

### Weekly Flood Situation Report for the Mekong River Basin

Prepared at: 16/06/2014, covering the week from the 09<sup>th</sup> June to the 16<sup>th</sup> June 2014

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

#### General weather patterns

During the week of 09<sup>th</sup> June to 16<sup>th</sup> June 2014 four weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather maps of the 10<sup>th</sup> June and 14<sup>th</sup> June 2014 are presented in the figures below:

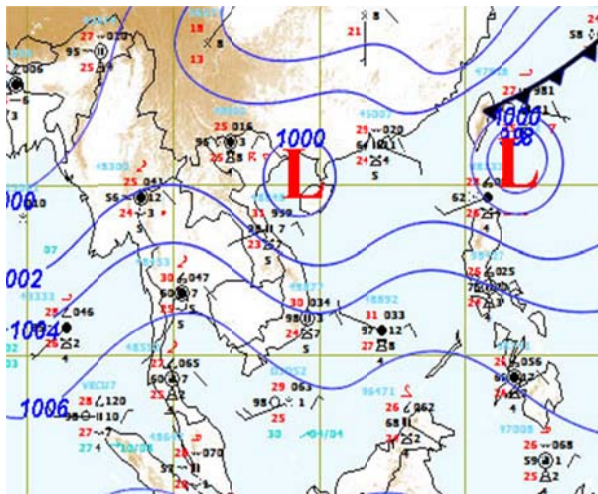


Figure 1: Weather map for 10<sup>th</sup> June 2014

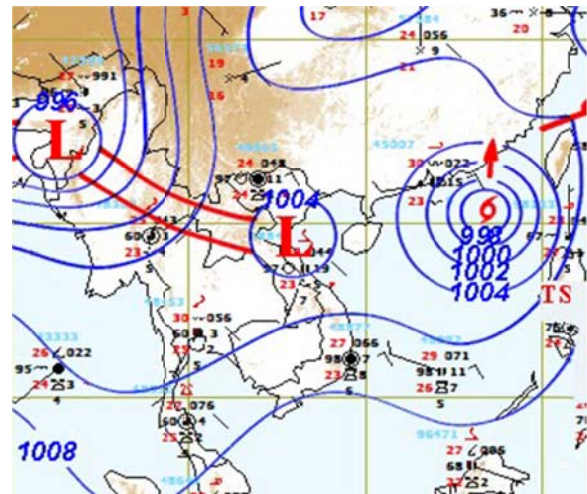


Figure 2: Weather map for 14<sup>th</sup> June 2014

#### Moderate South-West (SW) Monsoon

The moderate Southwest monsoon prevails over Myanmar, the Andaman Sea and the Gulf of Thailand at the surface. The westerly and Southwesterly winds prevail over Myanmar, Thailand and Indochina Peninsular (Figure 1).

#### Inter Tropical Convergence Zone (ITCZ)

ITCZ had been reported since middle of last week and laid across the upper South of Myanmar, the lower North and the Northeast of Thailand, the middle of Lao PDR and Viet Nam.

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

No TD, TS or TY have significant influenced the LMB during the last week.

#### Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge was observed.

#### Over weather situation

The weather of the last week was influenced by Southwest and ITCZ that laid across the upper South of Myanmar, the lower North and the Northeast of Thailand, the middle of Lao PDR and Viet Nam. Therefore, scatter heavy rainfalls had happened in many areas in middle reach of LMB. The accumulative weekly rainfall greater than 100 mm. are at Vientiane (100.6 mm.), Paksane (202.3 mm.), Nakhon Phanom (159.5 mm.), Thakhek (310.2 mm.), Khong Chiam (190.4 mm.), Pakse (113.4 mm.), Stung Treng (105 mm.). See Table A2 and Figure 3.

