# Australasian Hydrographer

## April 2013

Gardner River, South West, WA
(Photograph courtesy of Wayne Davies)

AUSTRALIAN HYDROGRAPHERS ASSOCIATION

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**Material Submitted**

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# Contents

FRANK DAVIES

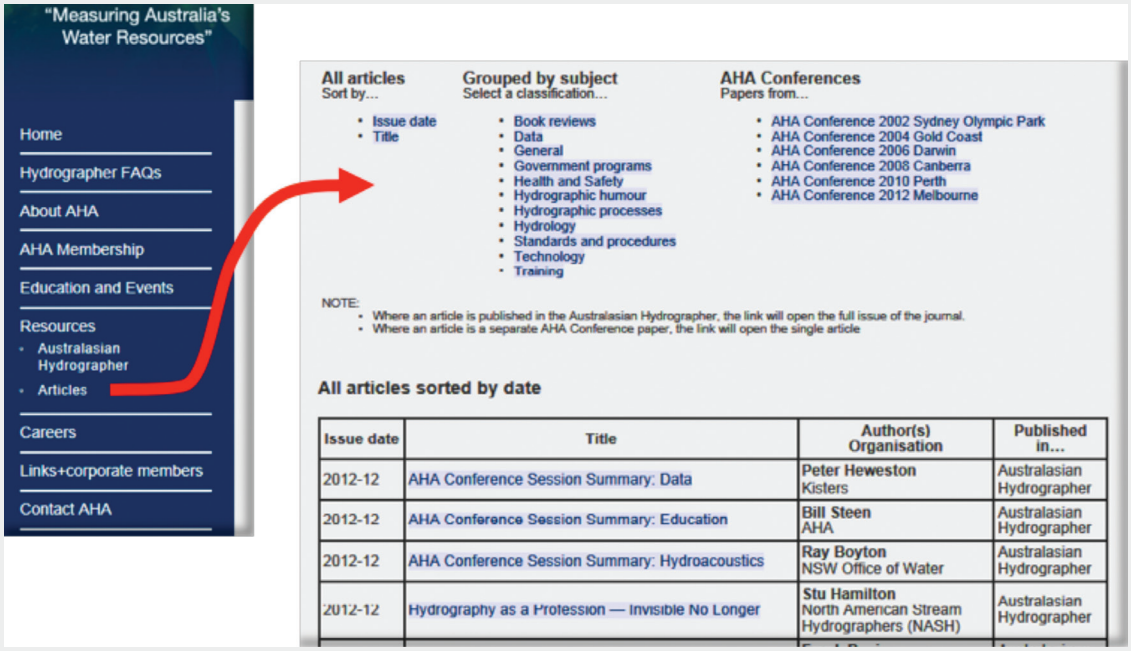
# Editor's Introduction

*In the last journal I wrote that a decision was imminent regarding the winner of a sponsorship package for attendance at the NZ Hydrological Society workshop in Palmerston North in February 2013. There were two lots of $1000 donated, one each from Kisters and Hydrological Services, for two people to attend. The NZHS also agreed to waiver the registration fees for both people. As promised, the winner, Shaun Gleeson, has provided some feedback on his experiences. Shaun's comments and those of his employer appear in the article "NZ workshop". Shaun was joined at the workshop by Natalie Noakes when the AHA Committee approached her to take up the second lot of sponsorship after Shaun's was the only sponsorship application received. Natalie's eligibility for the sponsorship was appropriate after she was awarded the best presentation prize at the 2012 AHA Conference.*

*Not to be confused with the workshop, Mic Clayton also went to NZ in November 2012 to attend the NZ Hydrological Society conference in Nelson. His article, headed by the Maori title, follows Shaun's and contains some interesting thoughts. In another contribution, Mic also has something to say about the new Hydrography Diploma.*

*Once again, I acknowledge articles in this journal taken from the Hydrographic Newsletter published by the Department of Water, WA. The contributions by Ross Sheridan, Peter Muirden and Stephen Keen are all from this source.*

*By now you will be familiar with the Monthly Updates informing you of AHA activity that you receive by email from the AHA's Publicity Officer, Grant Robinson. Grant has worked intensively to improve the content of the AHA web site. In case you missed it in the February 2013 update, Grant alluded to the large volume of conference and journal content that he has now collated. No longer do you have to trawl through numerous DVDs or copies of the journal to find a previously published document. Next time you visit www.aha.net.au take a look at what is available under the "Articles" link as demonstrated in the screen shots below.*



KRYSTAL HOULT

# Secretarial Update

# "Doing More with Less"

*The need to "do more with less" is perpetually present for us all; as individuals and families in our personal lives trying to achieve the right balance in making ends meet while trying to improve our quality of life; as employees and managers with performance targets to exceed; within small to large private businesses and companies in the battle to keep winning work and remaining profitable; through government organisations with increased budgetary constraints and ever more pressing responsibilities. In this climate associations like the AHA are equally, if not more so, facing the challenge to "do more with less" as our funding and resource bases are similarly hard-pressed.*

*I do not have anything particularly revolutionary to share in regards to surviving and prospering in an "economic downturn" and I am no economist. What I do know is that I am yet to hear an inspiring story about any individual, company or organisation that made it big or achieved great success during challenging times by hunkering down, focusing inward and burying their heads in the sand. The crux of all of the inspiring stories I have heard have their essence in points of difference, high quality standards, external focus, collaboration, innovative solutions and staying one step ahead.*

*What can you do today to work towards being a part of an inspiring story?*

*You can maintain your Association membership and make it work for you by getting involved, providing feedback and direction; join the Technical Reference Groups or at least keep tabs on their activity and provide input; ensure you and all the staff in your organisation/company are trained, diploma qualified and certified; take advantage of the advertising space allocated to corporate members in the journal; champion, contribute or at least keep a vested interest in the development of national standards; make a commitment to knock up an article for the next journal and read what others have contributed (look through the back catalogue that is available online); read the AHA Monthly Updates; visit the AHA website; start a feed on our LinkedIn page and read through and comment on what others have started; start planning for your abstract submission and attendance at AHA 2014.*

*"Doing more with less" is not the sole responsibility of high level management. Each and every individual has a role to play. What are you doing to ensure that you are an invaluable team member? How are you contributing to your own professional growth and fulfilment?*

## What has the Association been doing?

**Training & Certification**

1. *Gaining formal recognition of hydrography as a profession through attainment of an ANZSCO code.*
2. *Facilitating the establishment and on-going management of four Technical Reference Groups (TRGs): Training, Data, ADCP and Hydrometric Standards. Each Technical Reference Group is chaired by an AHA Committee Member.*
3. *Producing the face-to-face (as distinct from RPL) training materials for the diploma course, to simplify uptake by interested training providers. The ratings unit is already substantially complete and is to be reviewed by an RTO and the Training TRG shortly, with the survey unit next on the list.*
4. *Processing AHA certification applications.*
5. *Continuing to provide the hydrography basics course - 12 participants are booked in to attend the next course.*

**TRGs & National Standards**

6. *Providing a detailed review of the proposed BoM National Guidelines through our TRGs and substantial member involvement in the process undertaken.*
7. *Providing the Business Standards Forum with a letter of support for the proposed National Guidelines which are to be moved for acceptance at the next forum meeting in Canberra on Thursday 30 May.*

