AUSTRALIAN HYDROGRAPHERS ASSOCIATION

Australasian Hydrographer

Glenmaggie Weir bears the brunt of the June floods in Victoria!
Photo provided by Max Hayes.

August, 2007

The Australasian Hydrographer is the Journal of the Australian Hydrographers' Association Incorporated. ISSN 0812-5090

Save up to 90% on your telemetry comms costs

We can provide a wireless IP telemetry solution using your existing dataloggers and dynamic IP addresses that could pay for itself in less than 12 months (particularly with large networks based on CDMA dialup devices).

By replacing your CDMA modems with our iCE³ intelligent modem devices (available for GSM and Next-G™ networks) and installing HydroTel for your telemetry operation, you can convert existing dialup stations to wireless IP operation using readily available dynamic IP addressing. This will work on most dataloggers supported by HydroTel including Campbell, Unidata etc so you can leave existing loggers and sensors in place and simply replace the modem (which you will need to do for CDMA stations anyway with the closure of the CDMA network in early January).

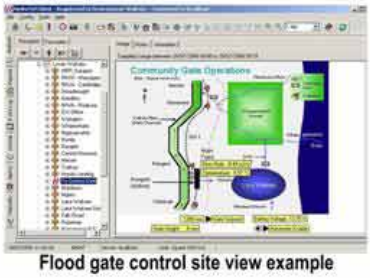
If you are polling 200 stations several times a day, your current call costs could be $100,000 or more. By switching to wireless IP this cost can be reduced to just $12,000 ($60 per year per station) resulting in a saving of $88,000 every year in total communications costs. Furthermore, you can increase the polling frequency without additional communication costs.

Please contact us to discuss details of the costs involved for upgrading your system so that you can assess the implications for your operations.

HydroTel® – leading edge environmental telemetry

See latest sensor values displayed over the top of catchment maps and with a single mouse click initiate an on-demand poll of a catchment area or an entire district containing several catchments. All visual data displays (graphs, site schematics and catchment maps) update dynamically as the HydroTel Communications Agents bring in new data via dialup, radio or wireless IP.

HydroTel handles most datalogger types, provides comprehensive alarm management and telemetry of colour photo images.



Flood gate control site view example

Communications may be done over a variety of transports (dialup, radio, IP, telnet etc). Data can be made available to your external stakeholders via the HydroTel Web Server which supports interactive graphs and data download.

iCE³ Wireless IP Circuit Extender

If you have considered migration to IP telemetry then you may have encountered either of the following hurdles:

- Replacing existing dataloggers with new IP dataloggers;
- Requirement for fixed Internet (IP) address.

The iCE³ provides a technological breakthrough enabling you to setup virtually any standard logger type (Campbell, Unidata etc) as a wireless IP device using either a dynamic or fixed IP address just by replacing the existing modem.

Although the use of dynamic IP addresses requires the use of a HydroTel® telemetry system, communication cost savings are likely to enable you to fully recover the cost of upgrading to HydroTel.

The iCE³ (available for both GSM/GPRS and Next-G™ networks) provides the most cost-effective migration strategy for replacement of "soon to be obsolete" CDMA devices.

iRIS 320 – Wireless IP Logger

- 4 x Analog Inputs
- 2 x Digital Inputs
- 2 x Digital Outputs
- SDI-12 Input
- VGA Camera Input
- GSM/GPRS or Next-G™ Comms

As well as logging sensor values, this logger complete with integrated communications module is also capable of taking pictures so you are able to see the level of inundation during flood events. The Wireless IP capability enables you to have pictures and sensor data transmitted via Internet every hour for a fraction of the cost of dialup telemetry.

Other features include: SMS data requests, Voice option, Heavy duty IP-65 casing, weather proof external LCD display and keypad, integrated charger/regulator circuitry.

iCAM VGA Camera Sensor for iRIS 320

For $660 (inc GST) this robust little unit adds visual imagery to your iRIS data logging. Images are taken at fixed intervals within a specified period each day and also can be initiated remotely "on-demand" if you are using HydroTel for your telemetry operations (you can even specify image size).

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THIS ISSUE

EDITORIAL

Yes, unbelievably we have had hydrographic excitement in Australia this year as our cover shows. Area receiving flooding rains included Gippsland area of Victoria, the Hunter region of New South Wales, Tasmania and the hinterland of Brisbane.

The isolated nature of these events, both in locations and timing emphasised the fickle nature of Australia's climate as the events did not co-operate with what we humans wanted by not covering areas where it was needed, or prolonged the rains over a longer period to have less destructive results.

While Gippslanders swam laps in paddocks, hardly any of the storms passed a further few kilometres over the Great Dividing Range to provide relief to the upper catchments of the Murray River system, and Melbourne's water supply only received a small increase as a result.

This isolated and sudden ferocity of events such as these make life for a hydrographer difficult and challenging as well. Such events test the level of preparedness of staff and infrastructure to monitor and report events as they occur, conduct important high flow gaugings in elevated risk conditions, the skills and knowledge of hydrographers are put the test after the event has finished as we attempt to devote time to analysing and checking results so they are fit for various data uses down the track and there area multitude of follow up activities that we know need to be attended to – but do we have the resources to get these done efficiently as well as continuing on with the routine activities associated with hydrometric data collection?

It is now being generally acknowledged that a skills shortage is occurring in our profession with an aging demographic, younger blood willing to learn are having difficulty finding appropriate study and training to prepare them for almost immediate hydrometric network operations (remember the days when traineeships guided new people into the profession with study and work related training?)

Hopefully with the increased impact of the long dry these issues will be addressed and the Association is involved in a number of exchanges with other bodies at present attempting to try and find a path for addressing the skills issue effectively. There is still some way to go on these issues but with your support we will see away forward that will benefit the Nations water plans.

