Mekong River Commission

Regional Flood Management and Mitigation Centre

Weekly Dry Season Situation Report for the Mekong River Basin, covering the week from 19th to 25th March 2019

Prepared on: 26/03/2019 by Flood Team

Weather Patterns, General Behaviors of the Mekong River and Dry Season Situation

General weather patterns:

No critical weather situation over the Lower Mekong Basin, during this week from 19th to 25th March 2019. However, water levels at key stations from Chiang Saen to Kompong Cham have been continued to rise above their long-term averages (LTAs) condition due to inflows from upstream parts. This week rainfall in the floodplain area in the Mekong Delta caused water level slightly increased above their LTAs from Chaktomuk to Neal Luong. However, the tidal stations at Tan Chau and Chau Doc, water levels are fluctuated over their LTAs.

General behavior of the Mekong River:

From 19th to 25th March 2019, water levels along the lower Mekong River from Thailand's Chiang Saen to Lao PDR's Luang Prabang and Thailand's Chiang Khan were still continuing rising above their long-term averages (LTAs), although no rainfall in these areas. As observed, water level at Luang Prabang were higher than previously recorded after the wet season ended in November 2018. The rising water level is still rising up in this month (March 2019). Because there was no heavy rainfall effected and inflow from Chiang Saen is experiencing the same trend, this rising water level at Luang Prabang could be suggested the backwater of Xayaburi's reservoir impoundment.
The forecasted trend from 26th March to 01 st April 2019 at Chiang Saen to Luang Prabang will be slightly decreasing but still stays above their LTAs at these stations. The trends were the same for the stations from Lao PDR's Vientiane to Cambodia's Kompong Cham at the same time as updstream. Water level at the lower stations from Cambodia's Phnom Penh at Chaktomuk to Neak Luong were slightly increased over their LTAs. However, the tidal stations at Viet Nam's Tan Chau on the Mekong River and Chau Doc on the Bassac River were fluctuating over their LTAs. As observed, there were different tidal trend of these 02 stations. It is needed to discuss and find out for justification of this changing.

For stations from Chiang Saen and Luang Prabang

Water levels from 19th to 25th March 2019 at Chiang Sean and Luang Prabang stations were stayed above their long-term averages (LTAs). From 26th March to 1st April 2019 will be slightly decreased but staying above their LTAs still.

Since last year 2018, the water level at Lao PDR's Luang Prabang rise over their historical long-term averages, based on the observed water level monitoring provided by Department of Hydrology and Meteorology (DMH). It showed the higher levels than previously historical maximum water level recorded from 2010 to 2018. The cause of abnormal rise of water level at Chiang Saen are likely caused by experience of hydropower operation upstream in the Southern Yunnan province of China during the Dry Season period. This inflow from Chiang Saen could be affected to the raised water levels at Luang Prabang and Chiang Khan stations (approximal 2 days travelling time of flows from Chiang Saen). However, the continuing rise water level on the Mekong mainstream to date at Luang Prabang is not likely effected by inflows from upstream or rainfall in the catchment. This raising up water level not due to high rainfall in the Upper Mekong Basin but rather a consequence of an increase of water impounding of hydropower downstream and other inflows from tributaries upstream of Luang Prabang. It is needed to deeper investigate for further detail information to find out what are the most influent inflows for this station.

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

Water levels from 19th to 25th March 2019 at Chiang Khan, Vientiane, Nong Khai and Paksane were increased the same trend as upstream and stayed above their LTAs. The water levels will be increasing the same trends as upstream inflows. It has been observed that since December 2018, the water level at Lao PDR's Paksane dropped drastically and raised constantly over their historical long-term averages, based on the observed water level data provided by Department of Hydrology and Meteorology (DMH). It showed the higher levels than previously historical water level recorded from 2010 to 2018. The raising water levels are not likely caused by rainfall in the upper Mekong Basin, but effected by a consequence of inflows from upstream and tributaries in the catchment. Based on the information provided by DMH, the rising trend of water level at Pakane may causes by the Nam Ngum hydropower dam operation during the dry season. It is needed to deeper investigate for further detail information to find out what are the most influent inflows for this station.

For stations from Nakhon Phanom to Pakse

Water levels from 19th to 25th March 2019 at Nakhon Phanom to Pakse were still increasing above their LTAs. Water levels at these stations will be increasing the same trends as upstream part.

For stations from Stung Treng to Kratie

Water levels from 19th to 25th March 2019 at Stung Treng to Kratie were also increased slightly above their LTAs. Water levels at these stations will be increasing the same trends as upstream part.

For stations from Kompong Cham, Phnom Penh to Prek Kdam

Water levels from 19th to 25th March 2019 at Kompong Cham down to Chaktomuk on the Bassace and Prekdam on the Tonle Sap were slightly increased and raised above their long-term averages (LTAs) due to the rainfall in the rainfall this week in the Mekong floodplain area.

Tan Chau and Chau Doc

Water levels from 19th to 25th March 2019 at Tan Chau on the Mekong and at Chau Doc on the Bassac were fluctuated over their long-term averages (LTAs). As observed, there were different tidal trend of these 02 stations. It is needed to discuss and find out for justification of this changing.

Conclusion

From 19th to 25th March 2019, water levels from Chiang Sean to Phnom Penh's Chaktomuk, Neak Luong on the Mekong River were increased above their LTAs due to the impact of inflows from upstream and rainfall in downstream of the Mekong floodplain areas. The abnormal raised water levels at Luang Prabang and Paksane were impacted by the impounding hydro-power at Xaiyaburi and the Dam operation at Nam Ngum. It is needed to further investigate and find out what the reasons cause of these rising water levels.
In general, water levels in the Mekong mainstream are staying above their LTAs, although there are reported of water shortage in the nearby area of the Mekong.

On the other hand, the hydrological conditions (rainfall and flows) of the Mekong River during early dry season 2019 (Jan to Mar) is characterized as high flow, compared to the long-term average. This caused a high-water level in the mainstream and many tributaries in rainfed watershed areas of the Lower Mekong Basin are likely caused by experience of hydropower operation upstream in the Southern Yunnan province of China during the Dry Season period and the abnormal rainfall in March in the floodplain area.

