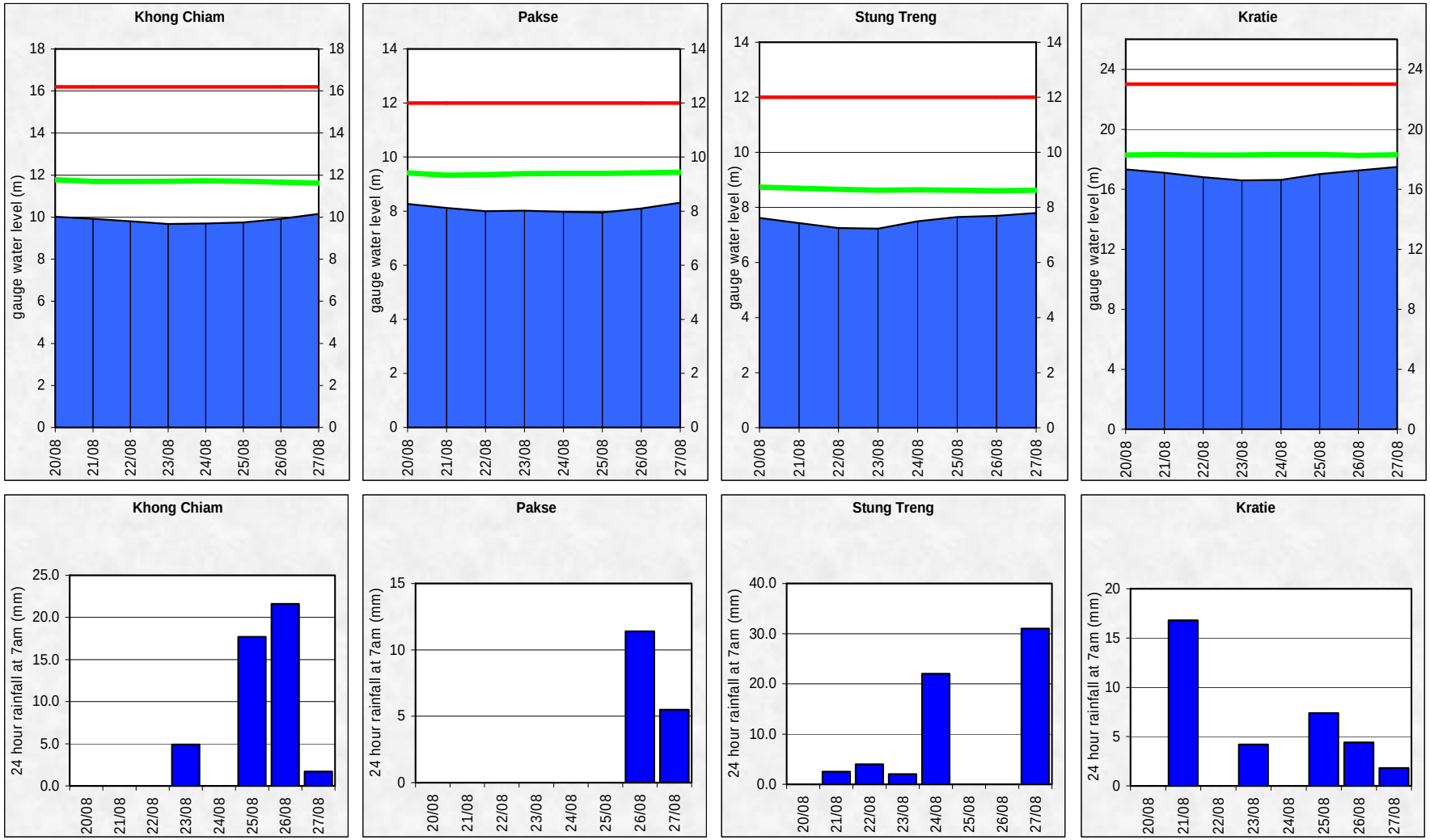


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

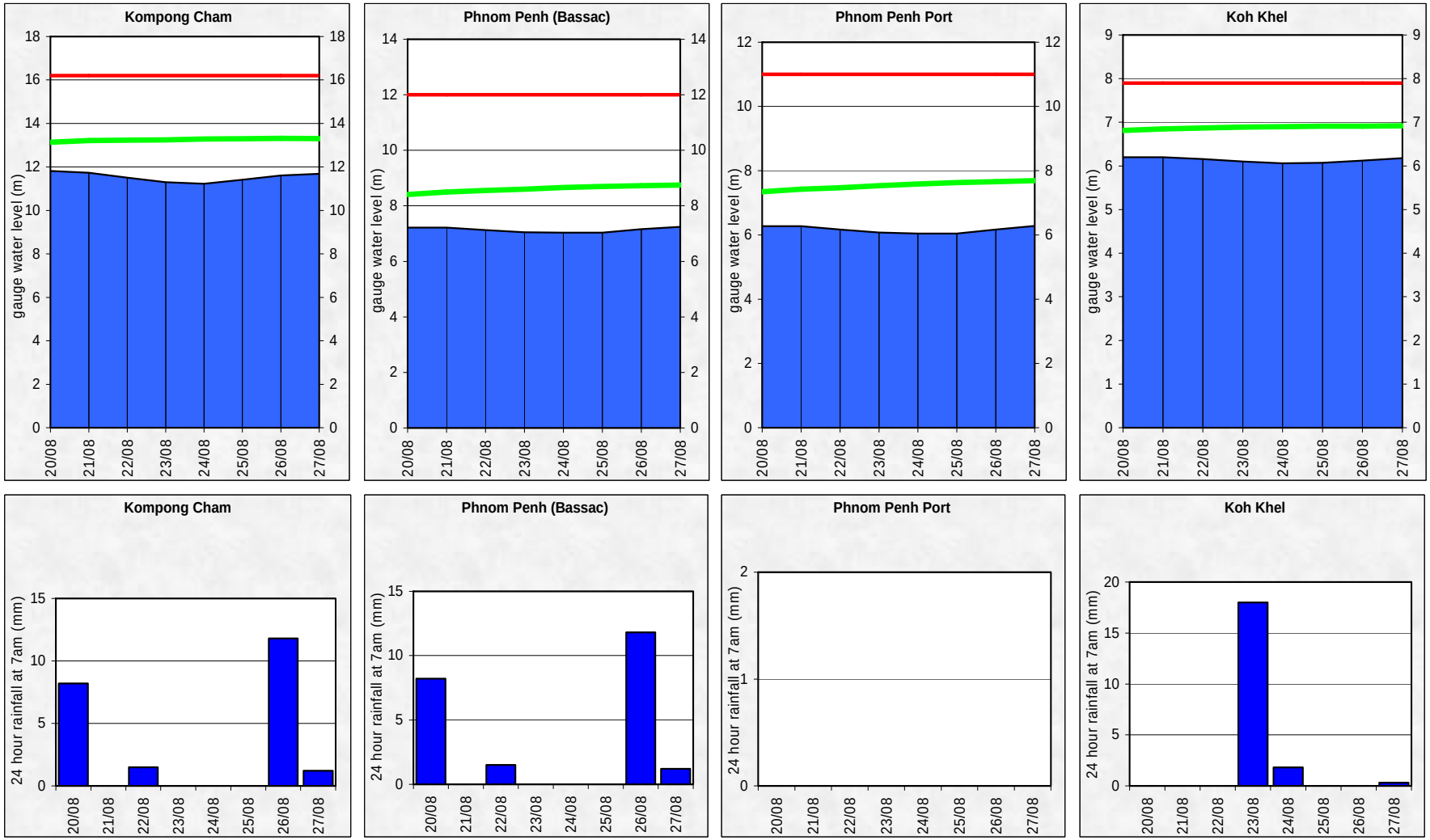
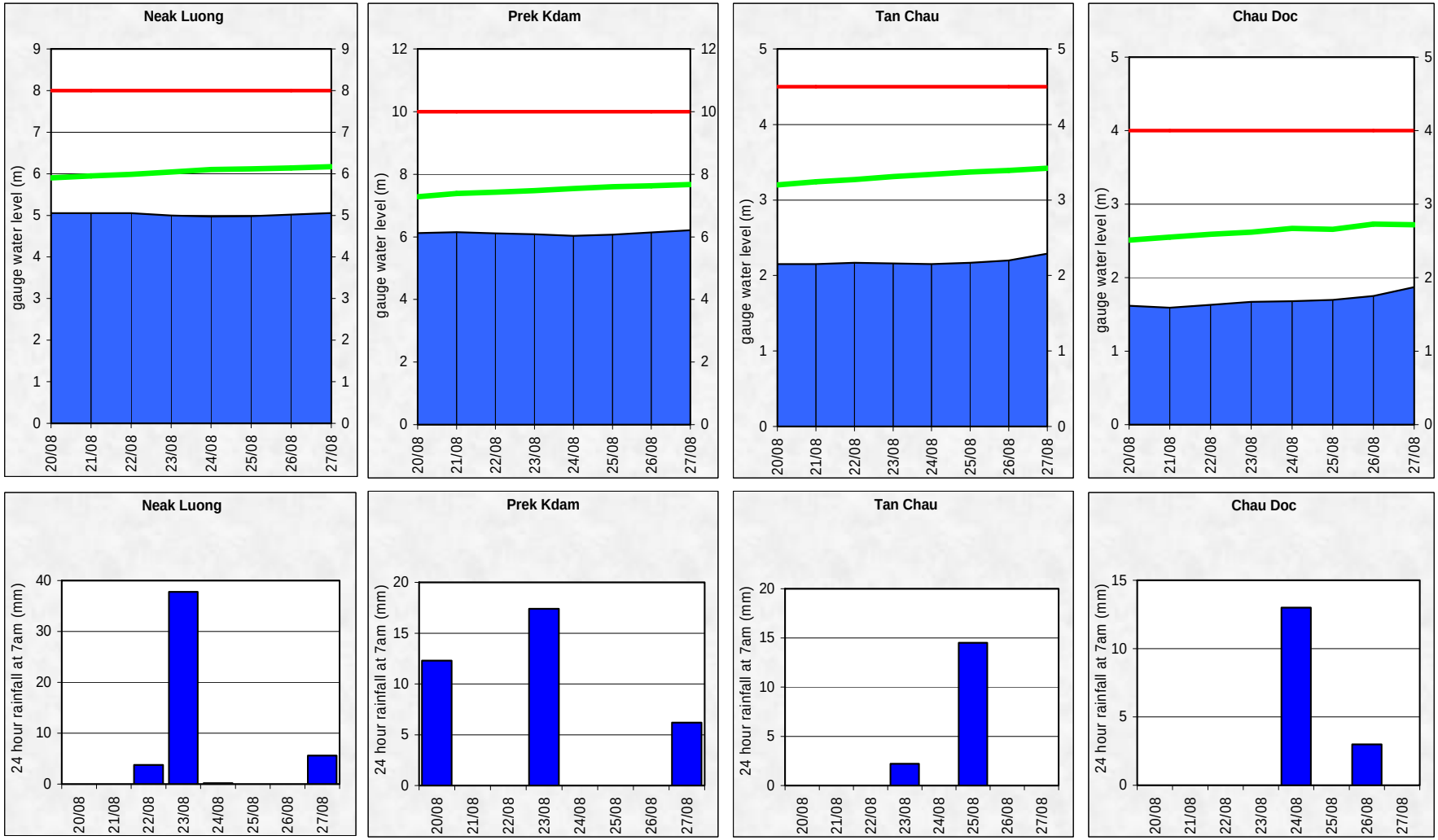


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

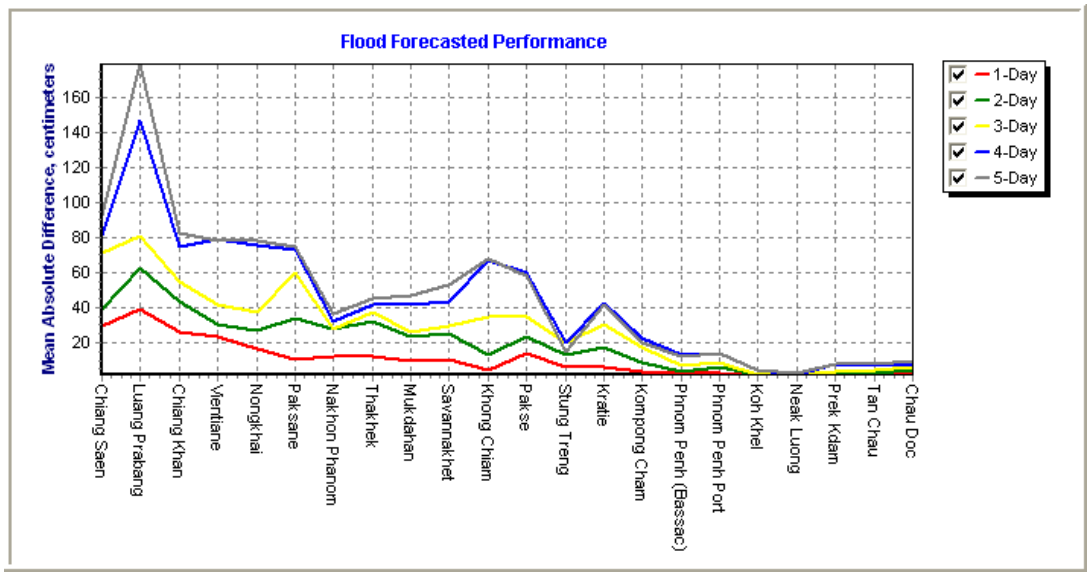
"Accuracy" describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model 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 normal pattern in which the accuracy is worse at upstream and getting better downstream, except Luang Prabang that perform worst among upstream station.

In general, accuracies at most stations for 1-day to 2-day forecast lead time are quite good except at Luang Prabang which performed worse than other stations.

The above differences due to 2 main factors: (1) high variability of the forecast rainfall NWP when critical weather appearances as ITCZ and low pressure trough; (2) internal model functionality in forecasting especially at those stations; for which the parameter adjustment in the model is not possible.

