



THE HYDROLOGICAL SOCIETY OF S.A.

c/o Water Resources Branch

Box 1751, Adelaide, S.A. 5001

NEWSLETTER NO. 49½

FEBRUARY 1986

EDITOR'S NOTE

There are two reasons why this Newsletter has been numbered "49½".

1. It is a little thinner than normal Society Newsletters should be, a reflection of December/January malaise.
2. Newsletter No. 50 is being planned as a celebratory publication.

Society members are encouraged to offer letters, articles, etc. for Newsletter No. 50 which will go to press in April.

J.R. Argue

GUEST EDITORIAL

HYDROLOGICAL SOCIETY PROSPECTS FOR 1986

The next editorial will appear in the Society's Newsletter No. 50. Then we may indulge in a warm look at what has passed, but for now will look forward in the short term.

This year our Society will offer the normal range of diverse and fascinating meetings, most of which are organised! A tentative programme is included in this Newsletter. We would welcome any suggestions from members for further topics worthy of presentation. Don't be deterred by the committee's problem in accommodating more topics, for your help will be welcomed.

We are also planning our first Symposium for three years, to be run jointly with the Soil Science Society and supported by the Water Research Foundation. It will address the vital questions of soil and water conservation and the potential conflicts between the two. It will be held in October.

Your Committee intends to award another Hydrological Society prize for final year students, and expects applicants from a broad range of water-related studies offered in various tertiary institutions.

The initiative on position papers is proceeding. Shortly the Committee will select the first topic to be addressed - we feel it to be important that members make known their preferences if they have not already done so (as is likely!) in order to guide this selection. We have all been delighted with the positive response to this initiative, typified by Bob Culver's letter printed in this Newsletter. When the topic for the first paper has been selected a working group, made up of Executive Committee and other members, will be formed, nominated, coerced (if need be) etc. to prepare a draft position paper for presentation to the Society. This stage is eagerly awaited, but will no doubt take a few months.

Finally, most, if not all, will agree that the Newsletter is benefitting from members' contributions - unsolicited and otherwise - whether as letters, informative articles or Guest Editorials. They all help the purpose for which the Hydrological Society was formed, so please keep it up.

John Waterhouse

LETTERS TO THE EDITOR

Dear Sir,

Your guest editorial (H.S.S.A. Newsletter, October 1985) brought back a flood of memories of the early years of the Society.

The major roles assumed were, as I recall, primarily twofold :

- (1) to provide a forum for a multi-disciplinary society where soil scientists, meteorologists, hydrologists (rare), engineers, geographers could meet and share common facets of the hydrologic cycle appropriate to their interests
- and
- (2) to provide a public forum where experts could speak (and be heard) on topics or projects of importance. Some of the early Symposia were well "picked up" by the press and seemed effective as I recall. We used to invite key Ministers to open one-day conferences!

In many activities some of the real experts are partly inhibited (by virtue of their employment) from making statements, however they are often able, on invitation particularly, to read factual papers which often achieves more for the cause.

Your comment and proposed action on position papers I trust is successful. From some experience with IEAust activities two problems often arose, firstly the size of the task if the paper is to be detailed (busy people can't find the time) and secondly, the source of the necessary data if the matter is highly controversial.

However, I support most strongly your efforts and hope they are successful.

The problem of lightweight loud-mouthed ill-informed activists for a cause is very real. Their stirring ability is out of all proportion to their numbers and adequacy of their cause which is often very selfish.

With all power.

Kind regards.

Bob Culver

FROM THE HYDROLOGICAL TRAPS ...

STATISTICAL RATIONAL METHOD STUDY

(Reporter : Ron Black)

Kinhill Stearns and the Engineering & Water Supply Department (E&WS) are continuing their work on the Statistical Rational Method applied to twenty Adelaide Hills catchments. Following the Australian Rainfall and Runoff workshop and subsequent meetings held with Professor David Pilgrim late last year, it has been decided to extend the previous study to incorporate a number of modifications necessary to reflect the changes in approaches to flood design to be published in the new edition of AR&R.

These include :

- ° using site specific intensity-frequency-duration curves produced by Dr. Ray Canterford of the Bureau of Meteorology for each catchment. (Regional I-F-D curves will not be recommended in the future.)
- ° taking skewness into account in these curves. The Adelaide Hills region has a very high coefficient of skewness of 0.6 to 0.7. Failure to include skewness causes considerable errors for recurrence intervals of 10 years and greater.
- ° deriving design times of concentration and runoff coefficients for the 1 in 2, 5, 10, 20, 50 and 100 year events.

The study is due to be completed by the end of February so that it can be incorporated in the new 1986 edition of AR&R.

ENVIRONMENTAL STUDY OF THE CHOWILLA ANA-BRANCH AREA (Reporter : Ron Black)

Kinhill Stearns is working with the Department of Environment and Planning (DEP) and the Engineering & Water Supply Department (E&WS) in an environmental study of the Chowilla Ana-branch area of the River Murray.

