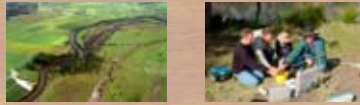


Water Quality Event Monitoring



Regional Natural Resource Management in Queensland

ID: WQEM 0630

EVENT SUMMARY LOAD CALCULATION Lower Burnett River (Mt Lawless) January 1976

Introduction

This fact sheet presents Event Mean Concentration (EMC) sediment load estimates collected from the Lower Burnett at the Mount Lawless gauging station (Figure 1) associated with three days of rain in January 1976 (Figure 2).

Methodology

Four suspended sediment samples (Table 1) were collected from the gauging station GS136002D and recorded in the DNR archives. Discharge was assumed to be $\pm 10\%$ 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 mg/L) with discharge (m^3s^{-1}), the average TSS value for the four 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 (Table 2). The EMC was calculated by dividing the event load by the event volume (Table 2).

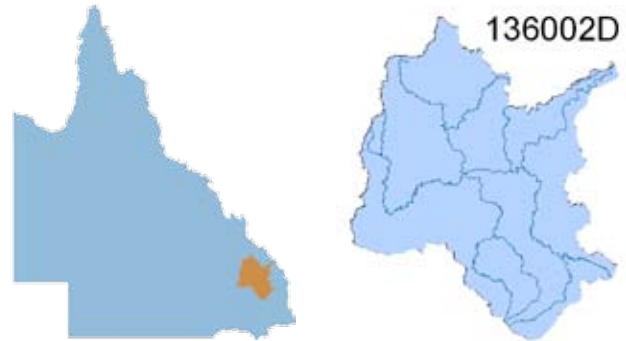


Figure 1. Lower Burnett event sampling location at Mt Lawless.

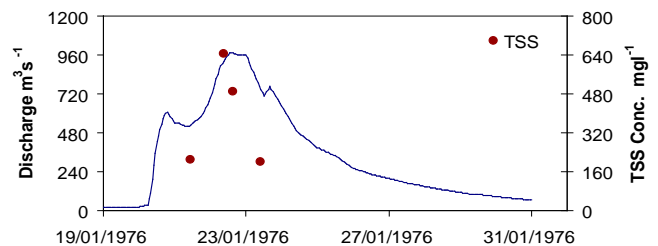


Figure 2. Sample times, discharge and TSS concentration of samples collected at Mt Lawless.

Flow Event Description

Catchment:	Burnett
Location:	GS136002D, Mount Lawless 25° 32' 46"S; 151° 39' 15"E
Catchment Area:	33,273 km ² (29,395 km ² upstream of the gauge)
Dominant Land Use: (upstream of gauge)	Grazing (79%), Forestry (9%), Nature Conservation (3%), Cropping (3%)(upstream of gauge)
Event Duration:	20/01/1976 - 31/01/1976

Cumulative Rainfall 21/01/1976-23/01/1976

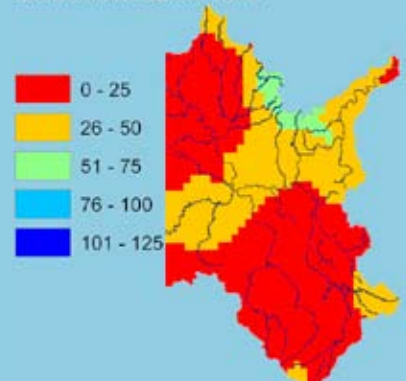


Figure 3. Cumulative rainfall during the event.

Results

This was a moderately strong runoff event from the Burnett catchment (Figure 5), which has an underlying geology of acid-intermediate igneous rocks (45%), sedimentary rocks (37%), and minor basalt (14%). The most common soil is sodic (31%) and vulnerable to erosion if vegetation is poor, rainfall is low (650-800mm/year), and upstream topography is mostly above 150m a.s.l. with a relief change of 565m from the headwaters. The EMC for TSS (384 mg l^{-1}) exceeded similar unit discharges from the Mary: Miva in 2005 (40 mg l^{-1}), Bauple East in 2005 (30 mg l^{-1}). Furthermore the EMC was high compared with a similar magnitude flow through this gauge one month later (131 mg l^{-1}), and through the Stone-lands gauge in 1996 (229 mg l^{-1}). The sediment load (136 KT) was predictable on the basis of loads observed at Mt Lawless in 1976 and 1983, and at Walla Weir in 1976 and 1982 (Figure 4).

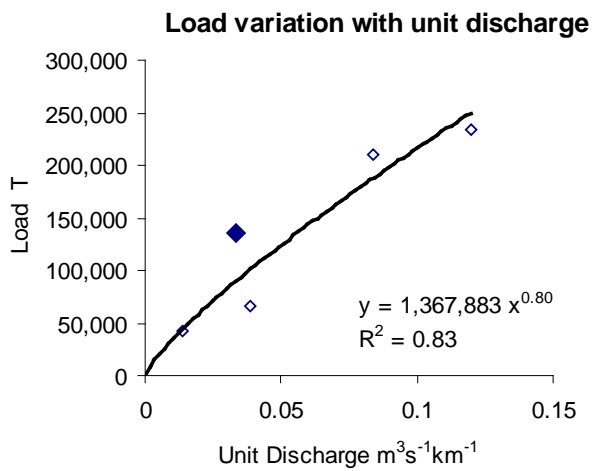


Figure 4. Suspended sediment delivery for the January 1976 event (closed symbol), in relation to other events (open symbols).

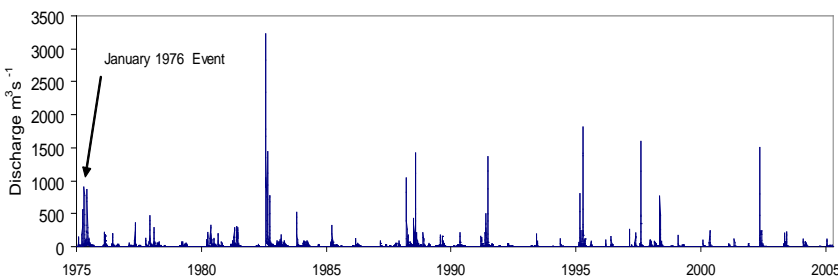


Figure 5. January 1976 event sampled at Mt Lawless in the context of historical (mean daily) discharge

Table 1. Discharge and sediment data for the January 1976 event at Mount Lawless.

Date/Time	Gauge Height (m)	Q (m ³ /s)	TSS (mg/l)
21/01/1976 11:00	3.21	562.893	207
22/01/1976 9:25	4.12	966.803	644
22/01/1976 15:10	4.12	966.803	488
23/01/1976 9:27	3.91	755.003	198

Table 2. Estimated load and event EMC for the January 1976 event at Mount Lawless.

		Lower Bound	Upper Bound
TSS Load (kilo-tonnes)	136	53	235
TSS EMC (mg/L)	384	148	664
Total Event Discharge (ML)	354,464		
Number of samples	4		
Max Event Discharge (m ³ /s)	976		
Period of record (yrs)	31		
% of time that the peak is equalled or exceeded	0.31		

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:

Esslemont, G. (2006) Water Quality Event Monitoring -Lower Burnett River (Mt Lawless) January 1976: Event

Summary Load Calculation (WQEM 0630) Department of Natural Resources and Water. ISBN 00000

Produced by the National Action Plan for Salinity and Water Quality

Queensland Water Quality State-level Investment Project