AUSTRALIAN HYDROGRAPHERS ASSOCIATION

Australasian Hydrographer

Inside this issue:

2002/3 DEADLINES

The following are dates by which I require submissions, and advertisements, for the newsletter and quarterly journal to be in my hands.(or on my computer!)

ISSUE	DATE
February (Q)	07/02/03
March/April	01/04/03
May (Q)	09/05/03
June/July	01/07/03
August (Q)	08/08/03
Sept/Oct	1/10/03
October (M)	07/10/03
November (Q)	06/11/03

Welcome to the December/January Newsletter

Seasons Greetings to our members. I hope the hydrographic Santa brought some hope of more water to our areas of expertise. Undoubtedly our Northern Territory associates have been kept busy with the monsoonal trough that has been sitting over them for the last few weeks.

Meanwhile the drought continues to ravage the south eastern areas of the continent and in some areas at present massive fires are affecting water catchments. In the aftermath of these fires some catchments, from which populations or industry, be it agriculture or industry, draw their water, the threat to water quality by possible increased nutrient runoff is a real threat to the resource. Monitoring and quantifying of the impact of following rainfalls (if it ever rains again) will most likely be key activities in the management of the resource in coming months. Unfortunately key monitoring sites may also have been impacted on, if not destroyed, by the fires which will place added pressure on those trying to maintain hydrometric networks and respond to new monitoring demands.

Hopefully you will have been browsing your recent editions of the Journal and have noticed expiry dates for your membership. We would ask you all to consider to renew your memberships promptly so that records can be updated and as correct as possible. Previous reminders about membership have prompted members to get in touch with us to correct membership details. Membership lists have been in the process of being tidied up and Scott has been investigating the option of payment by credit card. At present the facility is still not available but it is believed it is not far off. When renewing your membership please ensure that you update your details as necessary by filling out the Membership application/renewal form always included with the Newsletter and Journal.

New employment opportunities seem to be in a surge at present and job descriptions are covering a wider range of duties and functions. On an initial glance they may not seem to be relevant to what we do, not having the name hydrographer or field hydrologist attached to them, but if you take time to consider the position descriptions you will see that some of the opportunities are looking for people with strong skill in hydrometric data networks and the collection, analysis and interpretation of the information collected. If you feel like a change or even a challenge take time to look at the selection of employment opportunities in this newsletter.

And finally you may have noticed that the web site has not been updated for sometime. Well Scott has been working on the new upgraded web site which can now be found at **www.aha.net.au**. Areas are still under construction and fine tuning but it is being populated by current issues and announcements. If you have anything to go in it, there is an email link to for you to contribute. Check it out and help to make it grow and be up to date.

Use it or Lose it

A New Zealand Hydrological Society workshop promoting innovative use of Environmental Data

Unlock those archives. How can the data we collect best be displayed, disseminated and utilised? Operational or 'field" hydrologists have recognised skills in collecting and storing information, but how good are we at passing that information on? This is an opportunity to learn how others are approaching this challenge, and pass on advances you have made.

Presentations are equally welcomed on wider Environmental Monitoring issues, such as the growing requirement to collect water quality information with river and groundwater flows, or even traditional topics such a rainfall measurement.

The workshop will be held in Whangarei on Wednesday 12 March 2002. It is expected the cost will be $80, to be confirmed. You do not have to be a member of the New Zealand Hydrological Society to attend.

Expressions of interest and enquiries should be directed to:

Martin Doyle
Tasman District Council
Phone (03) 544 3414
Email martin.doyle@tdc.govt.nz

A Perspective on the 11th Australasian Hydrographic Conference

"Innovative Environmental Data Collection"

Andrew Pearce, DLWC, Dubbo, NSW

Issue:

The hydrographic industry within Australia (and internationally) continually struggles with poor communication and the never-ending duplication of methodology. "Re-inventing the wheel" is perpetual and an area that repeatedly displays the need for a greater effort in bringing this profession together.

Background:

The Australasian Hydrographers' Association was originally formed by a group of Hydrographers that saw a need to make themselves and their profession "heard and seen". As a result of their hard work the Australasian Hydrographers Association (AHA) continues today and is driving to pull in new members (individuals, corporate bodies and companies) to unite this industry and the many people involved in gathering informative and intelligent data. Keith McFadden and myself saw this as an opportunity to hear what others were doing in the wider industry front, network with other personnel and draw on outside experience; areas were (as hydrographers in the CWR) identifiable skill deficiencies can be addressed with training.

