

# Karst Groundwater at Birmingham June 2015

University of Birmingham

John Gunn and Ian Fairchild, convenors

<http://www.birmingham.ac.uk/generic/kgatb/index.aspx>



## Provisional Programme

### Saturday June 20<sup>th</sup> 09:00-17:00.

Workshop for consultants and professionals: *Groundwater in Carbonate Rocks*

### Sunday June 21<sup>st</sup> 09:00 - 19:00

Field workshop on *Groundwater in Cretaceous Carbonates*

### Monday June 22<sup>nd</sup> 09:00- 13:15 Oral sessions

Welcome and introduction to British carbonate karst environments

### Conference theme 1: Lithological, structural & stratigraphical influences on karst groundwaters

*Keynote Lecture by Dr Pierre-Yves Jeannin*

#### Lectures

Auler, A.S.	Paragenetic initiation and later overprint in cave passages: a review from Brazil
Farrant, A.R.	Stressed out: determining preferential flow pathways in karstic aquifers from cave survey data
Gautrey, S.J.,	Relative importance of lithologic, stratigraphic and structural controls of karst conduit development at the Victor Diamond Mine, James Bay Lowlands, Ontario, Canada
Hunt, B.B.	Influence of faulting and relay ramp structures on groundwater flow in the Karstic Edwards and Trinity Aquifers, Central Texas, USA
Klimchouk, A.	Functional organization and lithostratigraphic control of a large hypogene cave system in the Precambrian carbonates, NE Brazil
Myroie J.E.	Fresh-Water Lens Dissolution: The Lack of Strong Lithologic and Structural Control in a Laminar and Transitional Flow System
Palmer, A.N.	Duration and Significance of Vadose Perching in Karst: Mammoth Cave Region, USA
Petrus, K	Influence of layering on the formation and growth of dissolution pipes in karst systems
Raeisi, E.	Parameters controlling the general groundwater flow of the carbonate karst aquifers in the Zagros Simply Folded Belt

### Monday June 22<sup>nd</sup> 13:15 - 14:00

Buffet lunch outside the lecture theatre

## Monday June 22<sup>nd</sup> 14:00 - 18:30 Oral sessions

### Conference theme 2: Modelling Karst Groundwater Systems

Keynote Lecture by Dr Andreas Hartmann:

*Modelling karst hydrology - a balance of available information and model complexity*

#### Lectures

- Dewaide, L. Double-peaked breakthrough curves: from field data to laboratory analogue tests. A study case in the Dinant area (South of Belgium)
- Dubois, C. Hydrogeological modelling and upscaling of weathered karst aquifer by a distributed porosity approach
- Giese, M. Significance of parameters and processes for the evaluation of large scale tests in karst aquifers with numerical hybrid models
- Johannet, A. Neural networks modelling for long-term prediction of Albarine river discharge for various scenarii of global change (Ain basis - southern France)
- Kordilla, J. Approaches for modelling of flow and transport in unsaturated fractured aquifers - from catchment to pore scale
- Kovacs, A. What can we learn from hydrograph analysis? Theory and examples
- McCormack, T. Quantification of submarine/intertidal groundwater discharge from a lowland karst catchment
- Oehlmann, S. Reducing the ambiguity of karst aquifer models by pattern matching of flow and transport on catchment scale
- Reimann, T. Determination of controlling parameters for hydrodynamic and physicochemical signatures of karst aquifers by distributed parameter hybrid models
- Sauter, M. Scale dependence of hydraulic parameters in fractured and carbonate aquifers - the eternal story -
- Streetly, H.R. A water resource management tool for the Cotswolds Oolitic Limestone aquifers: Using the EA's MODFLOW/4R approach to regional groundwater modelling in a complex karstic system
- Zhdanov, S.V. Thermodynamic and kinetic modelling groundwater - carbonate rocks interactions for karst terrain Izhora plateau, Russian Federation

