Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 29/10/2012, covering the week from the 22nd October to the 28th October, 2012

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

General Weather Patterns

During the week of 22nd October to the 28th October 2012, five weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 22nd October and the 28th October bulletins are presented in the figures below:

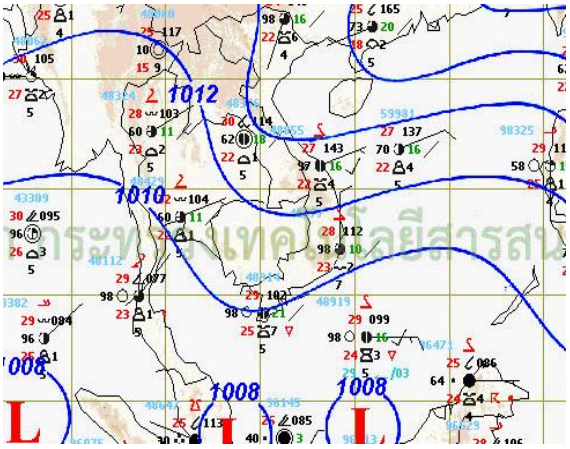


Figure 1: Weather map for 22nd October 2012

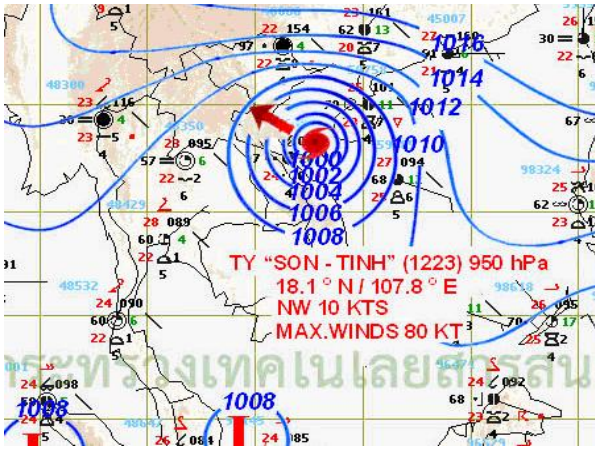


Figure 2: Weather map for 28th October 2012

South-West (SW) Monsoon

Moderate SW monsoon prevailed over the Andaman Sea and the Gulf of Thailand during last week (Figure 1 and 2).

Inter Tropical Convergence Zone (ITCZ)

No Inter Tropical Convergence Zone (ITCZ) was observed during the reporting period (Figure 1 and 2).

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

A tropical depression (TD) which was developed on 23 October 2012 in Western Pacific, East of Philippines, upgraded to Tropical storm (TS) named **SON-TINH** (1223) on 24-26 October, and then became Typhoon (TY) on 27-28 October 2012. After making landfall over Hai Phong in the Northern Viet Nam on 29 October, the Typhoon downgraded gradually to Tropical storm, Tropical depression, and low pressure as of 30 October. Figure 3 and 4 show weather maps with Tropical storm **SON-TINH** before its landfall. And figure 5 presents observed track of the storm from its surge location.

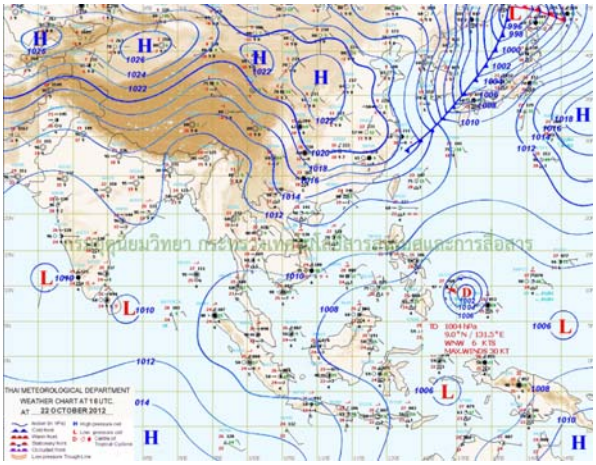


Figure 3: Weather map for TS SON-TINH on 23 Oct.
Source: Thai Meteorological Department.

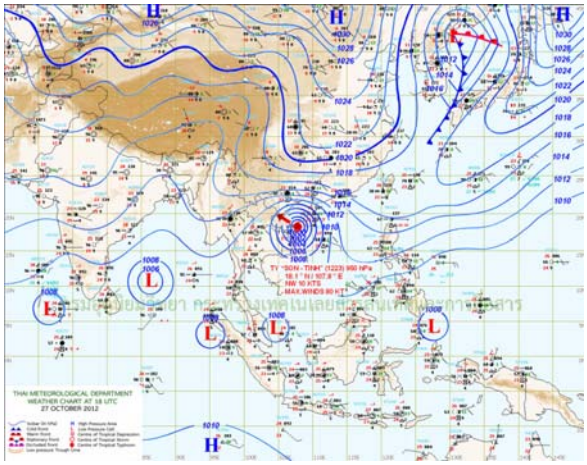


Figure 4: Weather map for TS SON-TINH on 28 Oct.

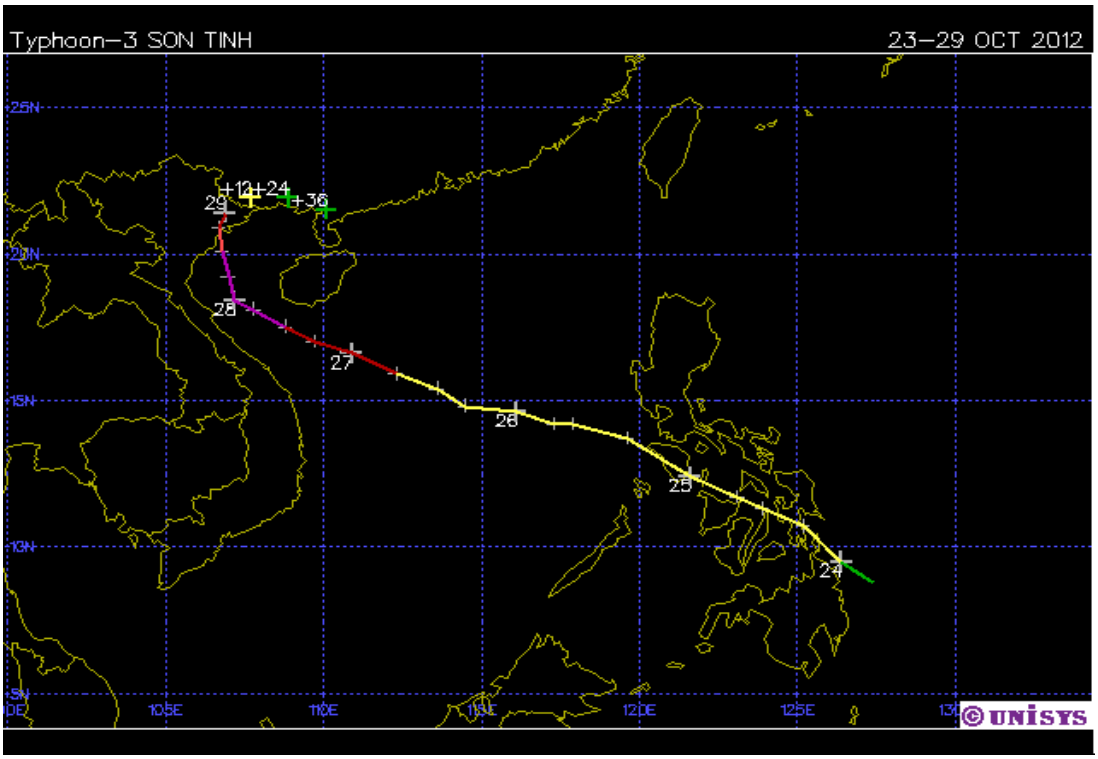


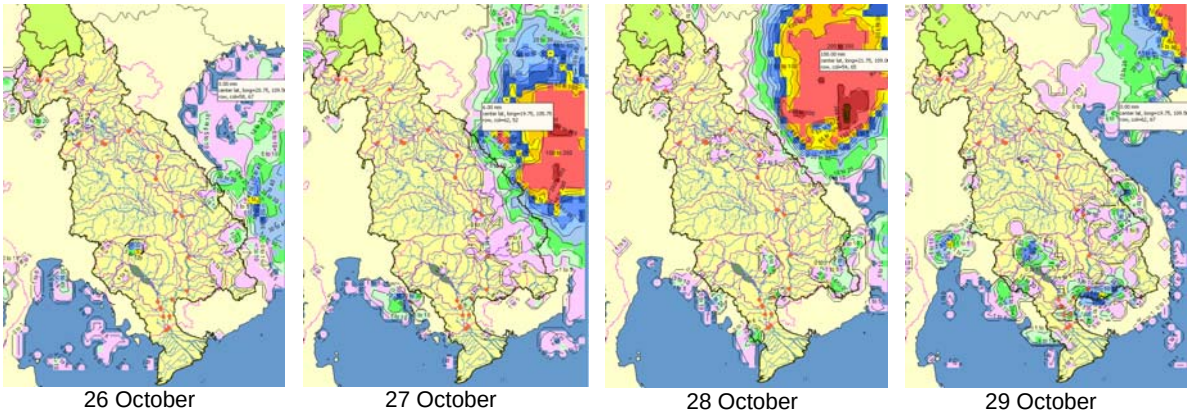
Figure 5: SON-TINH Storm Track
Source: UNISYS

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Overall weather situation

The effect of the Tropical storm **SON-TINH** on the Lower Mekong Basin is very limited, as rain gauges recorded small amount of rainfall at a few stations only (Please see Table A2: observed rainfall). It was consistent with TRMM data as shown in Figure 6 below.



26 October 27 October 28 October 29 October

Figure 6: TRMM Spatial and Temporal distribution of rainfall associated with TS SON-TINH

However, meteorological observation shows that, when approaching the end of wet season, rainfall pattern moves from upstream (North) to downstream (South) where limited amount of rainfall is still recorded. (Please see Table A2: observed rainfall).

General behaviour of the Mekong River

Water levels of all stations in LMB were below the long-term average for this time of the year during the monitoring period. Water levels at stations in the upper reach were more-or-less stable while water levels at stations in the middle reach showed a slight decreasing trend and water level in the lower reaches were gradually decreasing in last week.

Regarding 2 stations in downstream at Tan Chau and Chau Doc, water levels at both stations were also falling during last week and far below the long-term average for this time of the year.

For stations from Chiang Saen to Luang Prabang

Water level at these stations was more-or-less stable during monitoring period. These stations were recording levels that were below the long-term average for this time of the year.

