Circulation

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Low carbon future for the ICE

Achieving a low carbon future was the key theme in the Presidential Address of **Peter Hansford** as he was recently inaugurated as the 146th President of the Institution of Civil Engineers. Citing unprecedented environmental conditions, exemplified most recently by the disastrous flooding in Pakistan, Hansford announced that the ICE will develop a Low Carbon Routemap to 2050. This would "complement the recently laid out National Infrastructure Plan by outlining the steps [needed] to ensure the shift to a low carbon economy".

Announcement of that Plan represents something of a coup for the ICE after some sustained lobbying – while announcing an austerity budget for the next four years, Government has signalled its belief in infrastructure for increasing national competitiveness and addressing urgent needs for sustainability. The Plan offers hope for an upturn in revenue across the civil engineering sector and, with it, an upturn in demand for specialist hydrological input which will be required for projects in energy, transport, flood management and waste management. The address left no room for uncertainties in climate science, but rather set the civil engineering world on a course to achieve a legacy of a low carbon infrastructure. Expect more on this as BHS and ICE work together in the years ahead.

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President's piece

Since my last President's Piece, BHS has held its 2010 AGM at the University of Birmingham in September. The AGM is reported on page 13 but I wish to take this opportunity to welcome new committee members and to express thanks to all those who have contributed to the Society's activities over the past year. It's a particular pleasure to welcome onto Main Committee Professor Edmund Penning Rowsell (Middlesex University) and Rebecca Chadderton (Environment Agency) as committee members, and Bob Sargent (Hyder Consulting) as our new President-Elect. I look forward to working with all three in the year ahead. Claire Walsh's AGM report paints a picture of a very successful year thanks to a wealth of meeting organisation, the Newcastle Symposium and much behind the scenes work relating to our newsletter, journal, awards, web site and mailbase lists, and of course the financial management exercised by our Hon Treasurer Nigel Goody and all support work of Tim Fuller and colleagues at the ICE.

As I write this Piece, the new coalition government's Comprehensive Spending Review is still fresh in the headlines, and after months of anticipation. Few have been expecting good news and, given the breath of implications for hydrology, it seems deserving of some consideration here. No doubt we are all aware of the government's commitment to take such steps as may be necessary to achieve sustainable national financial management, but what will be the consequences for hydrology? While there is a major element of wait-and-see, the press releases and headlines of the past couple of weeks are instructive in some cases at least.

Starting with the positive, investment in major infrastructure ought to offer a lot of opportunity for hydrologists both in consultancies and in the regulation of new development, e.g. flood risk assessment. The government launched the first ever National Infrastructure Plan at the ICE. It focuses on the "networks and systems – in energy, transport, digital communications, floodwater, waste management and in science – that provide the infrastructure on which our economy depends" (ICE Press Release). Most of those areas have connections with hydrology. If the reality matches the bold vision, then there should be considerable welcome respite to ease the difficulties of some very challenging recent times. The renewables sector looks set to continue its recent positive form: maintenance of support structures for renewables should allow continued or even accelerated investment in hydro and terrestrial energy technologies which all require hydrological input.

Across the public sector, however, the plans are for huge cuts, though in many cases not as severe as had been expected. A programme of structural reform is proposed for the Environment Agency. The exact size of the cuts it faces is yet to be revealed. The focus is reported to be on achieving efficiency savings but, given the expected size of the cuts and recent job losses, there is a real risk that the changes proposed will impact on the science and expert functions which underpin the Agency's standing. Hydrologists might understandably wish to point to the value of hydrological work in protecting the environment and supporting sustainable development in a raft of different ways.

The science budget is reportedly to be safeguarded in recognition of the value of excellent science in supporting national economic growth. There is no statement from the UK research councils on how they intend to implement the demanding cuts in their budgets, but there are numerous links from this funding into UK hydrology. Many practising hydrologists are engaged in work which builds on research originating in NERC funding programmes over the past 40 or more years. In an increasingly competitive and international market for consultancy services, any losses in the support for world class research would be regrettable. The same NERC supports the facilities and research programmes of our own national centre of excellence in hydrology (and ecology), CEH, as well as various hydrological postgraduate taught and research programmes at leading universities. All of this activity, including the linkages between research and student teaching, has helped bring UK hydrology to its present leading role in the international scientific community.

For those committed to the cause, climate change, population growth, the scale of the flood threat across the UK and the often delicate balance between supply and demand for water could easily make a convincing case for growth of support for hydrology rather than any cuts. I'm conscious of just scratching the surface with these few words here. But special pleading is unlikely to be successful. There is an unenviable challenge in seeking to protect our national hydrological capability while contributing to the national economic imperatives. These are likely to be challenges which will face many BHS members in a variety of ways in the months and years to come.

Andrew Black
President

Integrating the concept of Integrated River Basin Management between the West and the East

A summer school on the subject of integrated river basin management was jointly held at the Centre of Water Research, Peking University and the Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Science, Lanzhou, in June 2010. The summer school featured presentations, workshops, field-trips and active discussions from UK and Chinese researchers, with an underlying theme of detailing the concept of Integrated River Basin Management as well as identifying key knowledge gaps relevant to both China and Europe.

