THE HYDROLOGICAL SOCIETY OF S.A. INC.

c/o Water Resources Branch
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GUEST EDITORIAL

WATER RESOURCES BRANCH (E. & W.S.) OPERATING IN A CUT-BACK ENVIRONMENT : A PERSONAL VIEW

I've worked in and out of Water Resources Branch for some years now, and although we have always talked about the coming "crunch" on resources (dollars, not water), I think in this particular financial year the crunch has indeed arrived. If you believe, as I do, that large government agencies in South Australia are embarking on a sustained and long term weight reduction exercise, then you might also be interested in my observations of W.R.B. in the context of this cut-back environment. The effects will be felt to varying degrees outside the Branch : in other departments, and among consultants and researchers; in fact among all members of the Society (H.S.S.A.).

What Business Are We In?

Water Resources Branch is in the knowledge industry. Its product is information. It achieves its output via three distinct components of the water resource management programme:

- hydrological analysis (assessing and measuring problems)
- resource management (doing the right things now)
- planning (looking ahead).

For each component there must be general objectives and quite specific goals. Whereas not too long ago we would take on almost any water related problem, now we must be much more selective. Priority setting has become mandatory.

It is vital that a balance is struck between these three separate components, and that this balance is continually reviewed and adjusted. For some years the emphasis in the Branch has been on resource management, with a reducing effect in the analytical area, and very little in the way of planning. In times of low population growth I believe that this balance is pretty good (although I have a personal bias towards hydrological analysis). The piont is that the Branch will need to base its priorities on informed contributions from the community - and that is an obvious role for the Society to look at. Perhaps one Society meeting annually should examine the past performance and projected workload of the Water Resources Branch.

Recent Trends and Some Predictions

Observing trends in an organisation can be very instructive. Here are a few that I've observed. I will leave readers to draw their own conclusions.

I have mentioned the move towards resource management, and away from hydrological analysis. I think resource management itself will become more sophisticated, with increasing reliance on local management plans and regional and Statewide policy formulation. Much less reliance will be placed on legislation, which has proved to be one of the most inefficient management tools.

Community involvement in water resources management will become much less structured. As at Langhorne Creek and Streaky Bay, the problems will be adopted by the community as their own. Solutions will be derived by the community, making use of Government assistance as required.

In turn this will necessitate the decentralisation of professionals from W.R.B. in Adelaide to country regions, a process which has already commenced.

Regional and Statewide planning or management studies will be carried out by multi-disciplinary, multi-departmental teams, supported by local government, community groups and consultants. The Mount Lofty Ranges Review Team is a good example. If may be too early to tell yet, but this particular trend appears to be working surprisingly well. Surprising, because as each government agency embarks on an enforced slimming exercise, one might expect less inter-departmental co-operation, not more.

A Role for Consultants and Researchers

I believe the role of non-government agency professionals in water resources management will increase as government manpower levels decrease. It is a mild form of privatisation, with all the efficiency and flexibility that is not available in the public sector at present. There are pitfalls, however, with the employment of consultants and researchers. For instance, I would

never employ a consultant unless I was prepared to devote considerable manpower of my own (say, 0.5 of a person) to work with the consultant on the project. As a general rule, funding research which has not been initiated by the Branch over some considerable gestation period, is a hazardous proposition. Indeed research funding by W.R.B. is in need of substantial overhaul.

The Pick of the Issues for 1990 and Beyond

If I were to select one single issue of Water Resources Management to be faced by all South Australians, it would be learning to accept that poor quality water is a fact of our environment, and that attempts to alter nature are very expensive. The Hydrological Society should take a leading role, first in de-bunking the rumour that we are short of water (there is plenty), and secondly by taking every opportunity to put our quality problems into context. APPROPRIATE and AFFORDABLE water quality goals is what the debate will be about in the next decade.

In Conclusion

I would speculate that W.R.B. is going to reduce in size significantly, and that as a result it is going to work a lot smarter. There will be a shake-out of activities and some will drop off. In some cases this won't be a bad thing.

To achieve the objectives of the water resources management programme, the problems will become community oriented, and outside professionals will bear more of the workload. The role of the Hydrological Society could become a key element of this new approach.

