

1st Brazil Ireland Research Event

A Year in UNIVERSITY COLLEGE CORK – A Brazilian Student's Experience of Science and Culture

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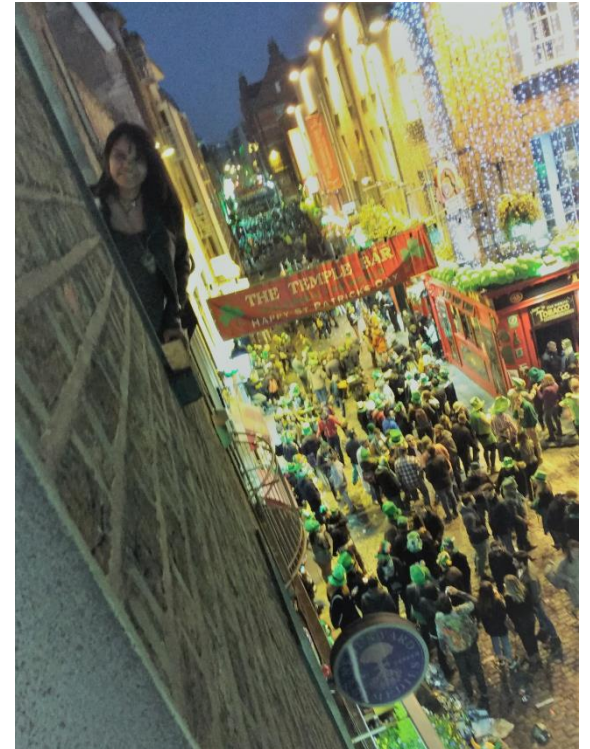
What's the craic?

- ▶ A life changing experience;
- ▶ What's the craic?



Brazil vs. Ireland

- ▶ Ireland and Brazil share a number of similarities;
- ▶ Get the chance to see the best from both worlds.



My experience in University College Cork

- ▶ Opportunity to see different approaches in Geology:
 - Theoretical vs. Practical



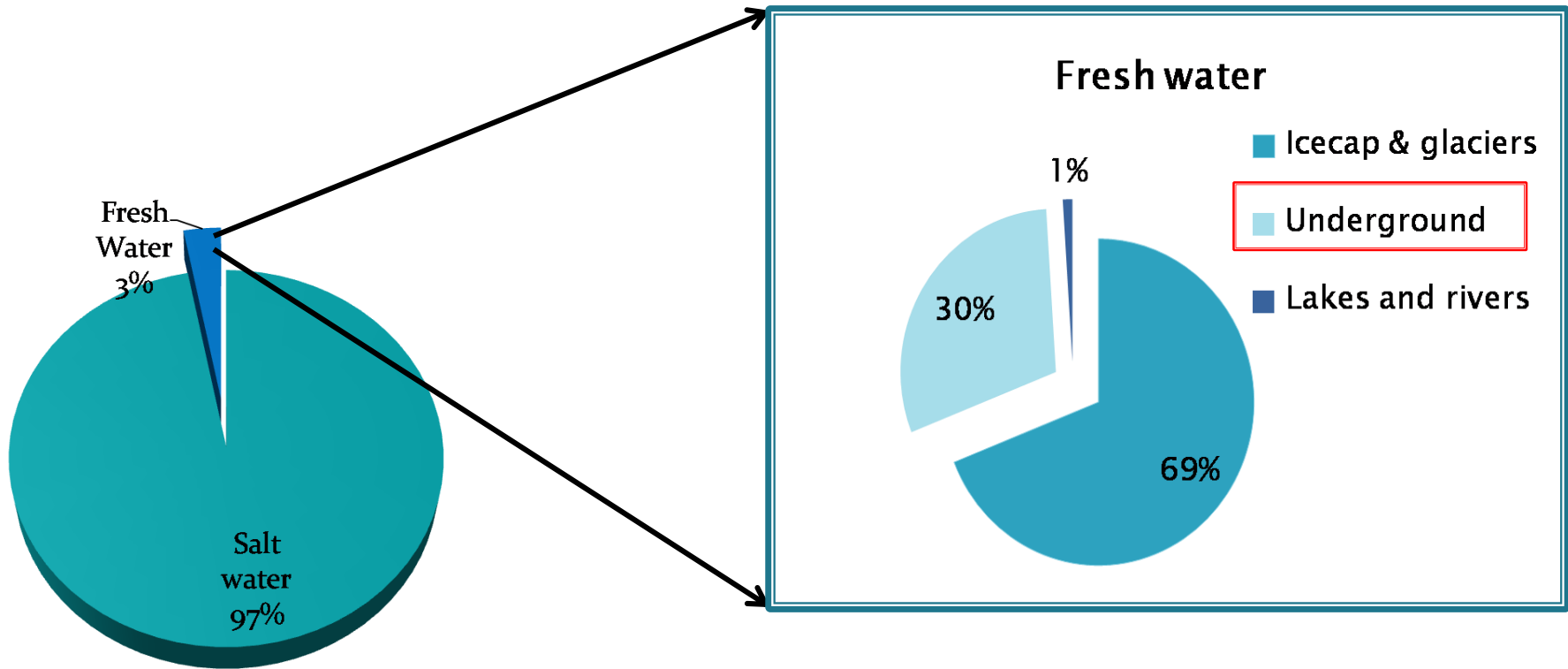
My experience in University College Cork