Dry season situation

On the other hand, drought risk cause of water shortage depends upon with the severity or 'intensity' of a drought (as measured by its likelihood of occurrence of rainfall, stream flow and soil moisture deficits) and the effecting of El Niño conditions in the focused area. Water shortage is likely dependent on water resources management strategy, including infrastructures of reservoir and cannel system and water supply facilities of each country.

Based on the information from the International Research Institute for Climate and Society (IRICS) and the Japan Meteorological Agency (JMA), the consensus of ENSO prediction models indicated that strong El Niño conditions is continuing during the Dry season from Jan-May 2019 in the Mekong Region.

For details information on water levels and rainfall at each key station are described as follows:

- Tables for observed water levels and rainfall for the last week in Annex A
- The water levels graphs showing the observed water levels for the season in Annex B

Annex A: Graphs and Tables

Table A1: Observed water levels

Unit: m

2019	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
19/03/2019	-	3.77	9.24	6.42	2.70	3.34	5.11	2.87	2.98	1.89	3.06	8.09	3.57	2.33	2.20	2.08	1.32	1.16	1.31
20/03/2019	-	3.78	9.13	6.40	2.70	3.34	5.09	2.92	3.02	2.04	3.06	8.17	3.57	2.30	2.12	2.10	1.29	1.37	1.53
21/03/2019	-	3.75	9.02	6.38	2.68	3.32	5.08	2.93	3.06	2.08	3.08	8.16	3.60	2.19	2.13	1.96	1.29	1.32	1.48
22/03/2019	-	3.73	9.06	6.40	2.62	3.29	5.03	2.91	3.06	2.07	3.11	8.19	3.65	2.31	2.16	1.58	1.29	1.17	1.31
23/03/2019	-	3.72	9.05	6.37	2.66	3.29	4.90	2.88	3.06	2.08	3.14	8.22	3.66	2.36		1.50	1.31	0.86	0.90
24/03/2019	-	3.73	8.90	6.32	2.65	3.28	4.93	2.84	3.03	2.01	3.14	8.30	3.71	2.33		1.52	1.41	0.41	0.24
25/03/2019	-	3.74	8.75	6.26	2.63	3.24	4.91	2.78	3.00	2.00	3.11	8.36	3.80	2.45		1.64	1.42	0.13	0.17

Table A2: Observed rainfall

Unit: mm

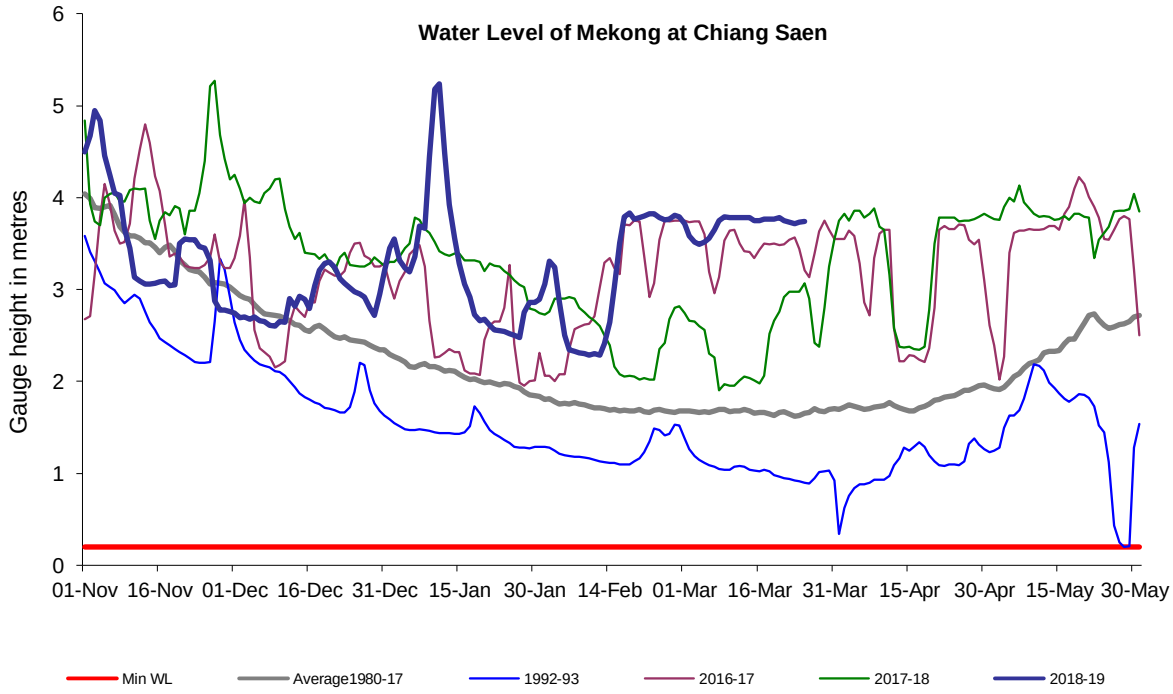
2019	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
19/03/2019	-	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20/03/2019	-	0.0	0.0	2.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21/03/2019	-	0.0	0.0	0.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22/03/2019	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23/03/2019	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	34.2	0.0	0.0		0.0	0.0	0.0	0.0
24/03/2019	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	28.9	2.2		1.2	0.0	0.0	0.0
25/03/2019	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	7.3	0.0	0.0

