

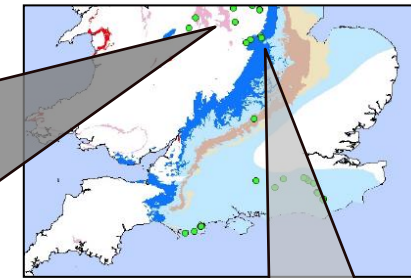
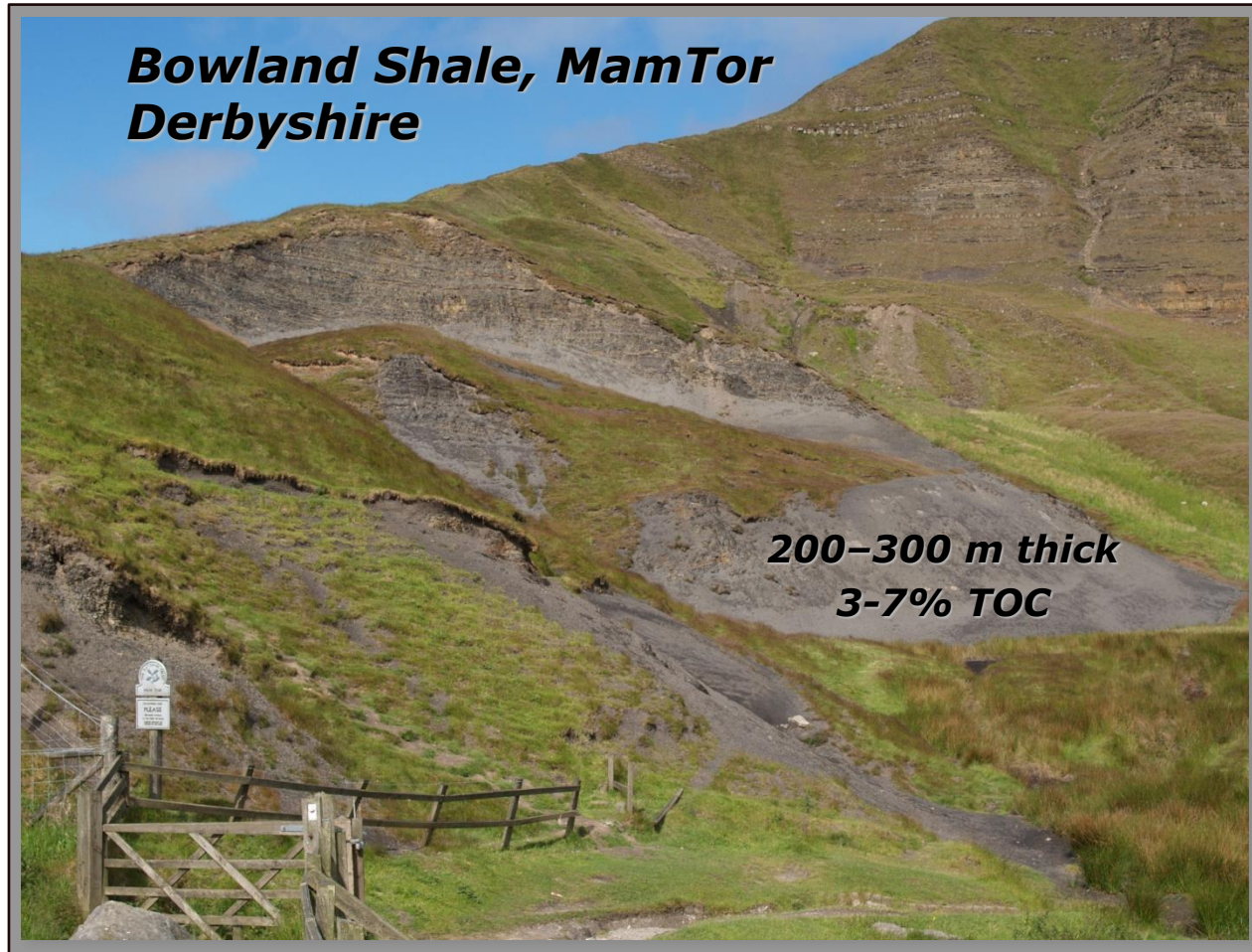
# NERC-ESRC Unconventional Hydrocarbons Programme Challenge 2 Update