**General**

8. *Facilitating the Kisters and Hydrological Services sponsorship prize for Shaun Gleeson (NOW) and Natalie Noakes (Sydney Water) to attend the New Zealand Hydrological Society's technical workshop held in February.*
9. *Evaluating venue options and taking steps to formally establish the Convening Committee for AHA 2014, the 17th biennial Australian Hydrographers Conference.*
10. *Cataloguing and making available online all past issues of the journal and conference papers dating back to 2001.*
11. *Providing our Monthly Updates.*
12. *Posting vacant job advertisements online and in the Updates.*

## Committee Meetings

*In addition to a steady stream of email correspondence and phone communication the Committee has met twice thus far in 2013; on the 7 February and the 14 April. All current committee members participated in these meetings. Our next formal meeting is planned for Wednesday 12 June. AHA members are encouraged to pass on items or points of interest for the Committee to consider and discuss. The Committee has made a commitment to meet bi-monthly during 2013, with three (majority) in-person meetings to be held.*

## Publicity Officer

*At our February Committee meeting Grant Robinson, our current AHA Webmaster, volunteered to take on the role of Publicity Officer for the Association which has been vacant for some time. This appointment was voted on and accepted by the Committee as an interim measure. Grant's position will be formally voted on by the membership at the upcoming AGM. In the short term Frank Davies will be continuing in his role as journal editor for the Association.*

## 2013 AGM

*Keep the evening of Wednesday 28 August free to attend the 2013 AGM in Canberra. All members are encouraged to attend and contribute to the agenda items to be discussed. The AGM is being held alongside the Kisters User Group meeting.*

## Membership Management

*The Association constitution contains clauses that set out eligibility for membership, how you can gain admission to the Association as a member, the rights and responsibilities of our members and how memberships may be terminated from both the member's and the AHA's standpoint. If you read the constitution (which is available online http://www.aha.net.au/about-aha/aha-constitution/) it is clear that membership is intended to be continuous. Please keep this in mind when you are considering your arrears notice for the 2012/13 financial year.*

*The Committee is currently working through the process of moving towards full external management of the administration of the Association. This will increase value to the members similar to the way in which the base organisation for conferences of recent years has been managed by a promotions company. Moving to an external party who specialises in administration will provide timing efficiencies by tapping into the company's core business skills and will enable the Association to be more responsive to members during standard business hours. However, the additional win of this switch is that it will substantially free up committee members and volunteers to spend more time providing quality technical input and contribution to the Association, something which is not as easily or affordably obtainable.*

# Development of Hydrometric Guidelines

***Simon Cruickshank***
***AHA Committee Member and Chair of ADT TRG***

The 2012 Melbourne AHA conference included a series of theme based discussions on Acoustic flow guidelines to be submitted to the Water Information Standards Business Forum for endorsement as industry standards. As a result of these discussions it was agreed that there was a requirement by the industry for research and development in a number of areas and that the AHA was the appropriate body to initiate and manage the process.

At the same time, the Bureau of Meteorology under its 'Improving Water Information' program is developing a national water data archive, known as the Australian Water Resources Information System, or AWRIS. Whilst developing AWRIS it became apparent that water data collection operations and standards varied considerably throughout the nation and that there was a strong requirement for standardisation.

In response, the AHA created Technical Reference Groups (TRGs) for the following subjects.

- Acoustic Doppler Technology (ADT)
- Hydrographic Training
- Hydrometric Standards
- Value Adding to Data

Volunteers from within the industry, AHA members and Bureau representatives contribute to the TRGs. This resulted in broad and balanced representation from the Federal Government, States and Territories, practitioners and managers. Each TRG is chaired by an AHA committee member with valuable administrative support from Linton Johnston at the Bureau.

The initial task of the Acoustic Doppler and Hydrometric Standards TRGs was to review and endorse the existing draft guidelines that had previously been developed by the Queensland Department of Natural Resources and Mines (QDNRM) and the NSW Office of Water (NOW), with significant input from other jurisdictions.

A three stage review process resulted in enhancement, clarification and modification of the guidelines. The TRGs also provided input to a glossary to ensure all guidelines had consistent use and definition of terms and acronyms. The result is a complete set of documents to ensure that data collected is consistent and comparable between various collecting organisations. The guidelines serve as a common national language developed, agreed and endorsed by industry to describe how we go about our business, and to communicate that with end users of data to assist them in judging fitness for purpose. The glossary terms will be added to the Australian Water Information Dictionary published by the Bureau.

The intent of these guidelines is not to enforce compliance. Rather they will provide a reference framework against which organisations can declare a level of conformance.

**Guidelines were developed in the following categories.**

1. Glossary (WISBF GL 100.00-2013)
2. Primary Measured Data (WISBF GL 100.01-2013)
3. Site Establishment and Operations (WISBF GL 100.02-2013)
4. Instrument and Measurement Systems Management (WISBF GL 100.03-2013)
5. Gauging (velocity-area method) (WISBF GL 100.04-2013)
6. Data editing, estimation and management (WISBF GL 100.05-2013)
7. Stream Discharge Relationship Development and Maintenance (WISBF GL 100.06-2013)
8. Training (WISBF GL 100.07-2013)

9. Application of Acoustic Doppler Current Profilers to Measure Discharge in Open Channels (WISBF GL 100.08-2013)
10. Application of In-situ Point Acoustic Doppler Velocity Meters for Determining Velocity in Open Channels (WISBF GL 100.09-2013)
11. Application of Point Acoustic Doppler Velocity Meters for Determining Discharge in Open Channels (WISBF GL 100.10-2013)

The 11 guidelines have been delivered to the Bureau with a recommendation from the TRGs, supported by the AHA, that the Water Information Standards Business Forum endorse the guidelines and that the Bureau publish them for use by the industry.

Once endorsed, it is anticipated that the guidelines will become available via the Bureau's website. The AHA will provide links from its website.

The AHA would like to take the opportunity to thank the large number of participants involved in the development of the guidelines, in particular the dedicated contributions from Mark Randall (QDNRM), Grant Robinson (NOW) and Linton Johnston. The AHA is excited by, and proud of these guidelines which have the potential to standardise hydrometric operations around the nation for the first time.