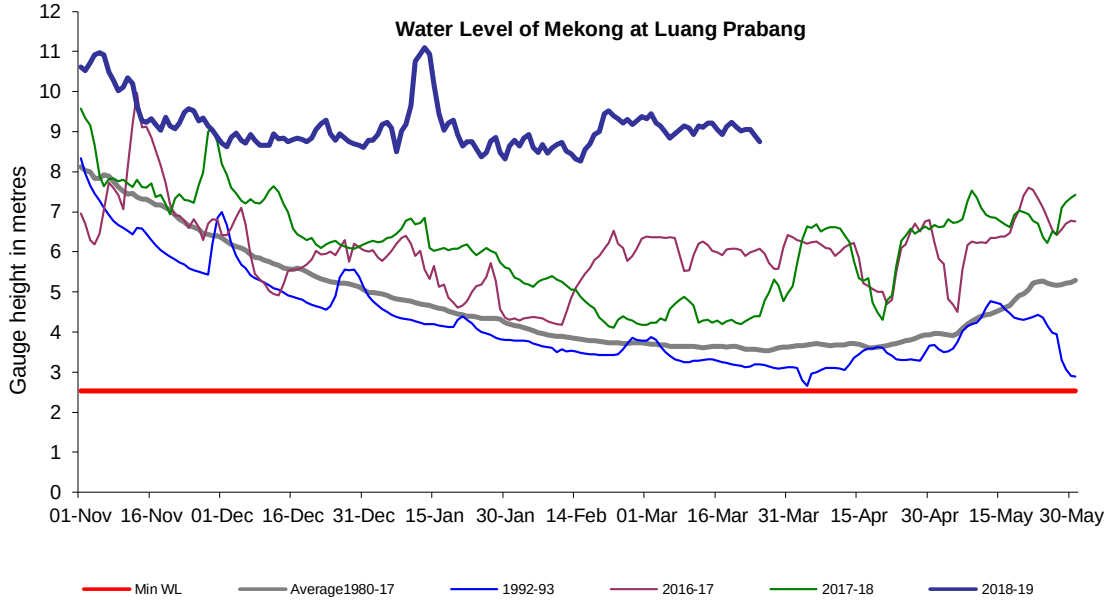
Note: No data available from China during the Dry Season

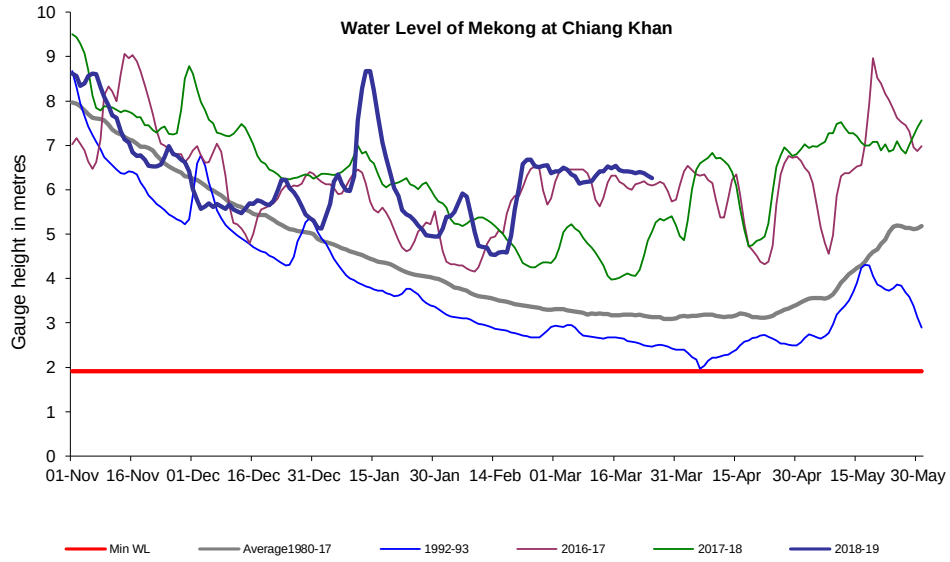
Annex B: Season Water Level Graphs

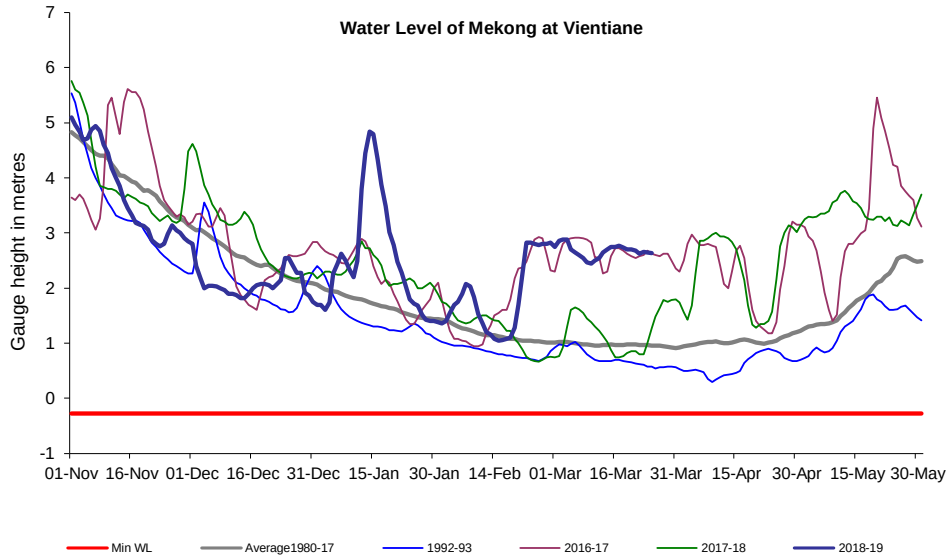
This Annex has the water level graphs of the report date. These graphs are distributed weekly by email together with the River Monitoring Bulletin.

