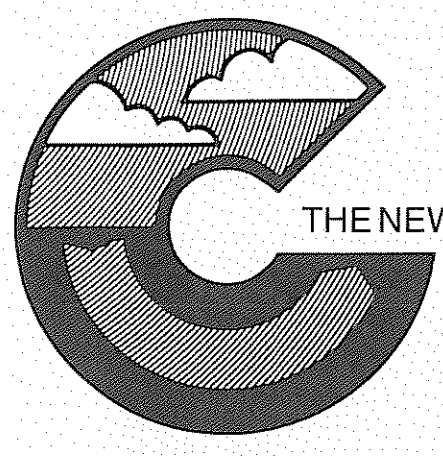
No. 88 February 2006



THE NEWSLETTER OF THE BRITISH HYDROLOGICAL SOCIETY

# Circulation

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- Web pages: **http://www.hydrology.org.uk/**

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# Science and policy on the banks of the Wear




**The 9th National Hydrology Symposium will take place at Durham University in September. This is the latest in a series that started at Hull in 1987 and has included successful events at Sheffield, Southampton, Cardiff, Heriot Watt, Salford, Newcastle and Birmingham Universities. Durham will be another great opportunity for members to meet and discuss the whole range of hydrology in a friendly environment.**

The ninth BHS National Hydrology Symposium will run from 10th to 13th September 2006. The broad theme is *Land management and the protection of the water environment: understanding the impact of new legislation*. It will continue the BHS tradition of bringing together hydrologists from a broad range of backgrounds, and encouraging debate between academics and end users.

Lectures will take place in the Department of Geography, with accommodation and meals at nearby Collingwood College, which offers modern, comfortable facilities. The conference dinner will be held in the Great Hall of Durham Castle, with a brief tour of the castle beforehand for those who wish to see something more of this World Heritage Site. Durham is a small city on a spectacular meander of the River Wear and all venues can be conveniently reached on foot. A visit to the Cathedral is highly recommended. Durham is easily accessible by road (A1), rail (east coast main line) and air (Newcastle or Durham-Tees Valley).

The Symposium will focus on a range of legislation (including the Water Framework Directive and Habitats Directive) with an impact upon the relationship between land management, hydrology and the water environment. This legislation is already changing how we use the landscape, and that will continue to change, but what does this mean for hydrology, and the processes driven by hydrology? What are the science and policy challenges? What will our hydrological processes and pathways look like as this legislation takes effect?

How will all this be influenced by our changing climate? Will monitoring systems need to be improved?

This Symposium aims to improve our understanding of the implications of this legislation for hydrological science, to disseminate our understanding of the impacts of land management upon the water environment, and to provide a focus for the kinds of hydrological questions that are going to dominate the next 20 years.

We plan to structure the conference around five themes, and have solicited keynote presentations and papers from key individuals as well as the general call for papers. The five themes we have identified are:

1. Legislation and policy: challenges for hydrology
2. Land management, hydrology and flood risk
3: Land management, hydrology and diffuse pollution
4. Land management, hydrology and ecosystem health
5. Looking to the future – will climate change undermine new legislation?

Keynote speakers already confirmed include: Chris Spray (SEPA, Scotland), Gilles Pinay (CNRS, France), Louise Heathwaite (Lancaster) and Jeff McDonnell (Oregon, USA). The Symposium will include a poster session and postgraduate students are particularly encouraged to contribute.

Anyone wishing to offer a paper or poster is asked to send a title and abstract to one of the convenors by **1st March** so that the programme can be compiled. Conference administration will be handled by the University's Conference and Tourism Office, with all registration online *(www.dur.ac.uk/conference.booking)*.

Convenors: Prof. Tim Burt *(t.p.burt@durham.ac.uk)* and Professor Stuart Lane *(s.n.lane@durham.ac.uk)*, Department of Geography, Durham University, Science Laboratories, South Road, Durham DH1 3LE.

# Travel grants & Exeter Fund

Travel grants are available to help BHS members whose travel expenses are not met by an employer to attend scientific meetings. The amount will depend on the nature and location of the meeting and the case put forward.

Grants are mainly intended to help younger members, but are open to all. Successful applicants will be expected to write a short report for *Circulation*.

The Exeter Fund offers grants to British hydrologists to take part in IAHS / IUGG events, such as the recent IAHS Scientific Assembly in Brazil.

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

As we enter into 2006, the risks of floods and droughts are again highlighted in the media. Many hydrologists will already be worrying, quite rightly, about the very high risk of below-average winter recharge continuing into late spring, with the looming prospects of drought looking more and more likely, at least in the South East of England.

Yet as hydrologists, should we be equally worried by the long-term effects of global warming? I am increasingly staggered that intelligent media voices do not seem to be able to provide a balanced commentary on the quantifiable (high) risk of UK drought and water shortages this summer, set against the unquantifiable (at this stage, tiny) risks raised of Greenland's icecap completely melting over several hundred years to cause a 7 metre rise in global sea-levels.

I suppose we should be comforted that, with such a scenario, UK hydrologists' jobs will be secure throughout the 21st century as we try to solve the problems of water resource shortages and increased flood risk for over-developed inland catchments, as massive population movements are planned away from low-lying parts such as London, East Anglia and the Somerset levels. Maybe we should start a BHS Public Relations department to help educate journalists about assessing 'risk'!

## Flooded with consultations

Suddenly in December BHS were asked to respond to two major consultation requests – first PPS25 Flood Risk Management, then Water Framework Directive River Basin Planning. There was also a request for comments on the reorganisation proposals at CEH.

All these are major issues of interest to hydrologists, and the first two have been put out to the membership via the BHS Mailbase for members to submit their views for us to compile into a formal response statement. I have to say that we have been underwhelmed by the response, which is disappointing. It goes without saying that in a typical overloaded working week, there is little space for matters that have little immediate impact on productivity or targets. Yet the Main Committee does need assistance from the membership in the consultation process, so it is not too late to submit your views, to **Tim Norton** on PPS25 and **Hilary Smithers** on River Basin Planning.

## Durham Symposium

The ninth National Hydrology Symposium is to be held at Durham University from 10th to 13th September 2006. The theme will be *'Land management and the protection of the water environment: understanding the impact of new legislation'*. With environmental legislation increasing at (some might say) an alarming rate, with the demands of the EU Water Framework Directive already being felt, and the Floods Directive coming soon, the impact of legislation on the working lives of hydrologists has never been greater. The call for papers has gone out, and we are expecting the historic Durham city location to be an attractive venue, with no major sporting distractions this year from Olympics or Ashes Test matches — even the football World Cup will have been decided by July! So please get your abstracts in now* and plan your leave around Durham in September.