P. J. HOEY

H.S.S.A.'s IAN LAING PRIZE

All tertiary schools and departments in South Australia whose fields of study embrace hydrology-related sciences or water resources management have been notified concerning the Society's Ian Laing Prize. These study fields include hydrology, hydraulics, meteorology, hydrogeology, oceanography, marine or freshwater ecology, aquatic chemistry, geomorphology, water law and water resource planning and management.

To be eligible for the Prize, applicants must be undertaking the final year of an ordinary or honours degree course or post-graduate diploma course. The value of the Prize in 1988 is $250.00.

The Prize is competitive and awarded on the basis of:

- overall academic record;
- performance in subjects or units specifically related to the fields listed above;
- a demonstrated interest in the fields of hydrology or water resources planning/management.

Applications for the Prize will be sought in June of this year.

ARTICLES OF INTEREST.....

THE ENVIRONMENT INSTITUTE OF AUSTRALIA
(contributed by Steve West)

At last - a professional body for environmental practitioners!

The first Annual Conference and inaugural general meeting of The Environment Institute of Australia were held in Sydney at the end of November 1987. With an opening address by Sir Ninion Stephen and presentations by leading environmental practitioners from around Australia, the enthusiasm of approximately 250 conference delegates was exciting to witness.

This long-awaited organisation is multi-disciplinary in approach and intends to:

- facilitate liaison and communication between environmental practitioners from disparate backgrounds and professions; and
- promote environmental knowledge and awareness, and ethical and competent environmental practice.

As might be expected in the first official year of operation, there are some basic issues to examine to ensure the appropriate philosophical and administrative directions. The following list gives some idea of the task at hand:

- review of draft constitution
- membership categories and terms
- development of a code of ethics
- arrangements for State Chapters
- Trans-Tasman affiliation
- viability of a Journal.

To enable early membership, and the numbers in South Australia are growing steadily, the annual fee is currently set at $20.00. However, this situation will be reviewed as part of the process of fixing membership categories - one of the many items to be researched prior to the next A.G.M. The two criteria presently used to determine membership eligibility are:

1. Any person who has formal qualifications in environmental and/or natural resource management; and
2. Any person who has professional expertise in environmental practice, given that he/she has had at least three years experience and who does not necessarily hold a formal qualification as for 1. above.

This unique association has been formed to aid communication between environmental practitioners with expereise in the many differing facets of environmental management.

Membership forms may be obtained by contacting Steve West of Water Resources Branch, E. & W.S. Department, on 227.1479.

GROUNDWATER CONTAMINATION : USE OF MODELS IN DECISION-MAKING

Amsterdam 26 - 29 October 1987
Organised by : IGWMC, Delft

Report by Peter Dillon (CSIRO Division of Water Resources Research)

People

One hundred and eighty eight participants, more than 80% of them modellers, attended the conference. The Netherlands' contingent accounted for one third of participants, 21 came from the U.S. and, notably, only 8 came from Britain. There were four Australian representatives : Steve Hancock and Frans Kalf from Australian Groundwater Consultants, Gary Pantelis of Aust. Nuclear Science and Technology Organisation, and myself representing CSIRO.

Papers

These focused on 1-D and 2-D models of aquifer flow and solute transport, and uncertainties associated with model predictions. Two speakers showed that models calibrated on potentiometric heads could be completely inadequate for predicting solute transport. Instead, solute patterns can provide sensitive calibration of groundwater flow parameters. Only one modeller, Carrera (Spain), is routinely using automated model calibration. His inverse model achieved marginally better calibration fit than the usual trial and error approach.

Surprisingly there was no report of advances in simulating chemical and biological reactions in point source studies, although progress has been made in identifying the adsorption characteristics of heavy metals, phosphorous and pesticides. Source and sink terms are generally poorly defined in practice and this produces a large component of the uncertainty in model predictions. Diffuse source pollution models are increasing in number and application, but along with most solute transport models are unvalidated. Model validation is seen as the key to the acceptance of modelling by decision makers.

