Circulation

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The newsletter of the British Hydrological Society



BHS membership

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Please email your material to bhs-circulation@outlook.com — contributions may be edited for length or clarity (**maximum** 1,000 words, or 750 with figures). Hydrological photos very welcome.

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In between issues of Circulation, you can keep up with the **British Hydrological Society** on social media:

LinkedIn—search for British Hydrological Society

Bluesky @britishhydrosoc.bsky.social

President's perspective

Duncan Faulkner

As I write my last of these articles before handing over to Joe Pearce as president, I'm conscious that it's a critical time to be involved in hydrology. The last few months alone have seen:

- Drought declared across much of the north and west of England – and further afield, severe drought across north, east and southern Africa (EU report, April 2025);
- A continuing water quality crisis, with public attention focused on the role of sewage discharges;
- Deadly floods in Texas (135 killed) – also South Korea (19 deaths) and the Philippines (30 deaths);
- Signs of accelerating climate change such as extreme heat across parts of Europe, the USA and Japan;
- Publication of the Cunliffe report of the independent water commission, which recommends a "fundamental reset of the water sector" including taking the water resource and water quality functions out of the Environment Agency;
- Publications of regional water resources (WR) plans for England by WR North, WR West and WR Southeast , under the Water Resources National Framework;
- Publication of the Environment Agency's National Framework for Water Resources 2025: water for growth, nature and a resilient future;
- Launch of Scottish Water's Long-term Strategy;
- Release of the Government Environment and Climate Change Committee report, 'Nitrogen: time to reduce, recycle, reuse', which calls for the UK to be more ambitious and strategic in its plans to manage nitrogen;
- New catchment descriptors and methods for the Flood Estimation Handbook, from UKCEH;

- The report of Phase 1 of a UK-wide project on improving estimation of the probable maximum flood;
- A special issue of the Philosophical Transactions of the Royal Society, on *Hydrology in the 21st century: challenges in science, to policy and practice*, arising from the meeting on this topic last year, organised by **Hayley Fowler, Gemma Coxon** and **Christopher White**.

I'm sure there's much more that could be added to this list. At the same time we have obstacles and concerning developments such as:

- Some world leaders sidelining, censoring or cutting science;
- Public attitudes, magnified by the media, such as a short attention span, a lack of nuance, seeking a single scapegoat, intolerance for complexity;
- Budget cuts, which are directly affecting hydrology and hydrometry.

In the words of **Linda Speight's** article from the Royal Society special issue, "As a discipline hydrology must better articulate why it matters to people to allow it to overcome the challenges of complacency and complexity in risk communication".

In the same issue, **Harriet Orr** and co-authors write of how "strong partnerships, open communication and a willingness to embrace uncertainty can accelerate the impact of hydrological research on policy and practice".

There is a clear role in all of this for the BHS. Editors Hayley, Gemma and Chris identify several unifying themes to the contributed papers. Two that seem especially relevant to BHS are Transdisciplinary collaboration and Education and capacity building.

In my 32 years as a BHS member, I've come to value more and more the sense of belonging to a supportive community that helps members develop strong partnerships: between employment sectors, specialisms and generations within hydrology, but also between hydrology and other disciplines. BHS can articulate the value of hydrology to decision-makers. And it plays an important role in developing capacity, encouraging people into hydrology (e.g. through the undergraduate dissertation awards) and providing opportunities for early career members to develop (e.g. in July's excellent Peter Wolf Symposium).

BHS is flourishing in so many ways. I will mention just three more that I'm particularly pleased to see:

- A revival of the regions, with events either recent or planned in the Pennines Hydrology Group, Midlands Region, Scottish Hydrological Group and joint southwest England and Wales Region.;
- A brand new website, to be launched in the autumn – huge thanks to **Liv Burns** for her energy in leading this;
- Strengthening collaborations, often transdisciplinary, with CIWEM, RMetS, IAHS, British Society for Geomorphology, Royal Geographical Society, Geological Society, UK Committee for International Hydrology.

Thank you to the many volunteers from our membership who contribute to BHS's continued success, particularly three trustees stepping down this year: **Gemma Coxon**, whose dynamism has been behind so many of our recent events, **Will Rust** who co-ordinated our webinars (recently attracting an audience of 400+) and **Katy Peat** who chaired the Education, Careers & Membership sub-committee for a year.

I am deeply grateful for the opportunity to have served as BHS president and I look forward to supporting Joe and the rest of the trustees over the year to come.

Catchment Science: Interactions of Hydrology, Biology and Geochemistry, Gordon Research Conference

Zeqiang Wang, University of Bristol

The 2025 Gordon Research Conference (GRC) on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry took place in Andover, New Hampshire, USA, bringing together a dynamic group of researchers exploring the complex linkages between water, ecosystems, geochemical processes and human influence in watershed environments. The conference fostered deep scientific exchange through invited speakers, evening poster presentations, and informal discussion. One of my favourite aspects of the conference was its remarkable diversity, both in participants' backgrounds and the range of scientific topics covered. Speakers and attendees came from institutions and organizations across the globe, sharing the latest developments in their fields. This diversity exposed me to many areas of research new to me, including advanced methods like isotope tracing and explainable machine learning, as well as interesting topics such as forest hydrology and water quality dynamics. These sessions were valuable for expanding my perspective and inspiring new directions in my own research.



Beyond the scientific program, delegates enjoyed mountain hiking, lake swimming, soccer and other recreational options - not only a welcome mental and physical break from the intense scientific discussions, but also a valuable way to build friendships and expand professional networks in an informal, relaxed setting.

We also had excellent meals each day, including fresh mussels and lobster, which added to the sense of community and comfort throughout the week.

During the conference, I presented my research on Diverging impacts of snow fractions and soil drainage on seasonal and annual water balance across snow-influenced catchments.