## Monday June 22<sup>nd</sup> 18:45 - 19:45 Business Meeting of IAH Karst Commission

## Tuesday June 23<sup>rd</sup> 09:00 - 13:15 Oral and Poster sessions

### Conference theme 2: Modelling Karst Groundwater Systems

#### Lectures

- De la Torre, B. Monitoring natural responses of karst springs water to characterize the hydrogeological functioning of Sierra de Jarastepar-Alto del Conio aquifer (S. Spain)
- Fiorillo, F. Long-term trend and fluctuations of karst spring discharge in central-southern Italy
- Jeelani, G. Estimating the sources of recharge to karst spring flows in a snow and glacierized catchment, western Himalaya (India)
- Malik, P. Recession curve analysis and water temperature vs. discharge relationship of karstic springs on the northern rim of the Silicka Planina Plateau (Slovakia)
- Paiva, I. The characterization of karst hydrological functioning based on spring responses analysis

### Conference theme 3: The ecology of karst groundwaters

Keynote Lecture by Prof Dr Christian Griebler

*Key drivers and major limitations of microbial growth and carbon cycling in natural and stressed groundwater ecosystems*

#### Lectures

Di Lorenzo, T	Is metabolism a key factor in determining groundwater copepod sensitivity to pollutants?
Galassi, D.M.P	Monitoring karstic springs: the role of groundwater meiofauna as indicators of aquifer hydrodynamics
Malard, F.	Multi-causality & spatial non-stationarity in the determinants of groundwater biodiversity patterns in Europe
Maurice, L.	The invertebrate ecology of Chalk groundwaters
Weitowitz, D.C.	Towards a new typology of subterranean habitats: Defining geohabitats for groundwater ecosystem investigations

Posters (poster presenters will have a 2-minute slot to introduce their paper and posters will be displayed outside the lecture theatre in the lunch area)

Cifoni, M.,	A protocol for a development, reproduction and population growth test with freshwater copepods
Fiasca, B.,	The EC-AQUALIFE Project in Italy: state of the art and future prospects
Knight, L.R.F.D	The aquatic invertebrate fauna of the Ogof Draenen cave system in South Wales
Knight, L.R.F.D.	Auto-ecological studies on <i>Niphargus glenniei</i> (Spooner, 1952) and <i>Niphargus aquilex</i> (Schiodte, 1855)
Robertson, A.L.	Groundwater flooding: Responses of groundwater ecosystems to an extreme recharge event.
Stubbington, R.	Density and richness estimates of invertebrates at the surface water - groundwater interface reflect the pump sampling method used
Wood, P.	Groundwater and macroinvertebrate recovery on the River Lathkill (Derbyshire) following supra-seasonal drought

## Tuesday June 23rd 13:15 - 14:00

Buffet lunch and poster viewing outside the lecture theatre

## Tuesday June 23<sup>rd</sup> 14:00 - 17:30

Choice of:

- Workshop on carbonate chemistry
- Workshop on groundwater fluorescence
- Workshop on carbonate groundwater ecology
- Field trip to historic underground limestone quarry workings and canals
- Free time!

## Tuesday June 23<sup>rd</sup> 19:00 - 22:00

Conference dinner with illustrated after-dinner talk by Professor Derek Ford:

*Karst and karst aquifers in the Northwest Territories of Canada: A Review.*

## Wednesday June 24<sup>th</sup> 09:00 - 13:15 Oral and Poster sessions

Conference theme 4: Human-Karst Groundwater Interactions

*Keynote lecture by Prof Dr Nico Goldscheider*

*A holistic perspective of karst systems, their services for humanity, and human impacts on karst*

### Lectures

Bajtos, P.	Environmental and emergency risks induced by mining in gypsum karst area (spisska Nova Ves, Slovakia)
Cowell, D.W.	Induced karst features in the drawdown zone of an open pit diamond mine in Ontario's James Bay Lowland, Canada
Blum, P.	Agriculture impact on nitrate concentrations in karst aquifers in Ireland
Mellander, P.-E.	Groundwater vulnerability assessment of an agricultural karst landscape
Calligaris, C.	Water has no boundaries: the example of the Reka/Timavo aquifer system (SLO-ITA)
Jiang, G.	Utilization of rainwater harvesting in bare karst areas for domestic use and ecological restoration
Karami, G.H.	Investigation of presence or lack of hydraulic connection between Emam-Gheise karst spring and water wells of Shahreza, Iran
Liu, H.	The response of Heilongtan spring to the 2010-2012 consecutive droughts of Yunnan Province, China
Sisovic, J.	The impact of water-conveyance tunnel on groundwater conditions - a case study of Pirot area, southeastern Serbia
Zhu, Y	Optimization of Groundwater for urban water supply and energy use in karst areas

