

**REPORT ON DROUGHT CONDITION
OF
PENINSULAR MALAYSIA
(BASED ON HYDROLOGIC ANALYSIS)**

August 15, 2005

**Hydrology and Water Resources Division
Department of Irrigation and Drainage
Malaysia**

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Report of Drought Condition in Peninsular Malaysia
(Based on Hydrologic Analysis)
August 15, 2005

Summary

Based on rainfall records in July 2005, collected from all 41 stations located on various locations in Peninsular Malaysia, indicate that most stations received substantial amount of rainfall during the second and third week of July. As a result, the drought condition has improved significantly from June to July for most part of Peninsular Malaysia, which are only 11 rainfall stations in July effected to drought compared 34 stations in June and 18 stations in May 2005. In July 2005, four out of ten rivers being monitored on-line still experiencing low flow condition. The rivers are Sg. Muda at Syed Omar Bridge, Sg. Kurau at Pondok Tanjung, Sg. Kerian at Selama and Sg. Johor at Rantau Panjang, these rivers has a low flow of 3.0 cumecs, 1.2 cumecs, 5.5 cumecs and 2 cumecs with 20 years, above 20 years, 10 to 20 years, above 20 years of Average Recurrence Interval (ARI) respectively.

From six dams being monitored on-line, as on August 15 2005, Klang Gate, Macap and Bekok dam has remaining storage of 17.16 million cubic meter (MCM), 3.30 MCM and 4.49 MCM or 60.12%, 31.51% and 25.51% respectively, compared with storage in July 18, 2005 which are 63.64%, 43.42% and 97.34%. It is shows that, the dam level in August becomes worst than July 2005. However, the dams level also becomes decrease from July to August 2005.

1. Rainfall Analysis

Overall, the drought condition in Peninsular Malaysia has significantly improved from Jun to July 2005. Based on Table 1, most of the rainfall stations recorded less amount of average rainfall in the month of June 2005 (100.9 mm) but better in May 2005 and July 2005, which are 184.0 mm and 151.29 mm respectively. In July 2005, most of the rainfall stations records above than 64.0 mm compared in June and May, which are 0.0 mm and

30.0 mm respectively, and it is show that a good improvement of receiving a rainfall. The rainfall data is then used as input to demarcate the isohytral map as shown in Figure 1 and 2.

Based on Table 1, 2 out of 7 rainfall stations in Johor still recording less rainfall with its deficiency ranging from 1% to 42% of its normal monthly rainfall. For the state of Perlis, Kedah, Penang, Perak, Selangor, Negeri Sembilan and Pahang the deficiency ranging from 1% to 40%. It shows that, the rainfall deficiency occurs to almost all of the West Coast states and west of Pahang. For East Coast states, especially Kelantan, Terengganu and east of Pahang, the rainfall deficiency range from 9% to 37%, which is less severe as compared to the west coast states.

Table 1 : Rainfall Analysis for May – July 2005

(MAY - JULY 2005)