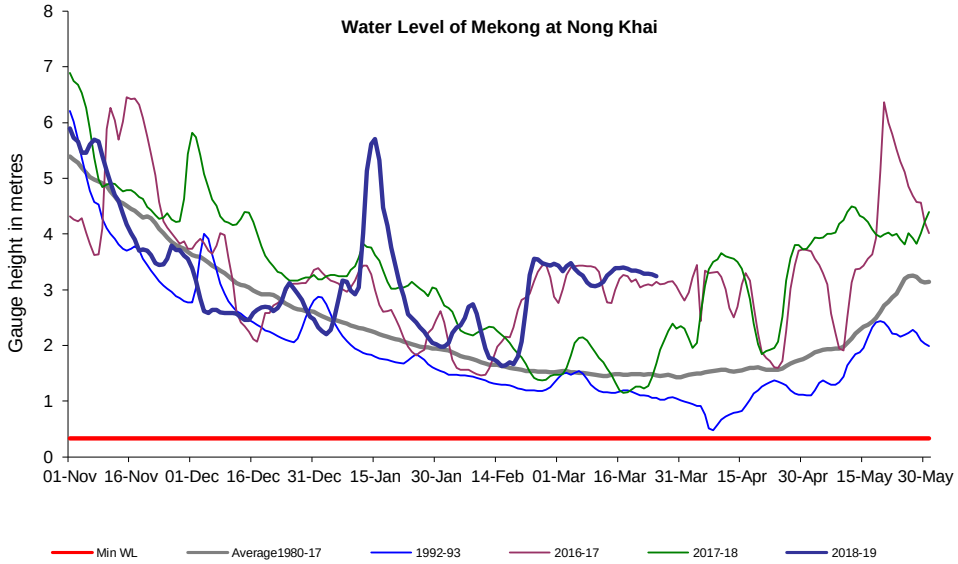
HYDROGRAPH AT 7 AM OF MEKONG TONLE SAP AND BASSAC AT MAINSTREAM STATIONS IN DRY SEASON FROM 19 TO 25 MARCH 2019

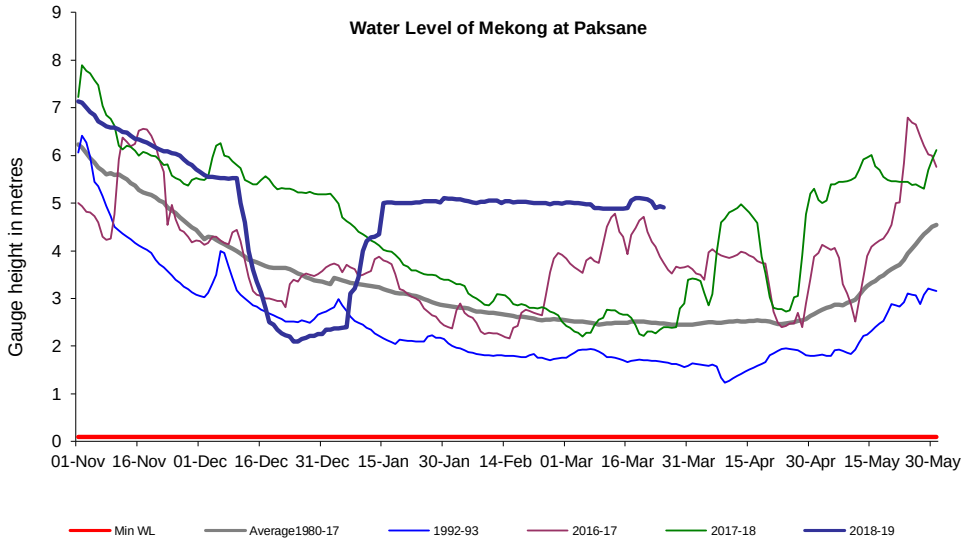


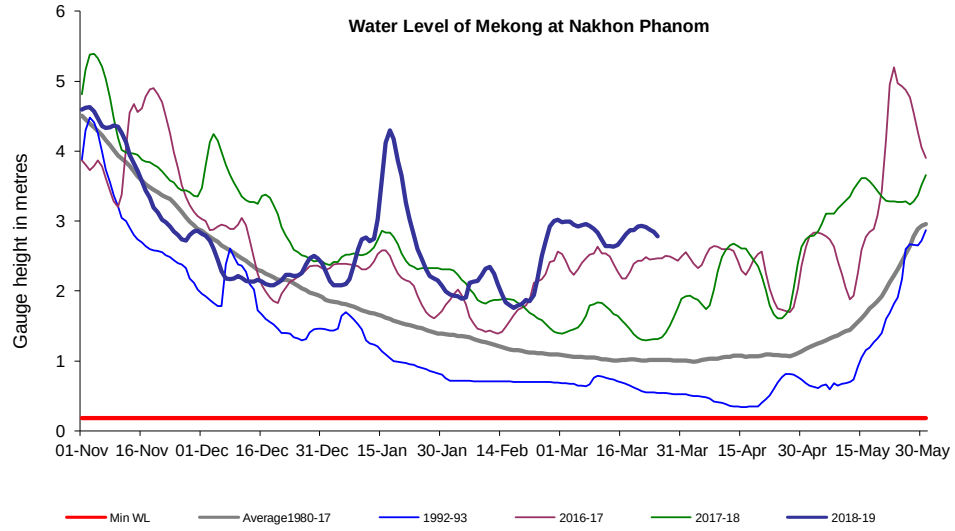


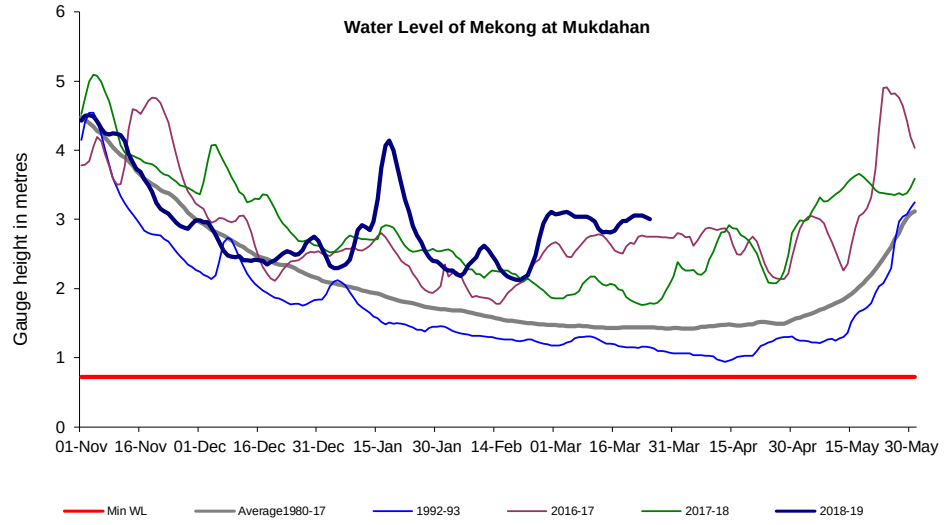

Water Level of Mekong at Chiang Khan
Gauge height in metres
10
9
8
7
6
5
4
3
2
1
0
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19