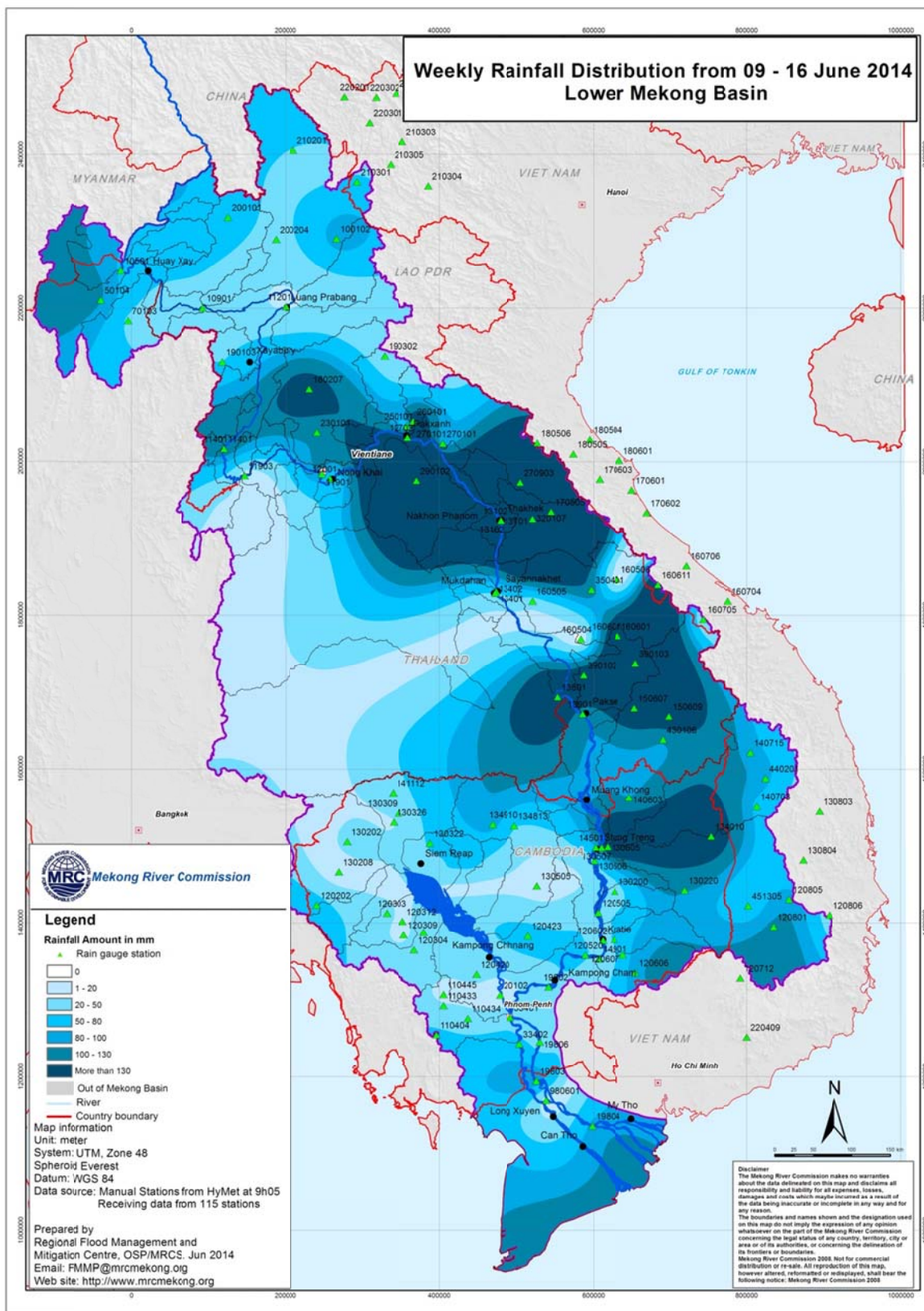


Figure 3: Weekly Rainfall Distribution from 09<sup>th</sup> – 16<sup>th</sup> June 2014 over the LMB

### **General behaviour of the Mekong River**

During the last week, the water levels at most stations in LMB were rising below the Long Time Average (LTA), except Chiang Saen that was about the LTA, Stung Treng and Kratie were above the LTA; and Chau Doc fluctuated around the LTA.

#### ***For stations from Chiang Saen and Luang Prabang***

Compared to the long term average (LTA), during the last week the rising water levels at Chiang Saen was about the LTA while at Luang Prabang was below the LTA.

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

Compared to the long term average (LTA), the water levels at these stations were rising below the LTA during the last week.

#### ***For stations from Thakhet/Nakon Phanom to Pakse***

Compared to the long term average (LTA), the water levels at these stations were rising below the LTA during the last week.

#### ***For stations from Stung Treng to Kompong Cham***

Compared to the long term average (LTA), the water levels at these stations except Kompong Cham were rising above the LTA at the end of last week.

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

Compared to the long term average (LTA), the water levels at these stations were rising below the LTA during the last week.

#### ***Tan Chau and Chau Doc***

Compared to the long term average (LTA), the water levels at both stations fluctuated below the LTA, except at Chau Doc was just around 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 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.

- Damage or victims:

No damage or loss of life due to river flooding was recorded anywhere along the Mekong River during the last 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

	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	
<b>2014</b>																								
09/06	536.61	3.02	5.33	5.53	2.30	2.99	4.51	2.62	3.90	2.92	1.95	3.17	2.15	3.22	8.60	3.92	2.12	1.13	2.08	1.50	1.21	0.49	0.54	
10/06	536.65	2.92	5.30	5.52	2.18	2.87	4.40	2.62	3.92	2.82	1.97	3.18	2.19	3.25	8.57	3.91	2.13	1.15	2.10	1.40	1.23	0.74	0.82	
11/06	536.52	3.13	5.26	5.56	2.15	2.81	4.35	2.60	3.93	2.89	1.95	3.29	2.28	3.32	8.62	3.91	2.15	1.19	2.12	1.26	1.25	0.78	0.88	
12/06	536.26	3.20	5.24	5.58	2.15	2.82	4.35	2.63	3.95	3.00	1.94	3.30	2.68	3.65	8.74	3.96	2.18	1.20	2.18	1.24	1.27	0.73	0.86	
13/06	536.51	3.23	5.44	5.54	2.20	2.84	4.61	2.76	4.11	3.11	1.95	3.50	3.02	3.79	9.29	4.20	2.25	1.26	2.23	1.68	1.38	0.62	0.72	
14/06	536.83	3.25	5.64	5.63	2.20	2.86	4.80	3.10	4.49	3.60	1.95	3.95	3.14	4.11	9.66	4.60	2.45	1.46	2.43	1.28	1.58	0.53	0.64	
15/06	536.83	3.31	5.75	5.85	2.26	2.92	4.88	3.35	4.70	3.97	2.40	4.49	3.28	4.25	10.21	4.98	2.70	1.71	2.48	1.78	1.84	0.31	0.22	
16/06	536.72	3.47	5.85	6.14	2.40	3.02	5.00	3.48	4.83	4.14	2.72	4.75	3.59	4.28	10.55	5.42	2.97	2.03	2.88	2.04	2.08	0.29	0.17	