NO	NO STESEN	May-05	JUN-05	Jul-05	Total Rainfall	(3Mth Cum Rf)	Diff(mm)	% Dev
1	6501005 (R1)	190.50	98.00	64.00	352.50	583.2	-230.7	-40
2	6206035 (K1)	143.00	84.00	92.00	319.00	442.7	-123.7	-28
3	6103047 (K3)	223.00	117.90	111.00	451.90	577.8	-125.9	-22
4	061 (K4)	199.00	99.10	94.70	392.80	638.2	-245.4	-38
5	566 (K5)	209.00	123.50	74.00	406.50	650.4	-243.9	-37
6	5505033 (P1)	257.50	99.00	106.00	462.50	537.6	-75.1	-14
7	5304045 (P2)	315.00	64.00	219.50	598.50	412.1	186.4	45
8	5302003 (P3)	381.00	38.50	143.50	563.00	556.2	6.8	1
9	4109095 (A4)	103.00	70.00	200.00	373.00	351.6	21.4	6
10	4011139 (A6)	103.00	140.00	184.50	427.50	498.1	-70.6	-14
11	4011144 (A8)	119.50	144.00	112.00	375.50	558.8	-183.3	-33
12	4511111 (A12)	251.00	59.00	120.50	430.50	591.1	-160.6	-27
13	5006021 (A14)	151.00	56.00	265.50	472.50	528.5	-56.0	-11
14	5003028 (A15)	175.50	0.00	119.00	294.50	428.7	-134.2	-31
15	5210069 (A16)	85.00	85.00	80.50	250.50	371.0	-120.5	-32
16	3411017 (B3)	88.00	17.50	89.50	195.00	274.7	-79.7	-29
17	2917001 (B4)	88.50	47.50	217.00	353.00	439.4	-86.4	-20
18	2818110 (B5)	209.00	90.00	68.00	367.00	410.1	-43.1	-11
19	3516022 (B6)	232.50	85.00	87.50	405.00	583.3	-178.3	-31
20	3117070 (B7)	242.00	41.00	157.02	440.02	564.0	-123.9	-22
21	3115079 (B8)	152.00	66.00	141.00	359.00	451.6	-92.6	-21
22	2719001 (N1)	200.50	130.50	258.00	589.00	385.7	203.3	53
23	3023098 (N3)	153.00	89.00	125.50	367.50	426.8	-59.3	-14
24	2321006 (M1)	157.00	46.50	273.50	477.00	404.8	72.2	18
25	2526001 (J1)	145.00	40.00	173.00	358.00	332.9	25.1	8
26	2033001 (J2)	109.00	131.91	137.00	377.91	420.8	-42.9	-10
27	1437116 (J5)	587.00	77.00	259.00	923.00	494.0	429.0	87
28	1829001 (J7)	30.00	138.50	145.50	314.00	540.9	-226.9	-42
29	2528002 (J8)	90.00	29.00	118.00	237.00	296.0	-59.0	-20
30	2536168 (J9)	168.00	209.00	135.50	512.50	519.6	-7.1	-1
31	2527004 (J10)	132.00	66.50	143.00	341.50	400.1	-58.6	-15
32	3424081 (C3)	89.00	60.00	103.50	252.50	326.5	-74.0	-23
33	3533102 (C4)	140.00	59.50	104.50	304.00	332.9	-28.9	-9
34	4414036 (C8)	123.00	88.00	158.00	369.00	442.9	-73.9	-17
35	3930012 (C9)	237.00	221.50	224.00	682.50	600.6	81.9	14
36	4726001 (D1)	277.00	200.00	209.00	686.00	754.7	-68.7	-9
37	4819027 (D2)	335.00	159.00	185.00	679.00	591.9	87.1	15
38	5921009 (D6)	130.50	291.50	244.50	666.50	560.8	105.7	19
39	4234109 (T1)	248.00	137.00	112.00	497.00	442.8	54.2	12
40	4734079 (T2)	71.00	55.50	94.50	221.00	348.1	-127.1	-37
41	5331048 (T5)	205.00	281.00	253.00	739.00	324.8	414.2	128
	MEAN	184.0	100.9	151.29	436.2	473.1	-36.9	-7.8

