The geology of the Black Country

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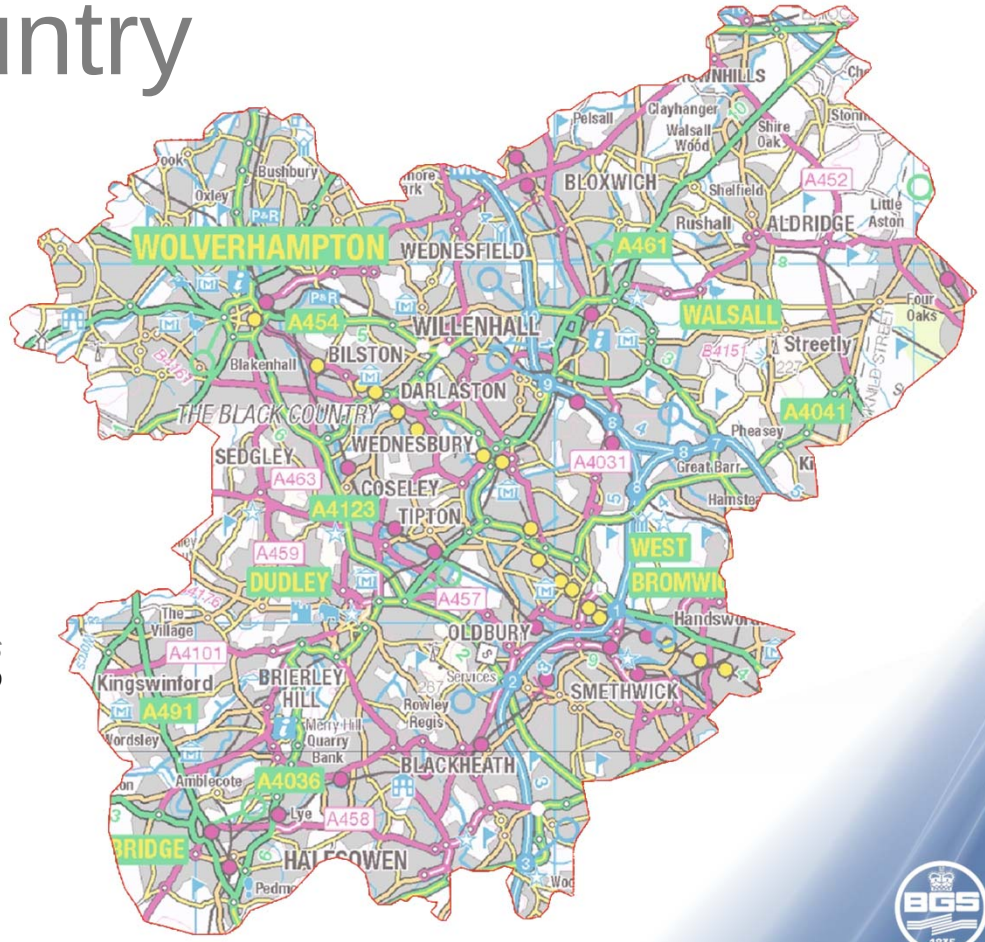
The Black Country

"It has always been said that the easiest way to start a fight in a Black Country pub is to ask for a definition of the term…"

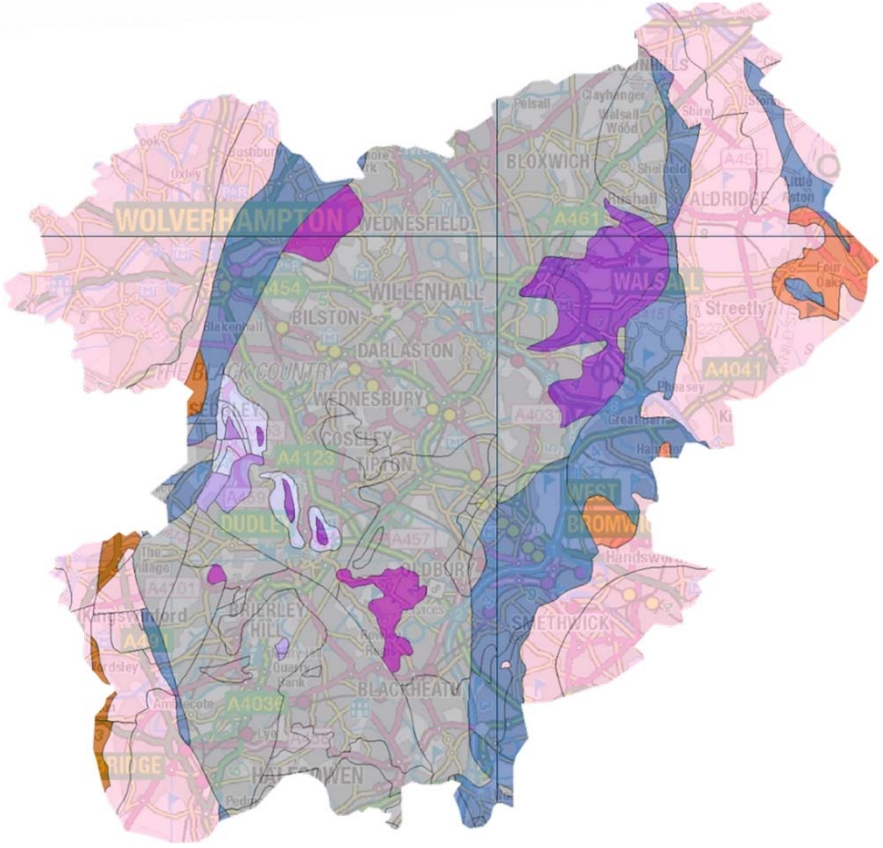
"…One takes it as the area encompassed by the famous '30-foot' coal seam; another that it is a wider region, stretching from Wolverhampton to the border of Smethwick; another that it is the four boroughs of Wolverhampton, Walsall, Sandwell and Dudley. Perhaps for this reason, the Ordnance Survey have been reluctant to spell it out on a map"