For stations from Chiang Khan to Paksane

Water levels at stations from Chiang Khan to Paksane showed a falling trend during the monitoring period. These stations were recording levels that are below the long-term average for this time of the year

For stations from Nakhon Phanom/Thakhek to Pakse

Water levels at stations from Nakhon Phanom/Thakhek to Pakse showed a falling trend during the monitoring period, although the levels are more-or-less stable for the middle of the week. These stations were recording levels that are below the long-term average for this time of the year.

For stations from Stung Treng to Kompong Cham

Water levels at stations from Strung Treng to Kompong Cham were gradually decreasing during last week and 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 were also gradually decreasing during last week and below the long-term average for this time of the year.

For Tan Chau and Chau Doc

Water levels were recessing in last week. Significantly affected by tides, both stations were recording levels that were far 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 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
22/10		3.90	7.98	7.91	4.57	5.22	6.38	4.01	5.24	3.85	2.71	4.62	3.44	4.40	11.65	8.18	6.95	6.09	6.02	5.09	6.84	2.65	2.43
23/10		3.82	7.85	7.90	4.54	5.20	6.36	4.03	5.24	3.83	2.59	4.41	3.27	4.31	11.44	8.01	6.84	5.96	5.94	5.00	6.76	2.59	2.37
24/10		3.86	7.68	7.80	4.50	5.17	6.32	4.01	5.23	3.83	2.59	4.45	3.30	4.21	11.25	7.84	6.70	5.85	5.84	4.91	6.67	2.54	2.33
25/10		3.84	7.54	7.66	4.40	5.10	6.28	3.99	5.21	3.82	2.62	4.44	3.32	4.19	11.08	7.61	6.58	5.77	5.76	4.80	6.58	2.52	2.34
26/10		4.26	7.46	7.50	4.37	4.96	6.22	3.96	5.17	3.82	2.62	4.39	3.23	4.19	10.96	7.52	6.47	5.67	5.73	4.70	6.52	2.52	2.36
27/10		4.20	7.46	7.38	4.17	4.80	6.19	3.92	5.14	3.83	2.62	4.39	3.20	4.13	10.92	7.43	6.37	5.57	5.60	4.60	6.44	2.47	2.33
28/10		4.20	7.75	7.30	4.00	4.68	6.13	3.82	5.04	3.78	2.68	4.39	3.20	4.09	10.80	7.35	6.30	5.49	5.52	4.54	6.41	2.42	2.28
29/10		4.18	7.76	7.32	3.90	4.58	6.07	3.72	4.95	3.67	2.72	4.38	3.21	4.08	10.70	7.25	6.23	5.41	5.50	4.46	6.34	2.37	2.23

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
22/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	0.9	1.6	nr	27.3	13.0
23/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	3.0	25.3	-	0.9	1.8	7.4	11.4	14.0
24/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.0	nr	21.5	-	6.5	8.6	6.3	7.4	
25/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	
26/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	
27/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	
28/10		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	
29/10		nr	nr	nr	nr	nr	nr	nr	0.5	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	5.0

