# Mekong River Commission

## Regional Flood Management and Mitigation Centre

# Weekly Flood Situation Report for the Mekong River Basin

**Prepared on: 18/07/2011, covering the week from the 11th to the 17th July 2011**

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

### General weather patterns

During the week of the 11th to the 17th July 2011, three weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 12th July and the 17th July bulletins are presented in the figures below:

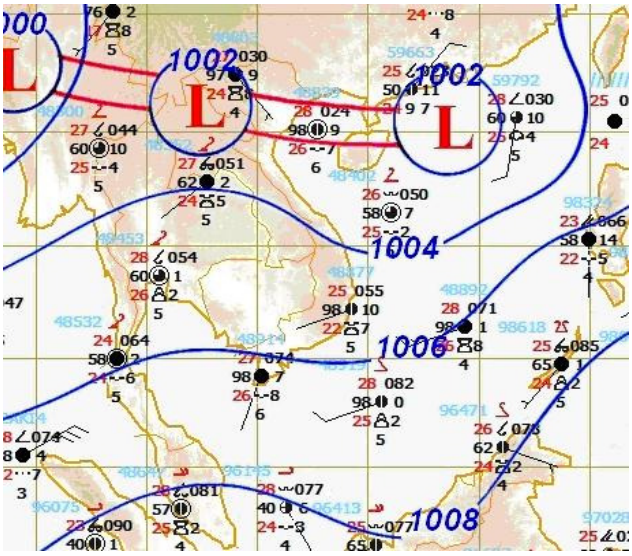



**Figure 1: Weather map for 12th July 2011**

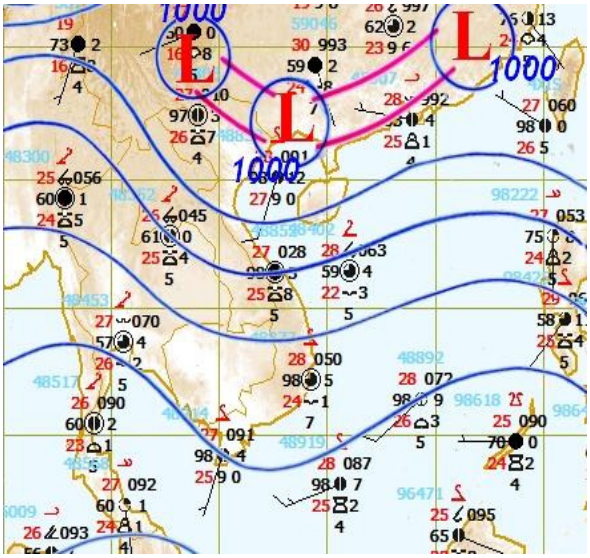



**Figure 2: Weather map for 17th July 2011**

Strong South-West (SW) Monsoon

Strong SW monsoon prevailed over Andaman Sea, Thailand, the Gulf of Thailand, Cambodia and was almost stationary during last week (Figure 1 and 2).

Inter Tropical Convergence Zone (ITCZ)

In the monitoring period, ITCZ laid across Myanmar, Thailand, Lao PDR and Viet Nam (Figure 1 and 2).

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

No TD, TS or TY have significant influenced to the LMB in this week.

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Over weather situation

Strong SW and ITCZ were observed frequently in the reporting period. Therefore, thundershower and isolated heavy rain occurred in the North, the South and Central of Myanmar, Thailand, Lao PDR, Viet Nam and the South, Southeast and Central of Cambodia as the result of these phenomena especially the areas from Vientiane/Nong Khai to Thakhek/Nakon Phanom (Figure 3).

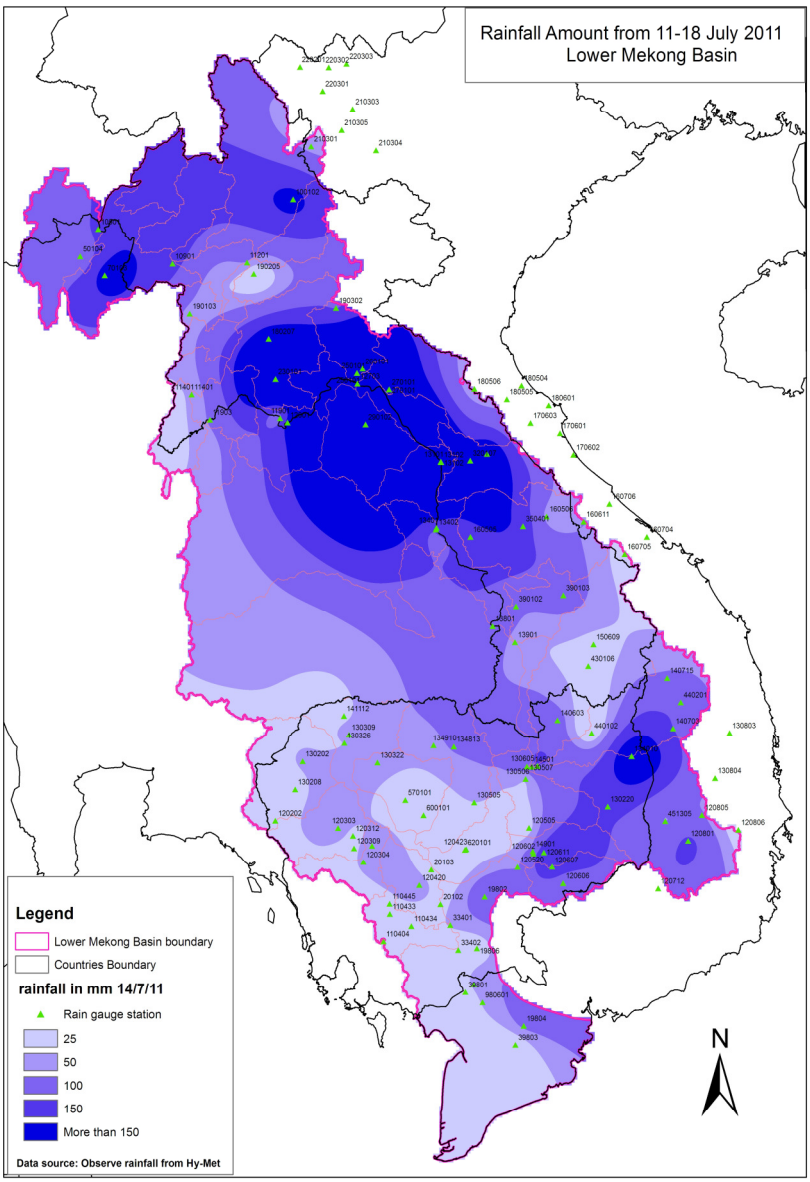



**Figure 3: Rainfall distribution over the LMB, covering the week 11 – 18 July, 2011**

## General behaviour of the Mekong River

Water levels at stations in the upper part of Lower Mekong Basin were somewhat below the long-term average while most stations in the middle and lower parts were recording levels that are somewhat above the long-term average for this time of the year. Water levels at stations in the upper and middle reaches of LMB were more-or-less stable in the first half of the week and then rising rapidly at the end of the week. Water levels at stations in the lower reach from Strung Treng to Phnom Penh Port/ Phnom Penh Bassac showed a more-or-less stable trend during the monitoring period. Regarding to two stations in downstream at Tan Chau and Chau Doc, water levels at those two stations were slightly increasing in the beginning of the week and then falling toward the of the week. Water levels at both stations were significant influenced by tidal.

### *For stations from Chiang Saen to Paksane*

Water levels were more-or-less stable in the first half of the week then increasing till the end of the week. Water levels of these stations were somewhat below the long-term average for this time of the year except Paksane where was recording level that is above the long-term average.

***For stations Thakhek/Nakon Phanom to Pakse***

Water levels at these stations were slightly falling in the beginning of the week and then rising rapidly toward the end of the week as the result of inter tropical convergence zone and strong Southwest monsoon influences. Most of these stations were recording levels that were above the long-term average for this time of the year.

Figure 4 shows rapidly rising of water levels at two mainstream stations: Thakhek and Nakon Phanom during last week.

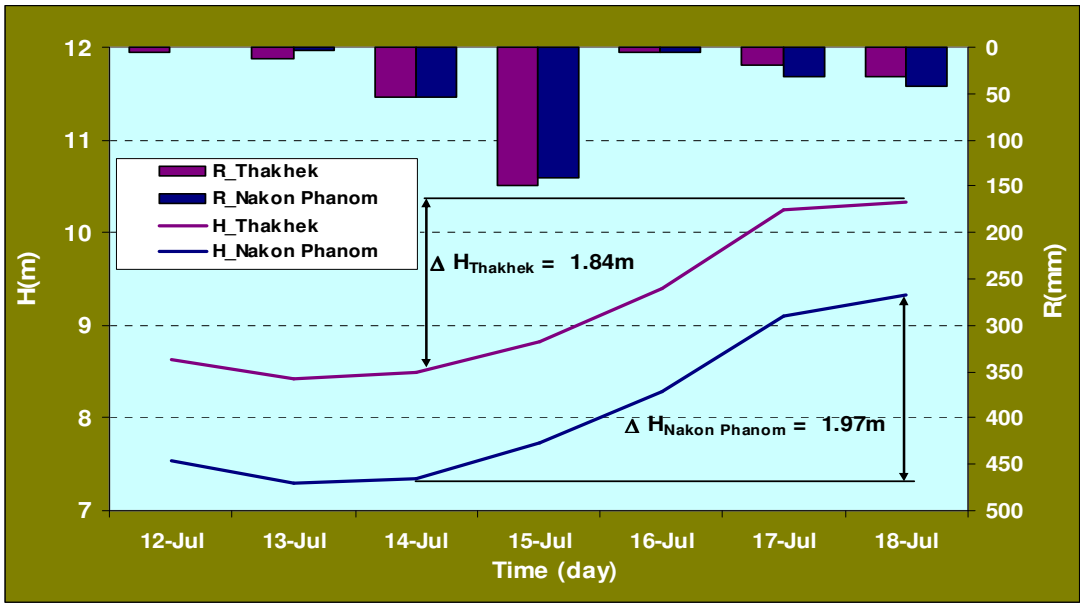



**Figure 4: Rapidly rising of water levels at stations: Thakhek and Nakon Phanom**

Water levels at stations on the tributaries such as Ban Tha Kok of Nam Song Khram river and Ban Phone Si of Nam Ca Dinh river were increasing quickly with amplitudes of 2.9m and 3.08m, respectively from 14 to 18 July (Figure 5)

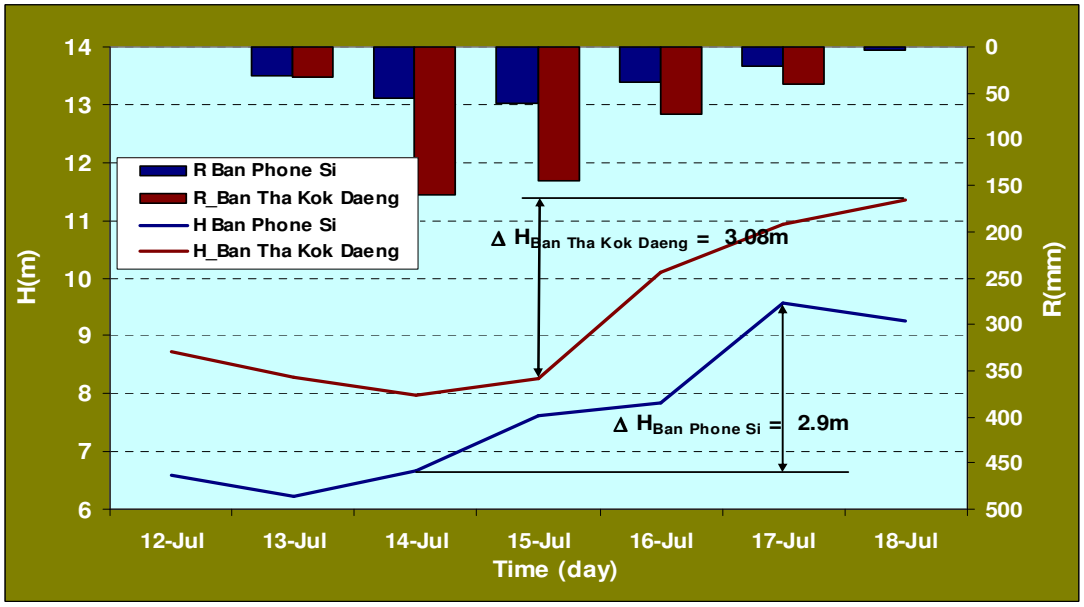



**Figure 5: Quickly rising of water levels at stations on tributaries: Nam Song Khram at Ban Tha Kok Daeng and Nam Ca Dinh at Ban Phone Si**

Recorded rainfall amount in the monitoring period was 277mm at Thakhek; 274mm at Nakon Phanom; 237.4mm at Ban Phone Si; 300.5mm at Ban Pak Kanhoung; 451.1mm at Ban Tha Kok Daeng.