My work explores '*Why/How climate seasonality and aridity dominate between-region differences in seasonal and annual water balance*' and '*What/Why/How controls within-region variations of seasonal and annual water balance in Snow-influenced Catchments*'. We found that: a) The spatial sensitivity of streamflow seasonality and anomaly to changes in snow fraction is very different in different climate contexts; and b) Poorly drained soil has dual effects on mean annual water yield, increasing dry season evaporation, but also increasing wet season runoff.

We explain these diverging impacts on streamflow by showing how the effect of soil drainage non-linearity and snow fractions vary regionally, depending on the prevailing water and energy balance regimes. The feedback was constructive and inspiring, helping to expand the broader relevance of my findings.

Overall, participating in the GRC Catchment Science conference was an intellectually stimulating and personally rewarding experience. The event was exceptionally well-organized. I thoroughly enjoyed the high-quality presentations, the opportunity to share my research, the insightful conversations, the fun outdoor activities, and the excellent meals. It was truly a standout experience of my academic and professional year, and I strongly encourage others to participate in this biennial conference. Last but not least, I sincerely appreciate the travel funding support from the British Hydrological Society, which made my participation possible.

A review of ReFH2 time to peak vs. LAG

James Molloy and Katie Russell, JBA Consulting

Lag analysis is a common approach for partially calibrating the ReFH2 rainfall-runoff model in design flood applications. Model parameters informed from catchment descriptors alone carry significant uncertainty; it is preferable to use local hydrometric data to reduce these uncertainties. Lag analysis provides a simplified method to achieve this, calibrating the Time to Peak Tp(0) unit hydrograph parameter using timing information from event rainfall and river level/flow data.

Current industry guidance for Lag adjustment assumes the FEH Rainfall-Runoff Lag method[2] can indirectly improve ReFH2 catchment-descriptor Tp(0) estimates. However this approach assumes the error from the 1999 FEH Tp(0) model is directly applicable to the ReFH2 catchment descriptor Tp(0) estimate. Research by JBA Labs[1] assesses this cross-model assumption and builds an updated regression model to bypass it, instead directly relating catchment Lag time to the ReFH2 Tp(0) parameter.

Aanalysis was limited to 57 English and Welsh catchments where both Lag time and Tp(0) data are available. This dataset does not represent some catchment types well including small, groundwater-dominated, urbanised, or very flat/very steep catchments. Regression analysis gave an alternative ReFH2 Tp(0) estimate incorporating Lag, DPLBAR and DPSBAR catchment descriptors. This model is based on a limited dataset so requires caution/sensitivity analysis before practical use, especially to any catchment types outside the range of the calibration. The best-fitting ReFH2 TP model from this study was:

$$Rural\ ReFH2\ TP = (LAG^{0.893})(DPLBAR^{0.210})(DPSBAR^{-0.187})$$

Figure 1 shows ratio comparisons of Tp(0) estimates from the 57 catchments using various estimation/adjustment methods (a wider boxplot indicates higher overall uncertainty). A surprising result from this analysis shows the current cross-model Lag transfer method for Tp(0) does not significantly outperform the ReFH2 catchment descriptor estimate on a national scale. The above regression model gives a noticeable improvement in the model performance versus the catchment descriptor Tp(0) model (blue boxplot in Figure 1). However the limited dataset is too small to undertake a full calibration / independent validation exercise to be fully confident in this conclusion.

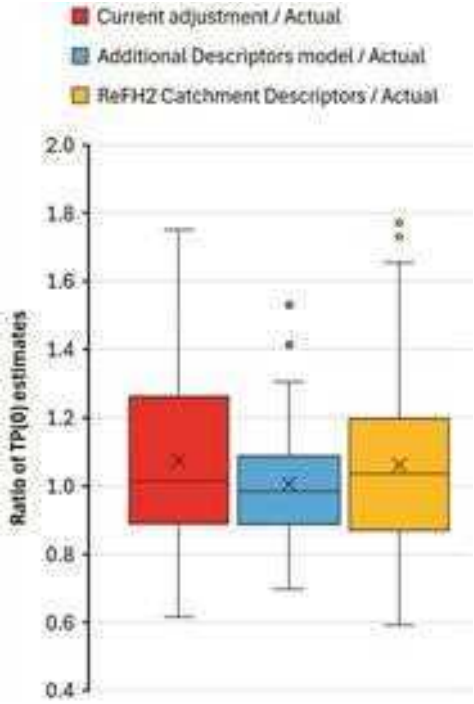


Figure 1. Ratio errors for the four Tp(0) estimation methods analysed

It is recommended for future studies to build a larger dataset of catchments with suitable Lag and calibrated ReFH2 Tp(0) parameters. A recent paired rainfall-flow event dataset from UKCEH[3] could form a useful starting point for this expanded analysis. Researchers and industry should also review current guidance for Lag data extraction from real-world datasets, as these can vary in real-world studies, even between experienced hydrologists, adding uncertainty to the overall process.

This study used open-source data; interested users are encouraged to explore these data or add to the dataset using other sources, building on this initial analysis. Even with the limited dataset used here, improving the Lag versus ReFH2 Tp(0) model seems achievable. A full R&D report is available on the Environment Agency Hydrology Practitioner SharePoint site or from the author via email on request.

References

1. Molloy and Russell (2025), ReFH2 Time to Peak regression versus catchment lag – R&D study supported by JBA Labs

2. Flood Estimation Handbook (1999), Volume 4 - Restatement and application of the Flood Studies Report rainfall-runoff method, Centre for Ecology and Hydrology.