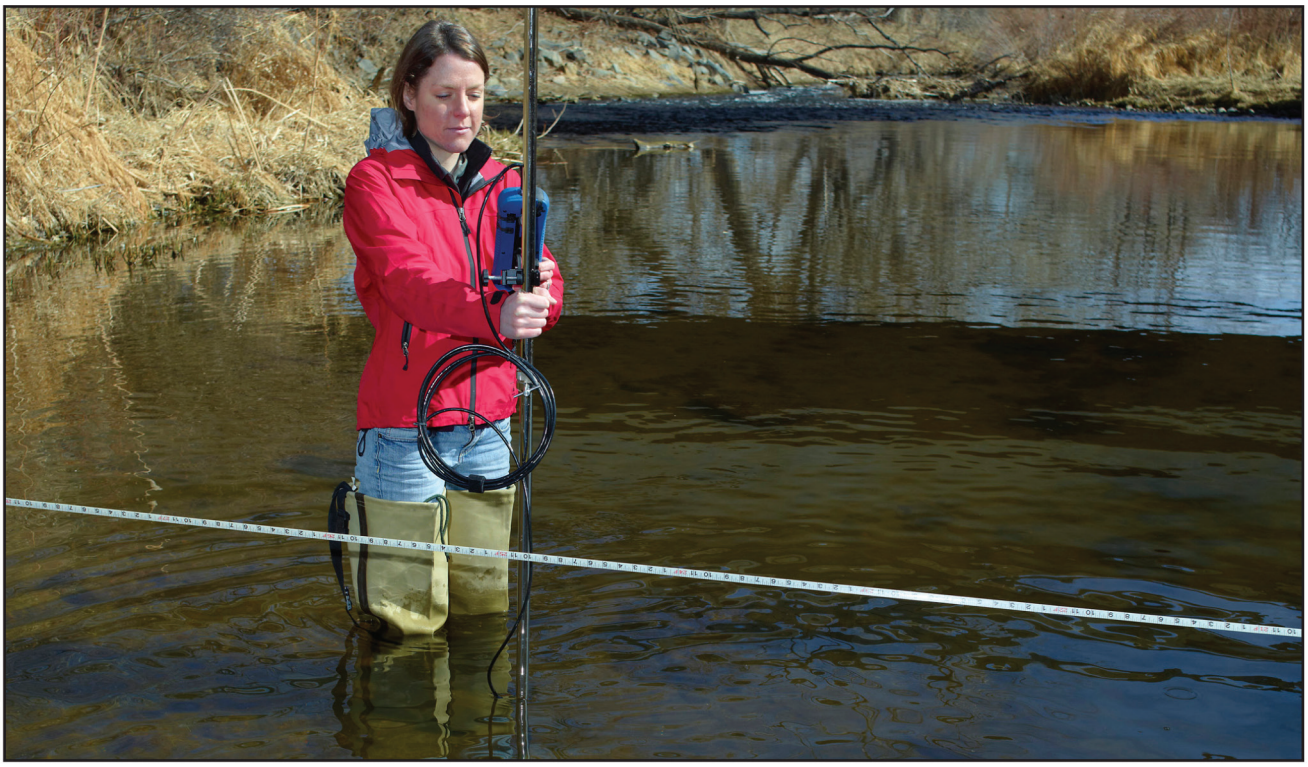
The Bureau will be asking the Australian hydrometric industry to use and comply with the guidelines and have input into future revisions as technology changes over time.

Although this body of work is complete, the Hydrometric Standards and Acoustic Doppler TRGs will continue. The Guidelines identified a number of areas that required research projects, development of tools to aid the industry, and additional standards.

In the meantime work continues by the Hydrographic Training and Value Adding to Data TRGs who will be reporting outcomes to AHA members via subsequent newsletters and the next AHA conference.

# OTT MF pro

Electromagnetic Current Meter



Reduce resources and time spent in the field with the OTT MF pro: a user-friendly, low maintenance, electromagnetic current meter for cost-efficient in-stream discharge measurement.

Maintenance-free electromagnetic sensor head, ideal for low-flow conditions and streams with heavy organic matter

Only one person needed for measurement and an economical electromagnetic sensor provide a cost-effective solution


Compact handheld automatically calculates discharge based on ISO method and graphs velocity on a color display in real-time

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OTT Hydromet

# A Hydrographic Journey Up the Hawkesbury-Nepean River

***Natalie Noakes***
***Sydney Water, NSW***

*(Natalie was voted winner of the best presentation at the 2012 Melbourne AHA conference. This is the abstract of her paper. To view the entire content, go to* http://aha.net.au/media/articles/noakes_natalie_2012.pdf *Editor)*

Sydney Water is developing a new modelling capability for the Hawkesbury-Nepean River system and South Creek to inform the wastewater servicing of Sydney's new growth centres. The model will be a powerful tool to predict and compare different options for urban development, environmental flows and other water resource management options in the Hawkesbury-Nepean system. The new model will inform infrastructure investment decisions of up to $2 billion.

This paper encompasses my journey as a Science graduate and a new Hydrographer working in the team delivering a challenging fieldwork and data delivery program to support the development of the model, often during difficult conditions.

The program started in January 2011 and is expected be completed by early 2013. It comprises of four main fieldwork components:

- bathymetric (hydrographic) surveys
- macrophyte (submerged aquatic vegetation) surveys
- tidal estuary profile Acoustic Doppler Current Profiler (ADCP) surveys
- event water quality sampling

The main focus of this paper is on the bathymetric survey including the technologies and methodology used and the challenges encountered along the way. These surveys required the collection and processing of reliable position and bed level elevation data (x, y, z) at an appropriate spatial density along 220 km of the Hawkesbury-Nepean River and South and Eastern creeks. The other three components (macrophyte surveys, ADCP surveys and event sampling) also required a combination of hydrographic and related hydrometric skills and knowledge, similar to those used in the bathymetric surveys. This also involved the development and adoption of new technologies and methodologies specific to each campaign program.

The aim of the macrophyte surveys were to generate information on the spatial distribution of aquatic 'macrophytes' (native and introduced) in freshwater reaches, with a particular focus on post flood changes. The methods and technologies used in the bathymetric surveys were adopted and modified for use in developing a new method assessing macrophytes.

The tidal estuary profiling of the Hawkesbury River required teams concurrently gauging using ADCPs and water quality profilers over full (semi diurnal) spring and neap tidal cycles at six key locations. The transects were selected using the recently collected bathymetry data and hydrometric principles. The key river locations, where tidal volume data was required, were spaced over a river reach of approximately 100 km from Bar Point (near Brooklyn) in the lower reaches of the Hawkesbury River to upstream Pitt Town (near Windsor). This gauging exercise required the safe and effective management of six boat crews including contractors, working in rotational shifts day and night and often in adverse weather conditions to cover the end to end cycles and full velocity reversals.

The event water quality sampling program required the installation and operation of refrigerated auto samplers at existing hydrometric gauging stations located in catchments with a range of land uses including rural, forested, and urban areas. Supplementary miniature data loggers (Divers) were deployed in-stream order to obtain time series water temperature data as well as back up conductivity and water level data.

# NZ Workshop

***Shaun Gleeson***
***NSW Office of Water Bega***

*(This journal contribution is taken from a press release by the NSW Office of Water. Editor)*

Earlier this year, Bega Hydrographer with the NSW Office of Water (NOW), Shaun Gleeson, was awarded sponsorship by the Australian Hydrographers Association (AHA), in conjunction with Kisters Technologies and Hydrological Services, to participate in the 2013 New Zealand Hydrological Society's technical workshop in late February.

The theme for the workshop - "Where have we come from and where we are going" - was fitting, given Shaun's recent promotion to Supervising Hydrometric Officer from his initial appointment with NOW as Cadet Hydrometric Officer through the NSW "jumpstart" program.

Over the two day workshop, which was held in Palmerston North, Shaun participated in a series of presentations from New Zealand, Australian and North American hydrographic professionals.

According to Shaun, notable presentations included site specific overviews of water monitoring stations in New Zealand, hydrometric flow variability analysis for the hydro-power industry, real-time monitoring of farmland soil moisture and lahar (hot acidic volcanic mud flow) monitoring in the central plateau of New Zealand.

"Of particular interest to myself was a presentation on the use of hydrographic flood monitoring data for the insurance industry in Australia," said Shaun.