MOVING 3 MONTHLY RAINFALL OF MAY – JULY 2005

MONTH : MAY 2005
PERIOD : MAR - MAY 2005

MONTH : JUNE 2005
PERIOD : APR - JUNE 2005

MONTH : JULY 2005
PERIOD : MAY - JULY 2005

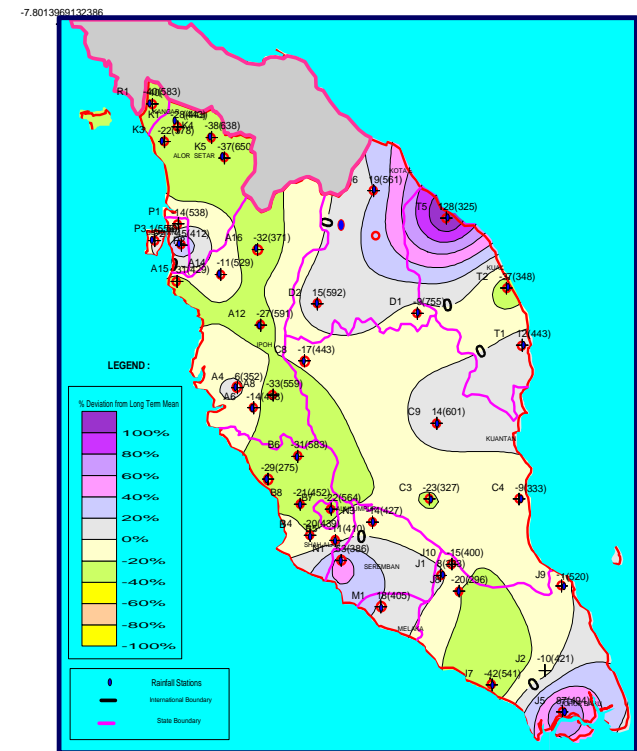
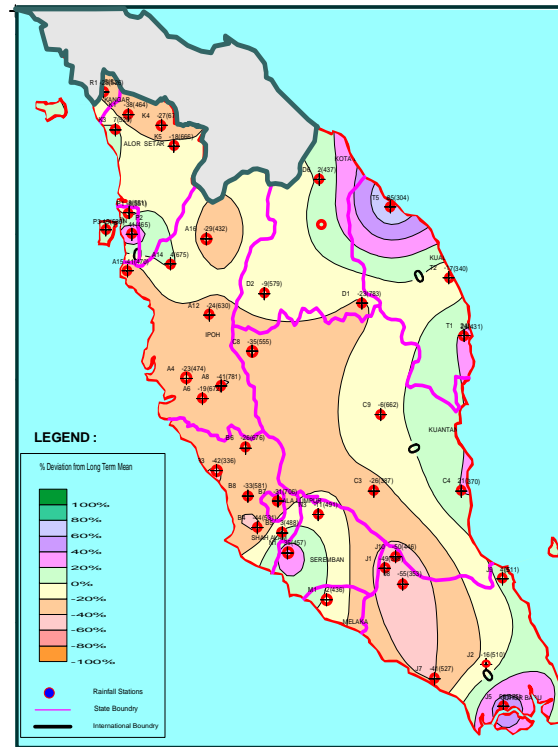
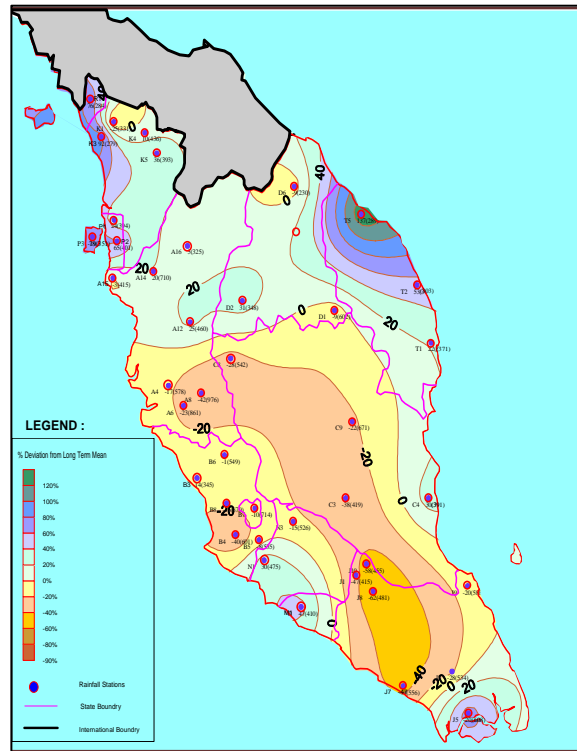


Figure 1 : Isohytal Map Showing Rainfall Deviation from Long Term Mean (May – July, 2005)