3. The UKCEH Flood Event Data Suite, Gianni Vesuviano, Matthew Fry, Oliver Swain, Hollie Cooper, Felipe Fileni, Amulya Chevuturi, and Doran Khamis, Paper presented at EGU 2025, Vienna, https://doi.org/10.5194/egusphere-egu25-7031

Wallingford HydroSolutions, ReFH Technical Guide, available at: https://refhdocs.hydrosolutions.co.uk/The-ReFH2-Model/Introduction/

New members

Abdelmula Abdalla
Alex Waterer
Belay Molla Sisay
Bertr Swart
Cara Fogarty
Diego Panici
Finley Taylor-Richardson
Henry Rong
Jamine Thompson
Masie Griffiths
Mateusz Pandzierski
Matt Langdon
Queen Suraajini Rajendran
Zara Rolland

Updates to the FEH statistical method

Adam Griffin & Gianni Vesuviano, UKCEH

What's new?

This year, UKCEH and the Flood Estimation team have released the first large update to the FEH statistical method for flood frequency estimation since 2008. Firstly, four new catchment descriptors have been added to those available through the NRFA Peak Flows dataset and the FEH Web Service:

- $SAAR_{9120}$ based on Met Office's HadUK grids
- $FARL_{2015}$ based on UKCEH's Land Cover Map 2015
- $URBEXT_{2015}$, based on LCM2015, and
- $BFIHOST_{19SCALED}$, a minor update on $BFIHOST_{19}$.

Using these new catchment descriptors and nearly twice the amount of annual maxima data available, all the main steps of ungauged flood frequency estimation have been updated:

- The QMED catchment descriptor equation, using updated catchment descriptors
- The donor transfer method, which corrects for spatial patterns in the model error of QMED
- The pooling approach, which uses hydrologically similar catchments to estimate rarer return levels
- Urban adjustments which take "as-rural" estimates and account for differences due to the impact of urbanisation on flow response.

Why update?

Although the old FEH methods have been the industry-standard, the large amount of new data available, due to increased openness of data and longer periods of record, allows a review of the methods to improve our estimates.

Additionally, for forward-looking projects at ungauged sites, we feel catchment descriptors that describe a more current state of a catchment can be more useful in a changing world.

Most of the improvements in terms of hard metrics are marginal, due to the already very high ceiling (R2 > 0.96). The main benefits are in improved data going into the methods and being more appropriate for usage in 2025 and beyond.

The old methods will still be available in WINFAP, and the old descriptors available on the WebService and in the Peak Flows datasets. Both will be in V14 of the Peak Flows dataset.

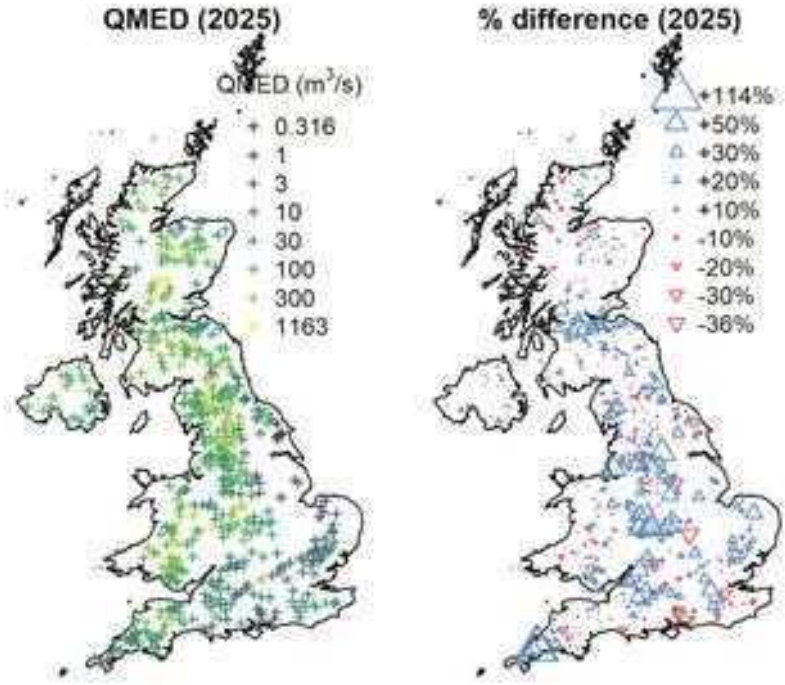


Figure 1: Changes in QMED between 2008 and 2025 methods

What's changed?

The **new QMED equation** uses the new catchment descriptors, and updated coefficients. The new donor method now recommends using eight donors, not six or one, for best results when using the QMED equation.

The new pooling method now includes $BFIHOST_{19SCALED}$ in the similarity metric, and is recommended to use 800 station-years, rather than 500 (this should still give a similar size of pooling group to those generated in 2008). With the new addition, stations should no longer be rejected from groups due to unusual BFIHOST.

$$QMED = 6.8247\, AREA^{0.8499}\; 0.178^{\left(\frac{1000}{SAAR_{9120}}\right)} \times FARL_{2015}{}^{3.045}\; 0.0321^{(BFIHOST_{19SCALED})^2}$$

Urban adjustments for QMED and growth curves have been updated with $URBEXT_{2015}$; adjustment is no longer needed for L-skewness, but should be applied to all catchments to avoid differences in performance across site types.

All the methods above work on all catchment sizes, so a separate Small Catchments method is no longer required for this application.

$$LCV_{urban} = 0.5269^{URBEXT_{2015}}\, LCV_{pooled}$$
$$LSKEW_{urban} = LSKEW_{pooled}$$

How should I use them?

- Always start with local data - if a value looks odd, see if local knowledge gives a better value. Check nearby catchments, check historical records, take new measurements;
- Use estimates based on gauged data if you have enough good quality data;

- Don't mix and match data and methods – use new catchment descriptors for the new methods only;
- Always use donor adjustment for the QMED equations, and apply urban adjustments to pooled estimates;
- These national-scale models assume nothing about local data quality and are the best on average under this assumption. Always verify your data, check your donors and your pooling groups;
- Always follow local/national guidance and regulations for flood frequency requirements.

