Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 22/09/2014, covering the week from the 15th to 22nd September 2014

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

General weather patterns

During the week of 15 to 22 September 2014 five weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps of the 15th September and 20th September 2014 are presented in the Figures 1 and 2 below:

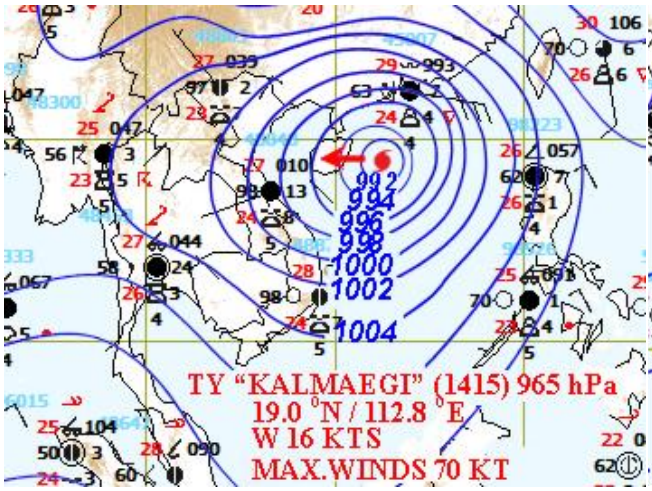


Figure 1: Weather map for 15th September 2014

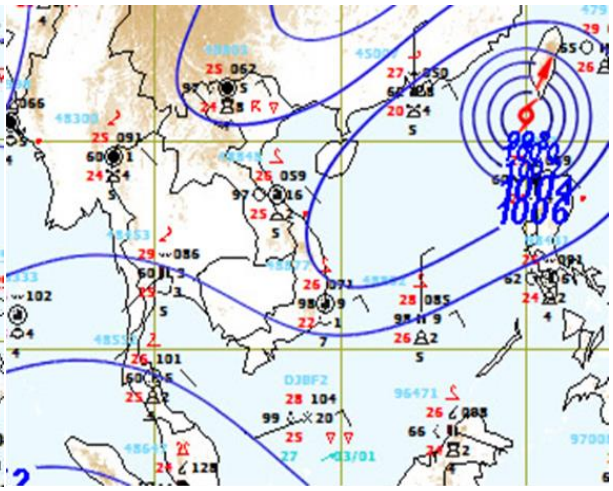


Figure 2: Weather map for 20th September 2014

Moderate South-West (SW) Monsoon

During last week, the Southwest monsoon was prevailed over Myanmar, the Andaman Sea, the Gulf of Thailand, Thailand and Indochina Peninsular (Figure 1 and Figure 2)

Inter Tropical Convergence Zone (ITCZ)

During last week, the Inter Tropical Convergence Zone (ITCZ) lies across the middle Myanmar, the upper Thailand, the North Lao PDR and Viet Nam (Figure 1 and Figure 2)

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

During last week, the Typhoon "KALMAEGI" was moving West – Northwest and has made landfall in Quang Ninh province of extreme northeastern Vietnam, located about 120 miles Northeast of Hanoi, at approximately 16:00 GMT (i.e. at 11:00 p.m. Vietnamese local time).

Figure 3: Typhoon (TY) KALMAEGI's tracks (*Source: National Centre Hydro_Meteorology Forecasting – NHCMF)*

Over weather situation

During last week, the influence of TY KALMAEGI has brought about heavy rain in some areas at upstream and middle of LMB. Therefore, the accumulative weekly rainfall greater than 100 mm are at Chiang Saen (290 mm – especially on 18 Sep within 24hours, it was recorded of 254 mm), Luang Prabang (213 mm), Paksane (199.4 mm of which only 1 day on 17 Sep was 135 mm). . See Table A2.

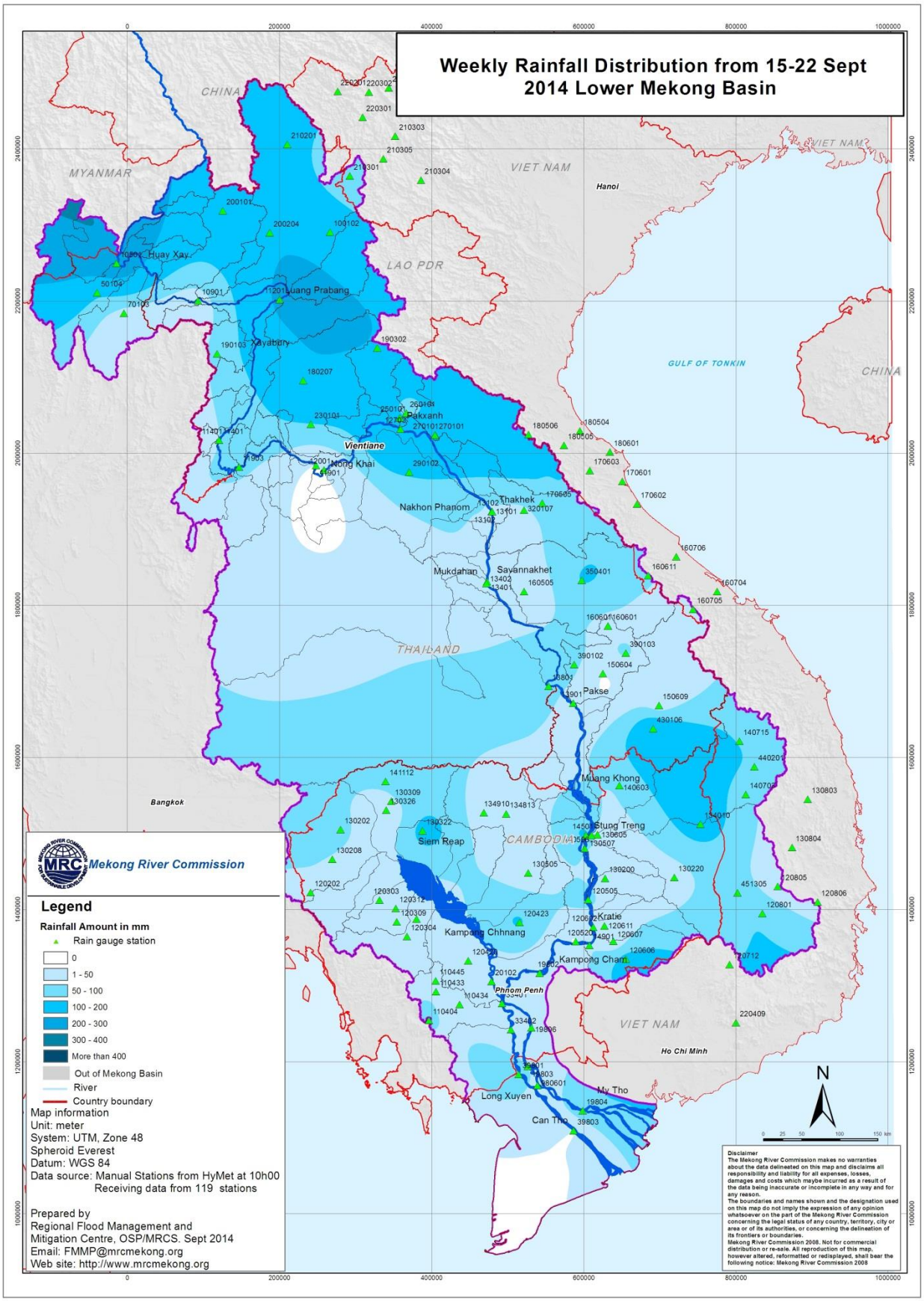


Figure 3: Weekly Rainfall Distribution from 15th – 22nd September 2014 over the LMB

General behaviour of the Mekong River

During last week, the water levels at most stations of the LMB were fluctuating below or just below the Long Term Average (LTA), except at Phnom Penh (Bassac) was just above the LTA.

For stations from Chiang Saen and Luang Prabang

Compared to the LTA, the water levels at these stations were fluctuating about LTA. At Jinghong station, Water Levels (WL) quickly rose up from beginning to the middle of last week due. At Luang Prabang, the WL rose up just above the LTA at the end of the last week.

For stations from Chiang Khan, Vientiane and Nongkhai and Paksane

Compared to the LTA, the water levels at these stations were fluctuating below the LTA, Except at Chiang Khan by the end of the last week; the WL was above the LTA.

For stations from Thakhet/Nakhon Phanom to Pakse

Compared to the LTA, the water levels at these stations were fluctuating below the LTA.

For stations from Stung Treng to Kompong Cham

Compared to the (LTA, the water levels at these stations were below the LTA.

For stations from Phnom Penh to Koh Khel/Neak Luong

Compared to the LTA, the water levels at these stations were below the LTA, except at Phnom Penh (Bassac) was just above the LTA.

Tan Chau and Chau Doc

Compared to the LTA, the water levels at these both stations were below the LTA.

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 the next three days) was reported anywhere on the mainstream of the Mekong River during the last week. Water levels were still significantly below flood levels (as defined by the national agency) at all forecast stations.

For more details see the following annexes:

- 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

2014	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
15/09	535.98	3.7	8.5	8.9	5.88	7.19	9.5	7.56	8.66	7.22	6.29	8.9	7.32	7.47	17.67	12.35	8.55	7.67	6.91	6.2	7.67	3.01	2.52
16/09	536.19	3.94	8.24	8.81	5.56	6.86	9.28	7.36	8.48	7.05	6.13	8.63	7.12	7.59	17.7	12.3	8.53	7.66	6.89	6.2	7.66	3	2.51
17/09	536.73	3.79	9.18	8.68	5.4	6.62	9.18	7.1	8.28	6.88	5.83	8.49	6.92	7.5	17.75	12.35	8.54	7.67	6.89	6.18	7.67	2.99	2.52
18/09	537.97	4.11	10.06	8.55	5.22	6.41	9.92	7.32	8.82	6.97	5.75	8.27	6.73	7.63	17.58	12.28	8.55	7.68	6.88	6.18	7.67	3.02	2.54
19/09	536.36	5.49	10.8	10.15	5.3	6.3	10.11	8.14	9.25	7.58	6.5	8.3	6.63	7.44	17.6	12.29	8.6	7.73	6.91	6.19	7.73	3.07	2.6
20/09	536.06	5.79	11.64	10.62	6.9	7.78	9.67	8.1	9.15	7.75	6.73	8.76	6.97	7.13	17.25	12.19	8.58	7.72	6.9	6.2	7.71	3.12	2.66
21/09	536.07	5.12	12.24	10.89	7.34	8.46	10.02	7.76	8.85	7.5	6.47	8.91	7.19	7.05	16.82	11.94	8.52	7.67	6.89	6.16	7.68	3.12	2.68
22/09	536.67	4.68	12.2	11.41	7.7	8.75	10.07	7.76	8.92	7.38	6.37	8.79	7.11	7.13	16.74	11.76	8.46	7.61	6.85	6.14	7.66	3.07	2.63