Thursday 9<sup>th</sup> September 2021

# UK Shale Gas

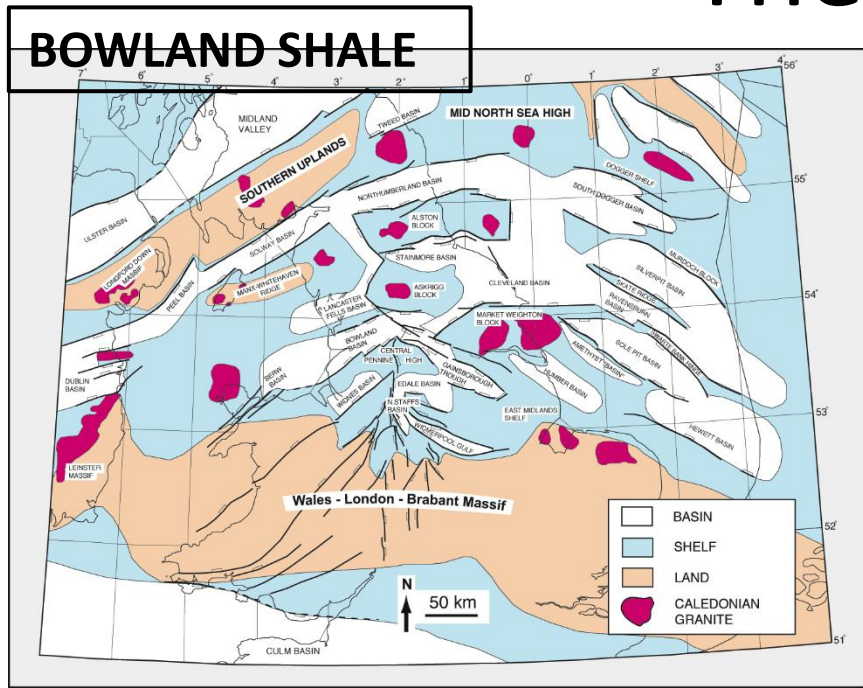
- We know where it is
- We know how good it is
- We know how complex the geology is
- We can characterise the geochemistry of the shales
- We know more about fracking & induced seismicity
- Importantly, we know it won't work
- Could we have known this 10 years ago and avoided a lot of wasted effort and money?

