Circulation

No. 99
November 2008

Contents

BHS National Hydrology Symposium, Exeter

*Travel grants**

President's Piece

Climate change - a plea for pragmatism

BHS Mailbase

Improving the FEH statistical procedures for flood frequency estimation

BHS Chronology - update

Ecohydraulics at scales relevant to organisms

News from Members

BHS 26th Annual General Meeting

BHS Student Award for 2008

New Committee Members

Diary of forthcoming events

*Note that the deadline for applications for the IAHS Scientific Assembly in Hyderabad is **30th November 2008**

Circulation is published quarterly. It is free to members of the British Hydrological Society and costs £25 to nonmembers on annual subscription.

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Circulation is indexed in *Geosystems' Hydrotitles* & *GeoArchive* and *NISC HydroROM*.

BHS 2008 Sustainable Hydrology for the 21st Century

The BHS Tenth National Hydrology Symposium was held in September at Exeter University. BHS has had many links with Exeter over the 25 years of the Society's existence and it is good to report that this event lived up to expectations. It's a great campus for our usual recipe of serious paper presentations plus convivial socialising, with comfortable on-campus accommodation close to efficient lecture theatres so that parallel sessions are not difficult to arrange. And they really were needed this time: 75 papers in two and half days - not bad going! The organisers also managed to give the 14 poster presentations plenty of exposure, to get (nearly) all of us on one of the three field trips on offer AND give us an 'indoor BBQ'* and a Conference Dinner.

There were some 150 delegates present, mostly for the complete 3-day package. Having been to all the BHS symposia, I thought it was a

*well, what did you expect this summer?!

shame we didn't manage to persuade even more of you to come (we had over 300 at the Third Symposium in Southampton). Being realistic, I guess we have to accept that time and money are both in short supply nowadays and we should just be very pleased that a small society like ours can put on such well-orchestrated and financially sound events.

We broke with tradition this time by not producing hard copy Proceedings to be included in the Registration fee and then made available for sale afterwards. The problem with simply including a CD with all 75 papers in delegate packs is that papers are not then 'published' in the usual way. We have remedied this problem by now assigning an ISBN number and formatting the electronic proceedings to give individual papers page numbers so that they can be cited in the literature. Authors have been sent details of the full reference for their papers and we shall be making this information available on the Publications page on the BHS web site. Ultimately, full texts will also be available there, along with papers from earlier symposia.

Much more exciting, however, is that discussions are in hand between the Editors of *Hydrology Research* and the Local Organising Committee of the Exeter meeting over a Special Issue of the journal which would contain key papers from the meeting, suitably expanded for journal publication.

My personal congratulations then to Soon-Thiam Khu and the rest of the Organising Committee for a splendid event.

Celia Kirby

New members

Anita Asadullah.....Halcrow Group Ltd, Leeds
James Brasington.....University of Aberystwyth
Alison Clare-Dagleish.....Hydro-Logic Ltd, Reading
Clare Louise Cox.....Halcrow, Peterborough
Martin Dipley.....Hydro-Logic Ltd, Reading
David Fadipe.....SEPA, East Kilbride
Elzbieta Anna Gawor.....MLM Ltd, Ipswich
Sohan Ghimire .....WSP, Cardiff
Jennifer Hand.....Weetwood, Tadcaster
Adam Hartland.....University of Birmingham
Matthew Horritt.....Halcrow, Swindon
Nicholas Howden.....Cranfield University
V B Ness Brazier...Scottish Natural Heritage, Edinburgh
Caryn Le Roux.....Government of Wales, Carmarthen
Penny Lloyd.....CEH, Wallingford
James Minto.....Envirocentre Ltd, Glasgow
Nuala Murphy.....National University of Ireland
Simon Palmer.....PBA Ltd, Reading
Tony Reynolds.....Tonkin & Taylor Ltd, New Zealand
Alexandra Savage.....University of Leeds
Michael Stewart Kaya.....Consulting Ltd, Bellshill
William Tandy.....Independent Consultant, Stourbridge
Joseph Michael Wheaton.....Idaho State University,USA
Alice Laura Wiggins.....Hydro-Logic Ltd, Reading

Travel grants

Travel grants are awarded from the Society's general funds to help BHS members whose travel expenses to attend scientific meetings are not met by an employer. Applicants should have been members of the Society for at least six months. The amount will depend on the nature and location of the meeting and the case put forward. Priority is given to members under 35 or retired from employment, who are presenting papers and who have not previously received support from BHS. Successful applicants will be expected to write a short report for *Circulation*. Travel grant applications should be made to the Hon Treasurer at least two months before the conference or meeting. The Exeter Fund, administered by the Society, offers grants to British hydrologists to take part in IAHS / IUGG events. **Note that the deadline for IASH Hyderabad applications is 20 November 2008.**

To apply, use the form at *www. hydrology.org.uk/ about_awards.htm* or contact **Peter Ede**, Mott MacDonald Group, Demeter House, Station Road, Cambridge, CB1 2RS *(tel 01223 463690, email peter.ede @mottmac.com).*

President's piece

The major theme of this PP must be comments on September's National Symposium in Exeter. This was a well attended and dynamic event, and I think that the vast majority of the 150 plus delegates would agree that it was very successful. Indeed one might even go so far as to quote from Shakespeare's famous St Crispin's Day speech from Henry V:

"*We few, we happy few, we band of brothers;*
For he to-day that sheds his blood with me
Shall be my brother; be he ne'er so vile,
This day shall gentle his condition;
And gentlemen in England now-a-bed;
Shall think themselves accurs'd they were not here".

Well maybe that's going a bit far, but overall the feedback I and other committee members received during and after the event was overwhelmingly positive. On behalf of the BHS membership and the committee I would like to thank Soon-Thiam Khu and Alix Slater of the University of Exeter and the members of the local organising committee for their efforts, with particular thanks to Dawei Han, Oliver Pollard and Murray Dale.

