Australasian Hydrographer

July 2012

A glimpse of recent years' flooding in Victoria: Hopkins River gauging station at Wickliffe just after the January 2011 flood peak (Photograph courtesy of Thiess Services Pty Ltd)

AUSTRALIAN HYDROGRAPHERS ASSOCIATION

AHA

Australian Hydrographers Association
The Secretary
Australian Hydrographers Association Incorporated
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Melbourne, VIC 3001

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Contents

FRANK DAVIES

Editor's Introduction

Many thanks are due to Krystal Hoult for much of the information presented in this journal. Her first year as secretary must have seemed a blur. You will read about some of her recent efforts including the AHA AGM agenda, the conference preparations, the conference agenda, liaison with the various conference speakers, getting on top of the membership database, and a brief reversion to her NZ roots. ADCPs continue to be the hydrographers' favourite equipment and Daniel Wagenaar provides an insight into developments in the NT. The Western Australian flavour of journal content is still present with two more articles "borrowed" from my employer's Hydrographic Newsletter. I hope you find these stories interesting, but if not, then I wait for your content for the next issue of the journal. Finally, Unidata's Matt Saunders presents his understanding of the options available for satellite telemetry. Thank you also to Greg Jones whose cartoons you will have seen appearing in recent issues. Does anyone else have a skilful hand and quick wit to match Greg's?

It is important to keep in mind what the AHA is all about. The constitution offers the following objectives of the association:

a. To encourage the development of all aspects of Hydrometric data collection, processing, analysis and presentation throughout Australia;
b. To contribute to the knowledge of, and encourage interest in Australia's water resources and management and utilization of such resources;
c. To provide a forum for the interchange of knowledge and ideas of a. and b. above; and
d. To represent the interest of all Australian Hydrographers and support staff.

One of the more delicate aspects the AHA committee face is the management and balance of commercial interests. And, before saying anything more, it is worth reiterating that the AHA is run by volunteers. To provide members with services it is often appropriate to rely on corporate sponsorship.

The journal is one of the mediums used by the AHA where decisions have to be made to ensure that commercial interests are correctly managed. Part of the entitlements of corporate AHA membership is one A4 sized advertisement in each journal issue. It is also possible to purchase advertising space. Beyond that, content should not directly promote products or services. However, just as non-commercial organisations may present information to members to promote hydrography, the same may be true for commercial organisations. I would also assume that a large proportion of AHA membership is made up of employees of commercial groups.

I therefore encourage all to contribute to the journal and trust that the decisions made by the AHA committee regarding journal content are appropriate.

Annual General Meeting

Please be advised of the following information regarding the 2012 Annual General Meeting of the Australian Hydrographers Association Incorporated.

The 32nd Annual General Meeting of the Australian Hydrographers Association Inc

Moonee Valley Racing Club, Melbourne
Gate 1 McPherson Street, Moonee Ponds
Wednesday 22nd August 2012, 11am to 12pm

The meeting will be held on the first day of presentations of the 2012 AHA Conference, with the Kisters User Group and the AHA 2012 Conference Welcome Evening being held on Tuesday the 21st August 2012.

Provisional Agenda

1. Attendees
2. Apologies
3. Confirm Minutes of the 2011 AGM
4. Receive Committee Reports
   - Chairman – Bill Steen
   - Secretary – Krystal Hoult
   - Treasurer – Max Hayes
5. Election of
   - Chairman
   - Treasurer
   - Two Committee Member Positions
6. General Business

Vacant Positions

I would encourage all members to consider the opportunity to become more involved in the Association. The current cycle of election of positions is now in line with the amended constitution and is conducted every two years.

If you wish to contribute more actively in the association please complete and return the nomination forms or proxy forms for voting you have receive via email.

General Business

AHA members wishing to have an item tabled in General Business at the AGM are required to lodge the item with the secretary of the AHA to arrive no later than 5pm Thursday 16th August 2012. Items may be sent to the secretary via email at secretary [at] aha (dot) net (dot) au or by post to:

The Secretary
Australian Hydrographers Association
GPO Box 1450
Melbourne, VIC 3001

Kind Regards,
Krystal Hoult
AHA Secretary

KRYSTAL HOULT

Secretarial Update

Conference Venue Visit

Early on the morning of Wednesday 11th July John Cameron (Department of Sustainability and Environment Victoria), Todd Lovell (Bureau of Meteorology), John Teres (National Promotions), Jess Patrick (Moonee Valley Racing Club) and I met for a walk through the venue for the 2012 AHA Conference.

We spent several hours going through all of the finer details of the conference, and while there is still a lot to do over the next few weeks, the venue visit has finally made things feel like they are starting to come together. National Promotions and the 2012 AHA Convening Committee are working tirelessly organising what I am absolutely sure will be another stunning AHA Conference.

What we have on offer at this year's conference with Moonee Valley Racing Club as the venue is space. After arriving at the conference at Gate 1 you will head towards the Racing Club Office signage, making your way through the foyer following well placed AHA Conference signs, into the elevator and down, coming out at the registration desk. After registration you will walk directly into the open plan exhibition area where one and all will have room to move. All food and beverages, aside from the dinner, will also be served in this space. On presentation days you will continue through the exhibition space to a separate room housing the presentation platform and classroom seating for all. The conference dinner and entertainment evening will be held upstairs above the presentation space. The view from this room will be truly spectacular with floor to ceiling glass windows overlooking the racecourse, interspaced with the leafy green of suburban Australia, and a stunning view of the city of Melbourne in the background.

During our wander around we also discovered Moonee Valley Legends, a spacious bistro and bar just a stone's throw from the main conference venue. This will be perfect for those couple of after-conference quiets, because hydrographers are responsible drinkers, aren't we?

Membership Database and Processing

Over the last couple of months I have fully taken over the processing of memberships from our previous secretary, Michael Whiting. This handover has unfortunately resulted in delays in membership processing and has held up the issue of renewals for the 2012/13 financial year. This has arisen due to unforeseen technical issues with the current Access database. These mostly relate to the downloading and installing of the database on my computer, as well as becoming familiar with the processes behind the scenes. Fortunately, Michael has the patience of a saint!

The AHA constitution allows for a three month window for members to remain financial after the end of the financial year. So, fortunately this wee delay does not affect member status until the end of September. However, once renewals do start getting emailed, which should be very shortly, it would be greatly appreciated if members were prompt in returning their completed forms and associated payments.

Please accept my sincere apologies for this unforeseen delay. Your patience and understanding will be greatly appreciated.

We are also still working at moving the database and membership to a web based system. However, this has been placed on the backburner during conference preparations and resolving the current database problems.

New Zealand Hydrological Society Reciprocal Conference Arrangement

On Thursday 10th to Friday 11th May the New Zealand Hydrological Society, in Association with Tasman District Council, held a "Change and Improvement in Operational Hydrology" workshop at Trafalgar Park in Nelson, New Zealand. The workshop was pitched as a forum for technical staff involved in operational hydrology to keep up to date with changes and contribute to the future of the industry. The workshop included formal presentations, videos and posters, focusing on aspects of change and their associated solutions.