Mic Clayton - Editor

The **Australasian Hydrographer** is the Journal of the **Australian Hydrographers' Association Incorporated**. The Journal is distributed quarterly to Members.
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Visit our **Web Site** at: **http://www.aha.net.au** to download a Membership application and to find contact details for your state representative.

Editorial and advertising enquiries should be directed to the Association's **Publicity Officer**, Mic Clayton.

Journal editions are generally produced February, May, August and November. Copy is requested to be with the Publicity Officer by the previous month.

e - mail publicist@aha.net.au , or
PO Box 843, COOMA, NSW, 2630.

Letters to the Editor

Dear Editor,

I really enjoyed the article "Water Information-clarifying its quality and making other understand" (May 2007), and how clearly the key issues were brought out, using that most basic of measurable items "water level".

I for one believe that this one aspect (ie discussing it, coming to grips with it, and maybe even heading towards a standard for "quantifying" quality) is the critical improvement aspect for the hydrometric industry in general (ie for water level, temperature, DO etc as well).

As you point out in your water level example, although AS3778 covers most aspects, it still requires intelligent thought to determine what aspect gazumps what other aspect (ie it's not always correct to simply add all the possible sources of uncertainty- because some are either/or)

So, keep up the good work. Looking forward to the next instalment.

Regards

Glenn McDermott

EarthTech

(*Glen has contributed an article on Uncertainty and Accuracy in this issue - Ed*)

Re - Water Information Clarifying its Quality and Making Others Understand

Commentary by Alex Springall [1]

Technohead's article in the May 2007 issue raises some important issues regarding water data quality coding, and one of the most important of these is the recognition that a number of components go to make up the final record quality of (say) a discharge record.

Most quality coding systems apply a lower numerical code to better data. As one who has been involved in developing data quality codes for many years, I recognised (but never solved) the problem of comparing the quality of two sets of data. For example, is a discharge record derived from a stage record of low precision and a rating with narrow confidence bounds better than a record derived from high precision stage measurement and a less precise rating? HYDSTRA and other systems attempt to solve this problem by applying the worst (ie numerically higher) quality code of either stage or rating, to the discharge record.

This implies that the quality codes of the two parameters are comparable. For example, the quality code that represents a precision of ±20mm in stage measurement should also represent a difference of 40mm between the 95% confidence bounds at the recorded stage.

However, even if it were possible to set up the quality codes for each parameter in this way, the code applied to a discharge record would be misleading. A discharge based on a rating quality that implied a 40mm difference between the confidence bounds and a ±20mm precision in recording stage would have the same quality code as a discharge based on a rating quality that implied a 40mm difference between the confidence bounds and a ±5mm precision in recording stage. This is not theoretically correct, neither does it give the user all the information that may be needed or is available.

An alternative system

Technohead's mention of binary codes set me thinking. In computer systems, it is not uncommon to report the status of the system by number. In some systems, these numbers are made up of a combination of binary codes representing the state of several components of the system. For instance, if a simple system is made up of four components, each having four possible states, the state of the system as a

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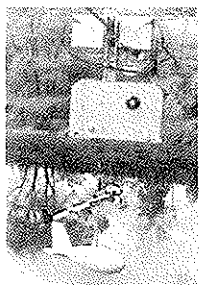
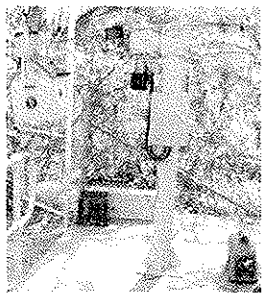


VERSATILE



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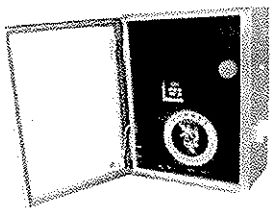

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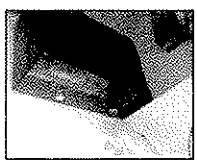

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whole could be represented by a decimal number between 0 and 255 (2^8-1), as shown below.

Component A		Component B		Component C		Component D		Instrument State code
1	0	1	1	1	0	0	1	185
0	1	0	0	1	1	1	0	78

A decimal-binary encoder allows the user to see the state of each component of the system.

Similarly, an 8 bit quality code could represent four quality values for each of four inputs or sixteen quality values for each of two inputs. For example a flow record quality code could be made up of the code for the rating made up of two bits and the code for the height record, of four bits, decoded to decimal. Similarly, the height record could be further decoded to two 2-bit components representing the precision of the height measurement and accuracy of time measurement.

Such a system would require that the location of the binary quality code for a 'parent' variable was always located in the same location in the 'child' variable. In the example above, the quality code for a discharge record may always be made up from:-

Height quality	Record code			Vacant bits		Rating quality	Table code
Height Quality	Precision Code	Time Quality	Accuracy code				
Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1

but not as

Rating quality	Table code	Vacant bits		Height Quality	Record code		
				Height Quality	Precision Code	Time Quality	Accuracy Code
Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1

The vacant bits could be used as quality codes for another variable, say conductivity, which would carry through to the code for salt load.

The main advantages of this system are that i) no 'child' record will have the same quality code for different quality 'parents', and ii) it allows a user to track down the origins of the quality code for any parent or child variable using a decimal-to-binary encoder. The main disadvantage is that the numerical quality codes for a 'child' variable do not necessarily increase as the overall quality of the data decreases.

1. Alex Springall is a retired Hydrographer who now teaches the Hydrography Certificate part time through OTEN, and turns wood into sawdust in his spare time

AHA Annual General Meeting 27th Annual General Meeting – 15th August 2007 Crowne Plaza, Canberra, Australian Capital Territory

Attendees:

Members: Mick Yemm, Peter Shaw, Ray Boyton, John Hayes, Paul Jensen, Tony Polchleb, , Karen Ellis, Judy Swan, Ross James, Mark Schmidt, Brian Chester, Alex Springall, Jacquie Bellhouse, Bill Steen (Chairman), Max Hayes (Treasurer), Mic Clayton (Publicist), Michael Whiting (Secretary), Denby Angus, , and Jason Venables.