Rushton (U.K.) drew attention to the lack of vertical resolution of contaminant concentrations in aquifers, a factor most conceded was vital. Spatial variability problems were discussed and many speakers showed semivariograms in describing the adequacy of data for modelling. Some stochastic approaches were presented, notably by Gorelick (U.S.) and Gates (U.S.). Both pointed to the difficulties encountered when using non-linear equations. De Marsily (France) presented a paper on stochastic approaches to fracture flow investigating the relationship between fracture connections and the size of the minimum valid volume of an "equivalent porous medium". His geostatistical approach could be used with down hole geophysical logs to make real world applications plausible.

(A more detailed report on this conference and a study tour of The Netherlands and England on the theme "DIFFUSE SOURCE GROUNDWATER CONTAMINATION : MEASUREMENT, MODELS and MANAGEMENT" is available from Peter (ph. 274.9387) at CSIRO Div. Water Resources, Urrbrae. Ed.)

MURRAY DARLING BASIN COMMISSION
(contributed by Claus Schonfeldt)

On 30 October 1987 the Prime Minister and the Premiers of N.S.W., Victoria and South Australia signed the Murray-Darling Basin Agreement.

This Agreement amends the existing River Murray Waters Agreement to provide for the Ministerial Council and an expanded River Murray Commission now to be called the Murray-Darling Basin Commission. The expansion provides for two Commissioners per government who, between them, represent the land, water and environmental interests of their government. The broadened role of the Commission is to provide advice to Council on the management of the Basin's land, water and environmental resources in addition to the statutory responsibilities under the existing River Murray Waters Agreement.

These new arrangements commenced on 1 January 1988.

S.A. Commissioners are Mr, D. J. Alexander, Chief Executive Officer of the Engineering and Water Supply Department, and Dr. I. McPhail, Director-General of the Department of Environment and Planning.

S.A. Deputy Commissioners are Mr. K.J. Shepherd, Director Business and Information Services of the Engineering and Water Supply Department, and Dr. J. C. Radcliffe, Director General of the Department of Agriculture.

Salinity and Drainage Strategy

The Ministerial Council has endorsed, in principle, the salinity and drainage strategy. The strategy deals with the problems of river salinity as well as waterlogging and land salinisation in the Murray and Murrumbidgee valleys.

The key concepts of the strategy deal with:

(1) joint government funding of salt interception schemes regardless of where in the Basin the schemes are located; and

(2) the rights of each State to undertake actions which will increase river salinity but within well defined limits.

The overall impact insofar as South Australia is concerned is that there will be a substantial nett reduction in river salinity.

There are distinct parallels with the original River Murray Waters Agreement of 1914 which dealt with water regulation and distribution. That agreement provided for sharing of costs of control structures and established a formula for sharing the regulated water.

This latest agreement is historically as significant for water quality (salinity) management.

FROM THE HYDROLOGICAL TRAPS.....

KINHILL HYDROLOGICAL ACTIVITIES

Reporter : Chris. Wright

The cancellation of the Jubilee Point project has meant some reduction in the workload in water related projects. However alternatives such as the Encounter Lakes project have some interesting features. Encounter Lakes is situated close to Victor Harbour and is a development around an excavated lake, similar to West Lakes in concept. As with West Lakes, there will be a tide-driven flushing system.

Kinhill has been active in the development of the Jubilee Almonds project close to Overland Corner, in the South Australian Riverland. The almond orchards will cover at least 400 hectares on completion and will be irrigated by pumping from the Murray River. The pump station will have an installed capacity of 1000 kW, and an operating pressure of 135 metres. The rising main, 525 mm diameter Ductile Iron Cement Lined pipeline, 3,500 metres long, is one of the first large-bore pipelines to be constructed of this material in the state. The tender was won by Tubemakers competing against manufacturers of fibre reinforced plastic pipe. The almond orchards will be developed in stages of 80 hectares per annum over five years. The selection of the internal irrigation system, and in particular the sprinklers, has been carefully monitored by the Department of Agriculture at Loxton, and the Sprinkler Testing Station has been used to select the appropriate undertree sprinkler. Issues related to possible future drainage problems have been carefully condidered by the developers and by the E. & W.S. Department, and proper provisions for monitoring and dealing with any future rise in the groundwater table have been made. The scheme is expected to reach its peak production of 1,000 tonnes of almonds per annum in ten years time. Secondary products include Almond husks which are sold for stockfeed for the live sheep trade, and shells which have been utilised as a filler in the manufacture of snail bait!