Current Situation:

The 11th AHC ran over four days (Wednesday 3 to Friday 5 July 2002) and involved the presentation of 27 papers and technical reports, a formal dinner and concluded with a field trip to Warragamba Dam (Saturday 6 July). This year saw sixteen companies represented, displaying the latest instrumentation and services technology, over 80 participating persons and individuals representing South Africa, USA, PNG, Italy, New Zealand, Tasmania and Australia. Although the endeavour is to bring the industry together every two years, this is the first such conference for the past six years. A combined attendance of over 200 individuals across the conference program is an encouraging sign that the collection of hydrometric information has a growing future.

The opening address was given by Right Honourable John Aquilina (Minister for Land and Water Conservation). 2002 has seen Mr Aquilina take the Department under his portfolio a second time. Previously he held this position in 1986 when we were known as Water Resources. The minister highlighted the change in focus over the past decade from measuring a water resource to the issue of water conservation. As the world's driest continent we need to be smart in the direction and attitude we take in the future, with further planning requiring the delivery of good data.

Technological changes have seen a change from tradition (though some is still kept) from the Department relying on the community to the community relying on the Department. With advancements in consultation to community groups, telemetry, data collection techniques and water quality issues, there is now a biological emphasis toward sustainable environmental management. Today the requirement is to justify data collection and analysis. Good data allows informative decisions and intelligent conclusions to be made with practical objectives being achieved through clear focused initiative.

The keynote address was delivered by Mr Alex Walker. As Managing Director for Sydney Water, he also highlighted changes within the industry, most notably the innovation of new technologies. With the core basis of hydrographic information still the same, the growing demand from clients is real time data being presented as useful information with a "self serve" approach to data access at anytime. Industry growth is influenced by change from what Mr Walker identified as five key areas.

Competition is a positive driver, which motivates greater efficiency in meeting client demands and improved technology to collect more accurate data. Consumerism for our data has increased, now being requested by not only specific clients but the public and other industries also. Globalisation is adding pressure to industry bodies as developing countries seek to monitor and conserve their own water resources. This in itself allows instrumentation companies to grow in new markets. However, the call for trained hydro graphic personnel to developing areas (from an already short-staffed industry) requires the data collection industry to streamline it's efficiencies to meet this gap along with a need to encourage the new generation to look at hydrographics as a real career potential.

Regulation has lead to a stronger industry base with companies and departments being challenged to provide a greater value for money product. Lastly, though probably the greatest influence to our industry, is the environment and the growing sensitivity and awareness of people toward conservation for tomorrow. Mark Harvey from Department of Water Resources, South Australia addressed the issue for accountability of environmental issues posing the question "How much are we compromising the environment with poor or indifferent planning of data collection sites and the interference to the natural area attributed to unnecessary multiple visitations"?

Professor James Ball from the University of NSW discussed the use of modelling to predict catchment response for conditions not yet experienced. Phil Downs (Environment Canterbury New Zealand) and Scott Walker (Sydney Water) also highlighted the use

of prediction modelling. These models are being used with real time data sets from stream height, water quality, flood warning and weather station sites, to allow authorities to action responses to forth coming conditions eg: high rainfall, poor access to sites, high flows (rating purposes) and flooding. It was pointed out that for models to be accurate, accurate data is required to check simulations. As a resource, the quality of the water now often influences the available quantity for use. This scenario leads to a greater need for data integration and accuracy so models can be tuned to simulate environmental systems.

Bronson McPherson (Manly Hydraulics Lab) and Scott Walker alluded to the fact that for the integration of data into decision support systems, a clear understanding of the data systems is first required. Real-time data is acquired from remote location catchments to a base station server for dissemination. Understanding the parameters such as catchment area, landuse, monitoring regime, sampling frequency and data speed becomes a priority. The data is being collected, the question remains "Is the data being utilised for maximum benefit"?

Continual real time data retrieval is also being used for staff safety. Remote access to a station logger, automatically time stamps remote link up which is verified by the data coordinator back at the central office. This simple but valuable tool has already saved the life of personnel. The ultimate benefit of real-time data capture is the ability to respond to failures, thereby reducing data lose and increasing network reliability. In a day and age where quality assurance plays a key role in client satisfaction, continued telemetered monitoring of entire station networks is already paying significant dividens. The question to be answered is "At what cost is a site without telemetry"?

