

Groundwater Extremes and Surface Water Impacts

10:00-16:30 Wednesday 3rd December 2014

Institution of Civil Engineers, One Great George Street,
Westminster, London, SW1P 3AA

In early spring 2012 the UK was experiencing a severe drought, with soils at their driest on record for the time of year, and groundwater levels in many boreholes across southern England at record lows. Twenty million customers were affected by water use restrictions and questions were being asked by Government about the sustainability of supplies if the drought continued. A potential crisis was avoided because of record rainfall between April-July 2012, the highest over England and Wales in the series extending back to 1766. During the following two winters the UK has experienced record high groundwater levels, resulting in the flooding of properties and the overloading of sewers. The types of flooding that occurred during early 2014 were varied: in places it was solely groundwater generated, in many areas fluvial, but in some locations caused by interacting groundwater and surface water systems.

This meeting, co-convened by the British Hydrological Society and the Hydrogeological Group of the Geological Society, will examine this remarkable period of climatic and hydrological extremes, discuss the nature of the interactions between groundwater systems and surface waters during both the drought and flood episodes, and consider the challenges in managing our water resources and in mitigating impacts during extremes. The programme will begin with two invited talks, considering these points from different perspectives and aiming at stimulating some lively debate!

PROGRAMME

10.00	Doors open
10.30 – 10.40	Welcome and introduction
10.40 – 11.20	Invited Speaker: David Evans It's the evaporation, stupid! Why we are going to need more storage and where is it going to come from?
11.20 – 12.00	Invited Speaker: Dr Mike Price It's the groundwater, stupid! Why we must learn to live with more variable stream networks.
12.00 – 12.30	Plenary discussion
12.30 – 13.30	Lunch and posters
13.30 – 14.00	S Parry^{1,2}, C Prudhomme¹, R Wilby², P Wood² (¹CEH.; ²Loughborough University) Characterising groundwater and streamflow drought termination: Application to long records in the UK.
14.00 – 14.30	S Morris¹, D Cobby¹, M Zaidman² (¹Jacobs; ²JBA Consulting) Modelling and mapping groundwater flows at the surface.
14.30 – 14.45	Plenary discussion
14.45 – 15.15	Coffee
15.15 – 15.45	L Edwards, V Fry, J Thomas (Environment Agency) Water quality impact of Chalk groundwater flooding: experiences from 2013/14 in the Thames Basin.
15.45 – 16.15	A Cambridge, W Rust (Atkins) The next frontier – integrating groundwater systems to understand river and sewer performance
16.15 – 16.30	Plenary discussion
16.30	Close

INVITED SPEAKERS

David Evans, OBE MSc FCIWEM MICE, is an independent consultant and ex-Water Resource Planning Manager for NRA Anglia. He has been involved in water resource management for nearly 50 years, largely in Britain's driest region - so more experienced than most as to the potential effects of a drier climate, which he will discuss along with potential response options:

"Our water regime is dominated by evaporation. For example, in an Anglian summer it consumes some 400 mm of water, compared to about 12 mm borrowed and returned by water supply. Now we are warned that summers will become hotter and drier - even more evaporation and less summer rain. If that comes true, what will be the consequences? And what are the response options? Is groundwater the answer? Perhaps, but this talk will argue that reservoirs are better."

Mike Price, BSc MSc DSc FGS CGeol CSci, has worked in hydrogeology since 1970 at BGS, Reading University and as a consultant. He has worked in the UK (especially on the Chalk) and also in arid regions of the world including the Libyan Sahara, the Thar Desert in Pakistan and India, and recently in Kenya. After the 1975-6 drought he wrote the text book "Introducing Groundwater" to explain hydrogeology to more people – "especially the media".

"To put it bluntly, surface hydrologists simply do not get it. Ignoring ice caps and glaciers (which we haven't had in this country for some time now) around 97.5 per cent of the world's fresh water is in the ground. The reason for this is gravity, which tries to drive every drop of water that falls from the sky as far as possible into the ground.

Put simply, the reason that very little of the Earth's liquid fresh water is on the surface is because surface water is water that the ground has rejected. If there is to be less effective rainfall, there will be less water for the ground to reject. As the water table rises and falls with varying recharge, the lengths of gaining reaches fluctuate, giving rise to intermittent streams, in Britain, most notably the 'winterbournes' of the Chalk. With climate change predicted to cause greater variation in effective rainfall both between winter and summer and from year to year then irrespective of groundwater abstraction those stream networks are going to show greater change in response – and we have to get used to the idea."

REGISTRATION

Please register online for this meeting via <http://www.ice.org.uk/Event?ID=3117>

Conference fees are £60 for BHS or Geol Soc members, £90 for non-members and £45 for retired/students.

Further details will appear shortly on the web pages of the BHS (www.hydrology.org.uk) and the Hydrogeological Group of the Geological Society (www.geolsoc.org.uk/hydro).

CONVENORS

Chris Jackson (British Geological Survey, crja@bgs.ac.uk), Maxine Zaidman (JBA Consulting, Maxine.Zaidman@jbaconsulting.com), Jon Mackay (British Geological Survey, joncka@bgs.ac.uk)