The symposium operated out of the excellent Peter Chalk Centre, with three adjacent lecture rooms providing delegates with a choice of three parallel sessions, and with posters, teas, coffee and lunches held in a large room nearby. The whole setup, including the residential accommodation was very good, and the whole 'package' resulted in a very enjoyable and stimulating symposium. I'm sure that our next symposium, which will be hosted by the University of Newcastle in 2010 and will be an international one, will be even more successful, and would expect the event to attract a significantly larger audience than Exeter.

One surprising (an slightly worrying ?) finding by our excellent Technical Secretary, Celia, was that 60 of those attending, including 7 authors, were not members of the society. In many ways it is encouraging to see that non-members are aware of our national symposium and are keen to participate, but it does beg the question, why are they not members as they are obviously interested in the society's activities ? Obviously these 60 non-members won't be reading this article, but if you are aware of a colleague who attended the Exeter symposium who is not yet a member, why not gently encourage them to join ? They can download an application form from our website and at £25 per annum, or only £12.50 for students, surely it is good value for money and will keep them informed of other interesting meetings.

My other theme for this PP is that the long promised "Guide to Professional Development and Professional Qualification for Hydrologists" is now available as a fairly advanced draft, and should be available for those interested to download from our website by the time this *Circulation* appears (look under either 'Hydrological Issues' and then 'Members' professional development', or 'Hydrological Gateway' and then 'Education and training). The Guide was 'launched' at a meeting during the Exeter symposium, where I described the aims of the exercise and explained the options towards chartered status for hydrologists. The launch meeting was very well attended showing that this is an important issue for members (and from the paragraph above, probably non-members also !). All 30 copies of the draft Guide that I provided were taken by those attending, and quite a few others have asked for a copy to be emailed to them as there were insufficient printed copies available on the day. I have described the possible routes towards chartered status for hydrologists in previous PPs and will not do so again. However, the Guide attempts to set out these routes, and attempts to provide guidance on the most appropriate chartered route to follow dependant upon your initial qualifications, your professional experience, and to an extent, where you see your career developing. The Guide contains a series of Appendices which try to suggest the types of hydrological experience that can be used to demonstrate achievement of the various required competencies for each of the awarding bodies, but these examples are far from complete. We hope to expand upon these suggested examples over time, and I would welcome feedback from members with further suggestions of types of experience that could be offered to

demonstrate compliance with any particular competence. Please send any suggestions to me (frank.farquharson@btinternet.com) and I will feed these into the Guide, which I hope will be a very dynamic, 'living' document over this first year as we strive towards a more complete version.

I must express very sincere thanks to the members of the very enthusiastic working group who helped produce this Guide. There were too many to thank personally although I must thank our immediate past-President, Rod Hawnt, who established the group and who set the whole process going. I think that although the Guide is far from being a polished, finished product, it does nevertheless explain the options for achieving chartered status and provide examples of how hydrological experience 'maps onto' the various awarding body competencies. It has only been possible to produce the current document thanks to the very active participation of the working group members, and I thank you all personally.

Frank Farquharson
President

Climate change
– a plea for pragmatism

By the time you read this issue of *Circulation*, the UKCIP08 will be available, and no doubt its contents will create a stir with politicians and the media. As professionals who will have to apply the information from UKCIP08, I would suggest that it is time for us to introduce a degree of practicality, however dull or indeed unfashionable this may appear.

The ***theory*** of human-induced climate change is now widely accepted within both the specialist scientific community and in the wider political and social arena. This acceptance has been supported by some general evidence of widespread, steady increases in temperature over recent years, along with apparent related trends in phenological indicators. The sensationalisation of some predictions has made the topic so newsworthy, that any event outside the perceived 'normal' is seized on as being the result of climate change (or global warming, the two being blurred in the public and media perception).

For all the advances in modelling, climate models remain approximations. The end results fit a pattern of shifting world climate zones polewards, which is in line with a more generally intuitive assumption that the zonal and vertical climate distribution of the world will be forced to extend boundaries by enhanced heat input. The models however lack resolution to provide detail in localised geographic zones and for variations at sub-seasonal and shorter periods, i.e. weather. The summers of 2007 and 2008 have both been cool and very wet. Conversely, the widespread drought conditions from 2004–2006 were largely brought about by low winter rainfall totals. Despite this, the mantra of hotter, drier summers and warmer wetter winters continues to be the standard projection.

Although frequently highlighted by politicians as 'wake-up calls', professionals in our field remain mostly unconvinced that individual major events can be taken as confirmation of climate change. The historic record of, for example, major rainstorms, holds many extreme events that far surpass recent so-called 'unprecedented' events. The Boscastle storm recorded rainfall depths well below the storm at Martinstown in 1955 and Bruton, Somerset, in 1917. The Sheffield and Hull events of 2006 cannot compare in depth or areal extent with the Norfolk storm of 1912. Given the vastly greater built-up area in and around Norwich, a repeat of the 1912 event today would indeed bring about catastrophic results. I would suggest that the scale of impacts and the immediate media attention now given to weather related phenomena have influenced views of severity of events. Recent pronouncements

connected with the launch of the DFID *Climate and Livelihoods* programme for Bangladesh have failed to acknowledge: (a) the massive growth in the population at risk, and (b) the success in **reducing** fatalities from floods and cyclones through better warning and refuge arrangements.

The future climate is postulated to bring more frequent and larger storm events, based largely on the assumption that a warmer atmosphere will hold more water vapour and the raised temperatures will enhance the rain-forming mechanism. This mechanism is however very complicated and, as well as temperature and humidity, depends on other factors such as low level and upper level winds, the speed of movement of cells and fronts, the development of hail, etc. How these different facets can be optimised to produce maximum rainfall conditions are not well understood, and are well below the resolution of climate models.