## Chartered status for hydrologists

I am pleased that we are now making some progress on one of my main themes for my two-year term of office: providing clearer guidance on routes to Chartered Status for hydrologists. This is the title for the next National Meeting on 22nd February at Imperial College. Speakers from ICE, CIWEM and the Royal Meteorological Society have been booked and all will be competing for the attentions of budding Chartered Engineers, Environmentalists or Scientists.

The morning presentations will be followed in the afternoon by case studies and interactive workshops, so there will be no shortage of information presented to help younger hydrologists decide which is the best route for them to follow. After the meeting, the challenge for the main Committee will be to summarise the information presented and to post clear guidance onto the BHS website. The aim is to do that by the end of April.

Check out the new BHS website for an update on other forthcoming meetings — there are lots of interesting events at both Regional and National level during the coming weeks and months.

*Rod Hawnt*

** Contact Tim or Stuart with a title now.*

# Water resources of South East England

**Here John Rodda* shares his response to the consultation on the South East Plan, in the form of a rewrite of the paragraphs on sustainable water resources and river quality management.**

## Warnings for water resources of the South East

There have been warnings recently on Radio 4 and in the press of reservoirs in South East England running dry, impending restrictions on water use, including standpipes in the streets and similar measures to reduce water use. This was in January 2006. With such a dry winter last year and little rain so far this winter, it seems highly likely that these and similar events will recur in the coming months.

If the population of South East England grows in line with government requirements, water services will suffer even more frequently from the consequences of a lack of water resources in years to come. To make matters worse, there is the threat of climate change and the changes to the hydrological regime that this will bring.

In January 2005 the South East England Regional Assembly published *"Clear vision for the South East: draft for public consultation"*. This Plan, for the period up to 2026, covers Berkshire, Buckinghamshire, East and West Sussex, Hampshire, the Isle of Wight, Kent, Oxfordshire and Surrey. It was distributed to all tiers of government in the region, and to other bodies, and to the public in an abbreviated form. Its aim is to provide a statutory regional framework for development, and particularly to allow additional houses to be built to accommodate about 1 million more people.

The Plan ranges widely, but pages 116 to 124 are of greatest interest for hydrologists, as this where water resources and floods are discussed. Brightwell-cum-Sotwell Parish Council was one of the bodies consulted, and as its Chairman, John Rodda rewrote paragraphs 1.20 to 1.34 on "Sustainable water resources and water quality" to overcome failings in the original. These failings included: no recognition of how scarce the south east's water resources are at present, and the absence of any sense of urgency in mounting a concerted and continuing education and public awareness campaign to reduce demand. This response *(below)* was forwarded to SEERA.

In July 2005 SEERA handed to the government a revised *Draft South East Plan: Part 1 Core Regional Policies*, which presumably had been written taking into account the responses received. Pages 105 to 113 contain paragraphs 3.1 to 5.9 dealing with water resources and floods. Those on water resources convey little appreciation of the seriousness of the situation in the south east. They fail to address the problems, rely on a "business as usual" approach and show no influences arising from John Rodda's rewrite *(which follows here)*.

## Sustainable water resources and river quality management

**1.20** The South East is one of the driest parts of the country. This is because the average annual rainfall, some 650mm, is amongst the lowest in Britain, while at 450mm or so, the evaporation is one of the highest. The remaining 200mm is the water resource that is available to replenish the soil and groundwater, maintain river flows and provide the basis for all life.

**1.21** Taking the whole area of the South East Region (about 20000 square kilometres), for the present population of about 8 million, this 200mm depth of water provides about 500 cubic metres of water per person a year. While this may seem a considerable quantity of water, according to World Bank criteria this figure places the South East amongst those areas of the world which currently suffer severe water stress. These include parts of Africa, the Middle East and much of southern Asia. According to UN data, Tunisia and Algeria for example, each have an available water resource of about 480 cubic metres per person a year

**1.22** However, the situation is improved locally in the South East by the reuse of substantial volumes of water. On the other hand, a considerable quantity is exported by the Thames as it flows into the London Region. Some small local additions may be obtained by desalination and import of water from France through the Channel Tunnel. The only other way of adding to the available resource is by transferring water from the wetter parts of the country to the South East.

**1.22** Of course, at certain times, rainfall totals are much higher than average, for instance, between September 2002 and February 2003 the Region received over 130% of the average, causing serious flooding in many areas. By contrast, between November 2004 and February 2005 the South East had recorded only a little over 50% of the average rainfall. These are the conditions that led to the notable droughts of 1995-97, the 1980s and 1975-76.

**1.23** Achieving a proper balance in the apportionment of this 500 cubic metres between the needs of the environment and those of agriculture, industry and the domestic sector is vital, in order to achieve sustainable development. However, in some places in the region, pressures on water resources are now very intense due to over-abstraction and to pollution from diffuse and point sources. Pollution comes from agricultural practices (fertilizers, herbicides and pesticides), land fill sites, effluent discharges from waste water treatment works and from industry, as well as from storm overflows, accidental spillages and runoff from roads and urban areas.

**1.24** While river water quality in the South East has improved in recent years, some water courses, lakes, ponds and wet lands are still being degraded by pollution and over abstraction. This degradation causes the aquatic environment to decline, decreasing biodiversity and lessening amenity values. Being porous and permeable, the Chalk and the other aquifers of the Region, are also vulnerable to pollution and need protection. More importantly, protection is required for the wells, boreholes and springs in these aquifers which are used for water supply. This is vital as over 70% of the public water supply of the South East comes from groundwater, the highest in the country.

**1.25** The scenarios employed for depicting the impact of climate change generally indicate that in the future, the region is likely to experience milder wetter winters and warmer drier summers: summers with intense rain storms from time to time. These conditions could lead to more winter recharge and increased river flows, together with higher evaporation rates in the summer, diminishing river flows and reducing capacities of rivers to dilute discharges of treated sewage effluent. Overall, climate change may lead to a decrease in the available water resource to below 200mm, but whether this will happen is unclear. For the lifetime of the Plan, the Region will suffer more from the effects of climate variability than climate change. A

* *John Rodda is an Honorary Member of BHS and a CEH Fellow at the Centre for Ecology and Hydrology, Wallingford. He was awarded the International Hydrology Prize in 2004. He has been President of the International Association of Hydrological Sciences and is a former Director of the Hydrology and Water Resources Department of the World Meteorological Organization in Geneva.*

drought of the proportions of those experienced recently could reduce the available runoff by half.