- ▶ Interaction with lecturers and classmates:
 - Exchanging skills



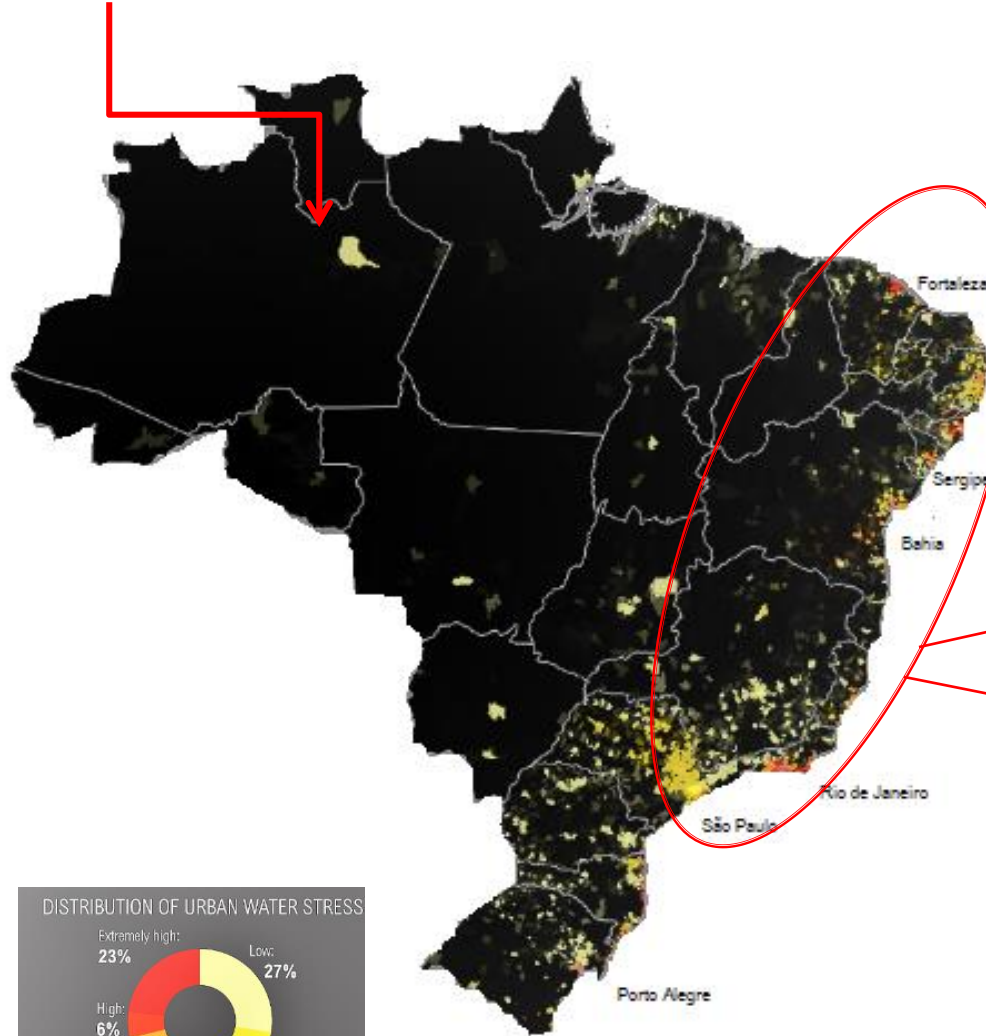
Hydrogeology research

► Why to study Hydrogeology?



Inequality of Water Distribution in Brazil

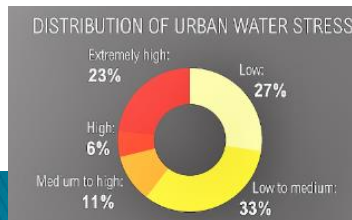
The Amazon River basin contains roughly 50 % of the country's water, but only 4 % of its population.