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	57.1	42.9	57.1	28.6	42.9	42.9	42.9	57.1	57.1	57.1	100.0	42.9	85.7	85.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	***72.7***
2-day	66.7	33.3	66.7	50.0	50.0	33.3	50.0	50.0	83.3	66.7	83.3	83.3	83.3	83.3	100.0	100.0	83.3	100.0	100.0	100.0	100.0	83.3	***75.0***
3-day	0.0	40.0	60.0	40.0	40.0	0.0	60.0	60.0	60.0	40.0	60.0	60.0	60.0	40.0	80.0	60.0	60.0	100.0	100.0	80.0	80.0	80.0	***57.3***
4-day	50.0	25.0	25.0	25.0	25.0	25.0	100.0	75.0	100.0	100.0	25.0	75.0	100.0	75.0	100.0	25.0	100.0	100.0	100.0	100.0	75.0	50.0	***67.0***
5-day	66.7	0.0	33.3	33.3	33.3	0.0	100.0	100.0	66.7	66.7	33.3	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)						
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	*10:26*	*0*	*-*	*4*	*08:12*	*08:09*	*07:09*	*06:20*	*08:54*	*07:28*	*07:09*	*0*	*1*	*4*	*15*	*145*	*2*	*123*
month	*10:32*	*0*	*-*	*15*	*08:12*	*08:12*	*07:13*	*06:12*	*08:49*	*07:24*	*07:36*	*5*	*1*	*6*	*79*	*485*	*5*	*405*
season	*10:36*	*1*	*-*	*50*	*07:39*	*-*	*07:20*	*06:10*	*08:50*	*07:23*	*07:23*	*10*	*1*	*83*	*644*	*1543*	*15*	*1159*

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.

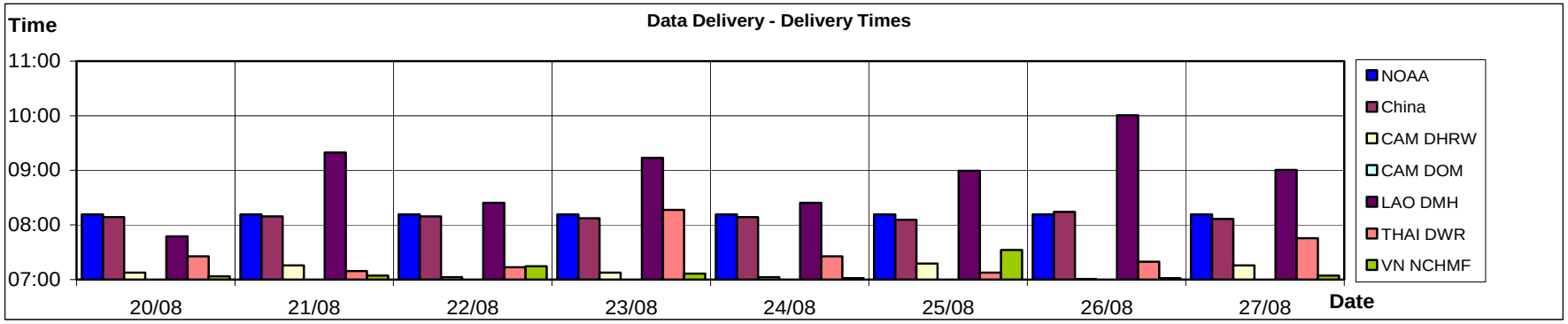


Figure B2: Data delivery times for the past 8 days including the current report date

