Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 12/11/2013, covering the week from the 04th November to the 11th November 2013

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

General weather patterns

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

According to the activating of the two Typhoons in the East Sea from 4th to 11th of November; the first one was "KROSA"; it was entered the north-eastern area of the East Sea early on 1st November after sweeping across the Philippines' Luzon island with sustained winds of about 103-133 km/h, spotted moving east-northeast towards Hoang Sa archipelago, and then it landed early on 4th of November into Da Nang province, Vietnam. It was bring a lot of rainfall for some basins for these areas. The second one was super typhoon "HAIYAN"; beginning from 6th of November with wind speed up to 315 km/h, it destroyed homes, schools and an airport in the eastern city of Tacloban of Philippine on 8th of November. After passed over Philippine, the "HAIYAN" was complex moving track on the East Sea areas before approach at Quang Ninh province, Vietnam early on 11th November (see figure 1, 2)

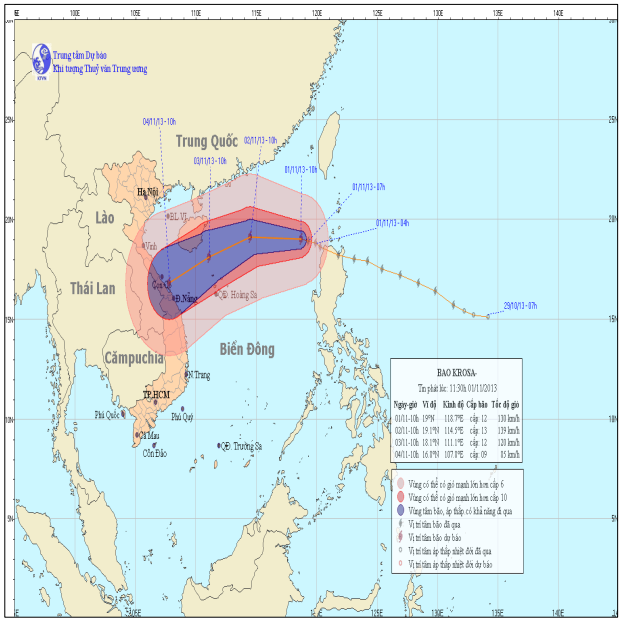


Figure 1: Track of TY "KROSA"

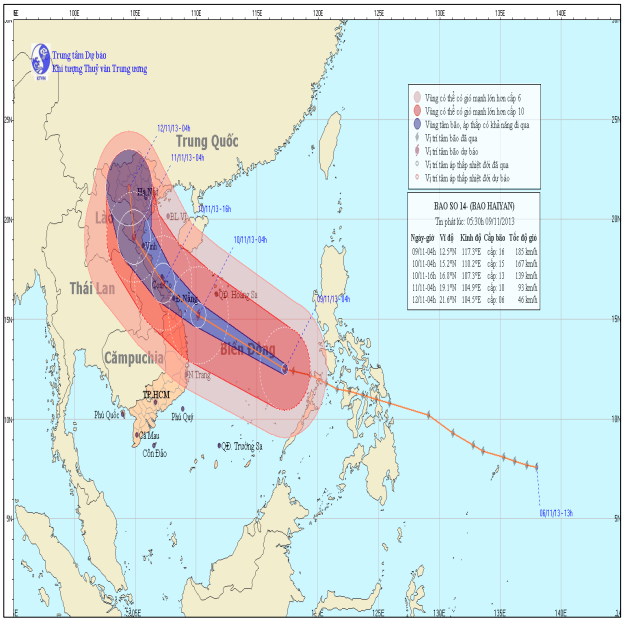


Figure 2: Track of TY "HAIYAN"

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Over weather situation

During the last week, although have two TYs was activity on the East Sea but no major effect to Lower Me Kong Basin, so all most no rain. Except from TY "KROSA" affected much only to Viet Nam's river basin areas and also some areas where near boundaries between Cambodia and Viet Nam (see figure 3).

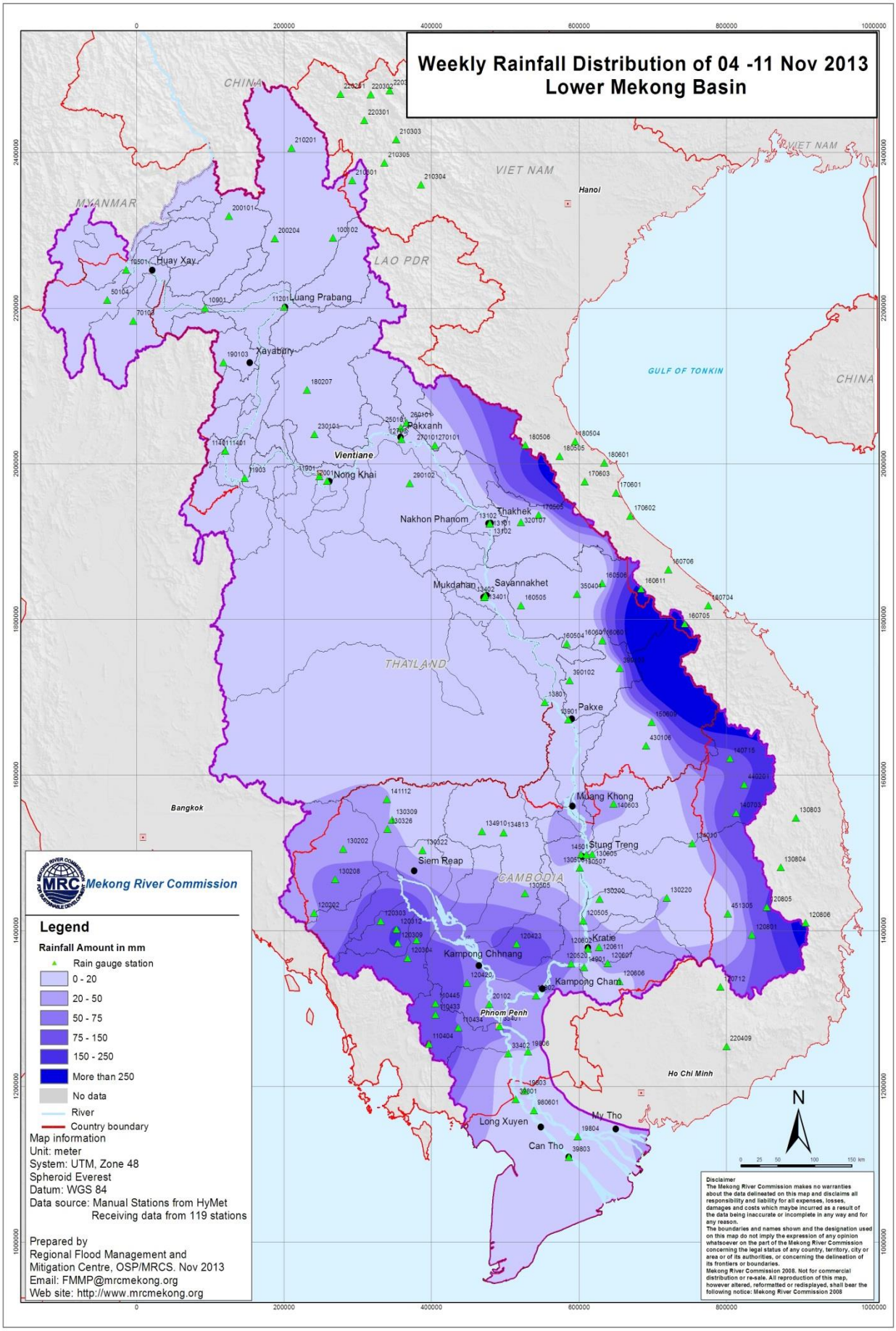


Figure 3: Weekly Rainfall Distribution covering the week 4th November – 11th November 2013

General behaviour of the Mekong River

During last week, water levels (WL) at most mainstream stations of the Lower Mekong Basin (LMB) slowly recessing, but some stations WL was higher than the long-term average water level (LTA).

For stations from Chiang Saen and Luang Prabang

During the last week, the WL at Chiang Saen slowly recessed and remained above the LTA, while at Luang Prabang slowly recessed and at second half under LTA.

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

During the last week, the WL at these stations slowly recessed and around the LTA, except the WL at Paksane station above the LTA.

For stations from Thakhet/Nakhon Phanom to Pakse

During the last week, the WL at these stations slowly changed and around the LTA.

For stations from Stung Treng to Kompong Cham

During the last week, the WL at these stations slowly changed and around the LTA.

For stations from Phnom Penh to Koh Khel/Neak Luong

During the last week, the WL at these stations slowly changed and around the LTA.

Tan Chau and Chau Doc

Water levels at these stations were slowly recessing under the LTA; on 5th November the WL (7h:00: 2,95 m) at Chau Doc station under alarm stage (3,0 m).

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

Flood Situation

Flood stage or alarm stage:

No flood stages

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

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
04/11		4.63	8.82	8.63	5.13	5.79	7.78	4.67	5.89	4.69	3.61	6.51	5.08	5.36	13.20	9.46	8.09	7.16	6.68	5.92	8.19	3.24	3.01
05/11		4.56	8.60	8.66	5.30	5.98	7.65	4.49	5.71	4.45	3.37	6.30	4.90	5.27	13.20	9.46	8.07	7.12	6.66	5.89	8.16	3.18	2.95
06/11		4.44	8.48	8.52	5.30	6.05	7.60	4.43	5.65	4.36	3.27	6.05	4.72	5.18	13.06	9.39	8.01	7.06	6.62	5.86	8.12	3.15	2.88
07/11		4.36	8.30	8.36	5.17	5.92	7.94	4.45	5.60	4.36	3.25	5.90	4.54	5.10	12.93	9.31	7.96	6.95	6.59	5.84	8.09	3.10	2.81
08/11		4.32	8.10	8.20	5.00	5.72	7.86	4.51	5.73	4.40	3.30	5.89	4.51	4.98	12.74	9.19	7.86	6.82	6.56	5.79	7.99	3.04	2.75
09/11		4.26	7.93	8.08	4.87	5.56	7.70	4.48	5.70	4.42	3.32	5.92	4.53	5.31	12.54	9.03	7.78	6.71	6.50	5.70	7.93	3.00	2.72
10/11		4.22	7.86	7.96	4.87	5.42	7.60	4.42	5.65	4.40	3.31	6.33	4.79	5.52	13.15	9.10	7.73	6.63	6.46	5.66	7.88	2.94	2.66
11/11		4.19	7.76	7.85	4.60	5.28	7.51	4.49	5.71	4.42	3.31	6.41	4.98	5.44	13.45	9.40	7.87	6.73	6.52	5.52	7.91	2.90	2.61