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

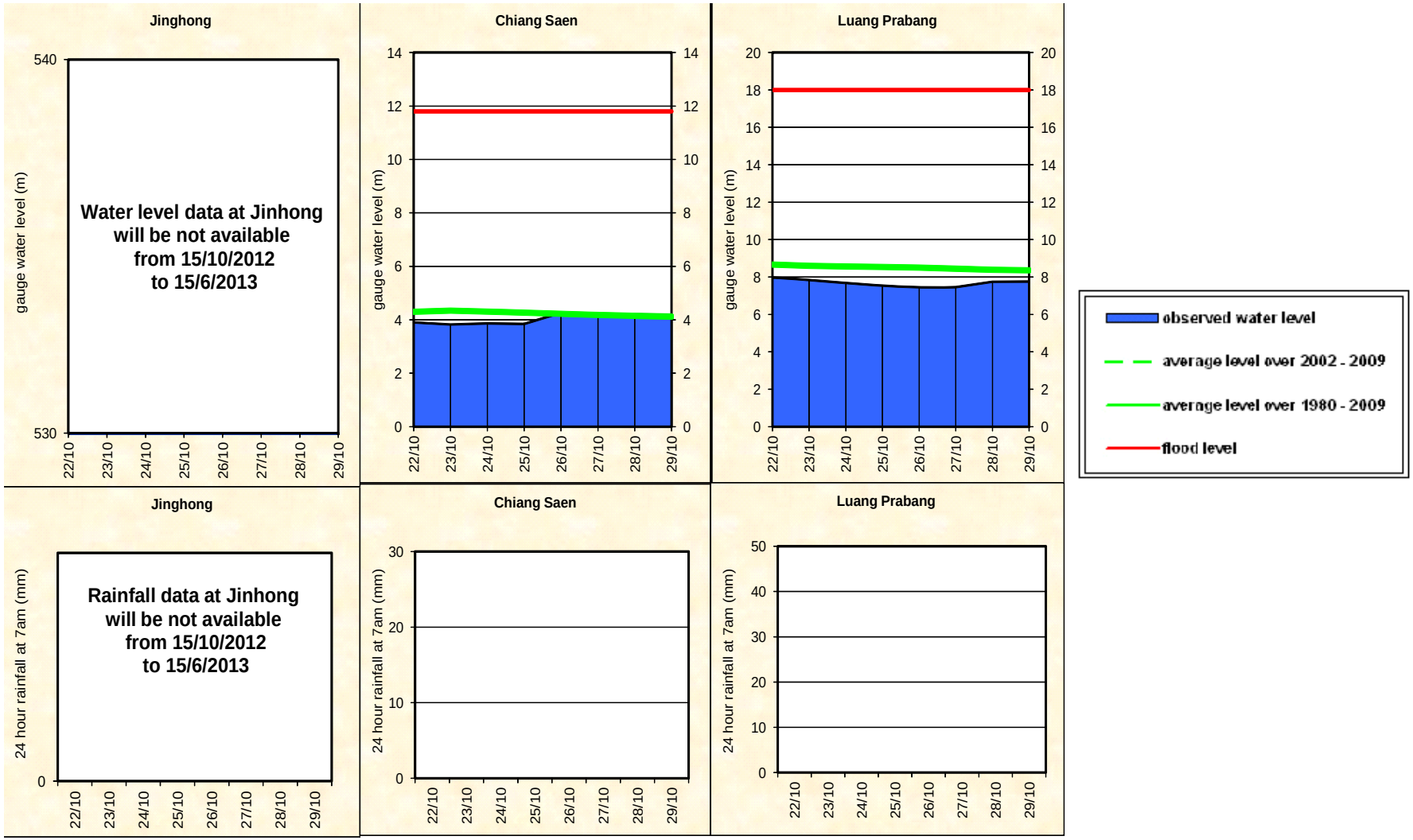


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

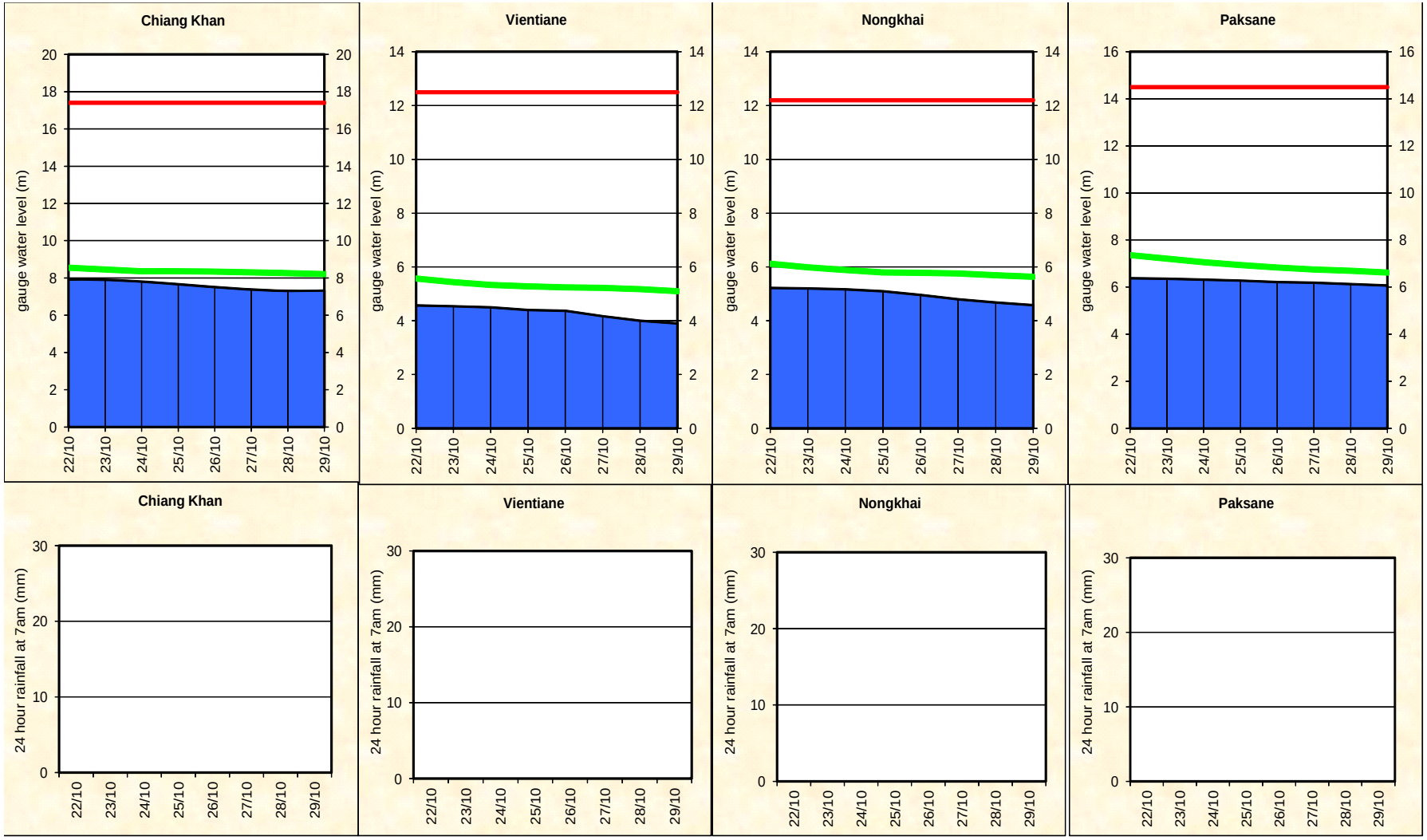


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

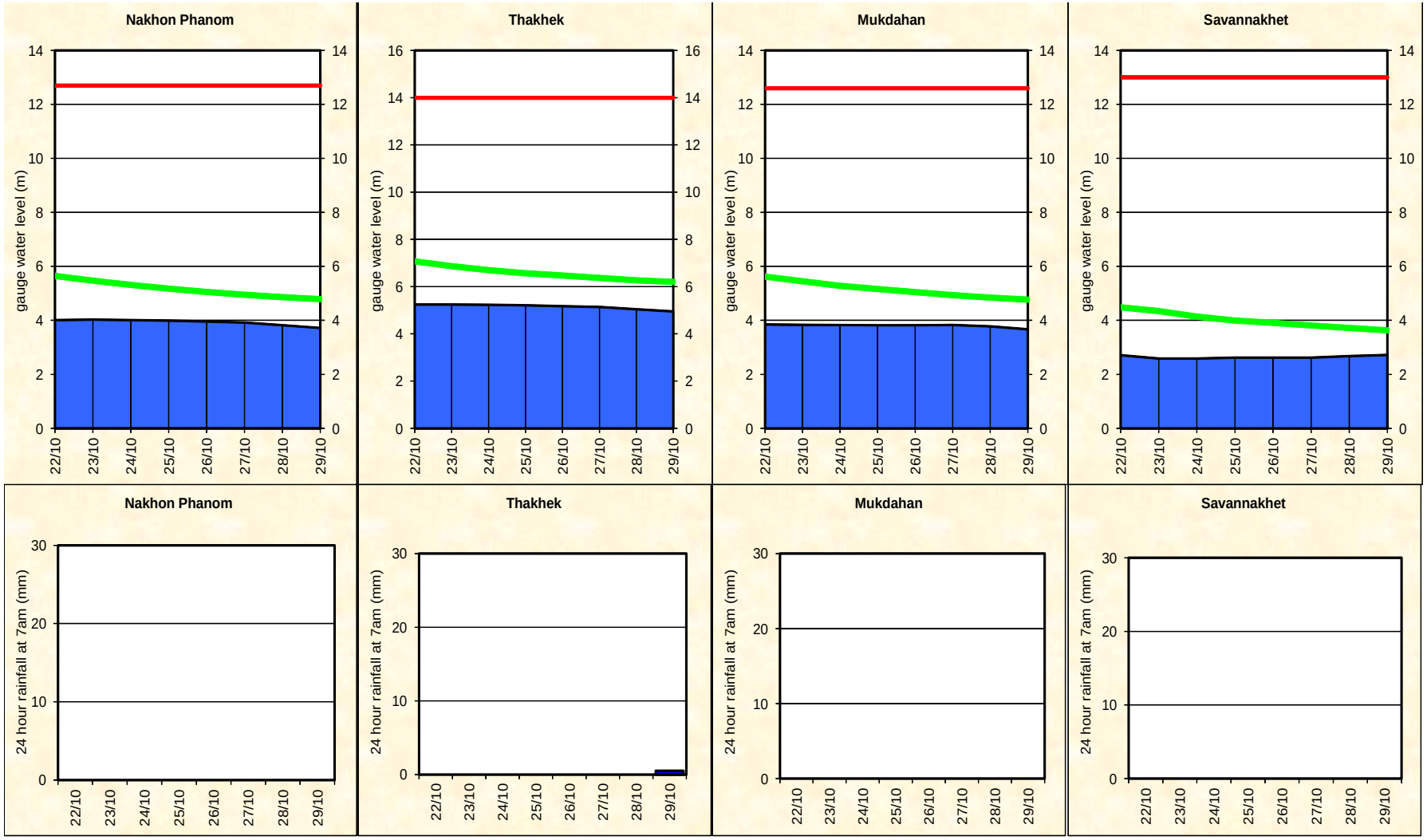


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

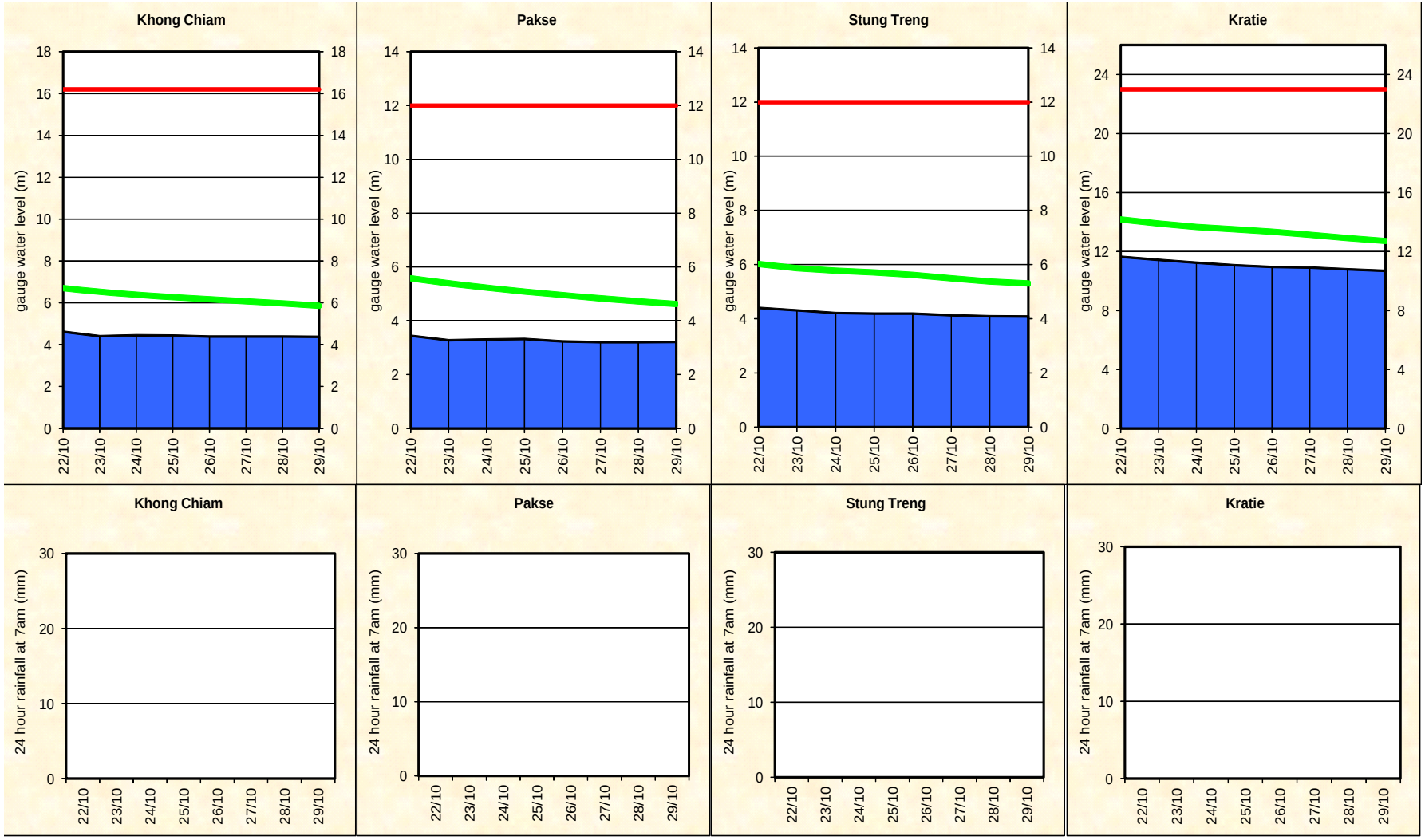


Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel

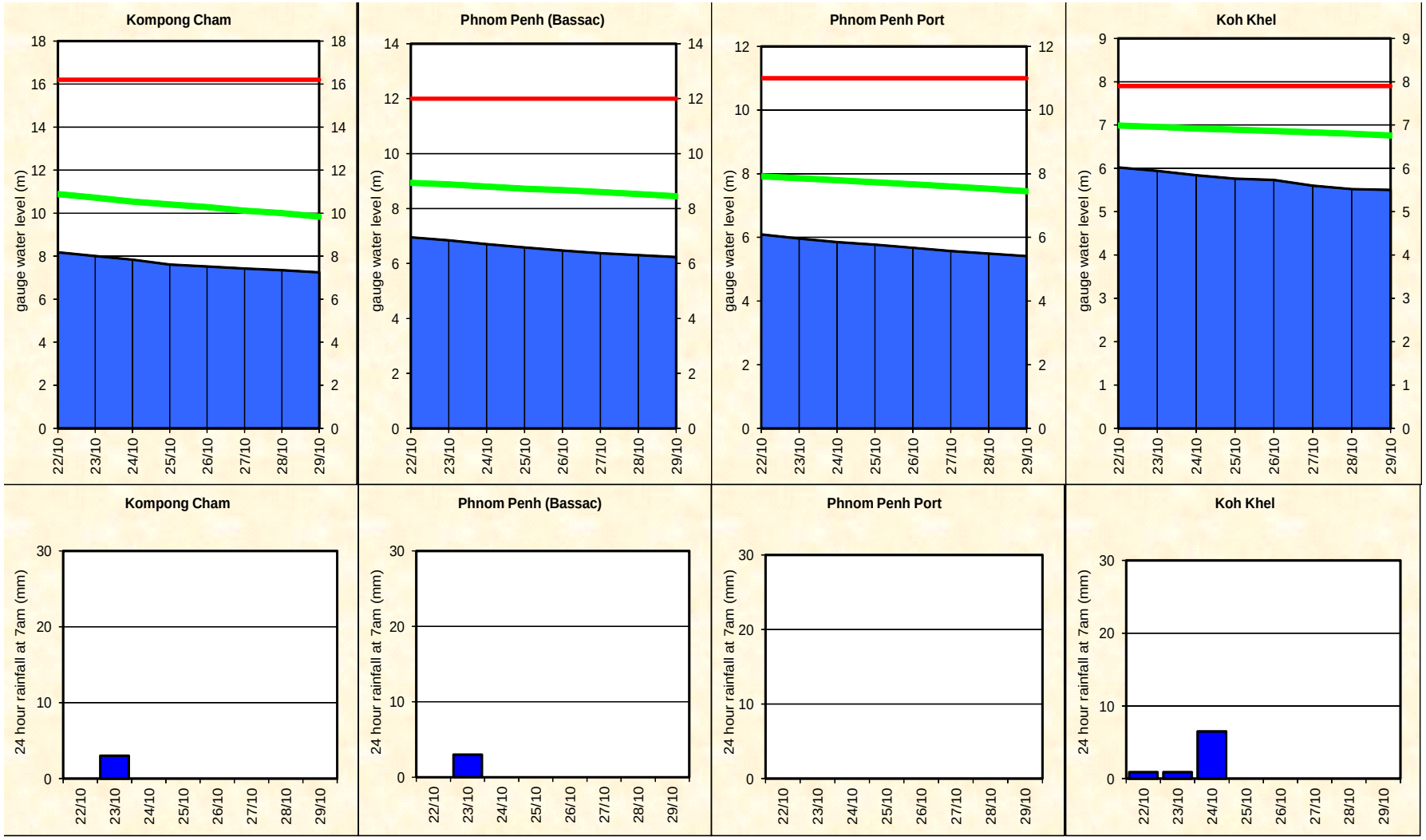
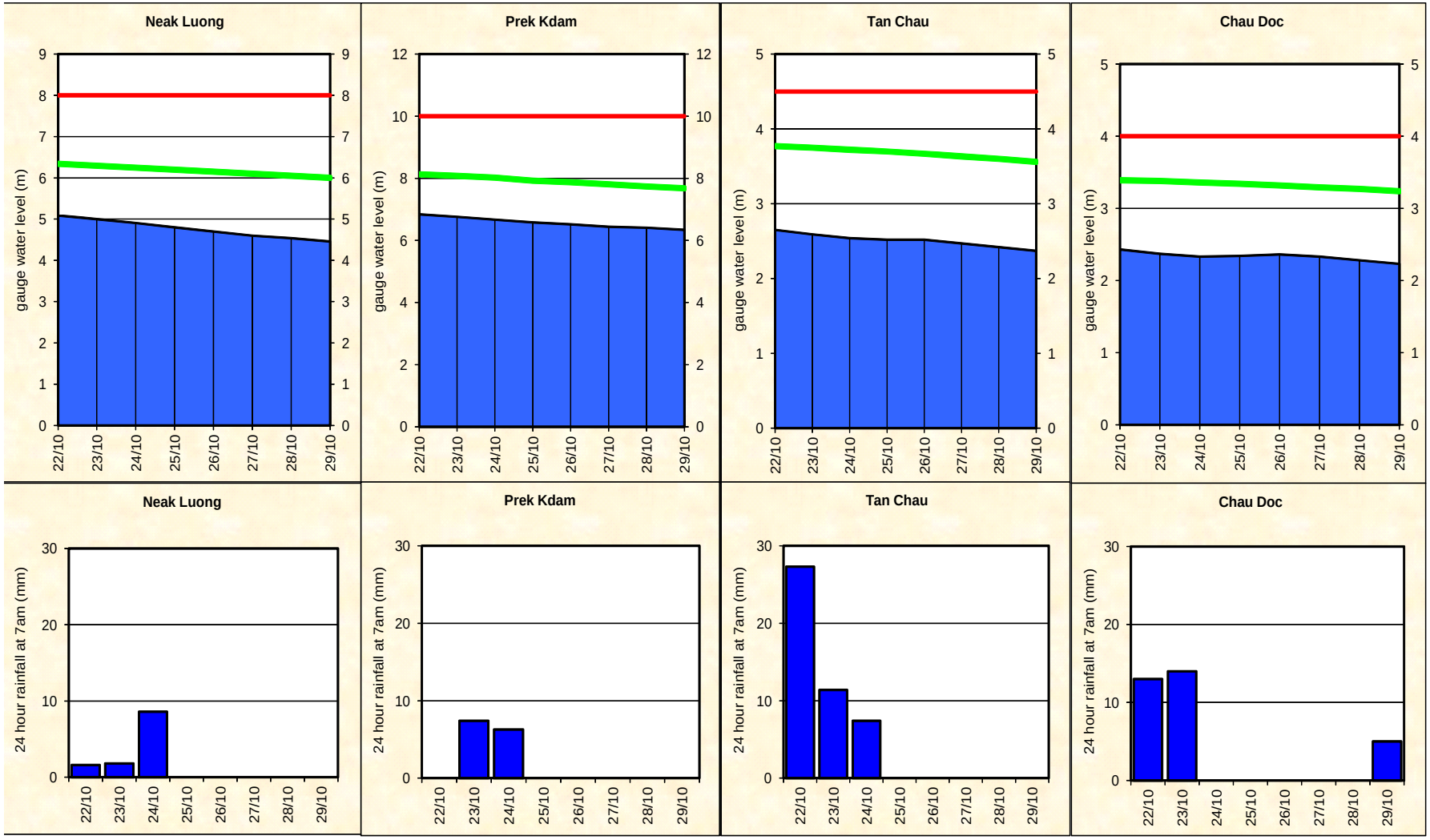


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

Accuracy

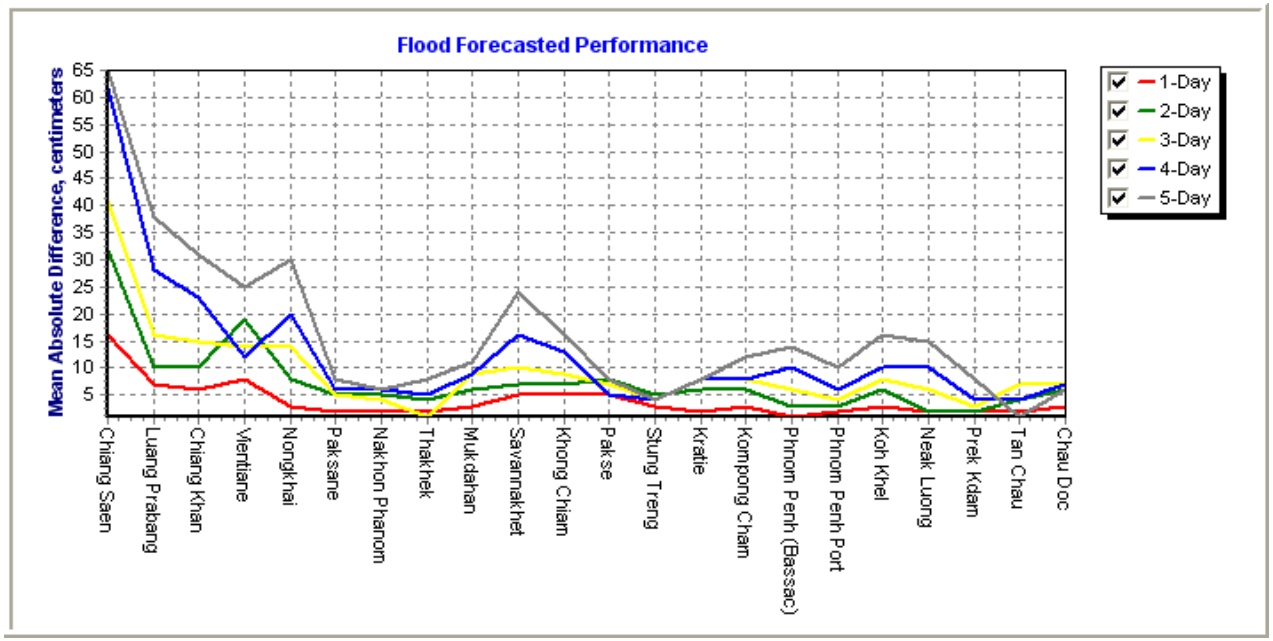
"Accuracy" describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model 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 a **normal pattern** in which accuracies at stations in the upper reach are not better than that at stations in the middle and lower reach of the Mekong mainstream.

In general, accuracies at most stations along mainstream of Mekong River in the LMB for all forecast lead time are fairly good. However, accuracies at Chiang Saen for 4-5 day forecast lead time were relatively lower than that of other stations, although its MAE is still smaller than the set benchmark value for the station.