Returning to seasonal weather behaviour, the prevalence of warmer (or cooler), wetter (or drier) than average conditions cannot be taken as a function of temperature alone. The procession of weather that makes up climate is the result of major, global three-dimensional wind and air mass patterns, and these major features dictate the prevalent weather conditions. The 'poor' summer (i.e. cool and wet) conditions of the last two years in this country have been associated with an anomalous southerly and westerly displacement of one of the waves in the mid-latitude jet-stream. The direction, position and structure of the jet-stream determines the track and intensity of depressions: elsewhere the changed patterns may well have resulted in some normally wet areas being dry. Can this displacement be attributed to anthropomorphic climate change? Do the climate change models simulate these fluctuations when forced by greater greenhouse gas concentration?

My overall conclusion therefore is that the climate change debate should be approached by hydrologists with careful professional judgement, particularly in assigning changed weather conditions within the climate framework. Our understanding is limited by the capacity of models, and our interpretation restricted by good baseline information, both in terms of historic data and the geographical coverage of present-day observations.

The climate change issue may have one great benefit, in that it has made a lay audience aware of the fact that climate is not a static phenomenon, which hydrologists and meteorologists know anyway. The drive to reduce carbon emissions must be welcomed as a common sense measure, to clean up the atmosphere and reduce the rate of consumption of non-renewable resources. However, if the climate change model projections and their assumed implications are themselves approximate, the opposite 'cause-and- effect' assumption that reduced greenhouse gas emissions will reverse climate change, are surely more tenuous. Projecting that reducing carbon emissions will ameliorate coastal erosion in East Anglia or flooding in Bangladesh is, in my view, certainly a step too far, and diverts attention from more useful and effective responses to impacts. As professionals, we need to be careful not to extend our conclusions beyond the boundaries of good science, and be clear when there are elements of doubt, or indeed that we simply don't know. We should also not be afraid to question some of the more wild and unfounded statements on climate change, despite the howls of contempt these signs of unorthodoxy cause.

James Dent

BHS Mailbase

As spelt out in the last issue of *Circulation*, we wish to keep the BHS-HYDROLOGY mailbase primarily for information exchange between members. This may include news on studentships and some specialist training events. We asked members to use our web site for job adverts for which there will be a charge (but this includes notification via the mailbase when such adverts are uploaded) and we wish to extend this policy to advertising fee-based technical courses. If members propose to use the mailbase for such courses and feel there are mitigating circumstances for relaxing this charge, please contact our Technical Secretary to discuss appropriate action.

Improving the FEH statistical procedures for flood frequency estimation

(EA/Defra R&D project SC050050)

For many years the Centre for Ecology & Hydrology and the Environment Agency have funded and conducted research to develop and improve methods for flood flow estimation, which, among other things, have led to the publication of the Flood Estimation Handbook (Institute of Hydrology, 1999) and the Revitalised Rainfall Runoff Method (EA R&D Project FD1913, 2005).

These procedures provide estimates of the flows that will occur in rivers on moderately rare occasions: flow values that have an exceedance probability in any given year of from 50 per cent (a 2-year return period) to 1 per cent (a 100-year return period), or even rarer. In the majority of cases where such estimates are required, the locations affected will be ungauged and too far from established river gauging stations for these to provide data records that can be immediately transferred. This highlights the need for robust methods for flood flow estimation at ungauged sites.

As part of R&D project SC050050, CEH was commissioned to develop improvements to several aspects of the Flood Estimation Handbook (FEH). The changes recommended arise, in part, because the HiFlows-UK project has led to the creation of a much improved database of systematically recorded flood data. Not only are the data records available now much longer than those used previously but the HiFlows-UK project put substantial effort into the quality control and assessment of the whole data-set. This means that the data available for analysis have been dramatically improved. Another influence on the changed procedures has been feedback from users of the FEH, both informal and formal. The project report is largely a technical description of the studies that have led to the new recommendations.

Results

Without substantially changing the overall framework of the existing FEH methodology, this project has updated most technical details of the FEH statistical method to improve the performance of the procedure. The updates include significant improvements to the theoretical statistical framework underlying the method. The key improvements are:

- A new regression model for estimating the median annual maximum flood (QMED) at ungauged catchments
- An improved procedure for the use of donor catchments for estimation of QMED at ungauged catchments
- An improved procedure for formation of pooling groups and estimation of pooled growth curves

In addition, the research considered some new descriptors of catchment topography and of local climate that had been proposed since the FEH study. In particular, the improved pooling-group procedures now include a new descriptor of floodplain extent.

Outputs and practical use

The improved procedures developed in this project will enable more accurate flood frequency estimation in the UK and will be of interest to practitioners and regulators alike. However, flood estimates produced by the new procedures can be substantially different from those produced using the FEH procedures. On taking the catchments whose data have been analysed as being typical, and treating them as if they were ungauged, the following ratios of the new estimates to the original FEH estimates are obtained:

The changes in QMED range from 0.55 to 2.0, with half being greater than 1.15 (25% are less than 1.0 and 25% are greater than 1.24). For the 1% (100-year return period) flood, the changes range from 0.48 to 2.24 , with half being greater than 1.14 (25% are less than 0.97 and 25% are

greater than 1.32). For both QMED and the 1% flood, the new procedure produced lower estimates than the FEH in the East of England, whereas increases in both quantities were generally observed in West England, Wales and Scotland.