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
04/11		0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr
05/11		0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	0.0	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr
06/11		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr
07/11		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	9.0	11.0	28.2	38.6	-	18.5	13.6	12.3	2.2	2.2
08/11		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	11.5	8.0	20.5	29.6	-	nr	6.2	19.5	nr	1.0
09/11		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	4.5	nr	nr	nr	-	nr	nr	nr	0.0	4.0
10/11		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	-	nr	nr	nr	nr	nr
11/11		nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr

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

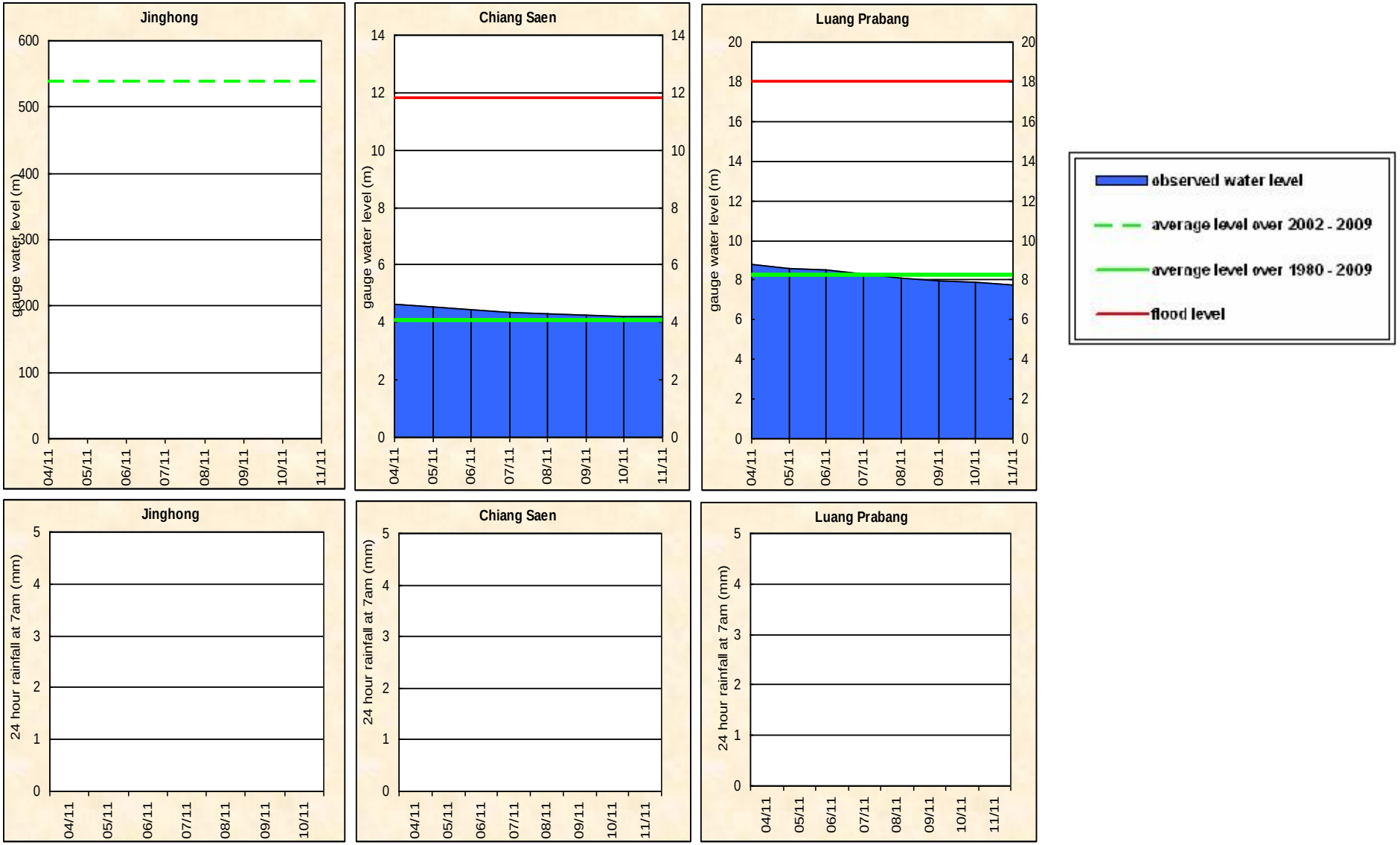


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

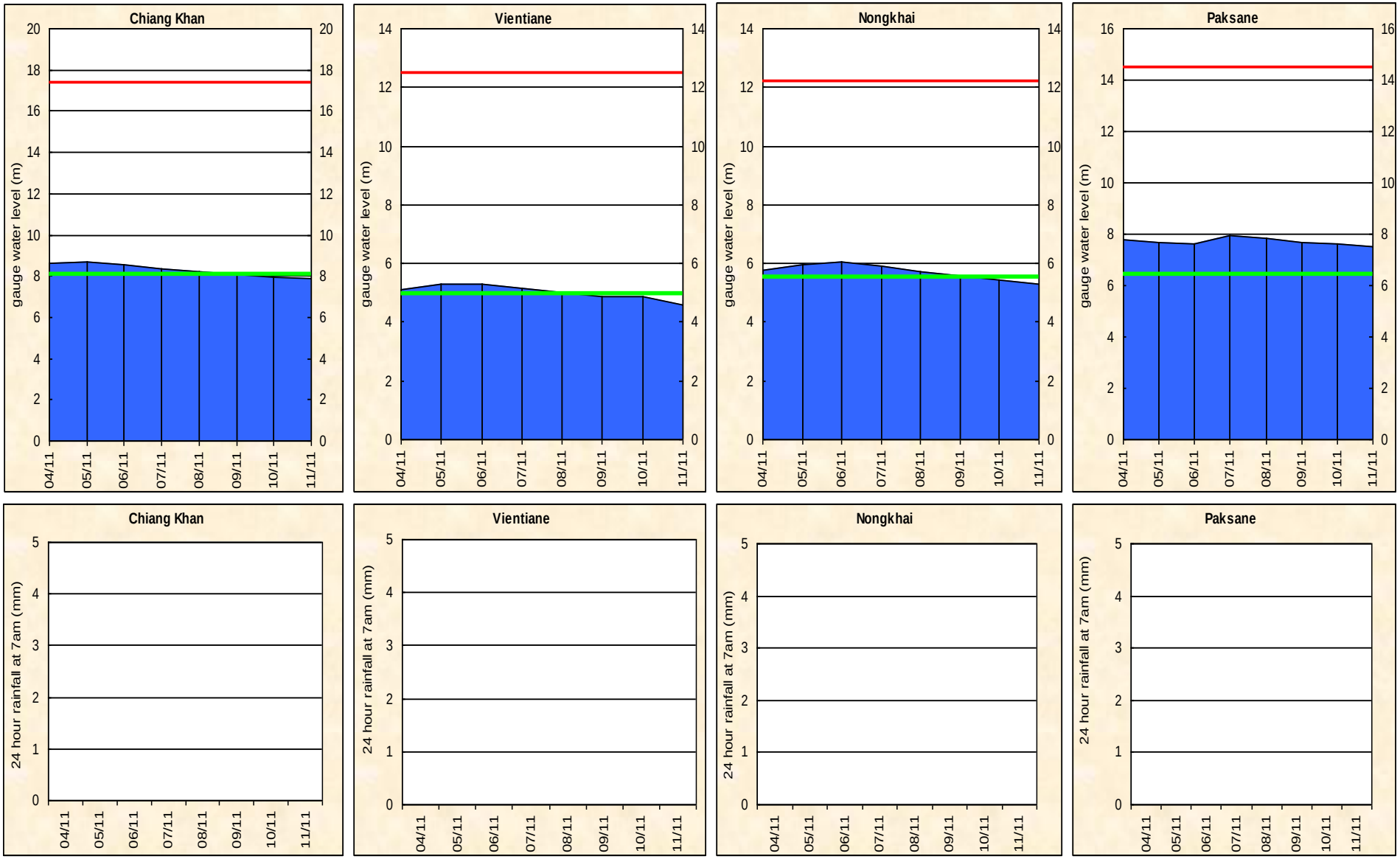


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

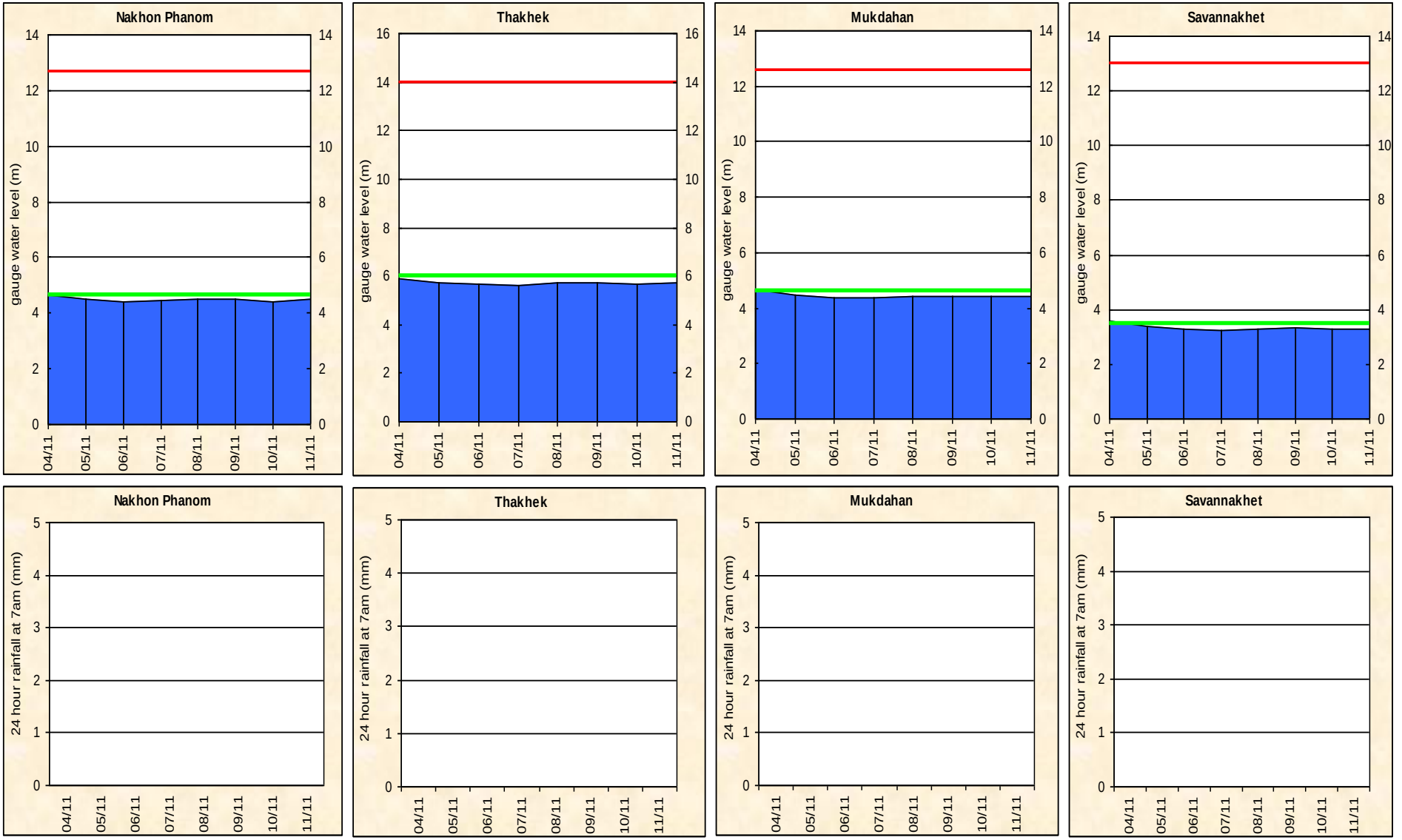


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

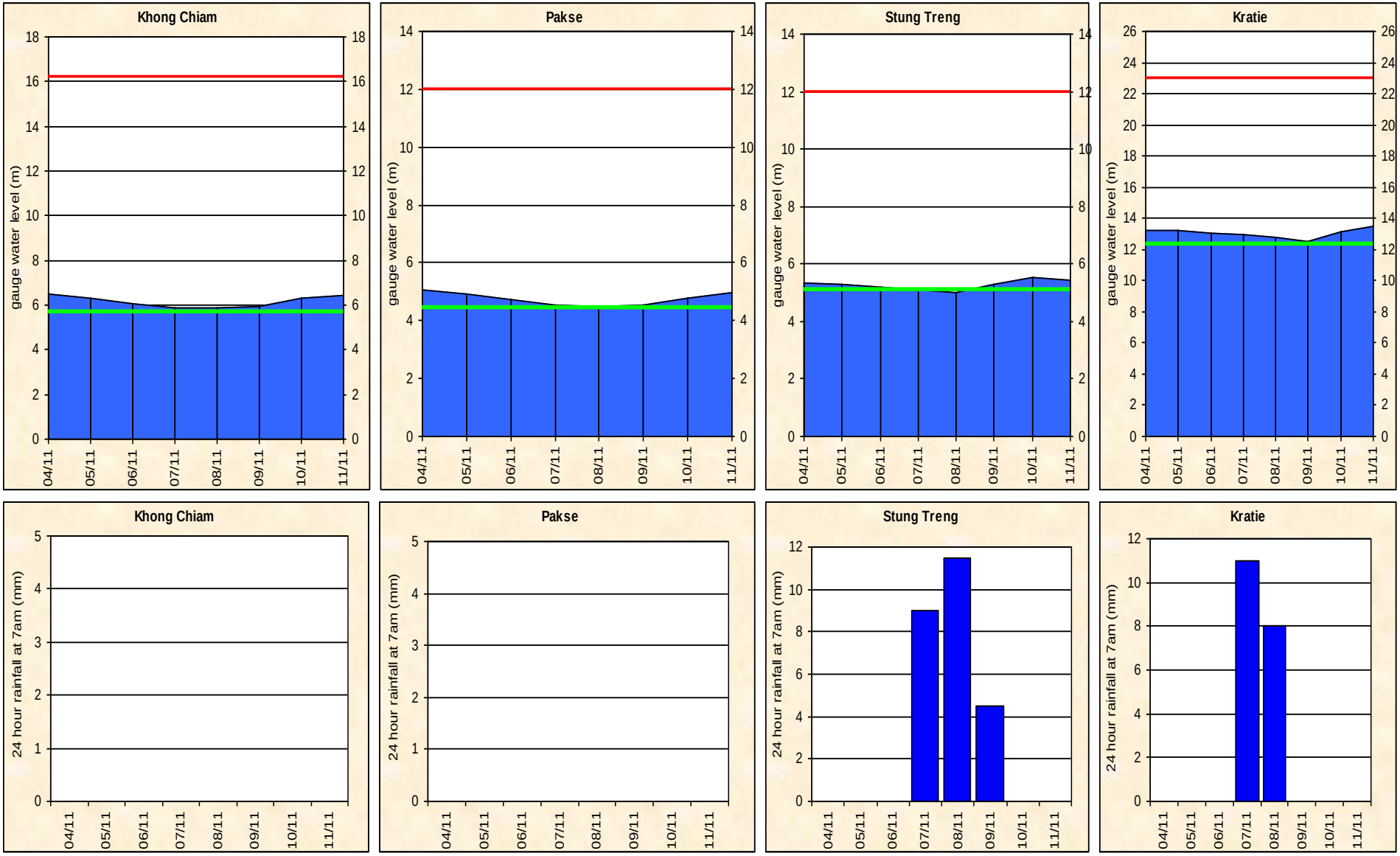


Figure A5: Water level and rainfall for Kopong Cham, Phnom Penh (Bassac and Port), and Koh Khel.

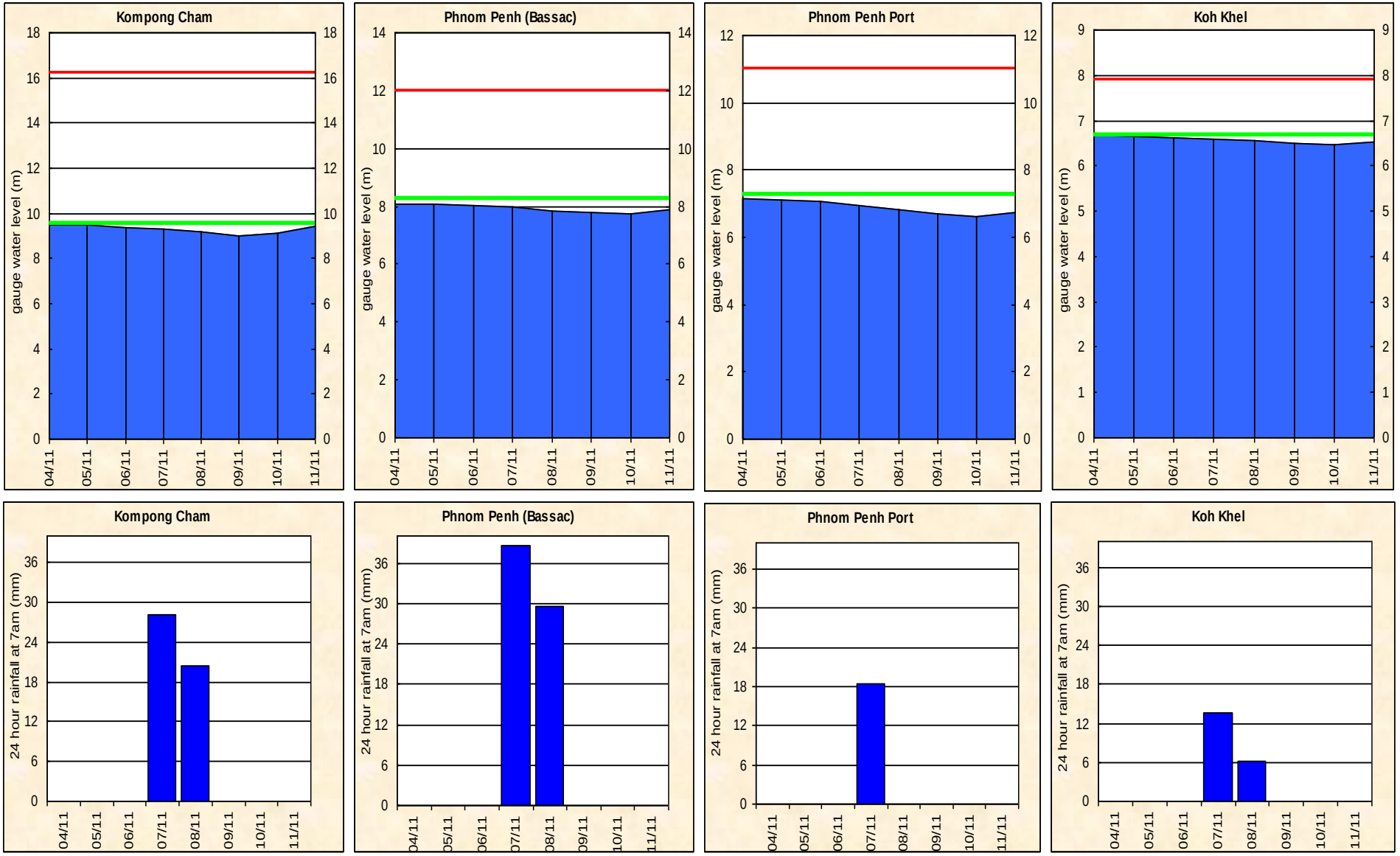
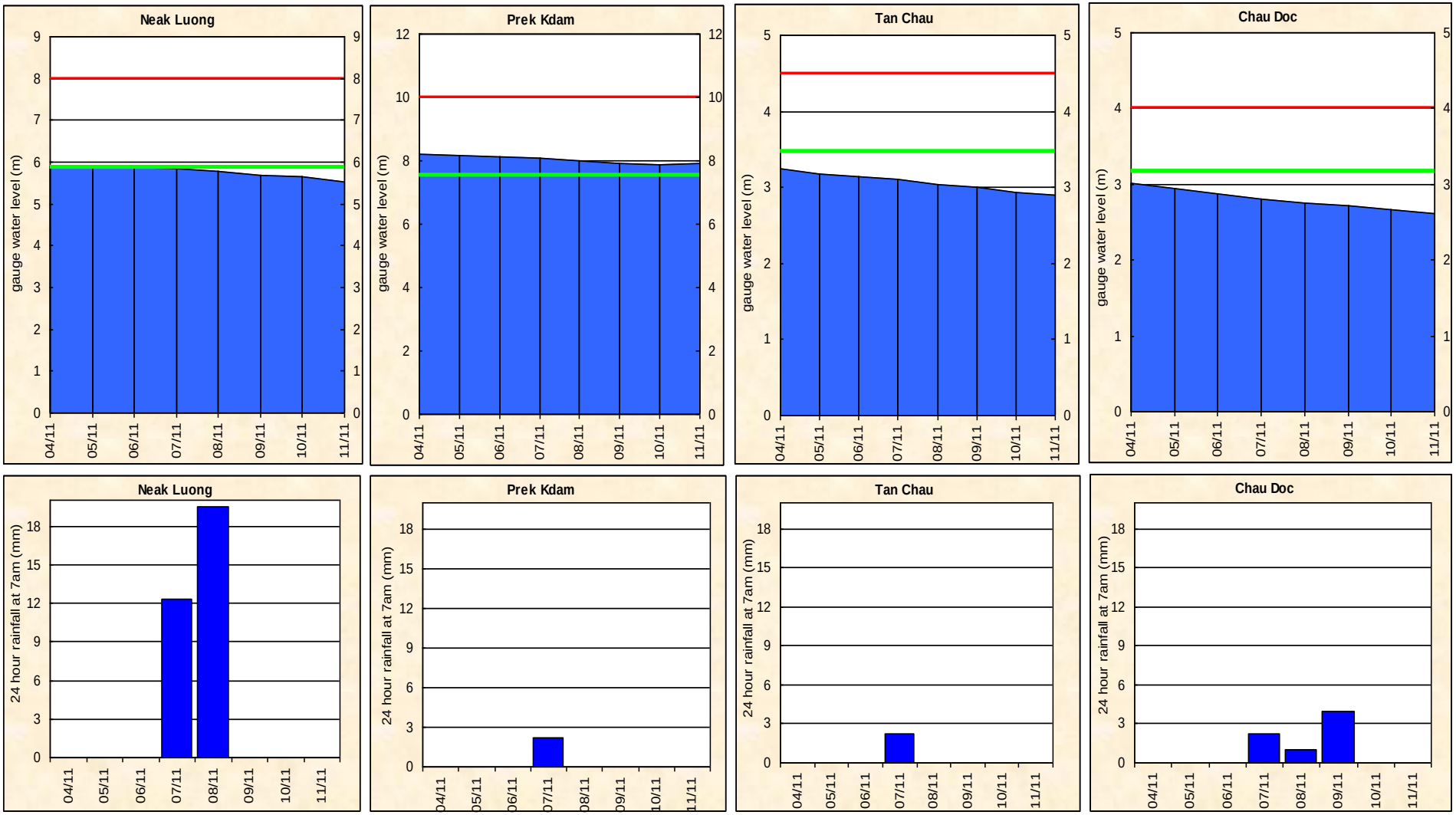