# The Bowland Shale

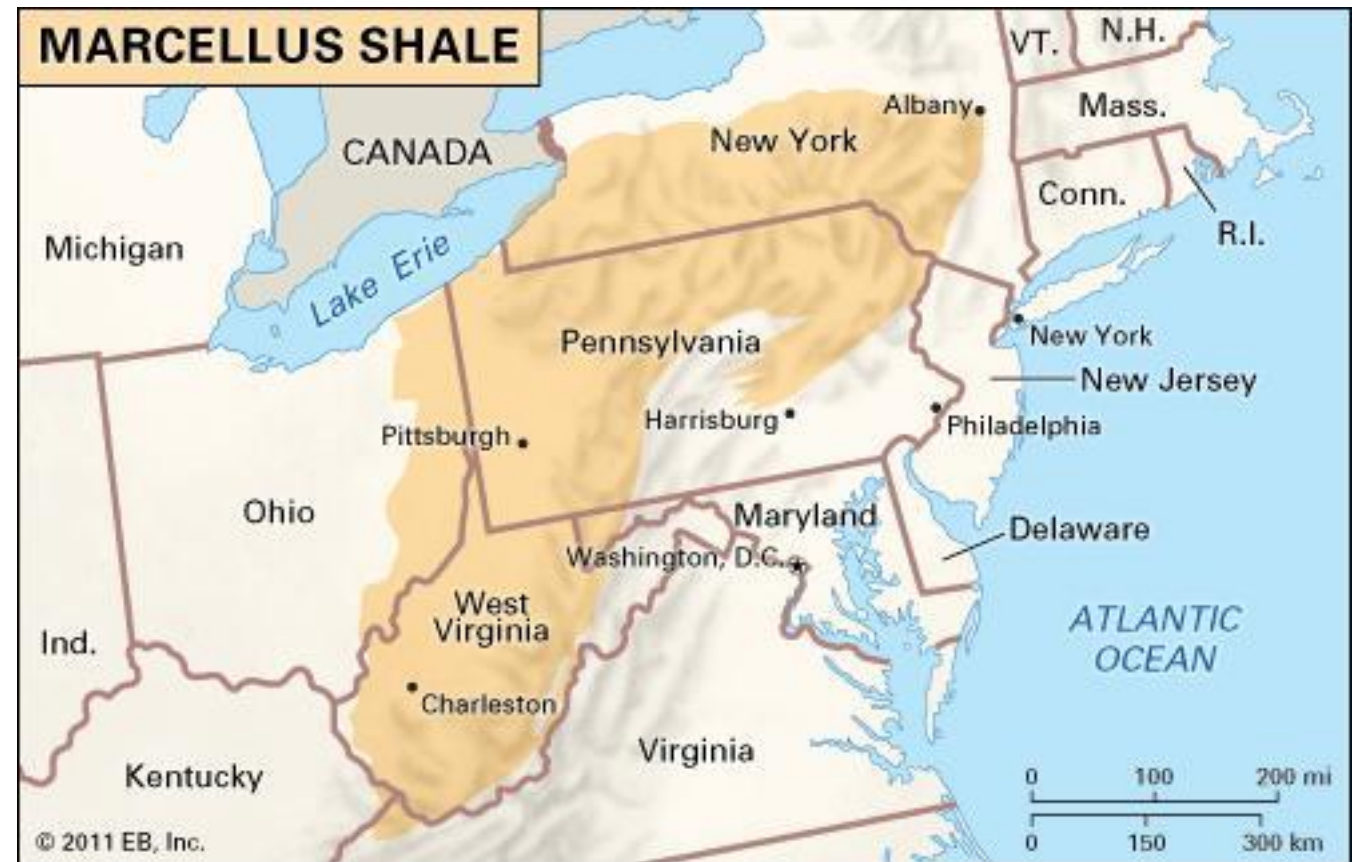


**Rempstone-1: Core**

# The Treasure Map?



Unlike the US, the Bowland Shale in the UK is confined to individual fault bounded basins



# UK biggest U-Turns 2021

- Boris Johnson on UK Tax increases

*No new  
taxes*



- Al Fraser on UK Shale Gas Potential



*UK Shales  
are great*

## Challenge 2: main outcomes

- OK UK Shale Gas is clearly a non-starter. Both the geology and public perception precludes this
- However, 3 years of UKUH funded research has generated some wonderful subsurface science relevant to renewable energy resources e.g.
  - Better understanding of Shales for potential CO<sub>2</sub> sequestration
  - Better understanding of rock mechanics & fracking with implications for Geothermal Energy and CCS
  - Better understanding of fluid flow in the subsurface particularly in tight rocks

# Post Doc research

- The project funded a group of exceptional post Docs who have all published excellent peer reviewed papers
- Bhavik Lohdia (IC) Bowland Shale resources now at UNSW
- Robin Thomas (IC) Fracture modelling
- Kieran Blacker (Leicester) petrophysics
- Mike Chandler (Manchester) Geomechanics & Fracture analysis
- Michael Sims (IC) Bowland Shale Geochemistry

## Challenge 2: Headlines

- Colin Snape: Hydrous pyrolysis. UK Shales not that good!
- Michael Sims: Bowland geochemistry. UK shales mixed kerogen types and again not that good!
- Joint Bristol/IC fracture observation/modelling. Induced seismicity cannot be predicted. Forget traffic light schemes.
- Bottom line: UK geology too complex and fragmented to support a commercially viable Shale Gas industry. US turned out to be a poor analog.



# Challenge 2: Publication Highlights

- Colin Snape (Nottingham)
  - Bowland Shale volumes 10x lower than Andrews (2013)
  - lower gas yields and maturity reassessment for dry gas
  - 10 years supply at current UK consumption rates. *Paper published in Nature Geoscience*
- Ernie Rutter (Manchester)
  - <10% of pores connected = lower effective permeability
  - Bowland Shale particularly poor cf Haynesville. Paper in prep
  - No evidence for link between acoustic velocity and K in shales. *Paper in prep*
- Kieran Blacker (Leicester)
  - Hyperspectral imaging
  - Non-destructive analysis of shales
  - TOC good correlation with core data
  - TOC not uniformly distributed through shale. *Poster EGU (2019)*