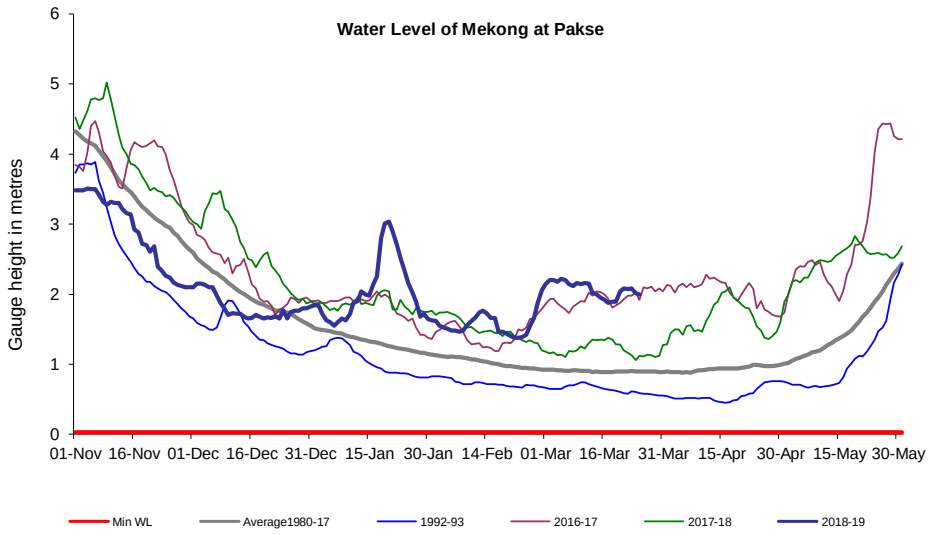

Water Level of Mekong at Vientiane
Gauge height in metres
7
6
5
4
3
2
1
0
-1
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19

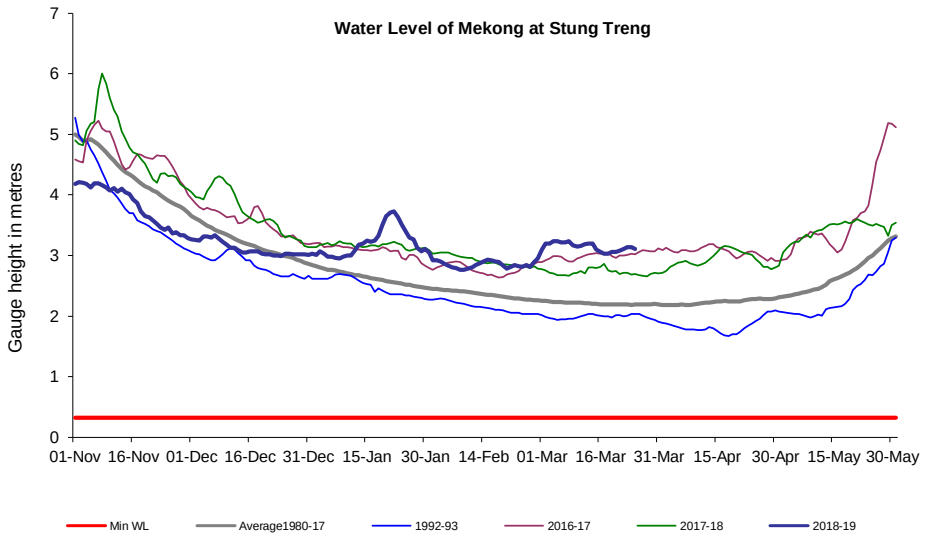

Water Level of Mekong at Nong Khai
Gauge height in metres
8
7
6
5
4
3
2
1
0
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19

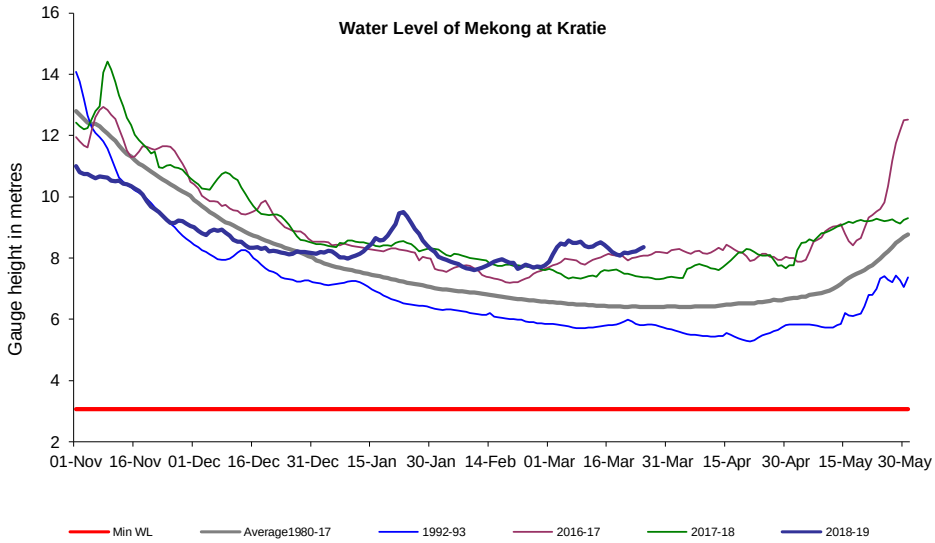

Water Level of Mekong at Paksane
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19