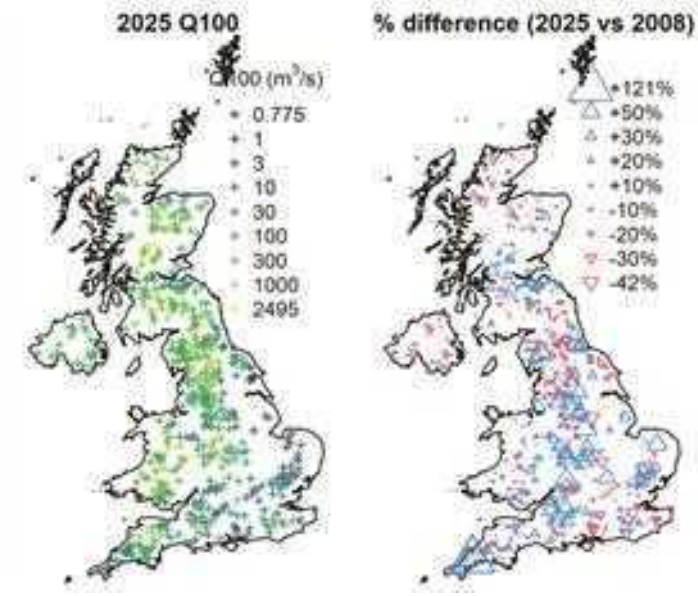


Figure 2: Changes in 100-year return levels, between 2008 and 2025 methods

The FEH team thanks all those who helped get this over the finish line: NRFA, Wallingford Hydrosolutions, EA, NRW, SEPA and DfI, and BHS for hosting the final webinars, available on the BHS YouTube channel. Full reports on FEH webpage: https://www.ceh.ac.uk/services/feh-2025-statistical-updates

BHS Pennines, evening of international hydrology

Ellen Broad, Mott MacDonald

In June 2025, the BHS Pennines Group hosted an Evening of International Hydrology at the University of Leeds, comprising of two interesting talks and some further networking and discussions over pizza.

The first talk was from **Mike Law**, who started his career in the UK with the NRA/EA and Weetwood but emigrated to New Zealand in 2009 and now works for Beca. He was back in the country over the summer and in touch with BHS Pennines, so we jumped at the chance to ask him to present some of his experiences.

Mike described some of the differences in hydrology between the UK and New Zealand, which was of particular interest to me having lived out there for 9 months back in 2018. Key takeaways were that there were no countrywide standard methods, and their extreme storm events are much larger than ours! This enabled me to reminisce as the maximum 48-hour rainfall total Mike quoted (1,086mm) occurred whilst I was living out there and washed away a bridge on the main highway that we had driven across less than 24 hours before!



It was also interesting to hear how natural events such as the Christchurch and Kaikoura earthquakes affect both working life and the work undertaken, including bridges being destroyed and rivers diverted when land rises six metres in a matter of minutes and changes the course of the river.

Mike went on to describe work he has undertaken in Pacific islands such as Fiji and Vanuatu, where data is much more limited, and there is reliance on local knowledge to describe key issues and collaborate on finding pragmatic solutions.

Our second talk was from **Rhiannon Bryan**, describing her experiences and challenges regarding hydrology in Africa and remote island nations. Key messages from her talk were also that data is a real struggle in some of these places and available data is heavily dependent on funding. Many river basins in Africa cross multiple countries and the example Rhiannon gave had a full data network for half of the catchment, but no data at all in the other half as it was a different nation that would not share information.

At the other end of the scale, small island nations may have no 'rivers' per se but can have significant changes in hydroclimate in a very small area. This presents completely different hydrological challenges, especially around water storage and distribution.

My main learning point from the meeting was that the UK is a very data-rich country which isn't always appreciated or realised. The event also prompted interesting discussions, particularly around whether BHS could aid with data collection and management overseas, which I'm sure will be continued at the day-long event about International Hydrology planned in December. It also provided time for invaluable catchups with old colleagues and a chance to make some new connections.

Thanks again to Mike and Rhiannon, and to the University of Leeds for hosting us.

Hydrological hindcasts help to prepare for worst-case drought scenarios

Wilson Chan with Lucy Barker, Steve Turner and Jamie Hannaford, UKCEH

This material was first published on the UKCEH blog, on 30th July 2025. Reproduced here with permission.

Following the driest spring in England for 132 years, the Met Office forecasts for the coming months are uncertain. Hydrological 'hindcasts' exploring how weather conditions could have developed in past years mean scientists can be wiser before future events.

This year's exceptionally dry spring, with rainfall deficits stretching over the past 12 months for some regions, meant river flows at the start of July were widely below normal, notably so across parts of central and eastern Britain. Many regions have officially declared a drought; others remain on alert as the situation continues to evolve. Several water companies have introduced temporary use bans (affecting a total of eight million people), reflecting growing concern over water availability and the need to conserve resources.

Prolonged drought conditions

Forecasts for the rest of summer and autumn remain uncertain; the Met Office three-month forecast suggests a roughly equal chance of either wet or dry conditions, with the Hydrological Outlook based on these forecasts showing higher likelihood of continued low river flows across eastern Britain. What began as a 'flash drought' in northern and western areas has evolved.

Long-term planning several months or seasons ahead is vital for sectors like farming and water resources. Given uncertain forecasts, a common approach is to ask what if a past dry year, like 1976 or 2022, was repeated again?

Answering this question relies on observations, and although the UK has relatively long records of river flows (with most starting in the 1960s and 70s), they are still limited when we want to consider rare outcomes as the full range of extremes is not well sampled.

The UNSEEN method

To anticipate more extreme but plausible outcomes, researchers are using 'hindcasts' – thousands of simulated weather conditions (an 'ensemble') that computer-based forecasting models consider may have happened at any given time in the past. Using hindcasts, climate extremes are much better sampled than in the observed record, which helps shed light on possible unprecedented outcomes.