***For stations from Strung treng to Kompong Chiam***

Water levels were falling in the first half of the week then slightly increasing till the end of the week. Water levels of these stations were somewhat above the long-term average for this time of the year.

***For stations from Phnom Penh Port/ Phnom Penh Bassac to Koh Khel/Neak Luong***

Water levels were falling in the first half of the week then slightly rising toward the end of the week. These stations were recording levels that are somewhat above the long-term average for this time of the year.

***Tan Chau and Chau Doc***

Water levels were slightly rising from the beginning to the mid of the week, then falling till the end of the week. Both stations were recording levels that are somewhat around the long-term average for this time of the year and significantly affected by tidal.

***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

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/07 | 537.29 | 4.01 | 8.88 | 9.10 | 5.84 | 7.09 | 9.38 | 7.77 | 8.85 | 7.60 | 6.80 | 8.25 | 6.78 | 6.52 | 15.71 | 10.41 | 6.23 | 5.35 | 5.51 | 4.22 | 5.14 | 1.81 | 1.42 |
| 12/07 | 537.48 | 3.48 | 8.84 | 9.12 | 5.86 | 6.96 | 9.14 | 7.53 | 8.64 | 7.30 | 6.49 | 7.97 | 6.47 | 6.33 | 15.40 | 10.14 | 6.08 | 5.20 | 5.40 | 4.11 | 5.04 | 1.87 | 1.59 |
| 13/07 | | 4.05 | 8.52 | 9.02 | 5.85 | 6.99 | 9.12 | 7.29 | 8.43 | 7.14 | 6.37 | 7.76 | 6.28 | 6.28 | 15.10 | 9.87 | 5.97 | 4.98 | 5.29 | 4.00 | 4.95 | 1.85 | 1.65 |
| 14/07 | 536.00 | 4.37 | 8.48 | 8.88 | 5.72 | 6.85 | 9.23 | 7.35 | 8.49 | 7.06 | 6.24 | 7.55 | 6.14 | 6.59 | 15.25 | 9.80 | 5.92 | 4.94 | 5.22 | 3.93 | 4.89 | 1.74 | 1.55 |
| 15/07 | | 4.06 | 8.72 | 8.82 | 5.63 | 6.84 | 9.14 | 7.73 | 8.83 | 7.50 | 6.67 | 7.64 | 6.13 | 6.75 | 15.82 | 10.10 | 5.99 | 5.00 | 5.26 | 4.06 | 4.95 | 1.64 | 1.32 |
| 16/07 | | 4.11 | 9.32 | 9.03 | 5.76 | 6.86 | 9.43 | 8.29 | 9.40 | 8.03 | 7.26 | 8.24 | 6.30 | 6.84 | 16.17 | 10.47 | 6.19 | 5.23 | 5.42 | 4.13 | 5.11 | 1.62 | 1.18 |
| 17/07 | | 4.53 | 9.48 | 9.34 | 5.93 | 7.09 | 10.15 | 9.10 | 10.24 | 8.76 | 7.98 | 8.92 | 7.14 | 6.84 | 16.11 | 10.59 | 6.32 | 5.38 | 5.52 | 4.24 | 5.21 | 1.61 | 1.12 |
| 18/07 | 536.83 | 5.05 | 9.73 | 9.67 | 6.33 | 7.49 | 10.08 | 9.32 | 10.33 | 9.20 | 8.41 | 9.68 | 7.74 | 6.90 | 15.91 | 10.48 | 6.30 | 5.37 | 5.52 | 4.26 | 5.22 | 1.62 | 1.12 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/07 | 2.0 | 0.30 | 11.0 | 4.3 | 2.5 | 61.8 | 96.2 | nr | nr | nr | nr | 4.9 | nr | nr | 16.0 | 5.7 | 1.6 | | nr | nr | nr | 32.8 | 0.40 |
| 12/07 | 0.0 | 1.4 | 2.4 | nr | nr | nr | 9.1 | nr | 5.0 | 5.5 | 6.5 | nr | nr | nr | nr | 35.0 | 0.2 | | nr | nr | 7.2 | 0.0 | 0.0 |
| 13/07 | 0.0 | 4.4 | nr | 5.1 | nr | nr | 8.3 | 3.4 | 11.4 | 24.6 | | 25.8 | 12.6 | 6.0 | 11.0 | 11.4 | 13.2 | | 1.8 | 3.0 | 9.3 | 2.6 | 5.0 |
| 14/07 | 2.0 | 55.5 | nr | 14.3 | 7.0 | 6.5 | 18.4 | 53.4 | 53.9 | 22.7 | 4.0 | 26.5 | 5.2 | 42.0 | 2.0 | 12.4 | 2.8 | | nr | 0.3 | nr | 1.3 | 0.9 |
| 15/07 | 0.0 | 16.8 | nr | 4.5 | 60.0 | 90.8 | 45.4 | 140.6 | 149.8 | 13.2 | 16.5 | 13.5 | 15.2 | 44.0 | 3.4 | 17.8 | 10.0 | | 0.5 | 0.4 | nr | 2.7 | 8.9 |
| 16/07 | 0.0 | 21.3 | 4.4 | 15.3 | 1.0 | 26.3 | 45.4 | 4.8 | 5.5 | 20.8 | 30.6 | 7.4 | 4.0 | 4.0 | 2.0 | nr | nr | | 1.4 | nr | nr | nr | 0.0 |
| 17/07 | 0.0 | 12.5 | nr | 5.2 | nr | 0.5 | 11.7 | 30.8 | 19.5 | 3.5 | 4.8 | 8.8 | 0.5 | nr | nr | nr | nr | | 0.3 | nr | nr | nr | 0.3 |
| 18/07 | 2.0 | 3.90 | 30.4 | 5.1 | nr | 4.0 | 5.9 | 41.1 | 31.9 | 1.3 | 81.2 | 2.6 | nr | 1.8 | 8.4 | nr | nr | | nr | 0.0 | nr | 0.0 | nr |