The prize for the best oral presentation at the workshop was a free registration at the AHA 2012 Conference in Melbourne, care of a donation from the Australian Hydrographers Association, with Environmental Collective (http://envco.co.nz/) providing sponsorship to assist with travel and accommodation.

Paul Hannah, an Environmental Officer at Otago Regional Council, was the winner with his presentation entitled "Heli Gauging and ADCP Platform Design." In exchange for his free registration, Paul will be giving his presentation at our Conference on Wednesday the 22nd August at 12pm on the first day of presentations. I encourage you all to get your conference registrations sorted and make the time to come and hear a fabulous presentation about innovation in hydrology at a "ground" roots level.

The New Zealand Hydrological Society has generously offered a reciprocal free registration for an Australian delegate to attend and present at one of their conferences. This prize is not up for offer at this year's conference due to timing. However, the possibility of an additional presentation day next year outside of the biennial conference timing has been floated. Alternatively, the free registration will be put on offer at the 2014 conference. We would appreciate member's thoughts with regards to an additional presentation day or alternatives for awarding the prize. The AHA committee would also like to source external sponsorship to assist with travel and accommodation for the winning presenter. Interested parties can contact us via email: committee [at] aha (dot) net (dot) au.

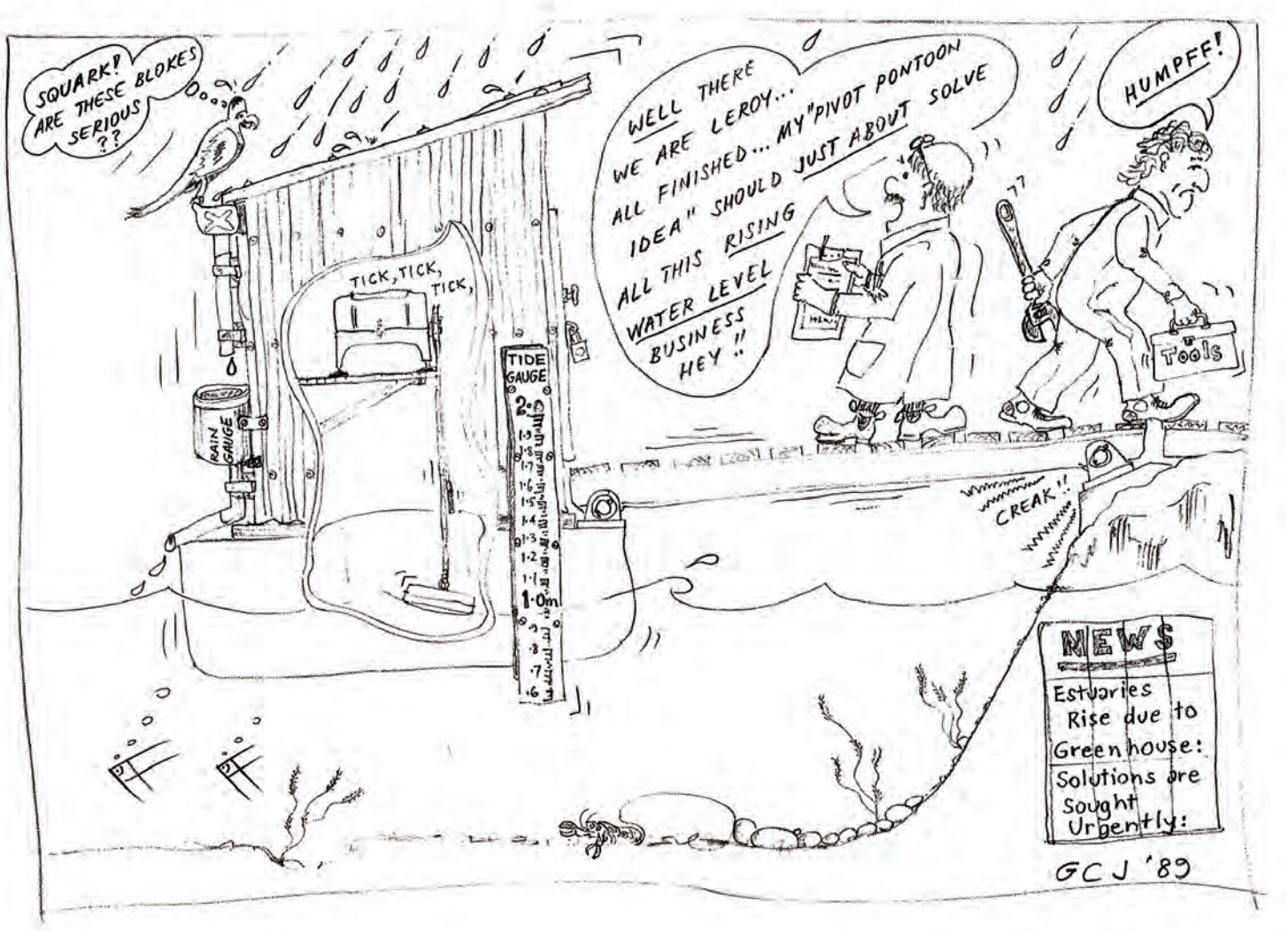
Paul Hannah: Heli Gauging and ADCP Platform Design - Conference Abstract

Since the advent of acoustic profilers being used for flow gauging the search has been on for the perfect platform in which to carry the ADCP. To date, the performance and cost of factory platforms on the market has proved disappointing. This has led to an array of prototype platforms being developed by the end users. This presentation will outline good hull characteristics for the use in challenging flood conditions. The hull shape of a platform has less influence on the data collected when being used in laminar, slower flow; therefore this presentation concentrates on suitable hull design for undertaking flood gaugings. Hull characteristics that will be discussed include the effect the cross-sectional profile of a hull has on the accuracy of depth measurements, and problems such as submarining, debris entrapment, cavitation and excess pitch. By deploying the appropriate platform in challenging conditions, the quality of data captured will be increased. The 'right' platform also increases safety for both the equipment and the operator(s).