The opening day included brief introductions and a general overview of the structure, objectives and expectations from the summer school, presented by **David Lerner** (University of Sheffield) and **Chunmiao Zheng** (University of Alabama and Centre for Water Research, Peking University). Following this, short presentations from individual delegates gave an insight into their background and research interests. I discussed my PhD research which has been looking at the effects of artificial drainage, drain-blocking and rotational heather burning on UK upland stream ecosystems.

Over the second and third day (i) land and water management; (ii) hydrology and water resources; (iii) water quality and biogeochemical processes, and; (iv) ecological concepts and issues were discussed. Three short talks given by **Bob Harris** (University of Sheffield), **Yi Zheng** (Centre for Water Research, Peking University) and **Mark Everard** (Environment Agency) discussed the historical context and current situation in the land and water management in Europe, China and South Africa respectively. The focus was on the policy/economic/social drivers, organisations responsible for management and the key roles for stakeholders. Furthermore, **Frank Schwartz** (Ohio State University) examined the lake/groundwater interactions and the use of Landsat data to show the impact of climate variability on the hydrology of Prairie Lake, North Dakota, USA. **Ben Surridge** (Lancaster University) outlined the practice of water quality management in Europe and led a practical session to analyse water quality data, while **Geoff Parker** (University of Cambridge) gave an introduction into watershed hydrology.

On the third day, Geoff Parker outlined some key issue relevant to managing surface water quality and quantity, while **Bridget Scanlon** (University of Texas) discussed the global impacts on water resources following conversions of natural ecosystems to agrosystems and the use of the GRACE (Gravity Recovery and Climate Experiment) satellite data to determine regional groundwater storage changes. A general introduction to ecological systems was presented by **Ed Shaw** (University of Sheffield), while **Denghua Yan** (Centre for Water Research, Peking University) discussed the water-related ecological concerns in China. To complete the day, Mark Everard outlined the

concept of applying systems thinking to catchments, ecosystems and the environment.

The fourth day included Mark Everard discussing the ideas of ecosystem thinking and he led a practical session on the methods for determining and analysing the potential local- and catchment-scale impacts following the proposed Pancheshwar Dam construction in Nepal/India. The fifth day was mainly centred on understanding the UK's physical, social and management context for catchment management, by taking the River Don as a case study. This session developed our ability to consider the complex trade-offs in managing catchment goods and services within the constraints of the various institutions involved. The next day, we were introduced to the different water resource management plans of the Haihe River Basin in the North China Plain. This case study allowed participants to understand how water is managed and the options that are used to mitigate water crises, in one of the most water scarce, environmentally stressed regions in the world. Day 7 included field visits to groundwater monitoring stations and to the HuaiRou reservoir. Approximately 67% of the water resources in Beijing come from groundwater and as a result, severe land subsidence has occurred in large parts of Beijing. Subsequently, we took a trip to TianZhu Land Subsidence Monitoring Centre which investigates the various options to mitigate land subsidence.

The eighth and ninth days were spent in Lanzhou, due south-west of Beijing, visiting the Yellow River (Huang He), the country's second longest river, and visiting the Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences research centre, to discuss the various research activities that take place in the Haihe River Basin.

This summer school provided



me with a detailed understanding of the key drivers, management challenges and institutional structures relevant to Integrated Catchment Management within Europe and China. More importantly, the summer school allowed myself and other delegates from both England and China to discuss these important issues in a relaxed atmosphere, and develop key networks to discuss research experiences and exchange ideas. I would like to thank the BHS for its generous financial assistance which allowed me to attend the summer school and visit a fascinating part of the world.

Sorain Ramchunder,
School of Geography, University of Leeds

New Members

Daniel John Boyce.....UK CIP, Warwick
James Brindley.....The Open University, Weymouth
Aminal Karim Chowdhury.....Royal Haskoning, Peterborough
Ian Coleman.....Westlakes Scientific Consulting Ltd, Carlisle
Rachel Ann Dearden.....British Geological Survey, Keyworth
Selma De Bolito Guerreiro.....University of Newcastle
Adebayo Oluwole Eludoyin.....University of Exeter
Andrew Gregory.....Royal Haskoning, Newcastle
Katie Jenkins.....University of Cambridge
Michael Kennedy.....Northern Rivers Institute, Aberdeen
Ratunka Gabriel Lekalakala.....Research Hydrologist South Africa
Kim Mack.....University of Exeter
Sudip Kamal Pal.....Heriot-Watt University, Edinburgh
Konrad Piegat.....University of Aberdeen
Michael Stirling.....Mott MacDonald, Glasgow
Robert Wilby.....Loughborough University
Nick Yeo.....Barnstaple

International Society of Limnology Congress

Cape Town, South Africa
August 2010



Founded in 1922, the International Society of Limnology has provided a platform for the communication of research and ideas across a wide spectrum of lakes' study from across the world. The 31st triennial congress was held for the first time on the African continent and highlighted a number of the global issues that face the aquatic sciences over the coming decades.