➤ About 80% of Brazil's population is concentrated in the East coast

REGION	Demographic Density (hab/km ²)	Concentration of Water Resources per region
North	4,12	68,5%
Northeast	34,15	3,3%
Midwest	8,75	15,7%
Southeast	86,92	6%
South	48,58	6,5%

SOURCE: IBGE / Agência Nacional das Águas (2010)

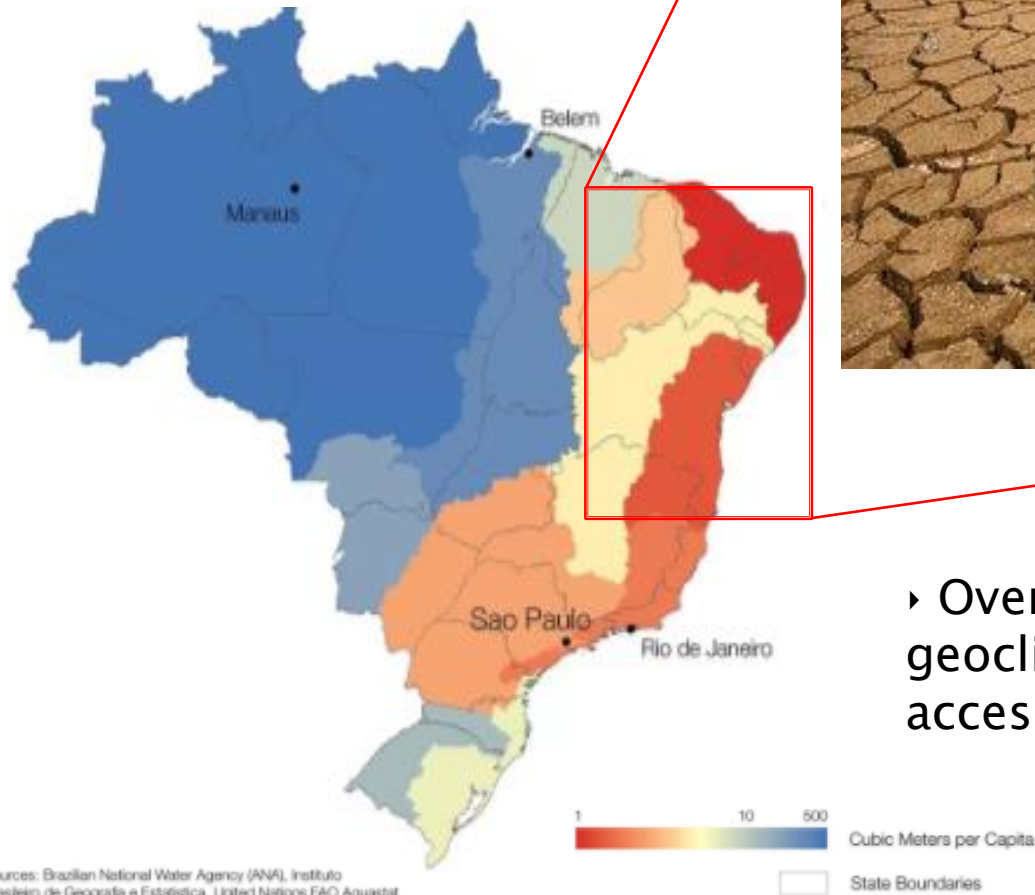


➤ While less than 10% of the Water resources is concentrated on the Northeast and Southeast