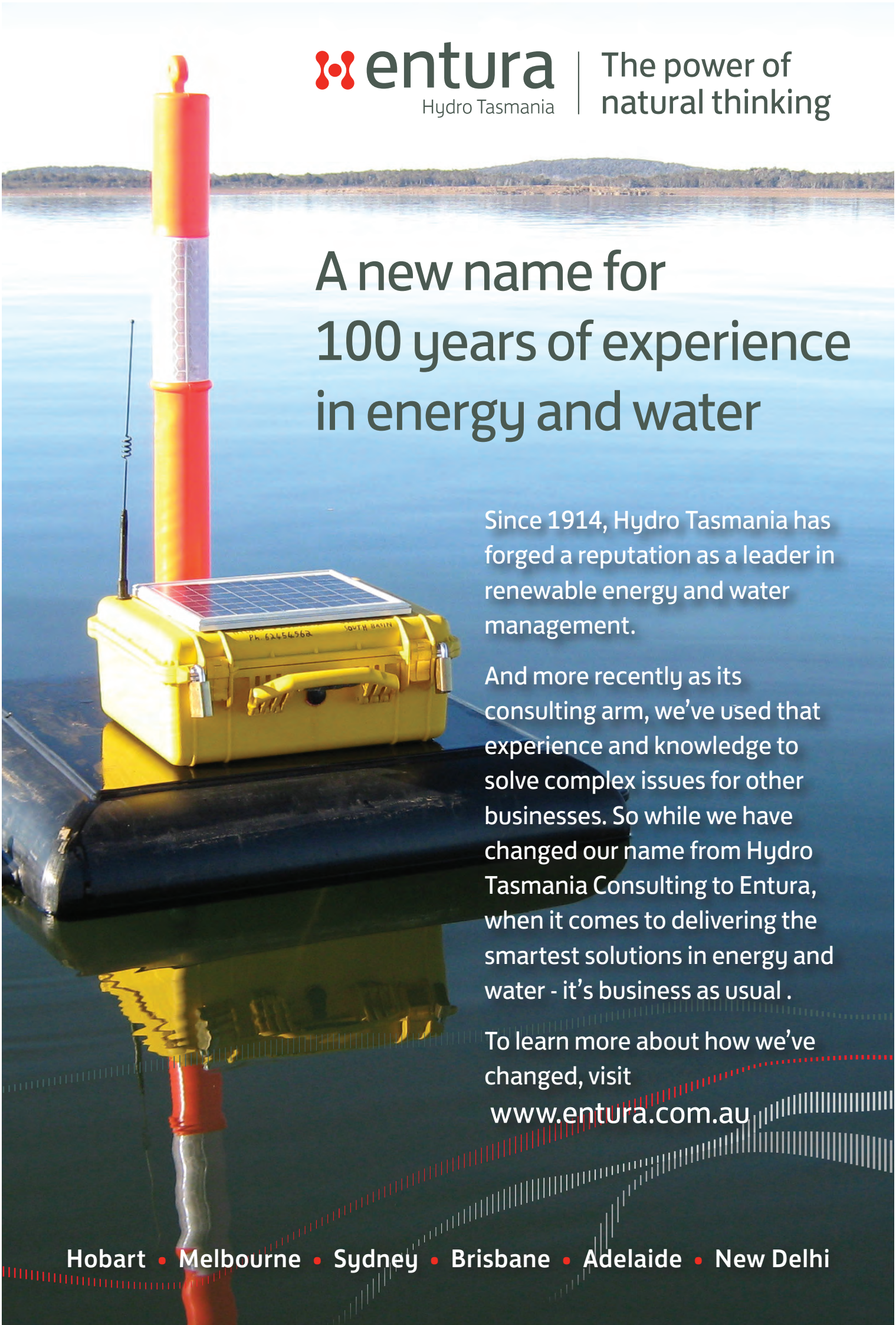
As a result of various factory hull trials and modifications (and a drowned M9) an ADCP platform was developed by ORC. This platform was designed with the intention of being able to safely tow it across flood waters either by hand, off the side of a jet boat, below a cableway or a helicopter.

In April ORC Field Hydrologists undertook a Helicopter gauging trial on two Otago Rivers. The aim of this trial was to determine whether robust hydrological data could be collected when towing an ADCP from a helicopter. Helicopters Otago Ltd was employed to carry out the gauging trial. The company has a long history of specialist flying including long line/live line work. Four of their most experienced pilots provided the expertise to make sure the operation was carried out safely. During the trial a number of comparative gaugings were conducted from a portable cableway and jet boat using both an M9 and a Rio Grande to provide baseline data.

The presentation will review the outcome of the platform's performance under the helicopter as well as the quality of the data collected. And finally, when working around swollen rivers safety is always paramount. The presentation will touch on the safeguards used to ensure both the safety of expensive equipment, and more importantly the safety of operators when heli gauging.



Cartoon by Greg Jones, Technical Officer.
SA Water, Mount Gambier, SA.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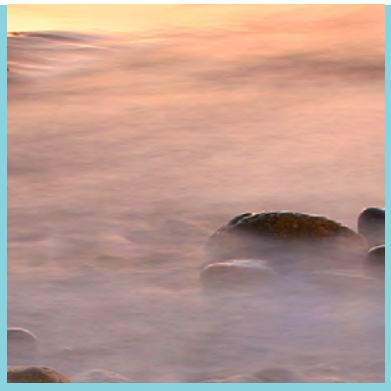
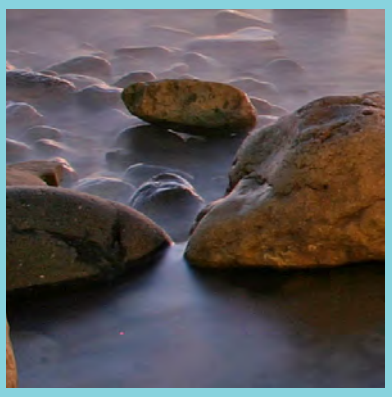
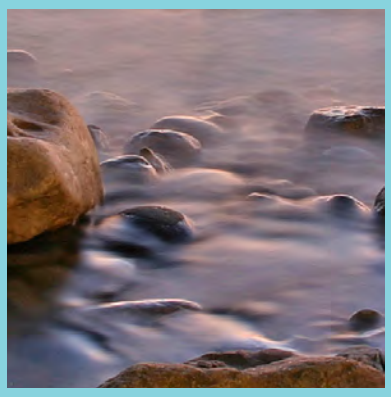
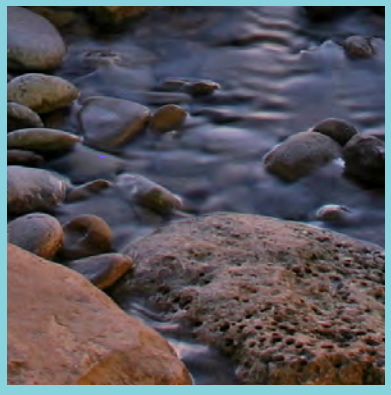


AHA Conference Program

Tuesday 21 to Friday 24







AUSTRALIAN HYDROGRAPHERS ASSOCIATION

AHA2012 CONFERENCE Melbourne

Australian Government
Bureau of Meteorology

Platinum Sponsor

Moonee Valley Racing Club
21-24 August 2012

ConferenceProgram

Tuesday 21th August

Time	Topic	Name / Location	Representing / Country
17:00	Registration		
18:00	Welcome Reception & Drinks	Exhibition Hall	Sponsored by SonTek YSI
20:00	Close		