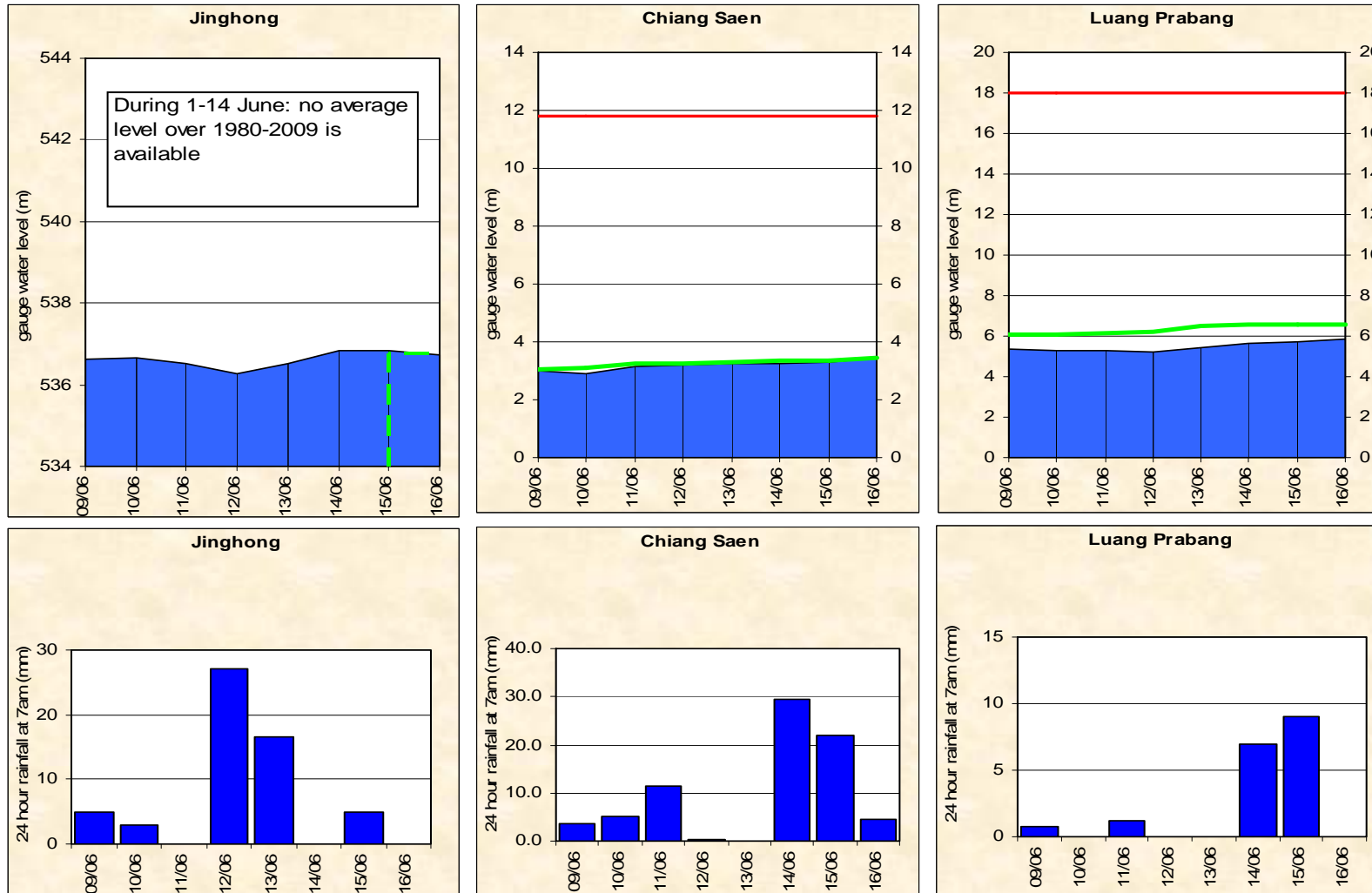
Unit in m

Table A2: observed rainfall

	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	
<b>2014</b>																								
09/06	5.00	3.50	0.80	7.10	17.80	0.00	28.00	0.90	0.20	19.60	17.70	0.00	nr	nr	nr	nr	nr	-	nr	4.60	nr	17.90	-	
10/06	3.00	5.10	nr	0.00	4.50	14.30	18.20	46.00	55.00	1.40	3.80	57.50	42.20	32.00	nr	nr	22.10	-	4.20	0.00	nr	0.00	-	
11/06	0.00	11.50	1.20	0.00	nr	0.00	5.00	0.00	11.70	6.90	2.40	81.30	47.60	35.00	4.50	17.10	nr	-	5.50	nr	nr	0.00	-	
12/06	27.00	0.40	nr	0.00	nr	0.00	35.80	41.40	34.20	13.80	23.40	5.10	5.20	24.50	7.40	0.50	1.80	-	6.60	3.40	nr	12.30	-	