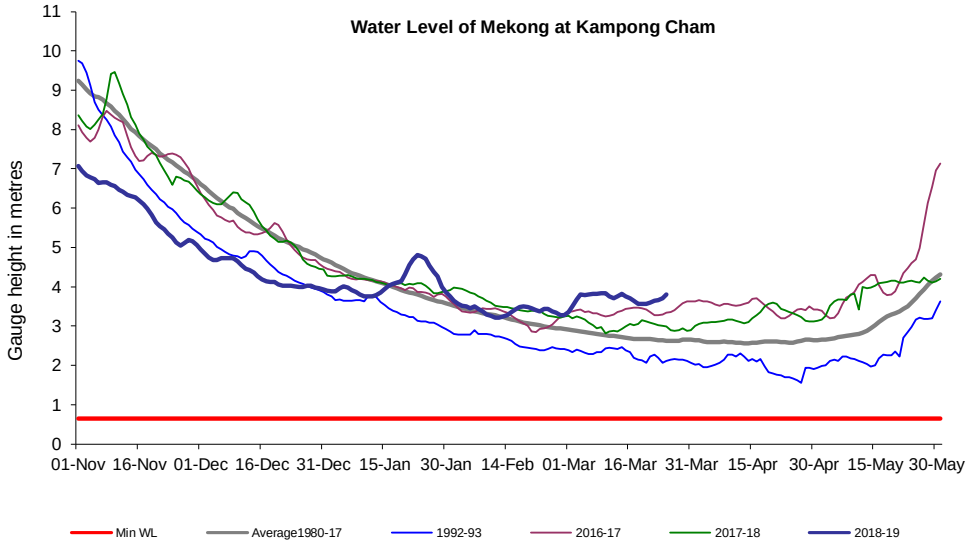

Water Level of Mekong at Nakhon Phanom
Gauge height in metres
0
1
2
3
4
5
6
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19