Wednesday 22th August

Time	Topic	Name / Location	Representing / Country
08:30	Registration and Coffee	Exhibition Hall	
09:00	Welcome / MC	William Steen	Australian Hydrographers' Association
09:15	**Keynote Speaker** Water Management Challenges in the Murray-Darling Basin	David Dreverman	Murray–Darling Basin Authority
09:45	**Lead Address Speaker 1** Strategic Directions in Water Resource Information Management	Adrian Spall	DSE Victoria
10:15	Morning Tea Incorporating Group photo	Exhibition Hall Ground Floor	Sponsored by Unidata
10:55	Welcome Back Draw	Conference Hall	Sponsored by Unidata
11:00	AHA Annual General Meeting	AHA Committee	Australian Hydrographers Association
12:00	Heli Gauging and ADCP Platform Design	Paul Hannah	Otago Regional Council, New Zealand
12:30	Lunch	Exhibition Hall	Sponsored by Unidata
13:25	Welcome Back Draw	Conference Hall	Sponsored by Unidata
13:30	**Hydroacoustic Keynote Speaker** Hydroacoustics in the USGS – Successes and Challenges	Kevin Oberg	USGS, Office of Surface Water
14:00	**Lead Address Speaker 1** Progress in Development of National ADCP Standards	Mark Randall	DNRM Queensland
14:30	**Lead Address Speaker 2** Flow Measurement Using Acoustic Technology	Rohan Oliver	Thiess Hydrographic Services
15:00	Afternoon Tea	Exhibition Hall	Sponsored by Unidata
15:25	Welcome Back Draw	Conference Hall	Sponsored by Unidata
15:30	Development of ADCP Deployment Equipment to Optimise Performance	David Spiers	DPIPWE Tasmania
15:50	Stream Flow Monitoring at Latrobe River Swing Bridge	Garry Leslie Wayne Ross	Thiess Hydrographic Services
16:10	Old and New, ADCP Versus Traditional	John Hayes	NSW Office of Water
16:30	Discussion	Ray Boyton (Chair) Kevin Oberg Mark Randall Rohan Oliver Paul Hannah David Spiers Garry Leslie & Wayne Ross John Hayes	NSW Office of Water USGS, Office of Surface Water DNRM Queensland Thiess Hydrographic Services Otago Regional Council, New Zealand DPIPWE Tasmania Thiess Hydrographic Services NSW Office of Water
17:15	Pitstop Drinks	Exhibition Hall	Sponsored by the Exhibitors
18:30	Pre Dinner Drinks	The Committee Function Room	
19:30	Dinner	The Committee Function Room	

*Please note that this program is subject to change, see aha.net.au for up to date info

ConferenceProgram

Thursday 23st August

Time	Topic	Name / Location	Representing / Country
08:30	Registration and Coffee	Exhibition Hall	
09:00	**Data Keynote Speaker** Water Data, a National Treasure	Dr Dasarath Jayasuriya	Bureau of Meteorology
09:30	**Lead Address Speaker 1** Why Data Matters - Surface Water Data as Assets	Dr Sabine Schreiber	DSE Victoria
10:00	**Lead Address Speaker 2** When the Data Hits the Road	Janice Green	Bureau of Meteorology
10:30	Morning Tea	Exhibition Hall	Sponsored by Unidata
10:55	Welcome Back Draw	Conference Hall	Sponsored by Unidata
11:00	Future Delivery of Hydrographic Services	David McPhee	DSE Victoria
11:20	Automatic Data Checking for Stream Data	Eric Hatfield	NSW Office of Water
11:40	Measurement Uncertainty and the Development of Data Quality Codes	Royd Cumming	Thiess Hydrographic Services
12:00	Discussion	Peter Heweston (Chair) Dr Dasarath Jayasuriya Dr Sabine Schreiber Janice Green David McPhee Eric Hatfield Royd Cumming	KISTERS Pty. Ltd Bureau of Meteorology DSE Victoria Bureau of Meteorology DSE Victoria NSW Office of Water Thiess Hydrographic Services
12:30	Lunch	Exhibition Hall	Sponsored by Unidata
13:25	Welcome Back Draw	Conference Hall	Sponsored by Unidata
13:30	**Education Lead Address Speaker 1** Hydrometric Qualifications – Where to Now?	Paul Langshaw	Australian Hydrographers Association
14:00	**Lead Address Speaker 2** Competency Based Training in the Northern Territory	Simon Cruickshank	Northern Territory Government
14:30	Discussion	William Steen (Chair) Paul Langshaw Simon Cruickshank Scott Walker Warren Jack	Australian Hydrographers Association Australian Hydrographers Association Northern Territory Government ALS/OTEN Australian Institute of Training (IOT)
15:00	Afternoon Tea	Exhibition Hall	Sponsored by Unidata
15:25	Welcome Back Draw	Conference Hall	Sponsored by Unidata
15:30	A National Approach to Water Information	Linton Johnston Grant Robinson	Bureau of Meteorology NSW Office of Water
15:50	Development and Deployment of a Portable Automated Logger System	Allan Garland	Thiess Hydrographic Services
16:10	Data Recovery - Christchurch Earthquake	Phil Downes	Environment Canterbury New Zealand
16:30	A Hydrographic Journey Along the Hawkesbury Nepean System	Natalie Noakes	Sydney Water
16:50	Brief for Field Day Prize Draws Passport Prizes	John Cameron William Steen	DSE Victoria Exhibitors Aquatic Informatics
17:00	Alex Miller Award and Close	Mike Lysaght William Steen	Hydrological Services Australian Hydrographers Association

*Please note that this program is subject to change, see aha.net.au for up to date info

ConferenceFieldTrip

Friday 24nd August - Field Day Trip

AHA 2012 CONFERENCE FIELD TRIP
The 2012 AHA Conference field trip will visit several sites that have been selected as they challenge conventional thinking about hydrographic practises and processes and provide some innovative solutions to long-term issues. It will also showcase picturesque areas of Victoria.

There will be some discussion about bushfires, their impacts on local communities and hydrographic systems and the ways that hydrographers support recovery from such fires. In addition the trip will broaden the understanding about bushfire impact on natural environments.

Sites have been selected to cover the Metropolitan landscape and natural environments.

ITINERARY

07:45 **Depart Moonee Valley Racing Club for Maribyrnong River at Keilor, Brimbank Park**

08:30 **Arrive Maribyrnong River, Brimbank Park**
Presentation by THIESS at their Maribyrnong test site. Demonstration of Melbourne Water Q boat and establishing a cross-wire at an ungauged location.

09:30 **Morning tea at Brimbank Park Cafe**

10:15 **Depart Brimbank for Yarra Ranges**
Tour through Yarra Valley with a possible short detour through a bushfire effected area.

11:45 **Arrive at Yarra Ranges Park**
Presentation to be provided on a controlled catchment yield study operating since the 1960's plus discussion about the potential impact of bushfire on the catchment.