The published research reports are available from the following websites:

Report: http://publications.environment-agency.gov.uk/pdf/SCHO0608BOFF-e-e.pdf

Summary: http://publications.environment-agency.gov.uk/pdf/SCHO0608BOFG-e-e.pdf

An internal Environment Agency guidance document on how these new methods should be applied for EA projects has also been prepared. Currently, Wallingford HydroSolutions is also incorporating these improvements into an updated version of the WINFAP software which should be available in late 2009.

For more information please contact:

Stefan Laeger, Environment Agency
Stefan.Laeger@environment-

BHS Chronology: update

As the *Chronology of British Hydrological Events* celebrates 10 years of service to the hydrology community, **Andrew Black** is pleased to report that development work is under way at the University of Dundee to provide a number of enhancements for the user community:

- Shift to professionally supported unix platform, providing greater reliability
- Database visibility to search engines, allowing better access to records
- Enhanced security to safeguard data
- Remote administration, allowing service requests to be shared among a distributed team
- Geo-referencing facility for new records and for retrospective application to existing records (where possible)
- Enhanced user interface

The resultant service will be linked through from the BHS web site, and is expected to provide improved functionality for users and a better match to current expectations, while being entirely adaptable to future needs and standards.

A team of beta-testers is being formed to spot issues for the developers to tweak — if you'd like to take part, please drop Andrew a line — a.z.black@dundee.ac.uk .

Launch of the new service is expected around year-end and will be announced via the BHS-HYDROLOGY mailbase list and in *Circulation*.



Ecohydraulics at scales relevant to organisms

BHS National meeting
Loughborough University
5 June 2008

This one-day meeting was held at Loughborough University and was co-convened by **Stephen Rice** and **Paul Wood** (Loughborough University), **Damia Vericat** (Aberystwyth University) and **Hamish Moir** (Macaulay Institute). The conference attracted an international audience of over 70 people from nine countries with attendees travelling from as far as Israel, the USA and Canada. The convenors opened proceedings with a reminder of the meeting's rationale: that process interactions between lotic organisms, flow and sediment at small (organism) scales are an essential element of the science that underpins successful river management; but that scaling-up such research is necessary to improve understanding of how communities and ecosystems at larger scales are affected by hydraulic processes.

The first session began with a keynote presentation by **Vlad Nikora** who raised pertinent and testing questions about the nature of ecohydraulics and its contested disciplinary definitions and status. The talk was illustrated using examples of the interactions between plants, animals and water flow at a range of spatial and temporal scales, and championed the 'double-averaging' methodology as a rigorous means of gaining a better understanding of flow–biota interactions from organism to management scales. This was followed by **Pam Nadan** on the potential value of 3-D computational fluid dynamics models of river reaches for modelling near-bed hydraulics across rough gravel beds and around macrophytes. The session was completed by **Matthieu Roy** who discussed the importance of turbulent flow conditions at a range of scales on fish habitat, concluding that medium to large scale turbulent structures, over 1 m in scale, have an over-riding influence.

Presentations continued on the interaction between hydraulics and fish habitat. **Jo Wheaton** began with a discussion of how sediment budgets may influence salmonid spawning habitat, and how the use of topographic data, utilising tools including DEM-differencing with adequately quantified uncertainty terms, can be of significance to ecohydraulic research. This session continued with **Rui Ferreira** who discussed a conceptual model highlighting the significance of imposed sand transport over gravel-beds. The final session before lunch, by **Paul Kemp**, focused on the practical applications of ecohydraulic research and how an understanding of the behavioural responses of fish species to hydraulic conditions can inform the design of fish passes to make them suitable for a range of species.

After the lunch break the talks resumed with **Jill Lancaster** who gave the second thought-provoking keynote address. Jill spoke about the challenges of unifying the studies of ecology and hydraulics and suggested that more ecological focus was needed to move the discipline of ecohydraulics into the realm of mainstream ecology. She highlighted the need to ask mutually-interesting research questions to promote truly interdisciplinary progress and cautioned use of common assumptions that reflect a lack of ecological input, such as that there are direct causal relationships between organism abundance and hydraulic parameters. This was followed by **Yaron Hershkovitz** who discussed ecosystem engineering by in-channel macrophtyes which can facilitate the presence of invertebrates by providing refugia during winter floods. Subsequently, **Karen van de Wolfshaar** presented research on the creation of habitat models for particular fish species based on hydraulic and vegetation parameters.

The final session began with **Helen Moggridge** presenting findings of her research with Angela Gurnell on the dispersal of plant propagules via transport and deposition by streams. This was followed by **Maurizio Righetti** who discussed results indicating that phytoplankton and bacterial activity can stabilise substrates in streams through adhesion of individual grains. The presentations ended as

they had begun, with a discussion on the importance of scale, this time by **Mark Fonstad**. Mark discussed the potential applications of aerial photographs to obtain information at a high resolution over large spatial scales. In the near future this may allow extraction of small-scale information relevant to individual organisms over entire channel networks.

The day's presentations were complemented by a diverse array of poster presentations. The links between hydraulics and fish habitat were well represented. **Marie-Pierre Gosselin**'s poster considered the utilisation of mesohabitats by fish, taking into account temporal variability, and **Megan Klaar** *et al.* found that coarse woody debris is a key determinate of mesoscale instream habitat for juvenile salmonids in glacial Alaskan streams as it creates small-scale hydraulic diversity. **Carvalho** *et al*. also looked at the small-scale hydraulic environment, specifically how boulders act as fish refugia. The integrated microhabitat requirements of Californian salmonids were reported in the poster by **Hamish Moir** and **Gregory Pasternack**. They emphasised that species-specific preferences for micro-habitat reflect the availability of joint hydraulic-sedimentary conditions.

