Water Quality Event Monitoring

Regional Natural Resource Management in Queensland

ID: WQEM 0632

EVENT SUMMARY LOAD CALCULATION

Lower Burnett River (Mt Lawless) April-May 1983

Introduction

This fact sheet presents Event Mean Concentration (EMC) sediment load estimates collected from the Lower Burnett at the Mount Lawless gauging station (Fig.1) in late April to early May 1983 (Fig.2).

Methodology

Five suspended sediment samples (Tab.1) were collected from the gauging station GS136002D and recorded in the DNR archives. Discharge was assumed to be ±10% of actual flow (http://www.nrm.qld.gov.au/water/monitoring/pdf/wm_data_col_stds.pdf), although during high flows accuracy is likely to be poorer (David Amos, NRW Hydrographer, *pers. comm.*). Field replicates were not collected, so there was no precision estimate for concentration data.

To relate total suspended sediment (TSS in mgl^{-1}) with discharge (m^3s^{-1}), the average TSS value for the five samples was assumed across the hydrograph. Error margins were 2 standard errors around the average TSS concentration, which were propagated across the hydrograph together with the 10% variation in flow. The event load was the sum of the products of hourly discharge and TSS concentrations. The EMC was calculated by dividing the event load by the event volume.

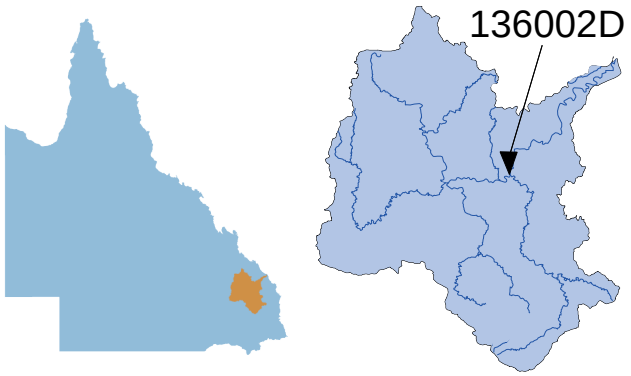

Figure 1. Lower Burnett event sampling location at Mt Lawless.

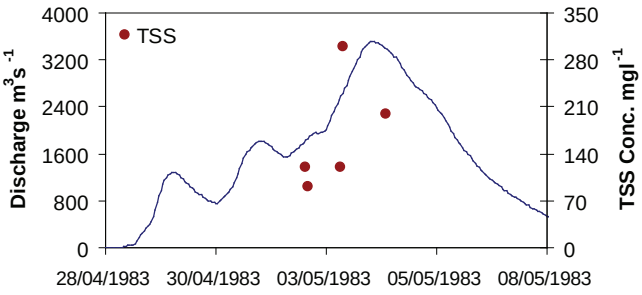

Figure 2. Sample times, discharge and TSS concentration of samples collected at Mt Lawless.

Flow Event Description

Catchment:	Burnett
Location:	GS136002D, Mount Lawless 25° 32′ 46″S; 151° 39′ 15″E
Catchment Area:	33,273 km2 (29,395 km2 upstream of the gauge)
Dominant Land Use: (upstream of gauge)	Grazing (79%), Forestry (9%), Nature Conservation (3%), Cropping (3%)
Event Duration:	28/04/1983 - 08/05/1983

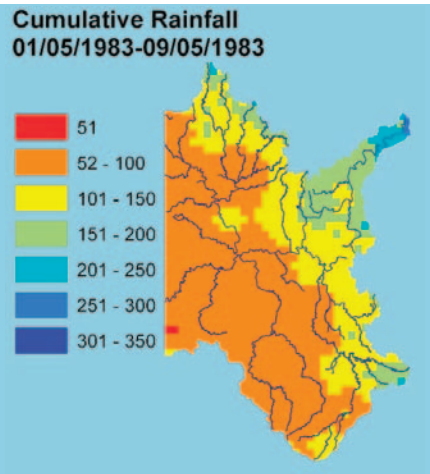

Figure 3. Cumulative rainfall during the event.