Visitors: Scott Crozier, Graham Parsons, Paul Cleaver, Gary Newton

Apologies:

Paul Langshaw, Bill Barrat, John Skinner.

Meeting Opened at 16:30

1. Verbal précis of minutes of last years AGM held in Darwin, from Mic Clayton. Accepted by Bill Steen, seconded by Tony Polchleb.

2. Chairman's Report read by Bill Steen (Refer attached Report). Ross James on behalf of the Bureau of Meteorology thanked the Australian Hydrographers Association for it collaboration for the Hydrographic Workshop.

3. Treasurers Report tabled by Max Hayes, including Budget Cycle for the next year.

4. Publicity Officer Report tabled by Mic Clayton.

5. Secretary's Report, and brief report on the Department of Water's 2007 100 Years of Hydrography Celebration, tabled by Michael Whiting.

6. Resignation of Scott Walker as a Committee Member tabled.

7. Election of additional Committee Member conducted. Paul Langshaw nominated with no other nominations provided. Paul Langshaw elected unopposed to the position.

General Business

1. The option of selecting Canberra as the location of the 2008 AHA Conference was discussed by Bill Steen. It was felt that this was an opportune time for the key players to provide representation at the Conference including:
   - Bureau of Meteorology.
   - National Water Commission.
   - Murray Darling Basin Commission.

   Various options for location and timing to be discussed at the next Committee meeting. Issues associated with the attendance of politicians was discussed with an understanding that Conference would need to be held when Parliament was in session.

   General consensus from members that this was seen as a good idea.

   Judy Swan indicated a willingness to provide assistance for organisation, and good to have an AHA point of contact in Canberra.

   Overall agreement by attending members for next AHA Conference to be held in Canberra.

2. Question raised by John Hayes regarding the $80 million of funding in Hydrometrics, can the AHA be directly involved in negotiating with Bureau of Meteorology i.e. the use of ADCP across the States (??)

   Comments:

   - ADCP usage was identified as part of the National Hydrographic Workshop for the creation of an expert committee. Summary of Workshop to follow soon.
   - The $80 million has not been distributed to the States, Telemetry is seen as possible technology for improving hydrometric data delivery.
   - AHA to remove the parochialism from across Australia, by presenting a national approach, and any proposals to be endorsed by the AHA to remove the issues associated with agency/company rivalries.

Meeting Closed at 17:35

Chairman's Report 2007

2006 and 2007 have been extremely interesting years for the hydrographic industry with the promises of major changes to occur over the next 5 years.

The most significant of these has been the Commonwealth government's announcement of a $10 billion injection into the water industry. Although this legislation has not been passed through parliament I strongly believe that in one form or another money will filter down to address hydrographic concerns.

Prior to the announcement of the National Plan for Water Security [NWSP] the AHA had actively pursued funding from the National Water Initiative to address quality standards. This proposal was lodged in September 2006. In early 2007 the National Water Commission, administers of the funding, contacted the AHA on numerous occasions to clarify various issues regarding our proposal. However since them after numerous attempts to obtain an update on the proposal we have had very little to no contact with NWC.

However under the NWSP there are provisions for the Bureau of Meteorology [BoM] to undertake the responsibility of national standards.

In July 2007 the AHA was asked to assist BoM in the coordination of a National Hydrographic Workshop to address the needs of the industry. The workshop agenda included;

- Water Data Standards
- The purposes for which water data is collected and by whom
- What standards are known to exist?
- Where are they applied
- Where are they documented
- How to structure a stocktake of standards in use
- The data chain
- The process for standards development and issue
- The role of the National Measurement Institute and Standards Australia
- Expert Panels and Legislative Instruments
- Compliance with standards
- Processes

Hydrographic Skills
- Bureau of Meteorology Technical Training
- Hydrographic skills training
- Options for the future and how to get there

The committee has also been actively looking into national hydrographic training and options for ensuring suitable qualifications are maintained to address the industries need and shortfall in hydrographic personal.

My strong belief is that the AHA is on the verge of lifting its profile and becoming more actively involved in national hydrographic issues.

Cheers

Bill Steen,
Chairman, Australian Hydrographers' Association

Secretary Report – 2007

This is the second year I have held the position of Secretary for the Association, over this time I have been fortunate enough to be part of the ongoing efforts of the committee to rebuild Association and improve services to its Members.

It has been a challenging year for me both personally and professionally and I look forward to being part of the Association over the next year.

Membership Summary

One of the key roles of the position has been the development and management of the Membership database, and the production of membership renewals at the start of each Financial Year.

The 2006/07 Members are distributed across Australia

State/Country	2006/07	2005/06
QLD	9	7
NSW	45	29
ACT	7	9
VIC	16	11
TAS	5	5
SA	12	12
WA	21	24
NT	7	5
International	8	4
Total	**130**	**106**

This distribution was made up of the following membership categories:

Membership Type	2006/07	2007/08 (Current)
Individual	76	30
Cadet/Student	6	4
Retired	7	2
Life	2	2
Bronze Corporate	9	4
Silver Corporate	-	1
Gold Corporate	2	2
Corporate	26	27
Sponsored Courtesy	2	2
Total	**130**	**74**

2006/07 Corporate Members:

Gold Corporate:
Thiess (Hydrographic Services).
Kisters Pty Ltd.

Bronze Corporate:
Bruttor International Pty Ltd.
Aqualab Scientific Pty Ltd.
Enviroequip Pty Ltd.
Scott Technical Instruments Ltd.
Water Data Services.
Science Reality.
Bureau of Meteorology.
Department of Water.
Unidata Pty Ltd.

