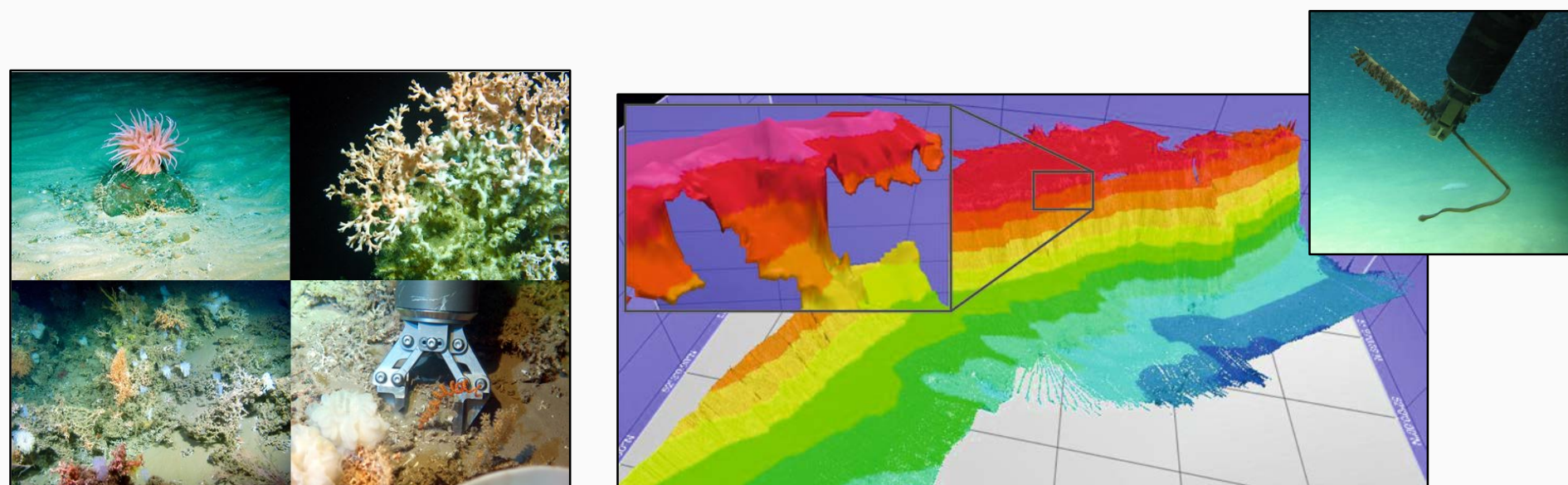


## Marine

This includes our marine-related research involving 3 main Targeted Projects: (i) Marine Acoustics, (ii) Enhancing knowledge and understanding of Ireland's seabed and (iii) Marine remote sensing applications. Acoustic methods provide an important means of characterising and studying of the sea bed and it's subsurface. This spoke will form an integrated broad band perspective on the acoustic noise field of the marine, will identify associated impacts of anthropogenic noise and will use the noise field as a subsurface imaging tool. Using associated methods, this spoke will provide strategic evaluations of Ireland's seabed pertinent to industries needs and evaluate seabed geohazards. New remote sensing software tools for industry will be developed which will support the economic development of Ireland's offshore regions and provide baselines for assessing 'Good Environmental Status (GES)'.