12:15 **Lunch**

13:15 **Site inspections Coranderrk study and Badger Creek site**
Inspection of the Badger Creek water monitoring site.

14:15 **Depart Yarra Ranges for Merri Creek at St Georges Road**

15:30 **Arrive at Merri Creek**
Melbourne Water will lead discussions on difficulties encountered with, and innovation required to operate the site within the urban landscape and a THIESS representative will be invited to discuss the water quality issues. Melbourne Water will be invited to leave the site in its "raw" condition in order to provoke discussion about vandalism and innovative solutions.

16:30 **Depart for Moonee Valley**

17:00 **Arrive at Moonee Valley for farewell drinks**
Kisters will be hosting this soiree.

ConferenceExhibitors

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Tyco Pumping Systems
Aqualab
John Morris Scientific

2012 Melbourne

Conference Keynote and Lead Speakers

These excerpts from the 2012 conference key speaker biographies give you a preview into the range and quality of people that you will be hearing from.

David Dreverman

Executive Director, River Management
Murray-Darling Basin Authority

David Dreverman is the Executive Director, River Management at the Murray-Darling Basin Authority. David joined the Murray-Darling Basin Commission in 2000 as Manager, Assets, and was appointed General Manager, River Murray Water of the Commission in 2003. He transferred to the Authority in his current role when it assumed the functions of the former Commission in December 2008.

Adrian Spall

Director, Water Information Management, Water Group
Department of Sustainability and Environment, Vic

Adrian is a Director within the Water Group of the Department of Sustainability and Environment, Victoria. Adrian's present responsibilities include delivering on a range of water information initiatives designed to improve the management and accessibility of water resource information across the State, particularly in the areas of water availability, quality and use within Victoria.

Kevin A Oberg

Hydrologist
U.S. Geological Survey

Kevin Oberg is the national coordinator for hydroacoustics for the U.S. Geological Survey (USGS) Office of Surface Water (OSW). Kevin leads OSW's efforts to develop new methods in the application of acoustics to hydraulic and hydrologic measurements in the USGS Water Mission Area. He also directs OSW efforts to provide technical training, technical support, and quality assurance of hydroacoustics methods within the USGS and internationally.

Mark Randall

Hydrographic Project Officer
Department of Natural Resources and Mines, Qld

Originally from the UK, Mark came to Australian in 2004 after completing his BSc Zoology Honours, for which he specialised in freshwater and marine ecosystems. Mark began working as a Hydrographic Project Officer for the Queensland Department of Environmental and Resource management in 2006. He is based in Mareeba, working predominantly in the Cape York Peninsula. Aside from his departmental hydrographic duties Mark has been involved in the process of establishing the national procedural standard for ADCP measurements as part of the BoM Modernisation and Extension program.

Rohan Oliver

Manager Northern Victoria Hydrographics Section
Thiess Services

Rohan Oliver is the Regional Manager for Thiess Services Hydrographic Group in Northern Victoria and is based in Kerang. He manages 30 staff located in 5 offices across the North of the State.

Dr Dasarath Jayasuriya

Acting Deputy Director Climate and Water Division
Bureau of Meteorology

Dr Dasarath (Jaya) Jayasuriya is the Acting Deputy Director Climate and Water at the Australian Bureau of Meteorology since August 2011.

A Civil Engineer by profession, Jaya completed his PhD from Monash University in the mid 80's and worked at Melbourne Water for 22 years prior to joining the Bureau in 2009.

Sabine G. Schreiber (PhD, M.Sc.)

Manager, Water Resource Assessment
Department of Sustainability and Environment, Vic

Sabine Schreiber manages the Regional Water Monitoring Partnership program under which approximately 80% of Victoria's regional surface water data is collected. Sabine's passion lies in data, the paths from data to information and in facilitating the use of information in policy and decision-making.

Janice Green

IFD Revision Project Manager
Bureau of Meteorology

Janice Green works for the Bureau of Meteorology heading up the team responsible for the revision of the Bureau's Intensity-Frequency-Duration (IFD) design rainfall estimates as part of the overall revision of Australian Rainfall and Runoff. Janice holds a Bachelor of Natural Resources and a Masters of Engineering Science and has over 25 years experience in hydrology, hydraulics, and water resource management incorporating a range of studies in Australia, Asia and India. She has worked in the public sector, at both state and federal levels, and also in private industry.

Paul Langshaw

Hydrometric Consultant
Rainman Water

Employment History
1972 – 1978 Sydney Water
1978 – 1989 BoM
1989 – 1992 Mid-life crisis – company director
1992 – 2005 AWT / Sydney Water
2005 – 2007 Greenspan
2007 – 2012 Hydrometric consultancy (Rainman water)

Paul is currently a committee member and Training Coordinator for the AHA.

Simon Cruickshank

Senior Manager Water Monitoring
Northern Territory Government

Simon commenced work in hydrography in 1994 after an aborted career in the marine industry. Signing on with what was then the Department of Land and Water Conservation (now NSW Office of Water) as a Hydrographic cadet, Simon was based in Forbes for 7 years becoming intimately familiar with the hydrology and geomorphology of the mighty Lachlan River including placements at the DLAWC instrumentation facility and Water Quality laboratory. Whilst a cadet, Simon completed a Bachelor of Technology Management by correspondence through Deakin University. In 2000, with the attraction of returning to the coast, Simon and family relocated to Darwin in the NT where he is now Manager of Water Monitoring.

Simon is currently a committee member of the AHA.

HYDROLOGICAL SERVICES PTY. LTD.
CASE STUDY

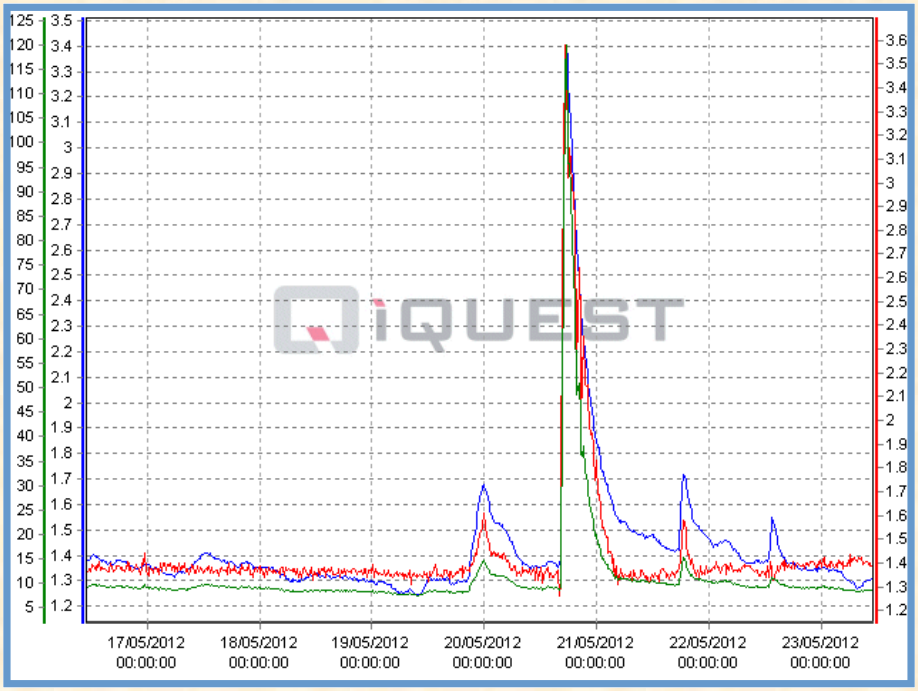
RQ30 RADAR WATER LEVEL / DISCHARGE SYSTEM TRIAL
SUNGAI LANGAT, MALAYSIA (May 2012)

