



IAH (Irish Group) CPD Course

# Groundwater, Hydrology & Climate Change



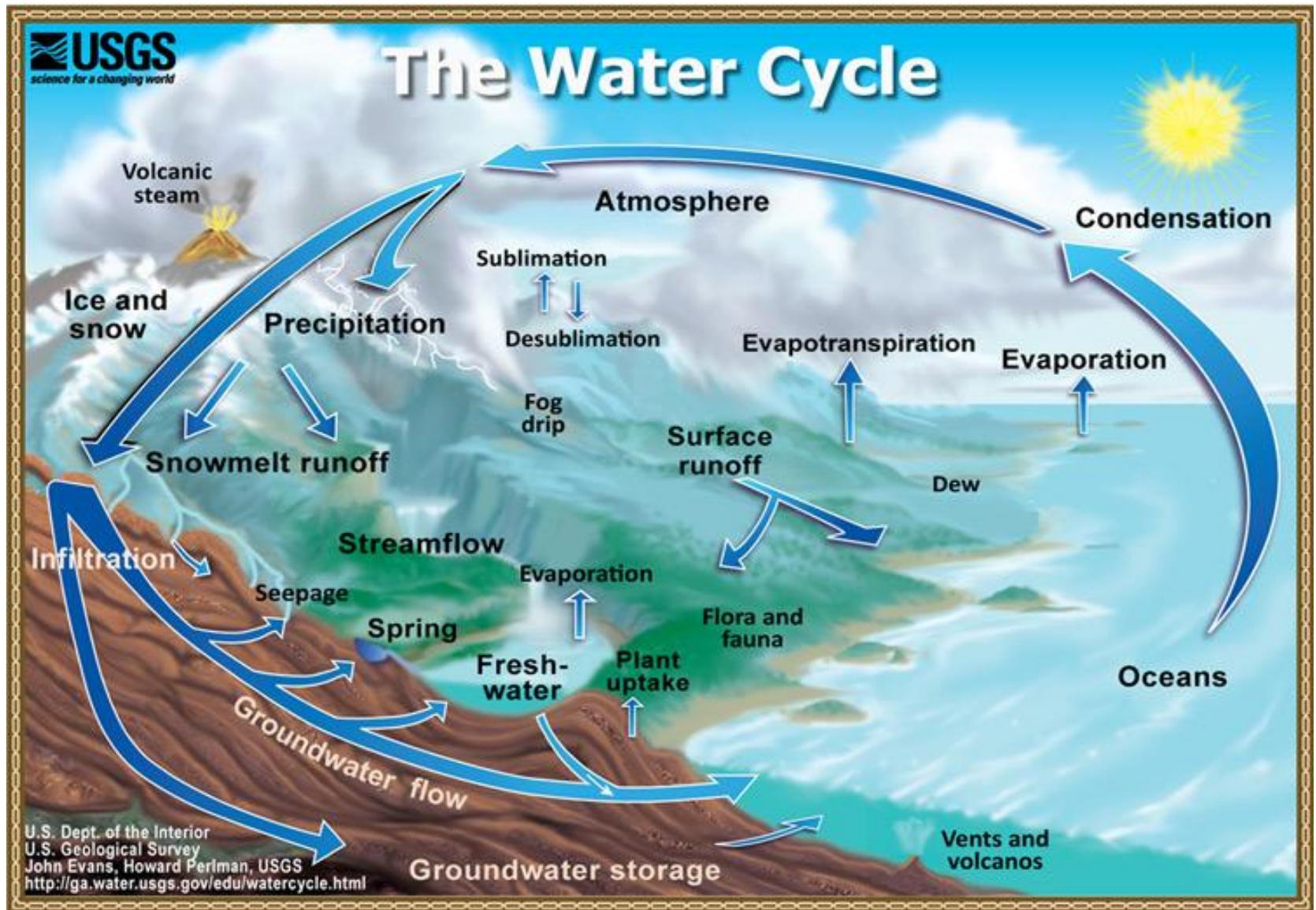
January 14, 2026

Beggars Bush, Haddington Road, Dublin



Geological Survey  
Suirbhéireacht Ghéolaíochta  
Ireland | Éireann

# Water and the hydrological cycle



**In the  
hydrological  
cycle we would  
like to know.....**

Everything (processes)