The above differences are perhaps caused by internal model functionality in forecasting at those stations for which the parameter adjustment in the model is not possible, and by uncertainty of NWP, SRE and TRMM.

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	71.4	100.0	100.0	85.7	100.0	100.0	100.0	100.0	100.0	85.7	85.7	85.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	***96.1***
2-day	100.0	100.0	100.0	66.7	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	83.3	100.0	100.0	83.3	100.0	***97.0***
3-day	40.0	100.0	100.0	80.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	60.0	100.0	80.0	100.0	100.0	80.0	60.0	***90.9***
4-day	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	50.0	100.0	75.0	100.0	100.0	100.0	75.0	***95.5***
5-day	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	100.0	100.0	100.0	100.0	100.0	100.0	100.0	***100.0***

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	*10:11*	*0*	*-*	*6*	*08:12*	*-*	*07:02*	*06:29*	*08:49*	*06:56*	*07:14*	*0*	*0*	*0*	*161*	*161*	*2*	*145*
month	*10:27*	*0*	*-*	*18*	*08:12*	*08:11*	*07:06*	*06:15*	*08:53*	*07:11*	*07:09*	*0*	*0*	*1*	*418*	*591*	*21*	*494*
season	*10:31*	*1*	*-*	*96*	*07:52*	*08:08*	*07:17*	*06:12*	*08:49*	*07:22*	*07:16*	*10*	*3*	*123*	*1201*	*2747*	*50*	*2294*

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.

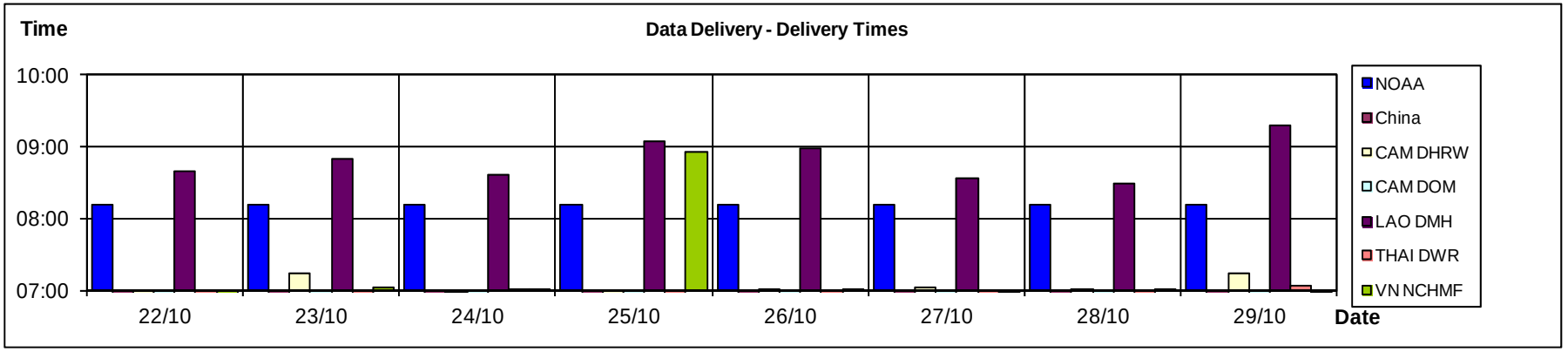


Figure B2: Data delivery times for the past 8 days including the current report date