BACKGROUND

At the request of the Malaysian Irrigation and Drainage Department (JPS), a site was selected on Sungai Langat immediately downstream of an existing long term JPS stream gauging station. The JPS had requested a 'turn-key' type solution so a complete system was designed and assembled at HS's Sydney complex.

SYSTEM DETAILS

- *Sommer Mess-Systemtechnik RQ30 radar level velocity sensor*
- *iQUEST iRIS350X data logger with on-board 3G modem*
- *20W solar panel and 12V DC 18ah sealed lead acid battery*
- *Data reported by FTP with iQUEST's Global Data Network service*



Blue = Level (metres) Red = Velocity (metres / sec.) Green = Discharge (cubic metres /sec.)

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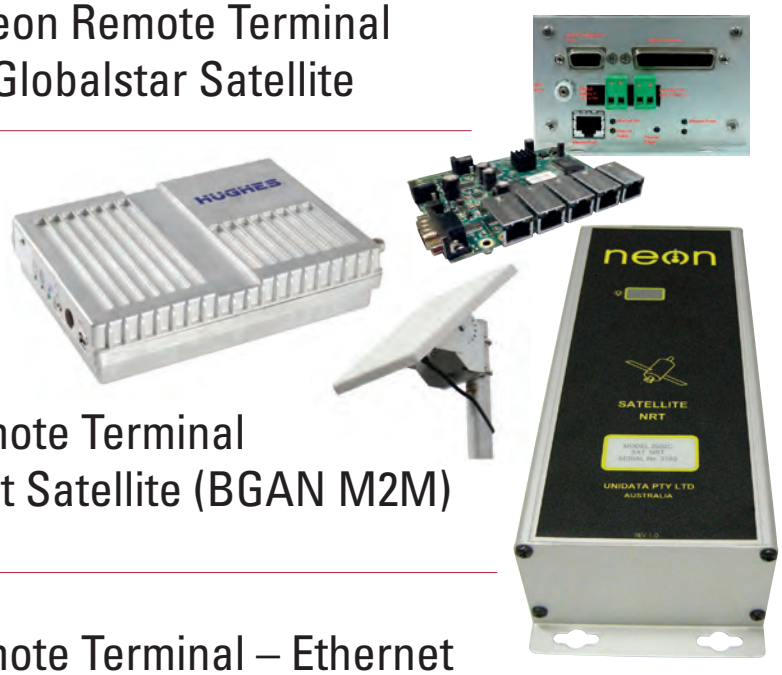

NEW

- Neon Remote Terminal
  – Inmarsat Satellite (BGAN M2M)

NEW

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Development of Communication Device for Riverboat

Daniel Wagenaar
Department of Natural Resources, Environment, The Arts and Sport, NT

Background

The Riverboat is manufactured by Oceanscience for Teledyne RDI Workhorse instruments to enable the hydrographer to perform flow measurements from bridges, cableways or manned boats.

The Riverboat consists of a trimaran hull design with the centre hull equipped with a water tight compartment, which houses the communication devices and power supply. The trimaran hull is a lightweight and stable platform in different flow conditions and this makes it ideal instrument in the flow measurement process.

Flow measurement is performed using an Acoustic Doppler Current Profiler (ADCP) that measures the water velocity and water depth throughout the section.

The presence of bed movement and high sediment loads during flood events especially in alluvial soils conditions influences the accuracy of these measurements and the following instrumentation is incorporated to accurately determine the instrument position and depth measurement.

- A100 GPS
- TriTech PA500 Echo Sounder

The data captured from the ADCP, GPS and Echo Sounder during the flow measurement is transferred from the Riverboat to a field computer using a communication device.

WinRiver II is the operating software used by RDI for the collection and processing of flow measurement data and the software is also able to supply real time information about flow, area and water depth measurements.

The number of data channels required if an ADCP, GPS and Echo Sounder is used during flow measurements consist of three and therefore communication devices currently available on the market is not sufficient for these purposes. The use of Bluetooth modems is an option however it is not robust enough for field work and a minimum of three modems will be required, which makes this impractical.

Communication Device Project

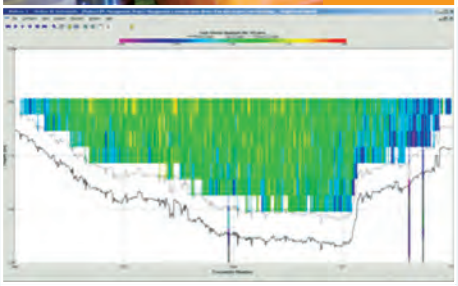
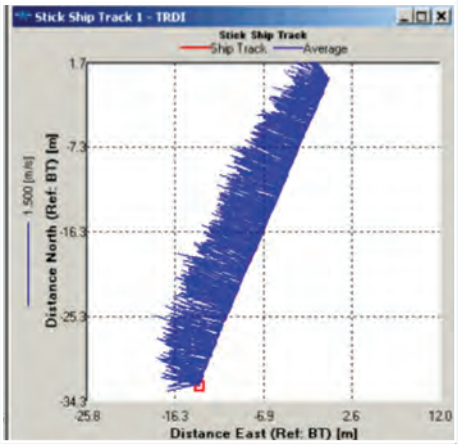
The Department of Natural Resources, Environment, The Arts and Sport in conjunction with UVS started a communication device project for the Riverboat consisting of the following development work.

- Identify a three channel communication device available on the market. The device must accommodate baud rate requirements of the different sensors.
- Single power supply for all three sensors. The power supply must accommodate voltage requirements of the different sensors.
- Communication device, power supply and wiring must be installed in existing water tight compartment.
- Manufacture of new shortened sensors cables.
- Manufacture mounting bracket for Echo Sounder.
- Drafting of an operational manual.
- Undergo field tests.

The outcomes of the project and the development work done by the different organisations are summarised in Table 1.

