

## ABSTRACTS

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### EROSION AND PRECIPITATION SYMPOSIUM

The following are abstracts of other papers to be presented.

**An Analysis of Some Data from Natural Alluvial Channels.** G. H. Caddie, Ministry of Works.

Gauging and sediment data, mainly from Colorado River stations, are examined. They are found to fit one of the cases from Maddock's (1966) analysis of data from laboratory flume experiments

i.e.  $v$  is proportional to  $(q S)^{0.3}$

Where  $v$  = mean velocity

$q$  = discharge per unit width

$S$  = slope

This is the case for  $q$ ,  $S$  independent variables and combined variance of velocity and friction factor minimized. The few data available for New Zealand rivers also conform to this relationship.

Velocity versus load data are also examined and found to be in fair agreement with the analysis of laboratory data provided variation in suspended sediment size is included in the analysis.

**An Approach to the Optimum Raingauge Network for Representative and Experimental Basins.** G. J. Blake and W. B. Morrissey, Ministry of Works.

The operation of representative and experimental basins throughout New Zealand has created the need for adequate rainfall sampling. Mr Morrissey deals with the practical problems encountered and discusses the development of pluviograph and raingauge and their application to N.Z. conditions.

Mr Blake discusses theoretical aspects with reference to existing raingauge networks.

**Some Studies of Erosion Rates in the Kaweka Range.** A. Cunningham, Protection Forestry Branch, N.Z. Forest Service.

Different types of erosion surface were illustrated, and their significance outlined. In the headwaters of the Tutaekuri River, which drains the south-eastern Kaweka Range, a detailed map had been drawn for 5,000 acres of the upper catchment. Within

this area 5,710 acres was shown to be devoid of plant cover. Bare pumice surfaces accounted for 1,900 acres; the remainder comprised erosion pavements, screens, or bare rock. At 3,300 ft altitude methods involving steel pins have been used for the last six years to measure the rate at which various surfaces are being removed. Bare pumice surfaces appear to erode very rapidly, sometimes at more than one inch per year. Erosion pavements are more stable, but photographic studies suggest that there is considerable downward movement of surface stones.

A formal paper was not presented.

#### **Persistence of Daily Weather in New Zealand.** J. Finkelstein, N.Z. Meteorological Service.

An analysis was carried out of the frequency of runs of various types of days, mainly based on rainfall. With one exception (cloudy days at Invercargill) the results indicated that the probability of the event occurring was increased appreciably after it had occurred once — in other words, there was persistence.

The frequencies all fitted a Markov chain model reasonably well; but for some of the precipitation data the model required adjustment to fit the frequencies of the longer runs satisfactorily.

The highest persistence found in precipitation data was for raindays at Milford Sound, but this was not nearly as high as the persistence of cold spells at Wellington.

#### **Some Observations of Micro-Climate and Erosion Processes in the Cass Basin in the Southern Alps.** J. M. Soons, University of Canterbury.

A basin representative of the central Southern Alps was established to study micro-climate and erosion. At a central station measurements are made of soil and air temperature, solar and net radiation, and rainfall; rainfall—run-off and sedimentation relationships are also observed at seven run-off plots.

Relationships have been established between rainfall and run-off, but not between run-off and sedimentation.

Needle ice was found to increase both sedimentation and infiltration. A time lag effect in sediment transport was discovered, causing doubt of the efficiency of the vegetation cover. Future study will be of the relationships during summer; also micro-climate data will be used to study evaporation rates.

## The Impact of High-Intensity Rain Storms on Some North Island Mountain Areas. P. J. Grant, Ministry of Works.

The impact of intense rain storms, with particular reference to parts of the Ruahine Range, was illustrated. In the absence of direct storm measurements the probable high-altitude rainfall amounts for some major storms have been assessed from storage raingauge catches.

A great deal of current vegetation damage and erosion is primarily the result of intense rainfalls.

Flood histories and river channel changes in the eastern Ruahine Range indicate that a marked increase in the rates of erosion, bedload transport, and channel change took place in the 1930s, and this became more pronounced in the late 1940s. This accelerated rate of change has continued to the present. It is postulated, therefore, that small-area rain storms in montane regions have increased in intensity since the 1930s.

A formal paper was not presented.

## Characteristics of Suspended Sediment Delivery. W. J. Fraser, Ministry of Works.

Suspended sediment discharges, particularly concentrations, show much variation and many anomalies during measurement over a storm period, and seasonally. This presents certain problems to the investigator.

An approach is suggested to the interpretation of sediment data, and variations caused by dilution, backwater, catchment condition, rainfall, snowmelt, etc. are considered.

An attempt is made to show how variations in quantities of sediment can indicate the origin.

## ERRATA

PRECALIBRATED FIBREGLASS FLOW MEASUREMENT STRUCTURES FOR EXPERIMENTAL BASINS by H. Drost, *J. Hydrol. (N.Z.)*, Vol. 5(1), page 20:

for "... a temporary 80 degree V-notch weir ..." read "... a temporary 90 degree V-notch weir ..."; page 21: for "... through the 45 degree V-notch ..." read "... through the  $\frac{1}{2}$ -90 degree V-notch ...".