Ecohydraulic research on invertebrates was presented by **Benoit Demars** *et al*. who examined whether macroinvertebrate traits, rather than species lists, could be related to within-channel habitats across different rivers. **Simon Hoggart** *et al*. studied macro-invertebrates in the tidal Thames and found that density was higher on river walls than inter-tidal areas. **Damia Vericat** *et al*. presented research on the physical mechanisms that drive invertebrate drift and the applications of a portable, in-stream flume to undertake experimental work on this topic.

Several posters also focused on how organisms can influence physical processes. **Matthew Johnson** presented experimental results showing that river-exposed gravels colonised by Hydropsychid caddisflies exhibit critical entrainment shear stresses that are significantly greater than those of uncolonised gravels due to the presence of silk threads. Research into biostabilisation was also presented by **Robert Grabowski** who gave an overview of ongoing research on physical, chemical and biological stabilising agents.

A final set of posters focused on the interactions between plants and hydraulics. **Thomas Euler**'s poster considered the relationship between plants and the pattern of scour and deposition induced around them. **Andrew Folkard** focused on the flow structures in the vicinity of plants and bivalves. **Helen Gavin** reported a project on the River Kennet to establish the habitat requirements of *Ranunculus* species and to quantify the impact of groundwater abstraction on these requirements. The question of relevant scales was tackled in the poster by **Graham Hill** who linked micro- and meso-scale habitat parameters and looked at whether they are biologically distinct. **Caroline Wallis**'s poster outlined her research on hydraulic patchiness and the intention to use ADCP technology and fuzzy clustering algorithms to map the dynamics of hydraulic patch mosaics over wide flow ranges. **Neil Dickson** *et al.* presented coupled geomorphological, hydrological and ecological field data that is intended to elucidate the patch-scale distribution of the environmental variables that sustain high ecological diversity in Alpine rivers.

From the questions asked of presenters and the conversations that filled the coffee breaks and poster session, it was clear that the meeting was both stimulating and informative. It was also apparent that individuals from different academic backgrounds (ecology, geography, engineering) and from different spheres of employment (academia, private sector, public agencies) have contrasting views of what ecohydraulics is and should be in terms of appropriate research questions, methods and outcomes. There is great diversity and some tension between these alternative views which would usefully be explored by interdisciplinary dialogue. To explore this issue in a little more depth, delegates have been asked to respond to a questionnaire that aims to tease out an accurate picture of what practitioners consider ecohydraulics to be and where it should go. The results of this exercise will be published alongside selected papers from the meeting in a special issue of *River Research and Applications*.

Matthew Johnson, Rachel Stubbington and Stephen Rice, Loughborough University

News from members

Hydrological references

Over 400 hydrological references — mainly published papers, monographs, reports — on various subjects (climate, rainfall/runoff, floods/droughts, ET, synthetic/operational hydrology, sedimentation, regional hydrology, water resources, irrigation and crop water requirements), collected over a 35-year period, are available in subject-indexed cardboard boxes to an individual researcher or research institution/university.

Contact **Riaz Hasan** by e-mail at mriazhasan@aol.com. The selected individual or institution must accept the entire collection.

Scottish Hydrological Group

The post of Honorary Secretary has now been taken on by Paul Hart (p.hart@royalhaskoning.com).

One of the most talked-about field trips at the recent Exeter meeting was the visit to Boscastle, ably organised by **Oliver Pollard**. Oliver has since suggested that we let members have this useful internet link to Environment Agency publications. https://publications.environment-agency.gov.uk/epages/eapublications.storefront/459d12b50119408c273fc0a80296067e/Customer/CheckUCOData

He tells us that if the user puts in the following in the query tool then they will see a set of reports/newsletters relating to the Boscastle flood defence scheme and also a readable report *Living with the risk, The floods in Boscastle and North Cornwall 16 August 2004*.
Keywords: Boscastle
Subject: Flooding
Regions: SouthWest

RE: Modelling extreme rainfall events (Joint Defra/EA R&D)

Another link of interest to hydrologists is the DEFRA R&D website. For example, the following links allow access to the following Joint Defra/EA R&D *Modelling extreme rainfall events - FD2210 reports*:
Technical Summary http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2210_7491_TSM.pdf
Technical report and final report http://sciencesearch.defra.gov.uk/

BHS 26th Annual General Meeting

The 26th Annual General Meeting of the British Hydrological Society was held during the 10th BHS National Hydrology Symposium, University of Exeter, 17th September 2008

President's Report

I will try to keep my report to this AGM as brief as possible, as those of you attending this symposium will have heard me speak at least two or three times already through my welcoming speech on Monday, my presentations of the new Professional Training and Development Guide on Monday and my speech during the banquet on Tuesday. Some may even have heard me present a paper !

It is encouraging to see an attendance of over 150 at the symposium, and I believe it demonstrates that hydrology is a very relevant and active profession in the current climate of severe summer flooding following on from a major two winter drought. The Pitt review of the summer flooding in 2007 prompts the Government to take hydrology very seriously and emphasises the need for a pool of scientific competence and experience within the Environment Agency. With the challenges of a changing climate, pressure on finite water resources and the Water Framework Directive for example, the profession of hydrology is one of great importance to sustained development and environmental protection. It is gratifying to see that BHS is still an active society with over 1000 members, and one which continues to host a wide-ranging programme of events.

When I came to office 12 months ago I said that I had two main targets for my presidency; getting the new joint BHS/Nordic Association for Hydrology (NHF) journal launched,

and helping members seeking to achieve chartered status. I am delighted to announce that the new journal, *Hydrology Research*, which has been renamed from the former Nordic Hydrology Journal, was launched in January this year. The journal has two co-editors, with the former editor of *Nordic Hydrology,* Prof Dan Rosbjerg of the Technical University of Denmark, continuing to represent NHF and Dr Ian Littlewood as the BHS editor. I congratulate Ian on his efforts to date.