Unit in m

Table A2: observed rainfall

Unit in mm

2014	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
15/09	0	0	nr	0	nr	0	nr	0	0.2	0	nr	78.4	nr	19	0	3.8	nr	nr	2.5	3.4	nr	nr	6
16/09	0	0	nr	54.4	nr	0	nr	4.1	19.4	0	35	0	4	1	33	12.3	0.7	nr	12.2	2.5	3.3	nr	6
17/09	1.5	0	64.2	0	nr	0	135.4	1.1	0.7	0	nr	0.5	nr	0	nr	nr	10.5	nr	12.8	3.2	7.4	32.8	38
18/09	10.5	254	88.2	0	nr	0	7.6	0.2	nr	0	nr	7.2	5	13	nr	nr	0.6	nr	nr	0	5.2	12.2	24
19/09	1.5	14	14.6	2.5	nr	0	6	0	nr	0	nr	0	nr	nr	nr	nr	1.1	nr	0	nr	nr	nr	nr
20/09	0	19.8	nr	0	nr	0	nr	0	nr	0	nr	0	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr
21/09	0	2.3	19.8	0	nr	2.3	24.8	23.4	19.8	5	nr	0	nr	16	nr	nr	23.6	nr	nr	nr	nr	nr	0.1
22/09	9	0	26.2	0	nr	1.3	25.6	8.1	8.3	8.3	14.4	0.5	nr	1	9.6	nr	nr	nr	nr	nr	nr	nr	0