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

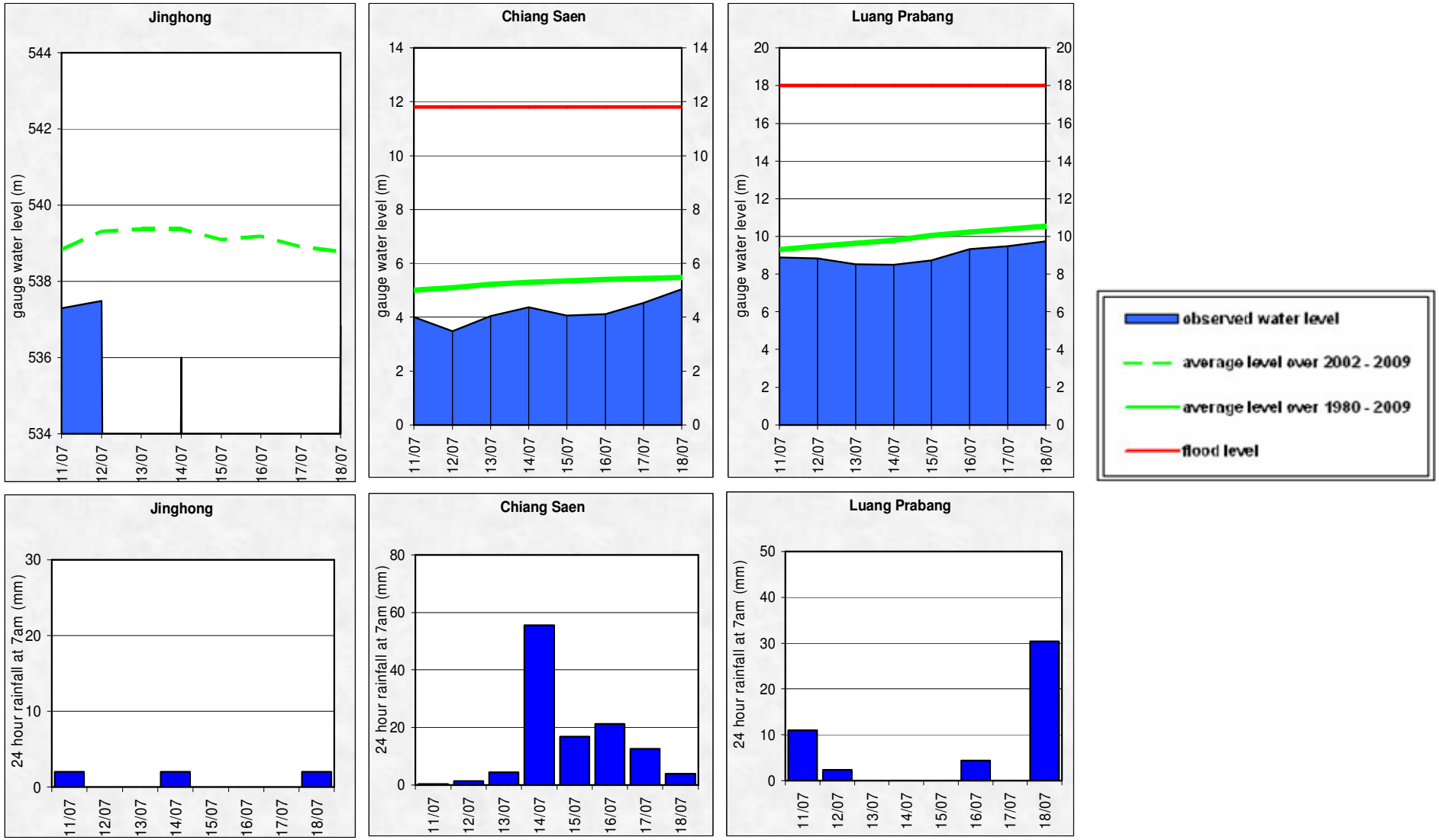


Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane

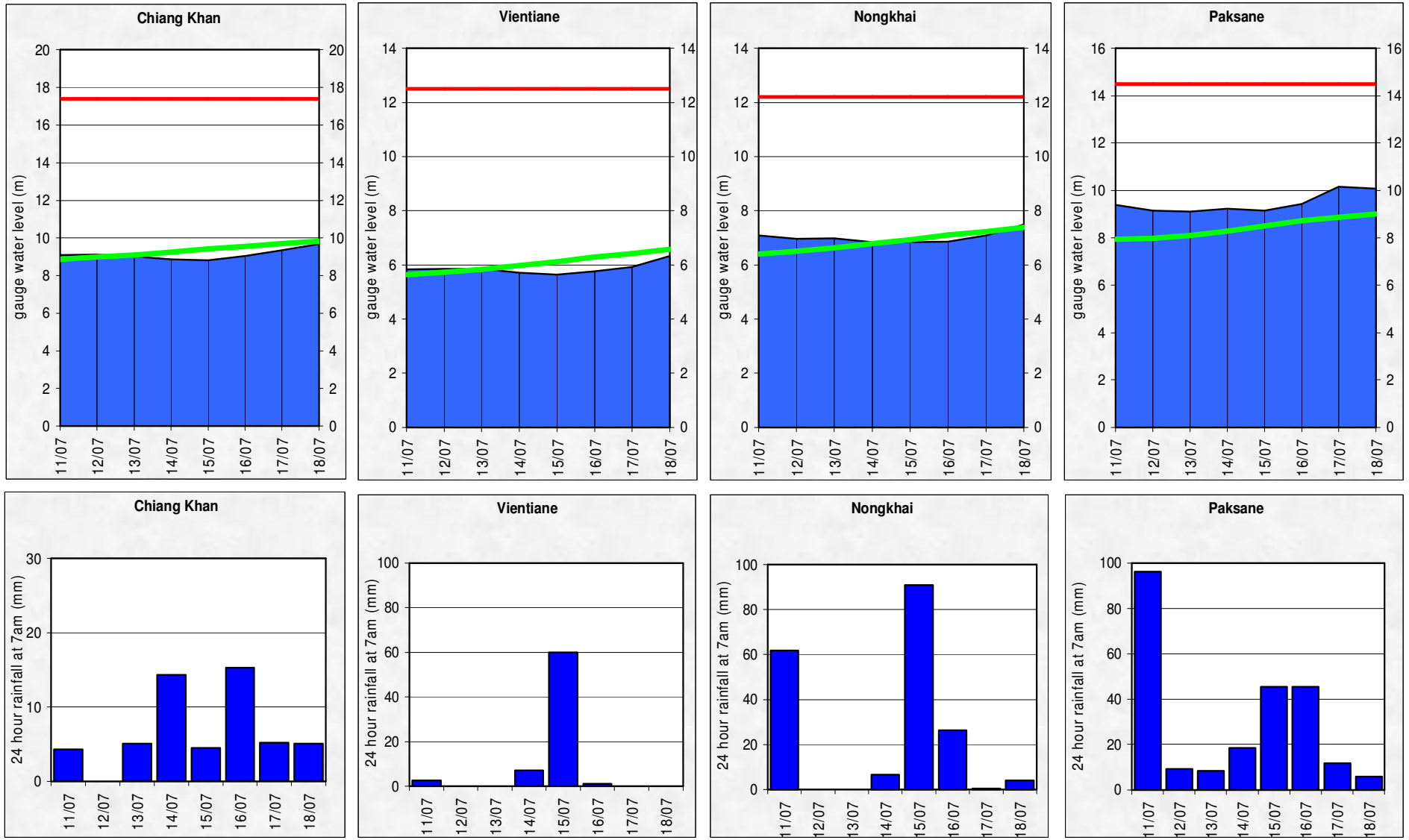


Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet

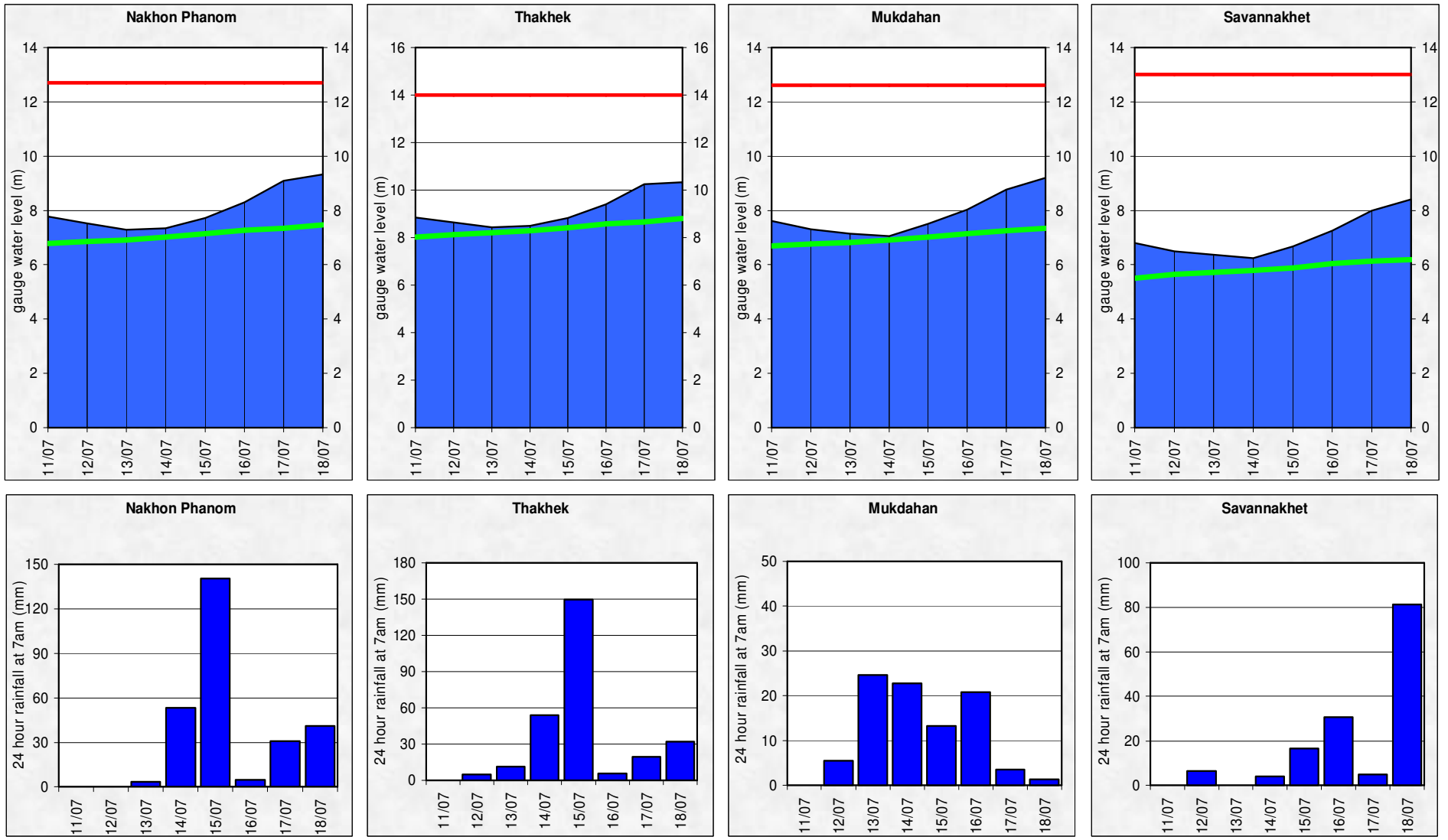


Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie

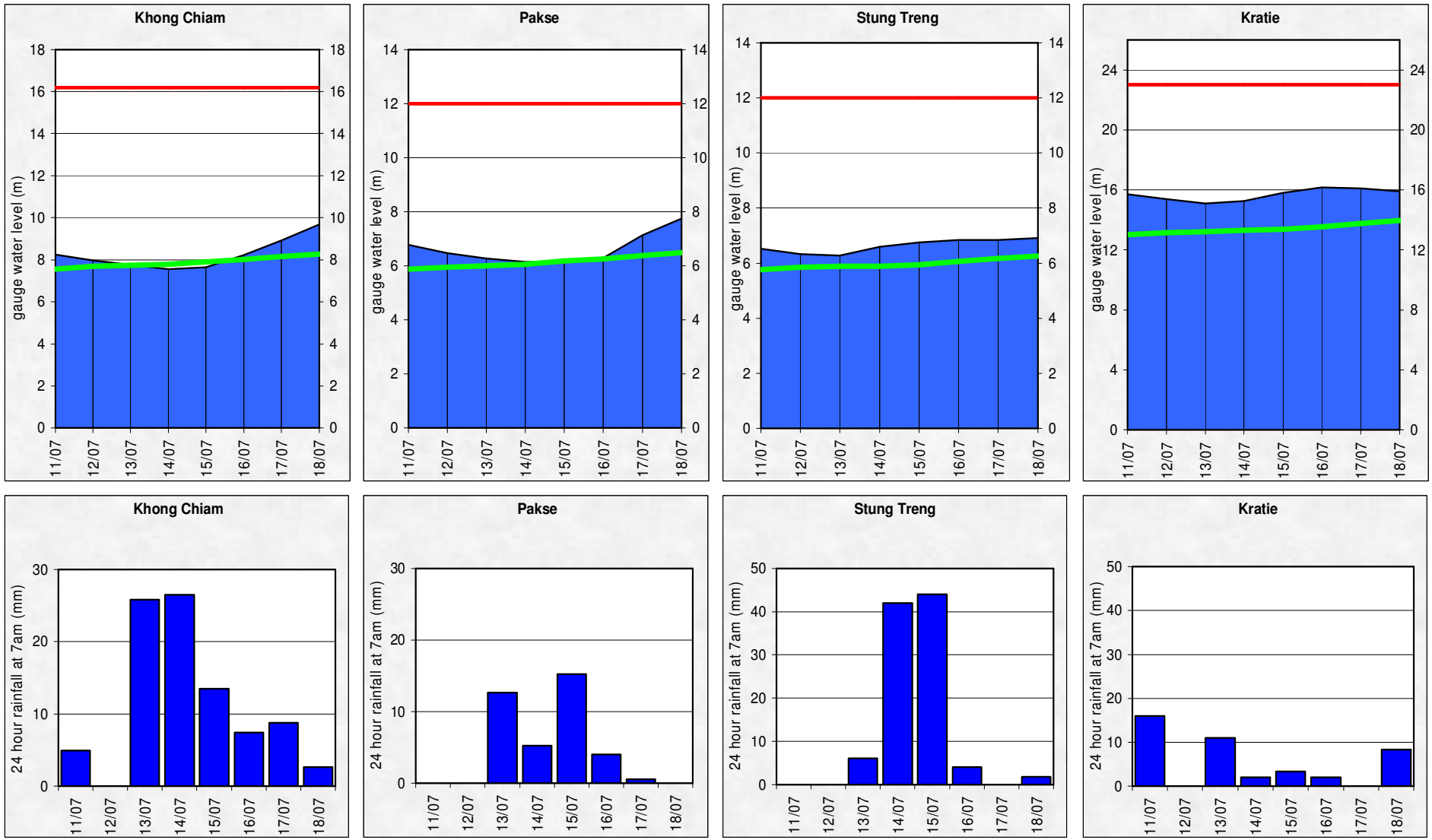


Figure A5: Water level and rainfall for Kompong Cham, Phnom Penh (Bassac and Port), and Koh Khel