I am also pleased to announce that a new Guide to Professional Development and Professional Qualification for Hydrologists was launched at this symposium on Monday afternoon, and this document is now available on the BHS website. The new guide is very much a 'living document' and I hope that it will evolve and be improved as the year goes on with more examples of how your hydrological professional experience can be 'mapped onto' the required competencies of the various awarding bodies. Any suggestions for improvements should be sent to me please.

I would like to end by thanking my fellow committee members for their efforts over the past year, with particular thanks to the Hon. Treasurer and Technical Secretary. Of course special thanks must also go to our retiring Hon. Secretary, Hayley Fowler, for such sterling work over the past few years.

I think that all of you here at this symposium will agree that the event has been very well attended, well organised and that the papers presented have been of a very high standard. I would like to thank Dr Soon-Thiam Khu and the members of his very effective organising committee for all their efforts, and express thanks also to Alix Slater, who has worked tirelessly to make everything work so well.

Frank Farquharson

Hon Secretary's Report

I would like to start by acknowledging the support the Society gets from the Institution of Civil Engineers and particularly from our Secretary, Tim Fuller, who has been a great help to myself and the Society again this year, and also by acknowledging the support of our Technical Secretary, Celia Kirby, who has once again done a sterling job.

This year has seen a wide range of National and Regional BHS meetings. Following the AGM in September 2007, held during a national meeting at Birmingham University, there have been eight further national meetings, including this 10th National Symposium.

The first national meeting on "Understanding processes for basin scale management" was organised by the UK PUB committee and held at the ICE in London on 17th October 2007. On the 8th January, a very well attended national meeting was held at Oxford University on "The Use of Historical Data for Rainfall and Flood Forecasting" which was very timely because of the devastating floods of summer 2007. On 20th February, the third national meeting was held in Newcastle organised by Claire Walsh on behalf of Pennines. This meeting on "Climate change: Scenarios, Impacts and Adaptation" was full, showing that climate change impacts are an important topic for our membership. On 7th May a well-attended national meeting on "Surface-water quality: dynamics, processes and management" was held at Birmingham University organised by BHS Midlands group. This was followed by another national meeting organised by Midlands on "Ecohydraulics at scales relevant to organisms" at Loughborough University on the 5th June. Finally a joint meeting was held with the Royal Statistical Society in London on the 24th June on "Uncertainty in climate predictions". BHS also sponsored a meeting on "Sustainable Communities" held in Newcastle on the 9th May following the successful meeting last year. organised by the regional young members of ICE.

In addition to this, the 2008 Peter Wolf Young Hydrologists Symposium was held in June at Edinburgh University and ably organised by Kate Heal and a team of PhD students. The symposium attracted 26 young hydrologists and consisted of a day of talks and posters followed by a field visit to the Tay catchment and distillery. The prizes for best talks were awarded to Sunitha Rao Pangala (Edinburgh University) and Jo Robinson (South West Water) and best poster awards went to Vesna Tripkovic (Newcastle University) and Helen Gibbs and Sylvia Maclaren (Enviros).

Successful meeting programmes were held in the Regions again this year, attracting large audiences. A wide variety of topics were covered by the locally very

active groups in the Pennines, South West, Midlands and South East Regions and by the Scottish Hydrological Group of the ICE. Day, afternoon and evening meetings and two field visits were held at a variety of venues.

On behalf of the Society, I would like to thank all of those involved in organising, speaking at, chairing and administrating meetings and also those who produce write-ups for Circulation. It's only through their efforts that the Society is able to continue to offer its large and varied programme of meetings each year. The meetings programme for 2008-09 is already well populated with national meetings on water resources, hyporheic hydrology and hydromorphology planned up to the end of January 2009.

We have continued our policy this year which allows people registering for events as non-members to join the Society for the remainder of the year on the strength of the higher charged rate and this has made a difference to membership numbers. As a result we continue to have over 1000 members of the Society.

The Society has responded to a few requests for consultation during the year and I'd like to thank those who have put views forward. I would also like to thank Celia Kirby who has made the process of responding to consultations much easier since her appointment as Technical Secretary. I would also like to thank Andrew Black and the team at Dundee University for continuing to look after the Society's publications and promoting their sales and Joe Pearce for continuing to manage the Society's mailbase.

For this year's undergraduate dissertation prize we had 12 entries from various Universities, which were judged by Claire Samuel and me. The entries were of a very high standard. We awarded first prize to Rebecca Anderson from Oxford University and the runner's up prizes to Piotr Cienciala from Southampton University and James Harley from Stirling University.

There are many changes this year to the membership of the committee. Three ordinary members (Sarah Dunn, Neil McIntyre and Tim Norton) retire after a three year elected term on the committee and we would like to thank them for their inputs over this time. We also received a resignation from Kelvin Limbrick and would like to thank him for his inputs over the last two years. Nominations were received from three Members for these positions on the Main Committee and one for each of the President Elect and Honorary Secretary positions. We would like to welcome Mark Wilkinson and Isabella Bovolo from Newcastle University and Simon Mathias from Imperial College onto the Committee and to congratulate Andrew Black from Dundee University on his election as President Elect and Claire Walsh from Newcastle University on her election as Honorary Secretary. Matt Horritt from Halcrow was also co-opted onto the Committee for the next year to replace Kelvin, and we would like to welcome him.

Finally, I'd like to thank the committee for the help and support they've given me this year. In particular the executive committee of Frank, Peter and John and for the great strengths and organisation that Celia has brought to her role as Technical Secretary. Finally, I would like to say that I have enjoyed my time as Honorary Secretary and wish the Society every success in the future as I hand over to Claire Walsh.

Hayley Fowler

Hon. Treasurer's Report

I am pleased to once again be able to report a healthy financial position, with General Funds having risen by about £9,000 and Total Funds having risen by about £2,000 over the year.