"Natalie Noakes, the winner of the best paper at AHA 2012 Conference in Melbourne, also addressed the workshop focusing on Sydney Water's bathymetry surveying in the Hawkesbury-Nepean catchment, which was very practical for all hydrographers present."

"Other interesting discussions included the Regional Councils of New Zealand undertaking of the National Environmental Monitoring Standards (NEMS), which is being development for hydrological/environmental monitoring utilising various international ISO standards modified to suit the New Zealand environment."

"This was particularly relevant, given that the Australian Government, through the Bureau of Meteorology (BOM) and assisted by the AHA, is seeking to do the same thing."

Shaun also cited that while the environments and conditions for monitoring between Australia and New Zealand are similar, the politics and governmental hierarchy between the two is dramatically different.

"For example, in New Zealand environmental monitoring funding and policies are developed for 16 regions, by 11 regional councils and five unitary territorial authorities. This means funding, policies and focus are provided for a relatively small area of land/catchments."

"While in Australia (28.6 times the size of New Zealand) the funding and policies are developed mostly at state or territory level over very large areas of land/catchments. Consequently, each state or territory government must prioritise and rationalise its funding across very large geographical areas, with the inherent possibility of important sites losing out."

"This was indeed a valuable insight into the complexities of different funding and policy models that natural resource managers and hydrographers in both countries face, each have its own associated pros and cons."

He said the workshop provided him with a network of contacts in New Zealand, as well as an insight into issues that Australia may face in future environmental monitoring.

“This trip is a great example of why involvement in professional associations, such as the AHA, is extremely beneficial to practitioners in Australia.”

“It shows how sponsorships can help bridge the funding gap for companies and governments to allow staff to broaden their knowledge and ultimately bring fresh insights to their workplace and perform to a higher standard,” Shaun said.

The next event for the New Zealand Hydrological Society is their annual conference in Palmerston North from the 19th to the 22nd of November 2013. Shaun encourages all who are interested to attend the event.

Shaun Gleeson using NOW’s recently acquired remote controlled ‘Q-Boat’ on the Darling River at Wilcannia.

# Waterways – 2011/12 Fact sheet

Melbourne Water is the caretaker of river health in the Port Phillip and Westernport region. In this role we manage:

- 8,400 kilometres of rivers and creeks
- 1,473 kilometres of drains
- 344 constructed waterway treatment systems and wetlands
- 300 monitoring stations on waterways and drains
- 157 urban lakes.

## Key achievements 2011/12

- $26.2M invested in streamside works to protect and improve river health - removing weeds across 1,310 km, revegetating 281 km of land along waterways, and stabilising eight sites subject to erosion
- $2.56M provided under our Stream Frontage Management Program to support a record 725 projects on private property – constructing 107km of fencing along waterways to exclude livestock, and planting more than 246,000 native seedlings
- Funded 125 Community Grant waterway management projects totalling $590,000 and supported public land managers through 114 Corridors of Green projects totalling $969,000
- Met a 70% target for total community satisfaction with waterways (scoring 77%)
- Released full environmental water entitlements to rivers including 11 billion litres for the Thomson River and 5 billion litres for the Yarra River
- Yarra River was runner-up in the prestigious International River Prize
- Completed construction of a new weir at Dights Falls on the Yarra River
- Completed consultation on drafts of the Healthy Waterways Strategy (2013-18) that will be used as a guide to protect the environmental health of our waterways and the amenity they provide, making Melbourne a better place to live Total reservoir storage level increased by 14.2% – rising from 55.8% at 1 July 2011 to 70% at 30 June 2012 (first time storages have reached 70% since January 1998)

Melbourne Water also manages water supply catchments, treats and supplies drinking and recycled water, and removes and treats most of Melbourne's sewage.

# Wai: Me Mātua Mohio tō Kahapupuri

*Mic Clayton*

Have you ever been to an emotional conference – or have you just gone for the drinks?

In late November last year I had the wonderful opportunity of heading across the ditch to New Zealand for a couple of weeks of hydrography and hydrology activities and attend the 51st New Zealand Hydrological Society Annual Conference in Nelson on the South Island.

Nelson was to see an influx of approximately 220 conference participants as well as a small gathering of exhibitors of hydrological software, technology and services products for the hydrological profession. Someone familiar to many of us at the AHA, Mike Ede, was at the airport that evening to ensure I made it safely into the metropolis of Nelson and didn't get lost on the way!

The theme for this year's conference was **"Water - know your limits"**. The title of this article is the Maori wording of the theme.

To convey the context of the theme for the conference I have borrowed a short extract from the conference website:

*"The limits to New Zealand's fresh water resources have never been as topical as in 2012. By the time of the Hydrological Society's Nelson conference in November, the government's Land and Water Forum will have delivered its recommendations. Principal among these are recommendations on tools for setting limits for water takes and for water quality, and methods for managing within limits once they have been set.*

*Alongside this context of increasingly fully allocated water (and land) resources are initiatives around the country to accelerate the planning for irrigation schemes, including in Nelson-Tasman where this conference will be held. How can we increase the intensity of our water and land use while staying within sustainable limits? This question is at the heart of our 2012 conference theme: Water – know your limits."*

I went to the conference and left, not so much a conference, but rather with emotion from a conference.

The start of the conference commenced with a traditional Maori Mihi, or official welcome to the visitors by the local Maori representative. The representative proclaims the welcome in the native tongue alternately explaining the meaning in English to the visitors as the ceremony proceeds. Generally, the Mihi honours the visitors, pays tribute to traditional ancestors, acknowledges Mother Earth, and gives thanks for our existence.

The Mihi was then followed by Waiata (song), which is an opportunity for the group to lend support to what has been said. I was bowled over by what occurred as the whole conference gathering joined in the singing of the waiata (myself included), not just the conveners at the front of the assembly. This was a hugely emotional moment for me. (what we sang: http://www.youtube.com/watch?v=7hsnGfYNY3k).

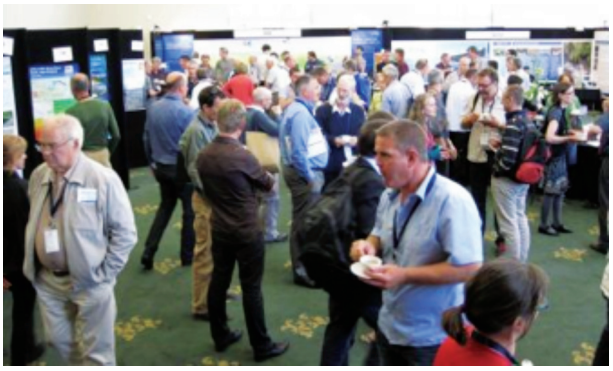
I have been emotionally charged following a footy grand final, at my wedding, when I win the meat raffle at the pub, but what's the deal with having emotions at the start of a conference?

I don't know. Is there something missing from the Australian water landscape that is not fulfilling my emotions? The connection of cultural traditions with water (as well as many other areas) is very strong in NZ. It forms a big part of any NZ event. Why not in Australia? The conference exposed me to many ideas and scenarios I had not considered previously.

## Conference format

The main conference technical section ran over three days, generally divided into three concurrent sessions of a variety of themes. With 78 presentations available to choose from on the first two days alone, the choices were many and varied.