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



Annex B: Accuracy and performance

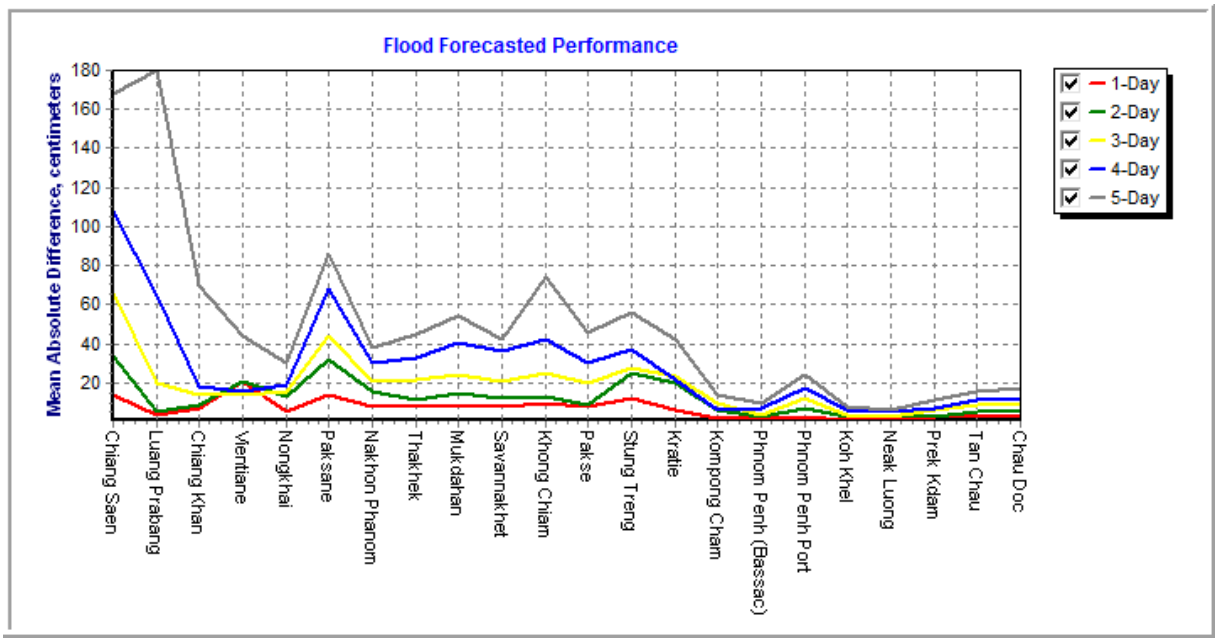
Accuracy

"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 good for 1-day to 5-day forecast lead time at all stations in LMB. However, the accuracies at Khong Chiam for 5-day forecast were less than expected.

The above differences due to three 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; (3) scattered local heavy rainfall induced by ITCZ happened in many tributaries and resulted in rapid rising water levels.

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	83.3	100.0	100.0	66.7	83.3	50.0	66.7	66.7	50.0	66.7	83.3	83.3	66.7	83.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	83.3	***83.3***
2-day	80.0	100.0	100.0	100.0	80.0	40.0	100.0	100.0	80.0	100.0	100.0	100.0	80.0	100.0	100.0	100.0	80.0	100.0	100.0	100.0	100.0	100.0	***92.7***
3-day	75.0	100.0	100.0	100.0	75.0	50.0	75.0	50.0	50.0	50.0	100.0	100.0	75.0	100.0	100.0	100.0	50.0	100.0	100.0	100.0	100.0	50.0	***81.8***
4-day	66.7	66.7	100.0	100.0	100.0	66.7	66.7	100.0	66.7	66.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	33.3	33.3	***84.8***
5-day	50.0	50.0	50.0	50.0	100.0	50.0	50.0	100.0	50.0	50.0	0.0	50.0	50.0	50.0	100.0	100.0	50.0	100.0	100.0	100.0	100.0	100.0	***68.2***

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

	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
1-day	25	25	25	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2-day	50	50	50	25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10	10	10	10
3-day	50	50	50	25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10	10	10	10
4-day	75	75	50	50	50	50	50	50	50	50	50	50	50	50	50	10	25	10	25	25	10	10
5-day	75	75	50	50	50	50	50	50	50	50	50	50	50	50	50	25	25	25	25	25	25	25

Note: *An indication of the accuracy given in the Table B2 is based on the performance of the forecast made in 2008 from the new flood forecasting system and the configuration for the 2009 flood season and is published on the website of MRC (http://ffw.mrcmekong.org/accuracy.htm).*

A new set of performance indicators that is established by combining international standards and the specific circumstances in the Mekong River Basin, is applied officially for the flood season of 2011 onward.

Performance

Performance is assessed by evaluating a number of performance indicators, see table and graphs below:

Table B3: Overview of performance indicators for the past 5 days including the current report date

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	*09:59*	*0*	*-*	*0*	*09:15*	*-*	*07:10*	*06:47*	*08:40*	*07:31*	*07:05*	*0*	*0*	*0*	*57*	*117*	*0*	*19*
month	*10:02*	*0*	*-*	*0*	*08:14*	*-*	*07:09*	*06:41*	*08:42*	*07:26*	*07:04*	*0*	*0*	*0*	*91*	*208*	*0*	*25*
season	*10:21*	*5*	*-*	*96*	*08:14*	*-*	*07:11*	*05:59*	*08:48*	*07:27*	*07:09*	*46*	*17*	*101*	*1888*	*4067*	*31*	*767*

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.

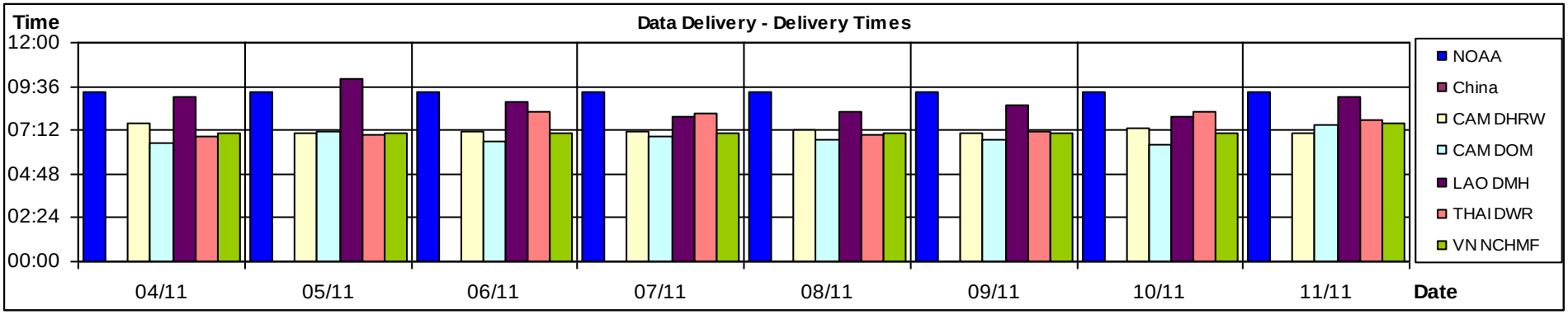


Figure B2: Data delivery times for the past 8 days including the current report date