**1.26** That the South East is such a vibrant region when the water resources are presently under such stress is a tribute to the skill and expertise of the Environment Agency, the water companies and their predecessors and to the other bodies concerned with the provision of water services and the protection of the environment. Abstractions from surface and groundwater sources currently provide for an average water consumption of about 150 litres per head per day, a figure which is slowly rising. In recent years the leakage rate of water put into supply has been reduced and now stands at about 23%. Whether further reductions can be achieved is open to discussion. Many new developments in the Region incorporate water saving features which reuse water, use waste water and reduce the amount of water used, while some existing buildings are being fitted with them.

**1.27** Nearly 99% of the waste water produced in the Region goes through treatment works and is discharged to rivers, water courses, to the ground and to the sea. This water is important locally in maintaining river flows. The level of treatment is generally high, but increasing it further has considerable cost and environmental implications.

**1.28** The development options for the Region: namely the three growth options and the two distribution options pose serious problems in terms of the South East's available water resources. Even with the lowest rate of house building, 25500 houses a year, this approximates to the provision in the Region of water services to a new city of the size of Oxford every second year. For 2025, the forecast population of the South East is about 9 million. This reduces the available water resource to 444 cubic metres per person per year, just about 20% more than the figure for Oman!

**1.29** The Environment Agency, the water companies and the Regional Assembly have modelled scenarios of the potential implications of different levels of housing growth, levels of water efficiency and the development of new sources. This has identified localities where additional water is needed and where there may be deficits in water supply. In addition the Agency and the water companies have defined sewage treatment catchments where the physical capacity of the river environment limits further growth. These are catchments where the quality of the effluent, or the ability to meet more stringent standards, or the ability of the receiving waters to accommodate effluent is problematical and are likely to increase if additional growth occurs in such catchments. There may be means for overcoming these problems, new technology for example, and these are being assessed. In the light of these findings the ability of these catchments to take additional housing growth will be reconsidered. These scenarios take account of climate change and investment plans. The output of the modelling and mapping will condition the spatial options of the South East Plan.

**1.30** A small number of new reservoirs are likely to be required in the Region within the lifetime of the Plan. They are included as options in statutory water company plans. They will provide extra storage to meet demand, but they do not increase the total available water resource. They require long lead times to proceed through the planning, assessment, funding and construction phases before they reach the operational stage. These schemes include:

*i* Upper Thames Reservoir by 2019/20
*ii* Enlargement of Bewl by 2014/15
*iii* Broad Oak by 2019/20
*iv* Clay Hill by 2014/15
*v* Havant Thicket by 2020/21

Enlargement of Darwell reservoir in East Sussex and a strategic option in North West Sussex may also be put forward. The possibilities for increasing storage by recharging certain aquifers need to be explored.

**1.31** Faced with water resources that are finite and a demand that is continuing to rise, the aim of the sustainable development of the Region appears to be untenable. There is no single way of dealing with water scarcity. However there are various measures that can be, and are being, taken to ameliorate these conditions. Achieving greater efficiency in the use of water is first amongst these, by additional re-use of water, using more grey water and reducing use in various procedures, dual flush toilets and smaller toilet cisterns, for example. The use of water saving fixture and fittings though the application of BREEAM standards, planning obligations, supplementary planning guidance, design guides and examples of good practice need to be followed. Improving the control of leakage is another means, while instituting forms of demand management, such as by making higher charges for water and lessening mains pressures are further ways. Universal metering must be another option. The impact of the low charges for water services in the South East need to be investigated. The effectiveness of these different measures has to be monitored as part of the Plan. Developments in locations where current and future water supply and waste water deficits occur are to be avoided. Developers have to expect meet the costs of solving such problems.

**1.32** The effects of most of these measures is likely to be minimal, however, unless and until there is far greater attention given to the serious nature of the South East's water scarcity problem. A continued, intense and well funded public awareness campaign needs to be mounted to inform and advise the public that water has to be saved at all times, not just when a drought is in progress. Education and training, public relations and publicity would be important to this campaign. Even more important, politicians and decision-makers must be schooled into the seriousness of the problem. There are great dangers in determining policy without the necessary knowledge.

**1.33** With so many unknowns surrounding decisions on the water future of the Region, it is imperative that studies are conducted into research needs. Such research, at one end of the range, could enquire into the adequacy of knowledge of the resource; at the other, it might explore improved ways of creating greater awareness of the scarcity problem amongst water users and stakeholders of the Region.

*John C. Rodda, January 2005*

# Younger members

**Tim Norton** has replaced **Suzanne Paget** as the representative for younger members. Tim will be trying to maximise the help that BHS can give to its younger members (under 30 years of age) and seeking to promote their role and profile in the Society. If you fall into this category, please contact Tim (01903 832390) so that we can compile a list of younger members.

Please feel free to contact Tim about anything that you would like to discuss, particularly matters that might be relevant to younger members.

# Correction

Apologies to the Hon. Treasurer, **Peter Ede**, whose email address was incorrect in the Committee list sent out with *Circulation 87*. Peter's contact details are as follows: Mott MacDonald Group, Demeter House, Station Road, Cambridge, CB1 2RS *(tel 01223 463690, email peter.ede @mottmac.com).*

**Copy deadline for *Circulation* No. 89 6th April 2006**

# New members

A warm welcome to the following 50 new members of the Society. We hope you will play an active part at local and/or national level, and contribute occasionally to *Circulation*, which always welcomes news and views from members.