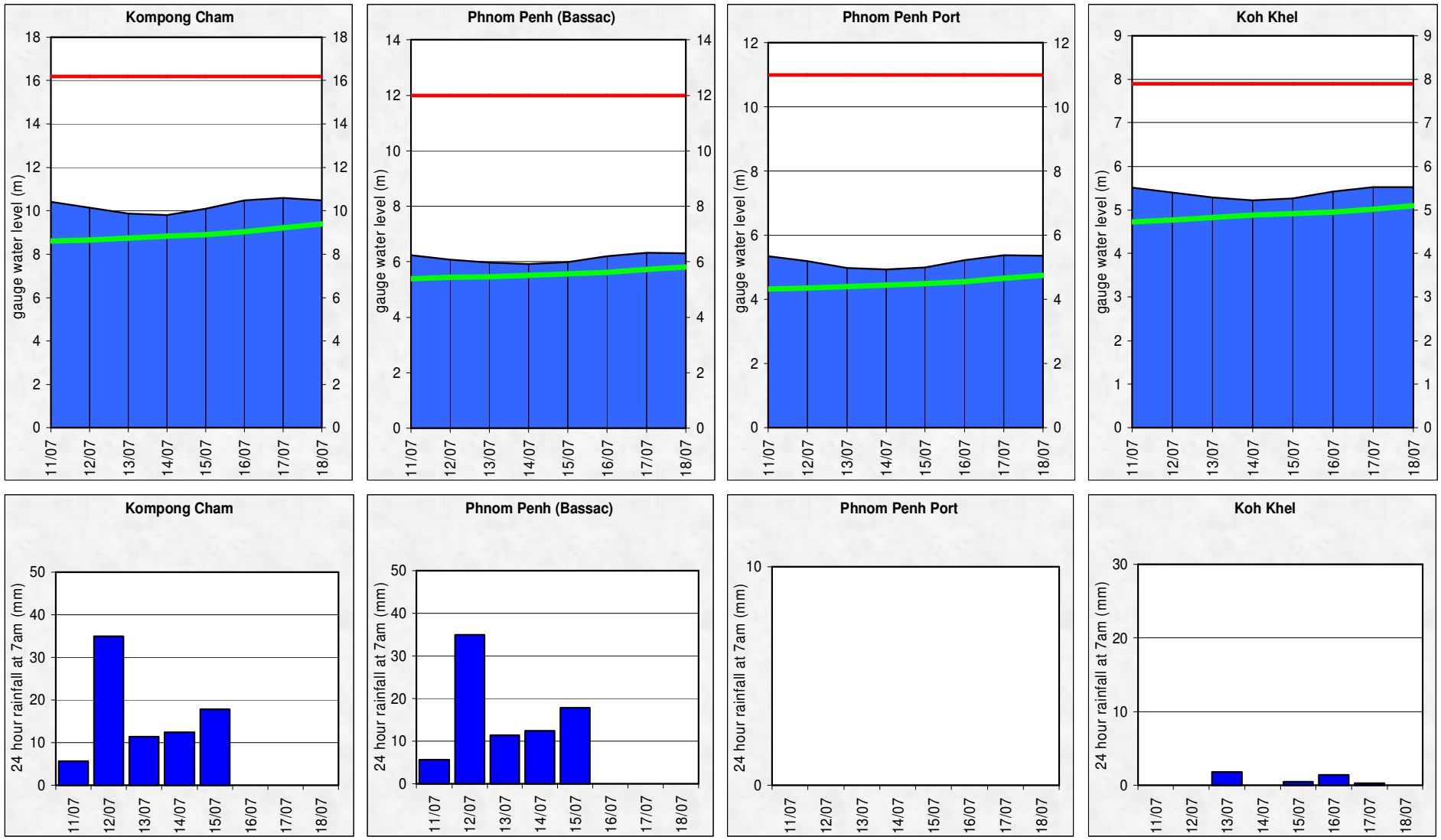
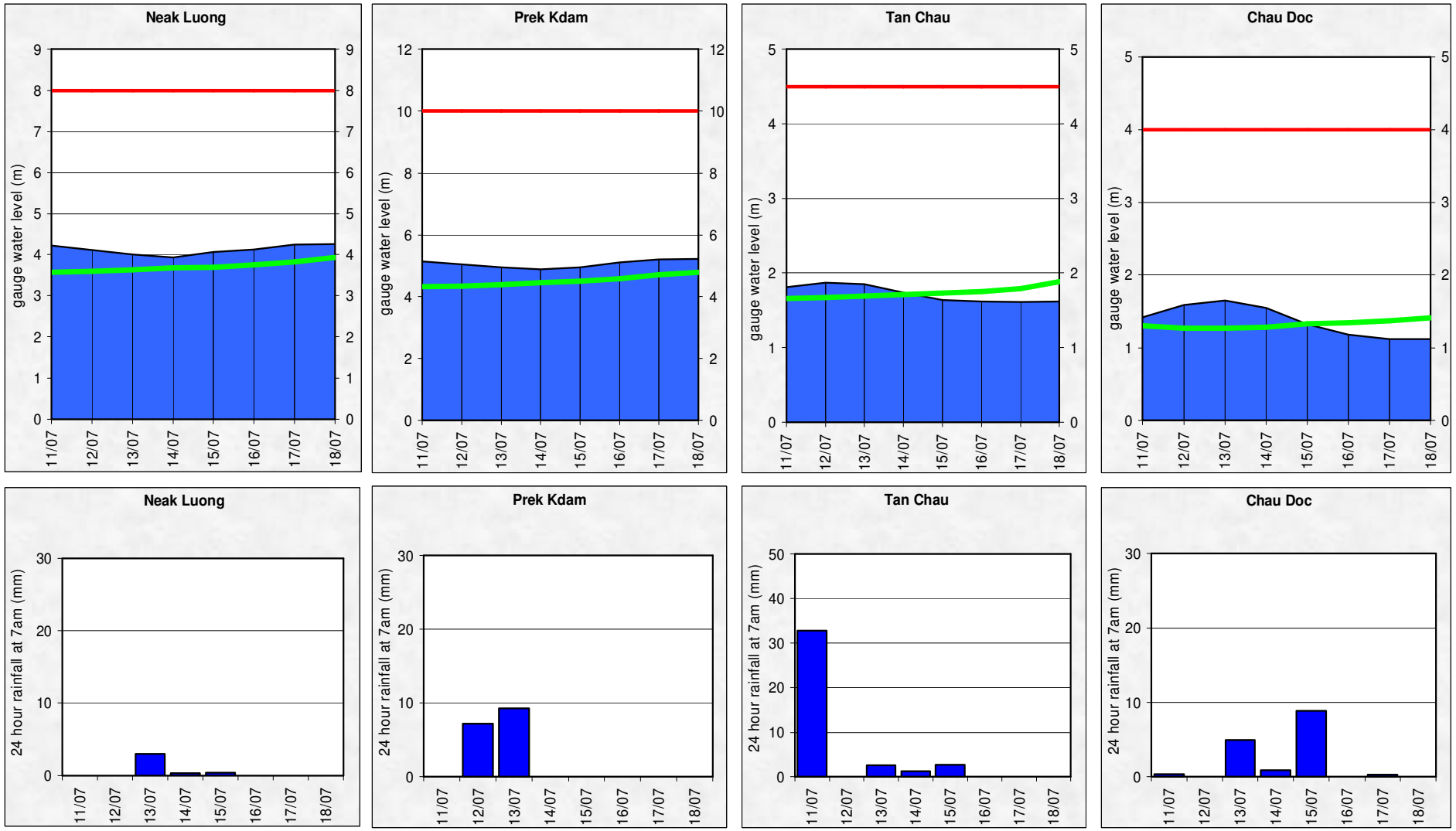


Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc



# Annex B: Accuracy and performance

## Accuracy

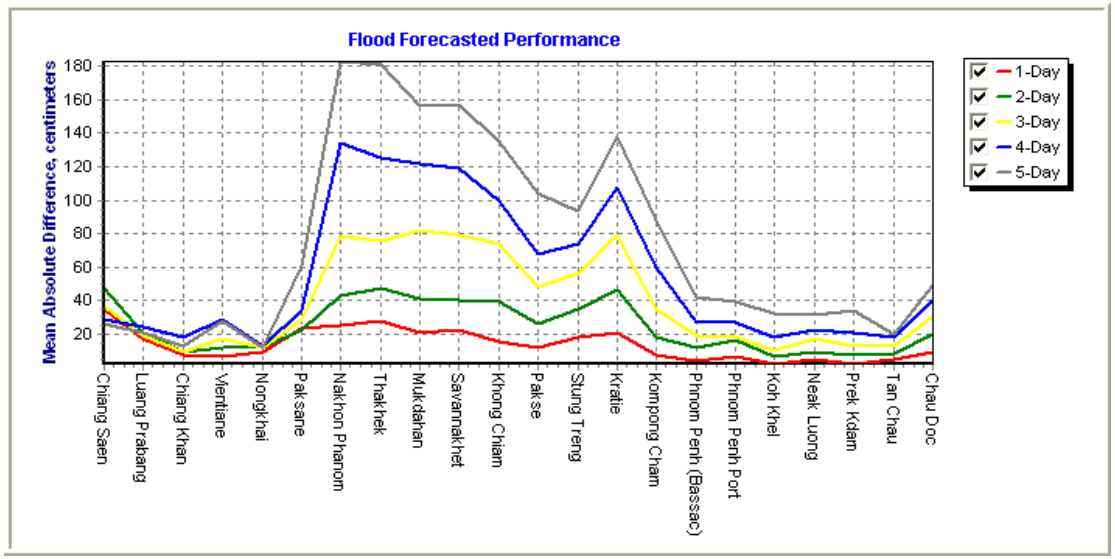
"Accuracy" describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model 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 the abnormal pattern, in which the accuracies at stations in the upper reach of LMB were much better than in middle reach.

In general, the overall accuracy is fairly good for 1-day to 3-day forecast lead time; however accuracies at stations from Nakon Phanom/Thakhek to Khong Chiam and Kratie for 4-day and 5-day forecast were less than expected.

The above differences are due to two main factors: (1) by internal model functionality in forecasting for middle reach of the LMB because of high variability of both SRE and rainfall forecast from NWP (NOAA) for which the parameter adjustment is not possible for stations in the middle reach of LMB when critical weather condition appeared; (2) the knowledge and experience of forecaster-n-charge in adjusting forecast result taking into account the flow contribution of tributaries to stations in the middle reach of LMB.