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

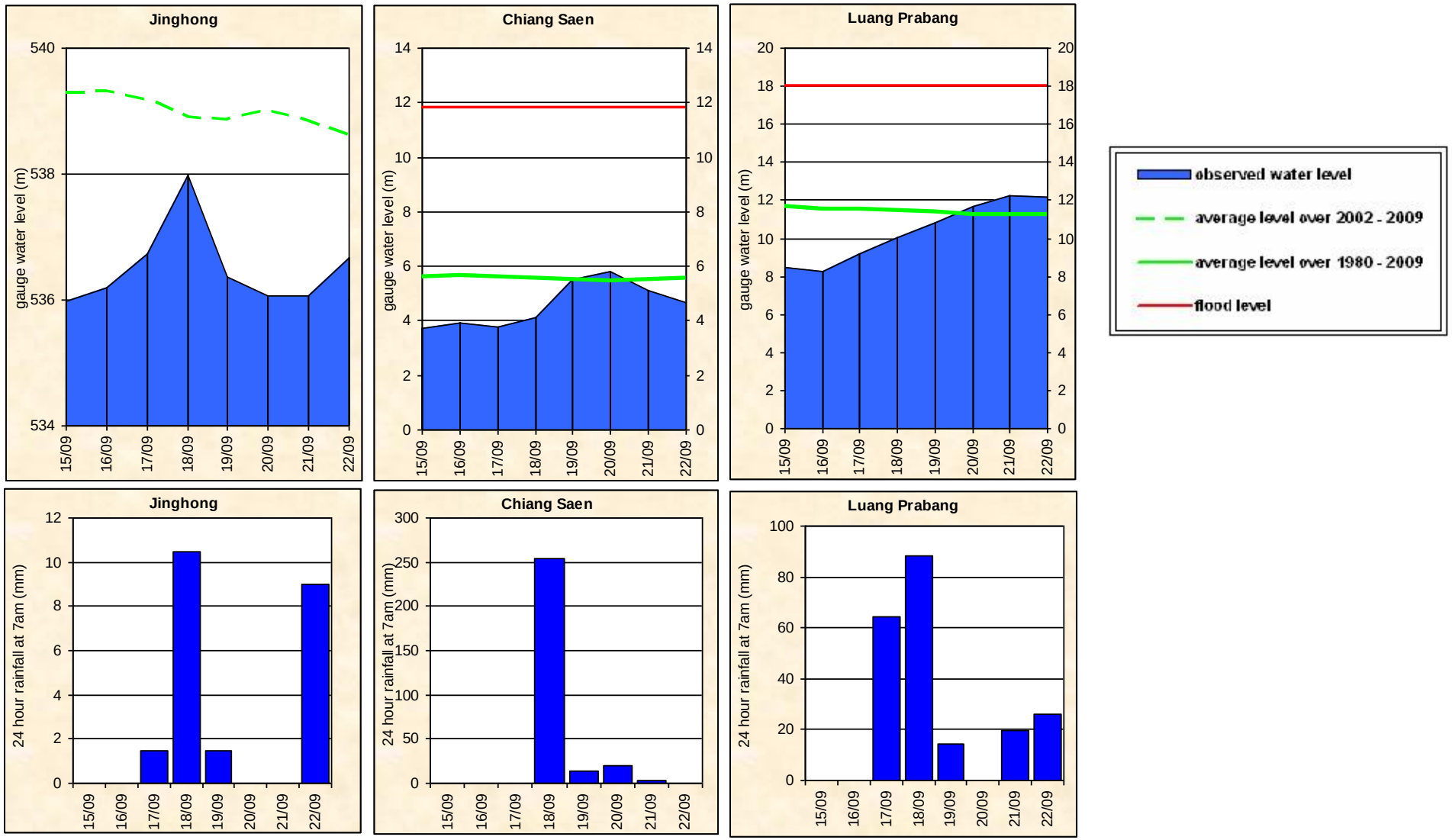


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

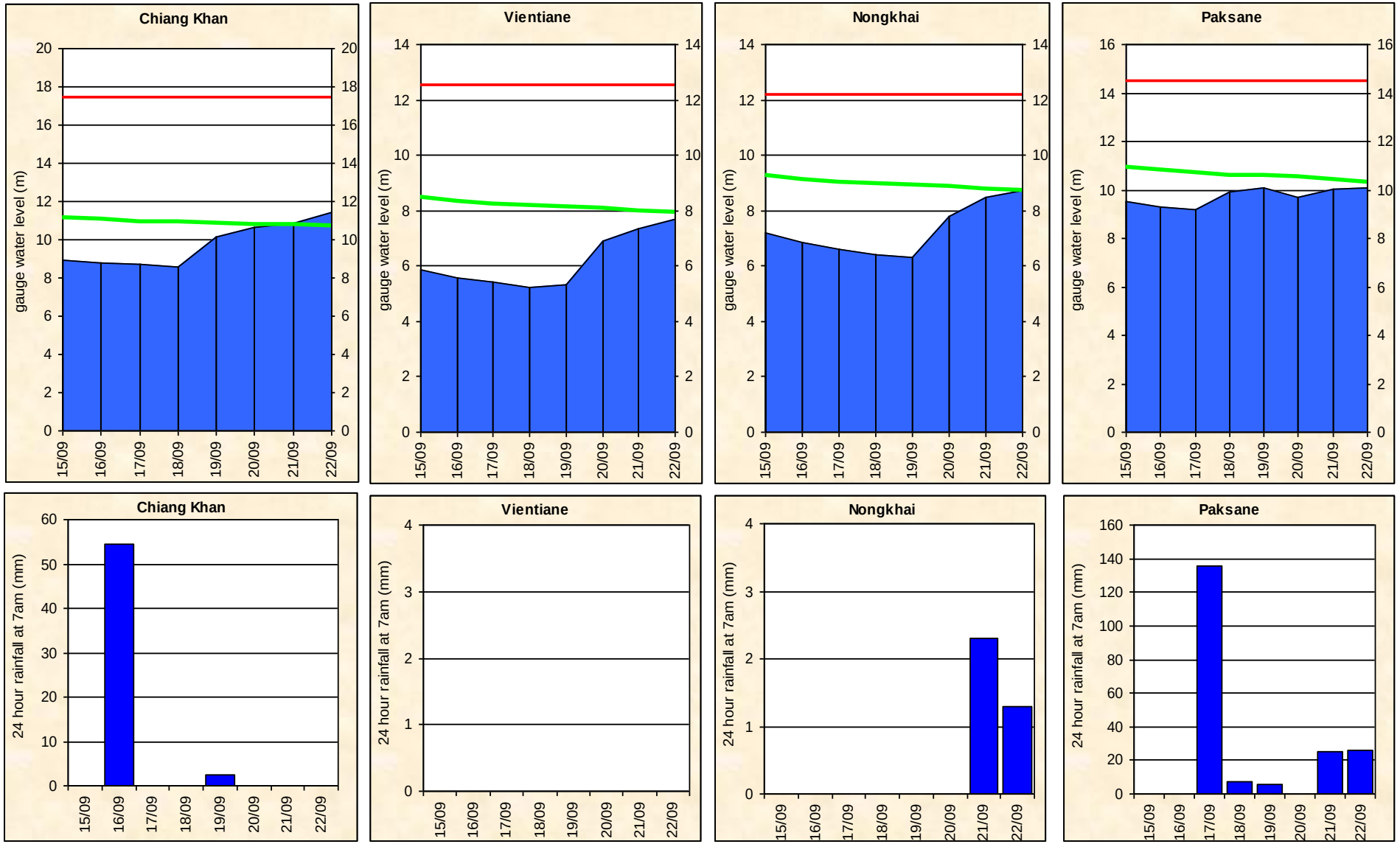


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

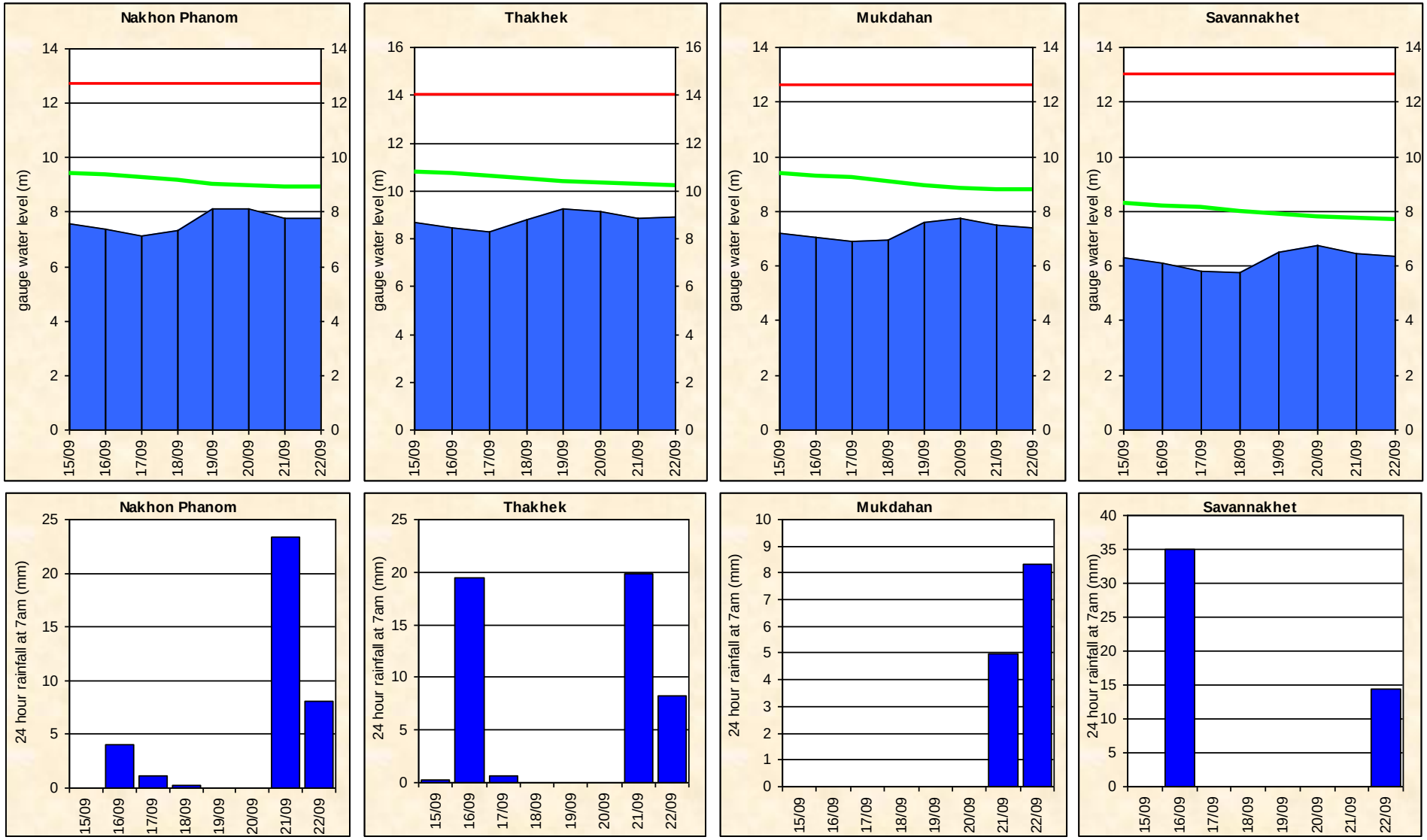


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

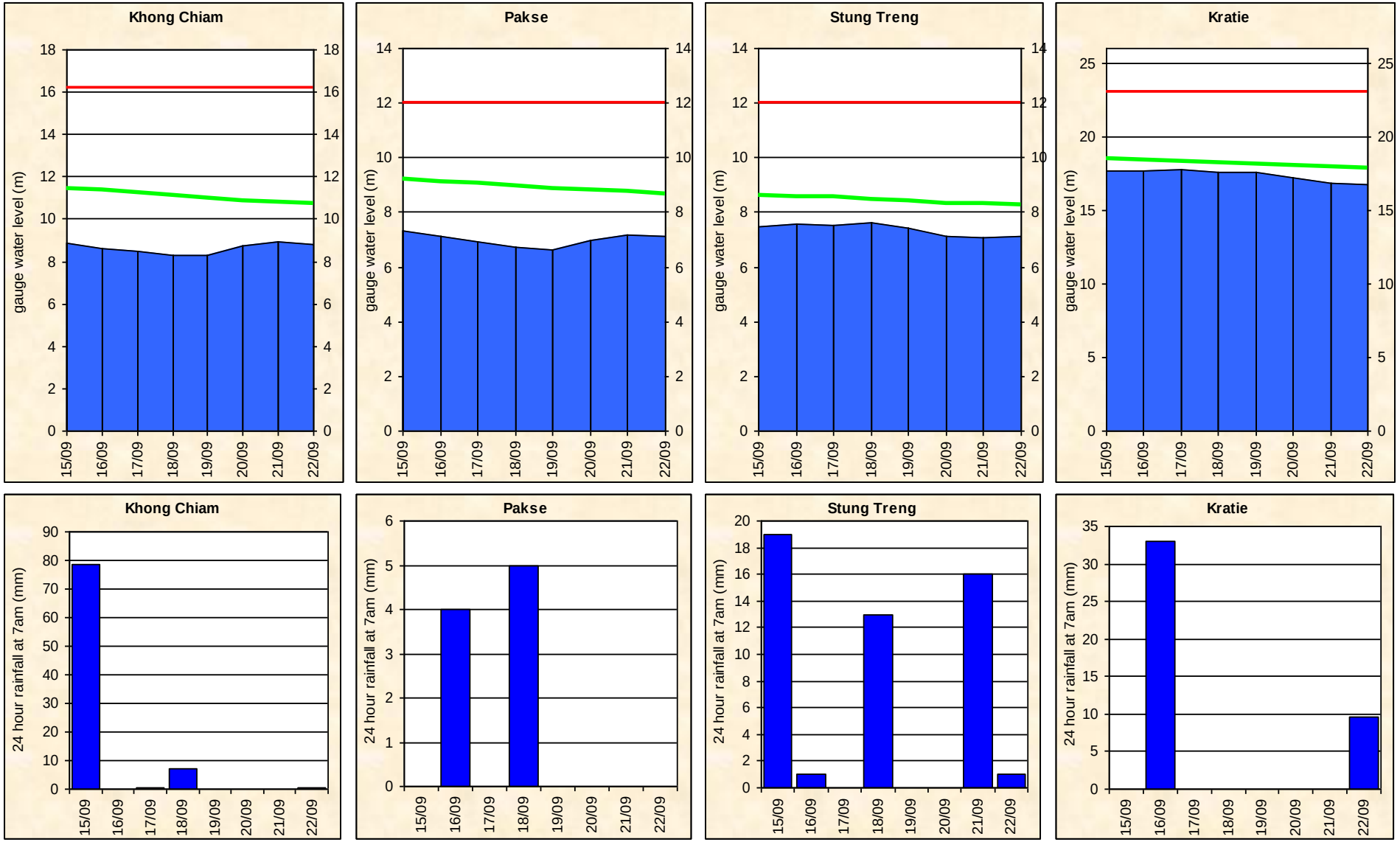


Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

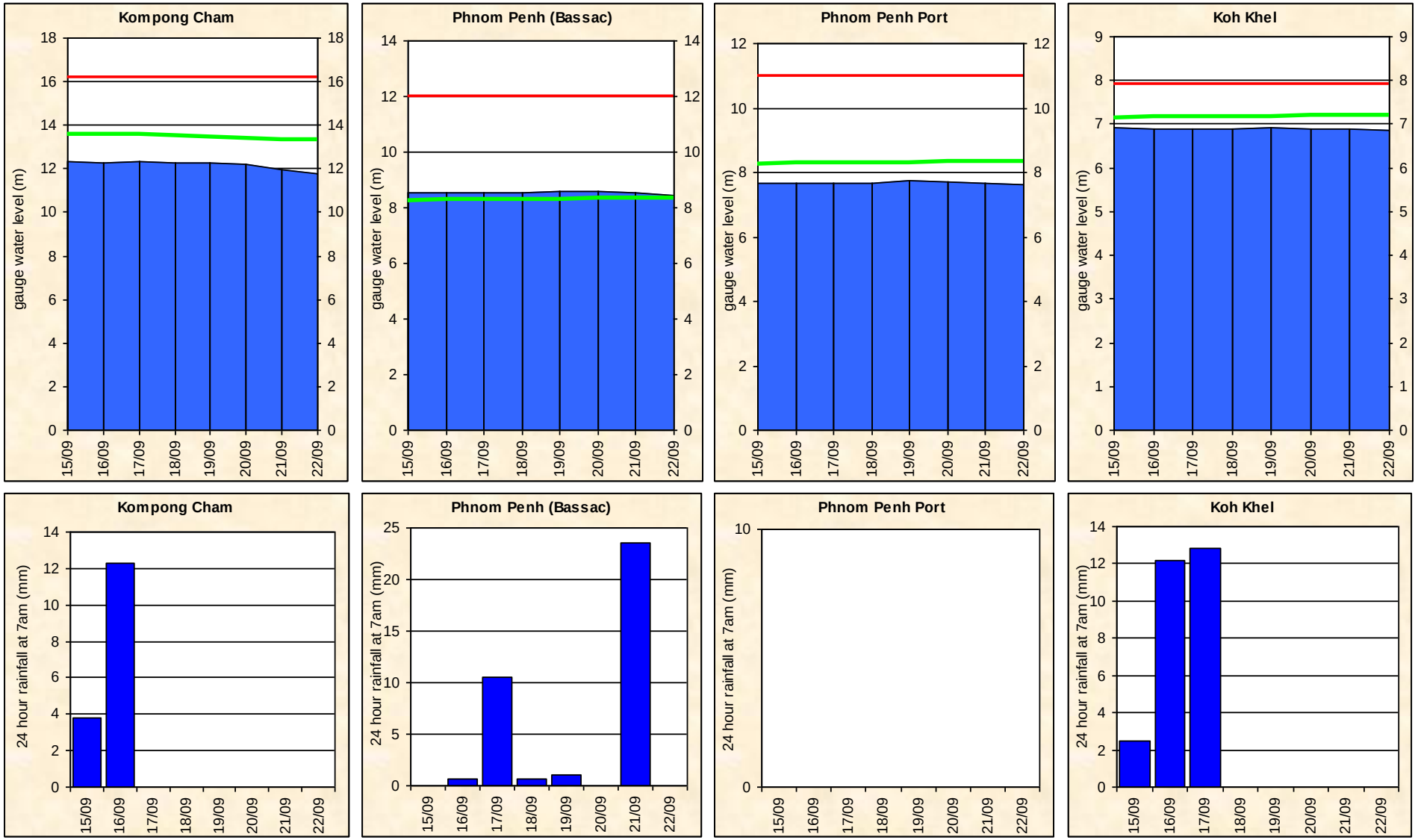
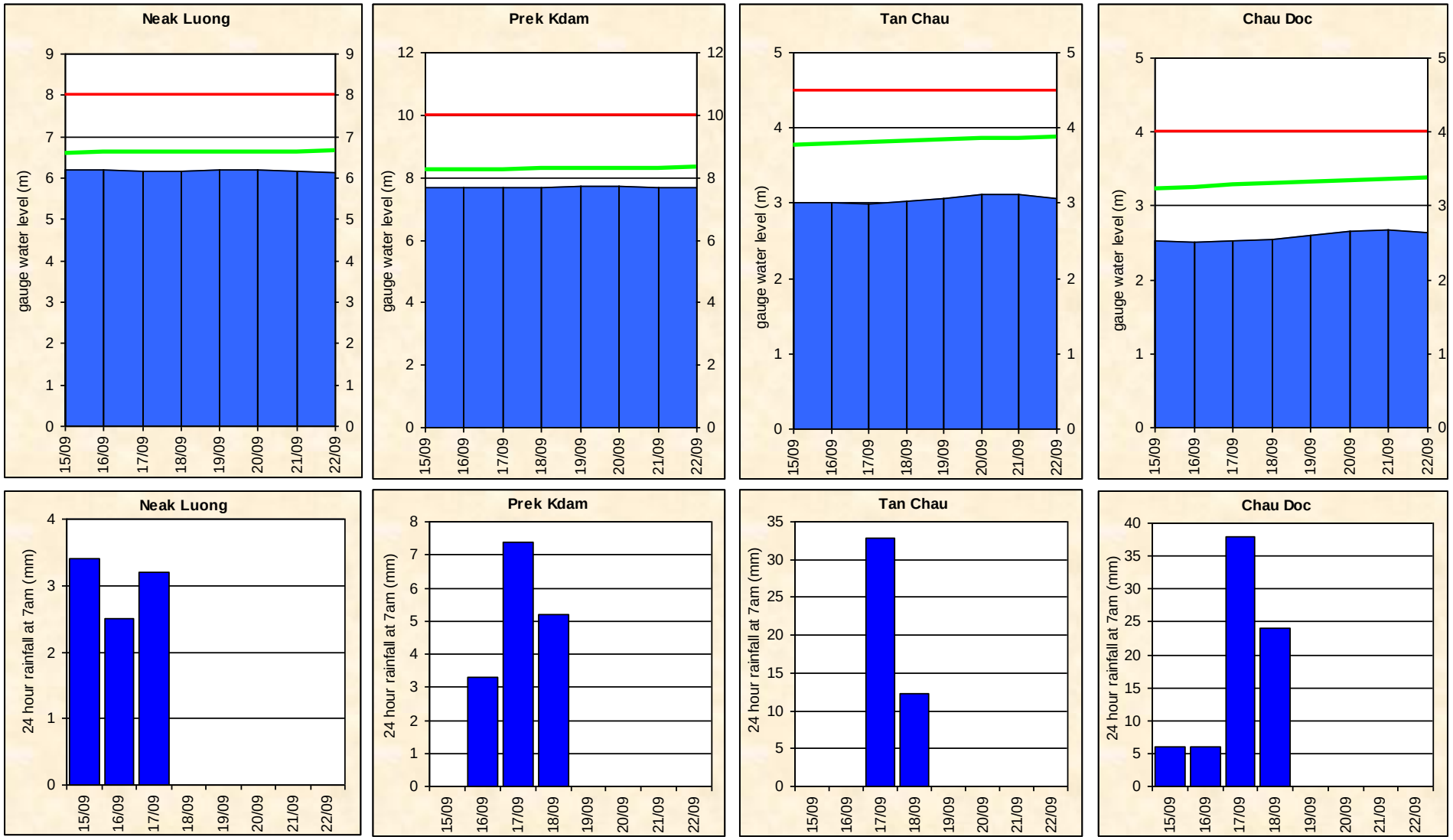