The international nature of the congress meant that research was presented from all of the global climate zones. This provided contrasting perspectives for the commonly studied temperate lakes with their more productive tropical counterparts and the sensitive boreal and arctic lake systems. The impacts of climate change, demand for water and eutrophication were recurring themes throughout the week. The importance of lake productivity was also considered in the Baldi lecture given by **Lewis** who suggested that around 90% of the world's lakes were likely to be limited by nutrients as opposed to light. This implies that the threat of anthropogenic eutrophication and a reduction in this limitation would lead to increased production of algae in most lakes. Global estimates of lake productivity were estimated to be 0.9 to 1.2 Pg Carbon yr^{-1} or around 1% of the global total. Several other studies also reported carbon budgets for lakes from the temperate zone where shallow lake Võrtsjärv in Estonia was reported by **Nõges** as being a net source for carbon, while a study by **Matvienko** found that four Brazilian tropical reservoirs were net carbon sinks.

The impending global water crisis was featured in a number of the plenary talks by **Hart**, **Perissinotto**, **Harding** and **Ashton** highlighting South Africa's water quantity, quality and supply problems, many of which share a commonality with the UK. Years of drought followed by intense rainfall events make the effective capture and storage of runoff a key issue for the country. Over three-quarters of the country's total runoff is captured by a dams ranging from numerous small capacity impoundments to multi-country mega dams. These large structures also highlight another critical global water issue, that of shared river basins and the policies driving river basin planning with multiple stakeholders. Lack of water supply has led to a demand management approach for many areas, with Cape Town authorities banning the sale of bottled water during the week of the conference. The problem of excessive sediment and nutrient supply, and subsequent nuisance cyanobacterial blooms, was also highlighted as a critical problem in the drinking water supply reservoirs, one which has worsened over recent decades.

Nutrients and eutrophication-related changes to the biological community were considered in the context of changing water temperatures. A long running mesocosm experiment from Denmark presented by **Jeppesen** found that increased temperatures in line with the A1 IPCC scenario would result in an increase in cyanobacteria, while even higher temperatures (A1+50%) resulted in a change to filamentous

algae. Hydrothermal stream waters in Iceland were used to test some commonly held hypotheses of algal response to nutrients and temperature by **Moss**. Common to a number of river systems, these streams were nitrogen limited and while temperature had no effect on algal diversity, increased nutrient loads led to a decrease in diversity.

The complicated process of lake restoration from eutrophic or turbid states was the focus of a number of presentations. Measures included the modification and diversion of nutrient-rich inflows, artificial aeration to prevent stratification, the reintroduction of aquatic vegetation, the biomanipulation of foodwebs through the introduction of planktivorous fish and the treatment of sediments to prevent internal loading. One study from Chaohu lake, China, by **Chen** used a range of these approaches with some limited success. Intensive intervention was needed to affect a change in the trophic status of a part of the lake, which also implies high cost. The difficulty in reversing the effects of eutrophication was also examined by **Yang** in the shallow Yangtze lakes. A hysteresis in response to a reduction in total phosphorus loading was found, where a switch to turbid conditions had not been reversed despite load reductions greater than the initial trigger concentrations.

Another key issue relating to lakes, reservoirs and climate change is that of water level fluctuations and the consequences for the ecology and functioning of the lake or reservoir system. In a plenary session on the subject, **Zohary** discussed the loss of littoral or lake shore habitat, which is the most productive, due to declining water levels and the potential consequences for fish spawning sites. The reduction in the volume of the deep water hypolimnion during stratification due to water level declines also raised issues of increased concentrations of dissolved nutrients and metals for internal loading. The ecological effect of water level fluctuations was considered in shallow Lake Balaton in Hungary by **Voros**, who found that algal composition changed in favour of *Cladophora* forming algal mats around newly shallow, warm shore areas, negatively impacting on recreational use of the lake. Physical conditions and the extension of stratification in a tropical reservoir was also related to warmer winter temperatures by **Branco**. The lack of reservoir overturn during one season resulted in increased concentrations of metals in the deep water due to prolonged anoxia.

A final theme for the week was the increasing use of technological tools to assist in the study and monitoring of lakes to improve both the research effort and lake management. From the measurement of vertical mixing using microstructure profiles on Esthwaite Water, UK by **Folkard** and hydroacoustic assessment of Arctic Charr recruitment in Lake Windermere, UK, by **Winfield** to the use of autonomous underwater vehicles for the study of ecological gradients in Lake Biwa, Japan, by **Kumagai**, new technologies are being exploited to advance our understanding of lake physical and ecological functioning.

A demonstration of the use of an online monitoring system for the prediction of algal blooms formed the subject of a plenary by **Recknagel.** Continuous monitoring combined with an understanding of the conditions of bloom formation in a system and probabilistic forecasting was shown to provide advance warning of problems allowing time for mitigation measures to be introduced. In order to implement this system, a combination of understanding in ecological, physical, chemical, engineering and planning areas are needed. At a wider level, this highlights a plea from the SIL president **Brian Moss** that we need to see better engagement between the disciplines of aquatic ecology and engineering in order to address the myriad of issues facing lakes and reservoirs in the future.