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 | 71.4 | 100.0 | 57.1 | 57.1 | 28.6 | 14.3 | 0.0 | 42.9 | 28.6 | 42.9 | 71.4 | 42.9 | 42.9 | 85.7 | 100.0 | 71.4 | 100.0 | 85.7 | 100.0 | 100.0 | 57.1 | ***61.7*** |
| 2-day | 50.0 | 83.3 | 100.0 | 83.3 | 83.3 | 66.7 | 33.3 | 33.3 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 33.3 | 83.3 | 50.0 | 33.3 | 83.3 | 66.7 | 66.7 | 66.7 | 16.7 | ***58.3*** |
| 3-day | 60.0 | 100.0 | 100.0 | 80.0 | 80.0 | 40.0 | 20.0 | 0.0 | 20.0 | 20.0 | 20.0 | 40.0 | 20.0 | 0.0 | 40.0 | 40.0 | 40.0 | 60.0 | 20.0 | 40.0 | 40.0 | 20.0 | ***40.9*** |
| 4-day | 100.0 | 100.0 | 100.0 | 75.0 | 100.0 | 75.0 | 0.0 | 0.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 50.0 | 25.0 | 50.0 | 50.0 | 50.0 | 50.0 | 0.0 | 0.0 | ***44.3*** |
| 5-day | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 66.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33.3 | 0.0 | 0.0 | 0.0 | 0.0 | 33.3 | 0.0 | 33.3 | 0.0 | 66.7 | 0.0 | ***33.3*** |

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) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2011** | 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* | *10:38* | *0* | *-* | *3* | *08:12* | *07:18* | *07:38* | *06:35* | *09:04* | *07:45* | *07:16* | *0* | *8* | *1* | *43* | *141* | *4* | *31* |
| *month* | *10:32* | *0* | *-* | *19* | *08:12* | *08:02* | *07:30* | *06:17* | *09:06* | *07:46* | *07:14* | *1* | *12* | *11* | *306* | *499* | *5* | *144* |
| *season* | *10:21* | *1* | *-* | *35* | *08:12* | *08:34* | *07:31* | *06:13* | *09:06* | *07:53* | *07:14* | *1* | *12* | *35* | *621* | *928* | *16* | *284* |

*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.

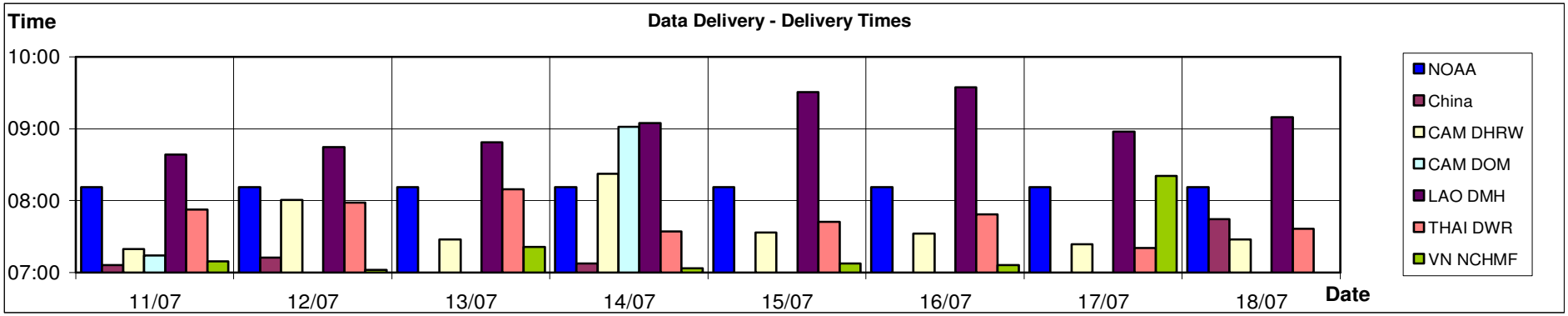



Figure B2: Data delivery times for the past 8 days including the current report date

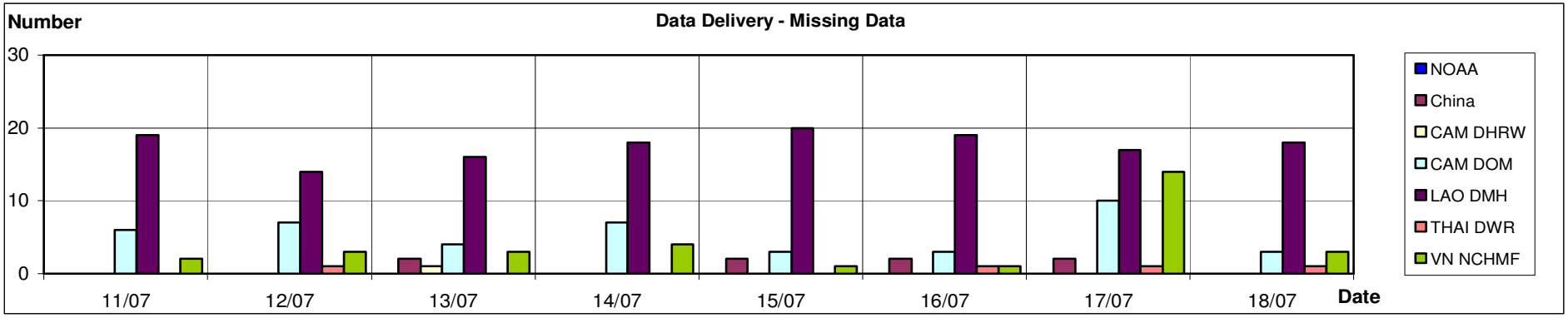



Figure B3: Missing data for the past 8 days including the current report date

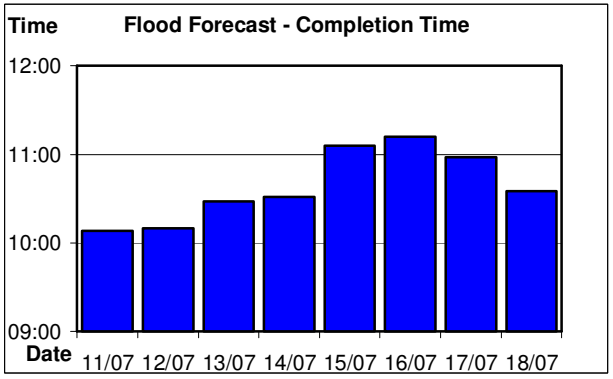



Figure B4: Flood forecast completion time

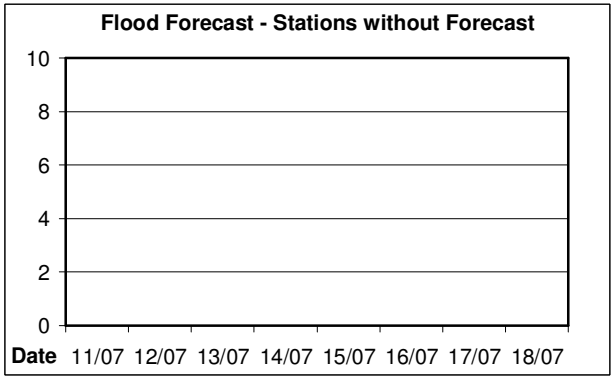



Figure B5: Flood forecast stations without forecast

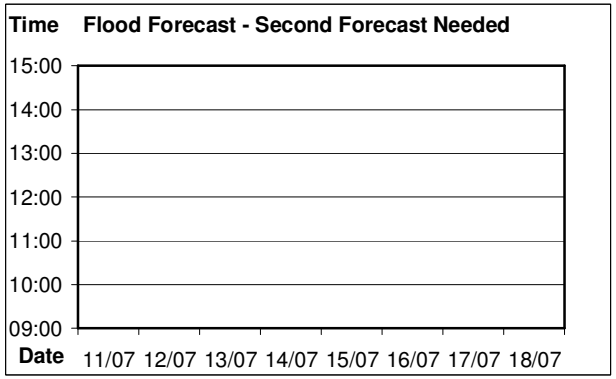


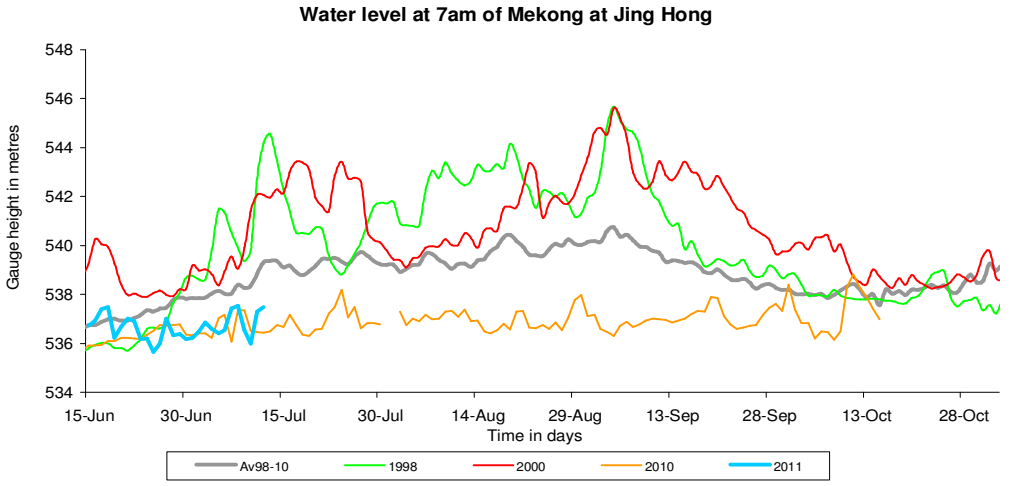

Figure B6: Second forecast needed

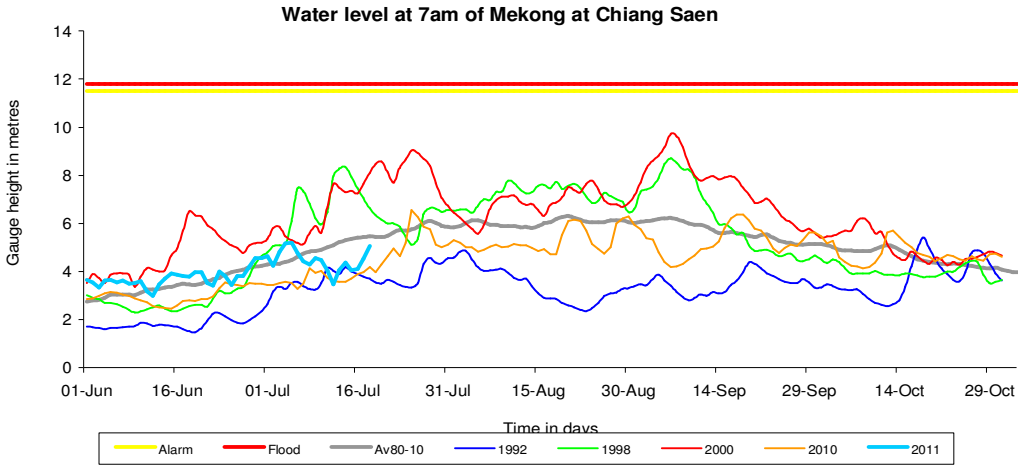
# Annex C: Season Water Level Graphs

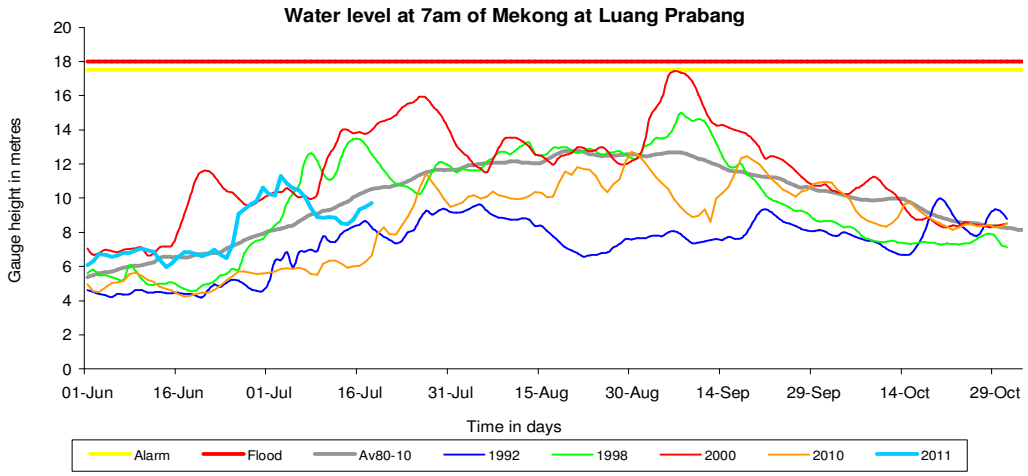
This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.