Sara Alexander ..... Leeds University
Victoria J Alexander ..... Environmental Consultant, Wigan
Zoa A Barnes ..... University of Birmingham
Nicola J Berry ..... University of Birmingham
Dr Lucy Bolton ..... Environment Agency, Nottingham
Michael Brown ..... West Yorkshire Police, Wakefield
Victoria Carpenter ..... Environment Agency, Camberley, Surrey
Joanne C Chesters ..... Carl Bro GRP Ltd, Leeds
Dr Karen M Clarke ..... Capita, Epsom, Surrey
Katherine Colby ..... University of Birmingham
Dr Matthew Crouch ..... Imperial College, London
Megan Dalgliesh ..... Environment Agency, Winchester
Andrew J Daugherty ..... JBA Consulting, Newcastle upon Tyne
Joseline Filippe ..... São Paulo University, Brazil
Liam Gaffney ..... Environment Agency, Warrington
Helen Godden ..... Hyder Consulting, Cardiff
Richard Grayson ..... University of Exeter
Dr K Akarin Grust ..... SEPA, Galashiels
Jonathan Harris ..... Mott MacDonald, Cambridge
Felicia Hicks ..... Arup, Leeds
David Kearney ..... JBA Consulting, Skipton, West Yorkshire
Francois E R Leesch ..... JBA Consulting, Newcastle upon Tyne
Dr Kelvin J Limbrick ..... Hyder Consulting, Bristol
Dr Simon S McCarthy ..... Middlesex University, Enfield
Mark McLaughlin ..... SEPA, East Kirkbride
Dr Stephen Merrett ..... Independent consultant, London
Josephine C Mitchell ..... Hydro-Logic Ltd, Reading
Sally Moodie ..... Jacobs Babtie, Glasgow
Dr Musafa Mokrech ..... University of Southampton
Paul Morgala ..... Atkins Water, Peterborough
Kathryn Pimble ..... Environment Agency, Shrewsbury
Lee J Pimble ..... Sonteck/YSI, Letchworth
Mark Pugh ..... Environment Agency, Flintshire
James J Rothwell ..... University of Manchester, Bolton
Fotios Sgouridis ..... Queen Mary University of London
Dr Iain Sime ..... Scottish Natural Heritage, Inverness
Simon Tanner ..... Environment Agency, London
Owen J Tarrant ..... Environment Agency, London
Angus Tree ..... Scottish Natural Heritage, Inverness
Jacqueline Turner ..... University of Newcastle upon Tyne
Dr Rebecca Wade ..... University of Abertay, Dundee
Lindsay Warrack ..... University of Newcastle upon Tyne
Ronald M Watson ..... JBA Consulting, Middlesbrough
Karen Weekes ..... Hydro-Logic Ltd, Reading
Ross Whitelaw ..... Royal Haskoning, Newcastle upon Tyne
Dr Paul Wilkinson ..... Halcrow Group Ltd, Waltham Cross, Herts
Neil Williams ..... Basingstoke, Hampshire
Dr Jean-Phillipe Vidal ..... HR Wallingford, Wallingford
Daniel Viviroli ..... University of Bern, Switzerland
Richard Zuccolo ..... University of Wales, Aberystwyth


## Imperial College London

Department of Civil and Environmental Engineering, South Kensington Campus, London

**Hydrology MSc courses:**

Hydrology for Environmental Management*

Hydrology and Business Studies

Hydrology and Sustainable Development

These courses are designed for those who wish to change to a career in hydrology, or to develop specialist knowledge and skills to advance existing careers. We welcome applications both from new graduates and from experienced professionals.

The courses may be followed full-time (1 year) or part-time (over 2 or 3 years, e.g. on a day-release basis). Individual modules can be followed as part of CPD (the courses are accredited by the Institution of Civil Engineers).

Hydrology modules include:
- Hydrological processes
- Hydrogeology
- Hydroinformatics
- Fluid mechanics
- Hydrometry and Meteorology
- Mathematics for hydrologists
- Stochastic hydrology
- Urban hydrology
- Water resources management
- Irrigation
- Contaminated land
- Surface water quality modelling
- Groundwater flow and quality
- Flood hydrology
- Rainfall-runoff modelling
- Water, wastes and health in developing countries

The courses also include a 5-month research project.

*On the HEM option, NERC Studentships may be available for eligible UK and EU applicants.

Full information is available on: **http://ewre-www.cv.ic.ac.uk/**


# Survey of members

The survey of BHS members that was carried out last year is now being analysed for publication in the next *Circulation*. The response rate was low, which could be due to widespread satisfaction (we hope so), or apathy, or perhaps members are just too busy?

# Register of consultants

The BHS Register of Consultants in Hydrology has been updated for 2006. The register (sent out with *Circulation*) lists consultancy firms with hydrology practices, hydro-meteorological equipment manufacturers and software firms, plus independent consultants.

The register provides focused advertising for hydrological services. It is mailed to over 900 BHS members and the details are also available on the BHS website at *http://www.hydrology.org.uk/register_consultants.htm*.

# BHS committee members

**Members might like to know a bit about the people who have been elected or appointed onto the committee, and some have provided a photo and a few details about themselves and their work and interests. They are in no particular order and not all of them are here yet!**



**Rod Hawnt**, the BHS President, is a hydrologist/ hydrometrist with over 30 years' experience in both public and private sectors. After a BSc in Environmental Sciences and an MSc in Water Resources Engineering, he worked for Thames Water where he qualified as a Chartered Civil Engineer. He 'privatised' himself in 1983 and in 1985 he founded Hydro-Logic Ltd, of which he is still Managing Director.

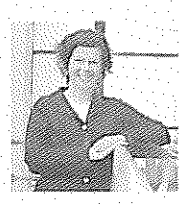
Rod is in his second term on the Committee, having previously served as Hon. Treasurer and elected member. His experience and interests include hydro-informatics, monitoring technology, open channel hydraulics, flow measurement, groundwater development and flood hydrology.



**Dr Ian Littlewood** is an Environmental Hydrologist and represents the Centre for Ecology and Hydrology on the committee. His research interests include the IHACRES methodology for modelling catchment scale rainfall streamflow dynamics.

Ian has worked in a government department and for a water authority. His PhD was on dynamics of acid runoff from moorland and afforested catchments in Wales. He is on CIWEM's Water Resources Panel and a board member of the International Environmental Modelling and Software Society (iEMSs).

He is on the Science Steering Group for the IAHS Decade for Prediction in Ungauged Basins (PUB), leads PUB Theme 7 and chairs the UK National Working Group for PUB.



**Professor Louise Heathwaite**, elected in 2003, is Director of the Centre for Sustainable Water Management at Lancaster University.

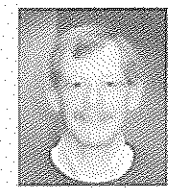
She read Environmental Sciences at East Anglia; her PhD at Bristol was on wetland hydrochemistry in the Somerset levels. She did research at Oxford and was the Environmental Hydrologist for the Nature Conservancy Council before joining the Geography Department at Sheffield, moving to the Lancaster Environment Centre in 2004. Her research interests include diffuse pollution and solute and sediment transport processes.

Louise was elected Vice President of the International Association of Hydrological Sciences (IAHS) in 2003.



