

Institute for Sustainable Water Resources



Welcome to the ISWR Newsletter

eWater update

As most of you will know, the CRC for Catchment Hydrology (which many ISWR members are contributors to) and the CRC for Freshwater Ecology will end on June 30th 2005. However, a new “eWater CRC” has been formed, with an ambitious program of product-focussed research across a wide range of water issues. For further information on eWater’s scope, have a look at www.ewatercrc.com.au.

Much of the planning for eWater is being done now. Bill Young is the Monash partner representative for eWater, and has been negotiating Monash’s involvement (which will include both Science and Engineering). Grace Mitchell is the “researcher representative” for Monash. Currently, planning for research and products is being undertaken, with an aim to have Project Agreements for the first 6 months of eWater in place within the next 2 months. It is likely that in the first 6 months, projects will involve a mix of completing CRCCH and CRCFE projects, and commencing the new eWater activities. If you have any questions about eWater, and Monash’s involvement, please contact grace.mitchell@eng.monash.edu. Grace will also try to keep you regularly updated – either through this newsletter or separate emails – on the progress of eWater planning.

Student news:

**Alain Seven* is joining us for 12 weeks as a final year intern. He is from Paris, studying Urban Planning and Civil Engineering at Ecole des Ingénieurs de la Ville de Paris. He will be looking at the interaction of stormwater reuse and environmental flow enhancement in urban streams. His office is Room 153. Please make him feel welcome to both the department and Australia.

**David McCarthy* has had a great month off and is all set to return to start his PhD studies in Stormwater Reuse. His first day as a postgraduate student will be 30 March. So, his cheerful face will be seen around the corridors for a few years to come.

*A new PhD student – *Mr. Yaron Zinger* – arrived at Monash on March 21st – albeit a bit jet-lagged! Yaron has a background in biotechnology, and is very keen to pursue his skills to better understand how biofilters work, and how they can be made to work better. Yaron will be supervised by Tim Fletcher, Ana Deletic, and possibly someone else, depending on the topic chosen. Yaron’s skills and interests will match very nicely with the current research group in ISWR looking directly or indirectly at biofilters – Ana, Tim, Dale, Belinda, Nilmini and Wenda. Please take the opportunity to welcome Yaron, and get to know him.

**Khagendra Thapa* (his nickname is Gen) has recently joined the ISWR. He will be working with Andrew Hoadley in Chemical Engineering on the dewatering of different sludges from municipal and industrial wastewater treatment processes. He will be exploring the techniques that have been used to understand the dewatering of lignite (brown coal) through compression filtration at moderate temperatures. His office is in building 37, room 117 (ph ext 59786).

Gen is from Nepal. In 1999, he was sponsored by AUSAid to study for a Bachelor of Environmental Engineering at RMIT University, which he completed with 1st class Honours. After graduation, he worked with Robert Bosch as a trainee environmental engineer in the area of exhaust gas treatment. In his first year with Bosch Germany he was based in Stuttgart and in his second year he was based in Japan. He has also worked as a vacation student with CSIRO on the treatment of portable water using micro filtration membranes. Gen also enjoys high altitude trekking, cricket, traveling and swimming and speaks four languages.

Collaboration with INSA de Lyon, France

Tim Fletcher, Ana Deletic and Matt Francey have submitted a joint application with the INSA de Lyon Hydrologie Urbaine laboratory, through the AFAS (Australia France Association of Sciences), to fund mutual visits over 2005, 2006 and 2007. The specific project deals with assessing uncertainty in urban stormwater and sanitary sewer system water quality models. Funding opportunities for Europe-Australia collaboration are also available (see <https://sciencegrants.dest.gov.au>). If successful, Jean-Luc Bertrand-Krajewski and his colleagues will visit the Department in April 2006, to coincide with the Urban Drainage Modelling/Water Sensitive Urban Design conference 2006, which is being convened by ISWR (under authority of the International Water Association). We are also in discussions to share a PhD student with INSA de Lyon, through the co-tutelle programme run by the French and Australian governments.

Modelling Infiltration and Biofiltration Systems – and a Sad Story

Many of you will be aware of Bernd Mertes – the German student from Essen University – who has been attempting to model infiltration and biofiltration system behaviour using SEEP/W and CTRAN/W. Bernd's work has been quite revealing (I think he may have described it as frustrating), in that it has shown a number of deficiencies in the use of these two models, for such stormwater systems (particularly where large particle-size filter media are involved, with high hydraulic conductivity).

Bernd is due to leave us soon, and was on-track to finish his report (having completed all of his modelling work). However, some low-life stole Bernd's car (an old Falcon that most people would want to be paid to take away!), along with his laptop, backup DVD, digital camera, and all photos of his trip. I think we all feel for Bernd on this – hopefully it does not change his opinion of Australia too much.