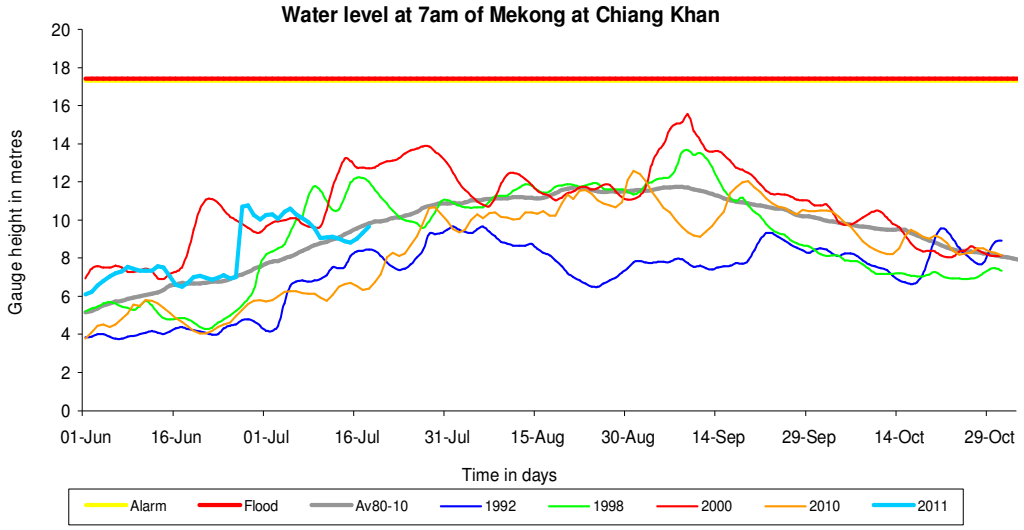
**HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS**

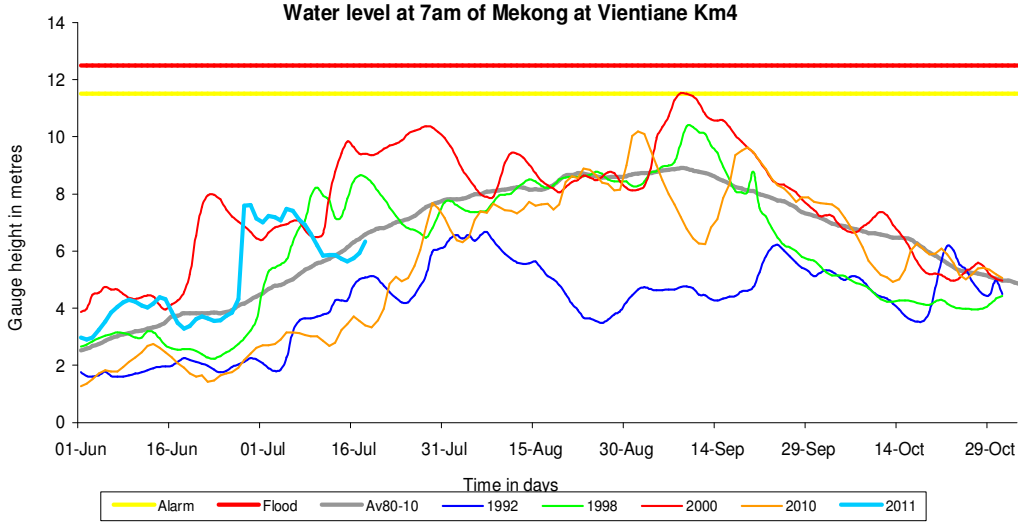
**IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER**

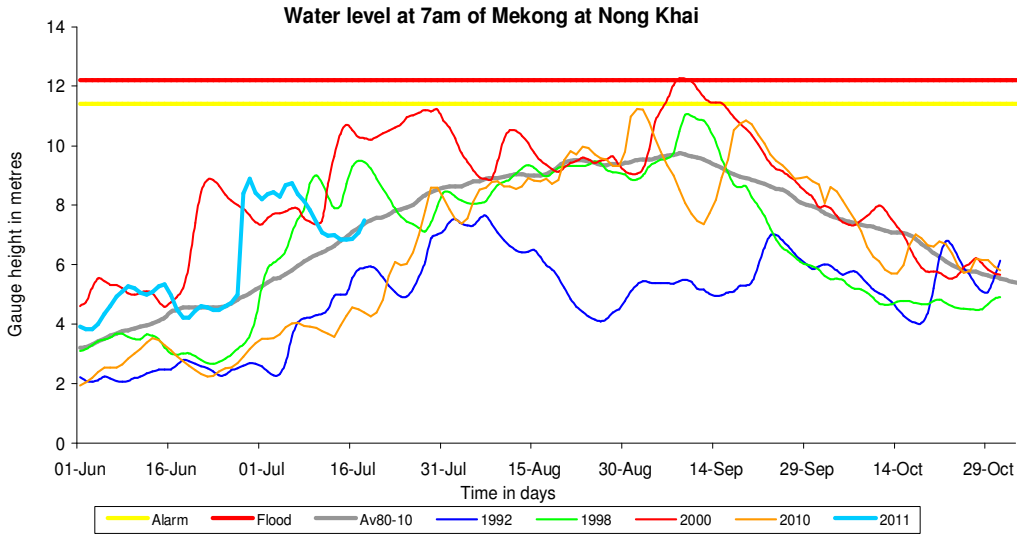


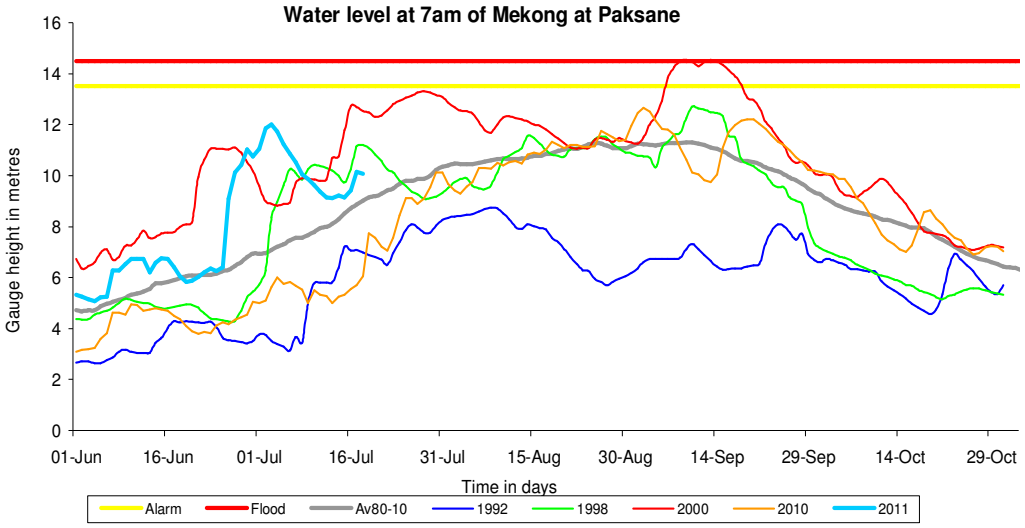



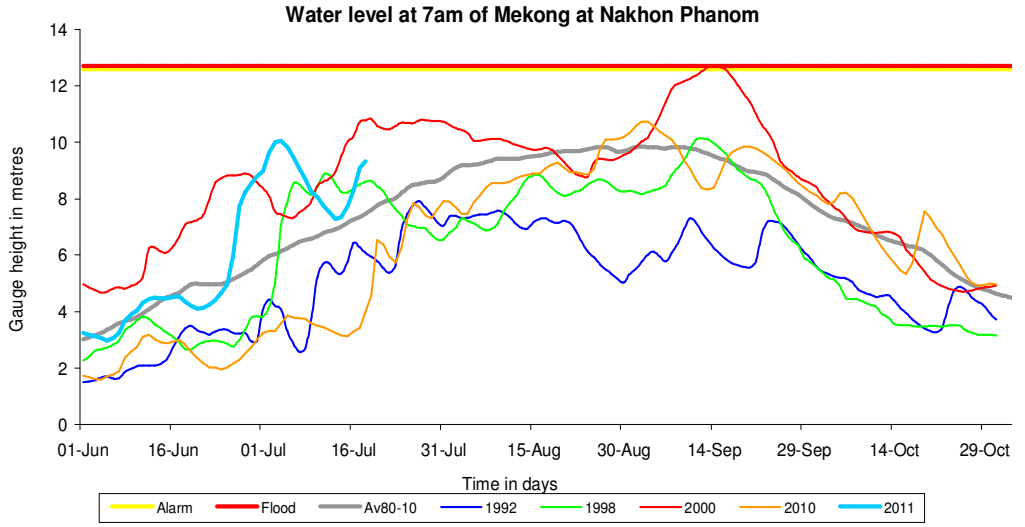



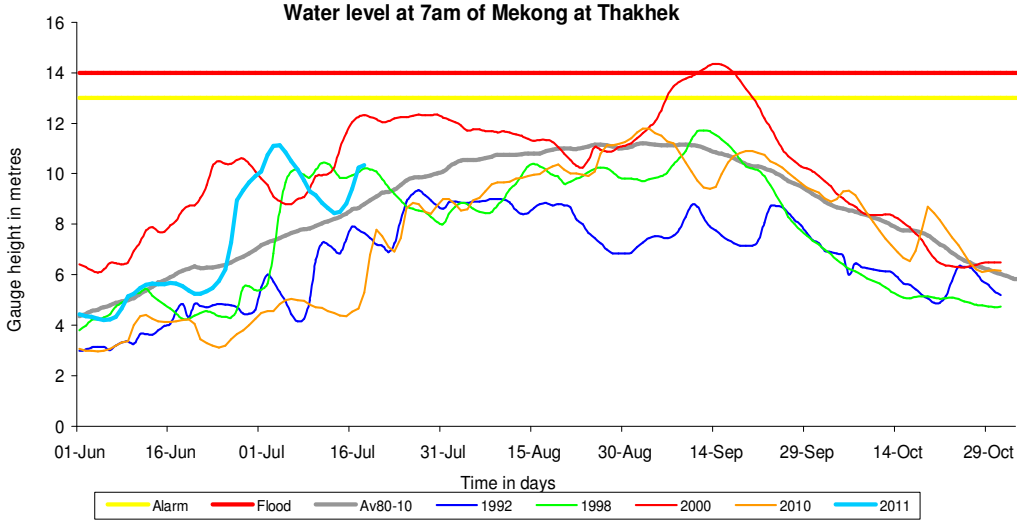

Water level at 7am of Mekong at Chiang Khan
Gauge height in metres
20
18
16
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