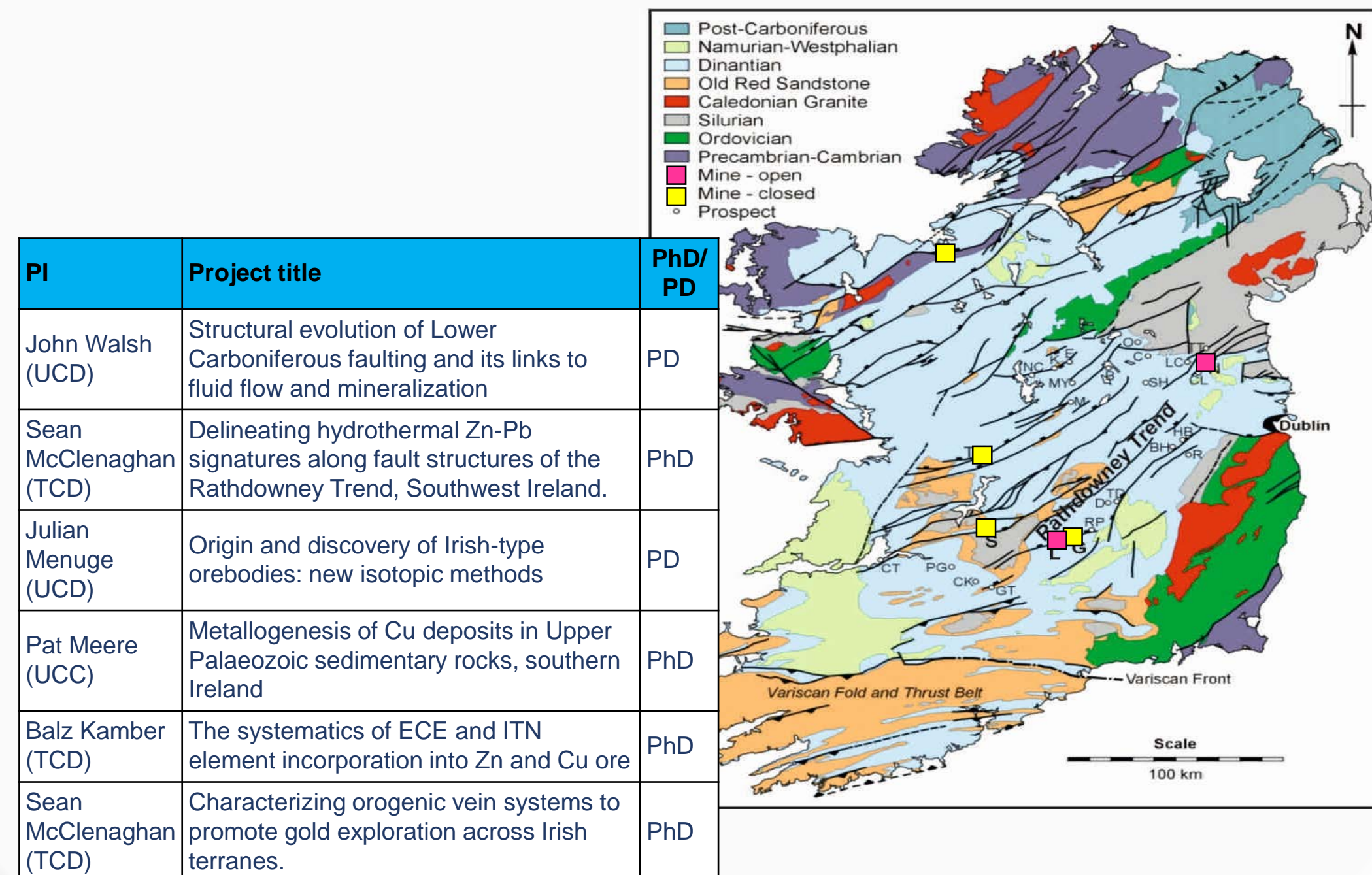


PI	Project title	PhD/PD
Chris Bean (DIAS)	Novel applications of broad band near sea floor pressure/acoustic monitoring for time lapse remote sensing of sea-bed processes	PD
Andy Wheeler (UCC)	Quaternary Seismostratigraphies of Irish Shelf Seas (QuSIS)	PD
Andy Wheeler (UCC)	Coral Carbonate Mound Archives for Submarine Canyon Exchange Processes (CoMA_CoP)	PhD
Timothy McCarthy (NUIM)	Marine Observation Platform & Slick Feature Mapping	PD
Peter Croot (UCC)	Influence of natural biogeochemical controls on primary productivity on the optical properties of surface seawater	PD
Peter Croot (NUIG)	Application of CDOM optical properties for tracing natural and manmade surface slicks.	PhD

## Raw Materials

More than 50% of the world's hydrocarbon reservoirs are in limestones. A major component of iCRAG's raw materials research concentrates on the world class Zn-Pb Irish Orefield, in which mineral deposits are entirely hosted by limestones. This spoke therefore provides an excellent basis for examining fluid flow with limestones, with a variety of potential implications for hydrocarbon studies including:

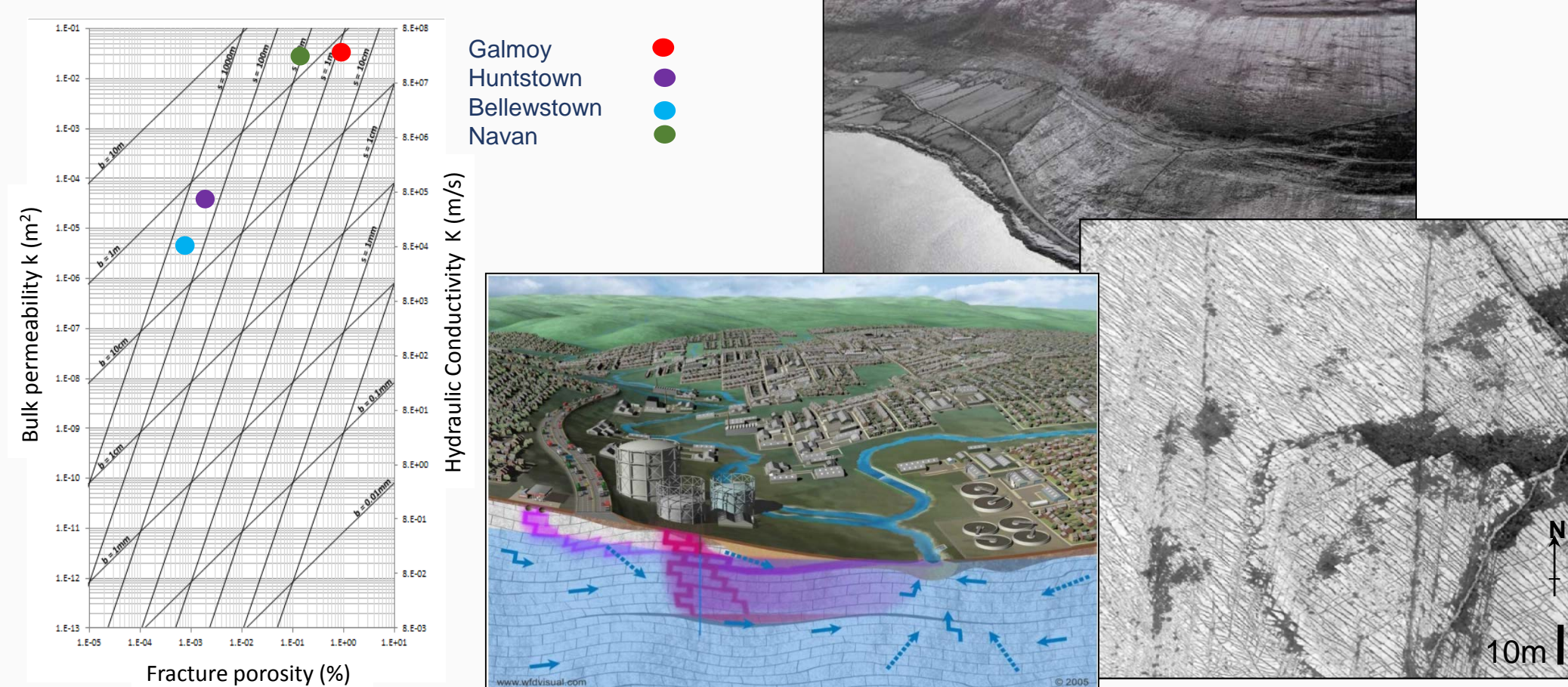
- Fault/fracture controlled fluid flow.
- Regional dolomitisation
- Fault/fracture geometries within limestones.