Christoff Le Grange (Department of Water Affairs and Forestry, South Africa) gave an action packed and informative presentation on their activities. With nearly 2000 gauging stations (most with up-stream and down-stream heights and water quality) the use of precalibrated artificial controls is used in 80% of all situations. This allows for improved rating for stations in a country were rainfall varies between less than 200 ml/yr to greater than 1000 ml/yr. Although the initial outlay for station establishment is higher due to materials for infrastructure, the improved accuracy of data quickly accounts for this higher cost. It certainly raises the question "Is the cost of no improvement to the control justified by a poorer quality data set than what can be achieved"?

The advancement of different telemetry techniques was considered with SMS text messaging being the latest frontier. Through rigorous testing this method has proved itself to be reliable future proof technology. Many of the presenters touched on the principal fact that they never limited their equipment, data, themselves or their clients to a single telemetry type. They employed whichever combination best suited each individual situation. Whether Telstra, Vodafone or Optus. Whether GMS, CDMA, Satellite, Radphone, UHF, VHF or a combination. Several networks operated by other industry authorities utilise radios to a base station then CDMA for multiple telemetry downloads throughout the course of each day. The point raised was "The only limitations are the ones you put on yourself"!

Further presentations in technology allowed John Hought (VEGA) to enlighten our senses to radar level measurement in hydrographic observations. Radar operates between 6.3 and 26 gigahertz and is not influenced by heat, wind, condensation, mist, fog, humidity, dust, or atmospheric pressure. By utilising a higher frequency an increased level of accuracy is achieved (2 to 10 mm over a 35-metre range). Radar probes are being successfully employed for level measurement of rivers, dams, weirs, billabongs, sewage outlets and for tidal monitoring. These probes have no contact with the water body, are low cost, low maintenance, low power use and can be used up to a range of 35-metres.

All forms of measurement have disadvantages, which must be weighed when selecting an instrument to use. David Johnstone (National Institute Water & Air research, New Zealand) focused primarily on this issue. Optimising data quality from environmental monitoring stations raises the question of what information is required. By knowing this it can be established what data is needed. The confidence of the data collected in turn establishes the value of the information. While random errors can be statistically quantified, systematic errors (due to a lack of understanding) lead to erroneous and poor decisions being made. This is where the selection of a sensor probe must be closely scrutinised since errors become accumulative from this point (so to speak).

Since the measurement point becomes representative of a wider area it is imperative that the correct sensor type be utilised for the situation. Choosing a simple, dumb or smart sensor is only part of a much broader equation. The resolution, sensitivity, range, parameter being measured and environmental location also need to be considered. Any probe can be made to work in the lab. The influence of temperature, accuracy, quantity and quality of data required and cost determined by client needs hence project objectives along with sensor reliability, robustness, utility and power needs will be contributing factors. Beyond the probe, it must be considered the data transmission and programming options, logger selection, maintenance

and calibration requirements. Then there is the question of installation and security.

Michael Clayton form the Department of Primary Industry Water Environment, Tasmania presented their findings from a rigorous 6-month test on turbidity probes. Utilising a Mindata 2600, Greenspan TS100 and BTG Polymetron (this probe has internal calibration utility) the experiment involved continuous data collection, minimum maintenance and frequent grab sampling to determine probe performance. Whilst turbidity remains a contentious issue, the parameter is influenced by particle size and shape, density, composition and the type of light used by the sensor probe.

It was established that the BTG operated within 10% FSD whilst the other two probes functioned within 5% FSD. Hence, it was established for turbidity probes to achieve optimum performance, a high level of maintenance is required. Clean lenses frequently, understanding and accounting for limitations, utilising lens cleaning and probe protection devices, calibrating the probe throughout the entire range and collecting frequent samples to verify recorded data. Glen McDermott (Sydney Water) raised the topic of the ramifications and issues involved with measurement uncertainty and "What is the ultimate effect of reduced visits per annum having on data quality"?

Wednesday late afternoon was given time for the AHA Annual General Meeting were new members to the committee of management were elected and the decision voted to re-establish the conference as a bi-annual event to bring the industry together. Thursday evening was a formal dinner with comedian entertainment and the presentation of the Alex Miller Award, which went to David Williams (Department of Infrastructure, Northern Territory) for the most entertaining and interesting presentation. David has been working for some time on a project in North-East Arnhem Land to model and understand the fluvial, wetland and estuarine interactions.

Friday was primarily devoted to HUG. The Hydsys Users Group meeting allowed staff to hear the merger of Time Studio and Hydsys into a corporate body under the new name HYDSTRA. The evening was the hydrographer's reunion with an early 0745 start (thanks to our convenors) on Saturday morning to look at the new works to the Warragamba Dam Auxiliary Spillway before lunch at Hydrological Services premises (courtesy of Bill Barrett).