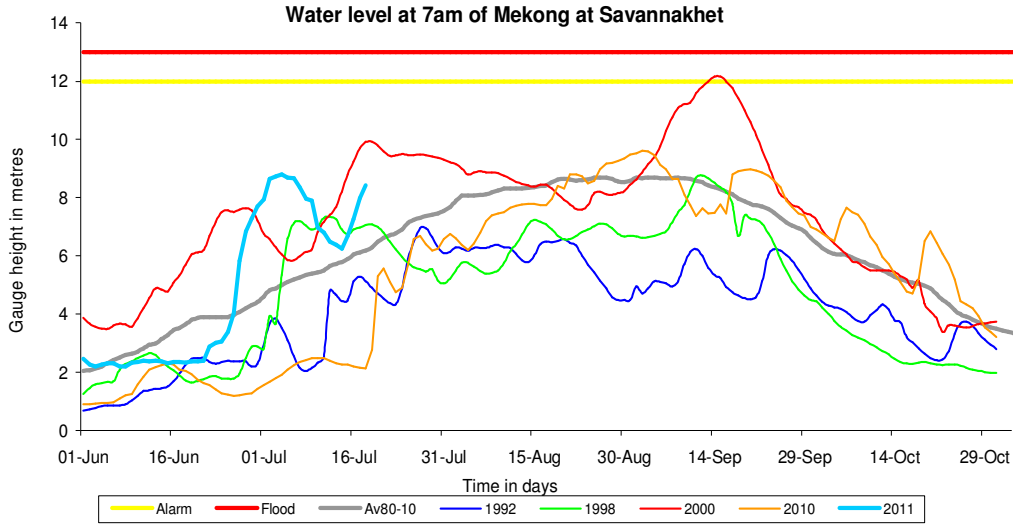

Water level at 7am of Mekong at Vientiane Km4
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

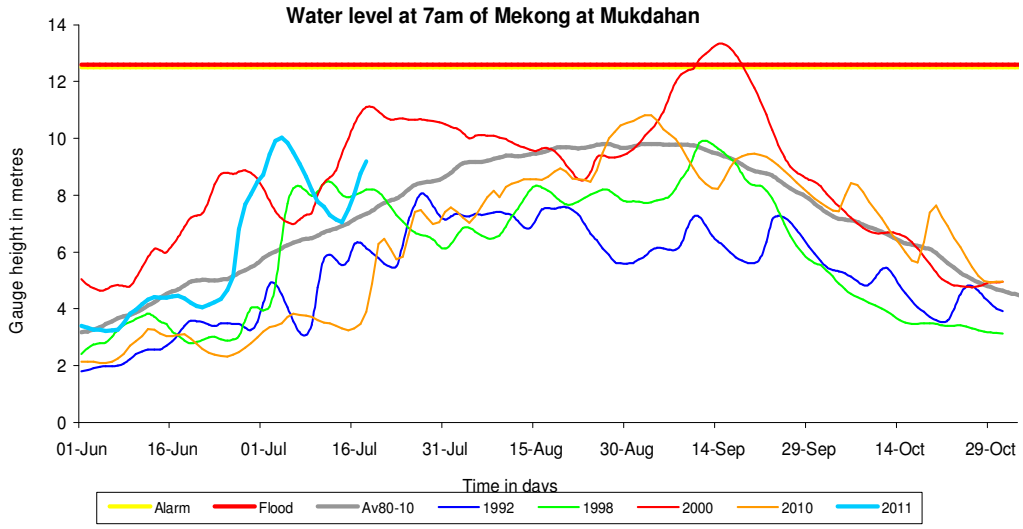

Water level at 7am of Mekong at Nong Khai
Gauge height in metres
14
12
10
8
6
4
2
0
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

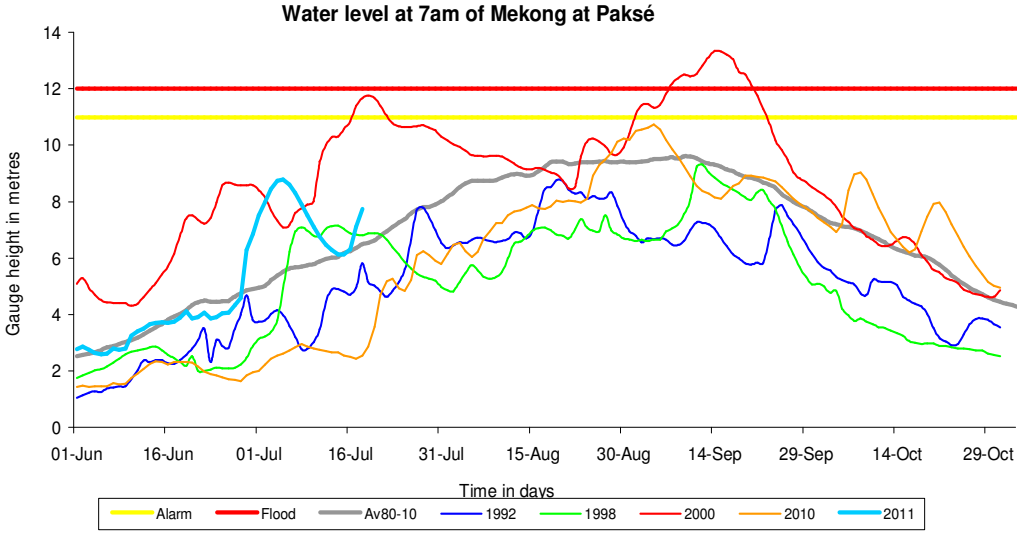

Water level at 7am of Mekong at Paksane
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

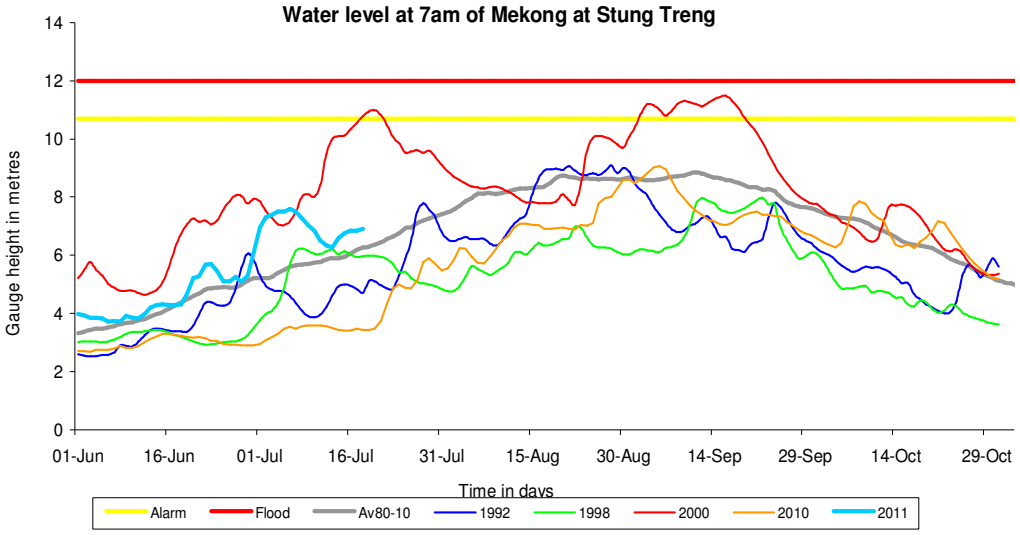

Water level at 7am of Mekong at Nakhon Phanom
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

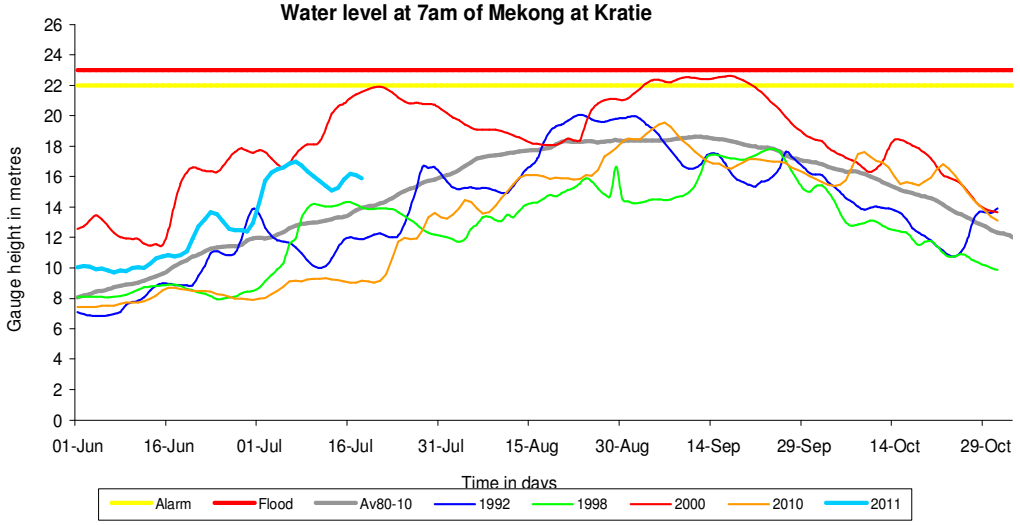

Water level at 7am of Mekong at Thakhek
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

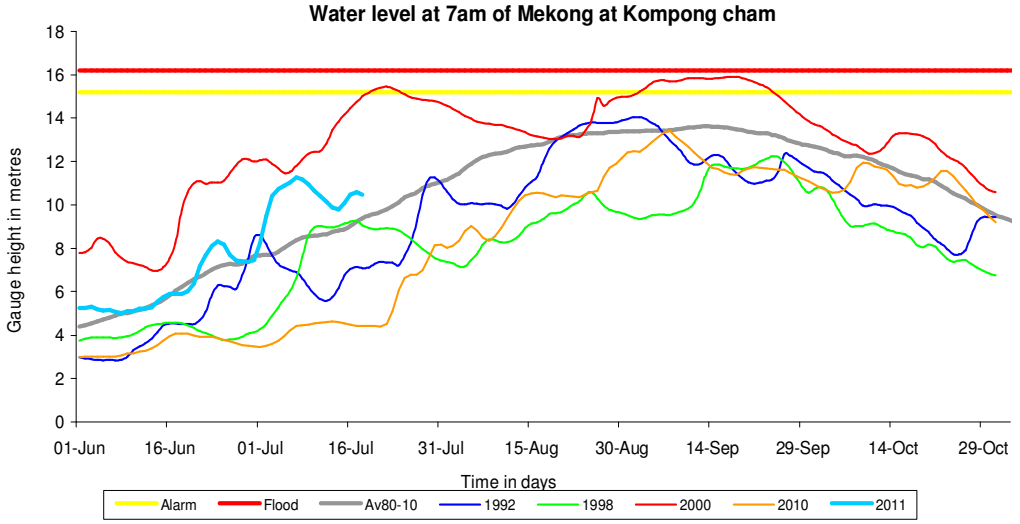

Water level at 7am of Mekong at Savannakhet
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