Table 1

Development	Description		Company
Three channel radio modem.	HydroLink ML3 Series is a three channel radio modem. Each channel has a different baud rate to accommodate the different sensors.		Ocean-Science
Single power supply for all sensors.	The power supply is connected to two on-board batteries and can supply 12V and 24V.		UVS
Installed in existing water tight compartment.	All instruments relating to radio modems, power supplies and batteries must be housed within the existing water tight compartment.	 	UVS

Development	Description		Company
Shortened sensor cables.	All sensor cables must be replaced with shortened versions. No excess cables must be on the outside of the hull.		UVS
Mounting Bracket for Echo Sounder.	The mounting bracket for the echo sounder is situated at the back of the centre hull of the Riverboat.		UVS
Field tests.	Field tests were performed to verify the communication device and the incorporation of the ADCP, echo sounder and GPS data in WinRiver II.	 	NRETAS

Summary

The setup of the system is straightforward especially with the clearly marked cables and self-explanatory manuals. It is important to note that the radio modems at the Riverboat and field computer is part of a set and cannot be switched if you have multiple systems.

The configuration of the ADCP, GPS and Echo Sounder in WinRiver II is also simple and the only difficulty is to identify the com port assigned to each USB converter. The new Panasonic Tough Books purchased have two serial ports incorporated in the docking station, which resolves the USB converter requirements.

The system developed by UVS and Oceanscience is more user-friendly and robust than any other communication devices available for this type of application. Although only preliminary tests were performed this is definitely the solution for Riverboats and RDI instrumentation.

On behalf of NRETAS I just want thank UVS, Oceanscience, RDI and Anthony Easman for their efforts in the development and testing of the instrumentation.

Improving Water Information

Seasonal Streamflow Forecasts
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maps the spatial relationships between important hydrological features
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Australian Government
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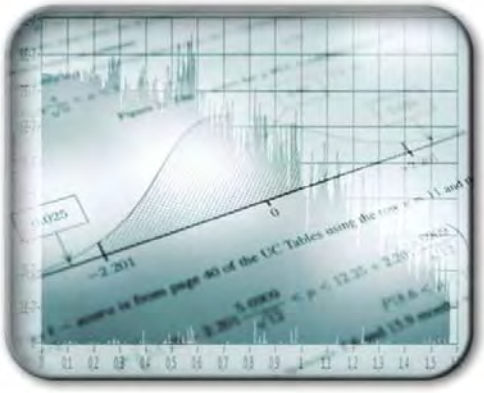
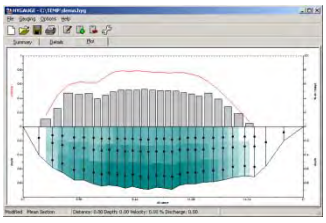
25 years
water management

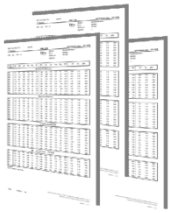
KISTERS' has been providing environmental data management software solutions since 1987. KISTERS' core business is the implementation of data management systems for environmental, hydrological, air quality and energy disciplines.

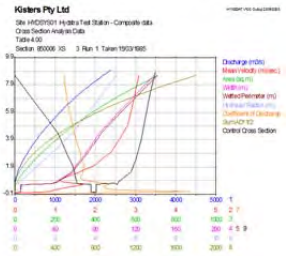


The KISTERS Group focuses on several fields of activities in environmental information including:

- Software for managing, analysing and reporting surface water, ground water, water quality, waste water, drinking water and meteorological data, including forecast and warning
- Software for real time applications and process control
- User-friendly GIS and Web-GIS solutions
- Hardware and software telemetry systems for surface water, ground water, water quality and meteorological stations
- Software and engineering services that range from the development of specifications and system analysis to software installation, training and maintenance







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Swivel Mounting Poles

Michael Whiting
Department of Water, WA

With the upgrade of the Kwolyin Hill gauging station to Neon IP Telemetry, it was necessary to provide a safe system for mounting a Next G antenna and 40W solar panel. The challenge was that the existing instrument shelter was located at the end of an embankment with a 2m drop on both sides and handrails eliminating access to the sides of the shed.

Thanks to a chance discovery, an off-the-shelf, swing-down pole system has been installed. Manufactured by www.swivelpole.com/au/, the unit is a bracket system relying on friction to lower poles safely and in difficult to access locations.

The system has various methods of attaching to existing infrastructure such as handrails. However, with the use of an internal adjustable wall bracket used for mounting our existing swing-down pole system and the 40NB 'Swivelpole' bracket and bulk head mount, it was successfully mounted to an existing 3m x 2m instrument shelter. With the cost of the external brackets close to $400 excluding the solar panel mount, 40NB post, and internal bracket, it is not a cheap undertaking. However, given the constraints for installation it was a good outcome.

The pole is lowered by slackening off the four bolts applying pressure to the friction plate, and slowly lowering the unit from the vertical to horizontal position. Other industries are using this system for lights and cameras in the mining, oil and gas industries so it has had rigorous field testing. The only limitations seem to be the mounting height which is limited to 1.8m from the bracket, and judging the amount of pressure to apply to the friction plate to slowly lower the pole.

External swivel pole bracket / friction plate.

Internal adjustable wall bracket.

Full system installed with security cover.

System in lowered position.

Overall it is a good outcome using both Department of Water designed and off-the-shelf products. It won't replace our existing rigid swing-down pole systems including stand-alone systems, shed mounted units and counter weighted float well systems, but offers an alternative in difficult situations.

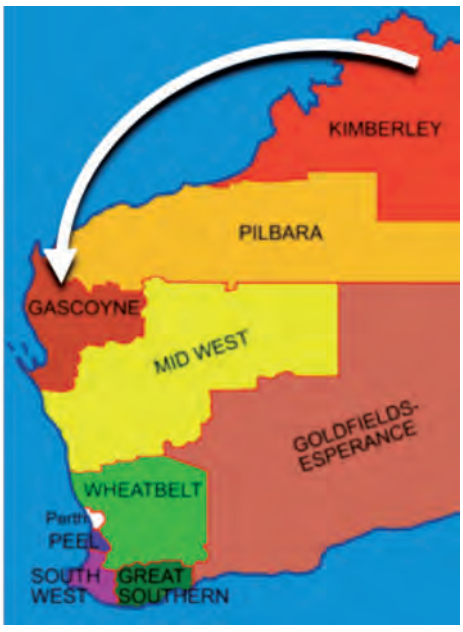
"A change is as good as …"

Nerissa Black (Kimberley) with assistance from Phil Correll (Mid West)
Department of Water, WA

In mid-May I left the Kimberley and spent a month in the Mid West experiencing, I believe, our state's most diverse hydrographic region, from the mighty, sandy Gascoyne River in the north, to the gorges of the Murchison River in Kalbarri National Park, to the smaller vegetated rocky streams in the south.

(To put Nerissa's story into context this regional map of WA shows her move was about 2,000 km as the crow flies, although the region itself is close to another 1000 km from north to south - editor).