The last three years have seen a steady increase in financial Membership, it is anticipated that this increase is due to not only the improving profile of the Association across the industry but also the resurgence of Hydrography across Australia.

A total of 115 renewals were generated during July, with a total of 100 renewals emailed out to members. This included past Members from 2006/07. This proved to be a more appropriate method of Membership renewal, with only 15 renewals requiring posting or hand delivery. It is anticipated that the membership rise to all time high over the next few months.

Committee Meetings:

Only one committee meeting was held since the last AGM in Darwin during 2006, this was held in Canberra on 26th May 2007. Key items of discussion included:

- Previous Conference / Next Conference.
- National Water Initiative Grant application.
- Future of Hydrography Certificate IV Training Course.

National Hydrographic Workshop:

An inaugural National Hydrographic Workshop was sponsored by the Bureau of Meteorology and the Association. This brought together a number of key representatives from across the Industry to discuss the implementation of the National Plan for Water Security by the Bureau of Meteorology and the issues faced by the Hydrographic Industry in delivering data to a National data warehouse.

Twenty one people attended this workshop over two days, with a considerable level of discussion and frankness regarding the state of industry. Over thirty pages of discussion notes were obtained during this time and will be summarised for presentation to the Membership in the next Journal.

Correspondence:

Most correspondence received over the last year by the Secretary is by email, mostly associated with Membership renewal and queries.

Michael Whiting

Secretary
Australian Hydrographers Association.

Account Summary
Australian Hydrographers Association Incorporated

Westpac A/C 033-259 13-0104

Opening Balnace: 1 January, 2006	$20,324.81
Income:	$38,364.00

	$58,688.81
Expenditure:	$12,285.00

Closing Balance, December 31 2006:	**$44,403.81**

Reconciliation:

Closing Balance, December 31 2006 (as per statement)	$44,403.81
Plus receipts not credited:	$0.00
Less Unpresented Cheques:	$0.00
Closing Balance, December 31 2006	**$44,403.81**

Westpac Investment A/C 033-259 21-5888

Balance as at 31 December 2006:

Opening Balance:	1 January 2006	$40,804.60
		$178.86
		$157.19
		$174.70
		$158.46
		$187.48
		$171.21
		$177.64
		$183.29
		$175.99
		$195.01
		$185.41
		$183.41
		$2,128.65
		Balance
at 31 December 2006	**$42,933.25**	

Statement Of Receipts and Expenditure,
January 1, 2006 to December 31, 2006

Income 2006

Subscriptions		11,808
Subscriptions Corp		5,875
Workshop		12,378
Interest		137
Refund Workshop		5,000
Sundries		583
(Refund Airfares 583)		
	TOTAL	**36,364**

Expenses 2006

Westpac Merch Fees		1,159
Aust Post		805
Workshop		
South East Printing		2,007
Travel Accom,Catering		762
Stationery		315
Trans Workshop		
Trans Max1 Direct (Investment Acc)		
Web Site		
AWA Fees (2 yrs)		3,500
Air Fares		2,049
AHA Photos (Conference)		1,500
Domain Name		38
Refunds Subscriptions		150
	TOTAL	**12,285**

Interest Max1 Investment Account **2,128.65**

Australian Hydrographers' Association Incorporated Projected Operational Budgets for 2008 and 2009

	2008	2009
INCOME		
Subscriptions	14000	15500
Interest		
*Westpac Cash Management A/C	2000	2000
*Cheque Account (Operating)	80	100
Total Budgeted Income	**$16,080**	**$17,600**
EXPENSES		
Auditor Fees	500	500
Bank Charges	500	1000
AGM costs	250	250
Conference	2500	2500
Education Awards		
*Travel Grant	1000	1000
*Study Grant	1000	1000
AWA – AHA Subscription	1750	2000
Office Expenses		
*Computer/Web	500	500
*Stationery	200	400
*Postage	200	1000
*Journal/Newsletter (P&P)	3500	4000
Travel Expenses		
*Fares	3000	3000
*Other	500	500
Total Budgeted Expenses	**$15,400**	**$17,650**
Projected Surplus/Deficit	**-$320**	**-$50**

Publicity Officers Report For Australian Hydrographers' Association Annual General Meeting, August 15, 2007

Journals were published:

- August, 2006
- December 2006
- February 2007
- May 2007 (Published June 07!)

Complimentary copies of the Journal continue to be forwarded to the New Zealand Hydrological Society and the Australasian Hydrographic Society. The Journal is also being forwarded to the State Library of NSW for archiving. The ISSN number for the Journal is 0812-5090 and the Library catalogue indicates Australian Hydrographer Newsletters/Journals extending back to the late 1970's!

Advice for this AGM was prepared and sent to members in July, 2007 as well as posted on the website.

Our Website continues at www.aha.net.au. I tried being fancy with a web stats report for the last year but it really is impossible to decipher real hits from skimming hits so haven't pursued it for this years report.

The service for distributing information about employment opportunities in our industry/science continues to be a popular service via the website. Thirty four positions were forwarded to members and posted on our website over the last 12 months, with quite a few attempts at poaching from across the ditch in NZ!

We also continued running our Mailman email service. All financial members are listed into the Mailman member database. The Mailman service is used by the committee to disseminate information about employment opportunities, short courses and other events or happenings around the place. At the beginning of August the Mailman member list had over 200 members though I suspect that this number may have increased recently due to a plethora of agency name changes and people now adding their new addresses to the list! A clean up may bring that back down to 190 or so in the next few weeks

The Mailman email service is also available for members to pass on items or events of interest to other members. The list is moderated to reduce inappropriate use but generally users have been well behaved!