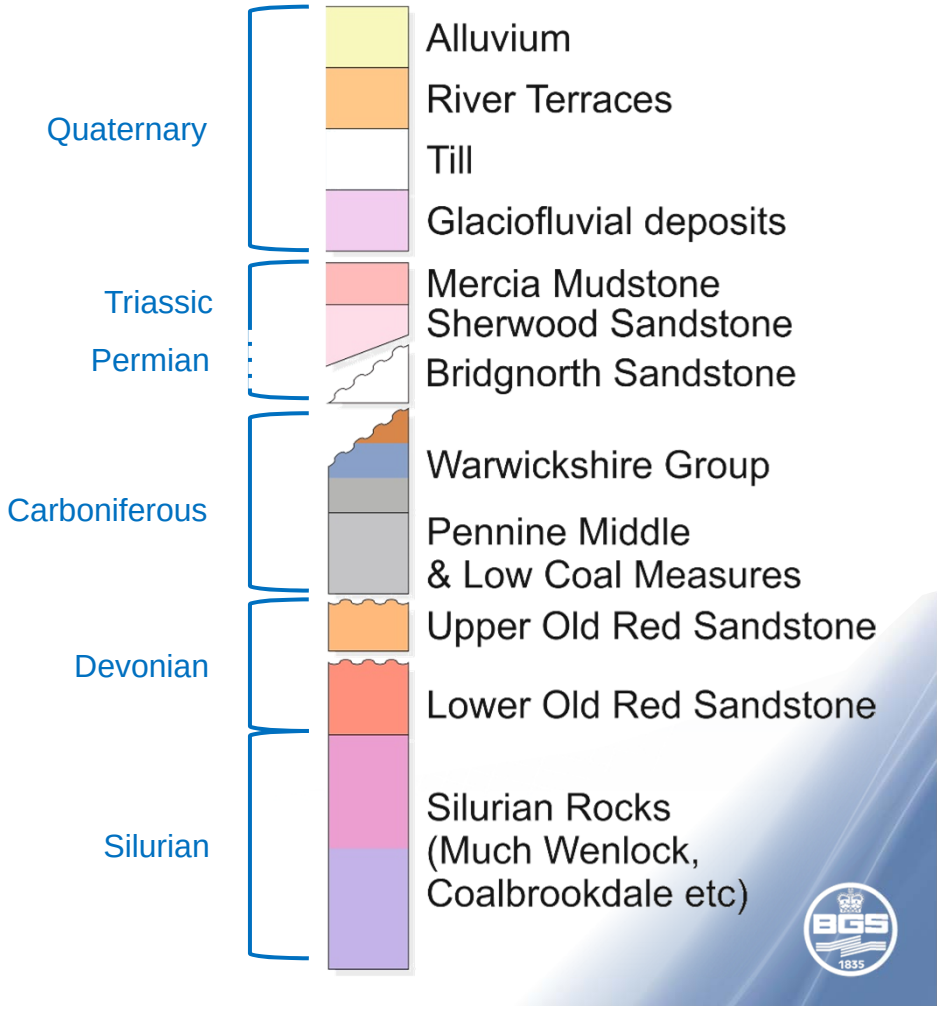
Dr Chris Upton – Black Country Echoes
(http://www.black-country-festival.co.uk/files/files/Black-Country-Echoes-Publication.pdf)

Despite differences in the interpretation, the Black Country is intimately linked to geology (heritage)