UKCEH scientists have applied this method – known as UNSEEN (Unprecedented simulated extremes using ensembles) – to explore how much worse the summer 2022 drought and the winter 2024 river flooding could have been. This helps us improve risk awareness of plausible worst cases for extreme events like floods and droughts.

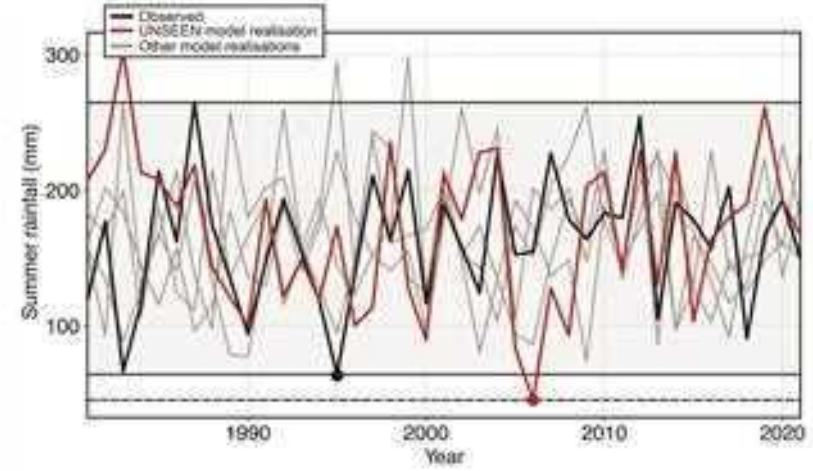


Figure 1: Unprecedented low summer rainfall in a hindcast (red)

Figure 2 shows observed summer rainfall since the 1980s averaged over East England (in black) and several simulated summer rainfall scenarios from the hindcast ensemble (in grey). The hindcast highlighted in red shows a summer with even less rainfall than the driest observed summer in the hindcast period (1995), while others contain months wetter than the wettest observed summer over this time period.

Preparing for the worst

Prolonged low rainfall in the UK is related to the position of the jet stream. If it is directed north of the UK, it deflects rain-bearing systems from the Atlantic away from the UK and encourages high pressure conditions that bring dry, settled weather. With over 3,000 plausible July-September simulated sequences in the hindcast archive, we can assess how river flows might change in response to different jet stream behaviour and associated rainfall patterns, including rare but plausible extremes.

River flow simulations starting from current conditions initialised with observed data until the end of June 2025, followed by the thousands of possible July-September sequences from the hindcast archive, show a wide range of possible river flow outcomes by September. This large set of possibilities are grouped into four ‘what-if’ storylines.

These storylines are a combination of whether July is ‘wet’ or ‘dry’, combined with whether the jet stream shifts to the north or south of the UK.

Looking across the thousands of possible July-September scenarios, even with above average rainfall over the next three months, river flows across central and southeast England are likely to remain in the Low category, echoing analysis in the latest Hydrological Outlook (Figure 3). Significantly above-average rainfall is required, over many months, to return to normal conditions.

In northeast England and east Scotland, river flows are also likely to remain low if these regions receive three-quarters or less of average July-September rainfall. A short-term recovery seems unlikely without sustained, exceptional rainfall. In contrast, rainfall over recent months across western Britain has buffered river flows, so they are less likely to fall into the Low category, unless rainfall over the next three months is significantly below average (ie 50% of average or less).

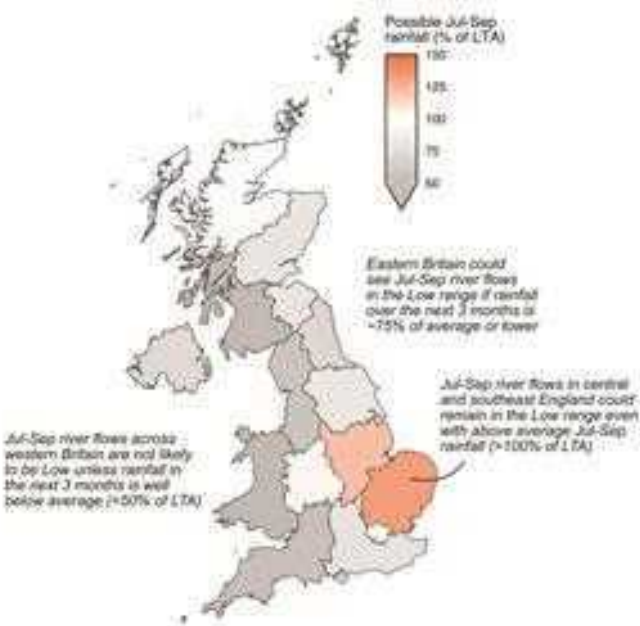


Figure 2: Possible July-September 2025 rainfall (as % of long term average) leading to Low category river flows

Forecasts of weather patterns of the summer and autumn months may give us a sign of which 'storyline' we might end up following. The UNSEEN method offers a novel opportunity to explore 'what -if' storylines by making use of the large sample of physically plausible weather sequences simulated by dynamical weather models. This helps fill the gaps of our limited observations to help plan ahead and anticipate plausible worst cases, and to explore the relative roles of different atmospheric circulation mechanisms on river flows.

(*To read the full article, please go to https://tinyurl.com/2e3abu8p)*

Peter Ede retires

Tom Beskeen, Mott MacDonald



After more than forty years with Mott MacDonald, Peter Ede, former treasurer and president of BHS has retired. Peter's career started in 1985 with a posting to Chad in central Africa. Despite an unplanned diversion via the Central African Republic he eventually made it, to work on a project looking at the water resources of Lake Chad. Over these early years he worked in various countries with a notable three year spell in Somalia as the resident hydrologist. This posting finished abruptly with his and other expatriates' evacuation days before the government collapsed in 1990.

This didn't deter Peter, and the international work continued with projects in over thirty countries including Pakistan, Yemen, Tanzania, Bangladesh, Egypt and Indonesia, covering both water resources and flood hydrology. The latter half of his career involved more focus on UK work, with projects for the Environment Agency, numerous hydropower projects in Scotland and support to water companies with water resource management plans.