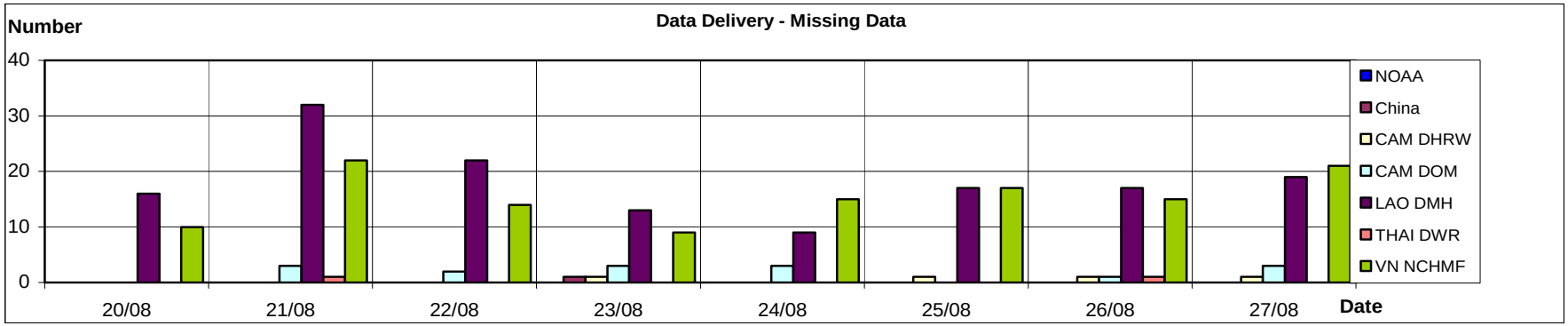


Figure B3: Missing data for the past 8 days including the current report date

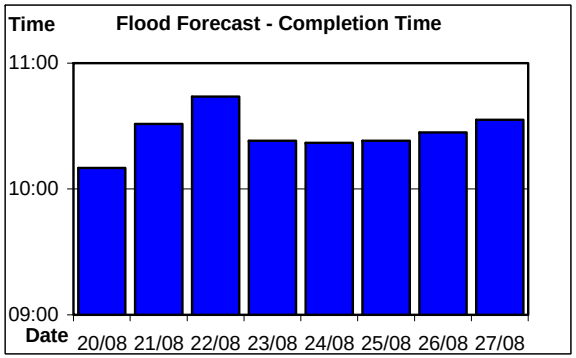


Figure B4: Flood forecast completion time

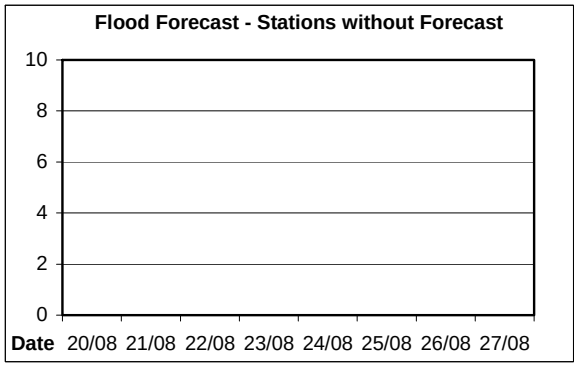


Figure B5: Flood forecast stations without forecast

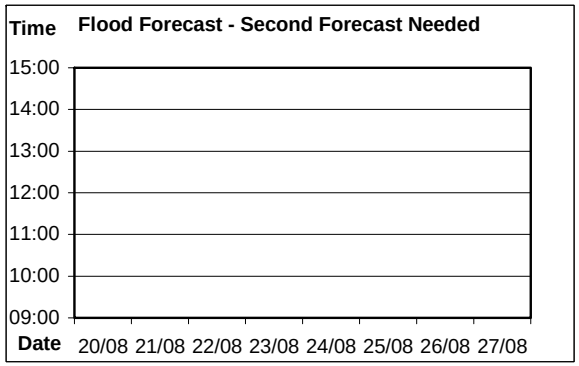


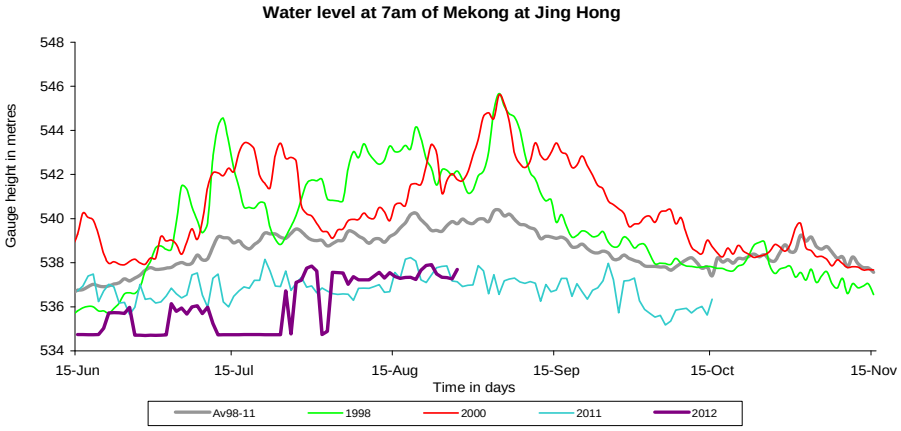
Figure B6: Second forecast needed

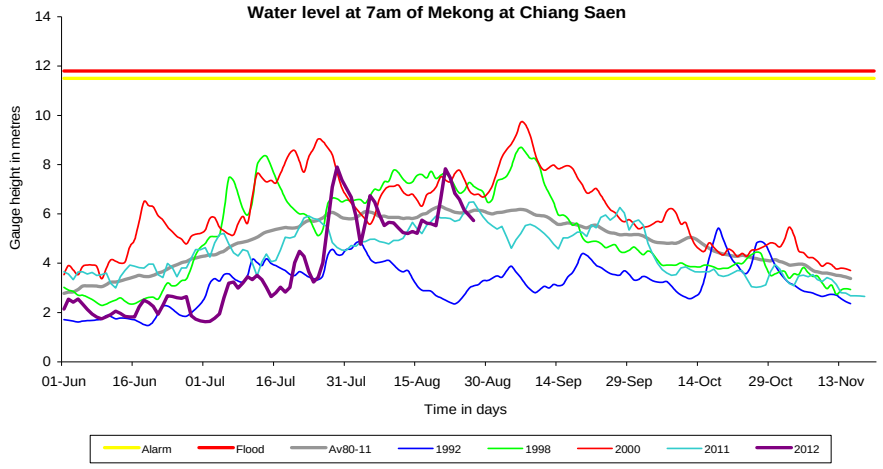
Annex C: Season Water Level Graphs

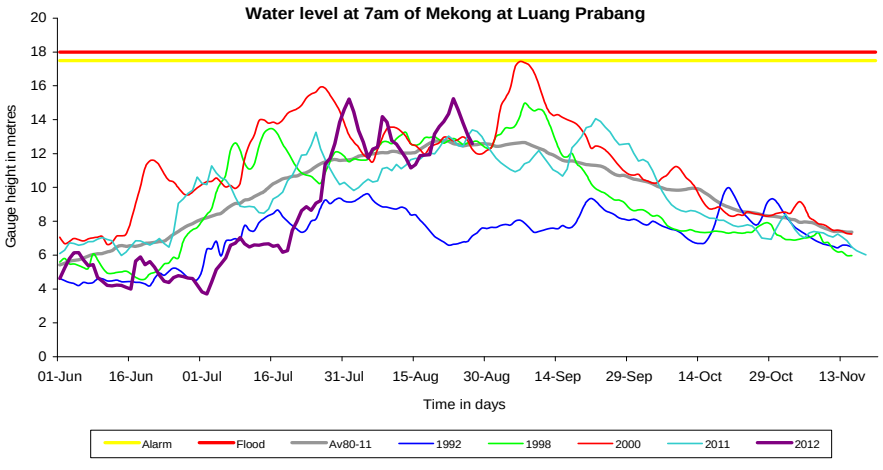
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

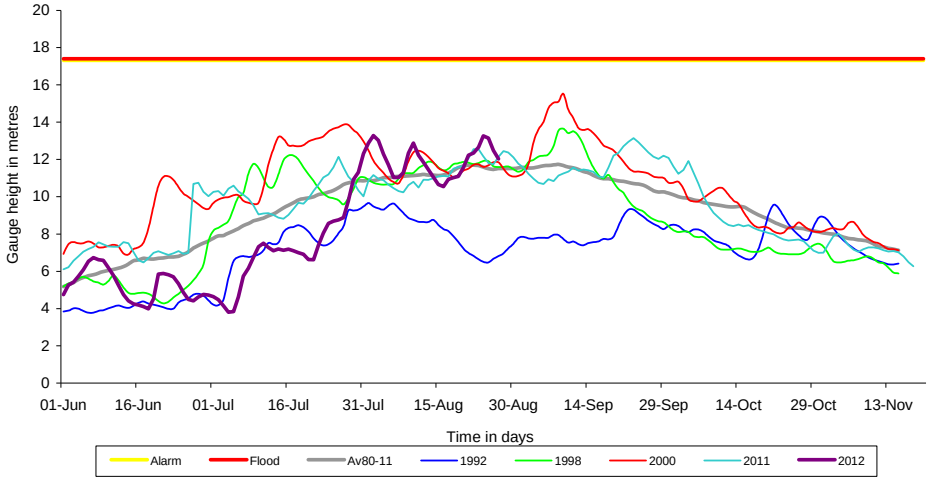
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER



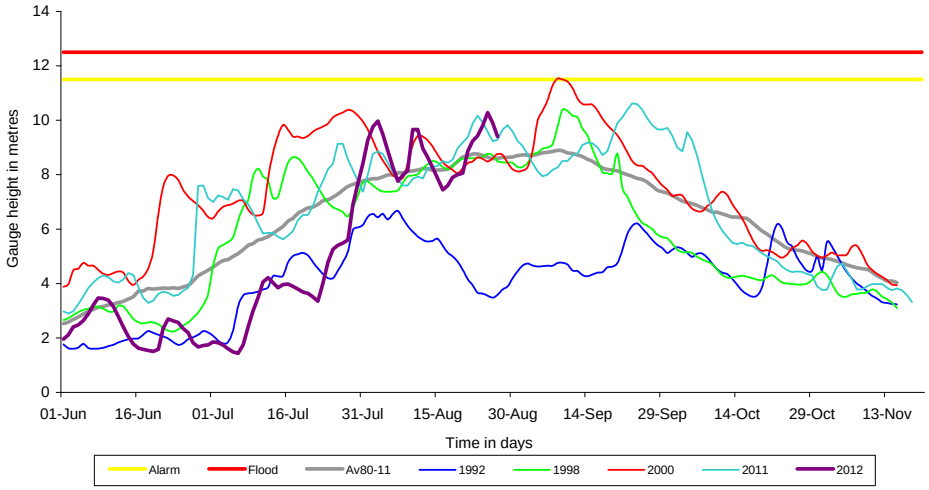




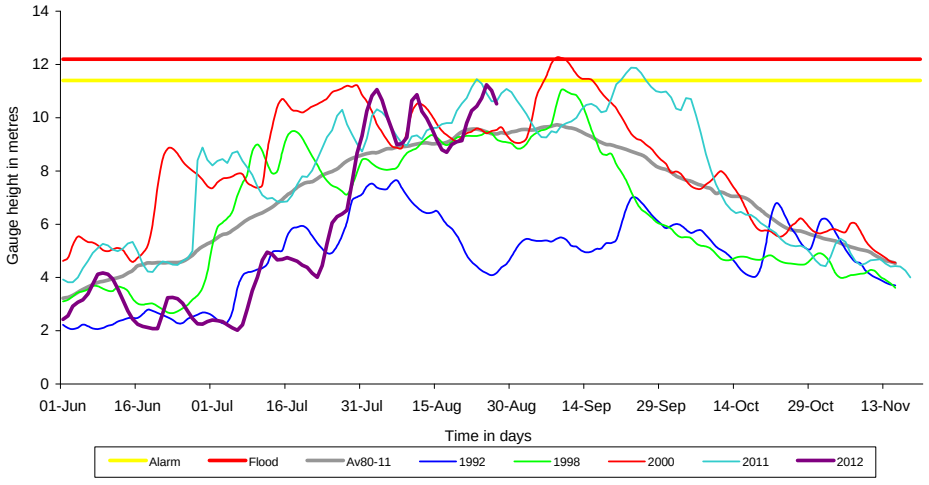
Water level at 7am of Mekong at Chiang Khan

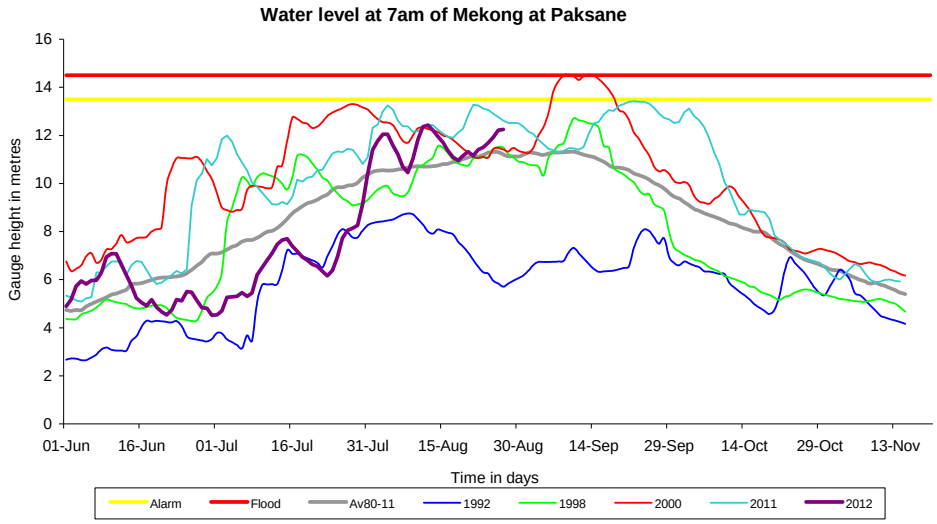


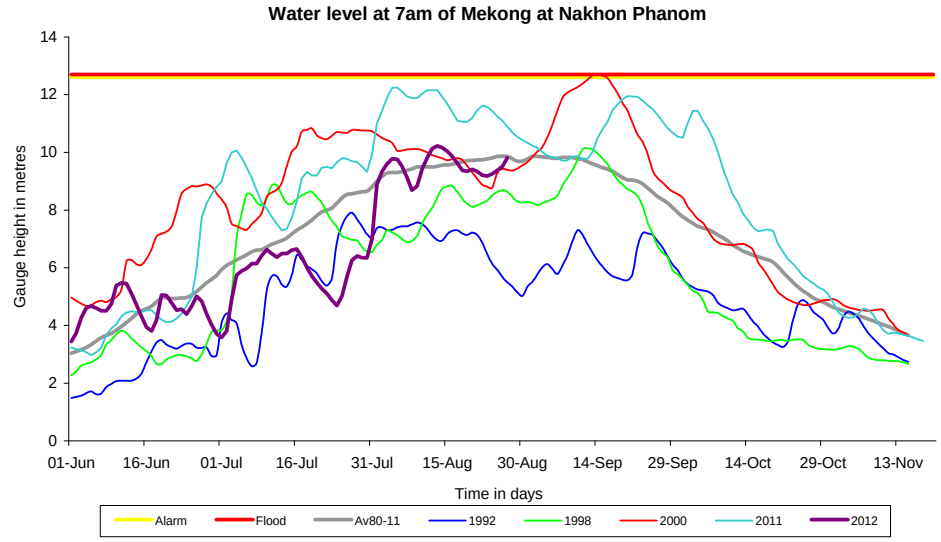
Water level at 7am of Mekong at Vientiane

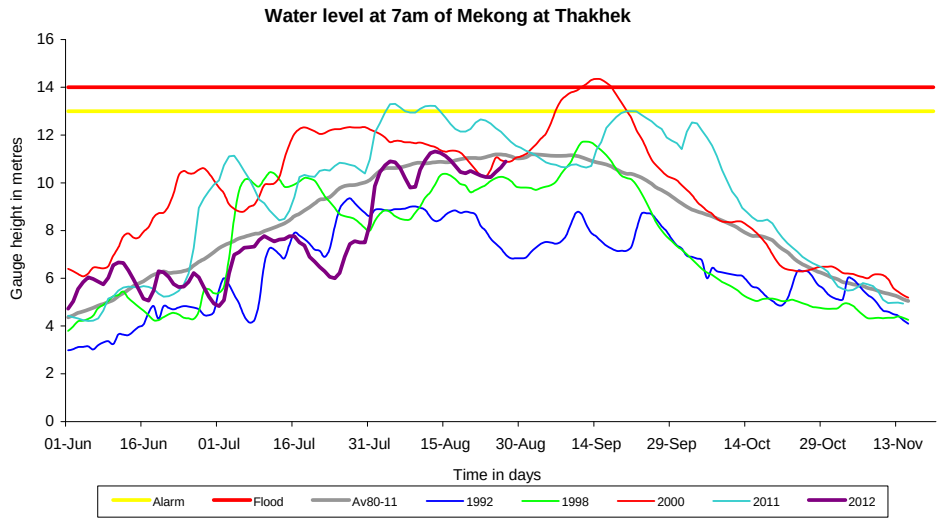


Water level at 7am of Mekong at Nong Khai

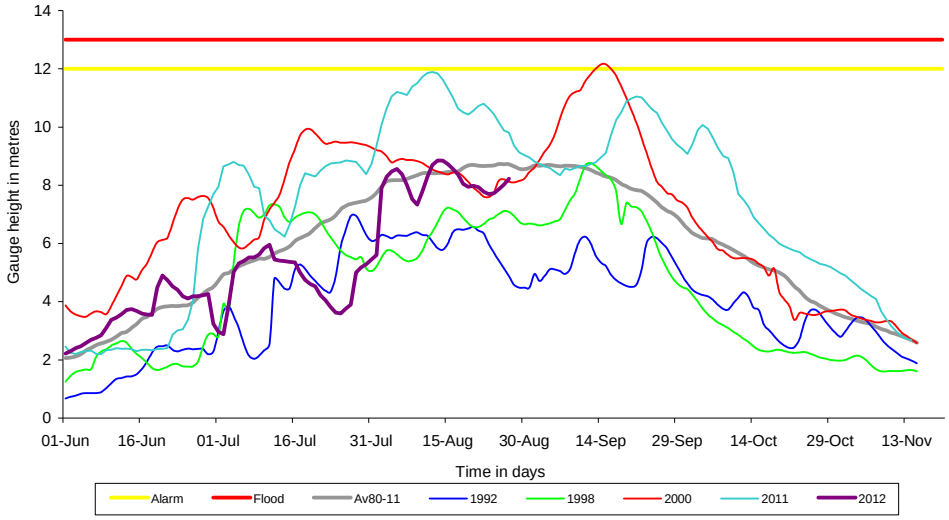



Water level at 7am of Mekong at Paksane
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