At the end of June 2008 we had 1039 paid-up members. This is exactly the same as at the same time last year. The consolidation of membership in excess of 1000 follows several years of significant growth. We have no reason to believe that lack of growth this year is a matter for concern.

The Statement of Financial Activities for the Year ended 30 June 2008 shows the accounts of the society that are to be audited and submitted in the Trustees Report of the Society to the Charity Commissioners. A detailed breakdown of income and expenditure for the Year ended 30 June 2008 is shown in the separate Financial Report. The reports show a generally healthy picture. Points in the accounts include:

- A significant gain over a series of National meetings, where income (£15,216) exceeded expenditure (£9,961). The costs do not include anything for room hire for meetings held at ICE which is part

of the package of services for which we paid ICE £5,150 in the past year.

- An approximate halving of travel awards from general funds, reversing the increase of the previous year. However, it is thought that the total is likely to rise again this year.
- A significant reduction in the value of investments held by the Exeter Fund. This was mainly due to adverse stock market conditions but also reflects the eight awards which were made to support attendance at the IAHS Symposium at Perugia in July 2007. The Fund will not be able to maintain this level of support for the 2009 Symposium, but the Committee will consider additional support via travel awards from general funds.
- No subscriptions to outside bodies. The Committee decided to cease membership of the Hazards Forum, the Earth Sciences Group and the Parliamentary Scientific and Technology Committee.
- Reductions in printing and postage costs, partly due to the change to printing *Circulation* at A5 size rather than A4.
- A temporary reduction in Trustee meeting expenses, largely because a change in one meeting date meant that there were three meetings in the year compared to five last year, rather than four in each year.

Most of the assets of the General Fund are held in accounts in the CAF (Charities Aid Foundation) Bank, whilst the Exeter Fund assets are invested in the Charities Official Investment Fund.

The initial forecast for 2008/09 shows approximate break-even, as was the case last year. The out-turn for 2007/08 was substantially more favourable in terms of General funds due to factors such as those listed in the previous section. It is unlikely that this would be repeated in the coming year, and in any case the Committee has no desire for reserves to increase further. The forecast does not include any profit or loss in relation to the symposium here at Exeter, but we believe that the financial out-turn will be satisfactory.
At present there is no indication of a need to change subscription rates, but this is of course kept under review.

I would like to thank my colleagues on the National Committee for their support, and to acknowledge the work of the staff of the Institution of Civil Engineers who handle the real business of running the Society. I believe that the finances of the Society are on a sound footing for the years ahead, and I look forward to my final year in this role.

Peter Ede

Editorial

At the AGM in Exeter, there was a brief discussion about using some of the Society's funds to make more of an investment in our web site, so that it becomes known as a centre for hydrological information.

What do members think about this? I am very aware that we seem to have a Society with a responsive 'core' of members who actively communicate via email and the rest who don't. My own gut feeling is that keeping in touch with one's peers will become exclusively electronic – most of our official correspondence already comes to us via the Internet. And if this is so, how do we cater for the needs of our members who still prefer paper transactions.

For those of you who are happy with the technology but who have not yet joined the BHS Mailbase, may I urge you to do so and also – to comply with the Data Protection Act – to let Tim Fuller have your blessing for the Society to use your email address for general communications. Finally, for those who get an electronic copy of *Circulation* from Tim, please note that this issue will be made available as a link via our web site, not as an email attachment as with recent issues (but you will still get a message to let you know when it is available).

Celia Kirby

BHS Student Award for 2008

There were 12 submission for this award this year, all to a very high standard. We are delighted to announce that the winner was **Rebecca Anderson*** (Oxford University) for '*Developing a flood inundation prediction methodology to improve floodplain management practices, using a raster based two dimensional model (USFLOOD-FP)*'.

The two runners-up were **Piotr Cienciala**, Southampton University and **James Harley**, Stirling University.

Here is an abstract of Rebecca's thesis:

Flooding is a major environmental hazard, occurring in both developed and developing countries, resulting in political, social and economic problems worldwide. In the UK these issues have been further highlighted with the occurrence of the July 2007 floods. The impact of these floods demonstrated the clear need for greater scientific unders-tanding driving appropriate preventative measures. Additionally, associated climate change modelling outcomes are forcing a re-examination of floodplain management within all major flood risk areas. It is thus timely to critically investigate modelling approaches to floodplain inundation prediction and to test model developments that may serve to improve current flood inundation predictive capabilities.

The prediction of flood inundation extent can be researched using inferential statistical models, hardware modelling, or numerical modelling. In this field numerical modelling is increasingly playing a dominant role, as it facilitates the inclusion of all potentially relevant parameters and importantly, predictions from numerical modelling can be highly resolved both spatially and temporally. To implement any form of intervention requires some type of *System response model* in order that estimation can be made of how the system might respond to different management techniques. This study uses LISFLOOD-FP (Bates and De Roo 2000), a raster based numerical hydrological model to investigate the impact of different vegetation species planted on the floodplain on flood risk reduction, as a 'soft' engineering approach. The resultant simulations are compared with simulations implementing 'hard' engineering solutions, such as raised structures to constrain inundation extent.

Following concepts developed by Beven (2006), a methodology is developed for including parameter uncertainty in model parameter-isation to ensure model outcomes provide the most realistic basis for management decisions.

The major findings from this study are firstly, that a 'soft' engineering approach could be employed to reduce flood risk on floodplains similar to that of the study reach. Importantly, for the vegetation classes examined, the inclusion of uncertainty modelling demonstrates that each vegetation class has a unique impact on inundation extent and can therefore be used as part a floodplain management strategy. Secondly, it is shown that flood inundation extent can be reduced by the management of vegetation *both* in the channel and on the floodplain. Thirdly 'hard' engineering approaches on floodplains of this type are shown to be viable options to control flow conveyance and hence inundation extent.