Results

This was a very strong runoff event from the Burnett catchment (Fig.4), which has an underlying geology of acid-intermediate igneous rocks (45%), sedimentary rocks (37%) and minor basalt (14%). Because soils are predominantly sodic (31%) they are vulnerable to erosion. Rainfall is low (650-800mm per year), and upstream topography is mostly above 150m a.s.l. with a relief change from the headwaters of 565m. The EMC concentration for TSS (166 mgl^{-1}) resembled a similar unit discharge through Gympie in 2005 (200 mgl-1). The sediment load (234 KT) was predictable on the basis of loads observed at Mt Lawless in 1976, and at Walla Weir in 1976 and 1982 (Fig.5).

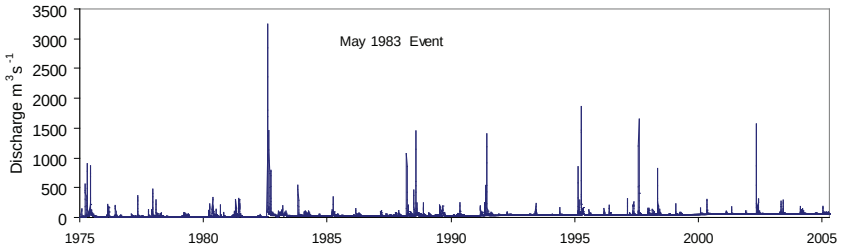

Figure 4. April-May 1983 event sampled at Mt Lawless in the context of historical (mean daily) discharge.

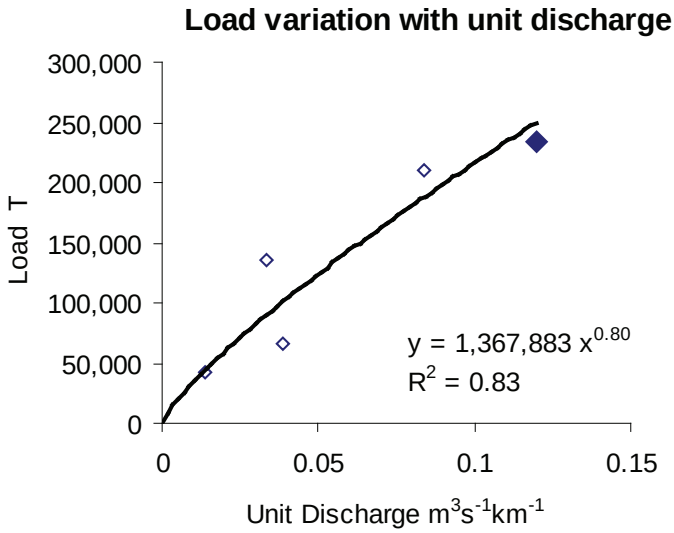

Figure 5. Suspended sediment delivery for the May 1983 event (closed symbol), in relation to other events (open symbols).

Table 1. Discharge and sediment data for the May 1983 event at Mount Lawless.

Date/Time	Gauge Height (m)	Q (m3/s)	TSS (mg/l)
2/05/1983 12:45	5.79	1874.05	120
2/05/1983 13:50	5.62	1815.82	90
3/05/1983 7:55	6.98	2675.097	120
3/05/1983 9:20	6.78	2477.137	300
4/05/1983 8:30	7.73	3271.51	200

Table 2. Estimated load and event EMC for the May 1983 event at Mount Lawless.

		Lower Bound	Upper Bound
TSS Load (kilo-tonnes)	234	114	375
TSS EMC (mg/L)	166	81	267
Total Event Discharge (ML)	1,408,218		
Number of samples	5		
Max Event Discharge (m3/s)	3515		
Period of record (yrs)	31		
% of time that the peak is equalled or exceeded	0.009		

For Further Information

Visit Water Quality Online, the NAP Water Quality website:

www.wqonline.info

We would like to thank the NRM&W Hydrographic unit, Bundaberg for collecting samples and supplying data. To reference this information sheet:
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