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc


Neak Luong
gauge water level (m)
Prek Kdam
gauge water level (m)
Tan Chau
gauge water level (m)
Chau Doc
gauge water level (m)
15/09
16/09
17/09
18/09
19/09
20/09
21/09
22/09
Neak Luong
24 hour rainfall at 7am (mm)
Prek Kdam
24 hour rainfall at 7am (mm)
Tan Chau
24 hour rainfall at 7am (mm)
Chau Doc
24 hour rainfall at 7am (mm)

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 lower parts of the LMB. However, the accuracies at Luang Prabang, Chiang Khan Vientiane, Nongkhai for 3 - 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 especially at stations in the upper part and in the Mekong delta where are affected by tidal; (2) the adjustment by utilizing the practical knowledge and experience of flood forecaster-in-charge.

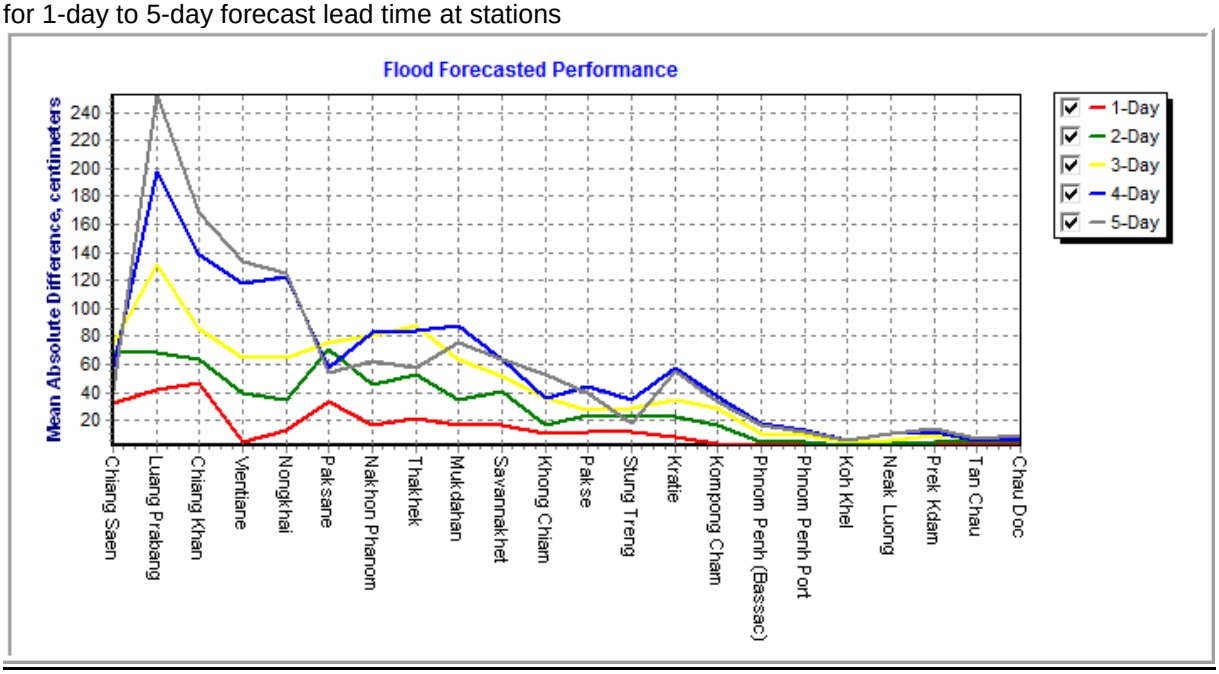


Figure B1: Average flood forecast accuracy along the Mekong mainstream

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

	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	42.9	28.6	42.9	100.0	28.6	28.6	42.9	57.1	28.6	42.9	57.1	57.1	42.9	71.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	***66.9***
2-day	50.0	50.0	33.3	66.7	50.0	33.3	33.3	16.7	66.7	50.0	83.3	50.0	66.7	66.7	83.3	83.3	100.0	100.0	100.0	83.3	100.0	100.0	***66.7***
3-day	20.0	20.0	40.0	20.0	20.0	40.0	20.0	0.0	20.0	40.0	20.0	40.0	40.0	60.0	80.0	60.0	60.0	100.0	100.0	60.0	80.0	100.0	***47.3***
4-day	50.0	0.0	0.0	0.0	0.0	50.0	25.0	25.0	0.0	25.0	50.0	75.0	75.0	50.0	75.0	25.0	75.0	75.0	100.0	100.0	75.0	75.0	***46.6***
5-day	100.0	0.0	0.0	0.0	33.3	66.7	33.3	33.3	33.3	33.3	33.3	66.7	100.0	33.3	66.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	***60.6***

Unit in %

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)						
2014	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	*10:12*	*00:00*	*-*	*08:12*	*07:52*	*07:43*	*07:10*	*07:07*	*08:22*	*07:29*	*07:15*	*0*	*0*	*1*	*0*	*167*	*0*	*3*
month	*09:59*	*00:00*	*-*	*07:27*	*08:06*	*07:47*	*07:07*	*07:05*	*08:16*	*07:31*	*07:13*	*0*	*0*	*1*	*0*	*401*	*0*	*3*
season	*10:13*	*00:00*	*-*	*07:21*	*08:10*	*07:54*	*07:12*	*07:11*	*08:03*	*07:33*	*07:13*	*4*	*8*	*47*	*10*	*2048*	*1*	*164*

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.

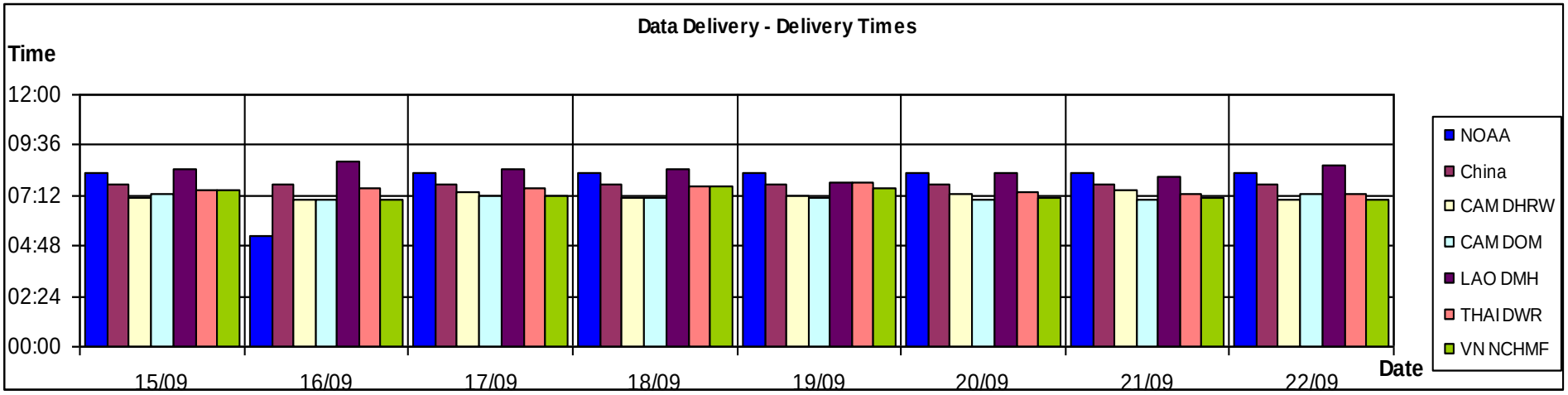


Figure B2: Data delivery times for the past 8 days including the current report date