A closer working relationship must be established / maintained with our bordering regions and industry representatives in order to remove communication breakdown and share new technologies and methodology. Therefore building a stronger industry base for the future.

AHA Office Bearers and Contact Information

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Secretary, Scott Walker
Scott.Walker@sydneywater.com.au
Treasurer, Max Hayes
gipps-hydro@i-o.net.au
Publicity Officer, Mic Clayton
michaelc@tassie.net.au
Public Officer, John Skinner
jskinner@ecowise.com.au
Web Site: http://www.aha.net.au

Techno Head

Recently Technohead had the opportunity to trial a Hydrological Services AD375A Shaft encoder and found a number of handy features available with it.

The unit is a dual output shaft encoder, outputting both an SDI-12 output and a 4-20 mA output. A nifty feature is that the 4-20 mA output can be configured to be representative of 65 different ranges from 1 metre to 65 metres in 1 metre increments That is the unit can have the output representing a 0 -1 metre range or the same unit configured to have the output scaled to a 0 - 30 metre range so electrical resolution is beautifully maintained for smaller measurement ranges!

The signals operate independentently of each other and the 4-20 mA output side of things is optically isolated as a measure of protection from power surge problems if the 4 - 20 is conneced to secondary equipment.

From the front it looks like your stsndard Hydrological Services shaft encoder but its backside has a sexy little backlit LCD screen and simple push button configuration enables the user to view the current level of the shaft encoder (a feature not available with your standard AD375 which can be very frustrating if you can't interrogate the data collection unit in the field). The configuration of the unit can also be altered via this screen and the push button system.

The trial conducted involved connection of the SDI-12 side of things to a Unidata 6541-11/c combined shaft encoder and Micrologger running on MEA Magpie software which logged both the 6541 and AD375A levels for comparison, while the 4-20 mA side was connected to an ELPRO canister. The ELPRO was configured to control and supply the power for the 4-20 mA loop at intervals of 1 minute and to transmit data on 5 mm variations of stage.

The trial ran over a period of two weeks on the bench and in a remote field location and basically data collection and data transmission from the setup in the field didn't miss a beat. The unit was easy to setup and interface with thedata collection platforms it was tested on and data sets collected tracked well against each other. Only one, considered minor, problem seemed to occur and that was that occassionally when in SDI-12 real time information mode within the Magpie program, the return responses from the AD375A seemed to get lost if the SDI-12 commands were ended accidently with the return key rathjer than an ! (exclamaton mark), though this was quickly sorted out by closing and reopening the SDI-12 comms window in Magpie. (*Bill has provided a response to this glitch and it is presented following this article - Ed*)

During bench testing a number of Magpie scheme configurations were played with including time based logging for the 6541 in parallel with event based (change in stage conditions) logging for the SDI-12 signal and all options gave good results.

In installations where there is more than one interested party in the water level being measured at a monitoring site, the AD375A offers a neat solution. Flood warning networks, be they council systems or the Met Bureaus networks utilising systems like Alert, can be piggybacked with a minimum of fuss while allowing the main on-site data collection system to be maintained easily.

Reply from Bill Barratt

Thanks for returnibg the demo AD375A with your constructive comments.

In regards to your comments:

1. We have checked the SDI-12 outputs and inputs from the AD375A with the SDI-12 checker we have from the U.S.A and it shows all signals conform to the specifications.
2. When changing ranges we would recommend the encoder be disconnected from the system. Then set up as if a new system including setting the range in the logger and telemetry system.

Regards

Bill Barratt.

NEED A JOB

(Some selections off the web)
You can also try **our web site**
http://www.aha.net.au
OR
Subscribe to 'NRMjobs' by sending a blank email to:
nrmjobs-subscribe@emailmedia.com.au

PRINCIPAL HYDROLOGIST (Readvertised) (26454)
Applications Close:- Friday, 7 February 2003.
Salary Range:- $58,895.00 - $63,380.00 per annum.
Location:- New Town.
Duties:- As a professional manager and practitioner, manage the Hydrology Section within allocated resources to provide information and advice that will ensure Tasmania's water resources are managed on a sustainable basis to support the continued prosperity and development of the State's industries and the

community's standard of living. Lead the design and implementation of hydrological studies and hydrometic monitoring systems in Tasmania's waterways. Co-ordinate the provision of specialist professional policy advice on hydrology, hydrometry, and water resources data management. Provide expert review of internal and external investigations, research and reports containing hydrology, hydrometry, data analysis and data management issues. Ensure the development and application of relevant knowledge, data networks, tools and techniques within the section.
For further information visit www.jobs.tas.gov.au
Closing date: 7 February 2003

PRINCIPAL PROJECT OFFICERS, WATER ASSESSMENT (3 positions),
Woolloongabba, Queensland
Salary range $64,501-$69,160pa; VRN: NRM 1740
Department of Natural Resources & Mines

KEY DUTIES: To provide professional leadership, management and direction of activities associated with groundwater/surface water resource assessment and research. Provide scientific leadership and advice through the ongoing development of surface/groundwater hydrologic and hydraulic modelling.