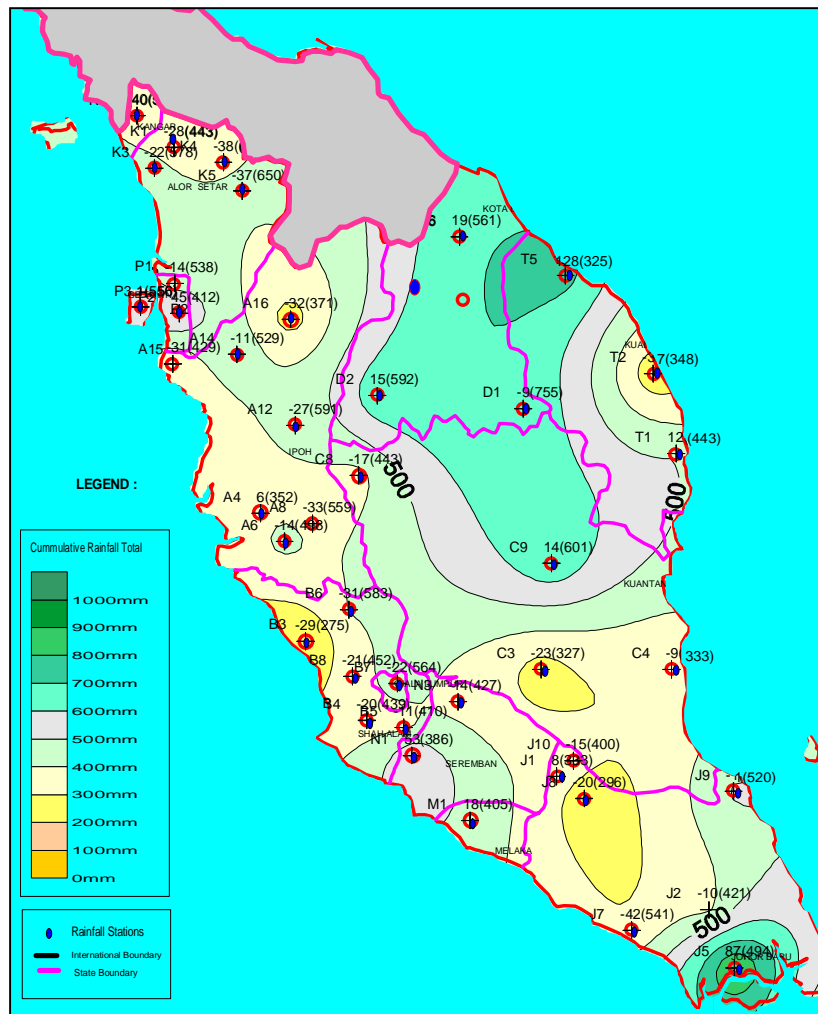


Figure 2 : Isohyet for Three Monthly Rainfall Distribution (July 2005)


2. Low Flow Analysis

Based on Table 2 and 3 shows as on August 15 2005, the flow of Sg. Muda at Jambatan Syed, Kedah is 3 cumecs and this value is slightly decrease from July which is 11 cumecs. This indicates that the drought condition is getting worst with an ARI of 20 years. Three other rivers, namely Sg. Kelantan at Jambatan Guillardmard, Sg. Bernam at Jambatan SKC, Sg. Kurau at Pondok Tanjung, SG. Kerian at Selama and Sg. Johor at Rantau Panjang is experiencing drought condition of 5 to 10 years ARI, 5 to 10 years ARI, above than 20 years ARI, 10 to 20 years ARI and above 20 years ARI respectively. Table 3 shows the on-line river monitoring in Drought Information Website on August 18, 2005 and other areas of Peninsular Malaysia have normal or near normal flow conditions.

Table 2 : Drought Monitoring by River Flow
(Data comparable with April 30, May 30, June 6, July 18 and Aug. 15, 2005)

Station Id	Name	State	River Flow (m ³ /s)				
			April 30	May 30	June 6	July 18	Aug. 15
5721480	Sg.Kelantan @ Guillardmard Bridge	Kelantan	83	254	245	128	102
5606480	Sg.Muda @ Syed Omar Bridge	Kedah	19	21	21	11	3
2816490	Sg.Langat @ Dengkil	Selangor	10	7	7	25	27
3813480	Sg.Bernam @ SKC Bridge	Selangor	19	16	16	13	11
4809490	Sg.Perak @ Kuala Kangsar	Perak	191	184	184	183	150
5007490	Sg.Kurau @ Pondok Tanjung	Perak	3.4	4.1	4.1	3.8	1.2
5206490	Sg.Kerian @ Selama	Perak	5.3	6.3	6.3	6.9	5.5
3424490	Sg.Pahang @ Temerloh	Pahang	258	277	277	330	187
1737490	Sg.Johor @ Rantau Panjang	Johor	5.3	3	3	18	2

Table 3 : Drought Monitoring by River Flow
(on-line Infokemarau)