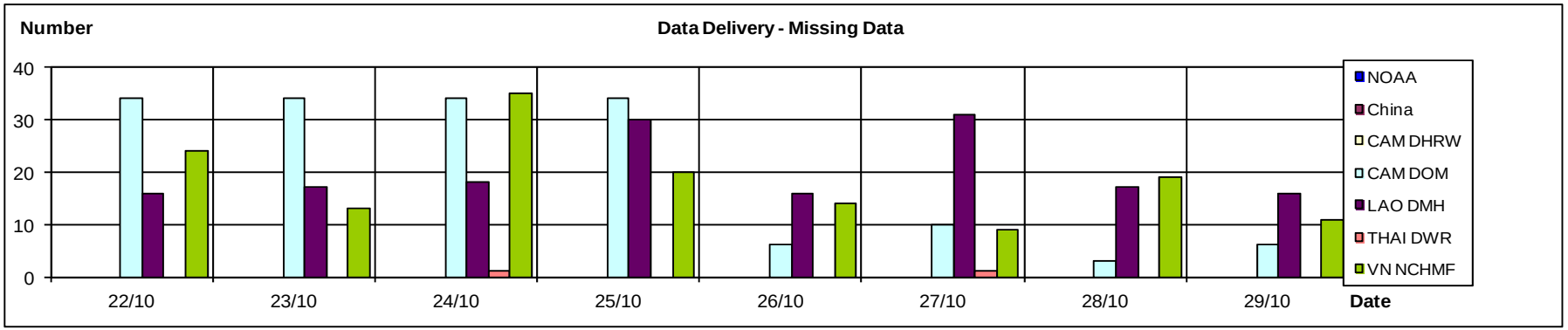


Figure B3: Missing data for the past 8 days including the current report date

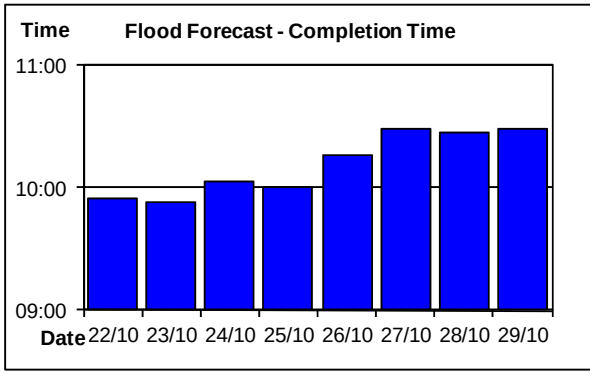


Figure B4: Flood forecast completion time

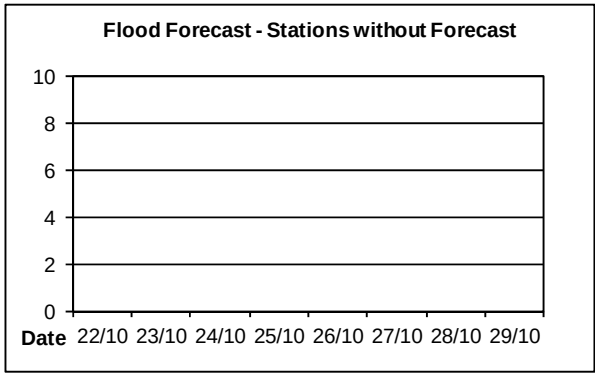


Figure B5: Flood forecast stations without forecast

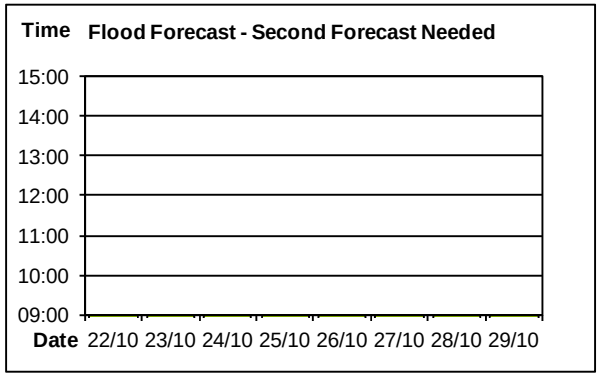


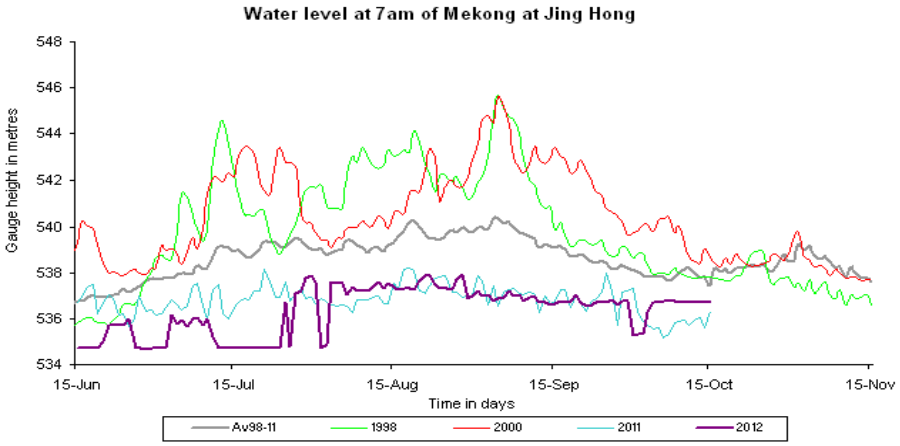
Figure B6: Second forecast needed

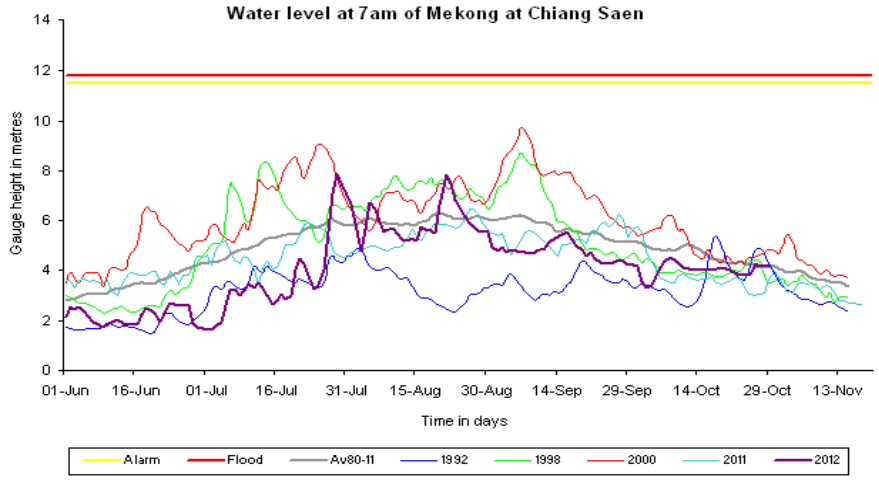
Annex C: Season Water Level Graphs

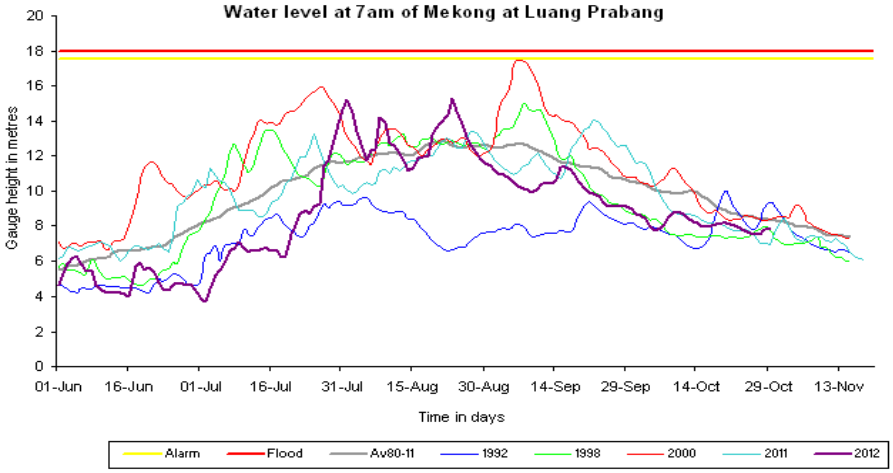
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

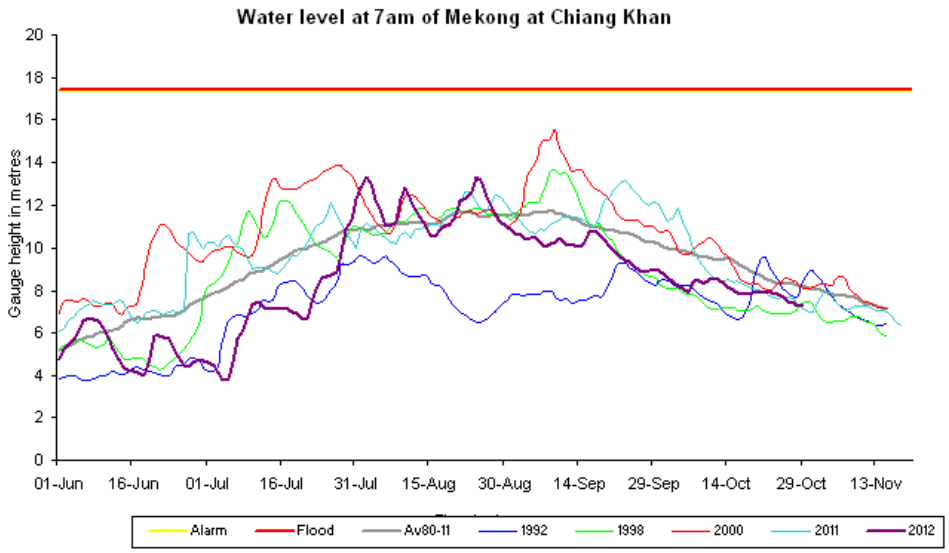
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