CONTACT: For a Position Description, visit: http://www.nrm.qld.gov.au/about/employment/current-vacancies
Closing date: 10 February 2003

ENGINEER/HYDROLOGIST (HYDROLOGY SECTION), Melbourne
Salary: $38,549-$49,198 or $50,421-$56,513pa
Bureau of Meteorology

The Bureau is the lead national agency with responsibility for flood warning services throughout Australia. Duties of the position extend across the investigation, design, installation and operation of flood warning systems. This includes development and application of hydrologic models, design and installation of data collection systems and the use and development of computer based forecasting systems. It involves liaison with partner agencies and application of project management skills; participation as a member of a forecast team during flood events and media liaison. The position involves shift work during periods of flooding.

CONTACT: Enquiries: Alan Baker, 03-9669-4983. Selection documentation: Lester Gerchow, 03-9669-4969. Closing date: 7 February 2003.

Dam Approval Overturned.

The Tasmanian Resource Management and Planning Appeal Tribunal has today overturned the approval of the proposed Meander Dam. The Tribunal has found the environmental impacts of this proposal on two threatened species, the spotted-tailed quoll and the heath species Eapcris aff. exserta, to be significant, and that the proposed mitigation measures for these impacts to be inadequate. The Tribunal has also found that the economic benefit was as unlikely to be as great as that stated by the proponent, and was instead likely to be somewhere in between that suggested by the proponent and the economic loss that the TCT's expert predicted. TCT Water Policy Officer Craig Woodfield says:
"We are also pleased that this saga is finally over, and hope that attention will now be focussed on sustainable management of water resources in the Meander Valley and elsewhere in Tasmania."

Excerpt from the Tribunal's decision:

"The dam would create economic benefits ranging from below zero to a substantial amount represented by a present value, at the higher estimate, of $39.4 million. On the state of evidence before the Tribunal, it is a matter of speculation as to where in that range the result would lie. In addition, there would be potential environmental benefit from the maintenance of an environmental flow in the Meander River. There would be flow on benefits by way of increased employment and general economic activity. To some lesser extent these benefits could also result from on-farm dam construction. To the extent that benefits would flow, they would be achieved at the cost of substantial adverse impacts upon both the quoll and Epacris species. Upon the evidence before the Tribunal no way was apparent of avoiding or even substantially mitigating those impacts upon the Epacris species. Whether reasonable mitigation of the impact upon the quoll species could be achieved was uncertain because provision of an adequate communication corridor to replace that existing through the proposed inundation areas would depend upon the acquisition of land outside the ownership and power of the applicant
Upon the present state of evidence the Tribunal is satisfied that the certain and further likely environmental harm arising from construction of and the existence of the dam, clearly outweigh the less certain benefits. The Tribunal is satisfied that the proper decision is to efuse a permit for the dam."

Membership Application/Renewal Form

The Secretary,
Australian Hydrographers Association,
P.O. Box 456
Bowral
N.S.W. 2576

Dear Sir

I wish to **Become a Member /Renew my Membership** of the Australian Hydrographers Association.

Name: _____

Address: _____

_____

Phone: _____

e-mail: _____

Employer: _____

Title: _____

Address: _____

_____

Declaration: My employer is an Australian Hydrographer Assn. Corporate member. Y / N

Membership Grade:
Individual Member ($100 to end of Year 2003)
Corporate Employee Member ($90 to end of Year 2003 only if your employer is a corporate member)
Retired/Student/Cadet ($50 to end of Year 2003)
Corporate ($500 to end of Year 2003)

I enclose **$** . *Please make cheques payable the Australian Hydrographers Association*

I wish to receive my monthly Newsletters by **e-mail / post / I will down-load from the web site.**
I wish to receive my quarterly Newsletter at my **Home / Work** Address.
I wish to receive my issues of *WATER* magazine at my **Home / Work** Address.

Signed: _____

Date Received _____ *Member Number* _____