Peter's contribution to the hydrological profession was recognised in 2017 with his appointment as president of BHS. For everyone, but particularly graduates joining the company, he offered support and encouragement, a keen eye for detail and a willingness to share his wisdom.

On behalf of everyone in Mott MacDonald and BHS, we thank Peter for his huge contribution and the invaluable support he has provided, and we wish him all the best for his retirement.

Letter to the Editor

From Rod Wilkinson, Acting Chair of CPI113 Hydrometry

Calling all hydrologists - set the Standard!

The British Standards Institute (BSI) is the UK's National Standards Body (NSB) responsible for developing and maintaining technical Standards in many sectors of industry such as manufacturing and construction. It mirrors the activity of NSBs in Europe through CEN, and Worldwide through ISO. The Standards are developed, reviewed and revised by Technical Committees each with its specific remit. CPI113 is one such committee, dealing with Hydrometry, the monitoring and measurement of key elements of the hydrological cycle, plus tidal levels in estuaries and coastal margins.

We are looking to the UK Hydrological community for the next generation of Standards makers to serve on this Committee. Most of the activity of CPI113 is in reviewing and revising existing documents, but on occasions there is a need to develop a new work item which may have a British, European or International focus. Hence this is an excellent opportunity to influence the future of your profession by recording for posterity your experience of practical hydrology and hydrometry through Standards. With the recent advances in Artificial Intelligence (AI) and its sub-division of Machine Learning (ML), this is an increasingly vital activity so that we ensure that ground truth (ie data from actual observed events) is still adequately observed and recorded and is used appropriately.

CPI113 meets on-line two to three times a year, but any additional time spent on developmental work is very much up to the individual. From experience this averages around 1 or 2 hours a month. Any liaison with other members of the Committee, as well as those in European and International groups is done via telephone, email, webinars and, occasionally, face to face meetings. Hence, the development and revision of standards, technical specifications and technical reports is a very collaborative

experience, particularly on European and International workstreams. The opportunity for focused networking and knowledge sharing is therefore extensive.

We are looking for volunteers to join the Committee. Anyone with a range of experience from different parts of the profession, including Government and NGOs, the Water Industry, Trade Associations, consultancies and Academia will be welcomed. Retired individuals that have been associated with such groups in the past are very welcome to become involved and share their valuable experience-based knowledge.

If you are interested in joining us or just want to discuss this further, please contact me by email at rodwilkinson2@gmail.com.

Rod Wilkinson CEnv, FCWEM

Acting Chair CPI113 Hydrometry

Attention all BHS members…..

Are you aware that you can reclaim tax paid on your BHS subscription?

BHS is on a list of organisations approved by HMRC, for which tax relief can be claimed on professional membership fees. You will need to answer 'yes' to:

- Being a BHS member is relevant to your job
- Your employer does not pay the subscription for you (or reimburse you)
- You have paid tax in the year you're claiming for

More information at https://www.gov.uk/tax-relief-for-employees/professional-fees-and-subscriptions

Spotlight on BHS Education & Careers sub-committee

Emma Cross

Back in April, we were delighted to host our **Working in Water webinar,** designed especially for undergraduates exploring pathways into hydrology. We were thrilled to welcome an inspiring panel of speakers - Dr Chris White, Samantha Mitchell, Rhiannon Bryon, and Ed Dimmock - who gave us a behind-the-scenes look at their careers across academia, industry, and government. Their stories brought hydrology to life and sparked great interest, with many people registering to attend and a positive turnout on the day. Huge thanks to Alex Scott from our committee for making it all happen! Missed it? Catch the full session on the British Hydrological Society YouTube channel: Career Insights: Working in Water – 03/04/25 Webinar.

The webinar was a good opportunity to promote the free membership BHS offers to students, alongside launching the **2025 BHS and JBA Trust Studentship Awards**. This scheme offers financial support for talented MSc and MRes students who wish to further their academic experience and qualifications in hydrology and catchment management. Applications closed on 7th July and we look forward to finding out more on this.



Meanwhile, Dr Chris White in our committee has been championing our **BHS Student Dissertation Award**, encouraging universities to submit dissertations from final-year students studying relevant pathway subjects. This award recognises the best undergraduate dissertation(s) in hydrology, aiming to raise the profile of hydrological education and inspire more undergraduates to study and research hydrology. (More details on our website: Student Award, although the 2025 deadline has passed).

In April, we shared a fresh wave of ideas to the Main Committee, all designed to expand the voluntary work of the Education and Careers sub-committee in support of our society's mission. One exciting development is the planning of a **Professional Development Month** in early 2026. We're also making connections with other societies and institutions to learn how they champion careers and education, with the goal of bringing new perspectives into our plans and activities and promoting more joined-up working where it's possible and provides benefits for all. It is hoped that insights from the **Peter Wolf Symposium,** held at the end of July 2025 will help play a key role in shaping our next career-focused webinar thanks to Dr Amy Green's work as the early careers representative on our committee. Stay tuned for more updates!

Want to get involved in the work of our society? One of the things you might want to consider is volunteering to join our Education and Careers or another of our sub-committees - Events, Communications, and Finance which drive our society's activities. With our Annual General Meeting on the 16th September, could getting involved in one of our sub-committees in the autumn be something that you could offer? Please get in contact with Joe Pearce (Education and Careers sub-committee chair and President Elect) at bhs_education@outlook.com in the first instance.