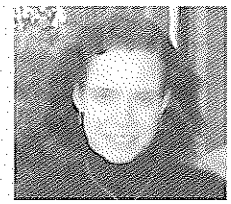
**Joe Pearce** became the BHS Honorary Secretary in 2004. He has been an hydrologist with the Environment Agency for the last 15 years, and a BHS member for almost that long. Joe is currently a Project Manager based at the Agency's office in Worthing, West Sussex, mainly carrying out flood risk management projects.

He has been actively involved with the BHS committee for around eight years, firstly through his work in the Southern (now South East) Section, and has been on the main Committee since 2002, first as an elected member and now as Hon. Secretary.



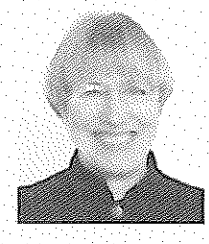
**Frank Farquharson** is the Institution of Civil Engineers' representative on the committee and represents BHS on the ICE Water Board. He heads the Water Resources Group at CEH, where he has worked for 32 years, initially on extending the rainfall-runoff models for the UK Flood Studies Report, but later on applied hydrological studies, mainly in developing countries.

Frank has a BSc in environmental sciences, an MSc in hydrology, and is a Chartered Civil Engineer. He has worked in over 40 countries, mainly in Africa, south-east Asia and the Indian sub-continent. His wide experience includes flood estimation, real-time flood forecasting and regional water resources assessments. More recently he has studied how climate change may affect floods and water resources, especially in developing countries.



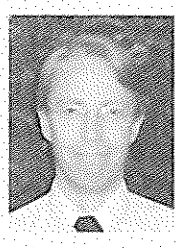
**Janet Makin** developed an interest in water during her Environmental Science degree in Norwich. She had a year off being an icecream lady (!) and then took the Water Resources MSc at Birmingham University in 1996-7.

She joined the graduate scheme run by United Utilities (formerly North West Water) and after two years got a job as hydrologist, and she has stayed with UU ever since! She is currently their Hydrology Manager: her key interests are drought management, water resource planning and day-to-day water source operation. In the last few years she has become chartered with CIWEM, IWO and CEnv.



**Dr Celia Kirby** has been a member of the BHS Main Committee since the inauguration of the Society, serving for most of the time as the Institute of Hydrology's representative.

She was the first Editor of *Circulation* and has played a leading role in the editing and preparation of most BHS publications, notably the published proceedings of the BHS National Hydrology Symposia and International Conference volumes.



**Peter Ede** joined the committee as Honorary Treasurer last year, maintaining a Mott MacDonald link in this post, following his former boss Terry Evans (1997-2001) and his colleague Steve Parsons (2001-2005).

Peter is a Senior Hydrologist who joined Sir M MacDonald and Partners in 1985. He has worked in nearly 20 countries and is looking forward to his first visit to Ghana in 2006.

Recent work in the UK includes flood risk mapping for the Environment Agency, reservoir yield assessment for Anglian Water and numerous yield studies for Scottish Water, ranging from very small burn sources to their largest integrated reservoir systems.



**Dr Hayley Fowler** is a research fellow in the Water Resource Systems Research Laboratory at Newcastle University, where she has worked in hydro-climatology for four years. Her research is on the impacts of climate change and variability upon water resources, developing weather-driven stochastic rainfall models, climatic variability and analysis of rainfall extremes for current and future climates in relation to flooding and drought. She was the BHS Pennines Hydrological Group representative on the BHS committee from 1998 to 2000.

# Impact of tsunamis on water resources and supply

## BHS South East Section meeting
## Institution of Civil Engineers, London
## 26 November 2005

**This evening meeting had been organised to discuss the impact of the South East Asian tsunami on water resources and supply in the area. Two speakers gave personal accounts of their experiences assisting in the aid effort following the devastating impact of the tsunami on Boxing Day 2004.**

**Adrian Butler**, a South East Section committee member took the chair and the presentations were given by **Patrick Butcher** (Flood mapping and data management technical specialist, Environment Agency) and **Lucy Lytton** (Senior hydrogeologist, Veolia Water).

Patrick's post-tsunami emergency experiences were with Oxfam's humanitarian relief programme in the province of Aceh in Indonesia during the period February to April 2005.

He displayed aerial photographic images which zoomed in from London to Lamno in West Aceh, using Google Earth mapping, and then travelled down the coast with oblique aerial shots of the coastline. These coastal views revealed signs of some sub-surface geological disturbances.

Travelling further south to the town of Meulaboh, where he spent most of his time, he showed comparisons made using high resolution satellite imagery of pre- and post-tsunami landscapes: these images clearly indicated the high degree of destruction that took place in this area. He then focused on the water distribution activities and their extent within the locality. Tanks of various sizes and shapes were placed at strategic points: they were filled by bowsers, which drew purified water from temporary sources.

To minimise the possibility of waterborne illnesses through water contamination, permanent raised latrines and wash places were built. Several images showed the generally high water table in many areas and the density of tents in the relief camps. The effluent from the sanitation facilities in the relief camps was pumped into tanks mounted on a flat bed lorry and then taken away to be discharged by gravity to a selected safe area.

The presentation concluded with a brief description of the survey of well-types and shallow well salinity investigations conducted in Aceh.

Lucy Lytton described the impact of the tsunami on community water supplies on the east coast of Sri Lanka. She had travelled there in early January 2005 as part of Veolia Waterforce, who worked very closely with the French Red Cross team. Part of the team was involved in the analysis of the water distribution network (which served 20% of the local population) and in leak detection. Leaks were fixed, and in demolished zones the network was terminated with a tap where possible, to permit community access to water.

The team's other main task was to investigate the private wells. 80% of the local population was supplied by wells taking water from the narrow sandy aquifer close to the coast. Many of the wells had been damaged or destroyed by the impact of the tsunami and contamination of the water supply was a common occurrence, including debris and ingress of saline water.

Immediate action involved investigating the water quality of the wells, their physical integrity, whether there was any rubbish or visible pollution and whether there was any pollution risk to the water supply (salinity or microbiological). Other activities included marking the wells that were surveyed, taking GPS measurements and interviewing the local population to determine the usage history of each well. A temporary alternative water supply was provided in the form of treatment units and standpipes.

The area visited by the Veolia team was very densely populated, with many wells and latrines close together, and the potential for contamination was very high, both before and after the tsunami. Many agencies were rehabilitating wells, but this work was sometimes relatively uncoordinated. There was even further potential for contamination from these activities, including fuel leakage from the pumps and seepage of the poor quality well discharge into the ground, causing recontamination of the aquifer.