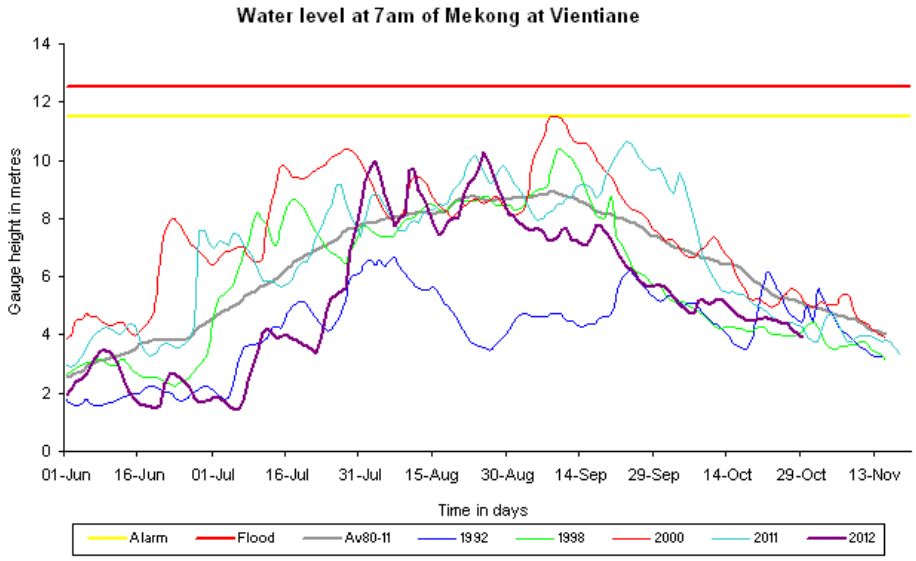
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

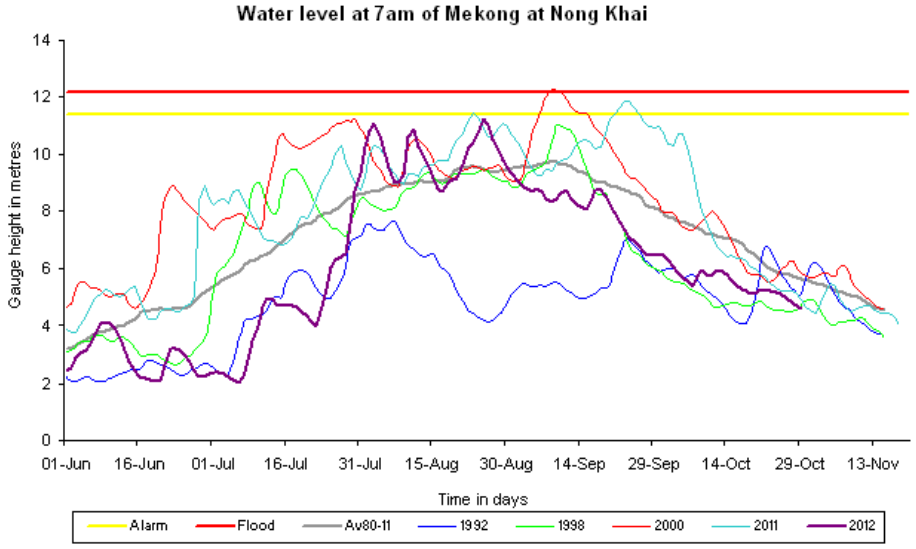


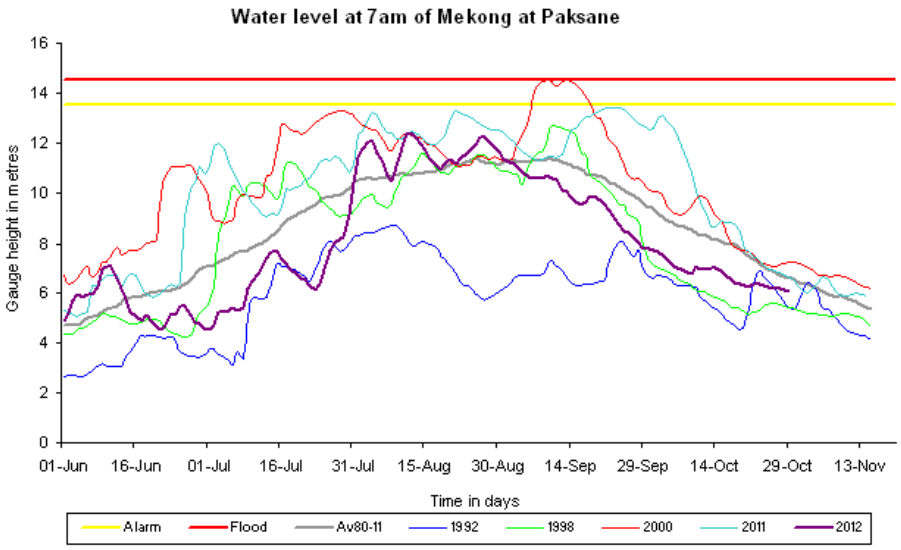


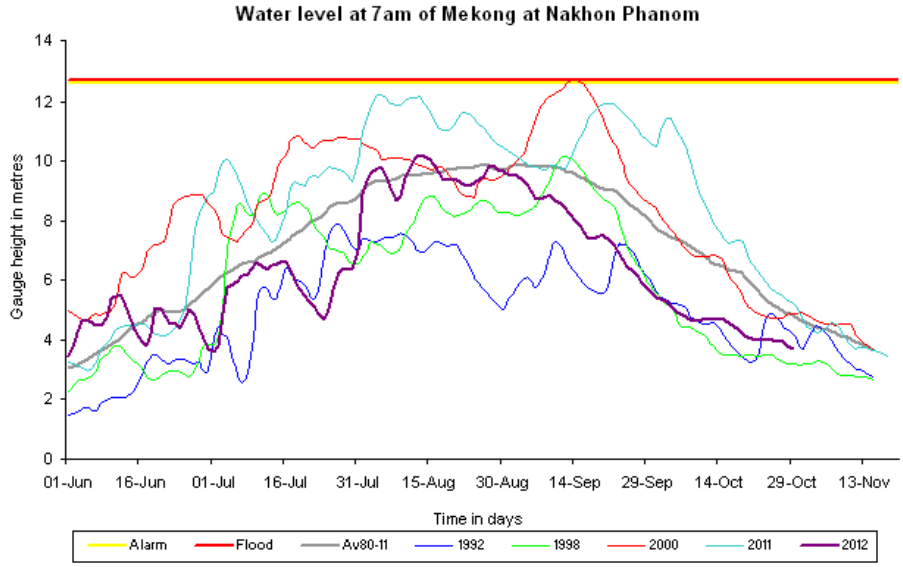


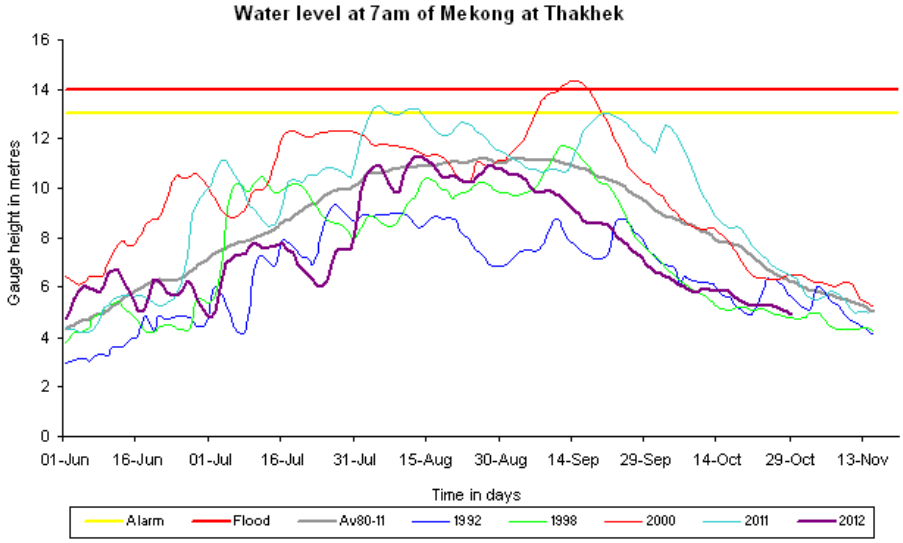

Water level at 7am of Mekong at Chiang Khan
Gauge height in metres
20
18
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

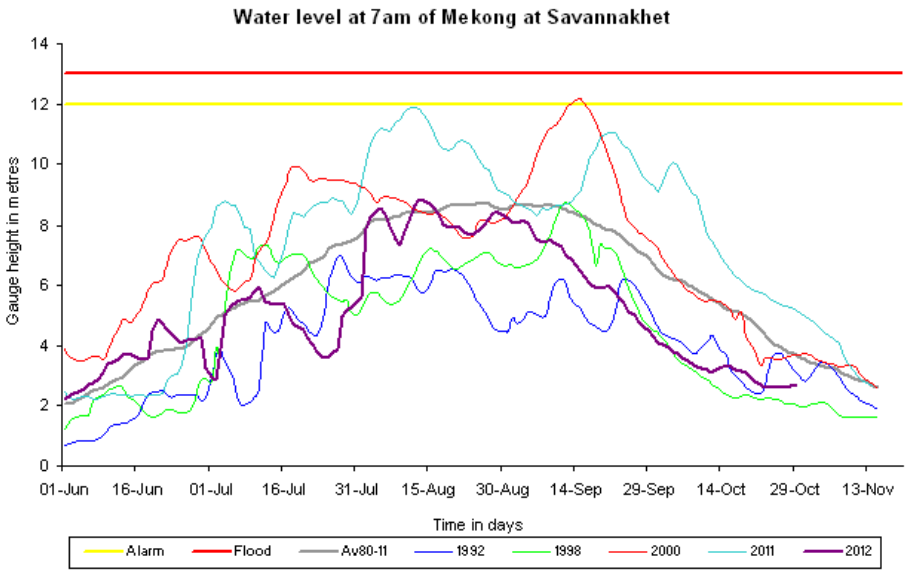

Water level at 7am of Mekong at Vientiane
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

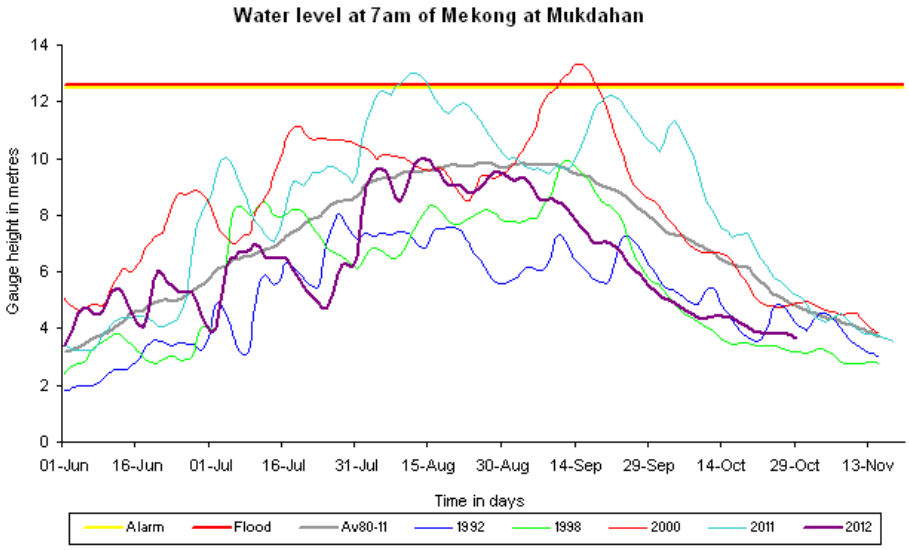

Water level at 7am of Mekong at Nong Khai
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