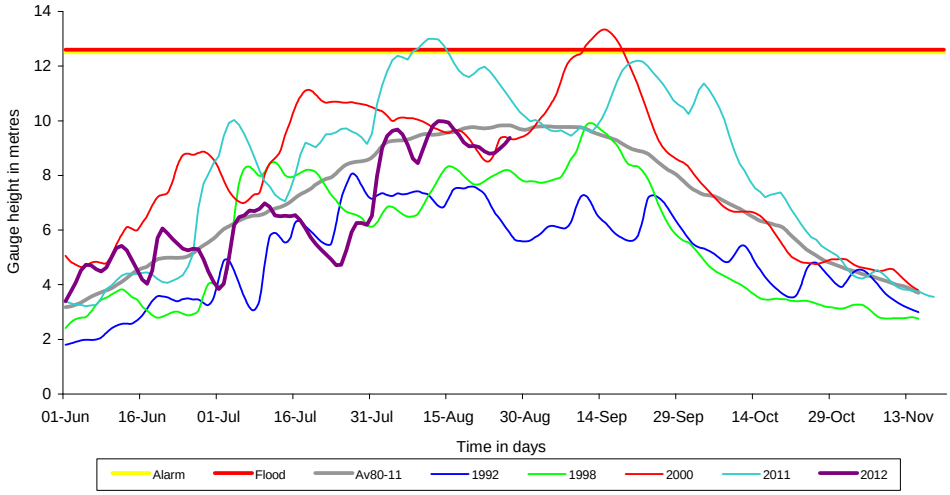

Water level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012


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

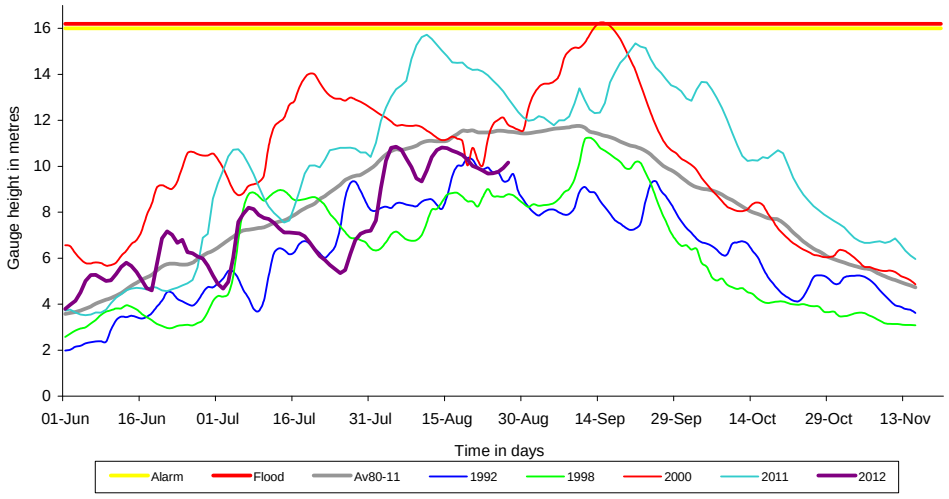
Water level at 7am of Mekong at Savannakhet

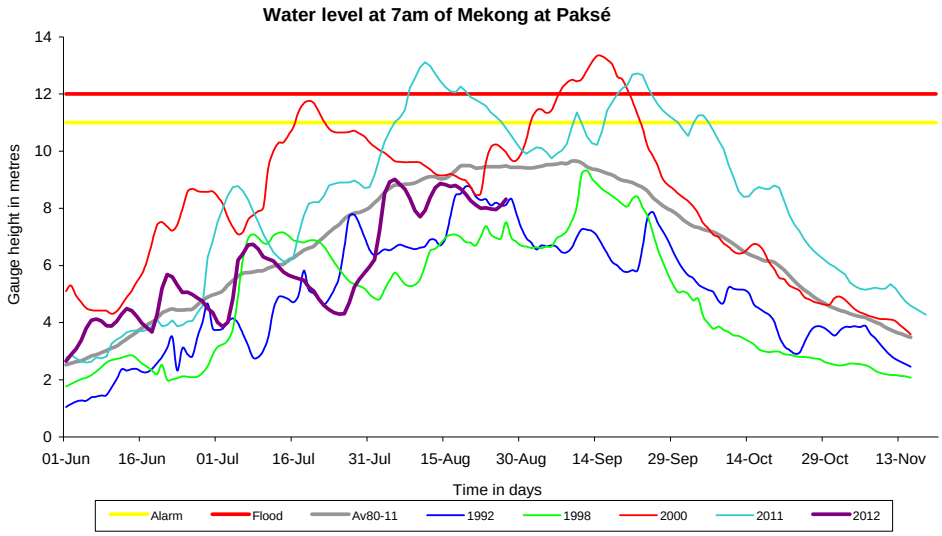


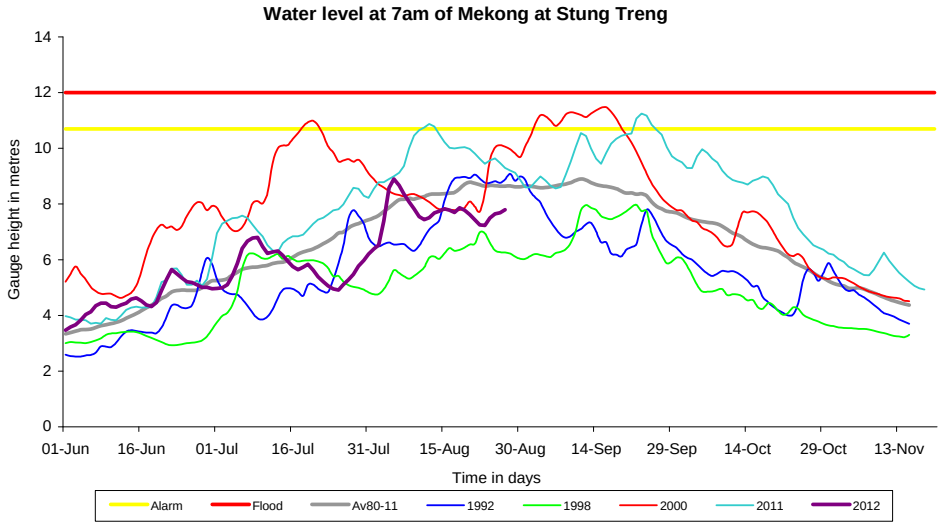
Water level at 7am of Mekong at Mukdahan