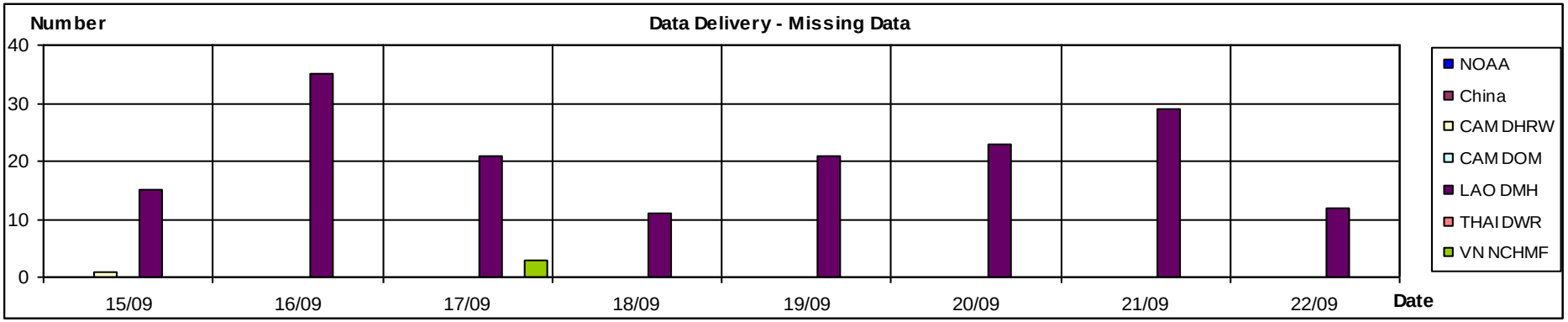


Figure B3: Missing data for the past 8 days including the current report date

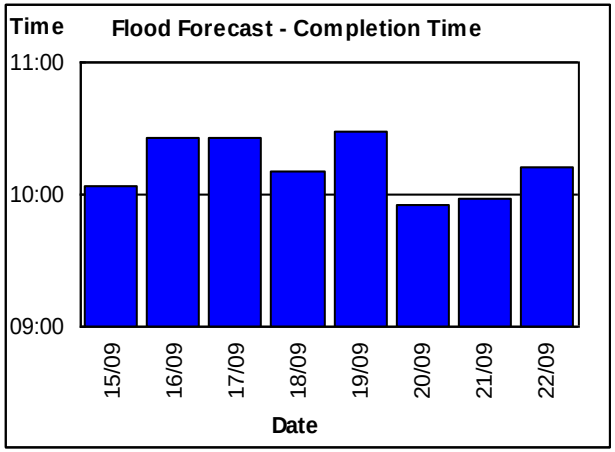


Figure B4: Flood forecast completion time

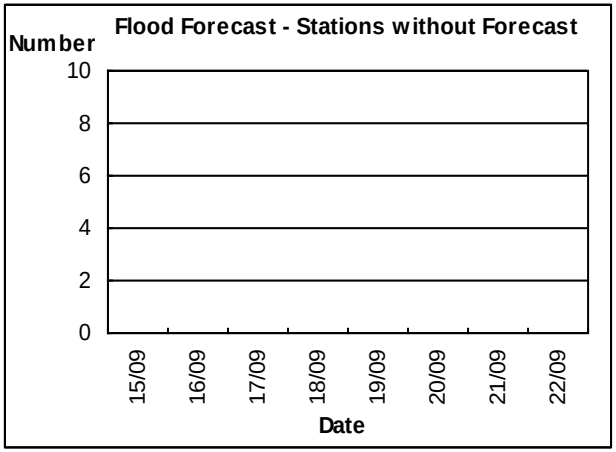


Figure B5: Flood forecast stations without forecast

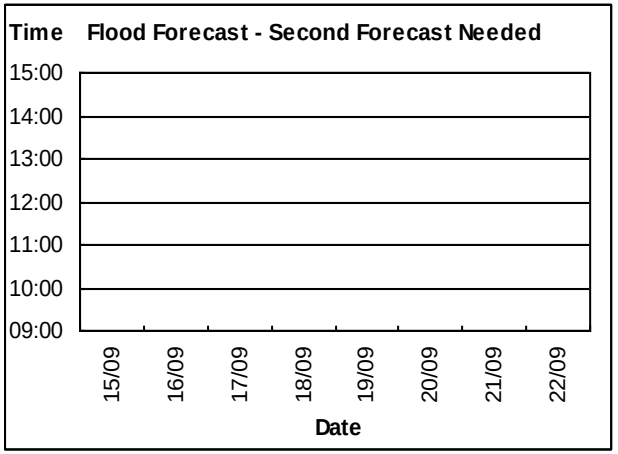


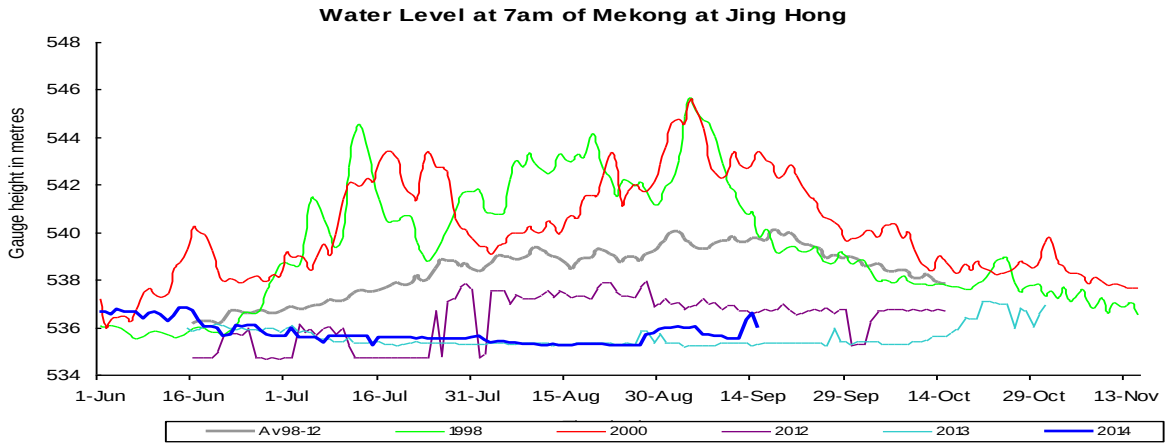
Figure B6: Second forecast needed

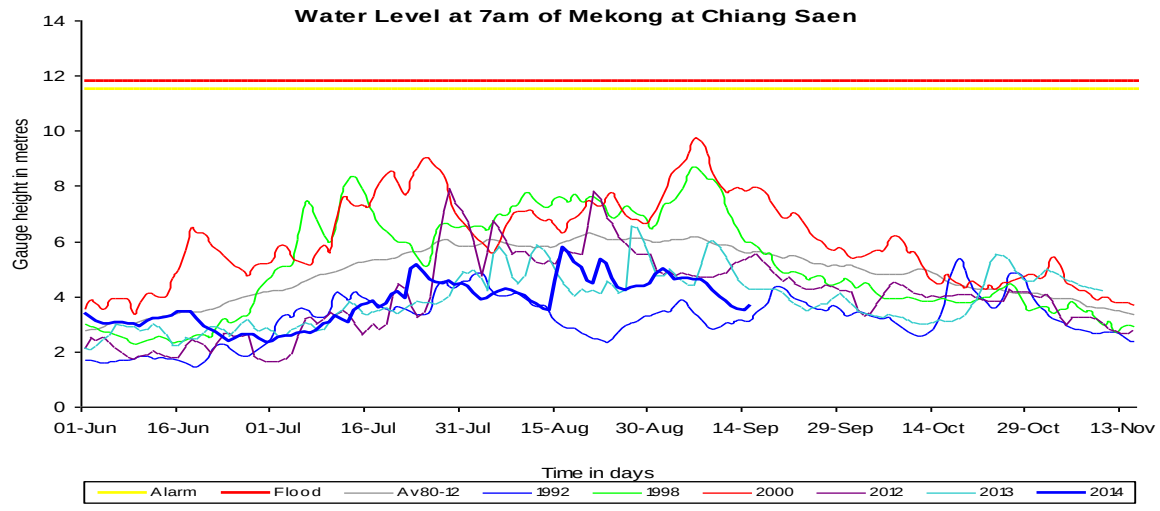
Annex C: Season Water Level Graphs

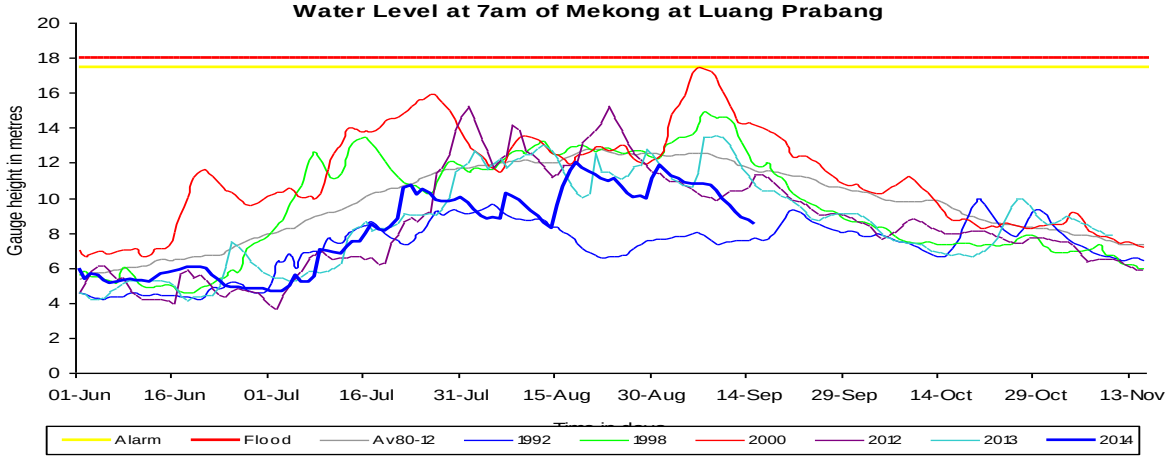
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

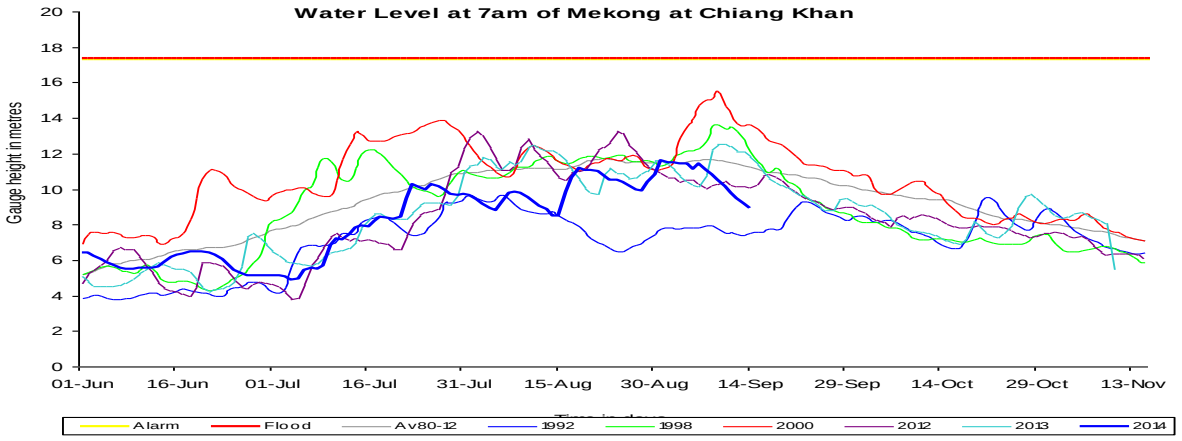
HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS

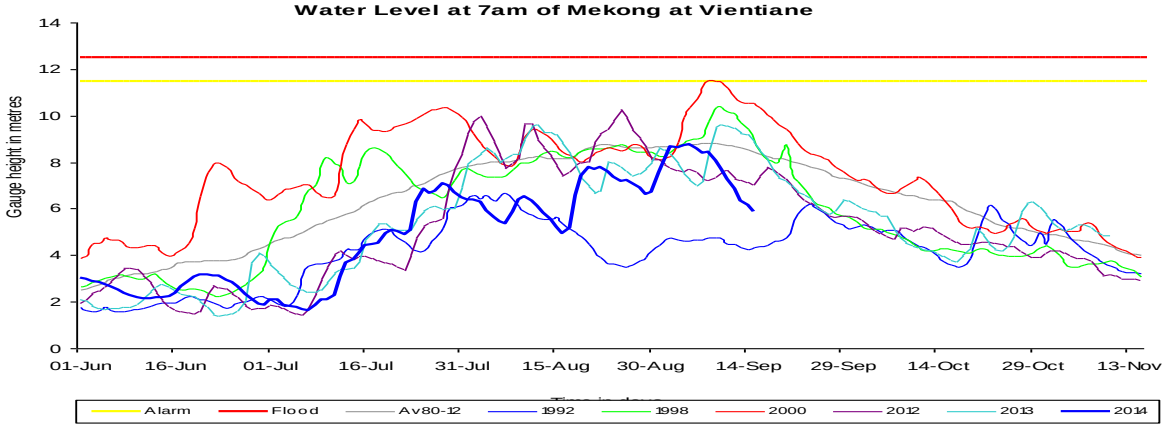
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

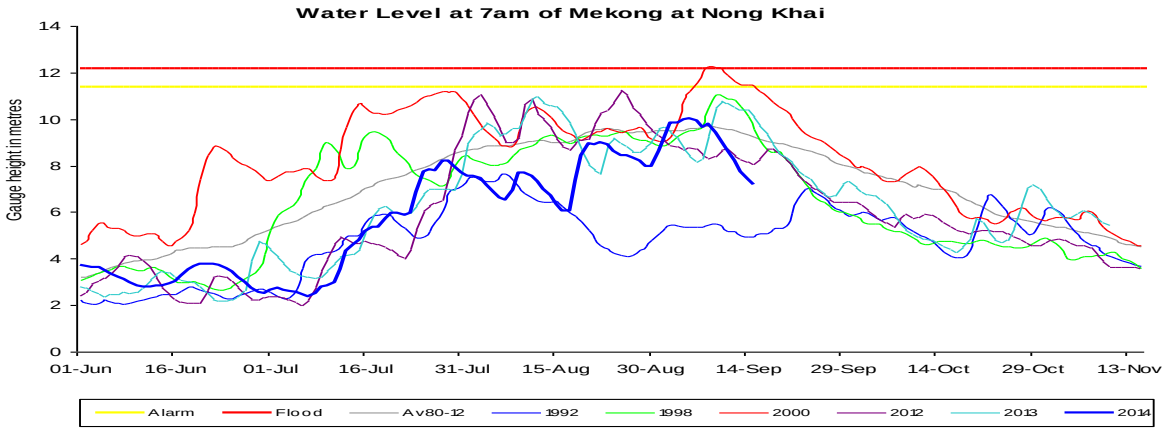


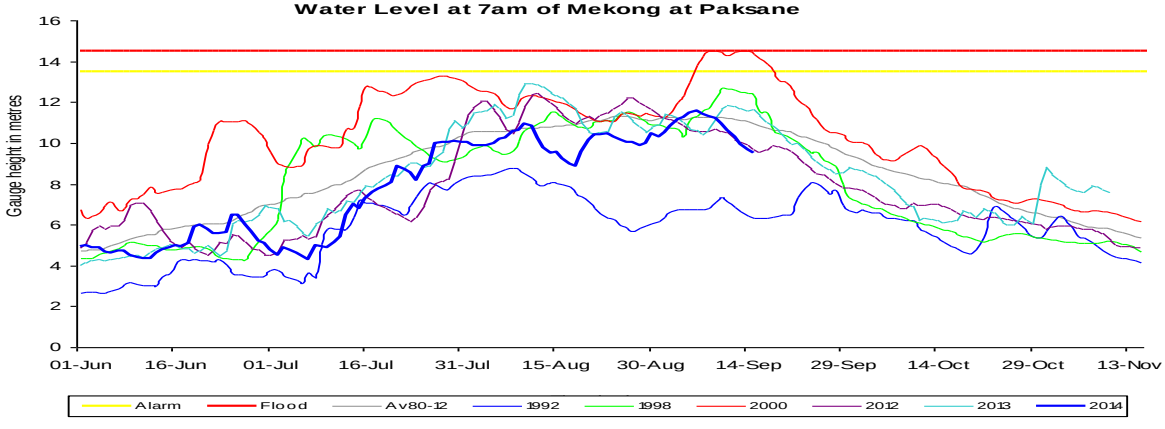


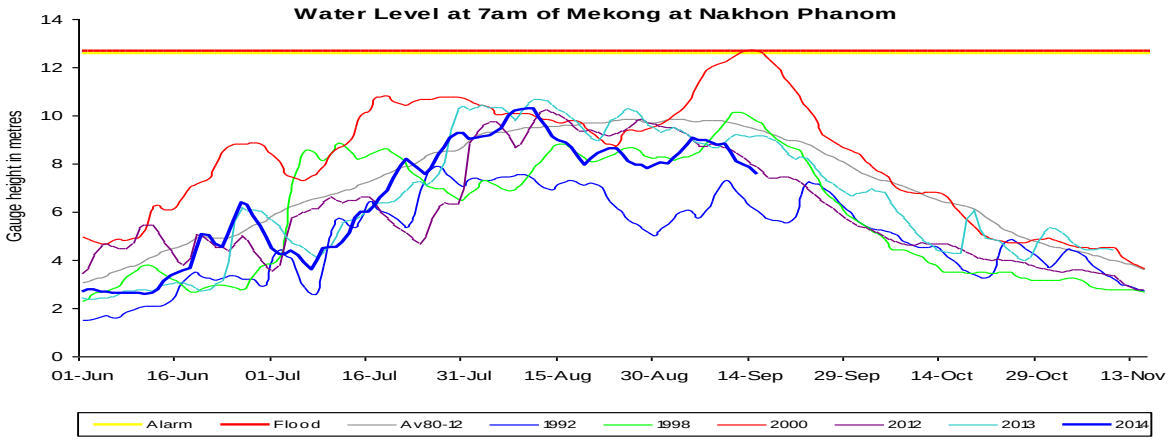


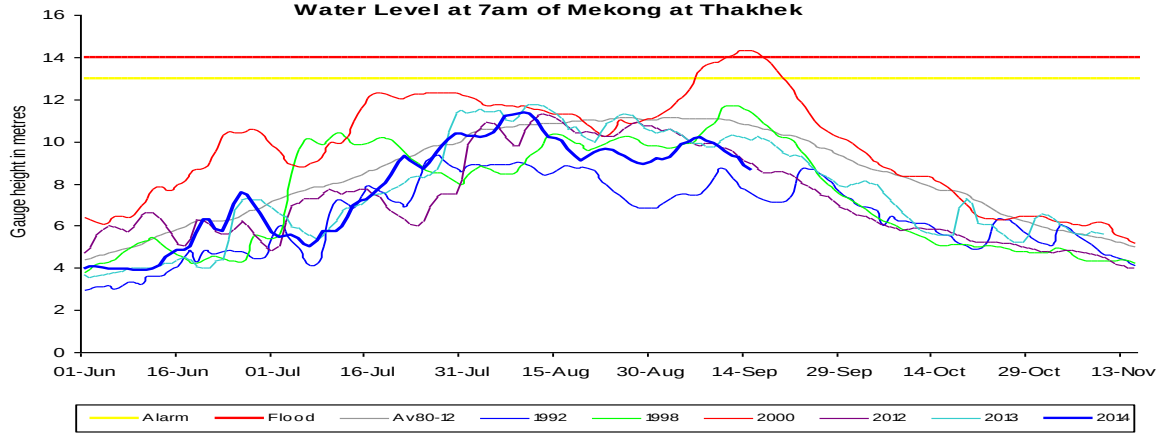

Water Level at 7am of Mekong at Chiang Khan
Gauge height in metres
20
18
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

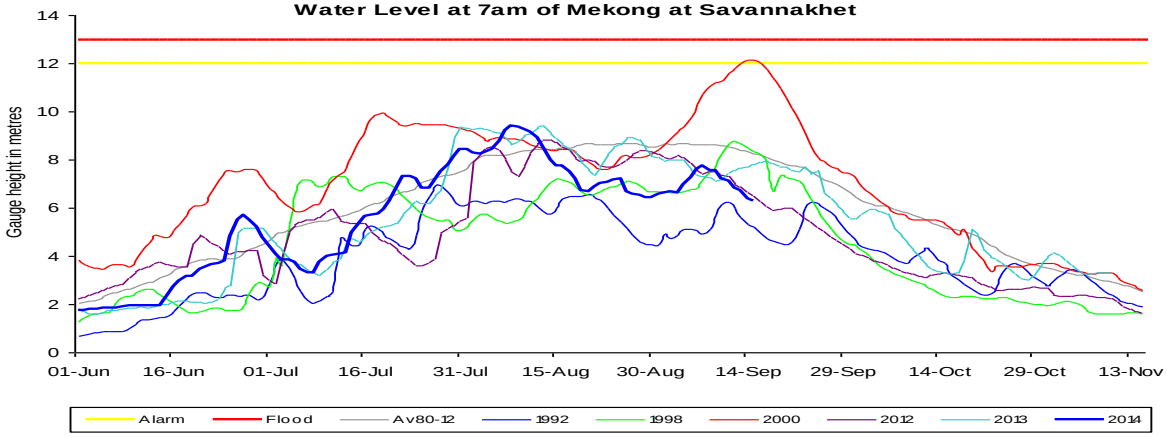

Water Level at 7am of Mekong at Vientiane
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

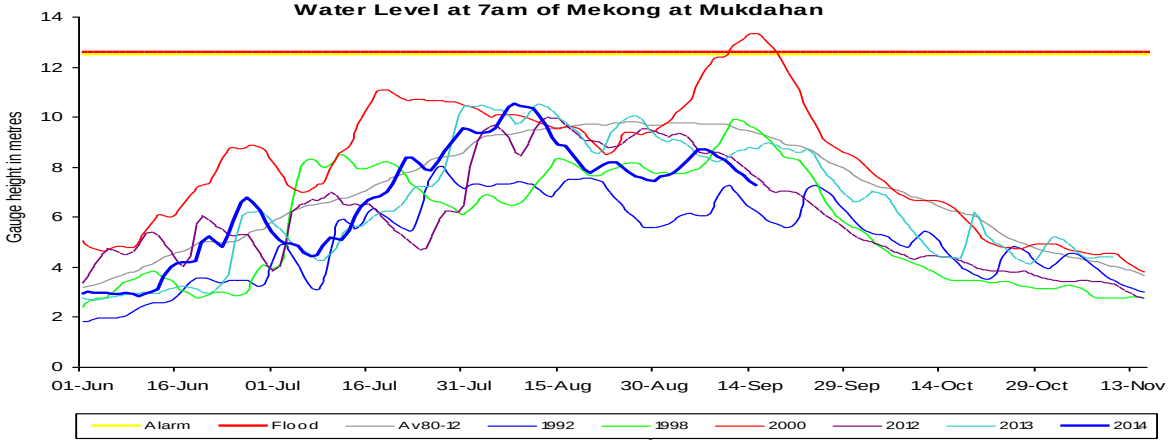

Water Level at 7am of Mekong at Nong Khai
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