URBAN RUNOFF QUANTITY/QUALITY DATA IN S.A.

Reporter : John Argue

A meeting of engineers and scientists interested in the problems posed by stormwater runoff from urban areas, in particular water quantity and quality, was held on Monday 8th February at S.A. Highways Department. Twenty-four representatives of Highways Department, E. & W.S. Department, Bureau of Meteorology, consulting engineers, local government, and the Australian Centre for Water Treatment and Water Quality Research attended.

The urgent need for measurement of urban runoff quantity/quality in South Asutralia was agreed in order to solve problems arising with certain of the State's recreational water bodies, e.g. Patawalonga, West Lakes, etc. An attractive spin-off from the data base which would emerge from such an initiative would be the opportunity to test, in the local environment, a number of urban runoff modelling procedures and computer packages developed in the eastern states or overseas.

The meeting formed a steering committee to operate under the auspices of Australian Centre for Water Treatment and Water Quality Research. Convenor of the committee is Dr. D. Mulcahy (School of Chemical Technology, S.A.I.T.). Hopes were expressed that the wide support expressed at the meeting would yield, in time, a data base which designers and recreational water resources planners have needed for the past two decades.

COOLING WATER FOR POWER STATION AT LOCHIEL

Reporter : John Waterhouse

Australian Groundwater Consultants have been busy working for the Electricity Trust of South Australia in the area north of Snowtown about 180 km north of Adelaide. The work has been aimed at establishing whether a supply of groundwater would be adequate for cooling of a power station at Lochiel. Aquifers in the Tertiary sediments of the northern St. Vincent Basin have been investigated by a preliminary drilling programme, and drawdown evaluated by means of a numerical model of the regional aquifer system.

The results will be reported to E.T.S.A. and will form part of the evaluation of one of the options for South Australia's future power generation.

THE MOUNT BARKER FLOOD STUDY

Reporter : Chris. Purton

An intense rainstorm on 9th April 1970 resulted in serious flooding along the creek systems of the Mount Barker township. Since that flood, there has been considerable development within the township. Some of this development has occurred within the limits of the 1970 flood-plain.

Pressures to develop floodplain land continued to increase in the 1970's and early 1980's. Consequently in 1985 the District Council of Mount Barker commissioned B.C. Tonkin & Associates to carry out a flood study of the township and prepare a management plan detailing the cost-effectiveness of various flood mitigation options.

Local flooding at Bernhardt Court, Mount Barker, in June 1987 demonstrated the wisdom in Council's decision to commission the study. These floods graphically demonstrated the desirability of having properly constructed flood-plain maps to assist the control of unsuitable development within flood plains. Post-analysis of this flood showed that the observed flood plain extent was closely predicted by the model set up for the study. The credibility of the entire study was greatly enhanced in the eyes of non-hydrologists by this dramatic model verification. (No, Tonkin's meteorologist, Chris. Purton, did not arrange for the rainstorm to fall on Mount Barker!)

The flood study recommended a programme of works to provide:

- a minimum 20 year standard of flood protection for existing developments affected by the Morphett Street creek system,
- a minimum 100 year standard of protection to other areas.

A conscious decision was made to combine good hydrology with sensitive environmental landscaping. For new development, it is recommended that the natural 100 year flood plain be zoned as drainage reserves and retained as open space. As far as possible, the natural creek regime should be preserved. Any necessary works within natural water courses should consider the environmental impact. Where appropriate, community input should be sought to assist in formulating the final shape of flood mitigation designs.

Tenders have recently been called for the first stage of the flood mitigation works for the area where the Mount Barker Creek joins with Railway Creek. It is intended that the flood mitigation scheme be systematically implemented over a number of years.