Importance of Hydrogeological studies

Northeast Drought crisis

Annual Renewable Surface
Water Resources of Brazil by Basin

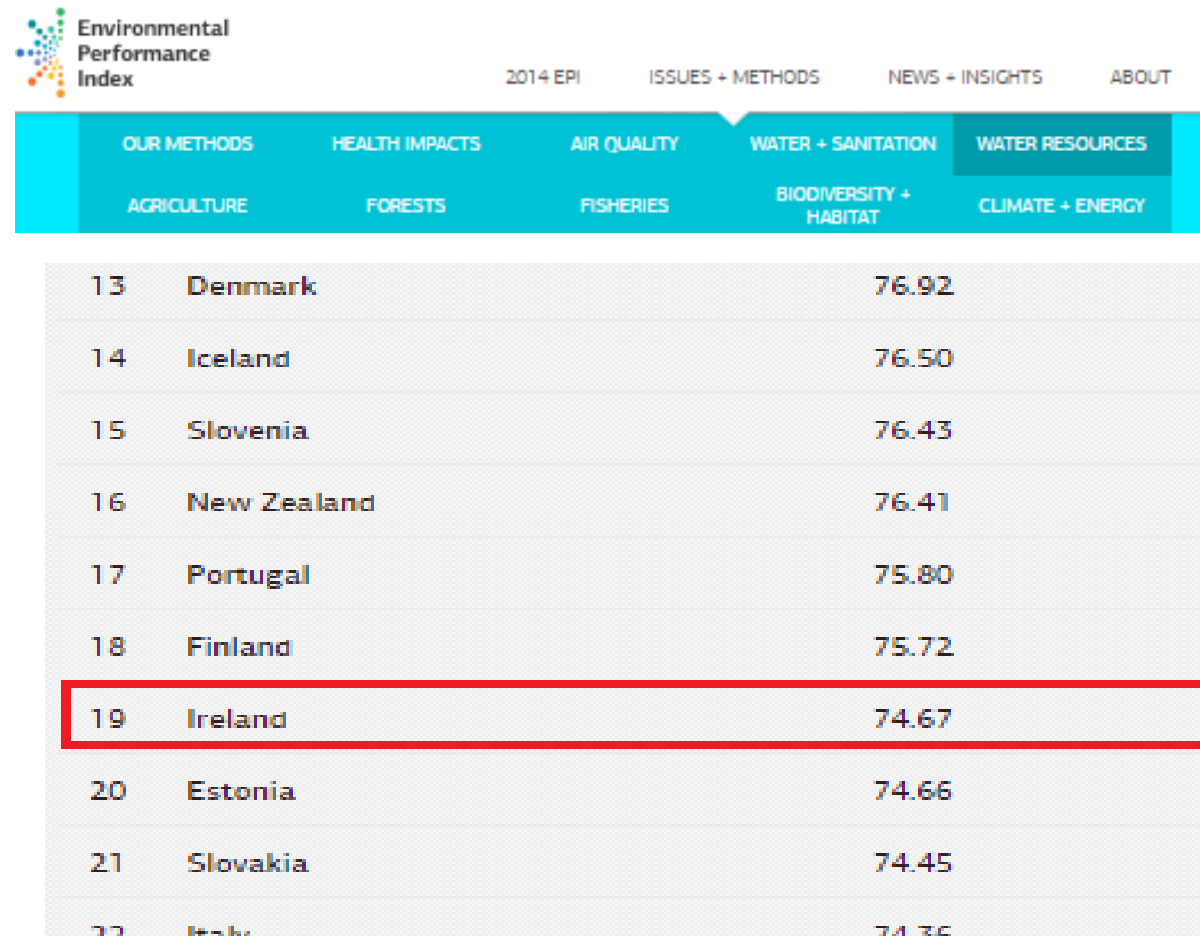


- › Over 10 million people live under geoclimatical conditions and lack of access to fresh water in the Northeast

As for Ireland...

- ▶ Ranked 19th in Environmental Performance
- ▶ Abundant water resources
- ▶ It has a well established Water Protection Policy and Programme
- ▶ The concepts learnt in Ireland can be used in the improvement of water management in Brazil and the world