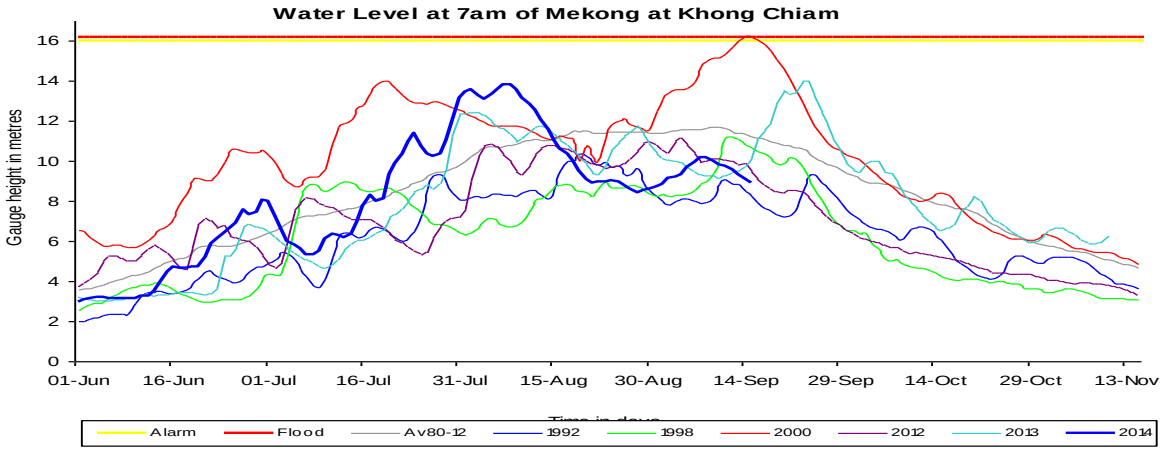

Water Level at 7am of Mekong at Paksane
Gauge height in metres
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

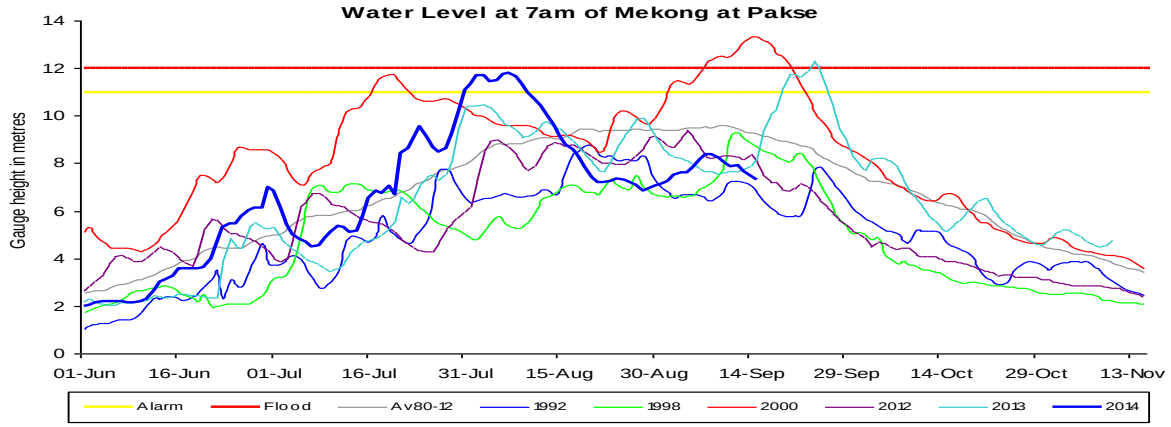

Water Level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

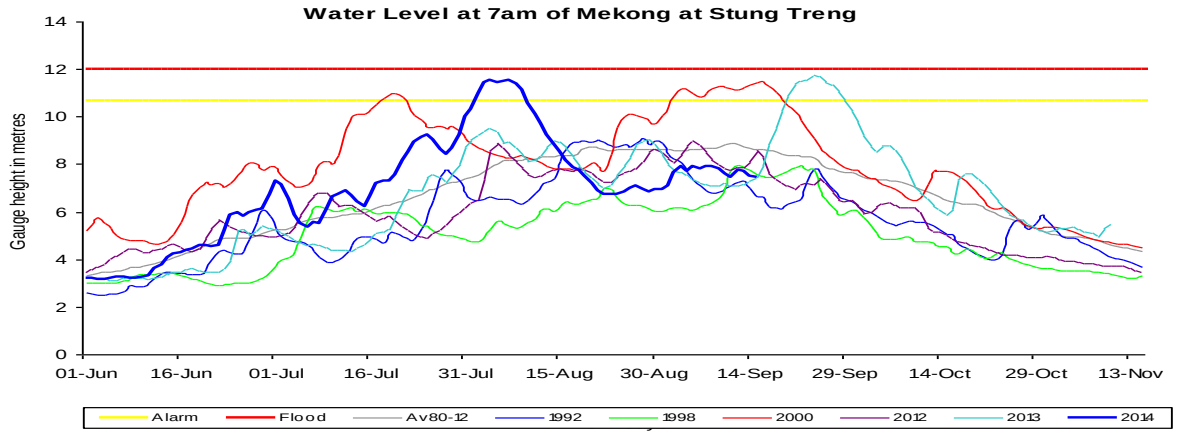

Water Level at 7am of Mekong at Thakhek
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

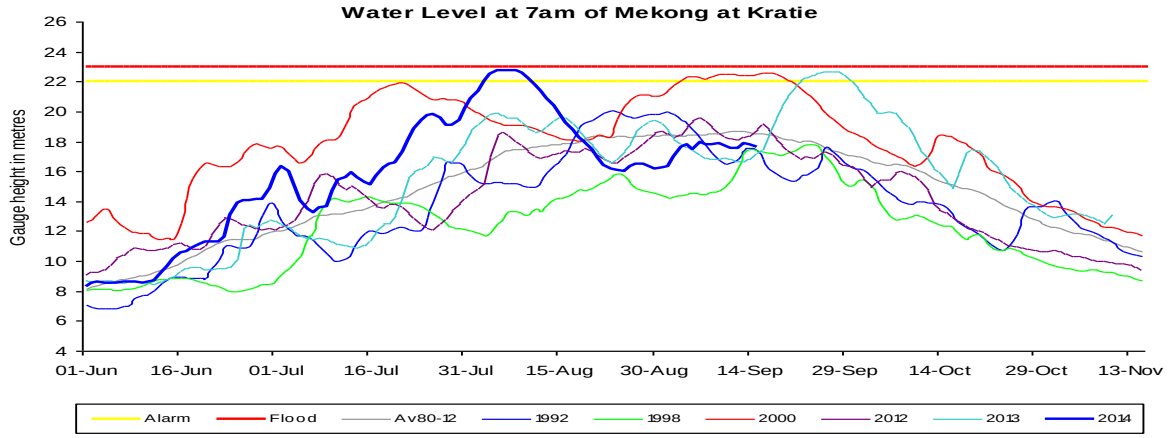

Water Level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

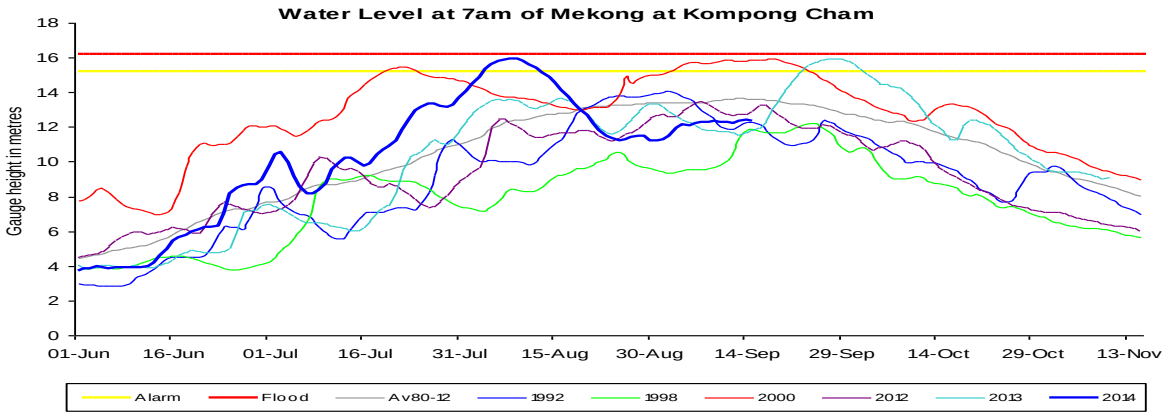

Water Level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

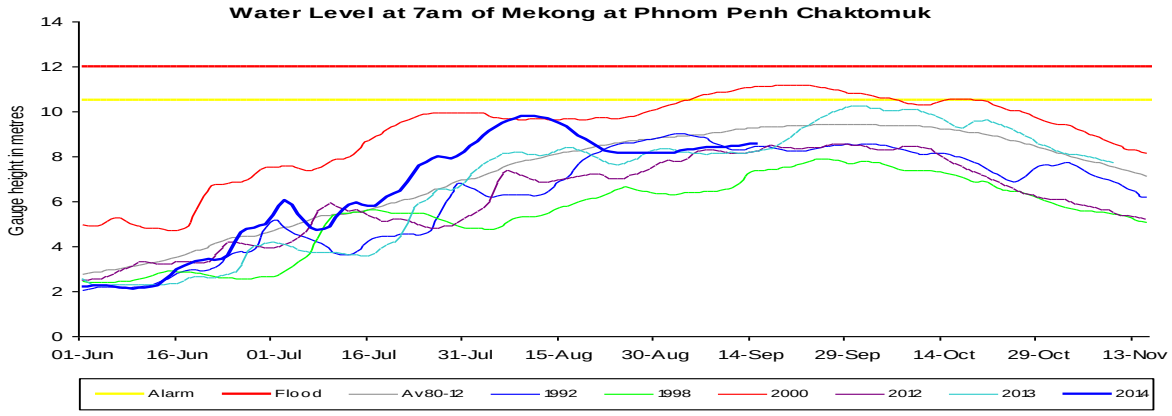

Water Level at 7am of Mekong at Khong Chiam
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