Wider methodological findings drawn from this study show that models of this type are difficult to validate in any conventional sense, because of (a) 'over para-meterisation', (b) equifinality, and (c) the restricted availability of key observations such as satellite imagery of flood extent. A review of model design is necessary to achieve high space/time resolution in the areas of greatest need, i.e. the flood boundary. Furthermore, for two-dimensional hydraulic models of the type used, it is particularly important to carry out a set of randomised realisations of model outcomes, to have confidence in the process controls that need to be deduced from the simulation outcomes in order, to deliver acceptable floodplain management scenarios.

* We understand that Rebecca is Prof. Malcolm Anderson's daughter: sounds like she has hydrology in her genes!

New BHS Main Committee members



Matt Horritt is a Special Modeller with Halcrow Group Ltd, based in Swindon. Matt joined Halcrow in 2007 after lecturing in civil engineering at the University of Bristol. His work is focused on the model development for integrated flood risk management, urban hydrology, and uncertainty analysis. He retains strong links with universities through the Flood Risk Management Research Consortium and guest lecturing.



Mark Wilkinson is our new Young Members Representative. Mark is currently working as a Research Associate in the School of Civil Engineering and Geosciences at Newcastle University. His current work is looking at farm-integrated runoff management. This is primarily based in the Belford Burn catchment in Northumberland where he is developing a flood management plan by storing and attenuating runoff on farm land. This project also linked to water quality and ecological issues. He is also working on developing a simple Decision Support Matrix tool which will help understand runoff risk on agricultural land and has interests in upland hydrology and meteorology, micro-renewable energy and urban drainage systems. Mark has recently submitted his PhD.



Simon Mathias graduated in Civil Engineering at University College London in 1999 and then got an MSc in Water Resources, Technology and Management from University of Birmingham. After this, Simon worked for a year as a civil engineer at Royal Haskoning, designing ports and harbours in their Westminster office. He then obtained his PhD in subsurface hydrology at the Department of Civil and Environmental Engineering in Imperial College London. Currently he is working within the same department as a Lecturer of Environmental Engineering sponsored by WorleyParsons. Simon is involved in a range of hydrological research activities concerning radioactive waste disposal, nutrient transport, water resource management, contaminated land remediation and carbon capture and storage.



Isabella Bovolo is a Research Associate in Water Resources in the School of Civil Engineering and Geosciences at Newcastle University. She has a BSc in Geochemistry from Manchester University and a PhD in Geology from Bristol University. Having expanded her interests in Earth Sciences to more water focused issues, her research interests now include catchment hydrology, shallow landslide modelling and climate and land-use change impacts on hydrological systems. Over the past six years, she has contributed to several European Commission research projects and worked with international teams on desertification in the Mediterranean, rainfall-induced shallow landslides in Italy and Spain, catchment hydrology in Ecuador, regional climate modelling of the West Bank and analysis of radar rainfall for the UK. She is an editor for *Environmental Research Letters*.

Forthcoming Events

Groundwater and Extreme Events
Burlington House, London
Tuesday, December 2nd 2008

Call for Registration
A one-day groundwater conference considering the impacts of climatic extremes on groundwater resources and groundwater quality within UK and North European aquifers. The meeting will include presentations on groundwater flooding as well as on water scarcity and drought.

Registration costs: Members £20, Non-members £40.00, Students £5. Drinks reception £8. Pay on the door. Coffee, tea and biscuits provided. Pre-registration is required for this meeting. To register, send an email entitled 'Groundwater and Extreme Events ' to Carole Sharratt, British Geological Survey (cesh@bgs.ac.uk) indicating: (i) name, (ii) affiliation, (iii) Geol Soc membership (if applicable). Please register by 21st November 2008 to facilitate catering.

Further details:
Daren Gooddy (BGS), Tel: 01491 692328, Email: dcg@bgs.ac.uk Sarah Beeson (Anglian Water), Tel 01223 542780, Email sBeeson@anglianwater.co.uk

Royal Meteorological Society
Meteorological Science in time and space - from local weather to global climate
University of Reading
29 June – 2 July 2009

There are three conference themes:
- The Water Cycle: from local rainfall to global changes in the hydrological cycle.
- Predicting Hazards and Risk: from local weather forecasts to dangerous climate change.
- Ecosystems, Atmospheric Composition, Weather and Climate: from urban air quality to earth system processes.

7th International Conference on River Basin Management, Malta
7–9 September 2009
Call for papers
to include all aspects of Hydrology, Ecology, Environmental Management, Flood Plains and Wetlands

Full conference information is available at:
http://www.wessex.ac.uk/rbm2009rem1a.html

Copy deadline for* Circulation *No. 100
16th January 2009

Diary

17th December 2008
BHS National Meeting
"Hyporheic hydrology: emerging ideas and management implications"
Organised by:
BHS Midland Section
Venue: Birmingham University
Contact: David Hannah (d.m.hannah@bham.ac.uk)

8th January 2009
BHS National Meeting
"Hydromorphology and the Water Framework Directive"
Organised by: Pennines Hydrological Group/British Society for Geomorphology
Venue: Liverpool University
Contact: Neil MacDonald (Neil.Macdonald@liverpool.ac.uk)

The Diary is a little light this time. Although there are several meetings going through the planning process, the Main Committee hopes members feel free to suggest topics on which they think there could be much useful discussion and therefore potential for a meeting, either Regional or National. If you have such an idea, do please contact our Secretary, Claire Walsh (claire.walsh@ncl.ac.uk) who will be delighted to hear from you.

Please note that ALL BHS meetings are eligible for CPD (although we know you would come anyway....)