Spamming has greatly reduced over the last twelve months but I have decided that we will continue to not have direct email addresses on the web site as it would most likely happen that the spammers would grab them once they reappeared. (The server becomes overloaded very quickly – within a week once we enter the spammers world – the policy of not having email links on our pages has extended the server fill up period to about 3 months and gradually getting longer as we minimise our exposure to spamming)

Above all I love to see those articles! I continue to enjoy the role of Publicity Officer for our Association but don't forget it's your Association and your input to the Journal is valued. Corporate Members are also encouraged to submit articles in relation to the work they are doing.

West Australian State Representative's Report

Department of Water

Hydrography in the Department of Water is moving forward, following a considerable down turn in measurement activities during the late 1990's and early 2000's. As with all organisations the need for trained and experienced staff is paramount to the survival of data collection within the Department.

The Department has recruited eighteen trainees over the last three years, whom participate in an intensive in-house Training program including the studying of a number of core subjects from the Certificate IV in Hydrography. However the growth of measurement activities is outstripping the capacity of the Training team to deliver trained hydrographers quickly, hence the need to recruit from other agencies and States, to meet the needs of the expanding business.

The Department of Water's clear direction for improved hydrographic measurement can be seen from the ongoing Capital Maintenance Program (approximate investment of $1 Million per year), for the maintenance and refurbishment of assets (including measurement structures and equipment).

A Strategic Management Plan is being written to focus on hydrographic measurement business including overall staffing structure, governance and associated input processes and data products.

The underlying network of the Surface Water Gauging Stations and Rainfall pluviographs are also under review possibly reopening key sites closed in the late 1990's.

2007 Year of Hydrography

2007 Will be celebrated as the Year of Hydrography within the Department of Water to recognise the contribution Hydrography has made to the development of Western Australia and the ongoing resurgence of the water measurement profession.

Some key historical events include:

Stream gauging commenced in earnest under C Y O'Connor on the Canning and Helena rivers in late 1890's in connection with plans for the Goldfields Water Supply Scheme

Hydrography paid a clear role in State development in the early 1900's when the *Public Works Department Act* was proclaimed with "*testing work"* which included "*general investigation for water supply purposes and includes…… the carrying out of tests, gaugings, borings, the construction of gauging weirs……"*

The first modern pluviograph or continuously recording rain gauge was introduced to Perth in 1945.

Hydrography in Western Australia expanded in the 1960's by our early predecessor the Public Works Department, met the challenge at that time by creating its own visionary training program to develop the first generation of this new breed of hydrographer "*to go out into the field and assess the State's water resources for the benefit of all."* Little has changed and our present day training program is a modern hybrid.

A number of key promotions have been developed by the Department including:

- Celebration launched by the Minister's for Water Resources (John Kobelke)
- Oral History recorded on CD and Book by Bill Bunbury – ABC National Radio Social History journalist.
- Use of 2007 Year of Hydrography branding by staff through; an email signature that is also integrated into all Department GIS Map products, and Seminar Banners.
- Weekly News articles on milestones over 100 years.
- Historic Instrumentation Display.
- Small token gifts.
- Australian Water Association and State Water Award Presentations.

In 1827 when the Swan River was initially surveyed by Captain James Stirling, that first summer was reported to have been cool and moist. The situation exaggerated the availability of fresh water and the cool easterly breezes led them to think that there were snow capped mountains east if the Darlings.

Fortunately we now know a little more about our climate and water resources, but there are still large knowledge gaps that will require the concerted efforts of hydrographers for many years to come.

Water Corporation

The value of/need for Hydrographers in the Water Corporation is growing steadily, now with a team of near thirty. Expectations are high in the area of providing data for long term planning, regulatory compliance and system performance.

The true art of hydrography isn't just in collecting 'Water Resource Assessment' data.

Hydro-Smart

As one of the few hydrographic consulting companies in Western Australia, Hydrosmart currently carries out a wide range of activities supporting the measurement activities of a number of agencies including:

- Operation of nine water quality and flow monitoring sites in one of the main water supply catchments for the Perth Metropolitan Area for the Water Corporation, and Department of Water.
- Soil moisture profiling and analysis of data at 5 research / study sites around Perth.
- Provide training, support, rating relationship review and discharge measurement strategies for various regional groups in Dept of Water.
- Re-design of research catchment flow monitoring assets for Dept of Water.

Key issues in Western Australia.

- Training of Hydrographers, and the survival of the Hydrography Certificate in a suitable format that has relevant content for the wider hydrographic industry, to provide suitability qualified hydrographers to meet the increasing demands for data.

- Support for the AHA to become the key organization to review and update the Australian Standards for hydrography.