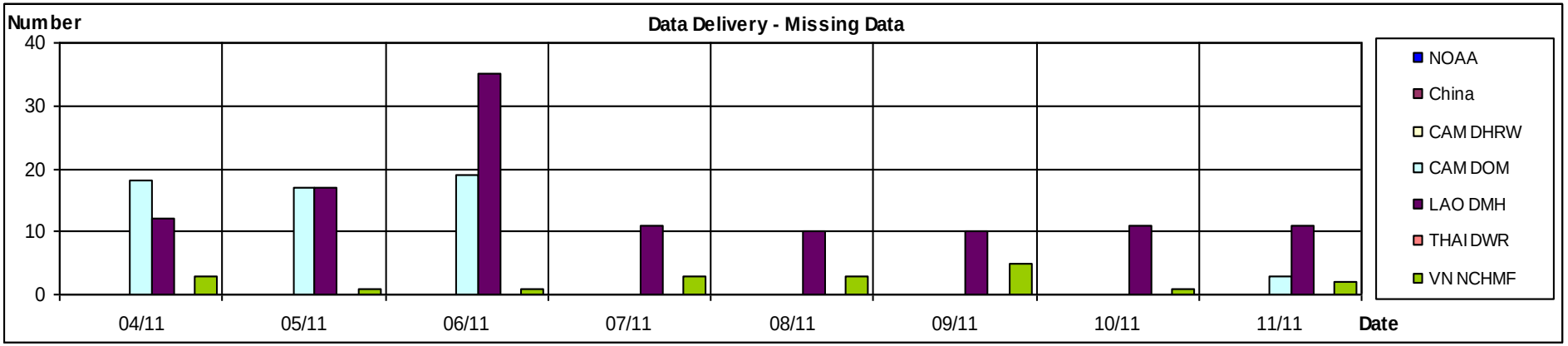


Figure B3: Missing data for the past 8 days including the current report date

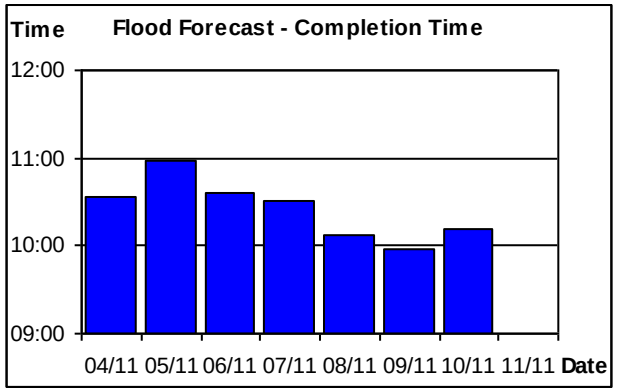


Figure B4: Flood forecast completion time

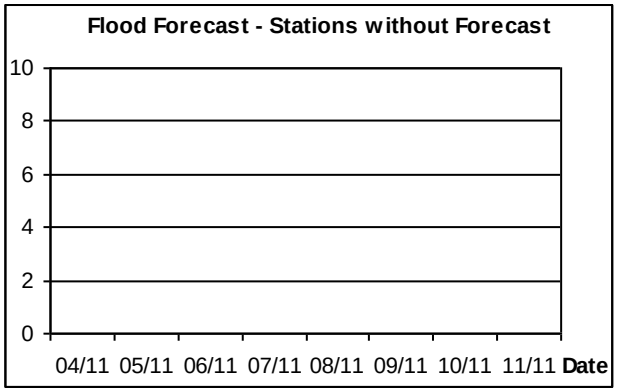


Figure B5: Flood forecast stations without forecast

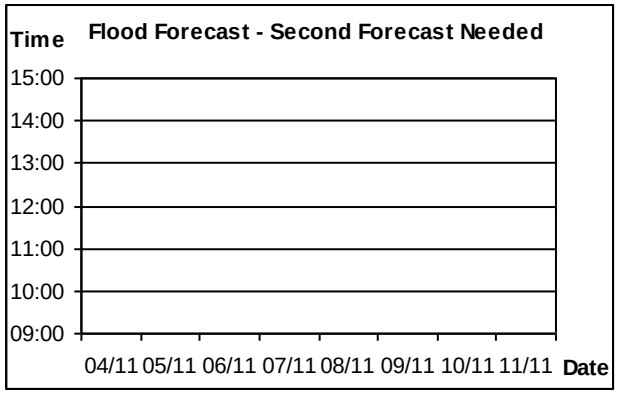
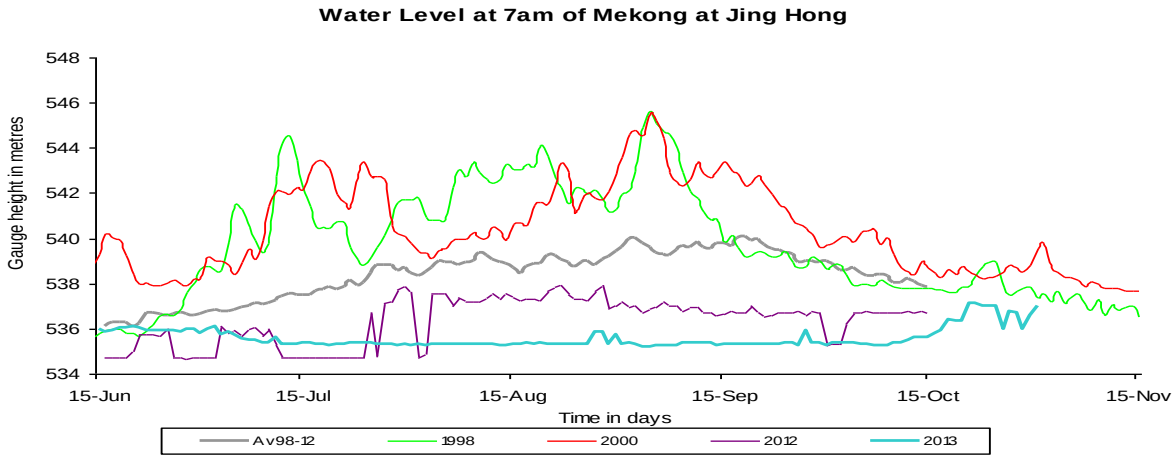


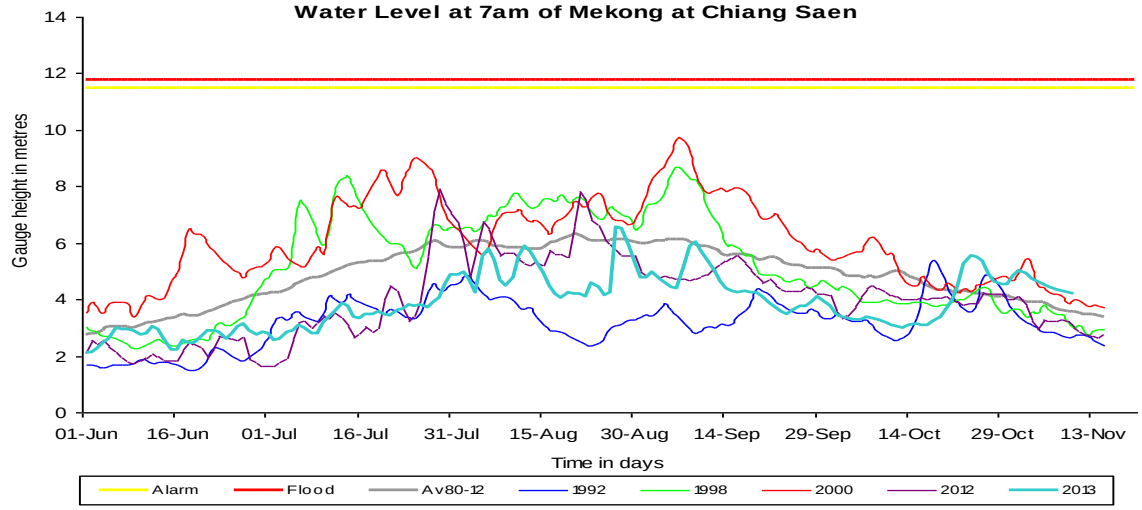
Figure B6: Second forecast needed

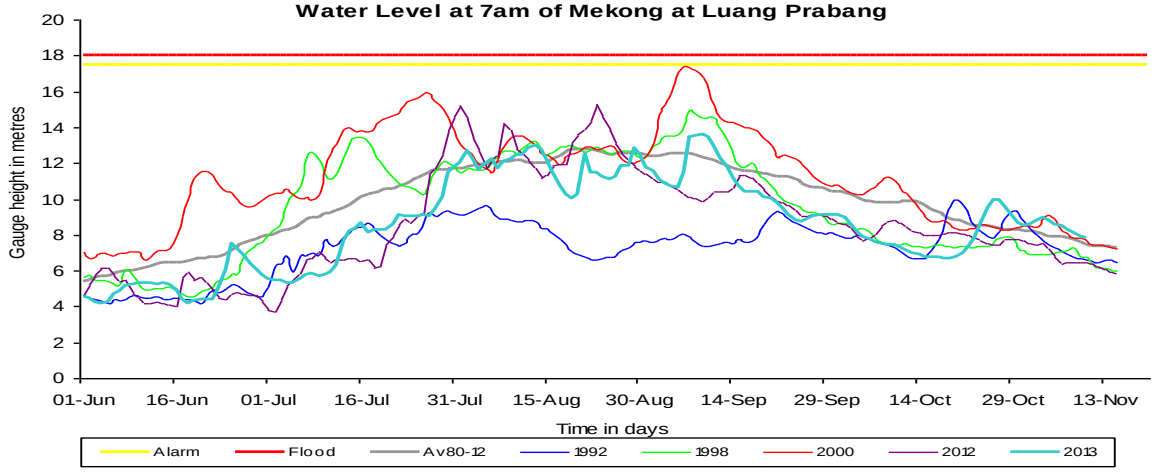
Annex C: Season Water Level Graphs

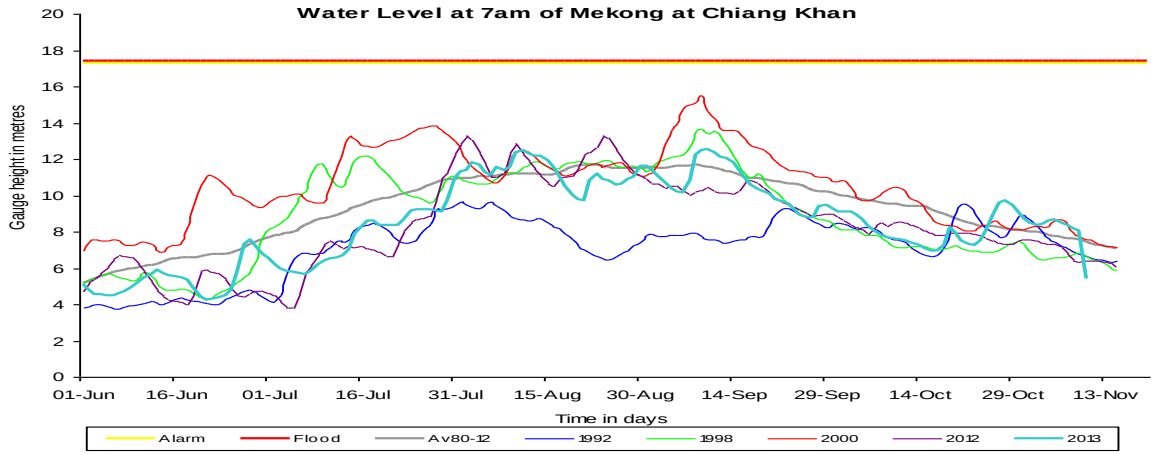
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

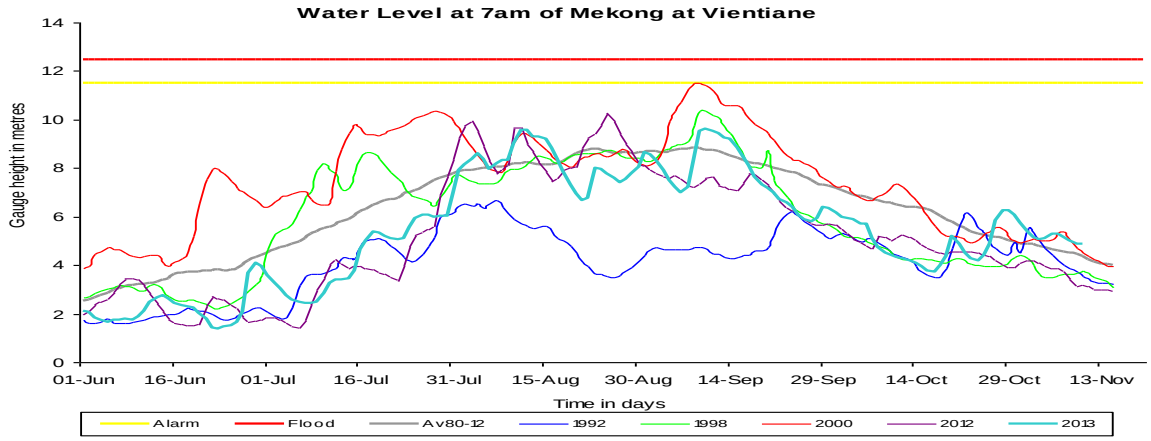
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