Presentations were grouped into themes to assist attendees getting around and choosing areas of professional interest. Timing of presentations was strictly policed by session chairs to enable attendees to move from one conference room to another if they wished to cross over between concurrent sessions. The format certainly keeps one awake, and burns off some of those calories built up at morning tea!



Time for talk and delicious morning and afternoon teas in the exhibitor's area

The third day of technical presentations saw a slightly different format with two concurrent sessions (36 short presentations) continuing but with a third stream, "Limits Special Session" running over the whole day.

Apart from the presentations, there were also approximately 25 poster papers on display. Papers ranged from dating aquifer water sources, studies on a lake that is approaching almost pure optical clarity, novel approaches with temperature sensors, and a kayak to identify potential new spring sources in the Avon River in Christchurch following the earthquakes.

The fourth day was for optional field trips of which there were three choices from local bus field trips in the Waimea and Motueka catchments, through to a human powered mountain bike option into the Mineral Belt region in the ranges behind Nelson.


Ice Breaker evening at The Boathouse

An Ice Breaker event was held by the water side at The Boathouse after the Day 1 proceedings but before this event Martin Doyle, whizzed me around Nelson for a quick Cook's tour of the city from the lookouts around town (some would call it 'going parking' but we didn't stay in one spot long enough!). The main part of Nelson City is fringed by Tasman Bay and hills on the other three sides. Martin's sage words of advice during this tour were that I had to remember if I came to a hill or the water as I tried to make my way home in the evening after the Ice Breaker (or any other post conference day activity involving an establishment), then I was not going the right way!

An important presentation for me on Day 1 was about the rapid development of National Environmental Monitoring Standards for New Zealand (Rob Christie). As at the time of the conference the Final Draft documents for Monitoring Standards was going live on the web for comment in December.

Being involved in the Bureau of Meteorology's Business Standards Forum I found this presentation of particular interest and also amazement at the speed at which the New Zealand development of a suite of draft monitoring standards has progressed.

The commitment to national standards has been driven from the ground up through the Local Authority Environmental Monitoring Group (LAEMG), but most importantly it was recognised that the model of standards development by enthusiastic individuals with a passion for their profession while still trying to do their day job needed to be changed.

As a result a structured, project managed and, most importantly, funded strategy has been developed to ensure consistent interlinked standards and training competencies. To date, ten draft standards have been put out for public comment. They are expected to be finalised in the near future. (http://www.landandwater.co.nz/#!/nems/).

In conjunction with this there is rapid development of a New Zealand Hydrology Certificate (based around the Australian qualification) and six assessors/training advisers have been trained to implement the assessment of qualifications. These assessors are from the NZ hydrological/hydrographic workforce. This is fundamentally different to the Australian model that uses registered training organisations to provide the assessment systems. As well, the new qualification was in the final approval processes under the New Zealand Qualifications Authority.

One might say, in a patronising way, "Yes, that's OK. New Zealand is only a little place anyway.", to dismiss their progress. But it made me think. Is the development model that we seem to be using in Australia the right one?

We speak the same language as the Kiwis, we can beat them at cricket and rugby league, and mostly at netball (don't mention the rugby) but they seem to be beating us hands down in the area of development of monitoring standards. Perhaps it is the disconnect of most of the Australian population from natural resource management and use compared to New Zealand or are our Commonwealth/State governance processes wrapped in too much bureaucracy? Something for us in Australia to think about and consider I would say.

In the evening after the proceedings of the second day, the NZHS AGM was held. Perhaps the item of most interest to us was the proposal to canvass and potentially establish, in the new year, a Hydrographers Sub Branch of the NZHS.

The NZHS membership tends to be primarily scientists, researchers and water managers with a smattering of hydrographers and field hydrologists. While New Zealand is lucky to have a group called LAEMG it consists mainly of local authorities and doesn't capture hydrographers in private industry.

Given New Zealand's rapid progress towards a national training program and data collection standards set, it is believed that there should be better representation of the New Zealand hydrographic cohort as well as connecting them better with the end data users. It was also interesting to note that the item spoke of hydrographers rather than field hydrologist. This differentiation within the society recognises the recent listing of hydrography as an occupation in Australia and New Zealand. An issue to watch!

Then on the last day of conference proceedings there was something different. A bit of an experiment was about to happen in Water Conference Land.

I was about to feel the love.

## 'Love' on the Third Day

The last day of the conference revolved around the Third Report of the New Zealand Land and Water Forum released in November, 2012. Its leading statement is:

*"The Forum's third major report covers managing within limits. It recommends integrated decision-making in catchments, continuous improvement of management practices to improve water quality and clearer rights to take and use water within set limits."*

From these two contexts you can more than appreciate the big challenge that the conveners had set themselves for the day. It was going to sink or swim!

The final session was titled a "Limits Special Session". You could almost call this a free form sort of forum, with a structure around primary speakers in sub sessions that then encourage discussion from the floor. The conveners had no idea if it would work, but work it did.

It is difficult to express every idea, concept and opinion here but imagine putting a whole lot of stakeholder's different coloured points of view in a big washing machine, running it all day and at various stages throughout the day getting the items out of the machine, seeing what they were starting to look like and then throwing a few more ideas that were germinating back in the washing machine for further mixing and later review of the results.

While there were key presenters in each sub session, the idea was to invoke free discussion from the floor. This discussion would, through the day, plant 'alternative' ideas in stakeholder's minds, attempting to give them a more holistic approach to land and water management in New Zealand. Many concepts and ideas were discussed, sometimes strongly debated. I'll just dot point some take-away points I gleaned from the sessions:

- Regardless of the science, the way of science debate has and still is in many places, one of combative science and there are only winners and losers.
- Those in the water debates (as well as other sciences) need to promote a new way of thinking and collaboration. The phrase water development should become Water Futures.
- Scientists need to communicate with all, including economists!
- Adaptive Management. What does that mean? Does it mean when Plan A starts faltering, you keep tinkering at the edges to try and prop it up or should you have a Plan B? That is, consider in your planning that there may be more than one way to achieve an outcome and be ready to change if necessary.
- It is important to not only measure stuff, it is more important to measure the right thing and in the right place!
- The challenge for all is to design programmes that have plausible futures and being able to communicate and explain these effectively to a variety of stake holders.

Perhaps my biggest take-away was from the statement that everyday people shouldn't have to become scientists and economists to be part of so called collaborative or consultative processes around natural resources or catchment issues. It was disempowering to the individual. The process needs to make information accessible and understandable by all regardless of culture, age sex or education.

In the final sub-session of this Limits Session the observers in the room were put on the spot. They were not to be passive participants watching various groups of people debate the issues. It was time for everyone in the room to contribute, challenge, make a statement, no matter how insignificant or grand they thought it was, about the day's sessions. There were over 60 observers in the room as well as the main panel participants from the day and everyone participated. It really made those assembled feel uplifted.

This final session drew a full circle for me around the main proceedings of the conference.

At the start we were welcomed to the conference with a Maori Mihi, a blessing placed upon us and acknowledgement of respect for Mother Earth and here we were completing the circle as we pulled together, found new understandings of the tasks we have to better manage the natural resources we are lucky to have available to us. Without sounding too melodramatic, I would have said there was a lot of love in the room by the end of the Limits Session!

I don't know if these words express how I went away from this event. Is wanting to hug everyone at a conference ending the appropriate thing to do?