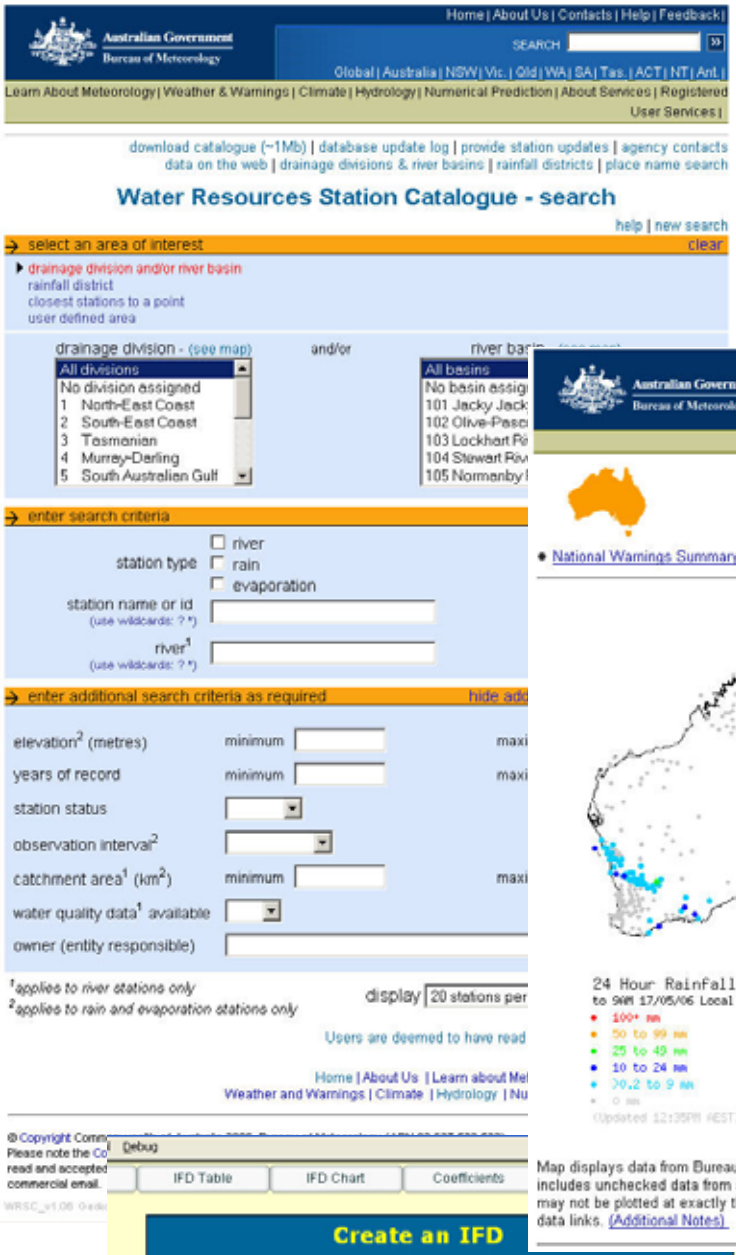
- Strong need for accreditation of qualified Hydrographers

Items of Interest

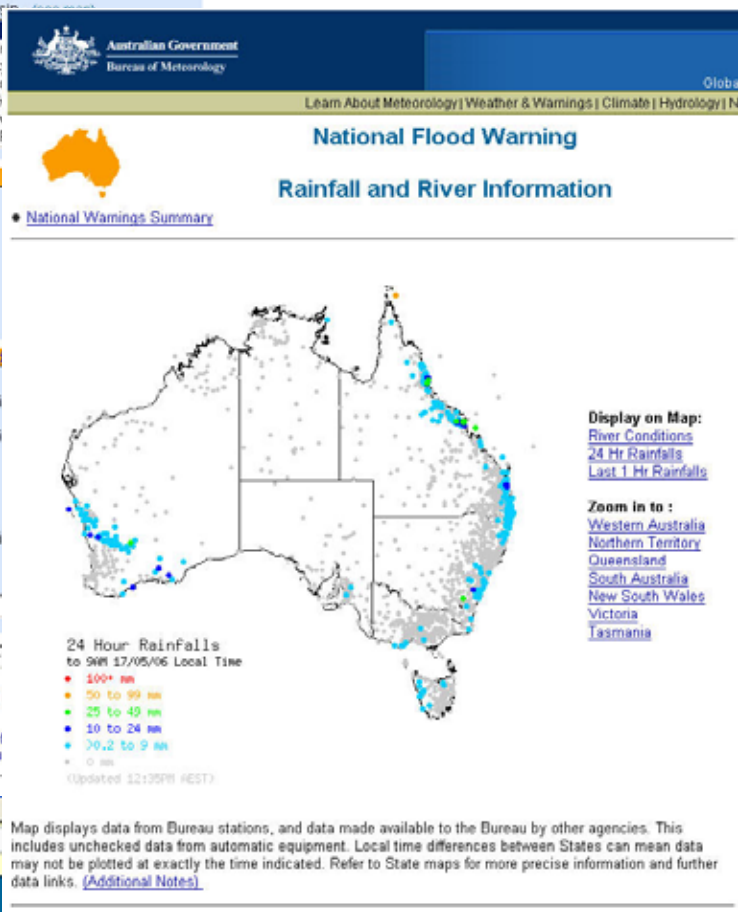
- A hydrographic seminar was organized by Brian Chester to coincide with the centennial publishing of a paper by JC Stevens. The success of this seminar indicates that there is sufficient interest and good will among all hydrographic practitioners in WA to possibly support an annual half-day seminar.

BUREAU OF METEOROLOGY RESOURCES ON THE WEB

www.bom.gov.au/hydro/wrsc



www.bom.gov.au/hydro/flood



National Hydrographic Workshop Melbourne, August 2-3 , 2007.

As Association members would have been aware the AHA has been involved in a submission to the National Water Commission to garner funding to develop water data quality guidelines for the proposed National water data base. This submission went to the NWC at about this time last year following the Darwin Conference.

Contact with the NWC followed over that time but in the intervening period it was announced that the Bureau of Meteorology would be the custodian of Australia's National Water Data Base system. The AHA Chairman, Bill Steen, continued to make contacts with NWC representatives and in turn Bureau Of Meteorology figures to see how the Associations submission was going. During these conversations, with Dr Rob Vertessy from the Bureau, it became apparent that what was required was a preliminary workshop on Australian water data collection, quality standards, and who and what organisations collected data in Australia as some of the identified areas of need for discussion and actions. Some viewed this as getting a process similar to the role that the previous Australian Water resources Council did through standard setting through Hydrographic Technical Committees in the1970's and 1980's.

The Bureau and the AHA worked together to bring together a range of water data collectors, data managers, water data QA people, water data trainers and gathered the group in Melbourne for two days to attempt to begin the nutting out some of the required groundwork for Australia's National Water Data Base.