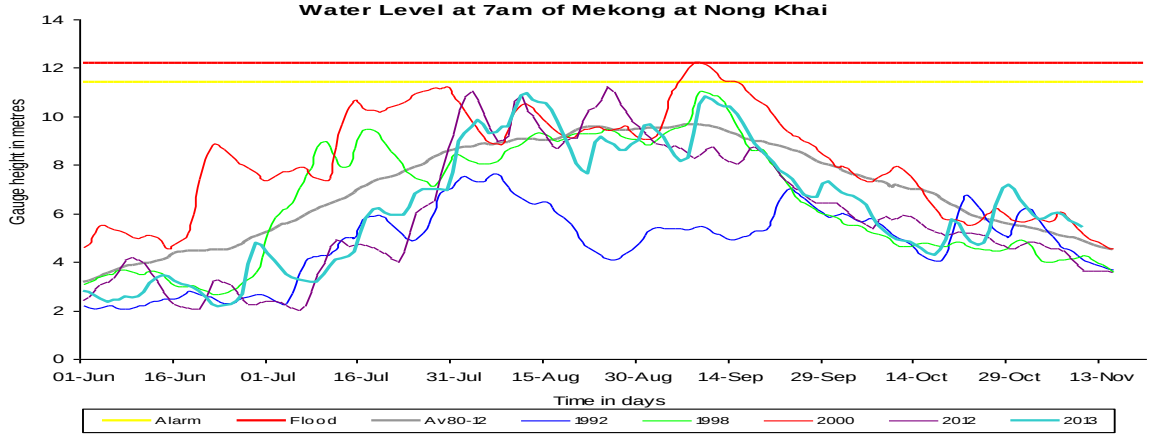







Water Level at 7am of Mekong at Chiang Khan
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Vientiane
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
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Nong Khai
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
Av80-12
1992
1998
2000
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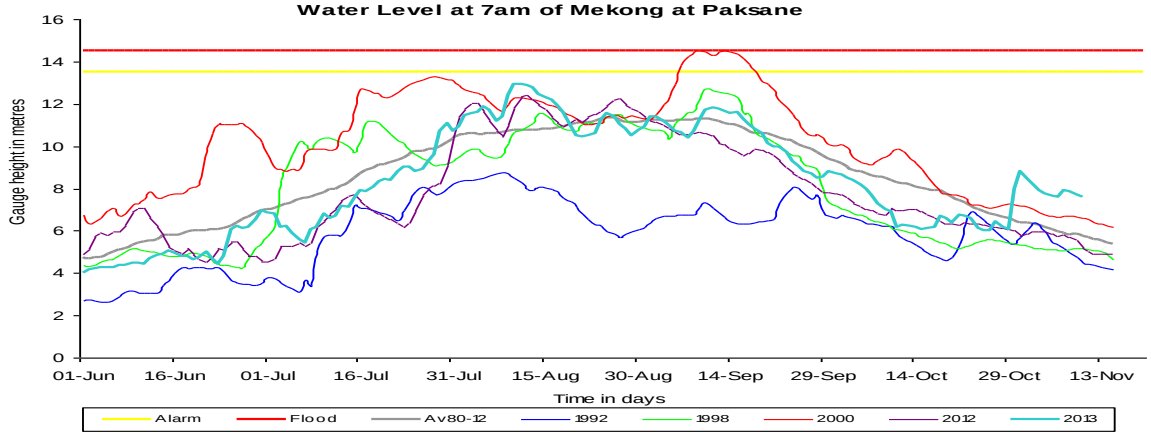
2013


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
Av80-12
1992
1998
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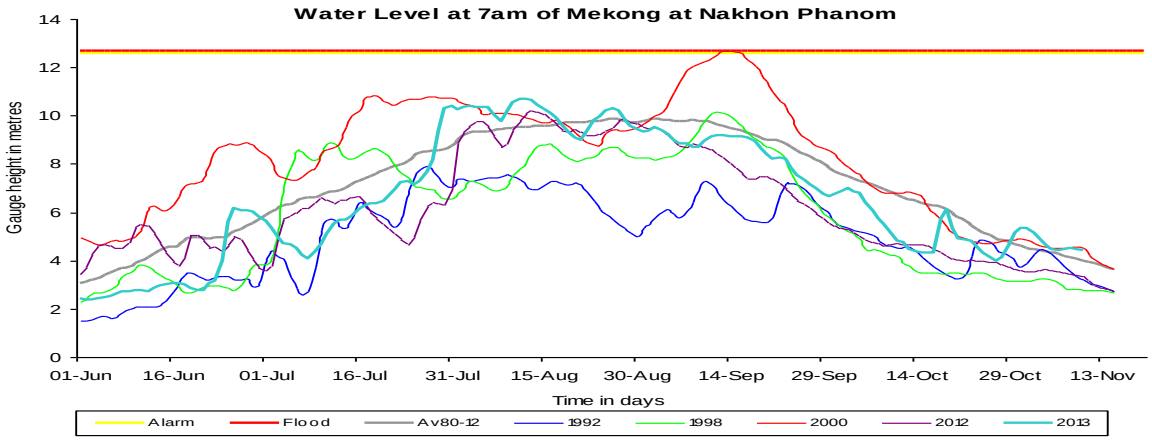
2013


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
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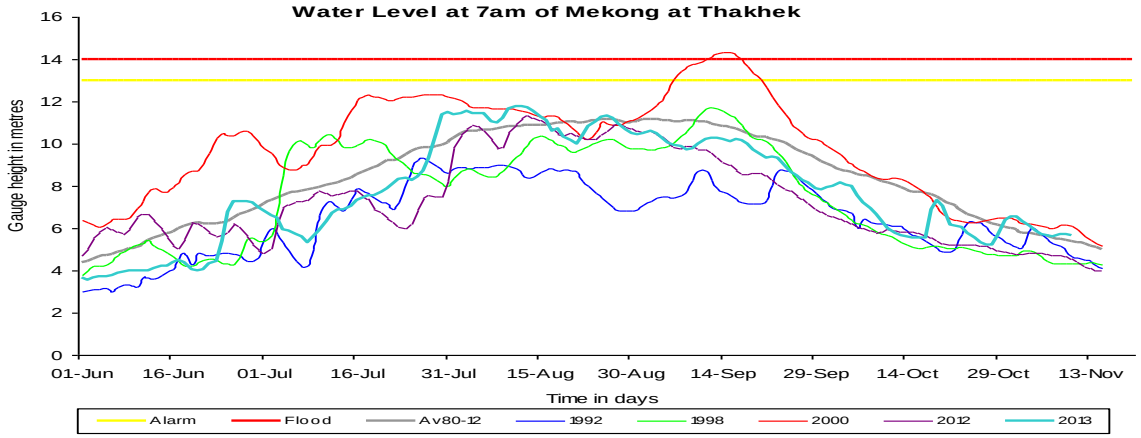
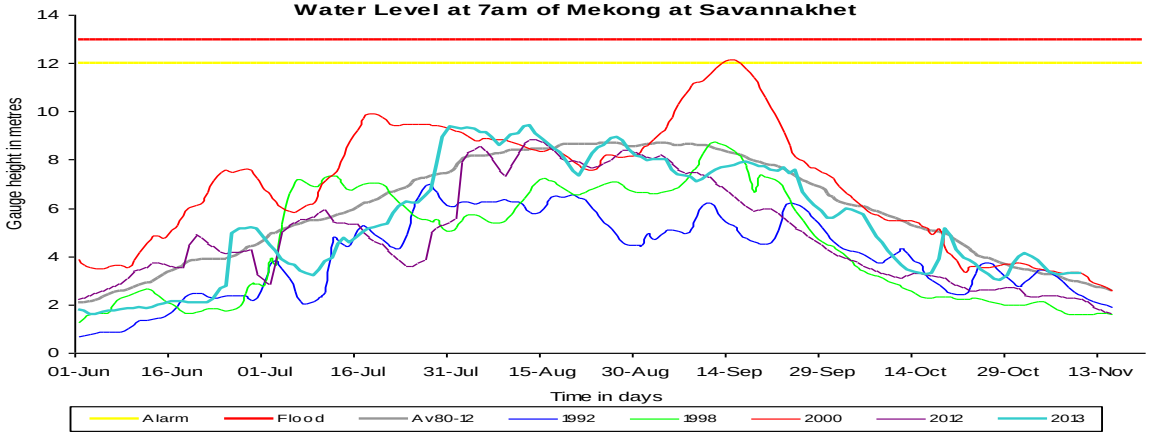
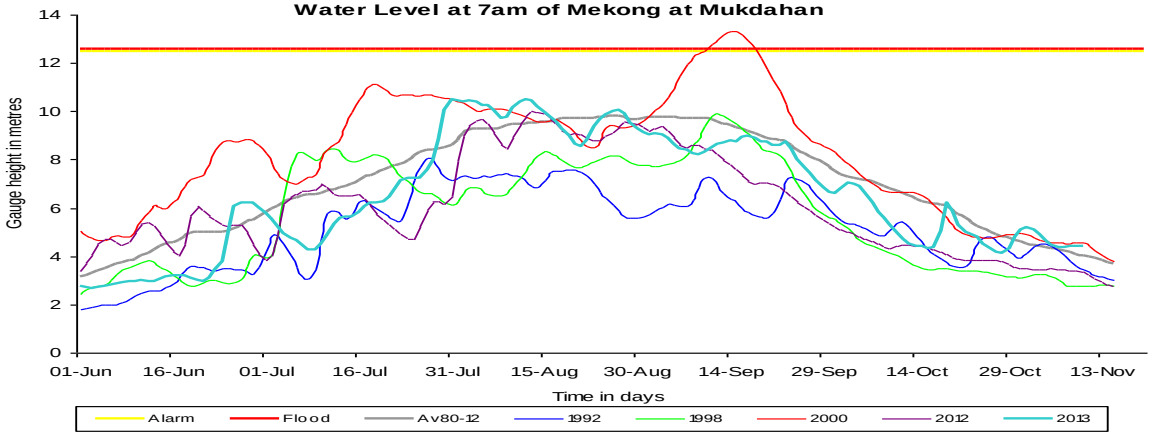
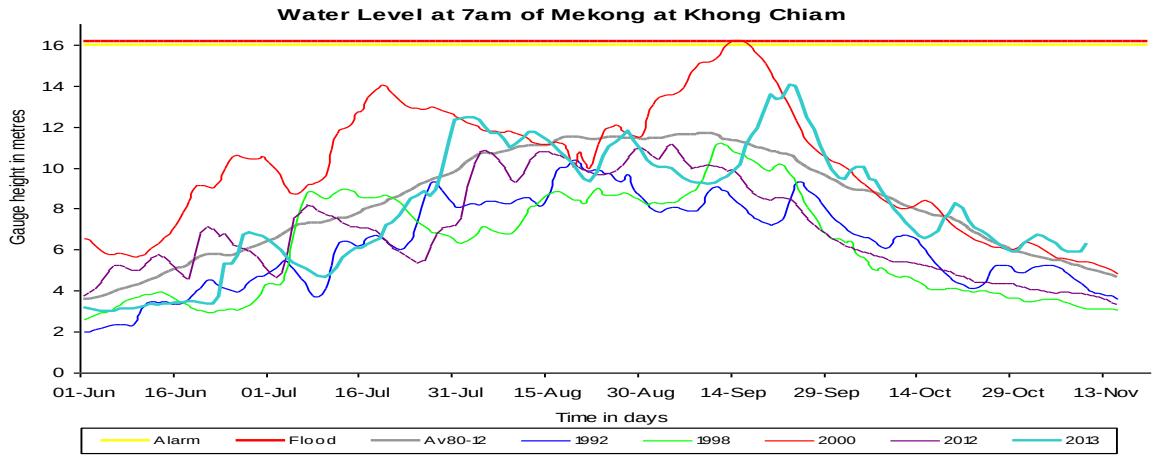
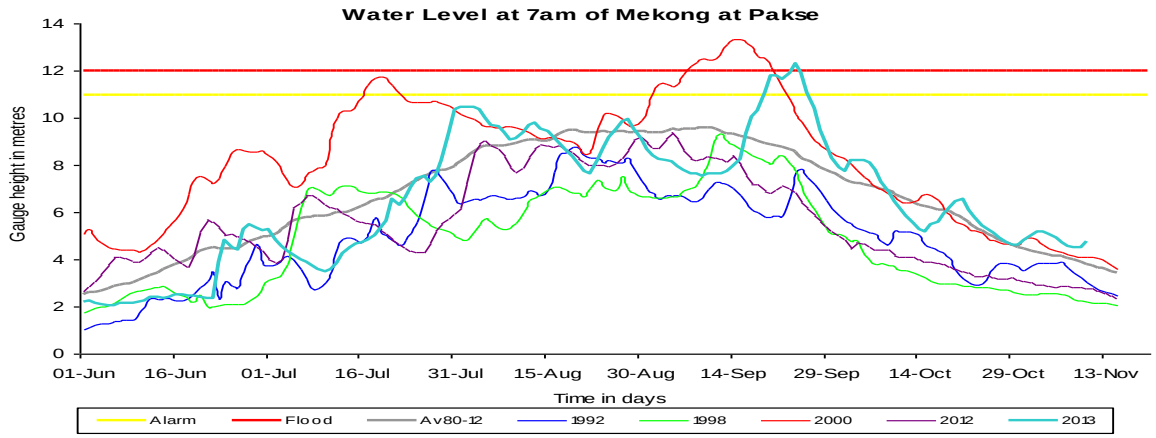
2012
2013