The E&WS is investigating a number of options for regulating outflows from the Chowilla Ana-branch creeks which carry high salt loads into the River Murray. Prior to the selection of one or more options for detailed evaluation (possibly including an environmental impact statement), this study aims at investigating and reporting on any major environmental constraints which may rule out any of the options.

Kinhill Stearns has included a team of specialists in the study, all of whom have particular expert knowledge of the Chowilla aquatic environment. They include the University of Adelaide's River Murray Research Unit and experts in river red gum ecology, avifauna and wetlands ecology.

The study is due for completion at the end of March 1986.

DRAINAGE STUDIES OF THE STRATHALBYN AND WILLUNGA TOWNSHIPS

(Reporter : Ron Black)

Kinhill Stearns is preparing drainage strategy plans for the District Councils of Strathalbyn and Willunga. The Highways Department drainage section is supervising the flood hydrology methodology and overall design.

The Strathalbyn study is in its final stages and will be completed by mid-February, while the Willunga study has just commenced.

E&WS WATER RESOURCES PROJECTS

(Reporter : Jerome Maquire)

- ° River Murray Model Feasibility Study

A draft report on this study has been produced by Lyall, Macoun and Joy for E&WS. The report details forecasting and water quality modelling needs. Four different models will be required for the effective management of the river.

- ° Onkaparinga Catchment Study

A major study of the Onkaparinga catchment has been commenced. The study will include all aspects of flooding, water resources and water quality.

- ° Local RORB Parameters

Mr. K. Schalk, on loan to E&WS from B.C. Tonkin & Associates, investigated local RORB model parameters and summarised previous studies. The results will be included in the new edition of Australian Rainfall and Runoff - 1986.

- ° Flow Forecasting

Water Resources Branch is investigating the reliability of inflows to the Departmental Reservoirs. A result of the study is expected to be major savings in the costs of pumping.

FOURTH CREEK CAMPBELLTOWN

(Reporter : Skip Tonkin)

Fourth Creek is, for most of its length, picturesque and enhances the environment to a degree which is jealously guarded by those people who reside close to it and also in adjoining streets.

Flooding of the creek in recent times has revealed the inadequacies of past Town Planning legislation in protecting the Creek from encroachment by Urban Land Development. The remedial action that can be taken in the implementation of flood mitigating works is limited, having in mind the extent of development that has taken place on the Creek's flood plain especially in its lower reaches.

The matching of local desires, to prevent flooding, and the opposite desire to prevent interference of any kind with the creek in its upper reaches provides both a philosophical and educational problem for the local Council.

Arising out of this situation is the degree of trust shown in the professionals who propose any flood mitigation scheme. For trust to be engendered there are three basic needs in communicating with the local residents :

- (a) Complete honesty about all the options studied.
- (b) The presentation of those options in a way readily understood by lay people.
- (c) Patience to convey technicalities in a one to one discussion.

This communicating process can be successful and rewarding for the professional when the lay person comprehends that a service is being rendered for the community at large.

The reversing of previous decisions to subdivide land and have part of that land vested in Council by the process of negotiated acquisition is an emotional experience for some residents and also a time consuming and expensive one for both parties. It should be recognised that consultation with community groups is not for the faint hearted but only for those dedicated to achieve the best for the local residents under the prevailing circumstances.

FLOOD FREQUENCY STUDY - RIVER MURRAY

(Reporter : Ken Potter)

Lange, Dames and Campbell Australia Pty. Ltd. are carrying out a flood frequency study for the River Murray using a joint frequency approach to Murray and DARling discharges. The generation of common period flows is an important element of the project. The study has been commissioned by the Engineering and Water Supply Department.

INTERNATIONAL SYMPOSIUM ON CONTROL OF LAND DESERTIFICATION

This symposium, sponsored by UNESCO, was recently held at the Desert Research Institute in Lanzhou, China.

The symposium was structured so that each country delivered a summary paper on desertification problems and progress within its national boundaries as well as a more detailed paper on some aspect of theory or technique. Ray Perry (CSIRO, Perth) presented the Australian summary paper and Dean Graetz (CSIRO, Canberra) presented a case study on using Landsat to assess and monitor semi-arid rangelands.

Australia is noted for the volume of literature which describes its resources, their distribution and, lately, the condition and status of land and water resources in particular. Most of us in Australia know that this understanding is still most inadequate but, for most of the countries represented at the symposium, it represents a stage that they have not yet reached.

The national summaries presented fell into two categories - those where the problem of land degradation had been recognised and progress was being made (Australia, USSR and China) and the others (India, Pakistan and Egypt) where the future seemed very gloomy indeed. In those countries, it is not that scientific understanding or technological capability is lacking, rather it is the relentless and escalating pressure of the burgeoning population that results in overuse and degradation of the land and water resources.

It is the political and social management problems which result in desertification that are the difficult problems to solve and the capacity of science to contribute to their solution is very limited.