THE GAMMON RANGES RAINGAUGE PROJECT

Reporter : Chris. Wright

As a result of initiatives from John Waterhouse, David Kemp and others of the Scientific Expedition Group, a project is underway to site an automatic raingauge on the Gammon Plateau in the Northern Flinders Ranges. There are few rainfall records in the area, and the project will collect valuable information on the pattern of rainfall. In addition, a series of vegetation monitoring points will be established to correlate the growth of vegetation with rainfall events. The raingauge will be serviced at regular 2-monthly intervals by members of the Scientific Expedition Group, which encourages school children to take part in scientific work while at the same time becoming accustomed to life in the outback. Support for the project has come from a wide range of sponsors including the E. & W.S. Department, which donated the raingauge, the Highways Department, National Parks and Wildlife Service, the University of Adelaide, and many private organisations.

John Waterhouse and Chris. Wright set the wheels in motion when they completed the first equipment drop at the end of January 1988. In temperatures approaching the 40's, they backpacked 30 kg of photographic marker points to the top of North Tusk Hill, to await deployment at strategic spots by subsequent groups of workers. The setting up of the raingauge will be a challenge since the data logging equipment and the water container have to be located below ground level to avoid high temperatures, and the opportunities for finding suitable fissures on the top of the ranges are likely to be few and far between. Any members wishing to support or participate in the project should contact John Waterhouse (Australian Groundwater Consultants) or David Kemp (Highways Department).

FROM THE SECRETARY.....

The programme of activities for 1988 has already started, with an address by Russell Marks on the establishment of HYDROMET, on Thursday 25th February. He explained the rationale for a single data base to hold data related to water resources from a variety of sources, and was able to cite many examples where data bases had just grown, rather than go through a process of logical development. HYDROMET is the new data base being established by the Engineering and Water Supply Department to hold all water related data in South Australia. It offers considerable potential for storage and retrieval of data both as samples at a particular time, and for time-series data.

The success of the meeting was in jeopardy for a while due to a lack of any alcoholic beverages; fortunately the Society of Nutritionists obliged by providing the necessaries in the nick of time, and saved the day.

There are seven more meetings scheduled, with the possibility of an eighth, and they are listed in the Programme. They include a wide range of topics, and a debate on the advisability or otherwise of "Mining" groundwater. The debate will be held with two speakers for and two against the motion. There may also be an opportunity for contributions from the floor. The list of speakers has not yet been finalised. It is hoped that a suitably graduated applause meter can be borrowed to judge the success or otherwise of each contribution. Please keep the evening free so that you can attend.

The Committee has been active in seeking entries for the 1988 Hydrological Society Prize, and notices have been posted in all appropriate academic centres. The value of the prize this year is $250. For details, contact Claus Schonfeldt.

Several nominations have been received for Honorary Life Membership of the Society, and presentation of the certificates will be made at the Annual General Meeting.

HYDSOC Committee for 1988

Graeme Dandy	Chairman	228.5472
Jerry Maguire	Treasurer	227.4552
Chris. Wright	Secretary	223.7011
Claus Schonfeldt	Vice-Chairman	227.2787
Zac Sibenaler		274.7573
Tony Thomson		227.3122
John Argue	Newsletter Editor	343.3131
Anwen Aukland	Records Secretary	274.7500
Chris. Purton		223.5583
Steve West		227.1479
Peter Smith		274.7691

PROGRAMME OF MEETINGS FOR THE REMAINDER OF 1988

March 29th

Developments in the Murray Darling Basin Management.
Speakers: Don Blackwell and Prof. John Burton.
This meeting will be held in AMF annex.

April 14th

Hydrology of the Northern Flinders Ranges, Leigh Creek catchments.
Speaker: David Kemp.

June 23rd

A debate : "Groundwater. To mine or not to mine?".
This meeting to be held in AMF.

August 18th

Hydrology of the solar system?
Speaker: Vince Kotwicki.

September 22nd

New developments in the Rehabilitation of Irrigation schemes. (Joint meeting with Irrigation Association.)
Speaker: to be announced.

October 20th

An update on the groundwater hydrology of the Great Artesian Basin.
Speaker: to be announced.

November 17th

Hydraulic behaviour of the Hunter River, sediment transport, river bed scouring.
Speaker: Phil Geary.

There will also be a meeting at which Peter Hoey and Tony Read will discuss "Off-stream Storage for Irrigation in Thailand". Date to be advised.

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