Peter Wolf early career hydrologists' symposium 2025, Liverpool University

Amy Green, early career representative, BHS committee, Newcastle University

This year's Peter Wolf Early Career Hydrologists Symposium was successfully hosted by the University of Liverpool on the 28th and 29th of July. An excellent turnout saw 53 registered attendees over the two days, from diverse backgrounds including academia, charity, consultancy and water companies. The event began with an opening address from **Prof. John Bridgeman** (Head of Civil Engineering, Liverpool University) on "the art of directing the great sources of power in nature for the use and convenience of man" (Thomas Tredgold, 1828) and **Duncan Faulkner** (BHS President) on the Cunliffe Review, historically dismissive attitudes to qualitative and social concerns in hydrology, and challenges in the relationship between the public and water companies.

The event had a strong focus on the role of hydrology in community engagement, with a compelling keynote by **Dr. Ben Howard** (Imperial College London) on co-producing research and flood risk action in Tamale, Ghana. Two interactive workshops drew high praise: one from the Floods and Droughts Research Infrastructure (FDRI) project on connecting communities to catchments, and another from CONVERSE, exploring community



visions for resilient riverscapes and effective collaboration. Led by **Luke Tumelty** (Imperial College London) and **Annie Ockelford** (University of Liverpool), both sessions fostered dynamic discussion and innovative ideas among participants.

The symposium featured high-quality presentations, and we extend our warm congratulations to this year's prize winners. Talks ranged from full-length talks to quick-fire sessions, alongside an engaging poster reception.

The event concluded with a conference dinner, providing further opportunity for networking and reflection. BHS provided free registration for attendees this year to ensure accessibility for all—a key value of the Peter Wolf Symposium. The welcoming atmosphere of Liverpool further enriched the experience for participants. Special thanks to the organising committee (**Gemma Coxon, Amy Green** and **Liv Burns** from BHS; Liverpool University) for their hard work, and especially to **Annie Ockelford**, whose dedication and leadership were key in making the symposium a success.

Congratulations to this year's prize winners:

Best poster - Shaini Naha (James Hutton Institute), *Developing a national scale drought modelling and forecasting framework for Scotland*.

Best quick-fire talk - Jake Thakur (Mott MacDonald), *Integrating hydrological and water quality models to improve the assessment of resource availability for water supply abstraction in the Anglian region*

Best full-length talk—joint winners **Sharon Mandipe** and **Chris Peso** (both UKCEH & Reading University), *Measuring river flows from the sky: does angle and positioning matter?* and *Unveiling the Sources, Fate and Transformation of Nutrients in Rivers: Novel Approaches for Monitoring River Confluences*, respectively.

Hydro-JULES summer 2025 newsletter

For the past few months, the Hydro-JULES project has been hugely busy, with updates on the Hydro-MIP initiative, ticket opening for the "Land and Water in a Changing Climate" event, Big Bang Science Fair attendance, progress in land surface data assimilation and hosting external researchers through the researcher exchange programme to name a few! You can find out all about the work that Hydro-JULES does throughout the year, by subscribing to our newsletter— find the full newsletter here: https://mailchi.mp/0b9d6efbc765/hydrojules-summer-2025-newsletter-17235203

To subscribe, go to https://hydro-jules.org/sign-up

Floods & Droughts Research Infrastructure (FDRI) Newsletter

It's been a packed spring and summer for FDRI implementation, with highlights including successfully installing our first piece of equipment in the upper Severn catchment, running interactive workshops to identify user needs for accessing FDRI data, showcasing FDRI technology and techniques at the European Geosciences Union (EGU) annual general assembly, and publishing a joint report from the UKCEH, University of Bristol and Environment Agency's interdisciplinary drought research priorities workshop.

You can read all the details of these in the full newsletter. Go to https://mailchi.mp/ceh.ac.uk/fdri-17234022?e=f1d530cff5

…and stay up to date by **subscribing at https://mailchi.mp/ceh.ac.uk/fdri-sign-up**

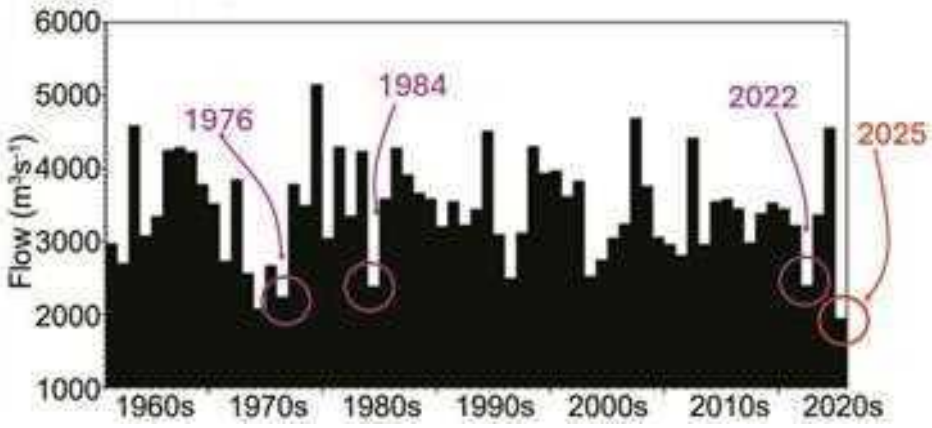
UK Hydrological Bulletin, May—July 2025

Compiled from UKCEH summaries

May was sunny, warm and largely dry. The mean temperature was 1.3°C above the long-term average (the fifth warmest in a record from 1884) and, despite downpours in the last week, May rainfall was 72% of the long-term average for the UK. This was an exceptional spring, with sustained warmth and rainfall deficits that have led to extremely dry soils. Extensive wildfires were reported (e.g. across western areas on the 5th-9th) and there were wider impacts on agriculture and terrestrial ecosystems. Average spring river flows were the lowest on record for many rivers across northern and western Britain, with localised environmental impacts (e.g. fish rescues and algal blooms) as well as reported impacts on navigation. Outflows for Great Britain across March-July were the lowest on record (in a series from 1961) (Figure 1).

May groundwater levels were in the normal or below normal range across southern and eastern areas but exceptionally low in some northern and western boreholes.