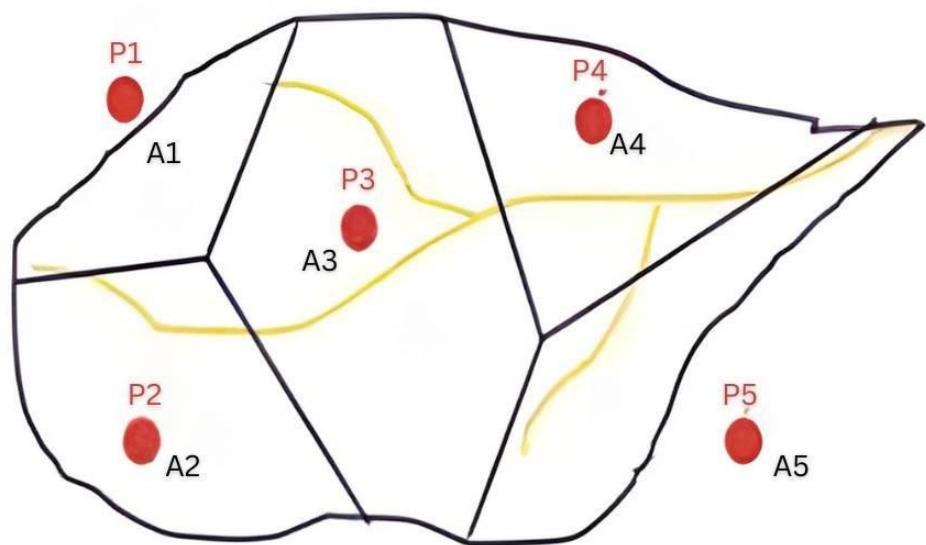
Everywhere (heterogeneity)

All of the time (transient systems)

.....and confidently (accuracy and  
precision)

# In practice, we often have

## Thiessen Polygon Method



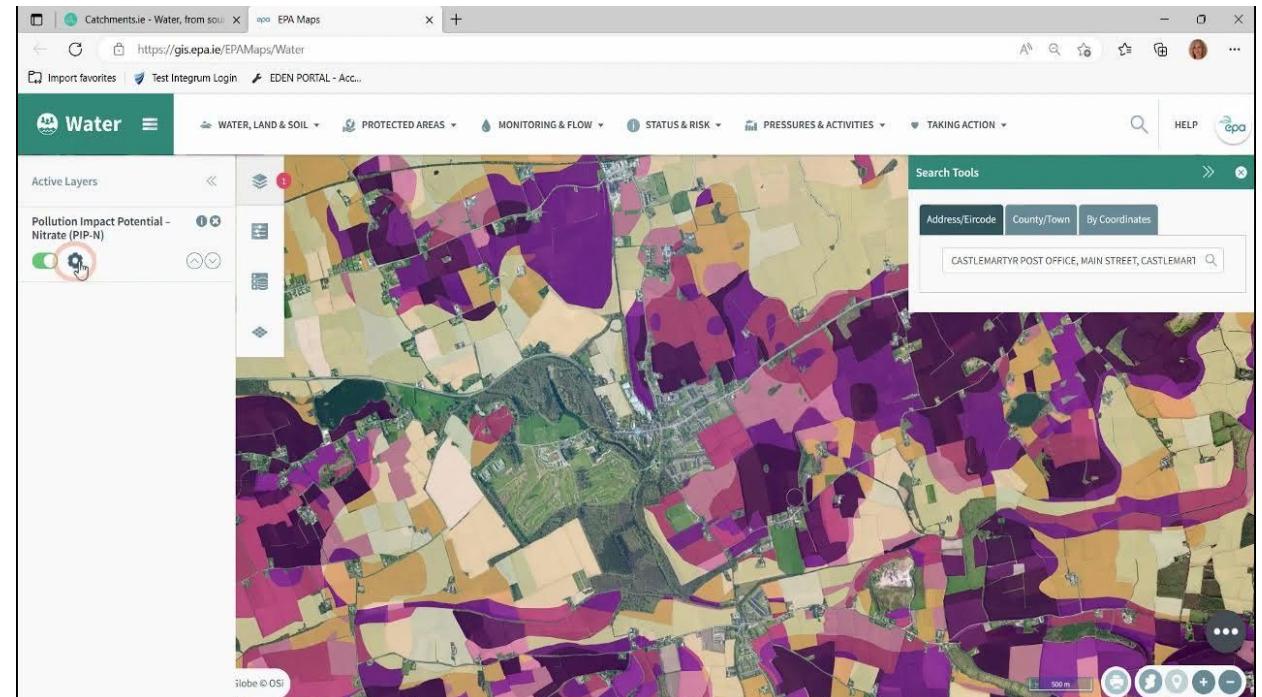
- Incomplete data
- Over limited areas
- With a restricted understanding of driving processes
- ... including how these vary with time.

# Added challenges...

- Across Ireland we have significant heterogeneity, including in.....
- Bedrock geology
- Subsoil geology
- Topography
- Land use

On going data collection and compilation have significantly improved our confidence in characterising hydrogeological processes and identifying/predicting the impacts of changes in natural processes.