 JPS MALAYSIA Drought Monitoring By River Flows									
Station Id	Name	State	Last Update	Water Level (m)	River Flow (m ³ /s)	Drought Flow For Various Return Periods(m ³ /s)			
						2-year	5-year	10-year	20-year
5721480	Sg.Kelantan @ Guillardmard Bridge	Kelantan	15/08/2005-14:01	8.37	102	154	114	88	69
5606480	Sg.Muda @ Syed Omar Bridge	Kedah	15/08/2005-14:01	6.10	3	13	8	5	3
2816490	Sg.Langat @ Dengkil	Selangor	15/08/2005-10:47	3.34	27	5	3	2	1
3813480	Sg.Bernam @ SKC Bridge	Selangor	15/08/2005-10:50	15.72	11	15	12	10	9
4809490	Sg.Perak @ Kuala Kangsar	Perak	15/08/2005-14:00	31.93	150	66	36	22	14
5007490	Sg.Kurau @ Pondok Tanjung	Perak	15/08/2005-14:01	11.50	1.2	3.4	2.4	1.9	1.5
5206490	Sg.Kerian @ Selama	Perak	15/08/2005-14:01	8.62	5.5	10.9	7.7	6.2	4.9
3424490	Sg.Pahang @ Temerloh	Pahang	15/08/2005-14:05	23.41	187	180	125	100	80
2527490	Sg.Muar @ Buluh Kasap	Johor	Off-line	1.58	-12	7.2	4.2	2.9	2.0
1737490	Sg.Johor @ Rantau Panjang	Johor	15/08/2005-13:04	2.15	2	8.5	5.5	4.2	3.2


3. Dam Storage Analysis

From the six dams monitored by Water Resources Unit, Hydrology and Water Resources Division, DID Malaysia as shown in Table 4 and 5, 2 dams Macap and Sembrong are still below the alert level with reading of 14.26 m and 6.30 m respectively. The different of current dam level with alert level are 0.86 m and 0.89 m respectively. Their remaining storages are 31.51 % and 25.51 %, respectively and this values are lowest than July 18,2005. The Batu Dam, Klang Gate Dam, Timah Tasoh dam and Bekok Dam shows a slightly increase of 8.42 m, 0.11 m, 0.34 m and 0.76 m respectively than the alert level. Table 5 shows the on-line dam monitoring in Drought Information Website on August 18, 2005.

Table 4 : Monitoring of Dam Storage Condition
(Data comparable with July 18 and Aug. 15, 2005)

Station Id	Name	State	Alert Level (m)	Water Level (m)		Remaining Dam Storage (MCM)		Remaining Dam Storage (%)	
				July 18	Aug. 15	July 18	Aug. 15	July 18	Aug. 15
3216490	Batu Dam	KL	93.00	101.66	101.42	29.74	29.24	90.39	90.83
3217480	Klang Gates Dam	KL	90.00	90.62	90.11	18.16	17.16	63.64	60.12
6602481	Timah Tasoh Dam	Perlis	27.68	28.00	28.02	19.91	20.12	60.42	61.06
1832480	Macap Dam	Johor	15.12	14.59	14.26	4.54	3.30	43.42	31.51
1931480	Sembrong Dam	Johor	7.19	6.50	6.30	5.35	4.49	30.42	25.51
2030481	Bekok Dam	Johor	12.50	13.26	13.26	30.97	30.97	97.34	97.34

Table 5 : Drought Monitoring by Dam Level
(on-line Infokemarau)

 JPS MALAYSIA Drought Monitoring By Dam Levels (Under Construction)							
Station Id	Name	State	Last Update	Water Level (m)	Alert Level (m)	Remaining Dam Storage (MCM)	Remaining Dam Storage (%)
3216490	Batu Dam	KL	15/08/2005-14:01	101.42	93.00	29.24	90.83
3217480	Klang Gates Dam	KL	15/08/2005-14:01	90.11	90.00	17.16	60.12
6602481	Timah Tasoh Dam	Perlis	15/08/2005-14:00	28.02	27.68	20.12	61.06
...	Bukit Merah Dam	Perak	15/08/2005-14:02	7.18	7.66	n/a	n/a
1832480	Macap Dam	Johor	15/08/2005-14:06	14.26	15.12	3.30	31.51
1931480	Sembrong Dam	Johor	11/08/2005-07:01	6.30	7.19	4.49	25.51
2030481	Bekok Dam	Johor	15/08/2005-14:00	13.26	12.50	30.97	97.34