Figure 1: Great Britain mean outflows, March to July, since 1961



In much of northern Britain, the dry spring adds to longer-term rainfall deficiencies, reflected in the end-of-May reservoir stocks. Combined stocks for England & Wales were the lowest on record in a series from 1990. Drought status was declared in north-west England on the 29th, with many other regions on alert.

Late May rainfall and a wet start to June brought some respite. Nevertheless, summer began with depleted river flows, groundwater levels and reservoir stocks. This heightened the risk of further dry weather impacts, particularly as climbing evaporation rates limit the effectiveness of rainfall through summer.

June began with unsettled conditions across the UK – a sharp contrast to the exceptionally dry spring. The second half was drier, with southerly air masses bringing heatwave conditions across England and Wales. It was the warmest June for England (2.5°C above long-term average) and the second warmest for the UK as a whole (both in series from 1890). Although total UK rainfall was average overall, this masked a stark contrast between above normal rainfall in northern and western Britain and below normal elsewhere. River flows across central and eastern Britain continued to recede and were notably to exceptionally low at month-end. Groundwater levels across most of the UK continued to decline and were mostly normal to below normal.

Reservoir stocks at most impoundments remained below average, with pronounced deficits of over 20% at East Lothian, Washburn, Bradford Supply Zone and Derwent Valley; with some (e.g. East Lothian, Washburn and Ardingly) registering new June minima. Drought status was declared in Yorkshire on the 9th and remained in place for north-west England.

Many regions remained on drought alert. Early July saw some summer downpours, but many areas remained dry, with further heatwave conditions. There was continued, and heightened, risk of drought impacts through summer, on agriculture, the environment and water supplies, especially across eastern Britain.

July was warm, sometimes hot, but often unsettled with localised heavy rain. High temperatures (on the 1st and from 9th-14th) contributed to the fifth warmest July for the UK (in a series from 1890). Rainfall was below average in south Wales and the south-west and above average for north-west regions (e.g. >120% of average for Highland and North West England regions). Deficits remained across all regions across the spring and summer so far (March-July) making this period comparable with notable drought years 1976 and 2022.

River flows so far in the north-west were normal or above normal (the Cumbrian Derwent and Leven recording more than twice their June-July averages), contrasting with notably and exceptionally low flows persisting in central and eastern rivers (the Yorkshire Derwent recording its lowest June-July flows in a series from 1974).

Soil moisture deficits remained high in central and southern England, and groundwater levels in the Chalk of southern England continued to decrease throughout July. Other major aquifers showed gradual decreases in groundwater; many monitoring points now show levels which are below normal to exceptionally low (Figure 2).

The Hydrological Outlook for August-October is that below normal flows are likely to persist in many areas, particularly south Wales and central and southern England. In these areas, and others that have so far missed much of the summer rainfall or where groundwater levels are low, above average rainfall is needed into the autumn months to ease pressures on water resources.



Figure 2: UK groundwater levels, July 2025. ***Ranking based on comparison between most recent level and same date in previous years of record***

The Hydrological Bulletins draw primarily on data and information from the UK Met Office and the CEH/BGS National Hydrological Monitoring Programme—the latter comprising data supplied by the Environment Agency, SEPA, NRW and Northern Ireland Environment Agency, as well as the UK water companies.

Forthcoming events

BHS Annual General Meeting, 16th September 2025 (via Zoom). This year's programme includes: exciting developments from the UK Flood Hydrology Roadmap, and updates from the FUTURE-FLOOD programme and FDRI initiative. Whether you're a practitioner, researcher, or policymaker, this is your chance to get ahead of the curve on projects that will influence UK flood risk guidance for years to come. Details for joining the call will be published online at https://www.hydrology.org.uk/meetings_events.php

Land and Water in a Changing Climate – what's next for Science and Policy? A Hydro-JULES event at The Royal Society, London, **24-25th September 2025**, bringing together the hydrological and land-surface modelling community, industry and policy makers across the UK to discuss how research can influence policy decisions. Keynote speakers: **Prof. Martyn Clark**, University of Calgary; **Dr Segolene Berthou**, Met Office; **Dr Glenn Watts**, UKCEH. Book tickets at https://enterprise.mitingu.com/ceh-events/land-water-changing-climate#registration (closes 9th Sept).

The Royal Meteorological Society and BHS will co-host **From Forecast to Action: Advancing Flash Flood Resilience on 8th October 2025** at The Geological Society, London. Three sessions: forecasting, warnings and decision-making; climate change and changing risks; policy, governance and interventions. https://www.rmets.org/event/forecast-action-advancing-flash-flood-resilience

Forecasting Summer Thunderstorms, Mason Gold Medal lecture by Brian Golding. **8th October 2025**, 6pm at University of Leeds (https://www.rmets.org/event/mason-gold-medal-lecture-forecasting-summer-thunderstorms)

XIIth Scientific Assembly of the International Association of Hydrological Sciences (IAHS 2025) will be in Roorkee, India, **5-10th October 2025**. An opportunity to communicate, exchange and project on all major topics in the hydrological sciences within the framework of sessions organized by all IAHS Commissions and Working Groups as well as the new HELPING Science for Solutions Decade. *BHS Exeter fund can support your attendance.*

A Fresh Water Future conference, organized by CIWEM and held at 30 Euston Square, London on **2nd December 2025**. The conference is aiming to build a more granular picture of how we quickly move from principles and concepts to mainstreamed delivery of a healthier and more resilient water environment that can sustain long-term UK prosperity. Register at https://www.ciwemevents.com/event/afwf/summary?RefId=Wesbite

Watch this space: plans are in progress for a BHS National Symposium, at the University of Leeds in autumn 2026.

Exeter fund

Early career participants who are giving a presentation at the biennial IAHS Scientific Assemblies can apply for a grant to help with travel costs. Full details can be found at: https://www.hydrology.org.uk/assets/ExeterFundBHSNewPolicy090119.pdf



British Hydrological Society