Follow-up actions for the private wells included trial pumping to evaluate the appropriate pump rate, suitable discharge methods, the danger of well collapse and the degree of improvement of water quality. Lessons learnt included the need for better coordination between aid agencies and a greater degree of sharing of technical data and problems encountered.

There was considerable interest in this meeting, and over 60 people attended, from a wide variety of organisations and institutions.

*Helen Procter*
*Atkins Water*

# Low flows and the hydro-illogical cycle

## BHS Midlands Section meeting
## University of Birmingham
## 14 December 2005

**This one day meeting, organised by David Hannah and Chris Bradley, considered the need to break the 'hydro-illogical' cycle associated with drought. This cycle is due to the mismatch between the short-term memory of human society and the longer-term propagation of drought through the atmosphere / surface water / groundwater system.**

The meeting was well attended, with 58 people taking part from academic, public and private sector backgrounds. **Geoff Petts** (University of Birmingham)

opened the meeting with a short presentation on the drought and low flow issue, explaining the concept of the hydro-illogical cycle through responses to multi-year droughts in the 1970s, 80s and 90s.

The first session focused on the climatological aspect to droughts, beginning with a presentation on *The hydroclimatology of drought* from **Glenn McGregor** (Kings College, London). After introducing different ways of defining droughts, Glenn discussed the climatological background to British drought events in 1984, 1993 and 2003, the prospects for the winter ahead, and the role of atmospheric circulation patterns in drought occurrence.

**Rob Wilby** (Environment Agency) spoke about *Natural climate variability – significance to long-term water planning*. He discussed the extent to which modern drought records are representative of long-term variability in drought occurrence, in terms of both the frequency and seasonality of drought, and the impact of the findings on climate change studies and water companies' drought plans.

The second session included presentations on surface and ground water drought. **Andy Young** (Centre for Ecology and Hydrology) spoke on *Low flows research and technology transfer 1980-2030 – current status and future needs*, giving a brief chronology of low flow estimation methods before going on to discuss the Low Flows 2000 project. Andy concluded by looking to the future and questioning how advances in regional climate models might impact on drought/water resources planning.

**Ian Holman** (Cranfield University) talked about *Groundwater resources and climate change*, highlighting the need to understand surface /groundwater interactions when considering drought. He discussed the impact of land use and land management practices upon the hydrological response of systems, with emphasis upon agricultural areas.

After a buffet lunch amongst the fossils in the Lapworth Museum of Geology, the third session looked at the ecological implications of drought. **Paul Wood** (Loughborough University) presented a paper on *The response of in-stream fauna to inter-annual flow variability with particular reference to drought* on behalf of **Wendy Monk** (also from Loughborough). Focusing on regional variation in the response of instream ecological community structure to drought, he highlighted the differences in hydroecological response between surface and groundwater dominated catchments, and also the general resilience of macroinvertebrate communities.

**David Gowing** (Open University) addressed *The temporal response of vegetation to soil hydrology*. He looked at floodplain meadows and the water stresses on these diverse ecosystems, discussing community tolerance ranges for these habitats in relation to other similar ecosystems and the response of community composition to the medium- to long-term climatology affecting these ecosystems.

Following afternoon tea, the final session moved on to look at the operational and management aspects of low flows and droughts. **Pauline Smith** (Environment Agency) turned the spotlight on *Drought Plans – how to be prepared*. She outlined the Agency's development and use of drought plans for the management of droughts.

In *Drought preparation in Severn Trent Water*, **Rod Wilkinson** (Severn Trent Water Ltd) highlighted procedures for the recognition of a drought, before giving more details of the operational side of drought planning from the standpoint of a water supply company. He reiterated the need for flexible drought planning and questioned whether increased storage capacity would provide a buffer against possible future climate change.

The final presentation was by **Kunle Akande** (Halcrow Group Ltd) on *Operational control rules for water management in drought periods*. Kunle described how consultants can 'add value' to low flow management by integrating the scientific and operational aspects of droughts, emphasising the use of multi-source control rules.

**David Hannah** closed the meeting by summing up key points and thanking the speakers and delegates for an interesting and informative meeting. David and fellow convenor **Chris Bradley** concluded by asking for suggestions of how the BHS Midlands Section could develop further and possible topics for future meetings.

*Harry Dixon and Daniel Kingston*
*(University of Birmingham)*

# Journal of Hydrology New Zealand

The Editor receives the newsletter *Current* and the *Journal* from the New Zealand Hydrological Society. Members may use the CEH Wallingford library by appointment *(tel 01491 692266)*.

**Contents of Volume 44 No.1, 2005**

*Estimation of nutrient sources and transport for New Zealand using the hybrid mechanistic-statistical model SPARROW* — A. H. Elliott, R. B. Alexander; G. E. Schwarz, Ude Shankar; J.E.S. Sukias and G. B. McBride

*Sediment yield following plantation forest harvesting, Coromandel Peninsula, North Island, New Zealand* — Chris Phillips, Michael Marden and Donna Rowan

*Effect of flow regulation on near-bank velocities and sediment transport potential: a case study from the Waikato River, New Zealand* — I. A. McConchie, I. E. J. Toleman and R. M. Hawke

**Contents of Volume 44, No. 2, 2005**

Editorial — Dr Richard Hawke

*The February 2004 floods in the Manawatu, New Zealand: hydrological significance and impact on channel morphology* — Ian C. Fuller and Richard G. Heerdegen

*Skill assessment of a linked precipitation-runoff flood forecasting system* — Richard Ibbitt, Craig Thompson and Richard Turner

*Definition of hydrochemical facies in the New Zealand National Groundwater Monitoring Programme* — Christopher Daughney and Robert R. Reeves

*Note on the pumped storage potential of the Onslow-Manorburn depression, New Zealand* — W E. Bardsley

# Red books about PUB

*Predictions in Ungauged Basins: International Perspectives on the State of the Art and Pathways Forward*, edited by Stewart Franks, Murugesu Sivapalan, Kuniyoshi Takeuchi and Yasuto Tachikawa, has been published by the IAHS Press in the red book series.

This is IAHS Publication 301, 2005 (ISBN 1-901502-38-4; 348 + xii pp.; Price £60.00; IAHS members' price £45.00). It is the outcome of the deliberations at the PUB workshop held at Perth, Western Australia, in February 2004, mainly attended by Australian and Japanese researchers.

The workshop assessed current hydrological prediction capabilities and future research directions to achieve significant improvements. The book combines chapters presenting innovative theoretical and practical possibilities of different approaches for prediction, with contributions describing the differing perspectives and needs of Australia and Japan in particular.