13/06	16.50	0.00	nr	1.80	0.00	2.80	10.40	41.10	39.70	4.00	3.00	17.30	13.50	4.50	nr	nr	0.30	-	0.20	4.30	nr	3.00	-	
14/06	0.00	29.50	7.00	36.40	47.20	13.40	24.80	nr	85.00	0.80	2.70	3.20	0.70	8.00	nr	2.20	8.80	-	35.50	22.40	nr	35.50	-	
15/06	5.00	22.00	9.00	12.70	26.50	23.00	51.70	nr	7.40	5.00	3.20	10.00	4.20	nr	nr	nr	nr	-	nr	0.00	nr	9.20	-	
16/06	0.00	4.50	nr	nr	4.60	1.30	28.40	30.10	77.00	nr	nr	16.00	nr	1.00	13.80	12.80	4.10	-	5.30	0.60	7.30	14.30	-	

Unit in mm

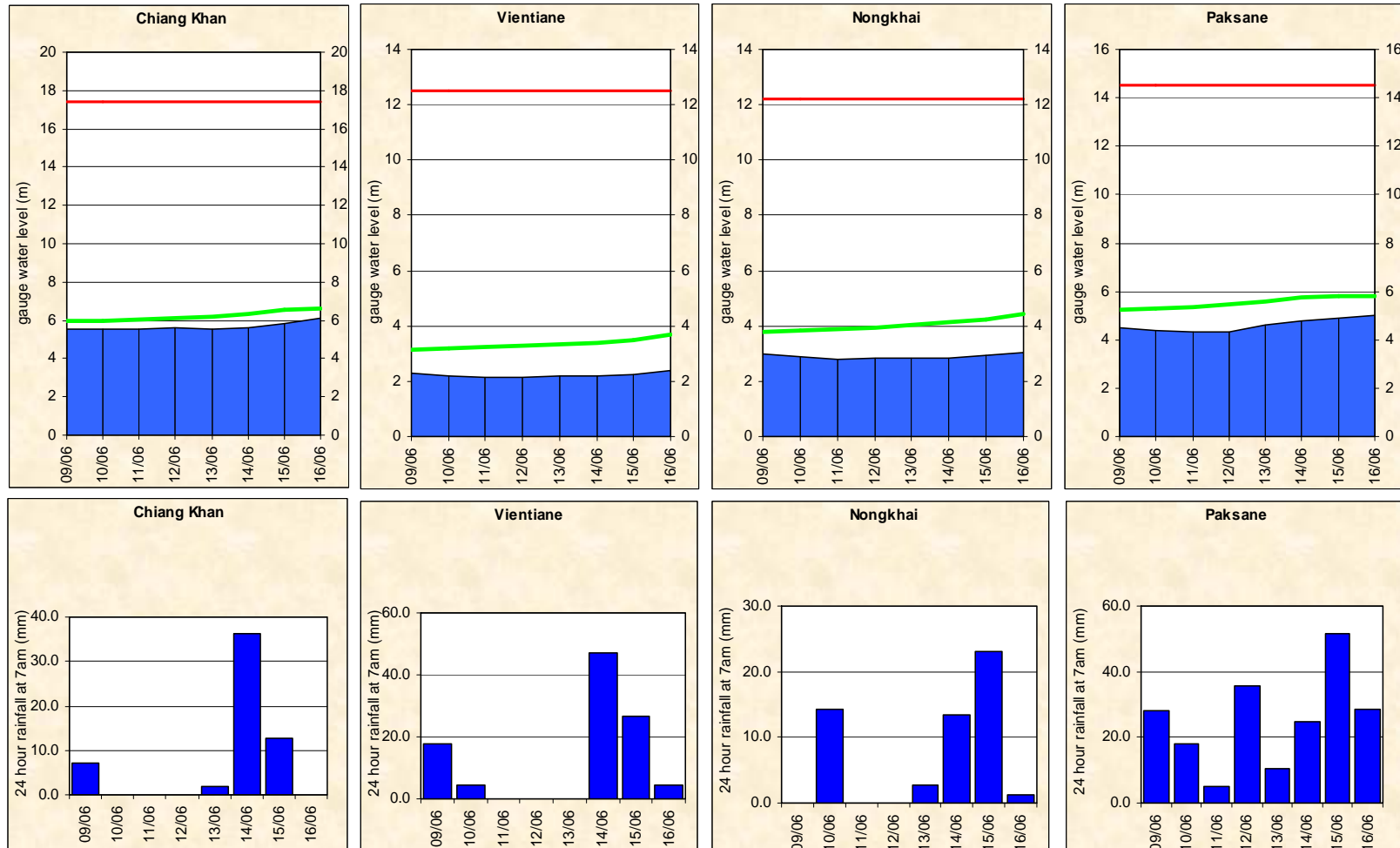
Figure A1: Water level and rainfall for Jinghong, Chiang Saen, and Luang Prabang