Questions the group discussed and attempted to answer or clarify current positions on included:

- *What are the various purposes or business drivers for the collection of water data in Australia? (e.g. flood forecasting, river operations, NRM monitoring obligations)*
- *Who are the key collectors of water data? (i.e. which organisations, what sort of data)*
- *What broad standards are known to be used in water data collection?(e.g. ISO, AS/NZS, agency-specific)*
- *How might we best structure our thinking about the various standards required and in use?*
- *Are different standards invoked for the various purposes identified above? If so, can you give an example? Is there a systematic way to characterise this differentiation?*
- *How is/may compliance with water data standards be facilitated? (e.g. documentation, training, monitoring)*
- *How is/may compliance with water data standards be monitored? (e.g. in-field inspection, data QA)*
- *Can you suggest a robust process for identifying and agreeing on the water data standards and compliance regime required for meeting NWI/NPWS objectives?*

Discussions were frank and open covering many of the issues above. What was highlighted in the workshop was the capacity of the hydrometric profession to supply the necessary personnel to assist in achieving the ideals and aims of the National Water Plan as they stand at present. Consistent collection standards and data quality application in water data collection across the nation will definitely be a major outcome, and many other topics regularly came back to education and training issues in the issues. With an aging demographic in our profession and current difficulties with maintaining appropriate skill levels and training/study programs for new recruits, the issue of professional development was a consistent theme in discussions.

Outcomes from the workshop are in the processed of being surmised by the Committee and when completed the discussions are expected to be summarised in greater depth in the next Journal

Melbourne Workshop Participants included a variety of representation from both agency (Bureau of Meteorology, NSWDEW, WADoW,NMI, SADWLBD, TasDPIW, Qld NRM), commercial bodies (HydroTas, SnowyHydro, Thiess, Tyco) and other interest groups (Water for Rivers)as well as members from the AHA committee.

KISTERS PTY LTD

Kisters Australian User Group Meeting. August 15 and 16, 2007.

The Australian Kisters User Group Meeting was held in Canberra on August 15 and 16, at the Crowne Plaza hotel in the city.

As usual discussions and presentations between users and Kisters staff were frank and enthusiastic both during the formal proceedings and informal gatherings outside of formal presentation times.

The keynote speaker was Doctor Rob Vertessy from the Bureau of Meteorology who has been seconded to BoM to get Australia's Water Data project into reality over the next couple of years, where he described the journey that will be occurring over the next few years to bring Australia's vast information on water resources into a single 'geofabric' vision, where data will be more easily and promptly accessed for water commerce and long term water resources studies and planning

The User Group departed for the dinner on the Magical Mystery Tour bus which set off into the cool dark night – with much hand pointing, U-turns and phrases like "I know Murrumbateman", we reached our destination at Shaw's Winery and Restaurant (At this stage workshop participants hadn't been issued with their Kisters Survival packs so this journey of mystery set pulses racing!)

Australian Hydrographers' Association Educational Grant

The Committee of the Australian Hydrographers' Association has instituted a number of awards/grants to encourage younger (and not so young) cadets and hydrographers to undertake studies in the Hydrography Certificate IV. This has been implemented in 2006 and the following information is provided to AHA members. AHA members are also encouraged to make their employers and others aware of this grant and that the Association wishes to support the development of cadetships and traineeships within the industry, this grant being one aspect of the Associations support.

Along with this Grant the committee has also instituted an Educational Travel Grant (closed end of April 2006) and the Committee is currently considering applicants for this Grant

The following describes the requirements and conditions for the Educational Grant.

PURPOSE

The purpose of the Educational Grant is to:

- promote the principle objective of the Association to further the development of the science of hydrography/field hydrology and its application to the understanding monitoring and management of Australia's water resources, and
- assist students undertaking the Hydrography Certificate IV (accredited under the Australian Qualifications Framework to undertake the final year Project (Subject 8004AA) as required in the course

THE GRANT

The Grant will be of a value of up to $1000 to assist the students undertaking studies in the Hydrography Certificate IV to purchase material/equipment and services necessary to undertake the Project in the final year of the course.

CONDITIONS

- The recipient will supply an initial abstract paper and a final project paper for publication in the Association's Journal "Australasian Hydrographer", and win advanced consideration for the right to present the Project paper (describing the work undertaken) at the Australian Hydrographers' Association Conference (at a future date) upon applying for the Conference Educational Travel Grant. (See previous section)
- The recipient will be a financial member of the Australian Hydrographers' Association.
- The recipient will normally be enrolled in the Hydrography Certificate IV (AQF).
- The recipient's project will have been approved by OTEN and/or the recipients employer as an appropriate project activity meeting the requirements of the Project (Subject 8004AA) in the Hydrography Certificate IV.
- Applications will include the approved Project proposal, a budget detailing other

sources of financial/material support (for example from the employer/supervisor).

- Applications will be assessed by the Association's Committee who may invite advice from appropriately qualified people. The Committee may liaise with the employer where necessary. More than one grant may be awarded annually, at the Committee's discretion.
- The grant will take the form of a reimbursement to the awarded value, paid to the individual, or as a rebate to the employer that has initially covered the recipients costs incurred, after presentation of proof of purchase of items/services.
- Items purchased with the Grant will become the property of the recipient's institution/employer or in the case of a stand alone student, the student.
- Proof of purchase of the items/services must be supplied to the Treasurer prior to reimbursement if this grant is awarded.

Further information and application forms can be found on the Associations website at ***www.aha.net.au***

UNCERTAINTY MUSINGS

Glen McDermott, Earth Tech.

Accuracy versus Uncertainty- what's the difference?

This might sound trivial, but in practice it is a question which often creates confusion. One of the reasons for this is that equipment manufacturers inevitably tell us about the "accuracy" of their instrument, and not it's measurement uncertainty.

