



IHD BULLETIN

NEW ZEALAND

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The International Hydrological Decade Bulletin is an official publication of the New Zealand National Committee for the International Hydrological Decade and presents, twice annually, a survey of programmes, activities and findings of hydrology in New Zealand, carried out under the auspices of the IHD; and also a summary of international activities.

COMMENTS BY THE CHAIRMAN

N.Z. National Committee

Although technical studies have begun, as indicated in Bulletin No. 1, and excellent co-operation is being found amongst all the disciplines concerned with hydrology, preparatory work is still far from complete. Thus, in this Bulletin, rather than present a further general summary, a progress report is given of activities in a subject where preparatory work for an IHD programme is most advanced. This relates to research that is most important in New Zealand, namely, that concerned with soil-water-plant relationships.

A. P. Campbell

SUMMARIZED REPORT OF THE TECHNICAL SUBCOMMITTEE ON EXPERIMENTAL BASINS*

INTRODUCTION

Although not strictly within its terms of reference, the subcommittee thought it desirable to consider the classification of the various types of basins proposed in the IHD programme and also the advantages of adopting standard definitions of certain important hydrological terms. Hence these matters are discussed first in this report.

CLASSIFICATION

The adoption of the following basin classification is recommended:

Class	Size	Soil/Vegetation Changes	Observations
Representative	< 200 sq. mls	Little change	Standard*
Benchmark	< 200 sq. mls	No change	Standard
Experimental	< 2 sq. mls	Artificial change	Full†
Vigil experimental	< 2 sq. mls	Little change	Full

*Observations include flow, precipitation and suspended sediment.

†Implies that a full investigation of the hydrological cycle will be attempted.

*Membership given in IHD Bulletin No. 1 publ. in J. of Hydrol. (N.Z.), Vol. 3 (1), June 1964

STANDARD DEFINITIONS

The subcommittee recommends that Provisional Procedure No. 19, of the Handbook of Hydrological Procedures issued by the Soil Conservation and Rivers Control Council, be

- (i) extended in due course
- (ii) accepted for national use
- (iii) forwarded to the IHD council in Paris with a recommendation that it be considered for international acceptance with or without revision.

ESTABLISHMENT

Experimental basins should be selected on the basis of the seven most important soils of New Zealand in combination with the seven most important vegetation types; and that on these basins, land management practices that require hydrological investigation should be carried out. Erosion was not considered a factor for the establishment of experimental basins. The subcommittee recommends the establishment of 19 IHD experimental basins as detailed below:

Soils	Vegetation	Serial No.	Experimental Basins Existing	Basins Required Desirable areas
Northern yellow-brown earths	Fern and scrub v. introduced grasses	1	Puketurua	—
Yellow-brown loams	Introduced grasses	2	—	Waipa/Stratford
Yellow-brown pumice soils	Fern and scrub v. introduced grasses	3	Otutira	—
	Introduced grasses v. pines	4	—	Kaingaroa
	Fern and scrub v. pines	5	—	?
	Introduced grasses	6	Makara	—
Central yellow-brown earths (stable)	Podocarp/Beech	7	Taita	—
	Introduced grasses v. pines	8	Moutere	—
	Introduced grasses v. pines	9	—	Gisborne
(unstable)	Introduced grasses v. pines	10	—	Wairarapa/Rangitikei
	Snow tussock	11	—	Old Man/Kirkliston Range
	Snow tussock/ beech	12	Camp Stream	—
High-country yellow-brown earths	Low tussock	13	—	Broken River
	Introduced grasses v. crops	14	Adair*	Nth Otago/Glenmark
Yellow-grey earths (high rainfall)	Introduced grasses v. pines	15	—	Selwyn/Berwick/Taieri
Yellow-grey earths (low rainfall)	Low tussock	16	—	Wither Hills/Molesworth/Tara Hills/Manuherikia
	Low tussock v. pines	17	—	Hokitika
Podzols	Rata/Kamahi	18	—	Arthur's Pass
	Beech	19	—	---
	Montane tussock	19	Devil's Elbow*	---

*Adair and Devil's Elbow to be adopted only if improvements can be carried out as specified in the full report.

The establishment of all these experimental basins is important and priorities should be resorted to only if funds and/or personnel are in short supply. An approximate list of priorities is as follows:

3, 4, 11, 9, 6, 7, 8, 14, 10, 12, 1, 16, 2, 13, 17, 18, 19, 15, 5.

REPRESENTATIVE BASINS

It is recommended that more emphasis should be given to the establishment of representative basins on the drier, and on cropping, areas.

PUBLICATION OF DATA

Two different publications should be used for the dissemination of data from experimental basins:

(i) A summary of basic observed data in the Hydrology Annual

(ii) An annual research report for each experimental basin.

The first should contain data for technical distribution only; the second should be a management and result report for wider distribution.

RESEARCH METHODS

The method of research on experimental basins should be by a full study of all relevant hydrological characteristics, such as infiltration, soil moisture, etc., and a chart detailing the methods has been prepared. This chart is given in the full report. Recommendations are made as to the selection of sites for detailed observations within basins and for the measurement of soil moisture, hydraulic conductivity, and infiltration.

No lysimeter work should be undertaken at present, but when this becomes desirable the tussock grasslands should be given first priority.

Tracer methods are important in hydrological research and the Institute of Nuclear Sciences should be approached for its co-operation.

Rainfall variation and special climate studies are desirable and these should be considered by the subcommittee on hydro-meteorology.

RECOMMENDED OBSERVATIONS

Recommendations have been made for the following activities on the 19 recommended experimental basins: flow, precipitation, climate, interception, soil moisture, compaction, infiltration, groundwater, solution losses, tracers, erosion and sediment, run-off plots, soil physical data and special vegetation problems. Details are listed in the full report.

CONTINUANCE OF SUBCOMMITTEE

Although, in effect, the submission of this report completes the task of the subcommittee as far as its terms of reference are concerned, the members were unanimous that it would be unwise to disband the subcommittee. There is no doubt that technical problems will arise in the setting-up and operation of experimental basins; and the existence of a group of experts to consider them and advise on their solution, and on any new technical developments, should be of great benefit to New Zealand and its part in the IHD.