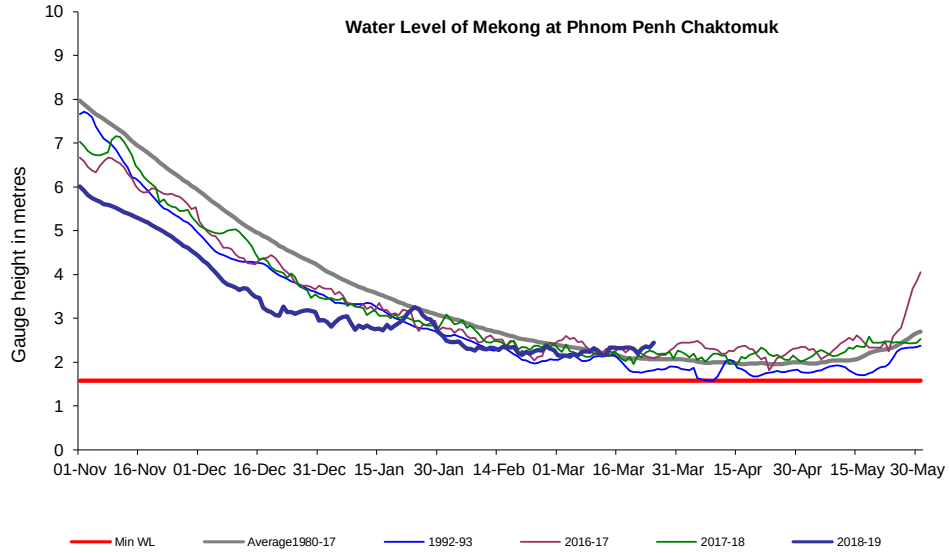

Water Level of Mekong at Mukdahan
Gauge height in metres
0
1
2
3
4
5
6
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Mekong at Pakse
Gauge height in metres
0
1
2
3
4
5
6
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Mekong at Stung Treng
Gauge height in metres
0
1
2
3
4
5
6
7
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Mekong at Kratie
Gauge height in metres
2
4
6
8
10
12
14
16
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Mekong at Kampong Cham
Gauge height in metres
11
10
9
8
7
6
5
4
3
2
1
0
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Mekong at Phnom Penh Chaktomuk
Gauge height in metres
10
9
8
7
6
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4
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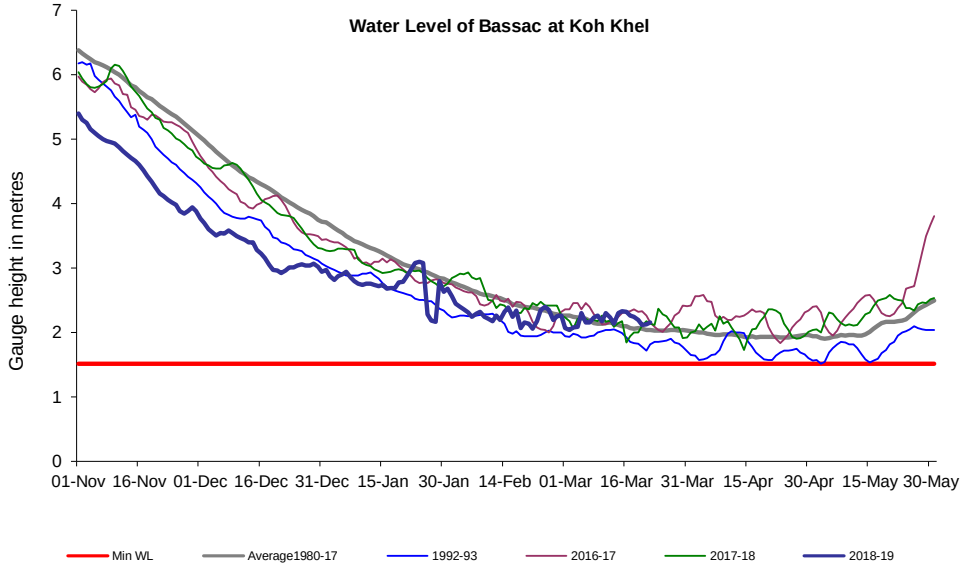
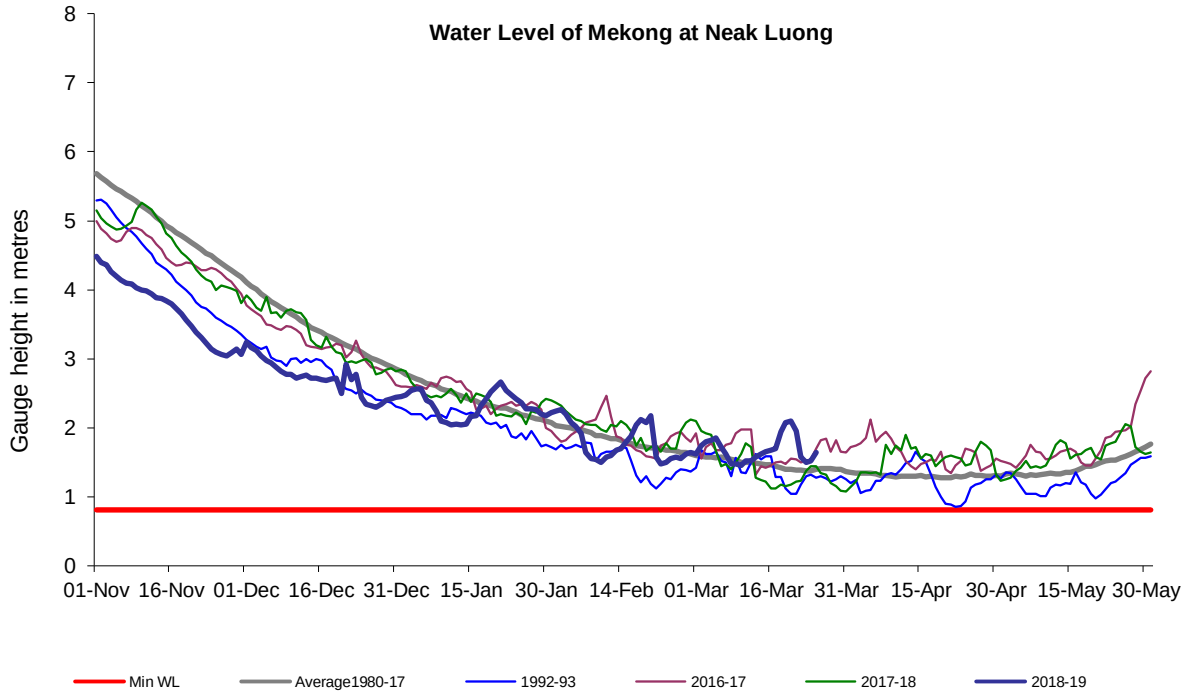