Environmental Performance Index



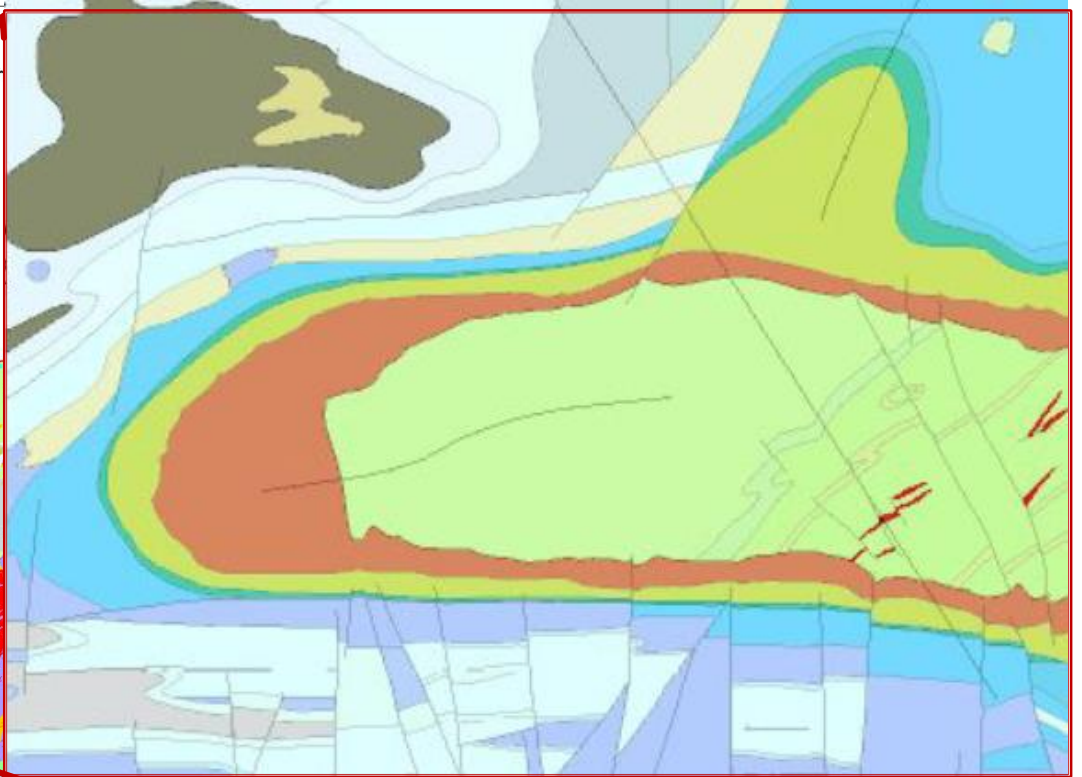
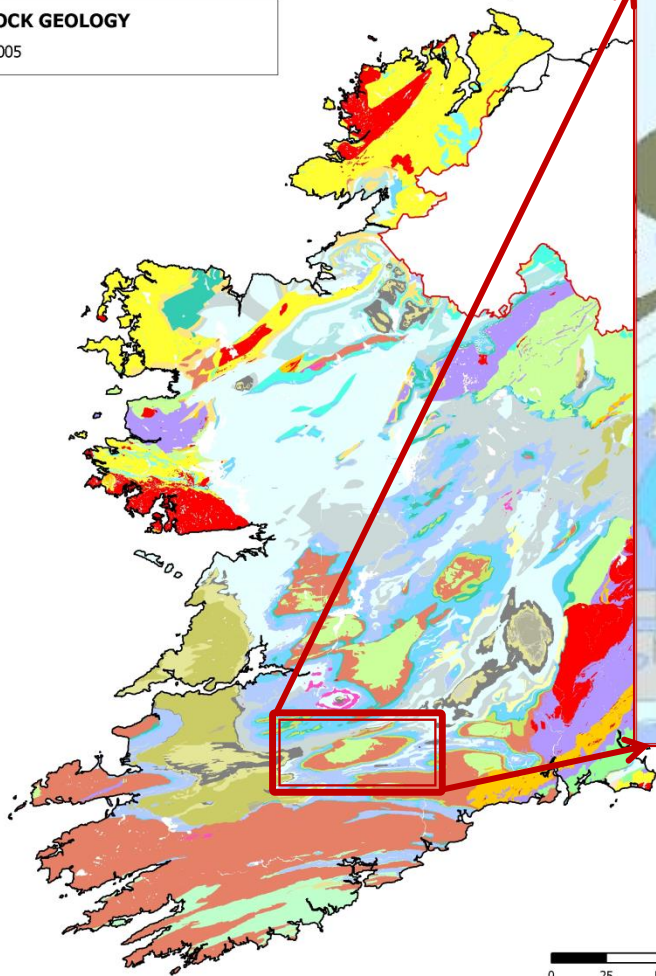
The screenshot shows the Environmental Performance Index website. The header includes the EPI logo and navigation links: 2014 EPI, ISSUES + METHODS, NEWS + INSIGHTS, and ABOUT. Below the header is a menu with categories: OUR METHODS, HEALTH IMPACTS, AIR QUALITY, WATER + SANITATION, and WATER RESOURCES. Under WATER RESOURCES, there are sub-categories: AGRICULTURE, FORESTS, FISHERIES, BIODIVERSITY + HABITAT, and CLIMATE + ENERGY. The main content area displays a table of country rankings. Ireland is highlighted with a red border at rank 19 with a score of 74.67.