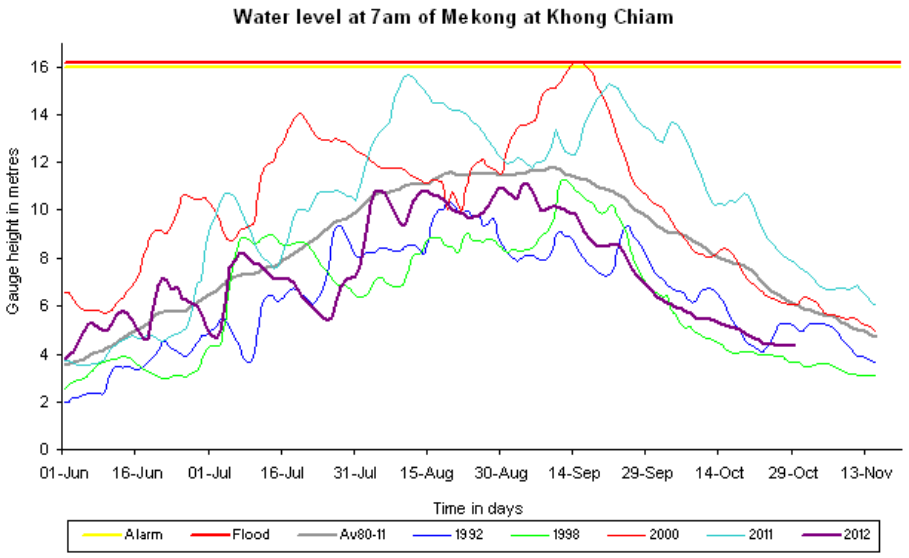

Water level at 7am of Mekong at Paksane
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

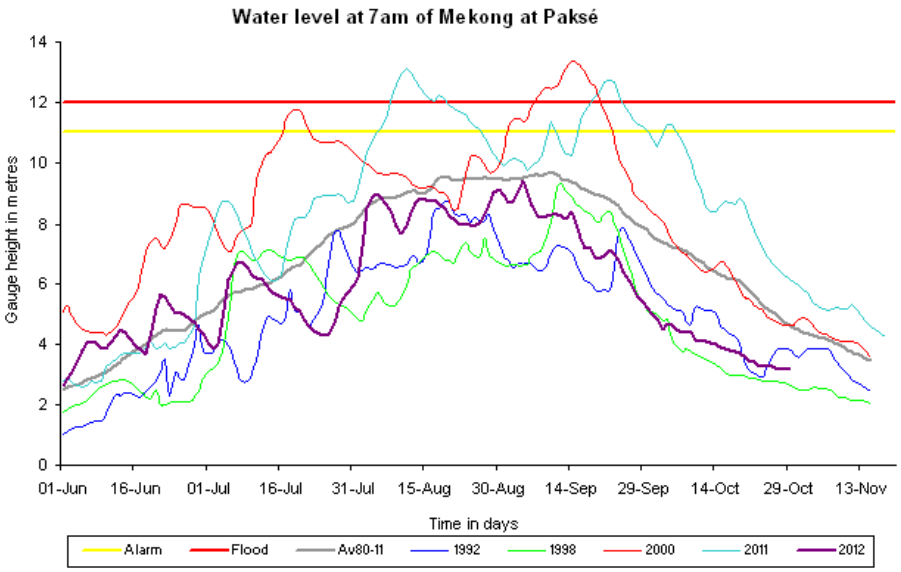

Water level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

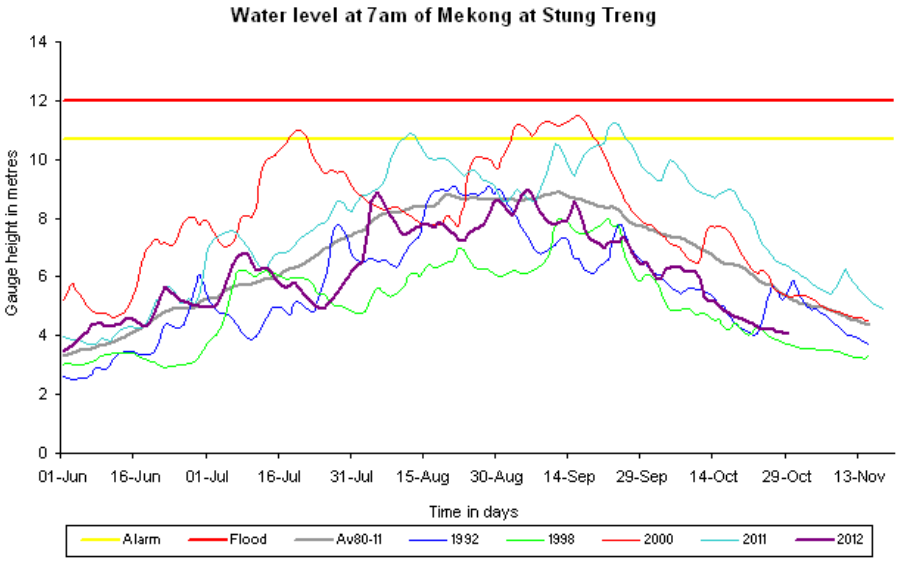

Water level at 7am of Mekong at Thakhek
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

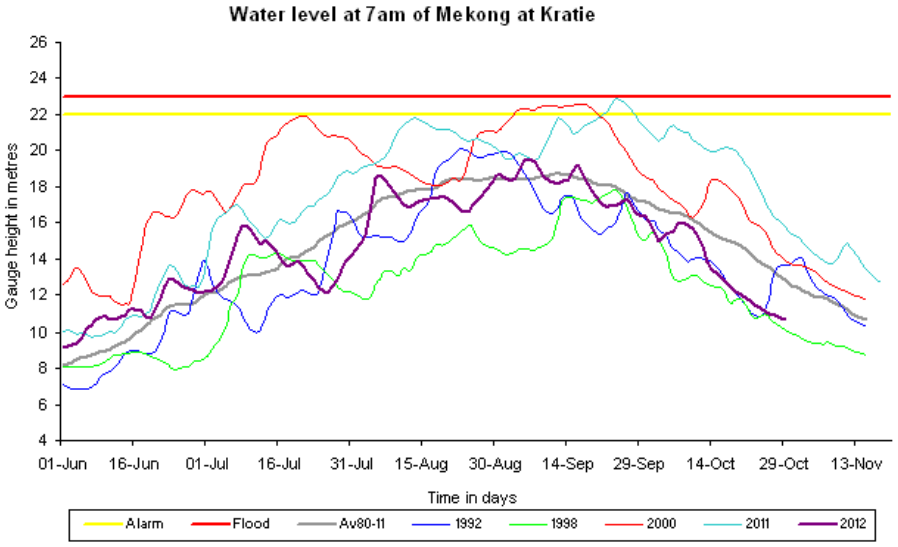

Water level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

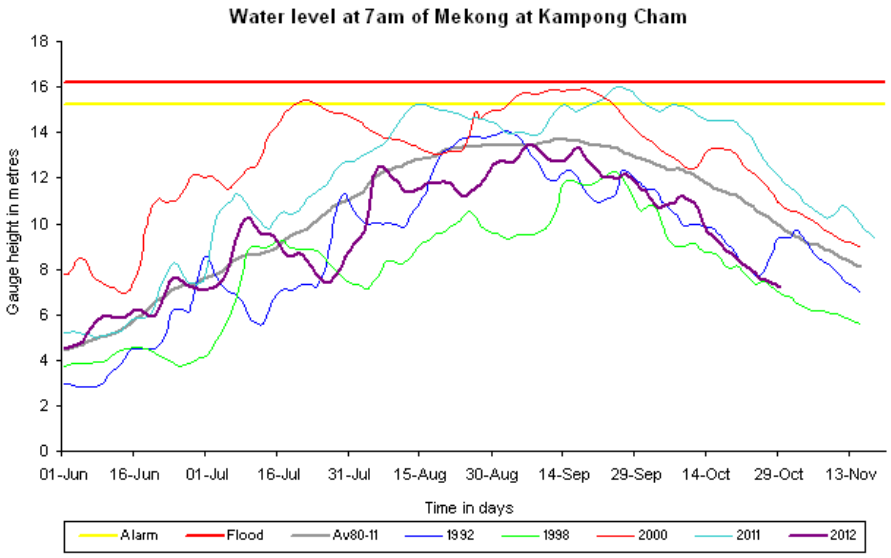

Water level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

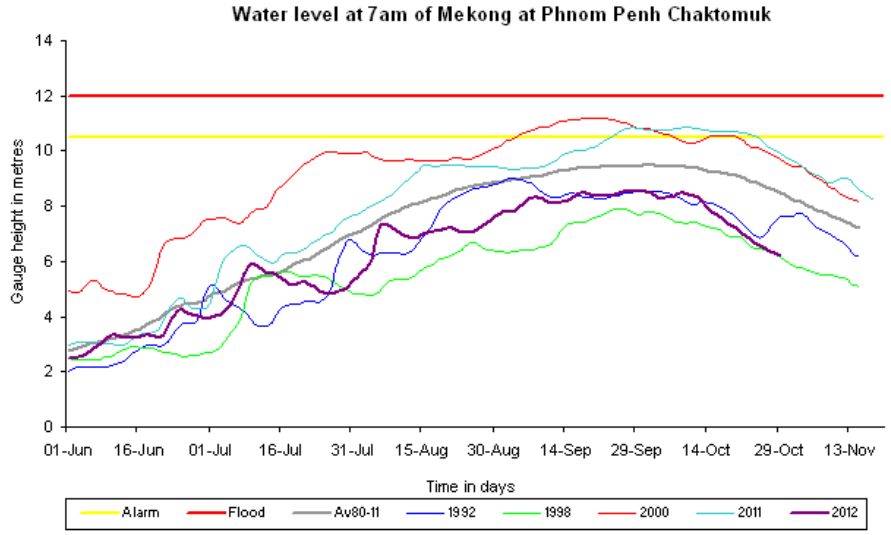

Water level at 7am of Mekong at Khong Chiam
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