We all wish Bernd the very best, and thank him for his contribution to the ISWR research program. Hopefully he'll be back one day, with an interest in ongoing research... and perhaps a desire for revenge on that car-thief!

MUSIC Team: Bugs are fixed, and Version 3 is on the way

The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) Team within the Cooperative Research Centre for Catchment Hydrology, which includes many members from ISWR, has been working very hard lately.

Firstly, as many may know, a small but significant bug was found in the software, where incorrect coefficients had been programmed into the nitrogen and phosphorus removal algorithms in the filter media of biofilters. The team took the opportunity, whilst fixing that bug, to update the algorithms, using the latest available international research. The team is now working on Version 3 of MUSIC, which incorporates lifecycle cost analysis, and other new capability.

Those interested, should look on the MUSIC website (www.toolkit.net.au/music), or ask Tim Fletcher.

New publication accepted in Water Research

ISWR PhD student Geoff Taylor (along with co-authors Tim Fletcher, Tony Wong, Peter Breen and Hugh Duncan), has just had a paper accepted for publication in Water Research. The paper, entitled "Composition of nitrogen in urban runoff: implications for stormwater management", describes some of the initial work undertaken in Geoff's PhD. Congratulations Geoff!

Tony Ladson's bit

This month I've been working on a paper related to flow resistance in streams.

Hydraulic calculations in natural streams routinely require an estimate of a stream roughness coefficient, such as Manning's n , but often this is not straightforward. In other countries, particularly New Zealand and the United States, roughness coefficients have been collected for broad classes of streams, different types of vegetation and specific flow conditions. Pictorial guides provide a firm basis for estimating these roughness coefficients. In some cases these guides are applicable to Australian conditions, but there are also many Australian streams that are not well covered by existing handbooks.

Back in 1984, our own Erwin Weinmann commented that "most promising method for improved estimation of Manning's n in natural Australian streams was a comprehensive data bank of Manning's n for typical stream reaches, accompanied by descriptive and photographic information". Well, we are finally making progress. Along with colleagues at the University of Melbourne, and with help from Erwin, Bob Keller and others, I've been assembling this dataset.

The paper that we are currently working on presents reach-representative estimates of Manning's n at a range of discharges in four rivers in Victoria: Acheron River at Taggerty, the Merrimans Creek at Stradbroke West, the Mitta Mitta River at Hinnomunjie Bridge and the Tambo River at Ramrod Creek. Values of Darcy-Weisbach's f and Chezy's C , were then calculated from Manning's n . Manning's n was found to remain almost constant over a large range of discharges.

Information on these and other sites is also available on the web <http://www.rivers.gov.au/roughness/index.htm> and if you'd like a copy of the draft paper, please email me at tony.ladson@eng.monash.edu.au

From Gavin Mudd:

Paperwork Abounds:

An intense period of work lately has helped to consolidate some papers, including several conference papers (mostly peer-reviewed too!) and journal papers. The majority centre around sustainable mining, and represent close to the final effort on this phase of the research (finally!), while others include groundwater, stormwater and modelling. The conference papers will see Gavin attending some 4-5 conferences this year (bring on those greenhouse gases and global dimming!).

Mudd Seminars:

Not that Gavin can talk at the drop of a hat, but he has just finished a seminar on "Sustainability, Mining & Communities" to the local Monash chapter of Engineers Without Borders (Wed March 23). Meanwhile, on Thursday March 31 (see details below) Gavin will give a seminar on the "The Great Artesian Basin - A Case Study in Groundwater Sustainability?" (more excuses for travel to remote parts of Australia and yet more greenhouse gases! In July, Gavin will be off to Longreach, QLD ... followed by Moree, NSW, in November)

Groundwater Research:

With Semester One well under way, new final year engineering student projects have been started on particular aspects of groundwater - including groundwater-dependent ecosystems and some mining projects. Other aspects include the potential links between some wetlands, groundwater and the effectiveness of stormwater treatment measures (stay tuned).

UNESCO Paris Workshop

By Grace Mitchell

Tim and I recently returned from an authors' workshop for the UNESCO IHP-VI Project One entitled "Data requirements in urban water management". Some nine of the authors were there, hailing from USA, UK, France, Serbia and of course, Australia. There is also an author from the Netherlands who wasn't able to attend. Ana Deletic is also part of the authorship team but wasn't able to attend this workshop – so we brought her back a snow dome of the Eiffel tower! Several UNESCO Science Sector: Division of Water Sciences staff members also passed in and out of the workshop, adding to the international mix.

The workshop went very well, the result of a very committed and capable authorship team. Their commitment helped us overcome the rather strange room (as you can see in the photos below) and encouraged everyone to stay on track. We didn't need to resort to using the online translating facilities despite the room being equipped for this. Ahh.... the indulgence of everyone else having to learn English as it is very much the international language for science.