## Conference Dinner and Field Trip

The night of the last day of the technical presentations saw the holding of the conference dinner at the Nelson School of Music. A few of us ducked off to put our dancing frocks on in preparation for the evening.

Regional wines, beers and food were on offer for the evening and by all accounts, all enjoyed the event. A challenge for all for the evening was a Water Tasting Competition.

On arrival, four carafes of water were in place on each table, numbered one to four. The challenge was to identify which was which, based on some descriptions provided. The blind samples were from Nelson's water supply, Blenheim's water supply, Takaka Spring water (one of the conference sponsors) and a sample of water dated at 38,000 years old from the well in the grounds of the Blenheim Hospital.

Swilling and tasting occurred around the building but only a few of us were game enough to try one of the samples that had significant 'stuff' floating around in it (that one turned out to be the Blenheim hospital water).

The final count had four tables correctly identifying the waters presented. It then came down to a tie break – "which sample has been tested positively for arsenic" by tables standing the right number of people corresponding to carafes 1, 2 , 3 or 4, which our table chose with complete accuracy (if you call five of us standing up to indicate sample number 4 accurate!) The prize was ours. Accepting the prize on behalf of our table I received a dozen bottles of – you won't guess – Takaka Spring Water!

The night continued onto the late hours as the band encouraged us all to boogie away our cares and worries. A good end to the main conference proceedings.

The next morning I lined myself up for the MTB Field Trip into the catchments behind Nelson led by intrepid adventurer Martin Doyle and co from Tasman Council. Having suffered a minor knee injury in a collision with snowboarders a couple of months previously I was unsure how I would fare with a choice between a 25 km or 50 km ride.

Meeting at the trip departure point, a few heads appeared to be struggling from the conference dinner the night before. Some would find it tougher than they thought!

The MTB trip explored the catchments behind Nelson along the Dun Mountain Railway Trail. Along the way we surveyed a major distribution/treatment plant for Nelson's water supply where water from a number of supplies are connected to the reticulated system. The plant is located in a steep, small valley surrounded by forestry activities, such that during high flow events debris becomes an issue. These events also impact on residential activities. Consequently, the Nelson Council has purchased the hillside above the plant to begin revegetation works.

Conference Dinner at Nelson School of Music.

The intrepid MTB Field Day groups.

Observing the logged slopes behind Nelson at a snack break.

The trail has also been impacted as rainfall runs unimpeded down the slopes washing away the softer trail cover that has built up over the years exposing rough rocky sections and contributing to washaways.

The trail continues upwards onto Dun Mountain. At the heart of the Nelson Mineral Belt, this is one of the most geologically interesting areas in New Zealand. Its diverse minerals also mean it has an interesting history; from early use by Māori as a source of argillite adzes, and in early European settler times as the centre for hopes of wealth from copper mining. The railway was built for these latter mining exploits and led to the development of Nelson as a major centre.

On the section of the trail that I rode, the trail rises 660 metres in 10 km and I thought to myself – this is a little bit steep for a railway and found on further questioning it was actually a horse tramway. To some of us who are a little bit besotted by all things steam this does not meet the definition of a railway!

The top of our climb saw us arrive at a shelter called Third House (the name gives it away as to why it is called what it is called) where an automatic rain gauge and storage gauge are located for catchment rainfall data collections. As we arrived the weather turned slightly nasty and we raced for cover of the shelter as the hail began impacting upon us.

Automatic rain gauge and storage gauge at Third House.

Half of the group continued on the trail around the larger loop that came back down the Matai valley rising to over 800 metres in alpine areas of the Mineral Belt. They survived the change in weather conditions that we experienced at Third House. Then after our grinding climb up it was time for the descent back the way we came; not as fast as one would have thought as in many places the exposed slopes meant that one loose rock on the trail had the capacity to send you careering down the slope with that sky/ground/sky/ground feeling. Our entire group arrived safely back beside the Matai River in Nelson if not a little wearier than when we first set out.

Descent along the Dun Mountain trail.

## In Conclusion

Put simply, I found the 51st New Zealand Hydrological Society conference a ripper. It gave me the opportunity to interact, be challenged and most importantly learn more about the hydrological world I work in.

Exposure to other hydrological areas, even those that one is not necessarily involved in such as groundwater (for me), broadens ones appreciation and understanding of issues that impact on the water cycle as a whole and not just the bits of the water cycle I concern myself with in my daily work. Sometimes you even absorb a new way of thinking about an issue you have in your work place from a perspective presented by a totally unrelated topic at the conference. Sometimes you get a Eureka moment from even the simplest presentation.

The New Zealand approach to natural resource management issues appears to be way ahead of what we are achieving in Australia. I sit here looking at how the Murray Darling Basin Plan seems to be a combative issue rather than a collaborative one – or is that what the media feeds me altering my perceptions?

I was also impressed by the way the indigenous Maori are incorporated into the management frameworks and the acknowledgement and respect of their traditions and natural resource knowledge is given during development processes. Will the same level of respect and acknowledgement for our own indigenous population ever mature?

As I stated earlier, the conference, for me at least, achieved a full circle result. The start of the circle was the Maori Mihi acknowledging respect for Mother Earth and the circle closing as the conference ‘Limits Session’ finished on a note of holistic catchment/natural resource management for the good of all. I found this outcome a very profound experience.

I wish to acknowledge the financial support and time to attend the conference I received from Snowy Hydro. I also would like to express thanks to Mike Ede (Marlborough District and Conference Convening Committee) for his encouragement a few months ago to participate in the conference and to Martin Doyle for his patience with the crippled Aussie that made his way slowly up Dun Mountain on the Friday MTB field trip.

I have returned from this conference refreshed. I hope others in the future will have the same opportunity to learn more about their profession, and maybe even their passions, at events such as this.

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# Remembering Brian Chester

One of Australia's long serving hydrographers, Brain Chester, died suddenly on February 11. Although Brian spent all of his working life in Western Australia, he was well known throughout Australia and had many international contacts in the hydrographic and hydrologic fraternity. At his funeral, two of his workmates presented the eulogies that follow.

## Brian Chester the Hydrographer

***Ross Sheridan***

*Brian started as a trainee hydrographer in 1964 as one of the first intakes of trainees in WA. For those who aren't aware, hydrographers are the ones who measure our state's water resources. Brian held this passion for water measurement throughout his working life.*

*Brian spent his early years working in country WA particularly in the Pilbara. During that period he was involved in identifying river gauging sites throughout the Pilbara for what was to become a vital network. This helped the Pilbara develop as it has.*

*From the late 1960s Brian's focus was mainly in the processing and analysis of water information and developing improvements in information collection. Brian was responsible for the development of many computing systems that would aid hydrography. Who of us will ever forget the "sum of AD to the half".*

*This was where I met Brian in the early 1970s. He was my mentor and guide for the next 20 years.*

*We often found ourselves like tweedle dee and tweedle dum. Brian had such an intellect that he could delve his way into understanding and improving hydrography and my role was to help him implement and sell his ideas and new systems. I treasure those times.*

*In 1984 Brian was appointed to the top job of his profession, Chief Hydrographer in the Public Works Department. He was responsible for staff postings around the State, which was a difficult role. He was always fair and honest in his dealings with staff and supported regional staff when they were located away from family. He also carried this role through the difficult time when we became the Water Authority and all the field hydrography was placed under regional management.*