Eleanor Mackay
Lancaster University/CEH

2010 British Hydrological Society newcastle university

The full BHS Third International Symposium Proceedings (133MB) are now available to download at http://www.ceg.ncl.ac.uk/bhs2010/ and also via the Publications page on the BHS web site. Papers are arranged alphabetically under session headings and hyper-linked from the contents list.

Diffuse pollution and eutrophication

14th International Conference, IWA Diffuse Pollution Specialist Group
Beaupré, Quebec, Canada, September 2010

The IWA Diffuse Pollution Specialist group hold an international conference annually, aimed at building a cooperation bridge to share and transfer knowledge and technology on diffuse pollution among established and young specialists from developed and developing countries. This year's meeting (DIPCON 2010) was held near Quebec City, on the Saint Lawrence River downstream of the Great Lakes which constitute one of the largest fresh water reserves. As in many other parts of the world, there have been growing concerns about the impacts of non-point source pollution from agricultural, urban and industrial activities in the Great Lakes and Saint Lawrence Basin. The variety and complexity of processes that generate diffuse pollution concern scientists, economists, policy specialists and stakeholders. DIPCON 2010 provided an opportunity to assemble this diverse group to work together to identify new approaches and solutions for protection of natural resources. The conference was attended by over 200 delegates from 36 countries from a broad range of backgrounds representing research institutes, government agencies, water and environmental regulators and universities.

The opening plenary session presented a local view on issues related to diffuse pollution in Quebec with keynote presentations from **Pierre Trépanier,** Canadian Commissioner of the International Joint Commission (Canada / US Boundary Waters Treaty), **Christiane Hudon**, Environment Canada, and **Denis Gilbert**, Fisheries and Oceans Canada. Christiane's talk discussed how the Saint Lawrence River had for many years been considered as a pipe for removing wastewater from the intensive urban and agricultural areas along its shores. However, designation of the Lac Saint-Pierre section of the river as a UNESCO World Biosphere Reserve has highlighted the vulnerability of freshwater wetlands to nutrient enrichment and low water levels. Issues of water quality in the Saint Lawrence River were further explored by Denis' talk in relation to the impact of low concentrations of dissolved oxygen on coastal waters and marine life.

The following two days were divided into three parallel sessions broadly split into 'Agriculture / Nutrient Targets', 'Economics / Urban issues' and 'Modelling / Integrated Watershed Management'. I attended most of the latter sessions, and presented an oral paper on "Catchment scale recovery from diffuse pollution: some initial scenario exploration".

Although the conference participants came from quite diverse backgrounds, there was clear convergence on several scientific issues that were considered as barriers to progress. This included understanding of the effectiveness of diffuse pollution measures, not just on chemical water quality but also, as presented by **Alain Rousseaeu**, in terms of biological integrity. **Aubert Michaud** highlighted the importance of studying multiple pollutants in combination when assessing the effectiveness of measures to evaluate whether combined effects are synergistic, cumulative or antagonistic. Multiple pollutants were also considered by **Helene Ehjed** in a study to evaluate loadings of metals from diffuse and point sources across the whole of Sweden. This model was considered valuable for providing an overview of hotspots and issues, but not suitable for evaluation of pollution mitigation.

In a policy context, identification of diffuse pollution hotspots can be valuable to help prioritise diffuse pollution management to achieve maximum benefits. **Ji-yong Choi** presented a study from Korea where a simple scoring system was

developed to rank different parts of a watershed according to the significance of diffuse pollution. The oral presentations were backed up by a larger number of posters accompanied by brief flash presentations.

As well as the highlights, the conference (as always) included a small share of 'run of the mill' model applications that instilled in me a familiar sense of frustration. Two particular bug-bears that cropped up were:

(1) Calibration of nutrient models using flow and nutrient loads as the only objective functions. These invariably give nice Nash–Sutcliffe efficiencies for the nutrient model as a result of the flow being included in the load calculation. Use concentrations if you want to know if the nutrient part of the model works!
(2) Application of catchment-scale models to evaluate the effectiveness of best management practices, using models that are not capable of representing the processes or scale of the management intervention. This remains a real modelling challenge, but let's not kid ourselves (and more importantly — others) by blindly churning numbers out of inappropriate models!

Representation from the UK was small, but included oral presentations by **Nigel Watson** evaluating the benefits of their community based approach to diffuse pollution control in the Loweswater catchment and a presentation by **Andy Vinten** on work being undertaken in the Lunan Monitored Priority Catchment to evaluate the effectiveness of diffuse pollution controls. **Brian D'Arcy**, a member of the IWA Diffuse Pollution Specialist Group Board, also presented a poster.

Two short workshop sessions were held during the conference,



The Saint Lawrence River from the summit of Mont Sainte Anne – venue for the conference welcome reception

again run as parallel sessions. The first, that I attended, explored the importance of physical processes through the topic of "Landscape controls on diffuse nutrient transfer in agricultural catchments". Invited presentations by **Jean-Marcel Dorioz** and **Mark Dubin** set the scene in relation to phosphorus and nitrate transfer respectively. The discussion reinforced the importance of understanding hydrological processes in order to evaluate diffuse pollution. In particular, the issue of connectivity was discussed. In relation to understanding this, the role of artificial barriers and flow pathways (including agricultural drainage) was emphasised.