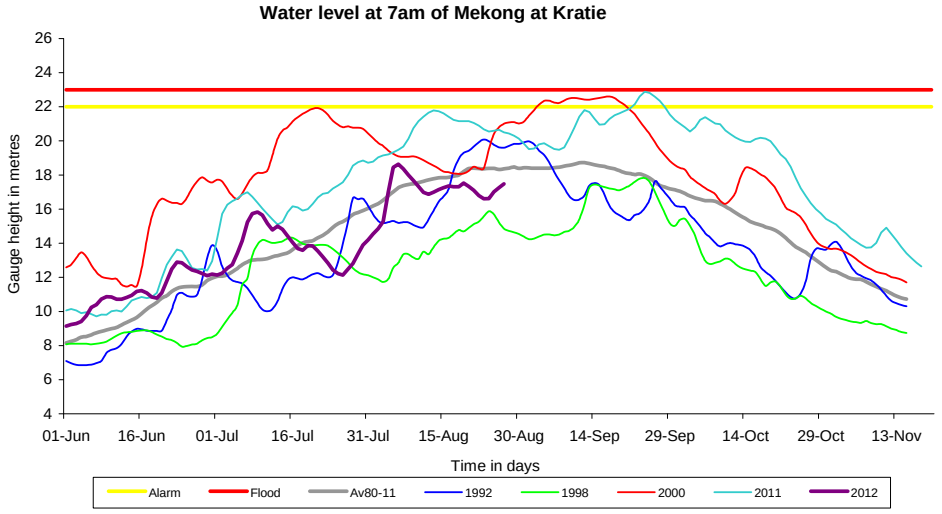


Water level at 7am of Mekong at Khong Chiam

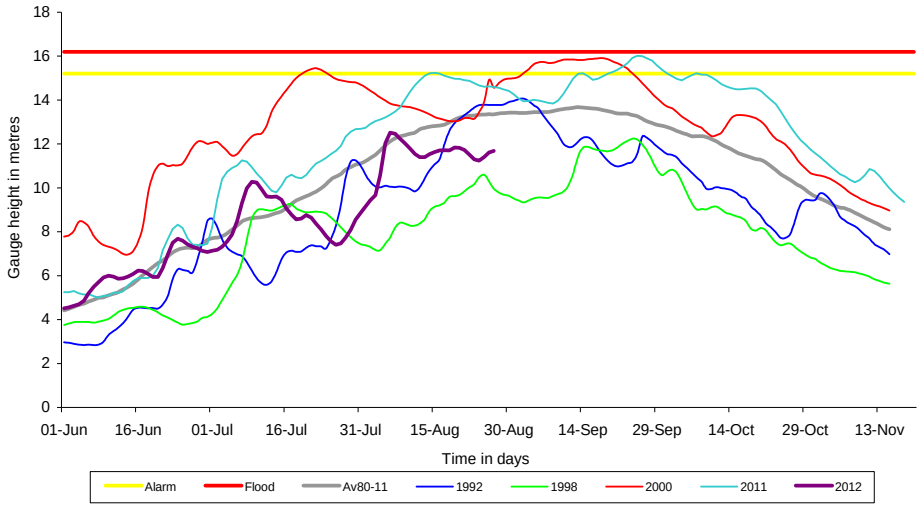



Water level at 7am of Mekong at Paksé
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

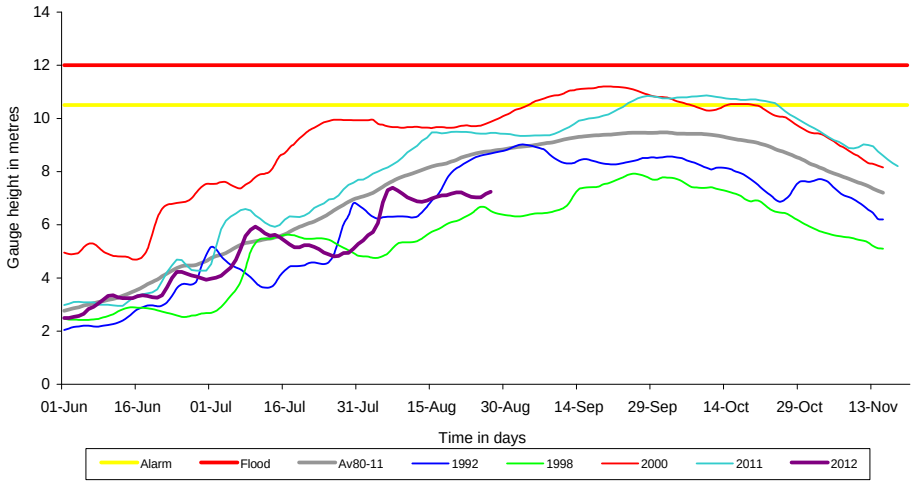

Water level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012


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

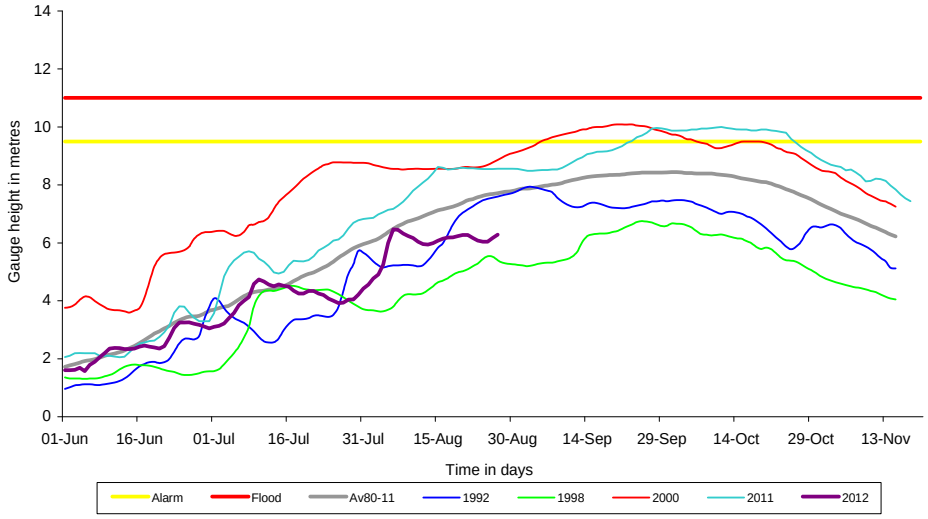
Water level at 7am of Mekong at Kampong Cham