## Groundwater

Nearly 20% of Ireland's water requirements are derived from subsurface groundwater. This reflects the predominance of limestone bedrock in Ireland, characterised by strong fracture and karst controlled groundwater flow. This permits investigation of the often-times highly heterogeneous nature of flow within limestones, both from qualitative and quantitative perspective, using methods which are sometimes applied in the hydrocarbon industry. Amongst the issues which will be examined are:

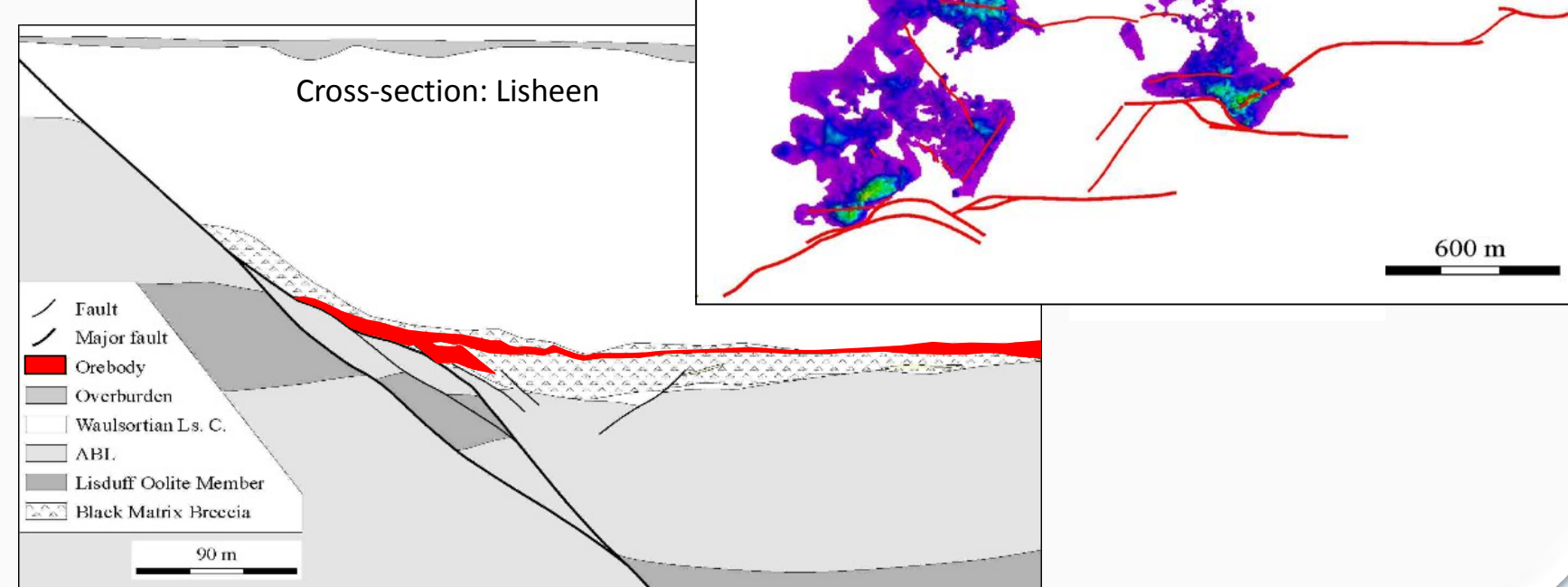
- Quantitative parameterisation of fault/fracture controlled fluid flow within limestones.
- Development of karst within limestones.
- Karst-controlled groundwater flow.



PI	Project title	PhD/PD
Laurence Gill (TCD)	Prediction of response (and solutions) of lowland karst areas prone to flooding to climate change	PhD
Bruce Misstear (TCD)	Impacts of changing climate on groundwater recharge in low storativity fractured-rock aquifers	PhD
John Walsh (TCD)	Quantitative assessment of the impact of faults, fractures and related karst networks on groundwater flow	PhD
Frank McDermott (UCD)	An investigation of arsenic sources, speciation and mobilization processes in selected Irish aquifers	PhD
Catherine Coxon (TCD)	Emerging organic contaminants arising in rural environments: investigations in karst and fractured bedrock aquifers	PhD

## 3D Ireland

Common datasets are unique national archives for research in different sectors (e.g. groundwater and mineral deposits are in the same rocks). Using archive mineral exploration/production data, together with geological and geophysical data supplemented by Geological Survey of Ireland (GSI) and Exploration and Mining Division (EMD), we will generate a 3D Geological Model of the Irish Carboniferous on a broad range of scales.



## Geophysics

Perform research and provide support on a broad range of geophysical techniques, though specialising in seismic methods in particular.

- Developing new imaging methodologies.
- Yielding Ireland's first ultra high resolution shallow (top 1km) passive seismic images.
- Compare Geological and Geophysical models directly.