I was exposed to float wells of all sizes and given my height, even took a few knocks to the head. I also experienced sheds on huge towers and "gun" cabinets with pump systems. As the Kimberley is almost completely composed of nitrogen gas pressure level systems, I previously had very little experience with float wells, conductivity probes and air pump pressure systems. So I gained valuable experience on these systems and equipment as well as progressing the installation of the Neon telemetry equipment.



Murchison River's Emu Springs gauging station is a nice setting to check wiring diagrams.

It was surprising how remote a number of the sites were, and it really hit home how sparse our state really is. We were on dirt roads through the Gascoyne, charging through sandy tracks and creeping up and down steep rocky outcrops in the Murchison. The weather was fantastic, around 26°C, even warmer than Kununurra on a few occasions. The last two days were pretty cold and wet but considering the great run of fine weather, I can't complain.

The experience of being in a different region is very rewarding and refreshing. Developing friendships with hydrographers in other regions is very beneficial in an occupation of limited professionals. Working with Mid West program manager Mighel Chivilo and Phil was fantastic. I'm sure that since they survived a month with me they would always welcome me for a beer and as a "phone a friend" when faced with hydrographic head scrambles.

It is possible to become a little immune to the challenges in your region so working in another region really opens your eyes and inspires you to look towards changes in your operating strategies. The vast differences in site controls, channel conditions and the effect on data processing keeps you on your toes. I think the chance to experience a new region is highly valuable and the support from regional management for this is much appreciated.

Another Neon install at Emu Springs.

Mighel Chivilo enjoying lunch with a view at Emu Springs.

Hill River float well Neon install.

What I gained from working in a different region was a new look at how to operate as a team, how to manage sites and data, new technical skills and a renewed appreciation for our line of work.

Other highlights of my Mid West experiences included:

- Wearing a fly net (only required once);
- Having a pie at the Dongara bakery;
- Staying at Bidgemia Station and having the power out an hour earlier than told and getting lost in the shower in the dark;
- Having a meal in Jurien on skimpy night;
- The friendly locals across the entire region;
- Seeing the extent of the 2011 Gascoyne floods;
- The iceberg melting off the coast of Geraldton (the ocean was FREEZING);
- Seeing wild goats and sheep and the mixed breeds (soats and gheets); and
- Eating crayfish.

Satellite Telemetry Options For Hydrographers

Matt Saunders
Unidata Pty Ltd

Unidata has continued its work on integrating several other satellite services into its range for remote monitoring. This article provides a summary of common satellite services available.

Unidata has tested / completed testing / integration of Iridium, Thuraya, Orbcom and Inmarsat as well as Globalstar, and we have done modelling on the data latency and equally importantly, the costs of these services. We have also modelled power consumption of these services. It is now clear to us that while these services are all satellite technology there are subtle aspects of each service which need to be considered. There are three distinct applications, where some service providers are more suitable than others.

If you have the need for what we call "alert" function, services such as Iridium short burst data, Inmarsat ISAT Data pro or Orbcom are probably best, especially Iridium and Inmarsat ISAT Data pro which are premium services. However, the data transmission costs escalate greatly for these services when the data rate is anything more than an occasional transmission of a short packet of data.

If you have the need for a traditional logging and reporting function, such as regular hydrographic data from a measurement site, perhaps with water level, flow and quality, then services such as Globalstar and Inmarsat are probably best as the data transmission costs are more reasonable for larger volumes of data.

In early 2012, Inmarsat released a new service, the Inmarsat BGAN M2M, and this appears to be the current leader in airtime pricing.

As technology improves, and as users choose to have a low resolution or high resolution image or perhaps a video capture capability, we expect the data load from traditional logging and reporting sites will grow. This will make the cost of sending larger amounts of data more regularly more important. For example, the routine transmission of an image, albeit a compressed image, from a measurement station camera is a new facility which Unidata, and other suppliers are now supporting.

Satellite services are also used for only the most remote locations. Another important consideration for such very remote locations is power consumption. The ability to turn off the satellite modem most of the time to conserve power is critical. Some services allow for this easily. However, some services need to establish a "session" each time the modem is powered on. The communication overheads in establishing a session are high, increasing the overall monthly cost to sometimes prohibitive levels.

The physical location of the measurement station is another consideration, and there is a clear distinction between Low Earth Orbit Systems and Geostationary Systems. If a Geostationary System is chosen, the satellite antenna must be located such that there is a clear view towards the geostationary satellite. Due to the satellite's location in the sky, this may sometimes not be possible, especially in deep valleys. If a Low Earth Orbit System is chosen, these systems transit the sky and satellite antennae, and regardless of location, should be able to "see" a satellite most of the time.

The commercial aspects and ongoing viability of all satellite providers needs to be considered. The primary purpose of the Inmarsat satellites used to be to provide for safety of ships at sea. Inmarsat is short for the "International Marine Satellite Organisation" and is well funded for this purpose and has been operating for many years.

Low earth Orbit systems are different, with Iridium providing the highest satellite numbers today, although the Iridium satellites are now closer to the end of their design life.

Globalstar has the smallest number of satellites today. However, they have recently launched their second generation satellites which will come on stream in 2011 / 2012. So they will most likely be the leader for Low Earth Orbit Satellites in 2012 / 2013.

The geographical location of your measurement station is another important consideration. For example, Iridium has coverage in the middle of the Pacific Ocean and in Antarctica, whereas Globalstar has coverage mainly over land areas. Inmarsat has a world-wide coverage but you still need to ensure a good view towards the satellite. The antenna elevation in, say north east Australia may be 60 degrees and very convenient. However, in south west Australia the elevation may be only 40 degrees and less convenient.

Finally, it is always prudent to have a mix of services. A flood alert system for example, may be best served by several different satellite providers to avoid putting all your eggs in one basket. The telecommunications industry calls this network diversity.

We have detailed cost models for satellite airtime pricing for typical data payloads for hydrographic measurement stations. The comparisons are interesting and they illuminate the differences between alert data payloads and longer term analysis data payloads.

If you would like a copy, please email m.saunders [at] Unidata (dot) com (dot) au.

Waterways
2010/11 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
- 1,463 kilometres of drains
- 315 constructed waterway treatment systems and wetlands
- 300 monitoring stations on waterways and drains
- 122 urban lakes

Key achievements 2010/11

- $17.5m invested in streamside works to improve river health
- $4.6m invested in Water Sensitive Urban Design projects to assist local councils
- Removed more than 2,000 cubic metres of rubbish from waterways (about 250 truck loads) after flood in February 2011
- Made significant progress implementing our *Flood Management Strategy*, including working with councils and emergency services to develop Flood Management Plans
- Began works to build a new weir and fishway at Dights Falls on the Yarra River
- Fully met the service standards set out in our *Customer Charter for Waterway Diversion Services*

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

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