More details, including the introductory chapter, are at *http://www.cig.ensmp.fr/~iahs/redbooks/301.htm*

Contact Jill Gash at IAHS Press *(tel 01491 692442, jilly@iahs.demon.co.uk)* to order this or other IAHS publications.

Red book No. 303 is also about PUB and is due out in the Spring of 2006. *"PUB: Promises and Progress"* is the Proceedings of the symposium on Prediction in Ungauged Basins held at the IAHS Assembly at Foz do Iguaçu, Brazil, in April 2005, and is also edited by M. Sivapalan *et al.*.

# Young hydrologists' prizes

**Prizes were presented to two young hydrologists at the BHS Committee meeting on 11th January at the Institution of Civil Engineers in London.**

The Young Person's Prize for the best presentation at the 2005 Postgraduate Symposium in Reading was awarded to **Andrew Ireson** (Imperial College) for his paper on modelling flow in the Chalk. The BHS Student Award for 2005 went to **Rebekah Rochester** (University College London) for her dissertation on modelling hydrological impacts of climate change on the River Lena in Siberia. Abstracts of each appear below.

The President **Rod Hawnt** presented Andrew with a tankard and Rebekah with a bowl and they each received certificates and cheques.

### Modelling flow processes in the Chalk unsaturated zone

**Andrew Ireson**

The English Chalk is a very important water resource. However, the processes that control the movement of both water and solutes through the unsaturated zone of the Chalk are not yet fully understood.

Extensive experimental work is being carried out in the Pang and Lambourn catchments in Berkshire, southern England, under the Lowland Catchment Research Programme, LOCAR. Recharge sites in these catchments are instrumented to collect measurements of water content and matric potential, as well as input (precipitation) and output (evaporation and recharge) fluxes.

Previous studies have indicated the need for fine temporal resolution data to monitor this system effectively. Because of the challenges faced in meeting this objective, a monitoring scheme was designed that combines a variety of instrumentation to provide the required range, accuracy and spatial and temporal resolution of data.

The field data were used to characterise the hydrological properties of the unsaturated zone and to gain insight into recharge processes. The interpretation of the data from the Chalk unsaturated zone at West Ilsley indicates that fracture flow, or preferential flow, is of secondary importance, or perhaps even negligible, and that the dominant recharge process is by the 'piston displacement' mechanism though the matrix (i.e. a process of hydraulic diffusion).

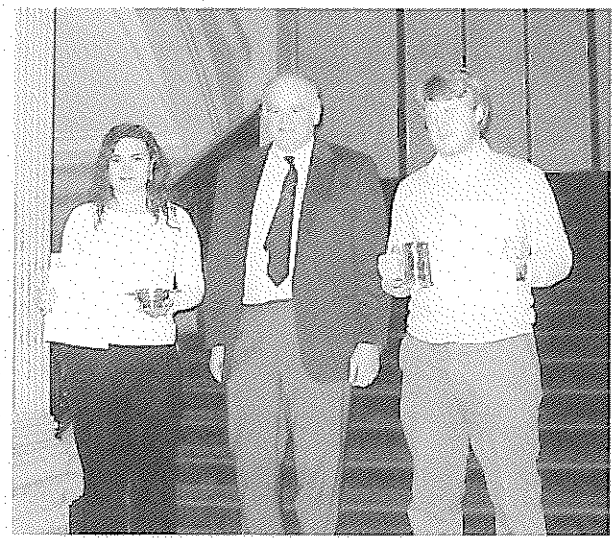
Work is continuing to use the high quality field data to parameterise the fracture-matrix hydraulic properties of the unsaturated Chalk, and then to use these relationships to simulate flow through the unsaturated zone of the Chalk, using physically-based numerical models. The model simulation can be verified against the same field data, as well as the water table response.

### Modelling the hydrological impacts of climate change on the Lena River, Siberia

**Rebekah Rochester**

The volume of freshwater input to the Arctic Ocean plays a significant role in the operation of the thermohaline circulation. It is therefore important to know estimates of future river discharge for Arctic draining rivers.

The study describes the construction of a semi-distributed hydrological model of the Arctic-draining Lena River, north-east Russia. The model is principally driven by temperature, precipitation and potential evapotranspiration.



Calibration (1948-1972) and validation (1973-1996) suggest that the model adequately simulates historical river discharge at four gauging stations in the basin, with Nash-Sutcliffe R2 values ranging from 0.82 to 0.92.

The model has been used to simulate the impacts of climate change on monthly river discharge for three time steps until 2099. Adjusted hydroclimatological datasets, based on the HadCm3 and GFDL Ocean-Atmosphere Global Climate Models (OAGCMs), have been run through the model from both A2 and B2 emission scenarios.

There is an expected increase to total annual flows, as well as a shift in the hydrologic regime with earlier spring discharges. The simulated results are found to be comparable to other modelling studies. Increases in temperature and precipitation are accountable for the changes in discharge.

The dissertation has enabled a comparison between different OAGCMs and scenarios so that the uncertainty of future discharge from the Lena can be assessed.

# Meeting

**BHS National Meeting**
**UK contributions to the Prediction in Ungauged Basins Decade (2003-2012)**
**14 June 2006, ICE London**

The International Association of Hydrological Sciences (IAHS) Decade for Prediction in Ungauged Basins (PUB) is now in its third year (see "PUB Corner" at *http://iahs.info*). A number of UK hydrologists are contributing to PUB — through its Science Steering Group, as Theme leaders, or as members of PUB working groups, including the UK National Working Group (UKWG), which is convening this meeting.

The programme for the morning will comprise presentations and short discussions, leaving the afternoon mainly for discussion leading towards formulating a UK response to the PUB Decade, embracing the needs and views of all practising UK hydrologists. That will help provide feedback to the Science Steering Group in the lead-up to the next IAHS Assembly in 2007.

This will be an opportunity for interested hydrologists from research institutes, universities, consultancies, environmental agencies and government departments to form a collective UK view of PUB so far and where it might go over the remaining years of the Decade.

Please put this date in your diaries now. The full programme will appear with the next issue of *Circulation*.

Contact: **Ian Littlewood**, PUB Science Steering Group *(igl@ceh.ac.uk)*.