The following day I attended the workshop on "Management Practices to Reduce Nutrient Loss from Agricultural Systems". This built strongly on the theme of 'effectiveness of management practices' that had already emerged from several talks. **Mark Tomer** and **Eric van Bochove** introduced this topic through their experiences at the USDA and Agriculture and Agri-Food Canada. The discussion further reinforced problems of scaling-up and how to prove effectiveness at river basin scales, against a background of high weather-induced temporal variability, and with limited spatial data resources, especially related to management. All of the workshop sessions are planned to provide the basis for papers to be published in *Water21*.

The final closing plenary session included a highly entertaining talk by **Kevin Parris** from the OECD. Amongst other issues, this talk highlighted the future pressures that could lead towards greater water pollution, including increasing global demand for food, growth in demand for agricultural feedstocks and the impacts of climate change and variability on agriculture. Kevin finished by suggesting a range of improvements in policy making that are required in order to move towards

sustainable management of water quality in agriculture.

It was clear to me throughout the conference that basic understanding of hydrological processes still needs to be better integrated within diffuse pollution studies. This presents a challenge to hydrologists to cross the boundaries into other scientific disciplines and look beyond simple consideration of rainfall and runoff in isolation from other environmental processes.

DIPCON 2011 will once again be a long way from home, taking place in Rotorua, New Zealand. Bearing in mind the costs of this year's conference I suggest that you start fund-raising now should you wish to participate — my thanks to BHS for helping me meet my budget to attend this year.

Sarah Dunn
Macaulay Land Use Research Institute

BHS Archives

Thanks to the good work of Frank Law, who will be a familiar figure to many BHS members, more early records of the British Hydrological Society have recently been deposited in the ICE archives. Members interested in seeing them should contact carol.morgan@ice.org.uk (Tel: 020 7665 2043) who is in the process of accessioning the material. Access to the archive is by appointment as space for visitors is limited.

The archive complements a rich collection of hydrological records held by the ICE, with the earliest hydrological observations by engineers dating back to the eighteenth century and the work of Smeaton and Grundy.

If you are unfamiliar with the Library, the online catalogue can be found at ICE Library Online Catalogue. BHS members are entitled to use the Library as part of the Service Level Agreement.

Mike Chrimes, ICE

The changing physical and social environment: hydrologic impacts and feedbacks

San Diego, USA
11-13 October 2010

The 2010 Hydrology conference organised by Elsevier and supported by UNESCO was attended by approximately 150 delegates from 31 countries. The conference was split into five themes: Hydrology and Climate Change; Hydrology biogeochemistry and environmental management; Hydrology health and improved socio-economic conditions; Hydrology history and conflicts; and Hydrology past present and future developments

Each theme had a keynote presentation from invited speakers, oral and poster presentations. **Mike Bonnell** (University of Dundee and UNESCO) gave the opening keynote presentation using the title of the conference. This was an excellent presentation as Mike took us through the main issues relating to physical and social change, such as climate change, land use change, problems of water scarcity and the technological, financial, and legislative approaches to deal with them.

He used examples from Tropical

Queensland, Scotland, Central America and India to show the effect of the changing physical and social environment of hydrology and how these are being addressed. A case study of 2700 mm of rain in 13 days in Tropical Queensland demonstrated how improper land use and land management can have devastating effects. An estimated 500 tonnes per ha of soil was lost from sugar- cane plantations during this event, carving out gulleys up to 10 m deep. The response was a zero tillage policy with harvested land being covered with trash (i.e. remnants of the harvested canes) to prevent such losses in the future.

Following this presentation the Conference continued with the Hydrology and Climate Change theme. Unfortunately this was a bit repetitive, as all the papers considered the hydrological impacts of climate change by downscaling a number of global circulation models and then comparing the results, albeit for different regions of the globe. Some papers also put too much emphasis on the statistics and mathematics of the model comparison and performance so that the overall aim of the study was no longer apparent. I personally feel that such papers concentrating on the mathematical aspects should not be presented for a general hydrological conference. They can often be confusing and of little interest to many of the delegates. This was illustrated by one of the delegates questioning a paper where the dispersion of statistical parameters had been discussed. The delegate had mistaken this dispersion for the physical dispersion of a substance in water and wanted to know how it related to the velocity!

The session covering hydrology, biogeochemistry and environmental management had a range of papers including water quality studies, vegetation and land use change, wetland restoration and the construction of artificial wetlands. Several papers in this section were from the local area which was a useful insight for delegates from humid regions like myself to understand some of the problems of arid zone hydrology. Of particular interest was the Machado lake restoration in LA where US$120 million was being invested to restore the quality of the 16 ha lake and surrounding wetlands for improved biodiversity and amenity value. The author, **Stephanie Bache** of Parsons Group, USA, described how high tech engineering solutions were being applied, such as a removal of P using osmosis and the input of dissolved oxygen from a metal cylinder known as a speece injector.