China has been remarkably successful and humane in this respect.

The involved web of man, land and society was best illustrated using data from an Egyptian national summary.

In 1983, the population of Egypt was 46 million with an annual growth rate of 2.6 percent, which will give a population of 70-75 million in the year 2000. Only 2.5 percent of the land area of Egypt can be farmed, the Nile Valley and Delta, so land is the limiting resource.

Since the completion of the Aswan High Dam and the suppression of the annual flood and silting, many major and micro nutrient deficiency symptoms have appeared among crops, requiring expensive fertiliser additions to remedy.

As the scarce land declines in fertility so the share per farmer also declines. In 1900, the land:man ratio was in the order of 0.48 acres per man. By 1984, this had been reduced to 0.13 per man. While this is an averaged figure for all the population, it is known that 80 percent of the farms in Egypt are less than two acres in area.

With land limited and fertility declining, farmers are forced to sell their top soil for mud bricks and house construction in order to buy the fertilisers they need. It does not require a systems analyst to forecast the eventual outcome of this system.

China has problems of desertification that are just as severe as those of India, Pakistan and Egypt but there has been an integrated approach to combating the problem that involves both scientific research and political and social commitment.

China has, within its borders, one-quarter of the world's population, all of whom are apparently adequately fed and housed. That simple statement cannot be honestly said about any other developing country.

China has extensive areas of desert lands, much of which has been degraded by centuries of overgrazing, injudicious cultivation and deforestation resulting in mobile sandy deserts that encroach upon the agricultural lands. The stabilising and reclamation of mobile dune fields was the major area of concern of the Chinese scientists who staff the Desert Research Institute. Their progress was impressive and even though their approach was very pragmatic, their coordination and cooperation with the people of the communes and prefectures ensured a rapid adoption and testing of research results.

Their work with the straw 'checker board' system and aerial seeding as methods for stabilising shifting dunes is impressive. Irrigation is used rather widely even in the most hyper-arid environments. To some observers, the Chinese are rather profligate in using both their run-off and groundwater resources.

During the field travel, participants saw examples of many familiar land degradation problems - salinity, overgrazing and massive soil erosion. The Chinese scientists, who are very compartmentalised in their research administration and funding, seem very aware of their nation's problems as do the common people. In the symposium summary meeting, the Australian delegation expressed the view that success in treating the symptoms of desertification should not shift attention away from the causes.

(from UNESCO Newsletter, April 1985)

FROM THE SECRETARY ...

PROPOSED PROGRAMME

The proposed programme of topics for meetings in 1986 is :

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|-------------|--|
| 13 February | "The South Australia-Victoria Groundwater Sharing agreement" - Fred Stadter; Harold Tuckwell |
| 18 March | "Behaviour of some polycyclic aromatic hydrocarbons, organochlorine pesticides and polychlorinated biphenyls in streams and estuarine environments", Reimer Herrmann, Professor of Hydrology, University of Bayreuth, F.G.R.
(Joint meeting with Royal Australian Chemical Institute) |
| 24 April | "Arkaroola Water Supply", Reg Sprigg |
| 26 June | "Wetlands in South Australia" |
| 28 August | A.G.M. - Topic to be announced |
| 30 October | "Lake Eyre Flooding" |

On Tuesday 21 October 1986 (9.00 am to 5.00 pm) the Society in conjunction with the Soil Science Society and Water Research Foundation will present a Symposium :

"Water and Soil - Our Basic Resources in Conflict?"

POSITION PAPERS

To date only some 12% of members have responded to the article in the last Newsletter. This response has been somewhat disappointing although those who have replied have had favourable and positive comments.

The Executive Committee considers that as many members as possible express their views on this initiative. To this end it has been decided to extend the period for responses until the night of the next General Meeting of the Society (13/2/86). The list of suggested topics is repeated in this Newsletter in case you have mislaid the original.

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It is suggested that the following list etc. may be copied by interested members and returned to Mr. P.D. Harvey, Secretary, H.S.S.A.

SUGGESTED POSITION PAPER TOPICS

	Your priority
A. <u>General Issues</u>	
◦ Flood mitigation/flood warning/flood plain planning/flood insurance	
◦ Sewage treatment works and common effluent disposal in inland areas	
◦ Policies on mining of groundwater reserves	
◦ Water allocation policies in irrigation areas; water allocation between conflicting uses, e.g. irrigation versus wetlands	
◦ Wetland protection and enhancement	
◦ Re-use of sewage effluent	
◦ Water quality standards	
B. <u>Specific Issues</u>	
◦ Prevention of uncontrolled artesian discharge in the G.A.B.	
◦ Protection of mound springs	
◦ Salinity and land clearing on Kangaroo Island	
◦ River Murray salinity control programme	
◦ Land use planning and water quality in the Mt. Lofty Ranges	
◦ Operation of the River Murray mouth	
◦ Impact of drainage in the South East of S.A. and the issue of over-drainage	

GENERAL OR SPECIFIC COMMENTS