# Diary

*15th March 2006*
BHS Pennines Hydrological Group
"Standards in the water industry: science and compliance"
Venue: Salford University
Contact: Dave Collins *(tel 0161 295 5525, email d.n.collins@salford.ac.uk)*

*22nd March 2006 (World Water Day)*
BHS National / South East meeting
"Does land management really affect flood risk?"
Venue: University of Cranfield, Silsoe
Contact: Helen Procter *(tel 01372 754201, email helen.procter@atkinsglobal.com)*

*2nd–7th April 2006*
European Geosciences Union (EGU) General Assembly, Vienna, Austria
*http://meetings.copernicus.org/egu2006/*

*24th April 2006*
BHS national meeting
"Hydrometric data quality and availability"
Venue: ICE, London, full day
Contact: Dave Stewart *(email dave.stewart@environment-agency.gov.uk)*

*25th April 2006*
Scottish Hydrological Group
Celebrating 40 Years of the SHG
"Hydrology and water resource development" — Prof. Paul Jowitt
Venue: Royal Society of Edinburgh,
Time: 6 for 6.30 p.m.
Contact: Mike Cranston *(tel 01738 627989, fax 01738 630997, email michael.cranston@sepa.org.uk)*

*26th–27th April 2006*
River Restoration Centre
7th Annual Network Conference:
"Ecological River Restoration"
Heriot-Watt University, Edinburgh
Details at *http://www.therrc.co.uk*

*11th May 2006*
BHS South East Section meeting
"Managing our coasts: competing interests"
Venue: ICE, London, Time: 18.00
Contact: Helen Procter *(see above)*

*24th May 2006*
BHS Pennines Hydrological Group
"Catchment management" — plus trip to Nafferton Farm & Group AGM
Venue: Newcastle University
Contact: Claire Walsh *(tel 0191 295 5525, email claire.walsh@ncl.ac.uk)*

*14th June 2006*
BHS National Meeting
"UK contributions to the Prediction in Ungauged Basins Decade (2003-2012)"
Venue: ICE London *(see Meetings)*

*15th June 2006*
BHS Pennines Hydrological Group
"Erosion and erosion modelling"
Venue: Lancaster University
Contact: John Quinton *(j.quinton@lancaster.ac.uk)*

**Copy deadline for *Circulation* No. 89 6th April 2006**

*21st June 2006*
BHS South East Section meeting
"Hydrological impacts of wastewater growth in the South East"
Venue: Reading University *(afternoon)*
Contact: Helen Procter *(see above)*

*30th June – 1st July 2006*
IAHS-UNESCO Kovacs Colloquium
"Frontiers in Flood Research"
Venue: UNESCO HQ, Paris
Contact: Pierre Hubert *(http://iahs.info/conferences/2006Kovacs.htm )*

*14th–18th August 2006*
International Conference on Riverine Hydroecology, supported by BHS
Venue: Stirling University, Scotland
Contact: Dr David Gilvear *(tel 01786 467840, email d.j.gilvear@stir.ac.uk), www.sbes.stir.ac.uk/riversconference*

*10th–13th September 2006*
9th National Hydrology Symposium *(and BHS AGM on 10th September)*
"Land management and the protection of the water environment: understanding the impact of new legislation"
Venue: Durham University
Contacts: Prof. Tim Burt *(t.p.burt@durham.ac.uk)*; Prof. Stuart Lane *(s.n.lane@durham.ac.uk).*

*13th–15th September 2006*
British Soil Science Soc. Annual Meeting
"Soil, vegetation and climate change"
Venue: University of Leeds
Contact: Pippa Chapman *(p.j.chapman@leeds.ac.uk)* or see *www.geog.leeds.ac.uk/conferences/index.html*

*20th–22nd September 2006*
ERB2006 – European Network of Experimental & Representative Basins
Venue: Luxembourg
web *http://erb2006.lippmann.lu*, fax *00 352 470264, email erb2006@lippmann.lu*

*26th–28th September 2006*
3rd International Symposium on Integrated Water Resources Management
Venue: Bochum, Germany
See *www.conventus.de/water* or contact Mrs Jana Radoi *(tel +49 3641 35 33 221, email water@conventus.de).*

# World Water Day events

**22nd March** is designated by the UN as World Water Day. The theme is Water and Culture and the aim is to promote public awareness of water resources and conservation. See *www.unesco.org/water/water_celebrations/index.shtml.*

As well as the BHS National / South East meeting on land management and flood risk at Silsoe *(see diary)* there are several other events on that day.

The World Water Forum meets in Mexico City from 16th to 22nd March — see *www.worldwaterforum4.org.mx.*

There are two events in Oxford: Waterwise and Watersave are holding a Water Efficiency Conference at Lady Margaret Hall, starting the day before *(see the BHS website)*, and the Oxfordshire Community Partnership, along with the university, the Environment Agency and Thames Water, is organising a day seminar on the future for Oxfordshire's water resources: see *http://ocwr.ouce.ox.ac.uk/seminar.html* or email *john.gates@ouce.ox.ac.uk.*

# Jeremy Meigh

As *Circulation* was going to press, the death was announced of BHS member **Dr Jeremy Meigh** (Centre for Ecology and Hydrology), aged 51. Jeremy first became ill in April last year after returning from Brazil and Ecuador. He died peacefully on 8th February at the end of a long series of critical illnesses, culminating in pneumonia. He leaves a wife, Caroline, and daughter, Alice.

Jeremy read Engineering Science at Oxford then took an MSc in Engineering Hydrology at Imperial College before working for engineering firms on overseas and UK projects, including the Thames Barrier. He did his PhD on sediment transport at the University of East Anglia, before joining what was then the Institute of Hydrology in 1985 to work on water resources in southern Africa and the World Flood Study.

Jeremy's career at CEH Wallingford spanned over 20 years, involving a wide range of overseas research and consultancy projects. He worked in over 30 countries, including most parts of Africa, the far east, India, Palestine, Russia and the UK. He was active in the UNESCO FRIEND (Flow Regimes from International Experimental and Network Data) and HELP (Hydrology for Environment, Life and Policy) initiatives, and led the UK contribution to the Southern Africa FRIEND project.

He was a key member of a World Bank team attempting to develop a cooperative framework through which the Nile basin riparian countries could begin to move towards an equitable and sustainable agreement on how to develop the water resources of the basin. Jeremy worked with lawyers and politicians as well as engineers to help develop trust and exchange of information between the countries.

More recently, he tried to help bridge the gap between the numerical sciences of hydrology and engineering and 'softer' socio-economic issues, amongst other things helping to develop a Water Poverty Index, as an indicator of a country or region's ability to cope with water stress.

His sharp intellect and analytical thinking were respected by all who worked with him, and he will be sadly missed by colleagues and friends.