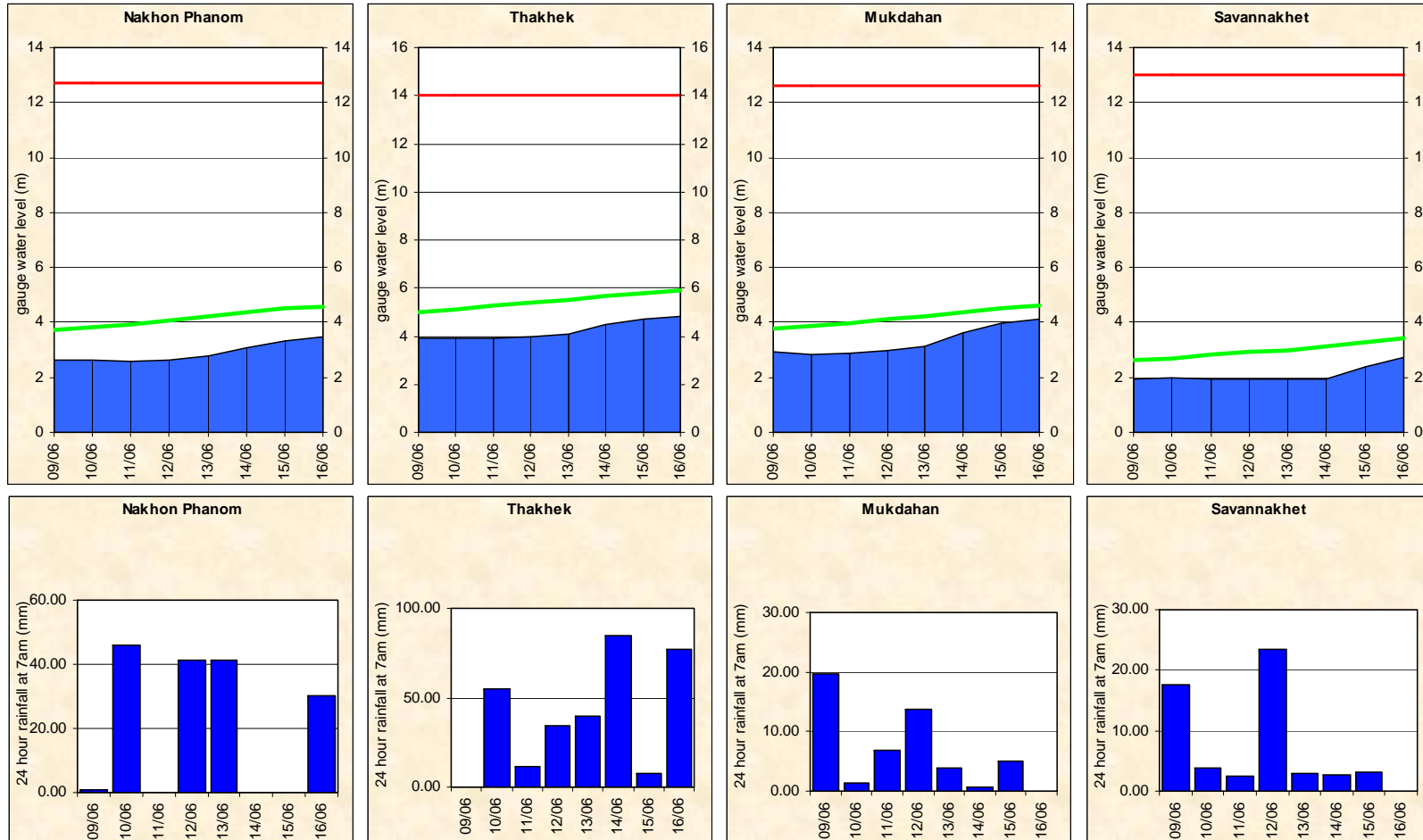
Monday, 16<sup>th</sup> June 2014

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



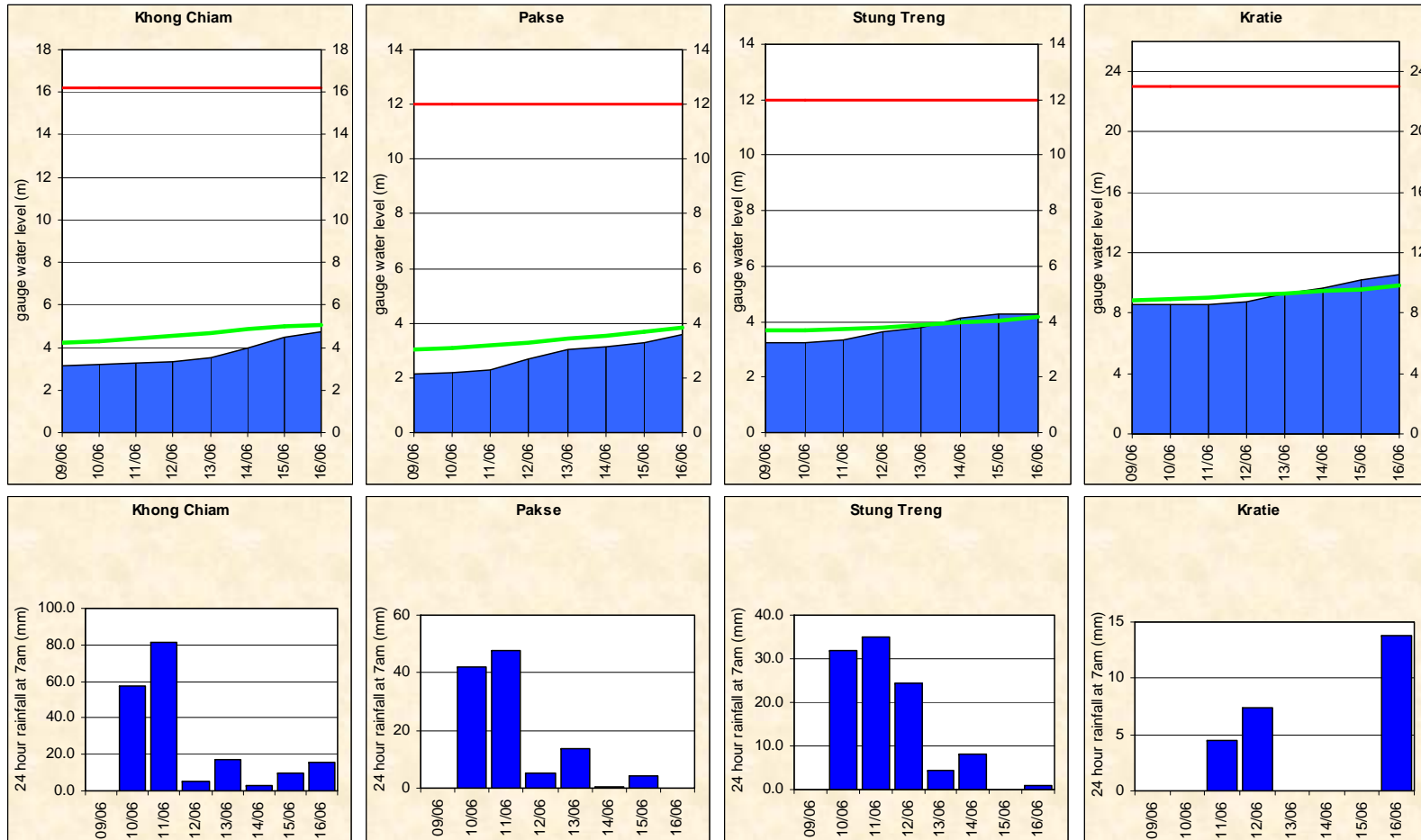
Monday, 16<sup>th</sup> June 2014

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



Monday, 16<sup>th</sup> June 2014

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





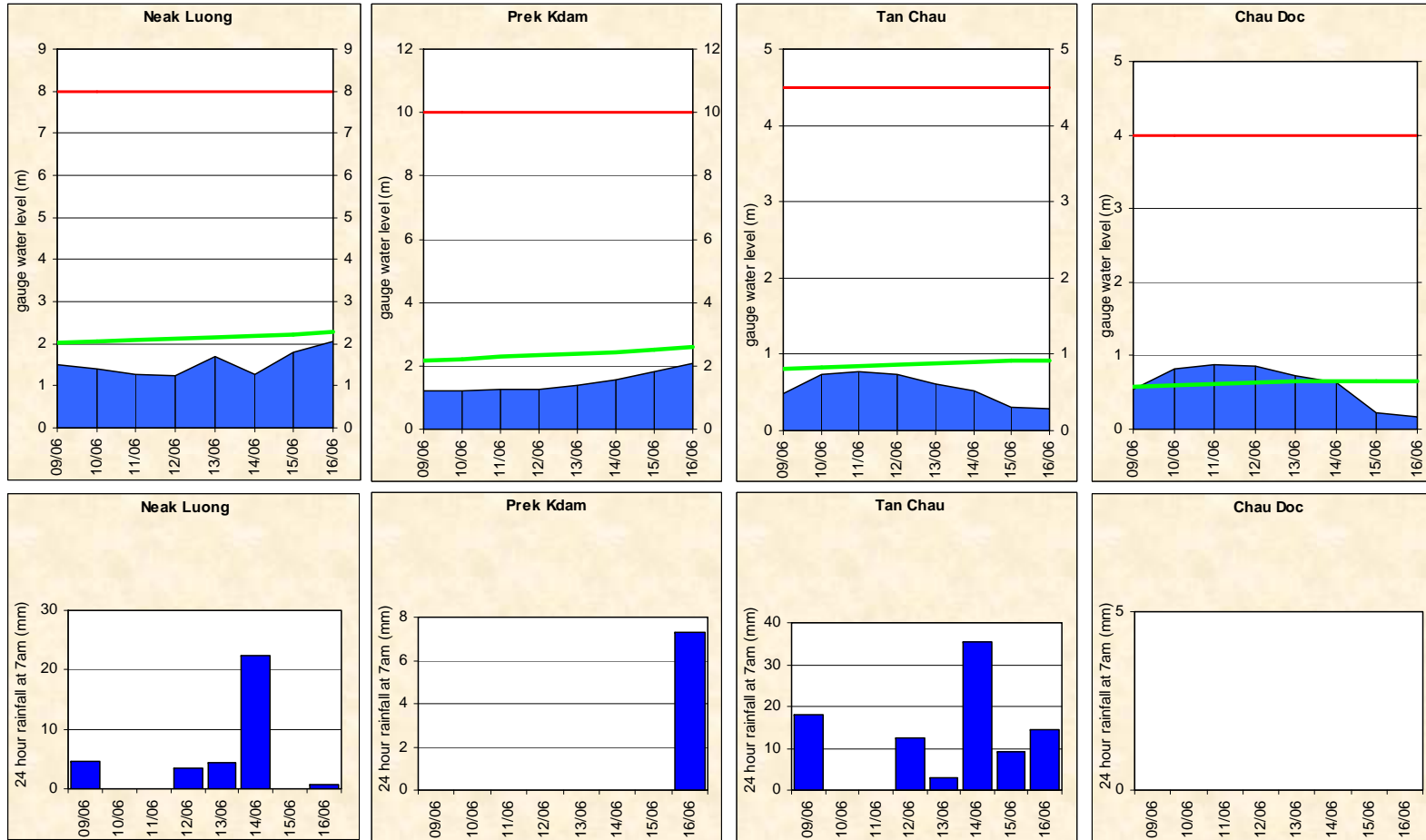
Monday, 16<sup>th</sup> June 2014

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



Monday, 16<sup>th</sup> June 2014