Generally speaking, accuracy is associated with air conditioned laboratory conditions for its derivation, while measurement uncertainty is more related to practical field conditions and sources of uncertainty additional to the instrument itself.

At some time a hydrographer/hydrologist becomes interested in the measurement uncertainty of discharges calculated from a rating curve- usually in answer to a client's question. The process of answering this question leads to having to find a way to convert the "accuracy" specification of the level instrument to a "measurement uncertainty" expression.

At first glance it appears difficult, as the two aspects (accuracy and measurement uncertainty) appear to come from different genealogical backgrounds:-

- *Accuracy* is always expressed as a single and absolute "accuracy" number (eg 0.5% of full scale range)- each instrument sold by the manufacturer generally comes with a calibration certificate for that instrument, with it's particular serial number, and which shows or states that each level or pressure range tested against their NATA reference gauge, has shown differences less than the specified upper limit of 0.5% of full scale range for this instrument
- *Measurement Uncertainty* however is always expressed as two numbers, the first being the ±% uncertainty, and the second being the statistical band or confidence level the ±% relates to (eg in the hydrometric industry, the 95%ile confidence interval is commonly used)

The method of converting the manufacturer's accuracy to a measurement uncertainty is explained in the ISO *Guide to the Expression of Measurement Uncertainty,* as it's method A. The only inputs needed are the tested points and their differences from the calibration sheet, as illustrated in the example below.

An example for a 0-10m level sensor

This example is for a level sensor which has a stated accuracy of 0.5% of full scale range. If the full scale range is 10m, this means the "accuracy" of a particular level or pressure measurement is ±0.05m or ±50mm. The current calibration certificate for the instrument supports this "accuracy" claim, and shows that for each of 5 reference levels, with repeat tests at each of 5 temperatures (ie 25 paired differences in all), no difference exceeds 50mm.

The "hypothetical" differences from the calibration test versus the reference instrument are shown in the table below:-

Level as measured on the reference gauge (m)	Observed difference (metres) between the subject test gauge and the in-situ reference gauge, at the stated temperature in degrees celsius				
	0	10	25	40	50
0.1	-0.04	-0.03	0.025	0.045	0.01
0.5	0.021	-0.042	0.026	0.002	-0.03
1	0.03	0.005	-0.006	0.03	-0.027
2	0.01	-0.015	0.008	-0.005	0.019
4	-0.007	-0.035	0.032	0.002	0.004

The mean and standard deviation of the above 25 differences are 0.00128m and 0.024729m respectively.

The combined uncertainty (ie systematic as well as random uncertainty) can then be calculated from the MEAN and STANDARD DEVIATION (STDEV) of the differences, as:-

$\pm\ value\ = 1.96 \times \sqrt{MEAN^{\ 2} + STDEV^{\ 2}}$, which will be at the 95%ile confidence interval.

In this example:- $\pm\, metres = \sqrt{0.00128^2 + 0.024729^2}$, which = ±0.049m.

The fact that in this example the 95%ile measurement uncertainty (ie ±0.049m) is very close to the stated accuracy (ie 0.05m), is just a coincidence. Most calibration sheet analyses of this sort should show a lower measurement uncertainty than indicated by the accuracy specification- in general.

Nuff said!

Membership Renewals

Membership renewal reminders have been distributed, encouraging your continued participation in the activities of the Association.

Those who have received them will notice that the hard work is done for you and the information you last provided to the Association is already filled in!

Its as simple as correcting the information (if needed) and returning the form with your payment to:

The Treasurer
Australian Hydrographers' Association
14 Kosciusko St,
Traralgon, Victoria 3844

Payment Options

The Association accepts payment of subscriptions by cheque, credit card and Electronic Funds Transfer. If you wish to debit from your account direct to the AHA account please email the treasurer to get our bank account details for EFT. (treasurer@aha.net.au)

Corporate Memberships

4 levels of Corporate Membership are offered as follows:

Corporate Membership Grade	**Annual Cost**	**Included Membership**
Bronze	$500	1
Silver	$1,000	6
Gold	$1,500	12
Platinum	$2,000	20

Main features of Australian Hydrographers' Association Membership (for both Individual and Corporate) include:

- Knowledge and information sharing amongst peers.
- Promotion and sponsorship opportunities at a biennial conference.
- Four journals, *Australasian Hydrographer*, per year.
- Association Website and peer group mailing list with discussion threads.
- Commitment to supporting continuing education of Hydrographers (Certificate IV Hydrography).
- Travel grant assistance scheme for student/cadet members to attend conferences.
- Educational grants.

- Job advertisement network to industry.
- Investing funds for educational support for hydrographic industry (Member of Industry Advisory Group).
- Supporting State based industry workshops.
- Access to and information about activities from other similar scientific and industry groups

ARTICLES FOR THE JOURNAL

I will admit that articles are getting a bit thin on the ground at present.

I'm sure that we all have some interesting trips or ideas we'd like to share as well as interesting images of hydrometric work.

So why not get them to me for inclusion in the Journal.

If you forward me articles in Word that would enable me to cut and paste easier into the Journal when preparing it.

Your Diary - 2007, 2008

Some dates to think about.

- Water Week, October 21, 2007.
- HYDRO 2007, Focus on Asia Australasian Hydrographic Society (Our Salty Friends!), Cairns, November 2007
- New Zealand Hydrological Society Workshop/Conference, November, 2007
- 14th AHA Conference, dates are now firming to early July, 2008. in the ACT region/South Eastern New South Wales. Details of location and dates are currently being finalised
- Late 2008, New Zealand Hydrological Society Workshop/Conference, South Island.

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Public Officer, John Skinner

Committee Members, Bill Barratt, Paul Langshaw

Some Advice for us from the Ministry of Construction, Japan

(Source: Hydrological Observation Explained in Pictures)