*Hydrographers aim to effectively determine the relationship between the height of a river and its flow. Brian's tireless work in this area was ground breaking and today the national system used by most hydrographers contains a number of his tools. In fact, Brian's work has been quoted in a text book on hydrology tools published internationally. The passage was called 'The Chester Method' for deriving flow relationships. He stands alongside international names in this field.*

*As I already mentioned Brian was a key mentor for me and many others of the hydrographic community across WA. He did this in his quiet and unassuming way and was always willing to offer his guidance and help. I am sure many here remember him for that support. Once when someone was having difficulty with a presentation Brian was the first one up to help, saving that person embarrassment.*

*He always welcoming when you met and had a very friendly disposition, with an infectious laugh.*

*Brian was affectionately known as "Chestie" by all his colleagues. On behalf of the hydrographic community I am privileged to say – thank you and so long Chestie.*

# Brian Chester the Hydrologist

***Peter Muirden***

*Ross has spoken about the first 30 years of Brian's career as a hydrographer. I'd like to talk a little on his career move into surface water hydrology from 1992, using hydrology to advance thinking in hydrography. He was always prepared to admit he lacked understanding and was prepared to study, research and bounce ideas off like-minded people.*

*When he started in hydrology he took an intense 3 month Post-Grad course in Hydrology in NSW, then over the years he travelled interstate and internationally listening to and giving presentations and talking to as many hydrologists and hydrographers as he could: picking their brains and formulating his ideas. Brian spent hours working on, evolving and perfecting the "Chester Method". He was respected nationally and internationally. I remember the long conversations Brian had with Peter Heweston as Peter was developing HYDSYS. I think Peter used to dread those conversations, but wouldn't dare avoid them because of all the information and understanding Brian would impart.*

*Brian had passion. He had genius. He had vision. He had respect from all those that mattered.*

*When I started as a hydrologist in WAWA in 1994, Brian and I became good friends, and he took me around the state introducing me to regional hydrographers many of whom are here today, and who all respected Brian's knowledge and understanding back then and will do for many years to come. He leaves a hydrographic legacy that will not be forgotten.*

*My role as an Engineer/Hydrologist was using the data collected by hydrographers. Brian helped me formulate my ideas on the importance of how data was collected. Not accepting data without understanding how it was produced; and how to pick up dodgy hydrographic methods. He showed me how to improve data quality and we spent HOURS brainstorming hydrographic theory and how to turn it into reality. He provided that mentoring role to me which is so important for professionals in gaining confidence and developing our true potential. And I hope I reciprocated with being a technical sounding board for his ideas and reaffirming his direction and self-confidence.*

*He will be missed by so many and remembered forever. Farewell Brian.*

# Australian Standards - When You weren't Looking…

***Mic Clayton***
***Team Leader Hydrographic Services Snowy Hydro Limited.***

Some of you might remember that ad with the famous line "I know boats!"

Did you know it is probably an analogy to describe your collection of dusty AS3778 standards sitting in that big folder in your office?

When was the last time you familiarised yourself with aspects of it or, perhaps more importantly, when was the last time you or your organisation reviewed the currency of the standards you are referring to in your procedures and processes?

Like everyone else, one of my favourite parts of AS3778 is, of course, AS3778.2.4 "Measurement of water flow in open channels, Part 2.4: General – Estimation of uncertainty of a flow rate measurement".

While busying myself over the last few weeks reviewing proposed hydrometric guidelines and procedures I dragged my copy out to review the uncertainty estimation techniques in this part with specific reference to uncertainties in gaugings contained in 'Annex D – Examples of estimating uncertainties in open channel flow measurement'. A neat little annex as it takes all the hard work out of trying to understand all that theory stuff that fills most of this part of the standard.

A few days later I was needing to check up on something in it, but being in another location where I didn't have physical access to my beloved AS3778 tome, I decided to utilise our online subscription for the Standards.

Upon opening it I went to Annex D to check the item I wanted to check, but amazingly it didn't look like the Annex D I was familiar with! I was confronted with something called "Basic statistical concepts for use in Type A measurements of Uncertainty" and within that section I couldn't even find a reference to my beloved area velocity uncertainties! Luckily, further reading led me to Annex G where the worked examples I wanted were lurking!

Feeling a little bit relieved I had located what I wanted, I decided to familiarise myself further with this new looking document and discovered the following:

- The latest version of AS3778.2.4 was published on August 6, 2007. My paper tome is dated March 12, 2001.
- This latest version is the third version of this part of the standard.
- Perhaps most importantly (and perhaps disturbingly) the preface states – "The objective of this Standard is to specify methods for measuring discharge in large rivers and estuaries by the moving boat technique".

Now looking at this last point is astounding. This statement does not exist in the second version. Does this mean that the newest version is not meant to be applied to standard area velocity gauging processes that many of us still undertake in our daily work?

I thought "Surely the members of Committee CE-024 would have picked this point up?", so I reviewed the list of the Committee Members and was further amazed to note that the committee in 2007 did not appear to have as members, any of the major government utilities or companies that employ the bulk of Australia's hydrographic/hydrometric professional community. Not that I mean any negative comment upon the professional skills of those that were on the committee, but it did seem odd that there was no Water Corporation, no Sydney Water, no Hydro Tasmania, etc., names that many of us would have been used to in previous review committees.

Last year it came up in other discussions I was involved in around hydrometric procedures that the ISO standard had altered the number of verticals that were desirable in a gauging measurement, basically increasing the number of verticals desired in a gauging.

Not a big deal on the surface, but what if a discharge measurement you made was challenged in court and your defence was that you had followed the standard and when asked to produce the evidence of your standard you produced the superseded version? It might sound far-fetched to most of us but when you are in court it is probably too late to update your quality assurance procedures.

Perhaps that now there is a national agenda for Hydrometric Guidelines and Standards, through BoM coordination and AHA support through its Technical Reference Groups, we should let the standards groups know where the bulk of the expertise lies in our industry when it comes to reviewing and revising the standards that apply directly to the work and functions we undertake.

There is also a central focus through the AHA and the various Technical Reference Groups. That should make it easier to communicate with all in our profession the latest advances in standards, new ways of doing things and new technologies that we use in our working world.

It is also time for us to be more pro-active in our profession and make sure we break into the cloistered world of the Standards Committees or at least be involved in the periods of invited comment on reviews of standards and guidelines.

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# Moving to the Hydrography Diploma

*Mic Clayton*

After a prolonged transition, the option to study to be a hydrographer in Australia via the Hydrography Certificate IV will cease to be available later this year. Replacing it will be the Diploma in Water Operations. While a hydrography specialism is not in place yet in the Diploma, it is being worked towards by educators and members of the AHA.

As you would all be aware by now, this transition means that study in our profession is moving from a course based mode to a competency based mode in gaining your qualification. This change has primarily been driven from a federal level via the states. Competency based qualifications became all the rage to address a variety of skills shortages around the nation. This reform also tied funding to it so obviously the states said yes.

Politics aside, what does this mean for current students studying to be a hydrographer and for future hydrographic career opportunities for the youth of our nation?