Rank	Country	Score
13	Denmark	76.92
14	Iceland	76.50
15	Slovenia	76.43
16	New Zealand	76.41
17	Portugal	75.80
18	Finland	75.72
19	Ireland	74.67
20	Estonia	74.66
21	Slovakia	74.45
22	Italy	74.36

Kiltorcan Sandstone Aquifer

BEDROCK GEOLOGY

March 2005



Important because:

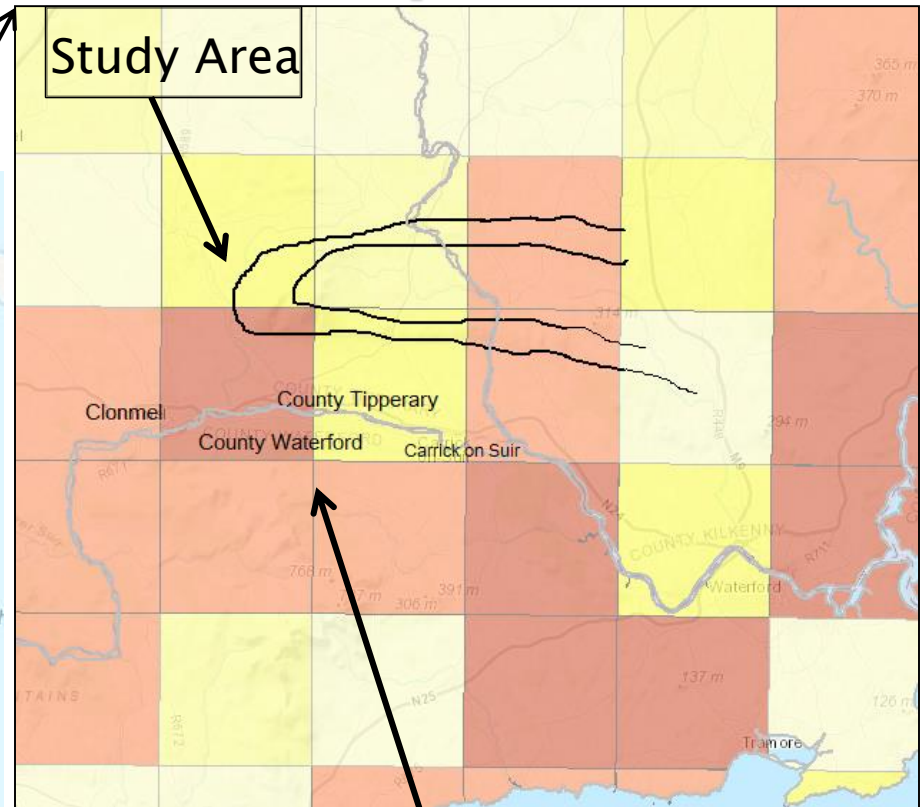
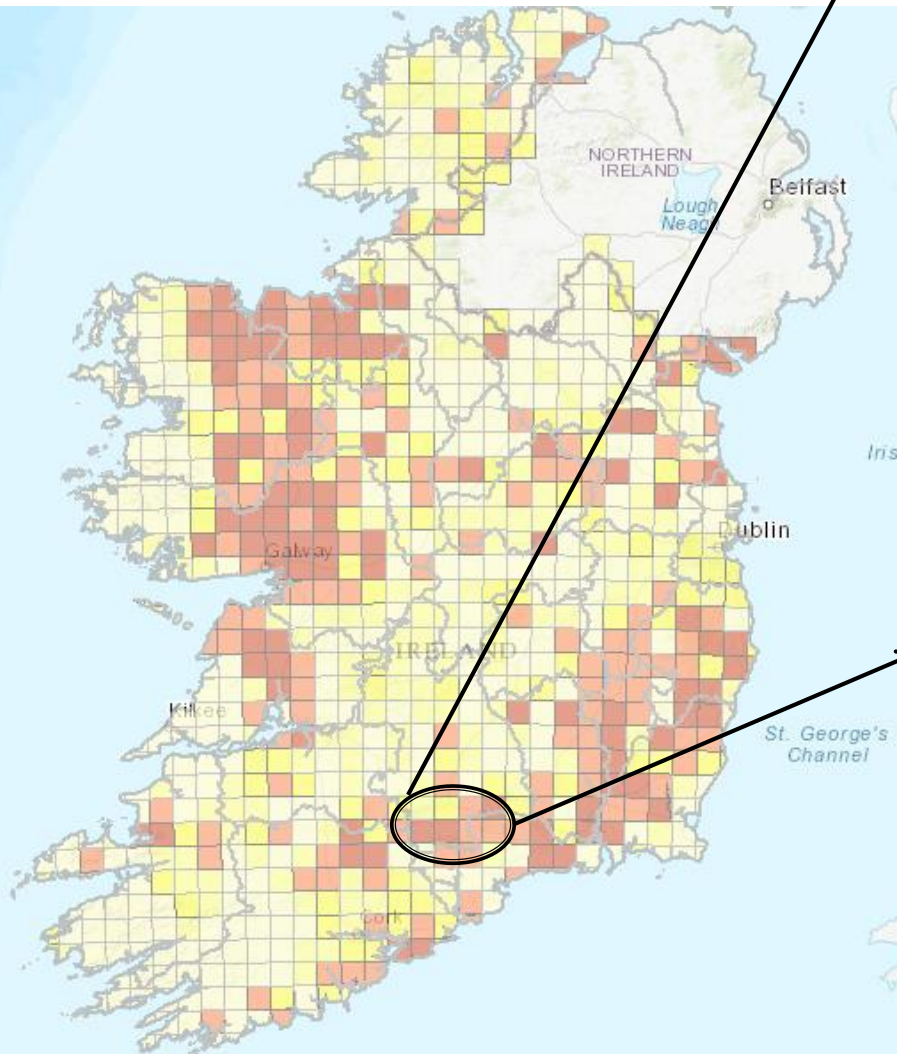
- It has unique features;
- One of the few confined aquifers in Ireland;
- Radon contamination hypothesis;