Posters (poster presenters will have a 2-minute slot to introduce their paper and posters will be displayed outside the lecture theatre in the lunch area)

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|------------------|---|
| Chemseddine, F   | Vulnerability of urbanisation in karst areas (Northeast Algeria)  |
| Chemseddine, F   | Characterisation of the main Karst aquifers of the Tez bent Plateau, Tebessa Region, Northeast Algeria, based on hydrogeochemical and isotopic data |
| Farr, G          | The Great Spring, South Wales UK: updating a Source Protection Zone in a complex karst aquifer  |
| Hartmann, A.     | A database to assess impacts of land use and climate change on Europe's karst regions   |
| Jebreen H        | Hydrochemistry and effect of karst on spring water in the Soreq catchment, Ramallah, West Bank  |
| Krajnc, B.       | Cave air dynamics and drip water geochemistry in Pisani rov-Postojna cave (Slovenia)  |
| Malard, A.,      | Assessment of annual resources in Swiss karst aquifers  |
| Venturieri, E.M. | An applicable model for karst in Gambier limestone in order to improve the water management in Mount Gambier region, southeast South Australia.     |

**Wednesday June 24<sup>th</sup> 13:15 - 14:00:** Buffet lunch and poster viewing outside the lecture theatre

**Wednesday June 24<sup>th</sup> 14:00 - 18:30**

Conference theme 4: Human-Karst Groundwater Interactions

Lectures

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|----------------|---|
| Buckley, R.    | Use of a 'lines of evidence' approach for Source Protection Zone delineation in the Corallian Limestone Aquifer of North Yorkshire  |
| Streetly, M.J. | Use of transient soil moisture balances and simple 1-D stores for investigating and protecting groundwater resources  |
| Schomburgk, S. | Representation of karst units in the Aquifer Reference System of France - BDLISA: challenges of small-scale mapping   |
| Schmidt, S.    | Evaluation of rapid recharge processes and spring source vulnerability of karst aquifers in semi-arid environments based on high-resolution monitoring  |
| Cook, S.       | Regional groundwater modelling of the Brighton and Worthing Chalk aquifer to both investigate the impacts of groundwater abstraction on surface water flows and to predict and optimise the source reliable output from public water supply source. |
| David, P.-Y.   | Participatory tool to improve knowledge, management and protection of the karstic chalk aquifer system in Eastern Normandy  |
| Schindel, G.   | Strategies for the response to hazardous materials releases in Karst  |

Conference theme 5: Isotopes and water tracing

Lectures

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|--------------|---|
| Gill, L.W.   | Use of stable isotopes to characterise the hydrogeology of a lowland karst aquifer  |
| Muhammad, F. | Chemical and isotope characteristic of the surface water in Karst dominated area of Kinta Valley, Malaysia  |
| Yonge, C.J.  | Stable isotope comparison of two major karst valley systems in the Canadian Rockies   |
| Ender, A.,   | In-cave tracer tests during dry and wet season with spatial resolution of transport parameters in a tropical karst aquifer                                      |
| Goeppert, N. | Advances in colloid and particle tracing with applications in karst hydrogeology  |
| Liu, Z.      | Hydrologically-driven variations in the karst-related carbon sink fluxes: insights from high-resolution monitoring of three karst catchments in Southwest China |
| Poulain, A.  | Complex hydrogeological dynamic of the Lomme Karst System (Belgium) characterized by high resolution monitoring and tracer tests                                |

**Wednesday June 24<sup>th</sup> 18:30**

Formal close of meeting and presentation of 'Young Karst Researcher' awards followed by briefing session for those attending the field trips.

**Thursday June 25<sup>th</sup> 08:00 - 19:00:** Fieldtrip: Groundwater in Jurassic carbonates

**Friday June 26<sup>th</sup> 08:00 - 19:00:** Fieldtrip: Groundwater in Carboniferous carbonates