Hydrology Health and Improved Socio-economic Conditions provided some input from more of a social sciences perspective and papers in this section gave some details of the human cost of large scale engineering schemes such as dams, which are not often covered in such scientific conferences. Of note was an example from Malaysia, (presented by **E. Andre**, from Edith Cowan University, Western Australia), where 10 000 forest inhabitants were forceably resettled. Despite promises of a better quality of life through more modern buildings, transport, access to schools and agricultural land, his study based on interviews with the displaced people concluded that they felt worse off due to missing their home forest environment, living in modern buildings which proved to be not as well built as their traditional long houses, and trying to farm land with infertile soils.

Likewise, delegates from disciplines outside hydrology and even science were prominent in the sections on Hydrology, History and Conflicts. There was also an interesting link between hydrology and archaeology in this section. A paper by **E. Novello**, from the Department of History, Padova University, Italy, described the development of artificial drainage and the reclaimation of land in Veneto (the area around Venice) over the past 400 years. The use of statistical data allowed the reconstruction of the landscape from the gradual transformation of wetlands into agricultural land and then industrial land.

A range of studies and topics were covered in the final section, Hydrology Past, Present and Future Developments. Many focused on the impacts of climate, land use and social change on the hydrological cycle. The theme of the hydrology of arid areas was still prominent. A couple of studies looked at flash floods in arid landscapes and the techniques employed for forecasting such events. These were presented by **T. Carpenter** (Hydrologic Research Centre, San Diego) looking at the situation in southern California, and **E. Morin** (Hebrew University of Jerusalem) who considered events in Israel. In both cases the effects of highland with steep slopes, thin soils, narrow valleys and the proximity to moisture-laden winds (from the Pacific Ocean and

the Mediterranean) produced conditions which were favourable for the occurrence of flash floods.

The conflicting problems of water use for agriculture against maintaining wetland ecosystems (a riverine forest corridor) in arid areas of the Yanqi basin in western China were discussed in a presentation from **Prof. Kinzelbach** from ETH Zurich.

Dedicated poster sessions to coincide with extended coffee breaks were held on the second and third days of the conference. This allowed proper time for the discussion of posters and more time for networking. The posters were generally of high quality and the opportunity of a one-on–one session with the author was particularly welcome. It was during the poster session where I found a study most closely related to the work which I was presenting. My study looked at the use of airborne thermal imagery to identify areas of groundwater seepage in the Lyth Valley, Cumbria. The idea being that areas showing the influence by groundwater with a temperature of about 11°C would show up as a hot spot during a survey taken during a cold winter night with air temperatures of –5°C. My images were provided by the Geomatics Group of the Environment Agency and taken from their survey aircraft. **Al Rango** of the US Department of Agriculture showed how they had been using similar techniques to identify soil water and crop interactions but using a remote controlled drone aircraft fitted with a broad band spectral camera for the remote sensing and a video camera to help pilot the plane.

The final afternoon included an official conference closure from **Geoff Syme**, Edith Cowan University, Western Australia, and a panel discussion. The latter was a forum for delegates to give their views on the conference. Most of the discussion was on the organisational aspects rather than the scientific content which suggested that the conference was not organised particularly well. In my opinion this was indeed the case, the 10 minutes allocated to each speaker (apart from six keynote speakers) was far too short, presentations were rushed, too often single slides were crammed with information which would probably have been better to show over 2–3 slides, and certainly on the first day, the session chairs were rather too accommodating and the talks over-ran by over an hour. I found this to my cost as my presentation was scheduled for 17:15 but I did not get up to speak until 18:30 when probably about half of the delegates had left. The conference also did not have any excursions which I feel are always a useful and enjoyable part of international hydrology conferences and give overseas visitors a chance to experience the local conditions.

Some of the constructed wetland sites which featured in the oral presentations were only 2 hours from the conference location and could have been incorporated as an excursion destination. Finally, the venue was perhaps not ideal, although the Hilton Resort and Spa provided a large conference room, nice lunches and comfortable surroundings, it was a long way from any other hotels where other delegates were staying, and bars, restaurants and other places of interest. The conference dinner around the hotel pool was poorly attended and rather costly ($70 for barbecued burgers and chicken wings), and generally there was little meeting of delegates following the conference sessions to continue discussions. Perhaps this is an argument for more conferences with lower cost venues and accommodation (such as universities) but with more chances for delegates to meet and discuss ideas outside of the conference sessions.

Harvey Rodda
Hydro-GIS Ltd

An apology

In the last issue of *Circulation*, in the excellent accounts on the EGU Assembly held earlier this year, the preamble to the report by Yi He assumed Yi is a 'he'. She most certainly is not, and I apologise most sincerely. This was a stupid mistake by someone who only this week got a letter addressed to Mr Celia Kirby. Yi's response has been that a Chinese female with 'He' as family name is frequently identified as a man but I hope that we never make such a sexist mistake again.

Celia Kirby

BHS 28th Annual General Meeting

The 28th AGM of the British Hydrological society was held on 22nd September 2010, at the University of Birmingham.

The meeting began with the presentation of the Student Prize to **Nick Yeo** from the University of Southampton for his excellent undergraduate dissertation, 'A lichenometric and palaeohydrualic flood reconstruction of the East and West Lyn, Lynmouth'. The two runners-up in the competition, **Tom Garner**, University of Bristol for his dissertation on 'Evaluating urban flood predictions, the value of data and the controls on predictive uncertainty: a limits of acceptability approach' and **Andrew Tedstone**, University of Cambridge for his research project on 'The subglacial drainage system of the Hagafellsjokull-Eystri' were also congratulated.

