

## EROSION RATE COEFFICIENTS FOR SOME NEW ZEALAND CATCHMENTS

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At the Lincoln Seminar on conservation hydrology (May 1963) a preliminary account was given of a trial procedure for the derivation of erosion rate coefficients from data on suspended sediment. This procedure outlined further developments on the general basis given by A.P. Campbell (1962).

In this new work simple numerical comparisons are obtained and the data is based on the "dominant discharge", a value of discharge which will be much used in the future in studies of land erosion and stream channels.

### DERIVATION OF COEFFICIENTS

Suspended sediment rating curves have been published for a number of sites (Soil Cons. & R.C.C., 1960).

The first step in deriving the coefficients for an area was to evaluate the dominant discharge  $Q_r$ , (the once in two year discharge), using the standard empirical methods (Campbell & Caddie, 1962) if necessary. Sites with sufficient samples between  $0.2Q_r$  and  $Q_r$  were then selected for the calculation of erosion rate coefficients.

The sediment discharge,  $G$ , at  $0.6 Q_r$  was obtained from the sediment rating curve. This value was divided by the catchment area and converted to the EROSION RATE COEFFICIENT ( $E_r$ ) in tons of suspended sediment per day per square mile. (Lincoln Seminarists will note that a change has been made from tons/sec. to tons/day to avoid decimal coefficients).

Many of the catchments are large and are not homogeneous. However, they do seem to fall into groups according to the type of country in the catchment (refer Table).

## FIELD SAMPLING

Erosion rate coefficients may be established for homogeneous catchments, or where catchment improvement work is being carried out, by collecting at least five sediment sample series in a single flood. If possible two should be taken with rising stage, one at the crest and two with falling stage. Sampling procedures have been outlined by A.C. Hopkins (1962).

The coefficient should be checked for two or three freshes.

DATA AND EROSION COEFFICIENTS ( $E_r$ )

River	Site	Catchment Area, A (Sq.miles)	Dominant Discharge Qr(c.f.s.)	G*	$E_r^{**}$
Waipaoa	Matawhero	730	45,000	14	1700
Waipaoa	Kanakanaia	610	40,000	16	2300
Waipaoa	Waipaoa Station	65	8,000	6.5	8600
Awhea	Brown Hill	45	6,000	1.3	2500
Motu	Coast Road	565	40,000	3.0	460
Mohaka	Raupunga	915	27,000	0.6	58
Mohaka	Glenfalls	385	20,000	0.25	57
Ngaruroro	Kuripapango	160	12,000	0.10	54
Manawatu	Akers	1630	57,000	2.0	106
Oroua	Forlongs	215	12,000	3.2	1300***
Wanganui	Paetawa	2605	112,000	8.0	265
Wanganui	Te Maire	860	34,000	0.3	30

\*G = G at 0.6 Qr, in tons/sec.

\*\* $E_r$  =  $G/A$ , in tons/day/sq.mile

\*\*\* = Doubtful reliability

## REFERENCES

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