Rock Units (from the study area)

- South Lodge Formation
- Carrigmaclea Formation
- Kiltorcan Formation
- Porter's Gate Formation
- Ballysteen Formation

Kiltorcan Sandstone Aquifer

► Radon Map of Ireland



Map Legend

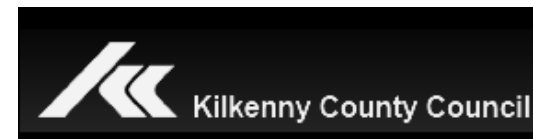
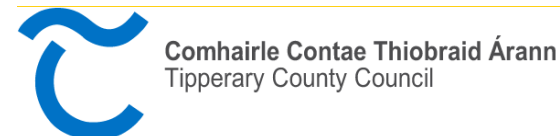
Estimated percentage of homes above the Reference Levels



High Radon Area
– More than 20%
of the houses are
estimated to be
above the
Reference Level

Methodology

- Data collection from:

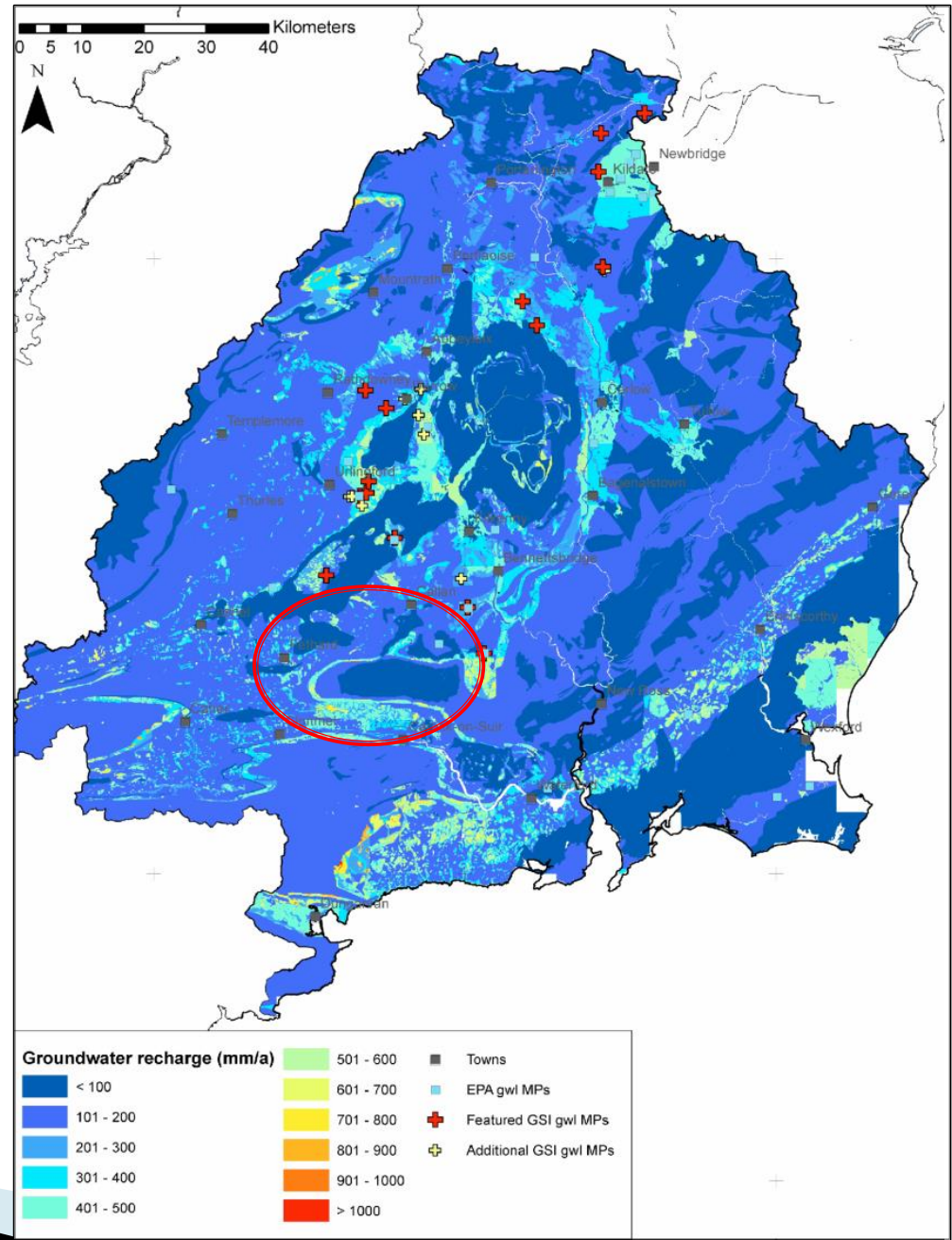


- Analysis of Hydrogeological features such as:
 - Structural geology;
 - Aquifer Units
 - Aquitard Units
 - Recharge zones;
 - Discharge zones
 - Flow Paths
 - Water Levels
 - Hydrochemistry;
 - Other

Kiltorcan Sandstone Aquifer

Analyse the Aquifer classifications:

- Calcareous Aquifer – WHY?
- Regionally important fractured aquifer – WHY?
- Understand the recharge zone patterns (Where the water comes from?)
- Understand the hydrochemistry flow – Water type changes along the flow paths



Kiltorcan Sandstone Aquifer

► Partial Results



27º Simpósio de
Geologia do Nordeste



AN OVERVIEW OF THE HYDROGEOLOGY OF THE KILTORCAN SANDSTONE AQUIFER, IRELAND.

Larissa Macêdo Cruz de Oliveira¹; Eileen McCarthy²
1 UFS/UCC; 2 UCC;

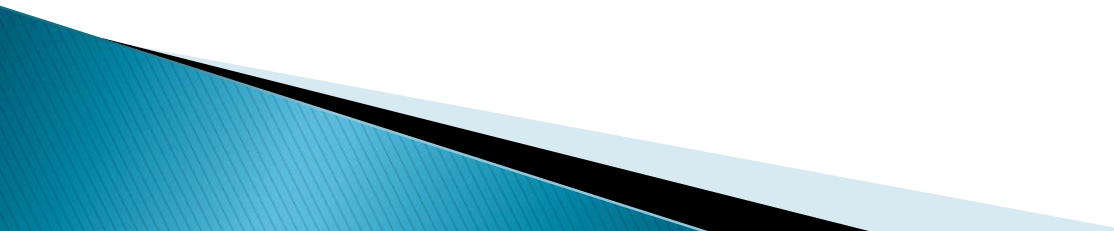