President, **Andrew Black** began by acknowledging that 2009/10 has been a good year for BHS, with membership numbers remaining steady, a number of well attended national and regional meetings, including an international symposium being organised, significant contributions by members to Circulation which have encouraged debate and the Society's journal, Hydrology Research attracting an increasing number of quality papers. Andrew alluded to the fact that the coming year may be hard for hydrology with the anticipated budget cuts in research funding and government agencies. Both parent societies of BHS have budget concerns with the ICE requested further contributions from their Associated Societies and CEH have indicated they may not be able to offer the same level of support to BHS has they have done in the past. Our President encouraged members to continue to support our excellent meeting programme where possible, make the most of informal networking opportunities and to 'fly the flag' for hydrology.
The minutes of the 27th AGM were approved by Chris Bradley (University of Birmingham) and Neil MacDonald (University of Liverpool).

Claire Walsh (Hon Secretary) reported that since the last AGM in September 2009, a further six national meetings have been held covering a range of topics and formats including a two-day residential meeting and the Society's first Saturday meeting. A wide range of activities and topics have also been covered by the active regional groups. Following on from successes in Exeter 1998 and London 2004, the Third International Symposium: 'Role of Hydrology in Managing Consequences of a Changing Global Environment' was held in July of this year at Newcastle University. The event was kindly sponsored by CEH, Environment Agency, SEPA, Newcastle University and Environmental Research Letters. Our Penman Lecturer was Professor Zbyszek Kundewicz and keynote addresses were also given by Jamie Hannaford of CEH, Professor Shabaz Khan of UNESCO and Professor Enda O'Connell from Newcastle University. In an open call, 215 abstracts were submitted to the ten sessions and following review, 140 papers were written for the Symposium Proceedings and over 60 posters were displayed. In addition an exhibition of 11 stands took place as well as a varied social programme which included field trips and the Symposium dinner, where the after-dinner speech was given by Professor Malcolm Newson. A number of the papers presented will be developed into full journal papers for a Special Issue of the Society's Journal – Hydrology Research. It was great to welcome over 240 delegates over the week from 20 different countries, and in particular it was encouraging to welcome a good proportion of early career hydrologists. The annual Peter Wolf Early Career Hydrologists Symposium was incorporated into the event and a poster competition was held, the standard of which was very high. The award for best poster was won by Nathan Forsythe (Newcastle University). Many people were involved in organising this event, the Society like to thank the session convenors, the Main Organising Committee, the BHS Committee and the local team at Newcastle University who worked tirelessly to ensure the week ran smoothly.

Nigel Goody (Hon Treasurer) explained that whilst total income was both less than received in 2008/09 and less than forecast, total expenditure for 2009/10 was also

less on both counts and total funds have risen. Nigel presented the estimate budget for 2010/11 and stated that subscription fees would remain the same.

We see a number of changes to the committee this year. Neil MacDonald steps down as an elected committee member but remains as Pennine Group representative. Matt Horritt has resigned from his co-opted post. Following nominations for ordinary committee members we are pleased to welcome **Rebecca Chadderton** from the Environment Agency and **Edmund Penning Roswell,** formerly of Middlesex University, to the main committee. We also congratulate Bob Sergeant on his election as President Elect. Claire Walsh will remain as Hon. Secretary for a second term.

Claire Walsh
Hon. Secretary

Our new committee members



REBECCA CHADDERTON has spent most of her career working for the Environment Agency, mainly within Flood and Coastal Risk Management. She is the Environment Agency lead for flood hydrology and is responsible for setting the direction of all flood hydrology research, software, use, and development within the organisation. She came to Flood and Coastal Risk Management via water resources planning and Hydrometry, and retains an interest, and links with hydrologists, in these areas. Rebecca has a BSc. in Environmental Sciences from Lancaster University and an MSc.(Eng.) in Water Resources Technology and Management from the University of Birmingham.



EDMUND PENNING-ROWSELL, OBE, is a geographer by discipline, taking his PhD from University College London. His research interests are the political economy of major hazards and how this affects decisions about investment in hazard mitigation.

His focus is on the social impact of floods, and the policy response from regional, national and international organisations. He has published several books and many papers on his research, and acted as consultant to numerous national and international environmental agencies, including the OECD, the Red Cross/Crescent, the UN, the World Bank, and the World Health Organisation.

Edmund founded the Flood Hazard Research Centre at Middlesex University (London, UK) in 1970, an acknowledged leader in the socio-economic analysis of flood hazards. This was recognised in 2000 by the Centre's prestigious Queen's Anniversary Prize for Further and Higher Education and the Centre's 2002-04 leadership role in Sir David King's 'Future Flooding' Foresight project.

Student Prize 2010

Each year we invite academic departments to submit an undergraduate dissertation to our Student Prize Competition. BHS launched its annual student award in 2002 to promote the study of hydrology and raise awareness of the Society at undergraduate level. Prizes are awarded on the achievement, relevance, originality and presentation of submitted final-year dissertations addressing scientific and applied issues in hydrology, judged by a panel drawn from the BHS Main Committee.