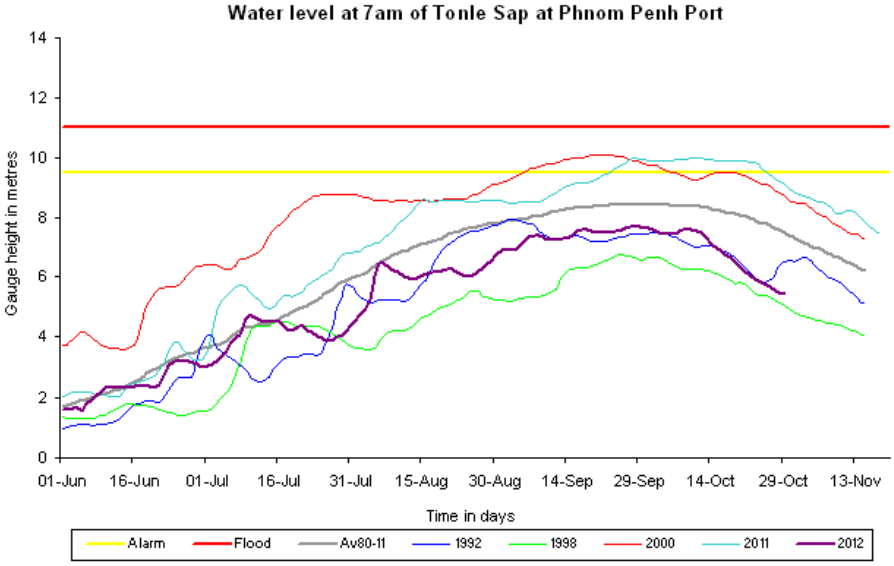

Water level at 7am of Mekong at Paksé
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

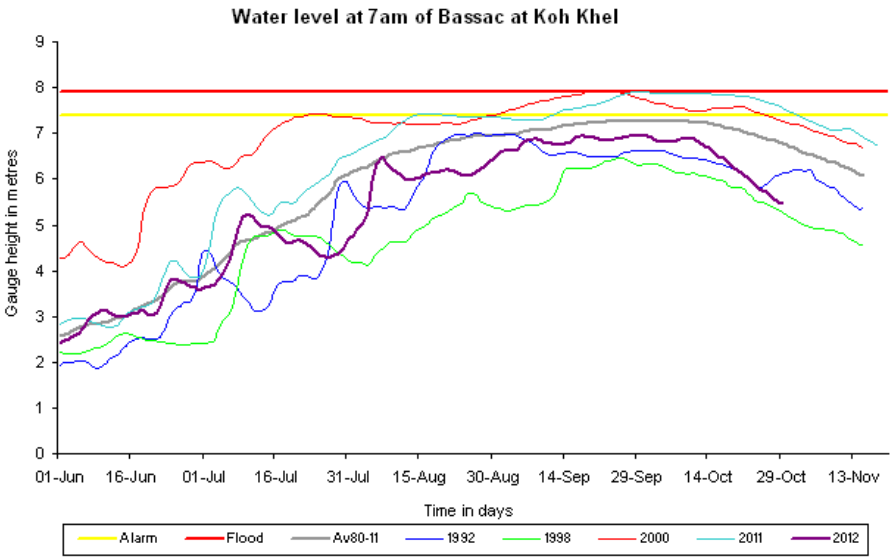

Water level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

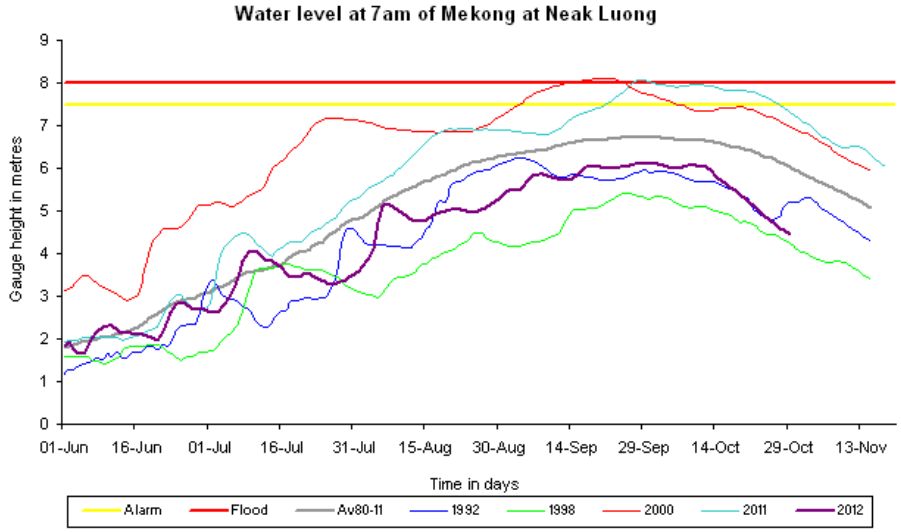

Water level at 7am of Mekong at Kratie
Gauge height in metres
4
6
8
10
12
14
16
18
20
22
24
26
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

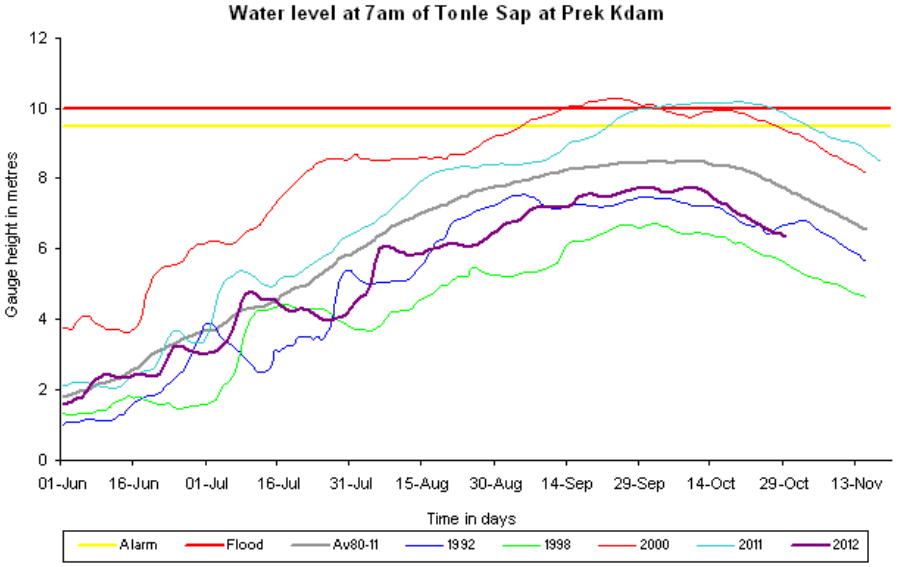

Water level at 7am of Mekong at Kampong Cham
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

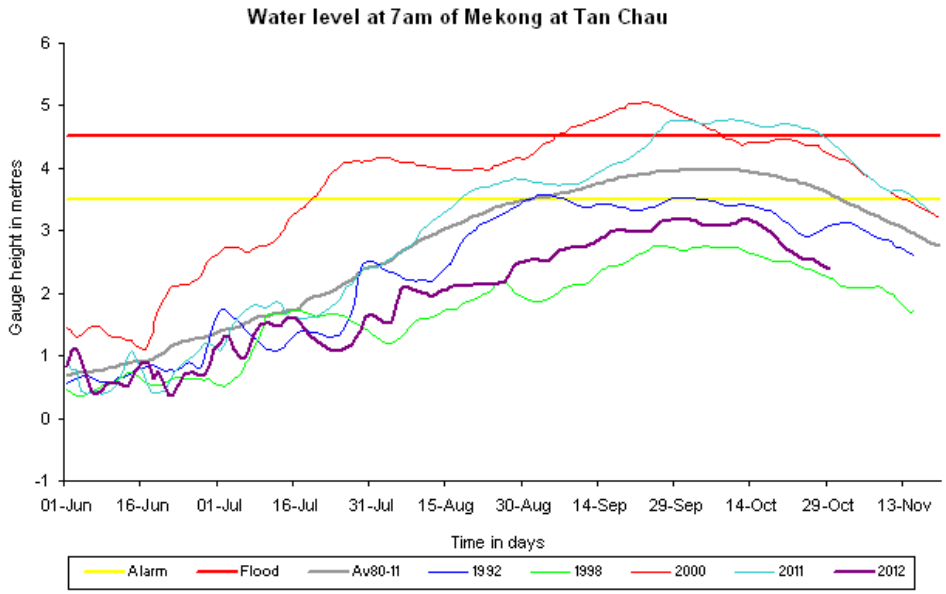

Water level at 7am of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012

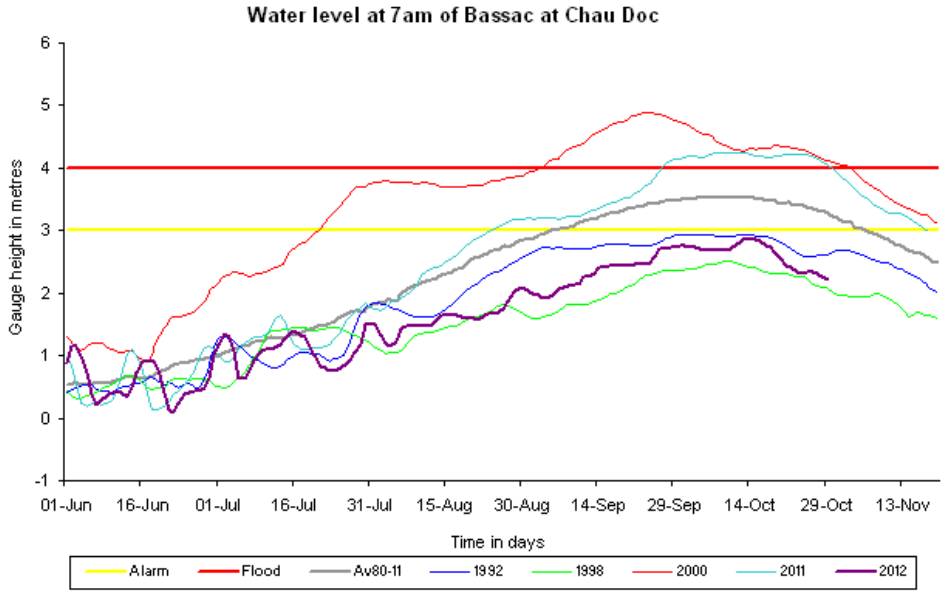

Water level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-11
1992
1998
2000
2011
2012


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