The Kiltorcan Sandstone Aquifer, whose importance has arisen continuously, is part of the South Eastern River Basin District (SRBD). The aquifer forms two Groundwater Bodies (GWB), the Carrick-on-Suir GWB and the Ballyhoura Kiltorcan GWB. They are located in different parts of the Munster basin yet they share a number of similarities. Both are classified as a Regionally Important Fissured Aquifer (Rf). The aim of this study was to perform a hydrogeological investigation of the Carrick-on-Suir GWB which consists of the bottom of the Kiltorcan Sandstone Formation and the beginning of Porter's Gate Formation. A desk study was carried out on the geology, hydrochemistry and hydraulic flow

Conclusions

- ▶ What I have gained from the research experience:
 - Development of professional and research skills;
 - Improvement of data collection and data analysis skills
 - Research management plans – Know how to plan the future steps
 - Software usage – ArcGis, advanced Excel
 - Self-confidence as a student

Conclusions

Future steps

- ▶ Continue the research as Final Graduation Project
 - ▶ Collect more data:
 - New data on wells and boreholes
 - Run geophysical survey
 - Create a 3D model for the Kiltorcan Sandstone Aquifer
 - ▶ Provide guidance for future aquifer management plans around the world
- 

Conclusions

► Possible Highlights:

- 1st partnership between the Universidade Federal de Sergipe and University College Cork
- To strenghten future links between Brazilian and Irish universities
- To inspire students to prospect future international research projects



Acknowledgments



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Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland



Thank you!