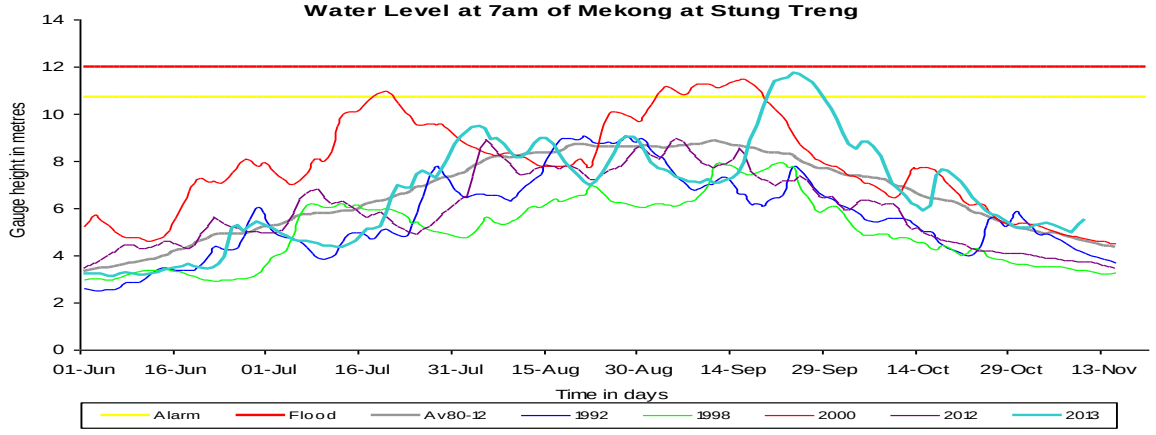

Water Level at 7am of Mekong at Thakhek
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

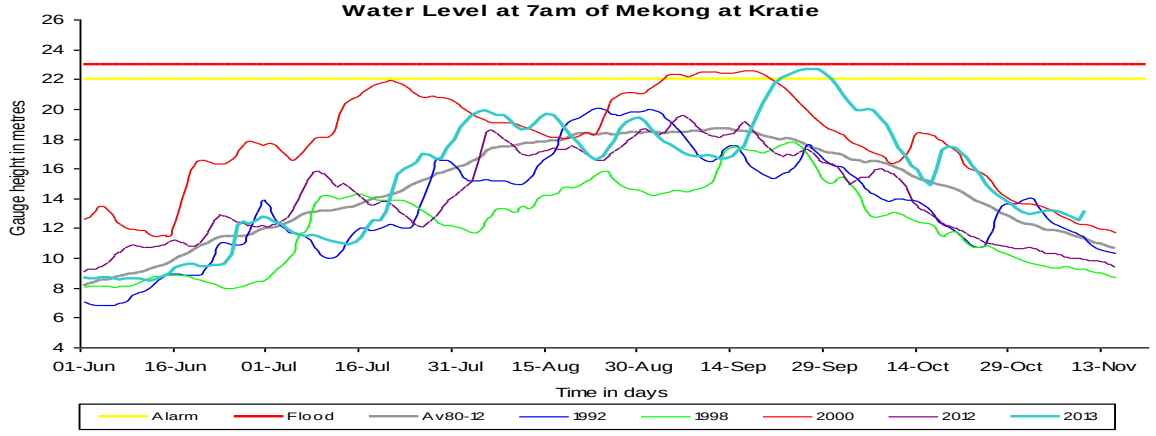

Water Level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

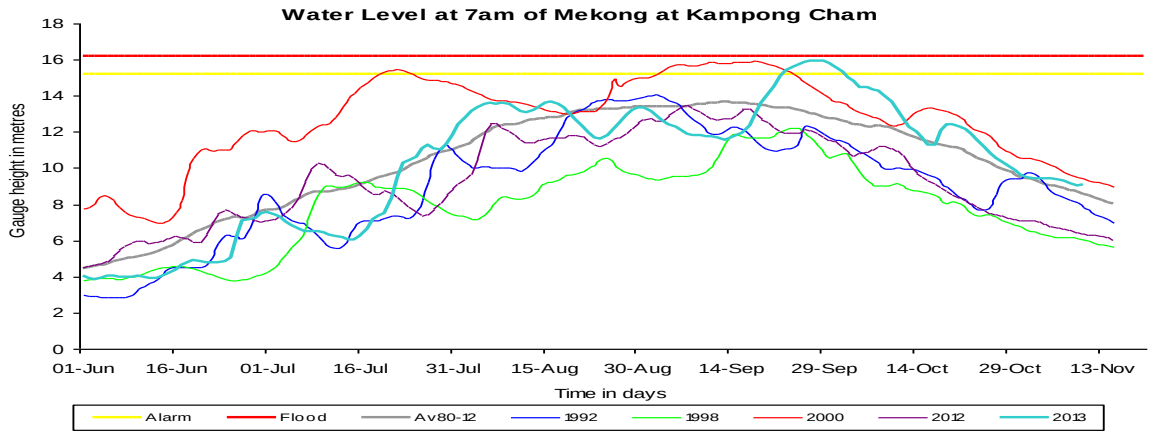

Water Level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Time in days
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

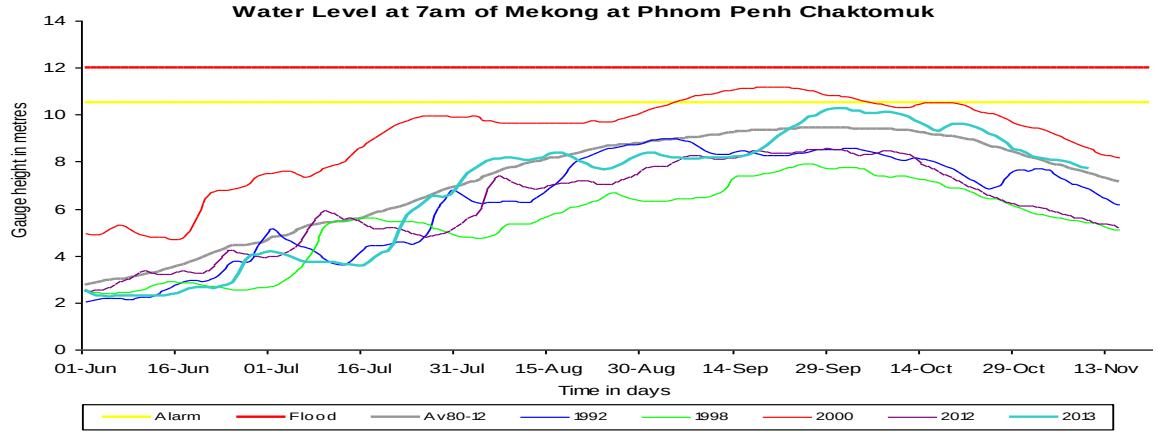

Water Level at 7am of Mekong at Khong Chiam
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