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 fairly good for 1-day to 5-day forecast lead time at stations

in the upper parts of the LMB and Tan Chau, Chau Doc. However, the accuracies at middle part stations as Nakhon Phanom to Mukdahan and Khong Chiam to Prek Kdam 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.

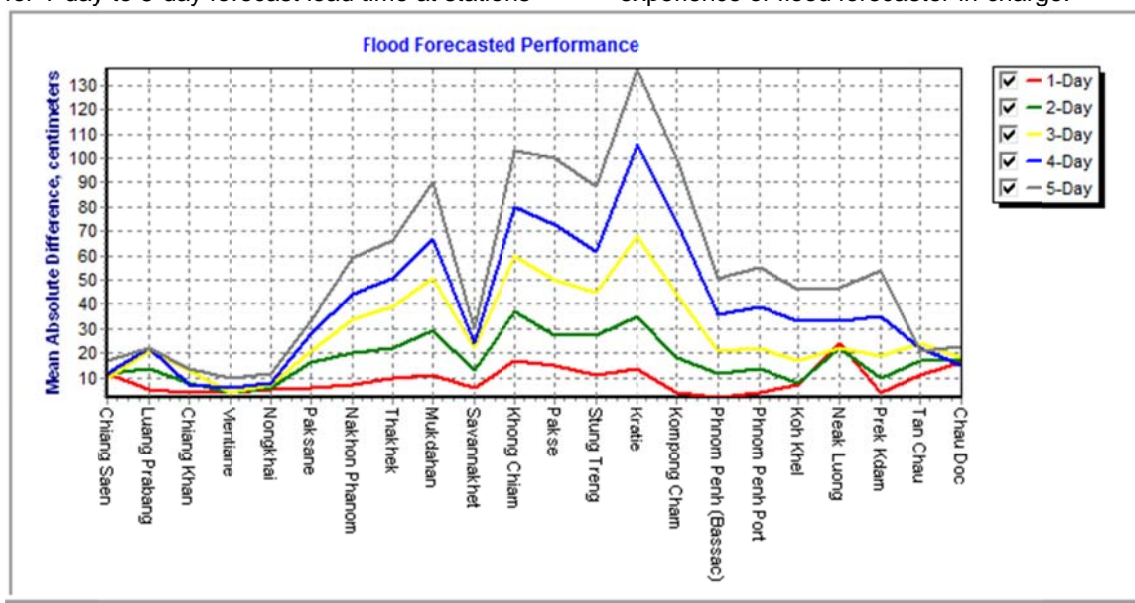


Figure B1: Average flood forecast accuracy along the Mekong mainstream

### 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

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	100.0	100.0	100.0	100.0	100.0	71.4	85.7	71.4	85.7	85.7	42.9	42.9	57.1	57.1	85.7	100.0	85.7	71.4	28.6	100.0	57.1	57.1	<b>76.6</b>
2-day	100.0	100.0	100.0	100.0	100.0	83.3	66.7	66.7	66.7	83.3	50.0	50.0	50.0	33.3	66.7	50.0	50.0	83.3	33.3	33.3	16.7	50.0	<b>65.2</b>
3-day	100.0	100.0	100.0	100.0	100.0	60.0	40.0	20.0	20.0	60.0	40.0	20.0	0.0	20.0	40.0	40.0	40.0	20.0	20.0	20.0	0.0	40.0	<b>45.5</b>
4-day	100.0	100.0	100.0	100.0	100.0	100.0	25.0	25.0	25.0	75.0	25.0	25.0	25.0	0.0	25.0	0.0	25.0	0.0	50.0	25.0	0.0	25.0	<b>44.3</b>
5-day	100.0	100.0	100.0	100.0	100.0	100.0	33.3	33.3	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	66.7	66.7	<b>42.4</b>