So, we now have a To-Do list as long as my arm and much to write over the next few months.

But, one of the best outcomes of the workshop was the common agreement that the document should end up being a valuable resource for urban water managers and researchers, enhancing the way in which data is collected, handled, interpreted, and stored.



After the To-do list was completed and we said our good byes to Biljana Radojevic, who is the primary contact from the UNESCO end, we had time for a celebratory dinner and a glass of wine each (see the photo's) which was just as well because the few hours that followed trying to get the train to the airport and then onto the flight proved to be a saga – but thankfully the only "incident" for the whole trip.



Trial of Draft Triple Bottom Line Assessment Guidelines for Proposed Stormwater Projects

André Taylor (with assistance from Tim Fletcher) has developed draft 'triple-bottom-line (TBL) assessment guidelines' for proposed urban stormwater projects that aim to improve or protect waterway health. These guidelines are now being trialled and will be finalised by 30 June 2005.

The trial has just begun in Brisbane. It involves assessing the *relative* merits (using financial, social and ecological assessment criteria) of four alternative streetscape stormwater designs for use in medium density residential settings. Subject to the views of the Expert Panel, it is likely that these design options will be:

1. Roadside grassed swales.
2. Bioretention systems within the centre of the road (median strip).
3. Traditional kerb, channel and enclosed drainage leading to an end-of-pipe stormwater treatment measure (e.g. a constructed wetland).
4. Traditional kerb, channel and enclosed drainage and no stormwater treatment (i.e. the 'do nothing' scenario).

The aims of the trial project are to:

1. Trial the draft TBL assessment guidelines to test their suitability and refine if necessary.
2. Use the trial to provide a forum to highlight, debate and potentially resolve specific obstacles to the adoption of common water sensitive design features in Brisbane (e.g. specific asset management and maintenance concerns with grassed swales in residential areas).
3. Use the opinions and knowledge of local technical experts, the general public and members of the community that live adjacent to examples of these designs to assess the financial, ecological and social 'pros and cons' of the design options in order to rank them. The ranking of the options will reflect their *relative* value to society or 'relative sustainability' (assuming the finalised assessment criteria align with well-accepted principles for sustainable development).
4. Help inform policy and design decisions in Brisbane (and elsewhere) regarding preferable designs for stormwater management in medium density residential areas.

For more information, contact André on ph. (02) 6582 0762 or andretaylor@iprimus.com.au.

Photos – Examples of the 4 likely design options

1.



3.



2.



4.



UPCOMING SEMINARS:

Thursday, March 31 at 12pm in the Civil Eng Seminar Room

Gavin Mudd

The Great Artesian Basin - A Case Study in Groundwater Sustainability?

The Great Artesian Basin (GAB) is one of the world's largest artesian groundwater systems and covers some 22% or 1.7 million sq km of Australia, including three states and one territory. It was first discovered in the late 1800s and drilling soon proved the vast extent of the GAB resource. This facilitated expansion of development into the very heart of Australia's arid interior through pastoral and mining activities as well as townships. An artesian bore would often be free-flowing at the surface with the resultant drains stretching for many kilometres - ultimately wasting almost all of the precious water.

As each state has constitutional control over water, there can arise conflicts where impacts stretch across arbitrary state borders due to different policy objectives and implementation. In recent years, there has been a major shift in government policy to help rehabilitate many of these wasteful bores and institute a sustainability ethic into the management of the groundwater from the GAB. Overseeing this program has been a joint state-commonwealth committee, the Great Artesian Basin Co-ordinating Committee (GABCC), to ensure that the funds being spent on bore rehabilitation and sustainable management are indeed achieving consistency across borders and, most importantly, groundwater management of the GAB as a whole.

Gavin sits as the independent environment representative on the GABCC and will present an overview of the Great Artesian Basin, its history, values and management and discuss present moves towards sustainability.

And just for fun

Q: How do bunnies stay healthy?

A: Eggercise

Q: Why did the Easter egg hide?

A: He was a little chicken!

Q: What do you call ten rabbits marching backwards?

A: A receding hareline.

Q: Why was the rabbit rubbing his head?

A: Because he had an eggache! (headache)

Q: How do you catch a unique bunny?

A: UNIQUE UP ON IT!

Q: Why did a fellow rabbit say that the Easter Bunny was self-centered?

A: Because he is eggocentric. (egocentric)

Q: Do you know how bunnies stay in shape?

A: Hareobics.

Q: Why did the magician have to cancel his show?

A: He'd just washed his hare and couldn't do a thing with it.

Q: What type of movie is about water fowl?

A: A duckumentary.

Q: What do you call rabbits that marched in a long sweltering Easter parade?

A: Hot, cross bunnies.

**I'd like to wish everyone a very happy Easter, take it easy and please drive safely if traveling.
Maryann**