Nick Yeo, University of Southampton receiving his award for winning the BHS 2010 Student Prize.

Ten entries were received this year, all of a high standard. First prize was awarded to **Nick Yeo** from University of Southampton, for his work "A lichenometric and palaeohydrualic flood reconstruction of the East and West Lyn, Lynmouth'. Two runner-up prizes were awarded, to Tom Garner, University of Bristol for his dissertation on 'Evaluating urban flood predictions, the value of data and the controls on predictive uncertainty: a limits of acceptability approach' and to Andrew Tedstone, University of Cambridge for his research project on 'The subglacial drainage system of the Hagafellsjokull-Eystri'. Abstracts of all three dissertation are given on our web site but Tim's is reproduced here.

A lichenometric and palaeohydraulic flood reconstruction of the East and West Lyn Rivers, Lynmouth
Nick Yeo

The South West of England is particularly susceptible to flooding, but rivers in the region frequently lack recorded discharge. Despite the devastation of the 1952 Lynmouth flood, the Lyn Rivers have remained ungauged, requiring reconstruction through indirect methods. In this study, lichenometry and palaeohydrology are applied to date flood events and reconstruct discharge on the East and West Lyn, Lynmouth. 474 gravestones are sampled in 10 graveyards to construct a lichen growth curve, deriving a growth rate of 0.29mm/year. This growth rate is applied to date 435 boulders in the Lyn Rivers. Four floods are identified in 1952, 1977, 1983 and 1991, which are correlated to documented floods in 1952, 1978, 1979, 1982 and 1990. The intermediate axis of these boulders at 9 cross sections were recorded and applied to palaeohydraulic calculations. The Manning equation indicates the 1952 flood was considerably lower in magnitude than previously suggested, calculating discharges of 319m3/s and 166m3/s for the East and West Lyn, respectively. Discharges of the 1977, 1983 and 1991 events are consistent with other regional floods, appearing to be part of a period of high incidence in the South West and a declining lichen dated flood magnitude trend in the UK.

Editorial

You know how irritated you get when a web site asks you if you want to be kept informed by emails about the latest gizmo. Well, we'd like to risk this reaction by asking members who haven't yet done so, to seriously consider joining up to the BHS Mailbase. In no way do we wish to clutter up your In Box but we do want to make sure we can keep you all informed of items that may be of interest and thus fulfil our aims of providing a useful professional service.

Celia Kirby

Managing Water Abstraction

We recently circulated the following note from **Anne Dacey**, Head of Water Resources Management in the Environment Agency, via the BHS Mailbase but in case you missed it (or are not subscribers - see Editorial) we reproduce it again here.

"We have published a new version of Managing Water Abstraction. You can download it from our website at: http://publications.environment-agency.gov.uk/pdf/GEHO0310BSBH-E-E.pdf.

It sets out our national approach and regulatory framework within which we manage water resources. It also provides details of how we have updated the Catchment Abstraction Management Strategy (CAMS) process to:

- ensure that water resource activities are managed in an integrated way with the Water Framework Directive;
- manage water resources with a Better Regulation approach;
- provide technical assessments to support regulatory decision making;
- help identify water resource actions to deliver Water Framework Directive objectives;
- provide a framework to deliver abstraction management measures.

We hope that you find the document informative. If you have any questions about CAMS then please email niall.jones@environment-agency.gov.uk or if about abstraction licensing then please email junier.browne@environment-agency.go.uk. You can find more information about CAMS on our website."

Diary

26th November 2010
The Abberton Scheme: a new strategic water resource for Essex.
BHS SE Section meeting
6.30 p.m.
Location: ICE, London
Contact: jo.wakefield@atkinsglobal.com

18 Jan 2011
Upland hydrology
BHS National Meeting
Organised with water@leeds
Time: 10.30
Location: University of Leeds
Contact: Rebecca Slack (Tel: 0113 343 3373)

11th January 2011
Fluvial Flood Defence Asset Management Plan – Northern Ireland
Joint SHG meeting with CIWEM
Time: 18.00 for 18.30
Location: The Royal Society of Edinburgh, 22-26 George Street, Edinburgh, EH2 2PQ (http://www.rse.org.uk/)

20th January 2011
Bringing UKCP09 into reality.
6.30 p.m.
BHS SE Section meeting
Location: ICE, London
Contact: jo.wakefield@atkinsglobal.com

9th February 2011
Flood Forecasting and Warning Developments
SHG Meeting
Location: A.K.Bell Library, York Place, Perth PH2 8EP

17th March 2011
Water footprints – who are they for?
BHS SE Section meeting
6.30 p.m.
Location: ICE, London
Contact: jo.wakefield@atkinsglobal.com

18-21 April 2011
Weather Radar and Hydrology
International Symposium organised by BHS & Royal Meteorological Society.
Location: University of Exeter
Contact: Bob Moore (Tel: 01491 692262) or www.wrah2011.org

April 2011 (TBC)
Hydrometery – where are we now with the forgotten science?
10.00 a.m.
Location: ICE, London

Copy deadline for Circulation No. 108 24th January 2011