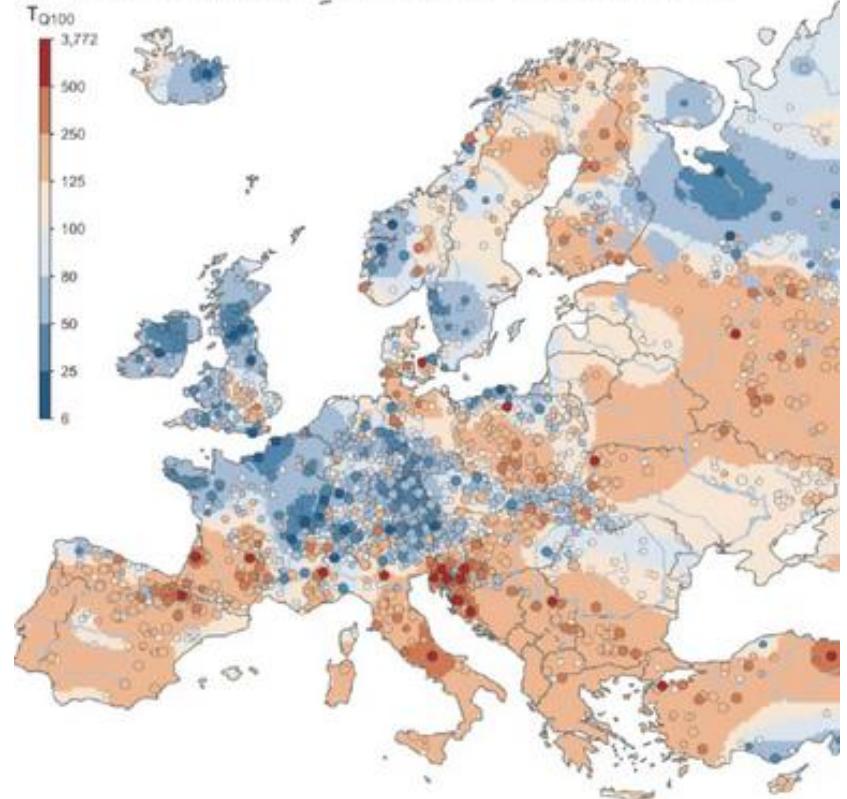
This has allowed us to address emerging issues with greater confidence.



# ...and Hydrology

- Recent years have witnessed
- New approaches to collecting hydrological data.
- New developments in hydrological data processing.
- New approaches to characterising and identifying hydrological processes
- Generation of new hydrological datasets and tools.
- Applies to whole hydrological cycle from source to sea.
- These have built confidence in how we deal with current and emerging issues, including climate change scenarios.

Estimated change in 100-year extreme flood



- Larger points indicate greater certainty in estimate
- Blue indicates increasing flood discharges
- Red indicates decreasing flood discharges
- The background pattern represents regional estimates

# Today's Meeting....

We will look at

- How changes in data acquisition have affected our view and how we deal with hydrological processes.
- How new datasets deal allow us to be more confident in hydrological characterisation.
- How this may be integrated to be better understand how groundwater interacts other hydrological processes.
- How this is anticipated to be impact by Climate Change.



# Schedule

- Presentations
- Presentation-specific Questions
- More general discussion
- Breaks for networking/further discussion.
- PLEASE ASK QUESTIONS!