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	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	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	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	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	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			Weather information available (number)	Arrival time of input data (average)							Missing data (number)						
	FF completed and sent (time)	stations without forecast	FF2 completed and sent (time)		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
<b>2014</b>																		
<i>week</i>	10:25	0	-	4	08:05	07:39	07:04	07:10	08:13	07:27	07:02	0	4	16	10	181	0	80
<i>month</i>	10:23	0	-	11	08:07	07:51	07:06	07:15	08:17	07:21	07:06	0	8	39	20	513	0	160
<i>season</i>	10:23	0	-	7	08:08	07:56	07:08	07:17	08:20	07:18	07:07	0	4	23	10	332	0	80

*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.

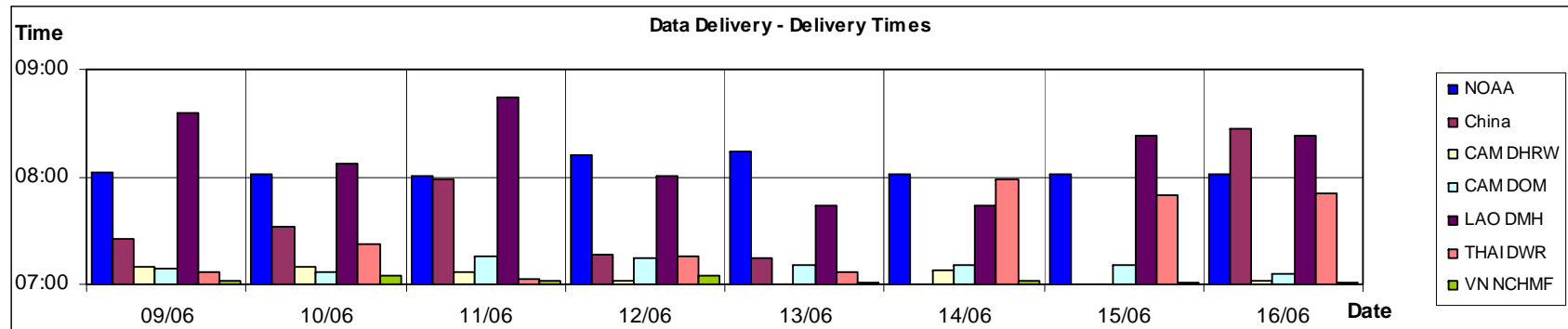


Figure B2: Data delivery times for the past 8 days including the current report date



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

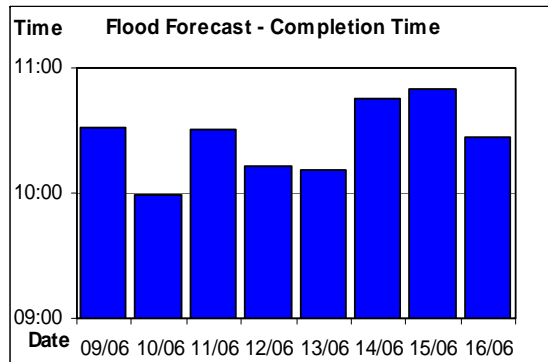


Figure B4: Flood forecast completion time

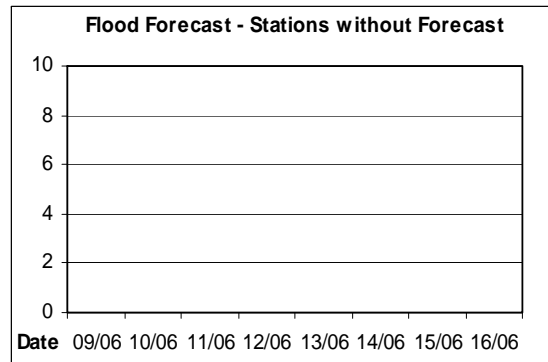


Figure B5: Flood forecast stations without forecast

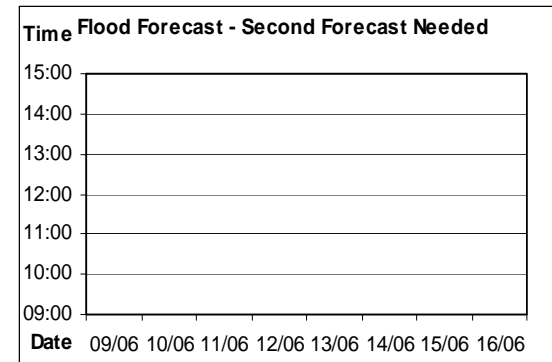


Figure B6: Second forecast needed



## 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