## New Challenges

1. Students of hydrography in Australia are currently enrolled in either the Diploma or the Hydrography Certificate IV.

   It appears that, from what I am observing, students re-enrolling in the Cert IV course this year are being advised that they must transfer to the Diploma. Depending on the student's level of hydrographic experience and studies to date in the Cert IV course, students can apply for a variety of previous learning or skills recognition to enable credit towards gaining qualifications in the new competency set for the Diploma. This process will vary for each individual.

   Ensuring that a student is not disadvantaged through this process will be a big challenge for the profession.

2. In the new world of the Diploma, there are a number of assumptions made as to how a student will achieve the skills and experiences to gain the final qualification.

   The first, and probably primary, assumption is that the student is employed in the field of hydrography already. Previously a student studying the Hydrography Certificate did not have to be employed to study. This has occurred in the past but is now not available to school leavers or those wishing to study for a career change.

   Is the new Diploma World unwittingly cutting off a potential supply of new hydrographers by discriminating against those not employed in the profession?

3. It is much too easy to have a 'Monkey See, Monkey Do' approach to mentoring. This approach does not contribute to knowledge growth and enrichment of future hydrographers.

   While an RTO may provide guides to assessments, possibly some course work to assist with learning gaps and the like there is still a requirement for the student's employer to support the claims of the student in the competency process.

   This relies heavily on, not just having suitable learning and mentoring processes within an organisation, but mentors of suitable quality and experience with an understanding of the Diploma framework as well as the subject matter.

   Ensuring consistent and quality mentoring across the Diploma is a critical challenge to the professional. Perhaps there should be a Mentor Support Group.

## New Responsibilities

During my involvement over recent years with the development of competencies within the Diploma framework, criticisms of the Cert IV course included phrases such as out of date, irrelevant subjects, and so on.

Reflecting on these criticisms I could understand to some extent why these existed. Organisations across Australia require different skills from hydrographers depending on where they are working or what they are measuring, so subjects considered irrelevant by one group may just as likely have been relevant to another organisation.

This didn't mean that the old Cert IV (and the older certificate course) was bad. It contains core and basic knowledge about hydrography, meteorology and hydrographic techniques. Even the dreaded hydraulics subjects provide an intrinsic knowledge that is often required by hydrographers in senior positions of technical responsibility.

Perhaps the Cert IV course wasn't as poor as these critics of it made out ***but perhaps the real issue was that organisations weren't complementing the knowledge enrichment of its staff in conjunction with the student's studies.***

Implicit in addressing the criticism of the old Cert IV course, through organisations supporting the move to the competency based mode of study, was that there would be an increased emphasis on the responsibility of the employer to:

- Provide an ***enriching work environment*** where skills and knowledge can be obtained by the student that align with the competencies.
- Provide or enable access by the students to ***suitably knowledgeable mentors and peers***.
- Have an ***active involvement*** in the professional development of staff undertaking Diploma studies. There is no just checking if a student has passed or failed a subject at the end of the year. The employer is expected to nurture the professional development of its staff undertaking these studies.

It is acknowledged that some organisations may not have the resources, or even quality of resources, to undertake these responsibilities effectively, but there are alternatives to assist the student in obtaining mentoring assistance.

One avenue is through OTEN. OTEN is currently offering regular online tutorials to students enrolled in the Diploma. These tutorials focus on a learning outcome (or two) of a competency and provide a group environment to ask questions, share difficulties in learning and so on.

Information about these tutorials can be accessed through the OTEN Hydrography Facebook page.

As a minimum, an organisation should be encouraging its staff to participate in these types of study activities.

As a mentor/supervisor for a number of employees in my organisation I have begun participating in this online activity. Why? one might ask given I am already a qualified hydrographic professional with extensive experience in the field. Well it's not necessarily for me to learn something new (who knows, I might!) but rather being responsible for maintaining a connection with the learning processes that my staff are undertaking. Participating in this activity also supports my own mentoring skills development and learning.

It also potentially provides an opportunity for students from one organisation to understand what other organisations do and expose them to different ideas or processes. The networking can also enable the student to have another port of call for assistance if required.

## Into the Future

With the development of the Diploma, which involved many agencies and organisations including the AHA, there came with it a responsibility on the organisations and the profession to be ***actively involved*** in the nurturing the development of existing hydrographers and future hydrographers. This will require tapping into the wider hydrographic community to support the new qualifications pathways through mentoring and knowledge sharing. The level of support will vary between organisations and individuals, but it needs to be happening and continuing.

The quality and consistency of mentoring is just as important and the ongoing development of mentors should be considered as an important activity of hydrographic groups such as the AHA.

I am still concerned at the lack of a pathway for school leavers, or those seeking a career change, as the current model of the Diploma does not cater for this pool of students if they aren't employed in the profession.

It is regularly acknowledged that the hydrographic workforce is aging? How do we meet the challenge of providing for the new blood? How do we encourage employers and organisations to once again support the concept of trainees?

Finally, us more senior hands have a huge collective wealth of hydrographic knowledge and experiences. We shouldn't hide our lamps under a bushel but rather we should share our passion for our profession with those who wish to learn and grow in it.

# Close Encounters of the Lizard Kind

***Stephen Keen***
***Department of Water, WA, Mandurah***

The location is a station we visit once a fortnight to once a month, depending on rainfall. Anyway, when I was first taken here 18 months ago I was shown the lizard that lived in the hut.

"Don't worry", they told me.

"He never comes out of his little gap at the back of the hut".

True to their word, it had never been anywhere but in his little gap for the last 18 months. THAT WAS UNTIL LAST WEEK.

Arriving at the station, the first thing I do is open the door of the hut and look to see if there are any snakes or the lizard lurking around on the floor. I pushed the door open and stepped into the doorway to scout the inside as per normal. At this stage I felt something touch my cap. That's strange, I thought, so I stopped and stood still. Suddenly a long thin tail snaked its way down the brim of my cap in front of my right eye, followed by another thin tail snaking down past my cap in front of my left eye. I could feel and hear the scales scrapping against the peak of my cap and, as you can imagine, I went into sensory overload being fully wired after having just finished a black coffee. I leapt back out the door with a scream that would have broken glass, thinking I will most likely need a change of undies.

Anyway, as you can see in the photos my mate the lizard had found a girlfriend and was having a great time with her above the doorway. That was until I walked in and he lost his grip and plopped onto my head. They stayed this way the whole time we were there and we had to use a broom to lift them up so we could get the door shut.

Fortunately, my workmate Laura was able to take some photos to provide credence to my lizard encounter story.

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# Hydrographer Takes a Career Change

***Mike Lysaght***

In a recent trip to Thailand I happened to meet the Buddhist monk in the photograph. Nothing unusual about that, you might say. Well, no, but I did spend some time with him on Koh Samui and found him to be a real nice gentle soul. Not only that, but prior to his last six years of religious life I discovered that he had previously spent over forty years with EGAT (Thailand Hydroelectric authority) as a field hydrographer. He had a good working knowledge of Hydrological Services products and really knew his stuff.

Now, how's that for a career change!

# Hydrographer Doing it in Water?

***Mike Lysaght***

Hydrographers certainly have to work in trying conditions. I was given this photograph some time ago. It shows a USGS hydrographer doing a gauging on a stream called Granite Creek somewhere in Wyoming. Something we don't see much of in Australia although the Snowy Mountains hydrographers might have something to say about that?

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