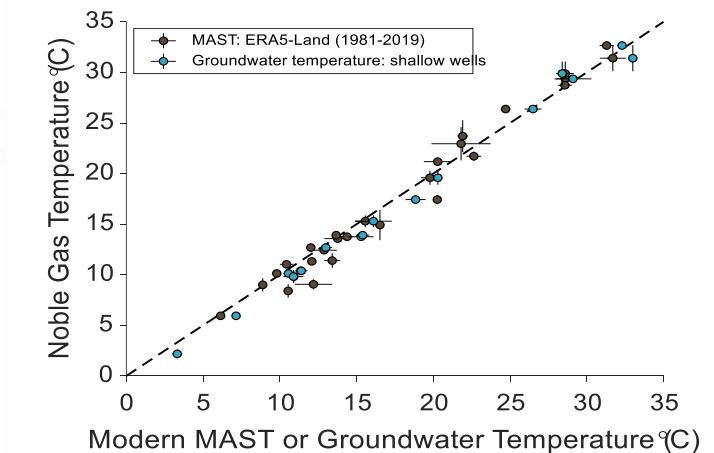
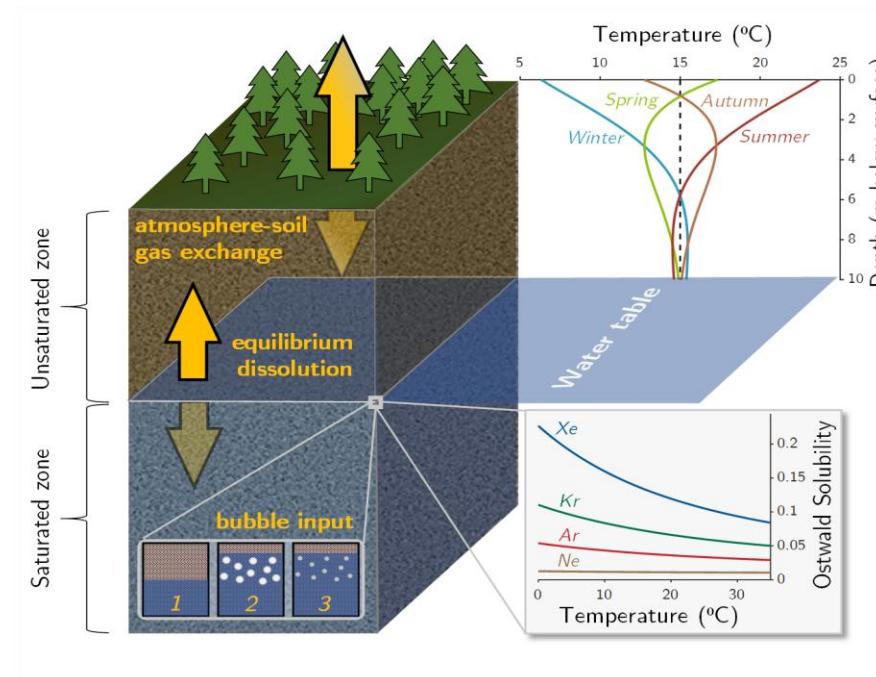
Time	Topic	Speaker	Institute
09:30	Introduction /Welcome	Ray Flynn	IAH/QUB
09:40	'Climate Change and Hydrology: from observations to projections'	Conor Murphy	Maynooth University
10:20	Rainfall extremes and projections	Barry Coonan	Met Eireann
11:00	Questions/Discussion - Tea Break		
11:30	Current Status of the Irish Soil Moisture Observation Network (ISMON) and Future Plans for SM and ET Products	Klara Finkele	Met Eireann
12:10	Groundwater Recharge	Bruce Misstear	TCD (Emeritus)
12:50	Questions/Discussion -Lunch		
13:45	Hydrometry and design flood estimation	Ollie Nicholson	OPW
14:25	Modelling Inland Responses/ Baseflow	Brendan Quigley	RPS-Tetratech
15:05	Questions/Discussion -Tea Break		
15:25	'Process-based and data-driven forecasting of compound coastal-fluvial floods in urban environment	Indiana Olbert	University of Galway
16:05	Integrated Water Resource Management	Matt Craig	EPA
16:45	Questions/Discussion		



## Alan Seltzer, UCD

### *Dissolved Gas Tracers in Groundwater: Climate to Denitrification*

- 📍 Beggars Bush, D04 K7X4
- 📅 Tuesday 3<sup>rd</sup> February
- 🕒 Tea & Coffee: 5:15 pm
- 🕒 Presentation: 5:45 pm



Seltzer et al. (2021)



# 2026 Annual Conference

## Groundwater 2036:



*Building Resilience for the Next Decade*

Tullamore Court Hotel April 14 &15, 2026

[conference@iah-ireland.org](mailto:conference@iah-ireland.org)



Time	Topic	Speaker	Institute
09:00	<i>Arrival Tea &amp; Coffee</i>		
09:30	Introduction /Welcome	Ray Flynn	IAH/QUB
09:40	Climate Change and Hydrology: from observations to projections	Conor Murphy	Maynooth University
10:20	Rainfall extremes and projections	Barry Coonan	Met Eireann
11:00	<i>Questions/Discussion &amp; Tea Break</i>		
11:30	Current Status of the Irish Soil Moisture Observation Network (ISMON) and Future Plans for SM and ET Products	Klara Finkele	Met Eireann
12:10	Groundwater Recharge	Bruce Misstear	TCD (Emeritus)
12:50	<i>Questions/Discussion &amp; Lunch</i>		
13:45	Hydrometry and design flood estimation	Ollie Nicholson	OPW
14:25	Modelling Inland Responses/ Baseflow	Brendan Quigley	RPS-Tetratech
15:05	<i>Questions/Discussion &amp; Tea Break</i>		
15:25	Process-based and data-driven forecasting of compound coastal-fluvial floods in urban environment	Indiana Olbert	University of Galway
16:05	Integrated Water Resource Management	Matt Craig	EPA
16:45	<i>Questions/Discussion &amp; Wrap Up</i>		