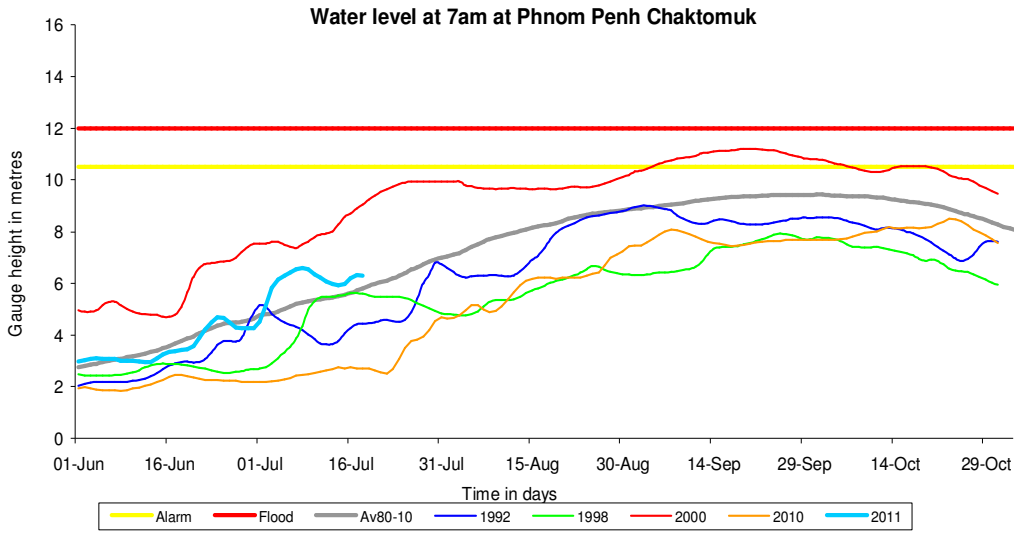

Water level at 7am of Mekong at Mukdahan
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

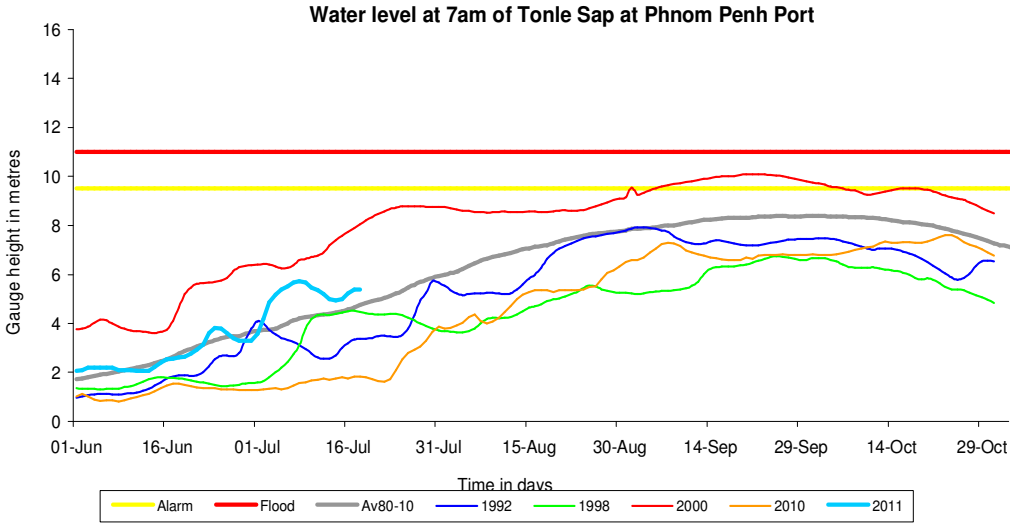

Water level at 7am of Mekong at Paksé
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

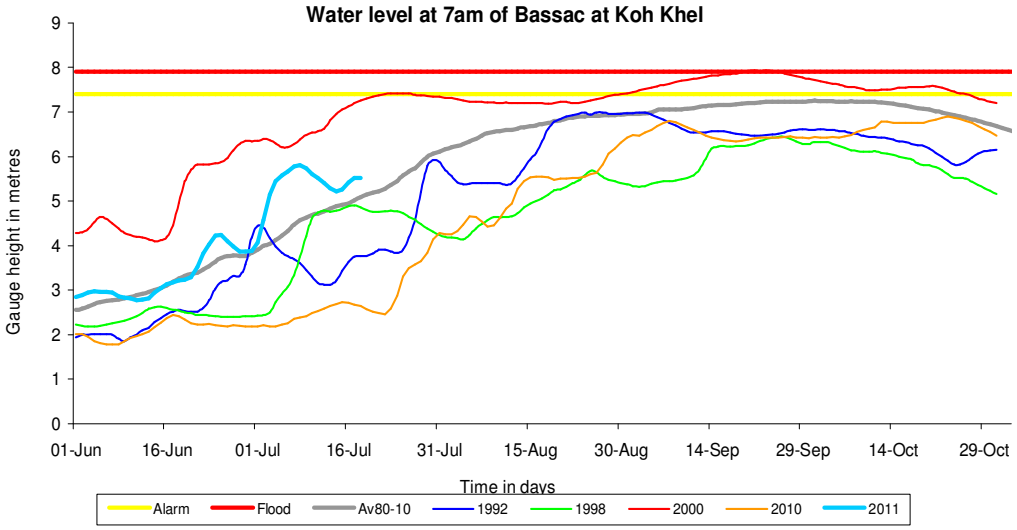

Water level at 7am of Mekong at Stung Treng
Gauge height in metres
0
2
4
6
8
10
12
14
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

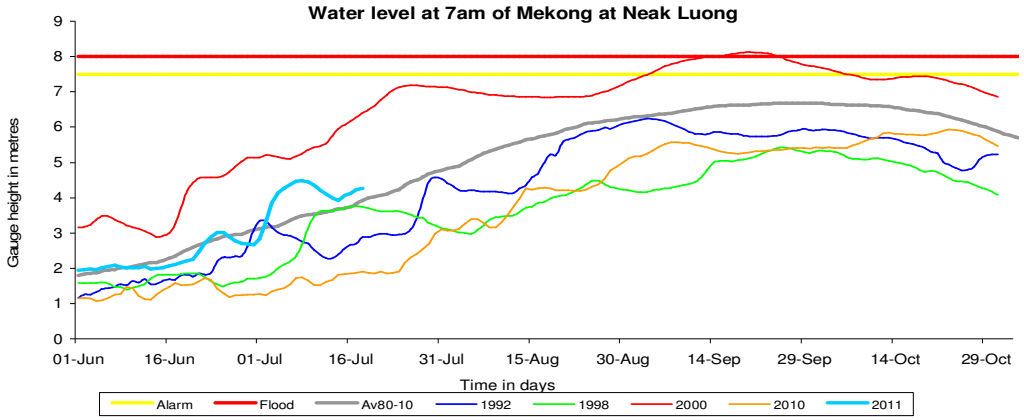

Water level at 7am of Mekong at Kratie
Gauge height in metres
0
2
4
6
8
10
12
14
16
18
20
22
24
26
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

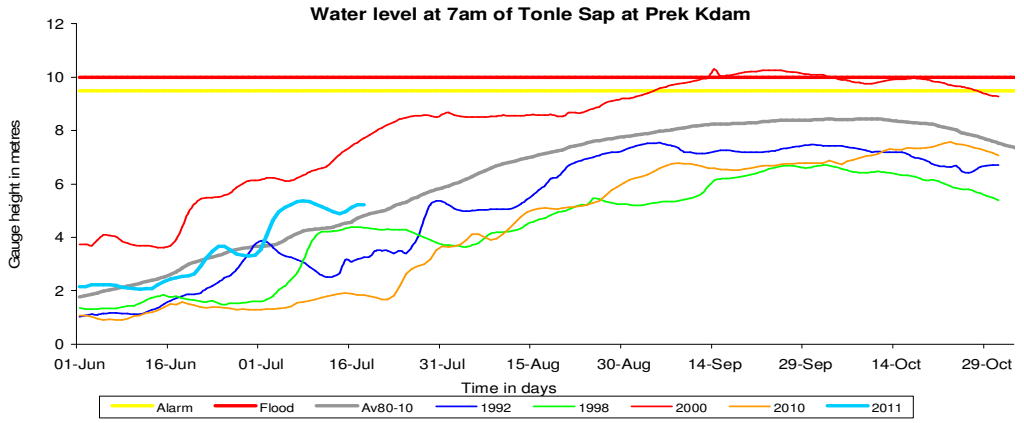

Water level at 7am of Mekong at Kompong cham
Gauge height in metres
0
2
4
6
8
10
12
14
16
18
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

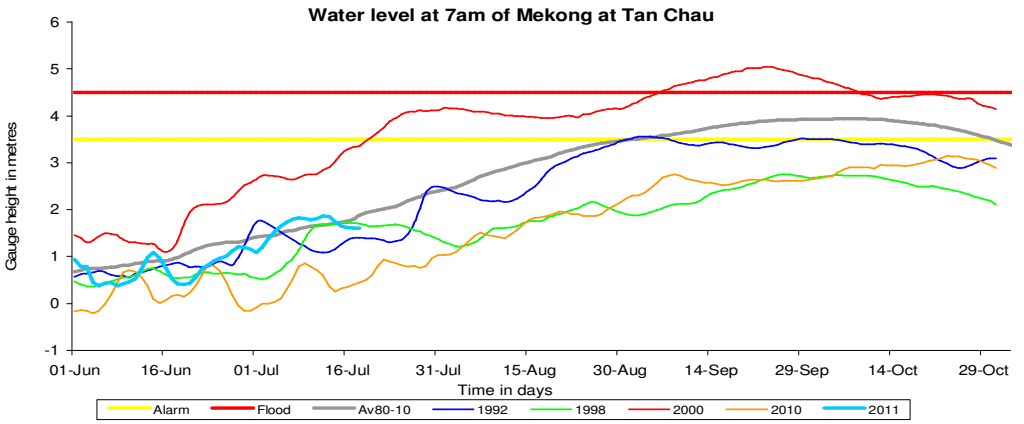

Water level at 7am at Phnom Penh Chaktomuk
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011

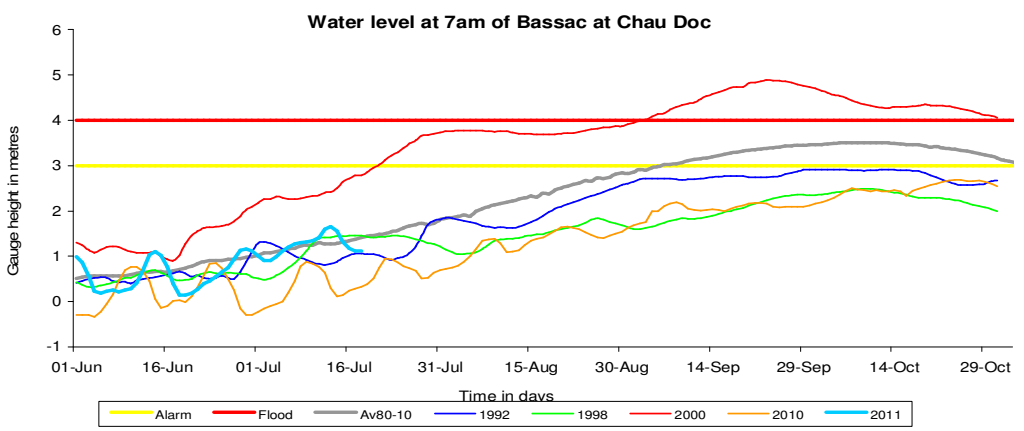

Water level at 7am of Tonle Sap at Phnom Penh Port
Gauge height in metres
0
2
4
6
8
10
12
14
16
01-Jun
16-Jun
01-Jul
16-Jul
31-Jul
15-Aug
30-Aug
14-Sep
29-Sep
14-Oct
29-Oct
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011


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
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011


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
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011


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
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011


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
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011


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
Time in days
Alarm
Flood
Av80-10
1992
1998
2000
2010
2011