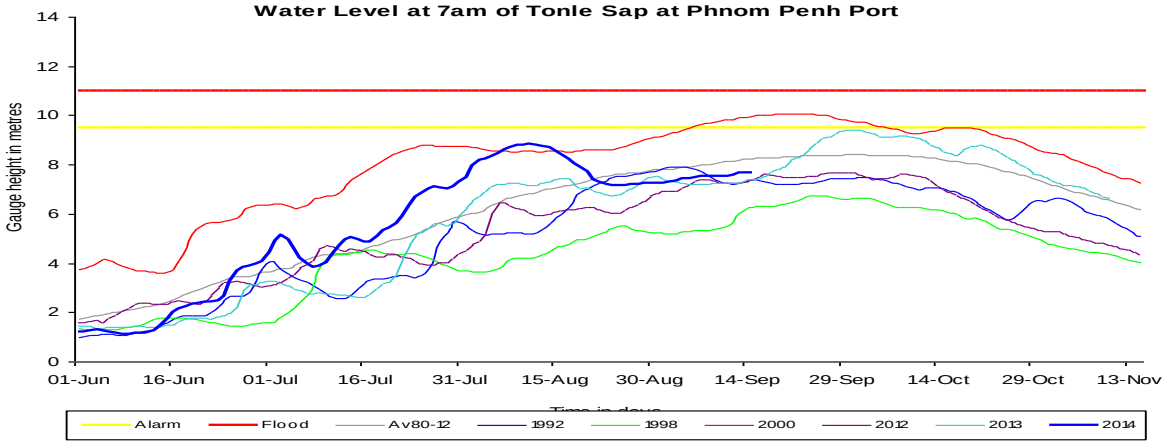

Water Level at 7am of Mekong at Pakse
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

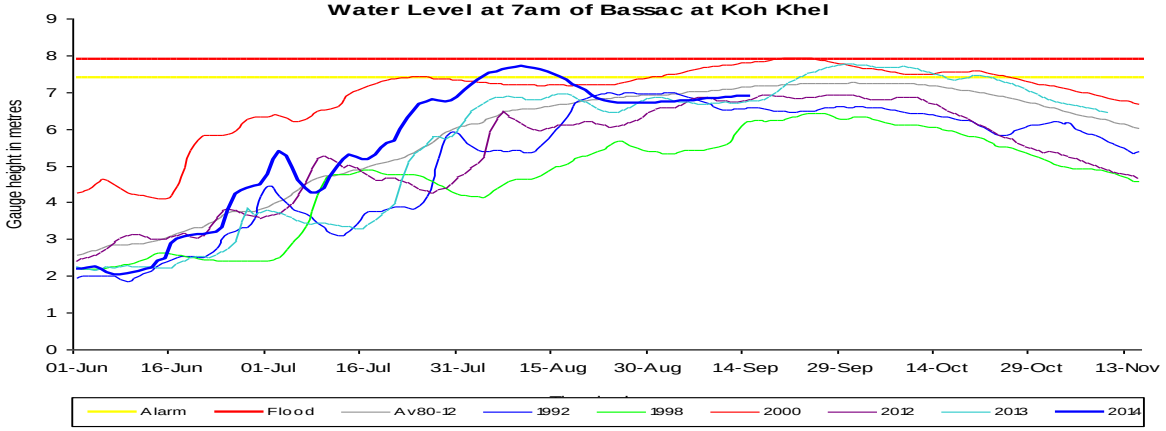

Water Level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

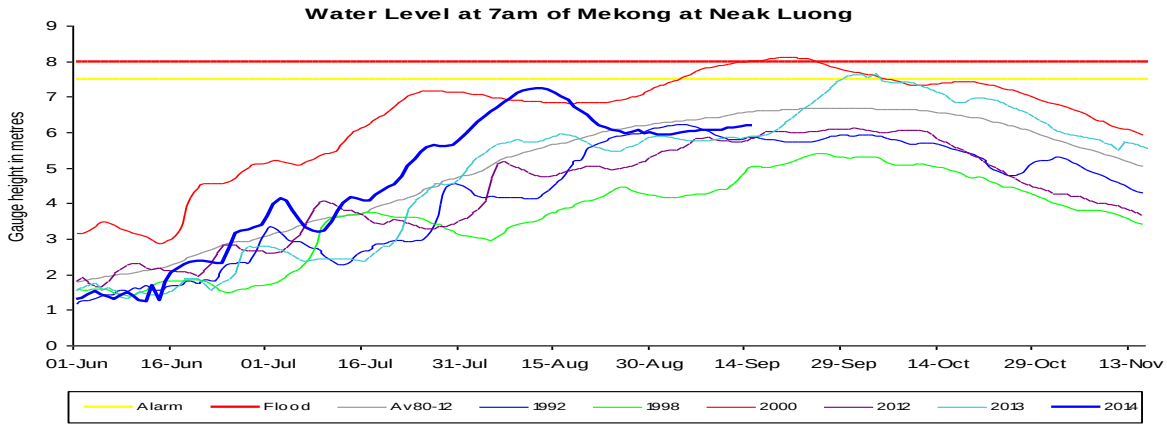

Water Level at 7am of Mekong at Kratie
Gauge height in metres
4
6
8
10
12
14
16
18
20
22
24
26
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

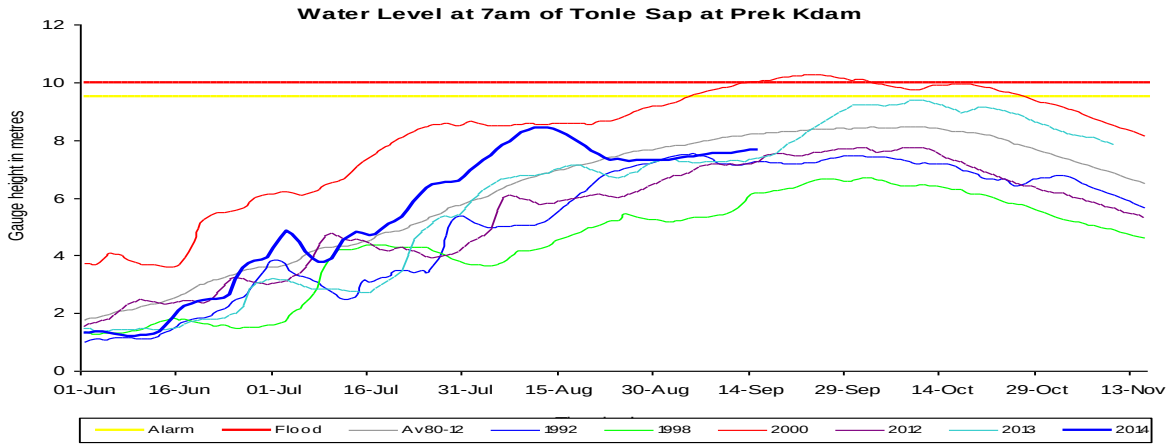

Water Level at 7am of Mekong at Kompong Cham
Gauge height in metres
18
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

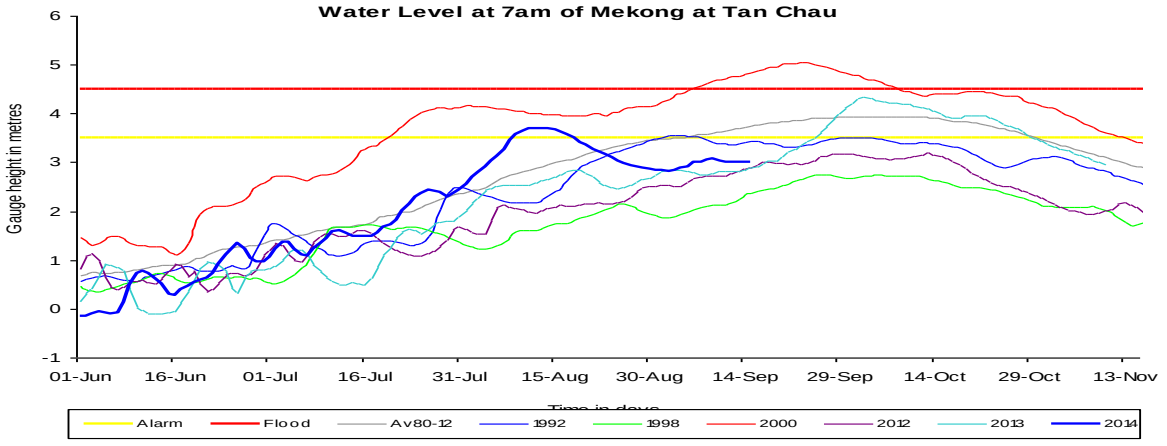

Water Level at 7am of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014

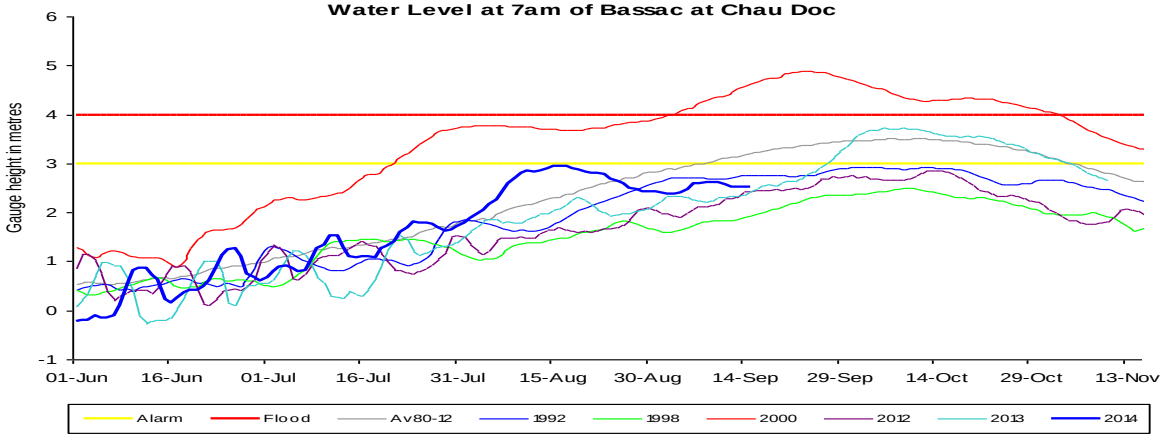

Water Level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
13-Nov
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014


Water Level at 7am of Bassac at Koh Khel
Gauge height in metres
9
8
7
6
5
4
3
2
1
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
Av80-12
1992
1998
2000
2012
2013
2014


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
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014


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
Alarm
Flood
Av80-12
1992
1998
2000
2012
2013
2014


Water Level at 7am of Mekong at Tan Chau
Gauge height in metres
-1
0
1
2
3
4
5
6
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
2014


Water Level at 7am of Bassac at Chau Doc
Gauge height in metres
-1
0
1
2
3
4
5
6
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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2014