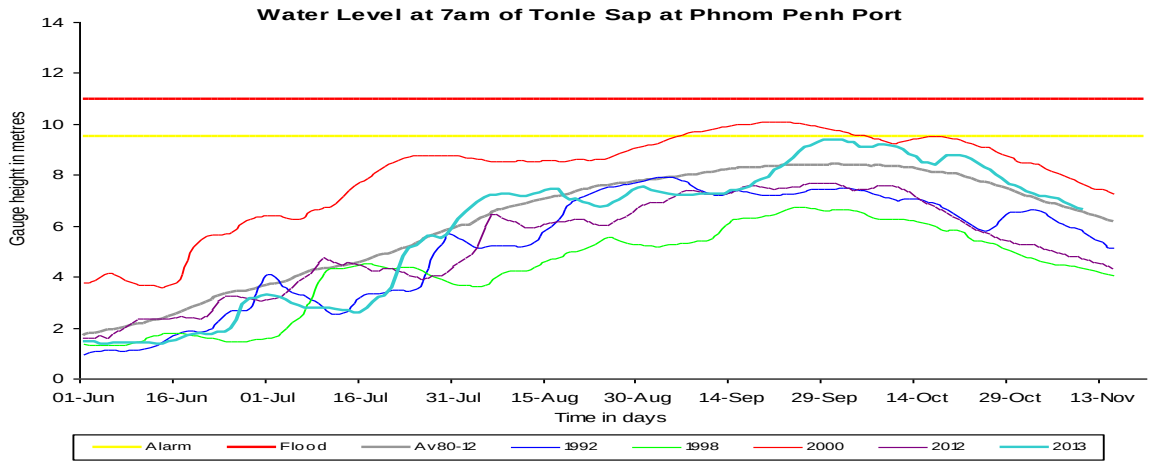

Water Level at 7am of Mekong at Pakse
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013

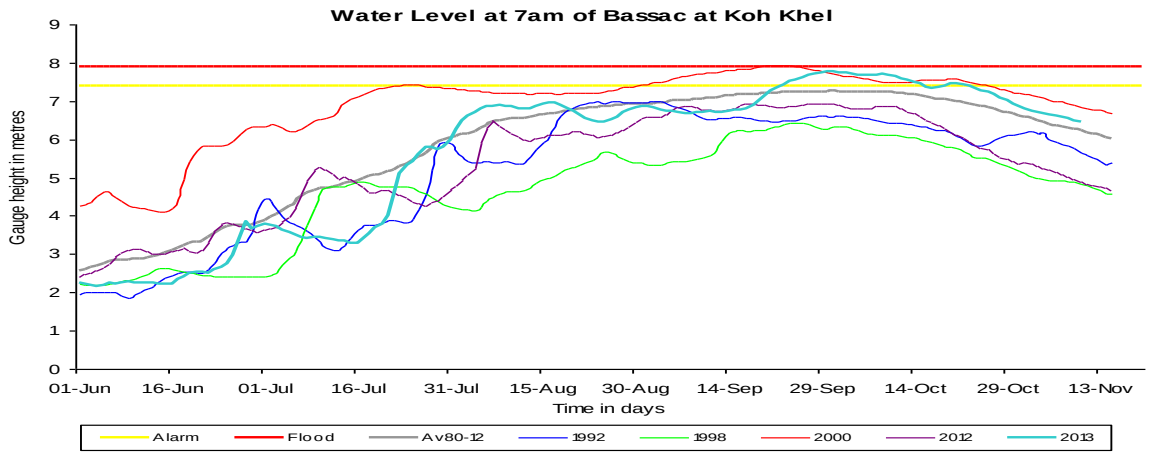

Water Level at 7am of Mekong at Stung Treng
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Mekong at Kratie
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
Av80-12
1992
1998
2000
2012
2013


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
Av80-12
1992
1998
2000
2012
2013


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
Av80-12
1992
1998
2000
2012
2013


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
Av80-12
1992
1998
2000
2012
2013


Water Level at 7am of Bassac at Koh Khel
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
Av80-12
1992
1998
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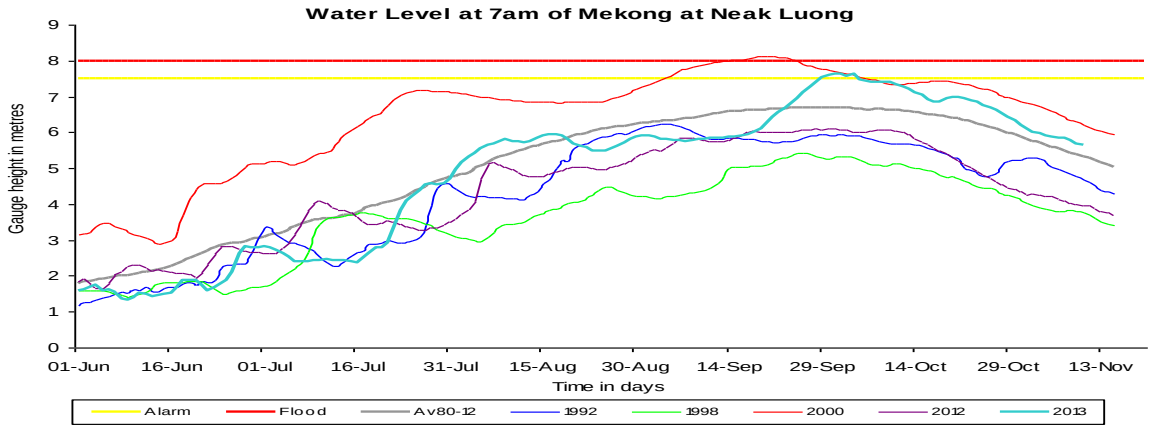
2012
2013


Water Level at 7am of Mekong at Neak Luong
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
Av80-12
1992
1998
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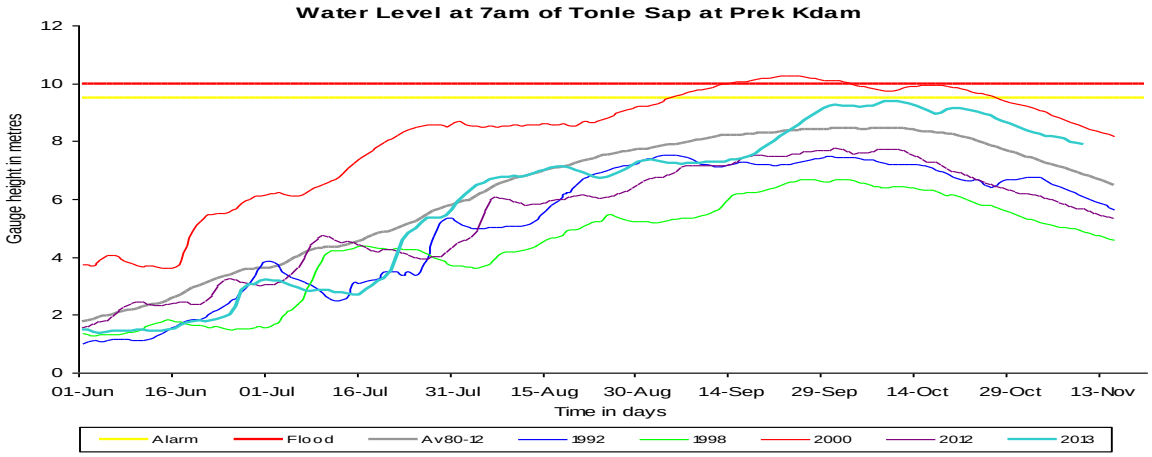
2012
2013


Water Level at 7am of Tonle Sap at Prek Kdam
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
Av80-12
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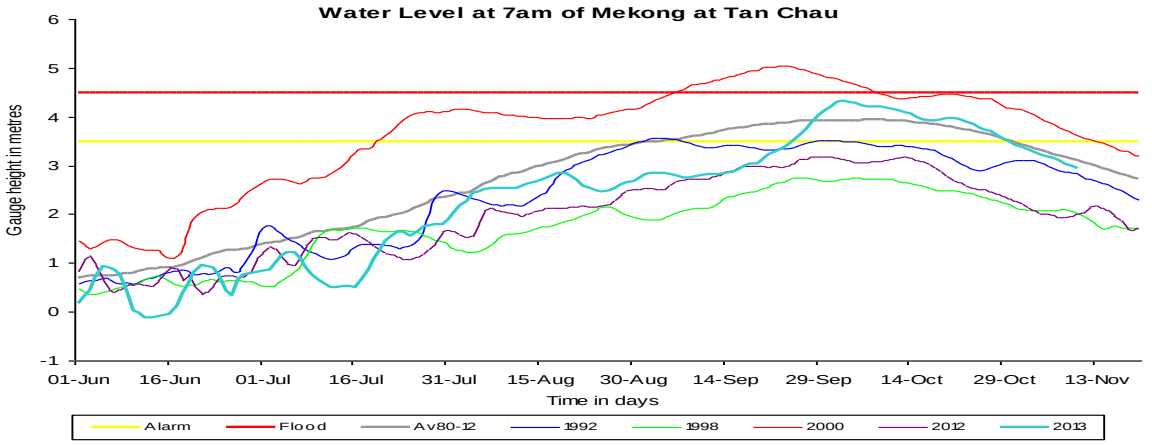
Water Level at 7am of Mekong at Tan Chau
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
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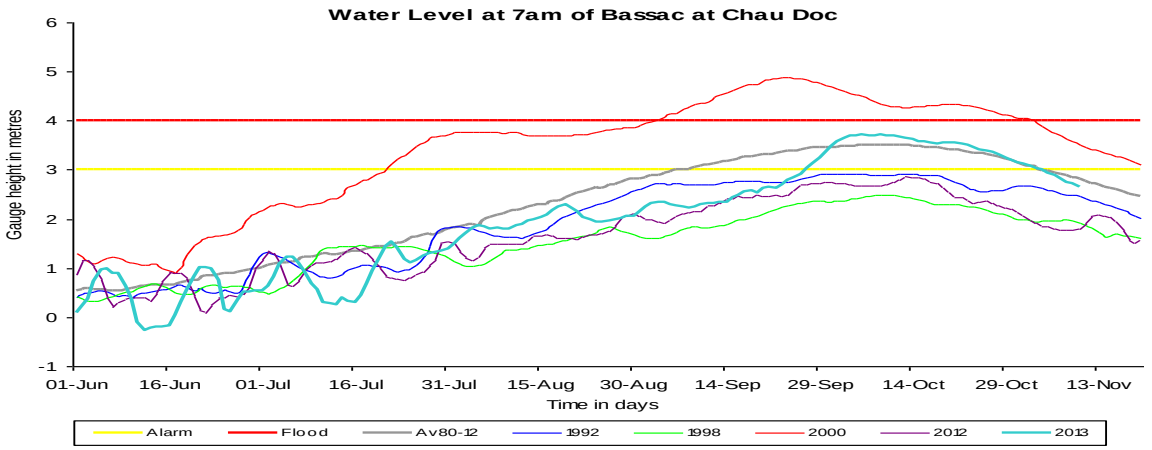
Water Level at 7am of Bassac at Chau Doc
Gauge height in metres
Time in days
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
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2012
2013