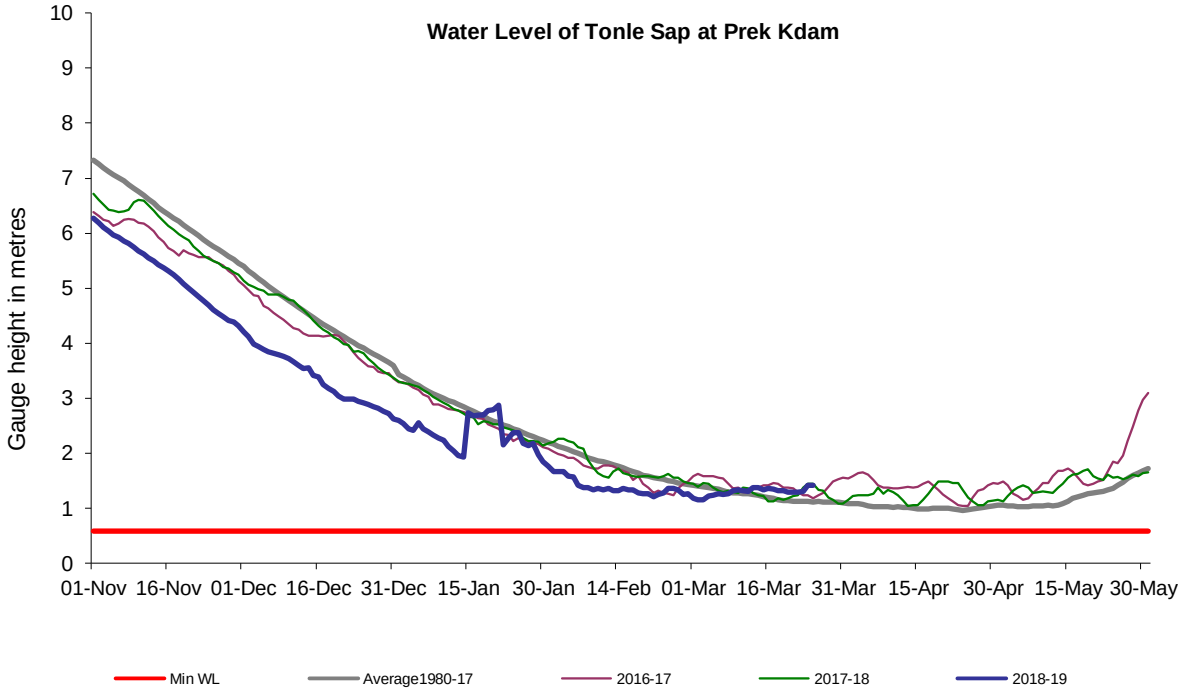
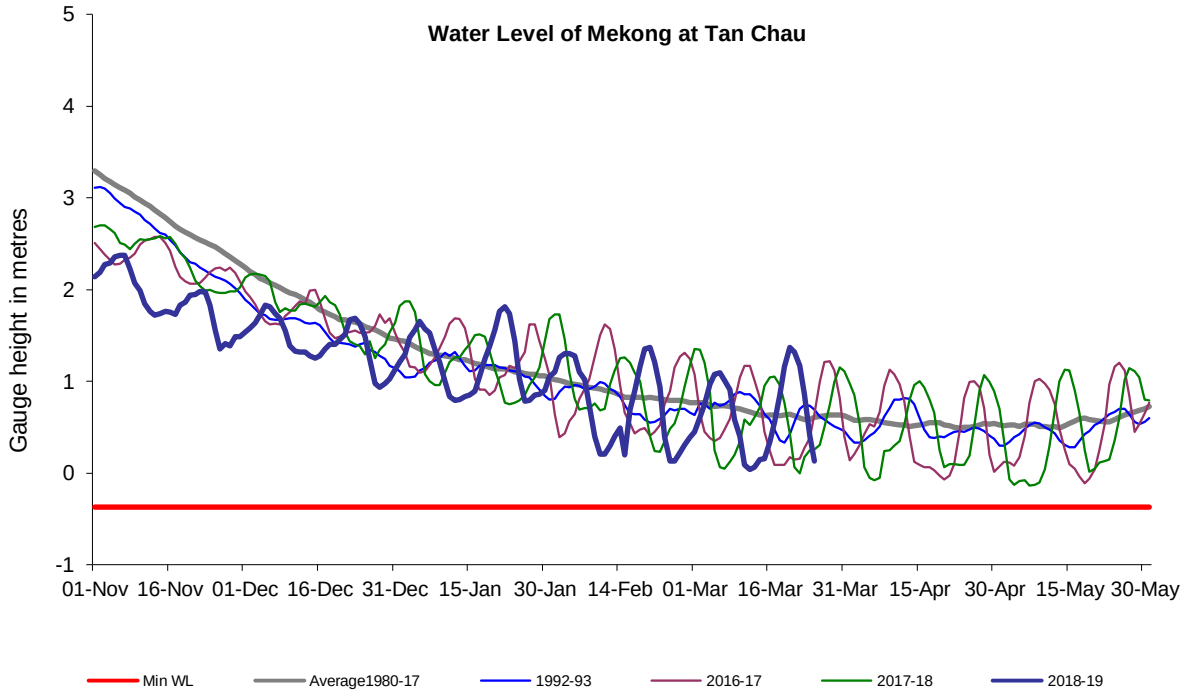
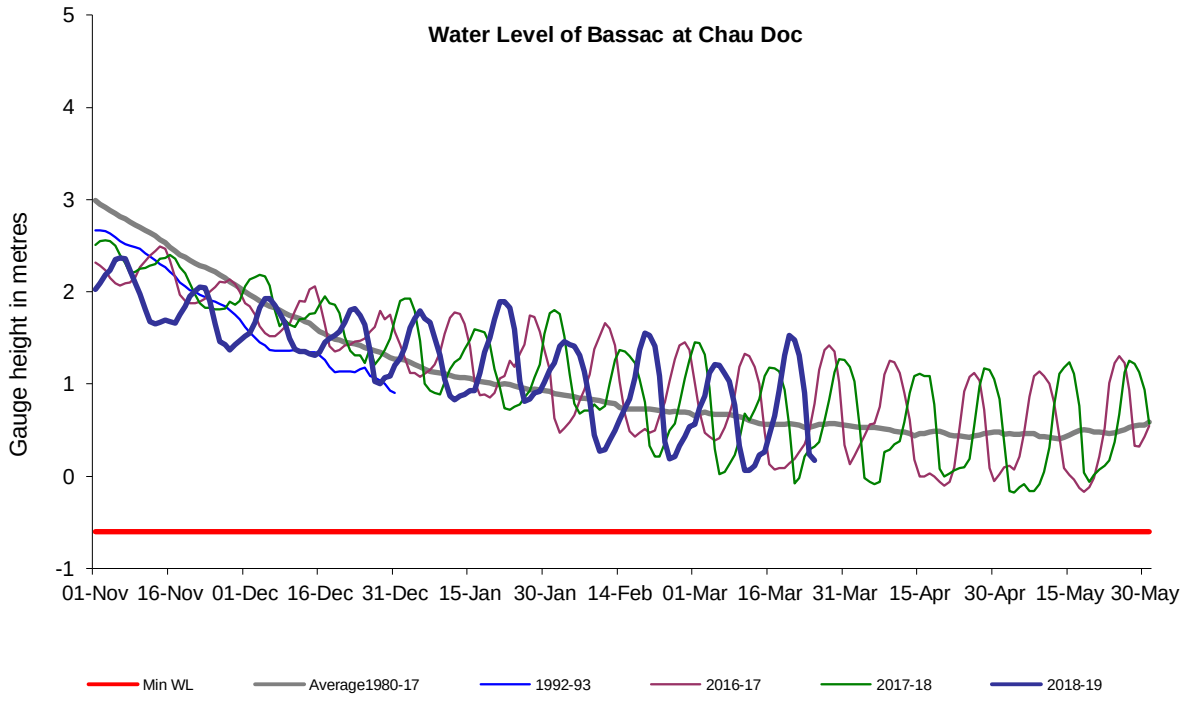
2
1
0
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Bassac at Koh Khel
Gauge height in metres
7
6
5
4
3
2
1
0
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Mekong at Neak Luong
Gauge height in metres
0
1
2
3
4
5
6
7
8
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Tonle Sap at Prek Kdam
Gauge height in metres
0
1
2
3
4
5
6
7
8
9
10
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
2016-17
2017-18
2018-19


Water Level of Mekong at Tan Chau
Gauge height in metres
5
4
3
2
1
0
-1
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19


Water Level of Bassac at Chau Doc
Gauge height in metres
5
4
3
2
1
0
-1
01-Nov 16-Nov 01-Dec 16-Dec 31-Dec 15-Jan 30-Jan 14-Feb 01-Mar 16-Mar 31-Mar 15-Apr 30-Apr 15-May 30-May
Min WL
Average1980-17
1992-93
2016-17
2017-18
2018-19