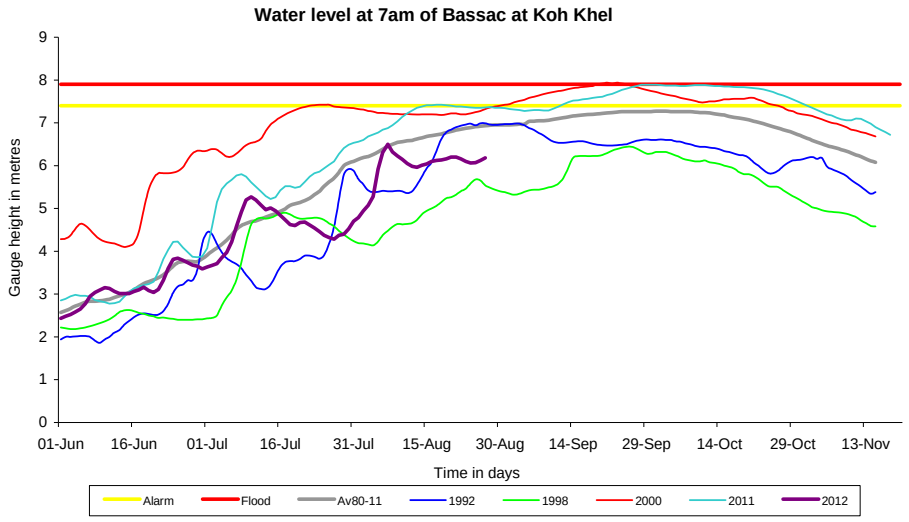


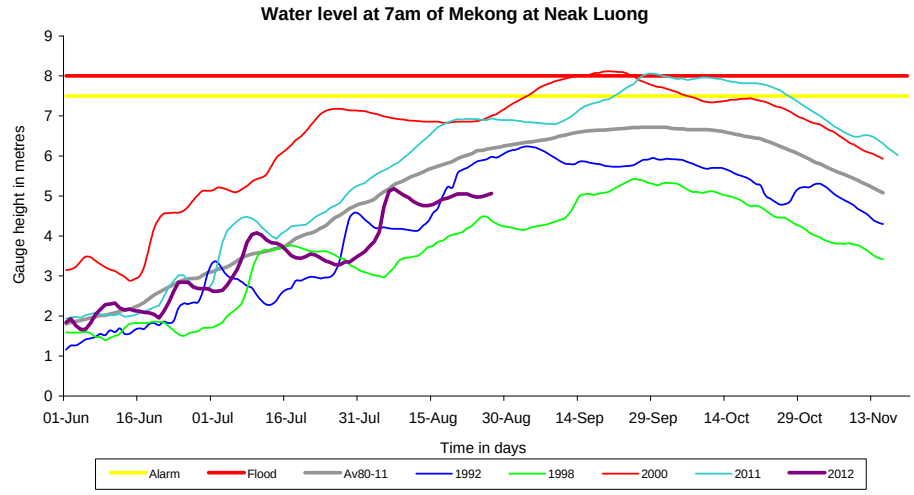
Water level at 7am of Mekong at Phnom Penh Chaktomuk

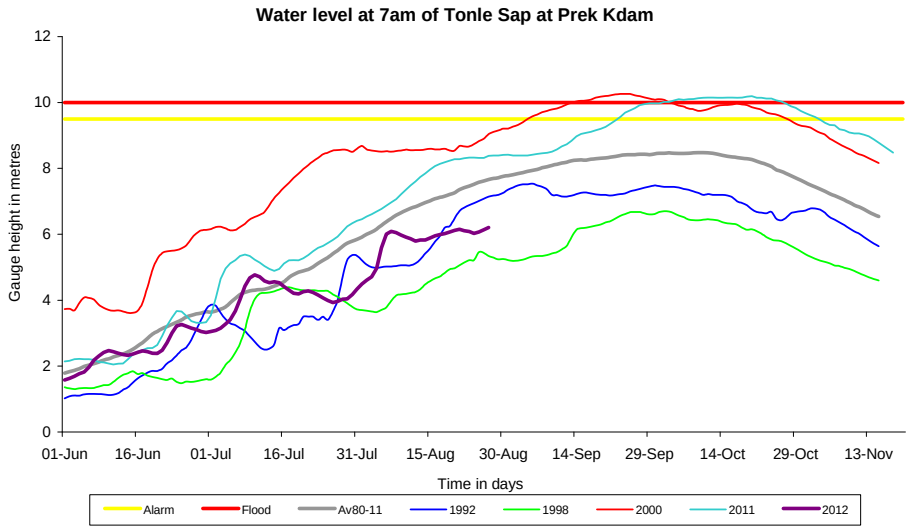


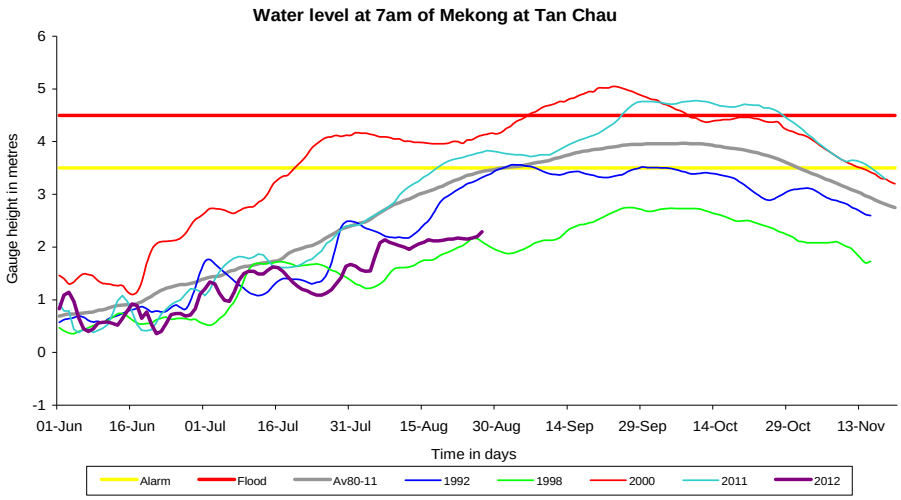
Water level at 7am of Tonle Sap at Phnom Penh Port

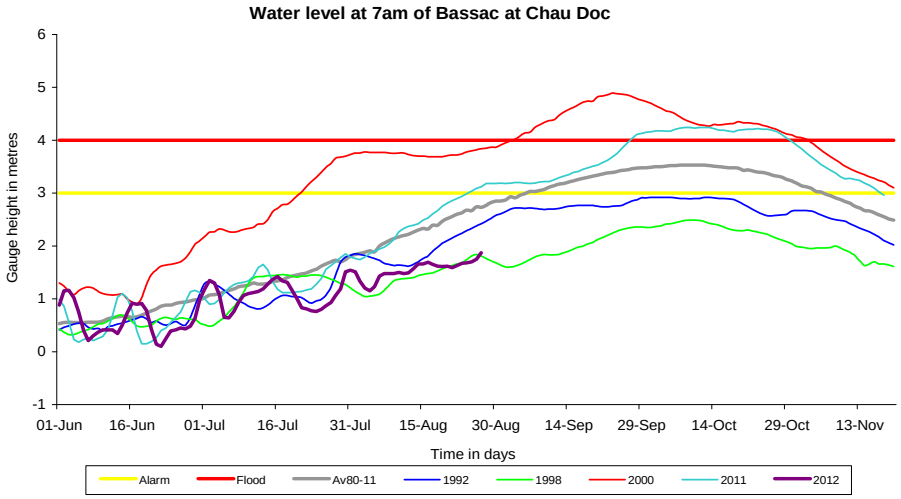



Water level at 7am of Bassac at Koh Khel
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012


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