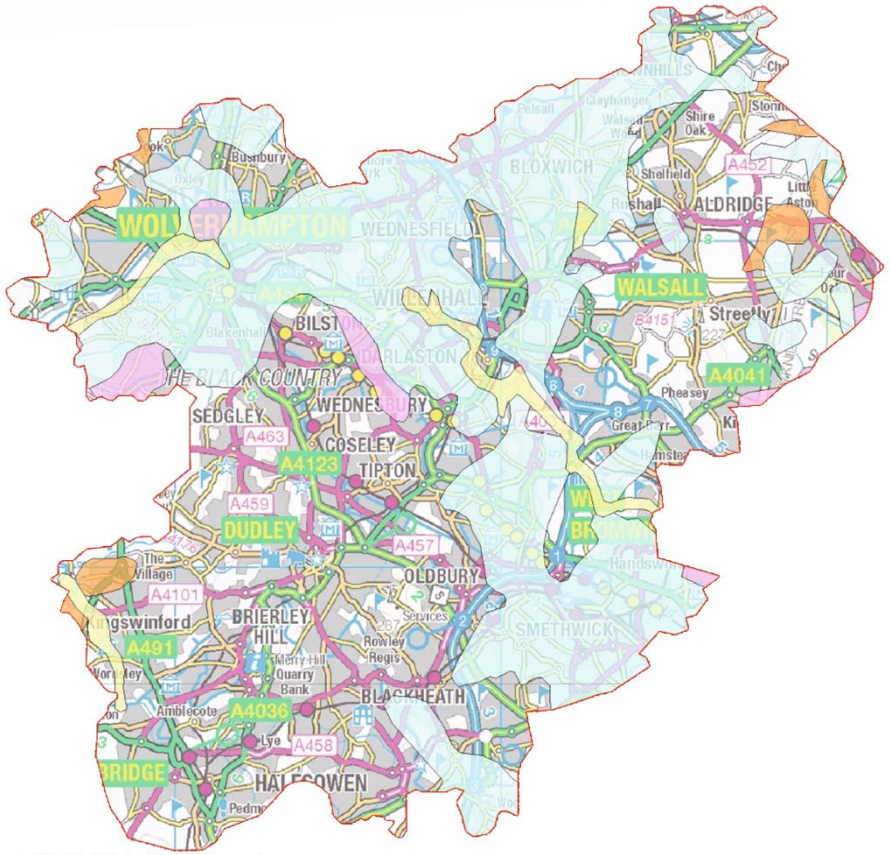


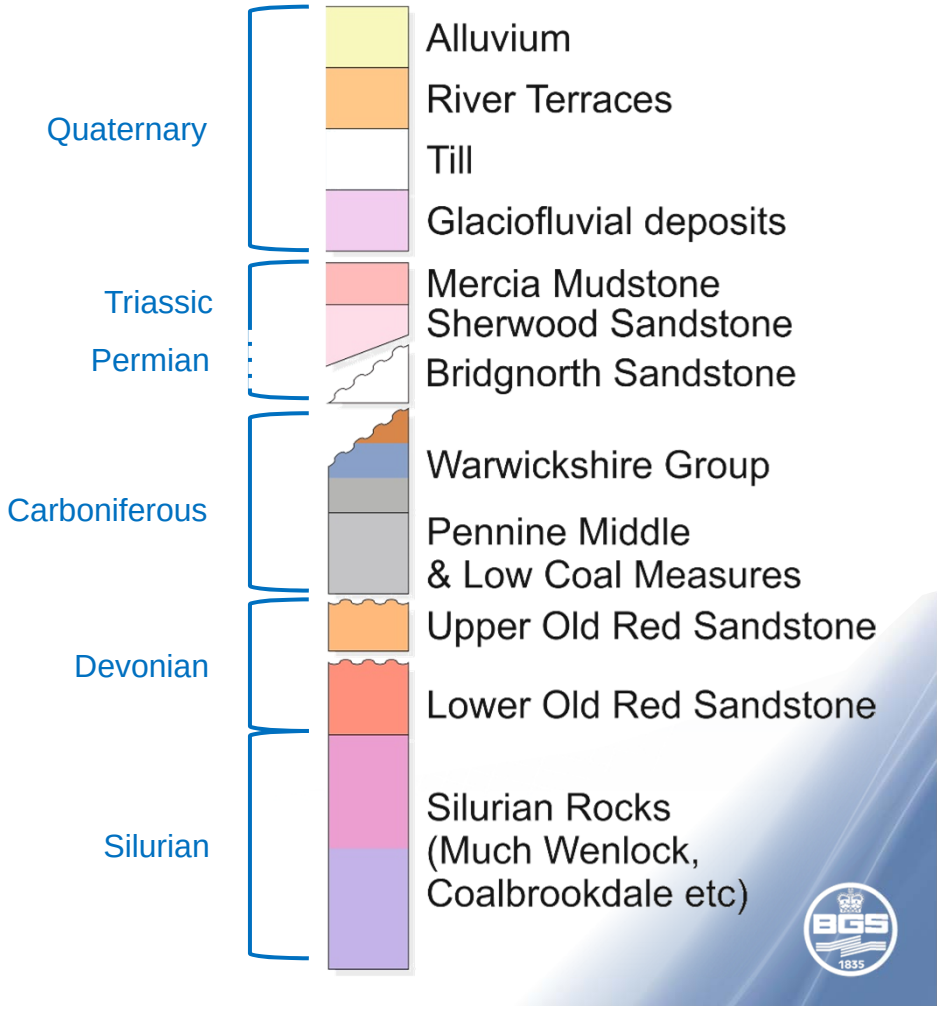
Introduction

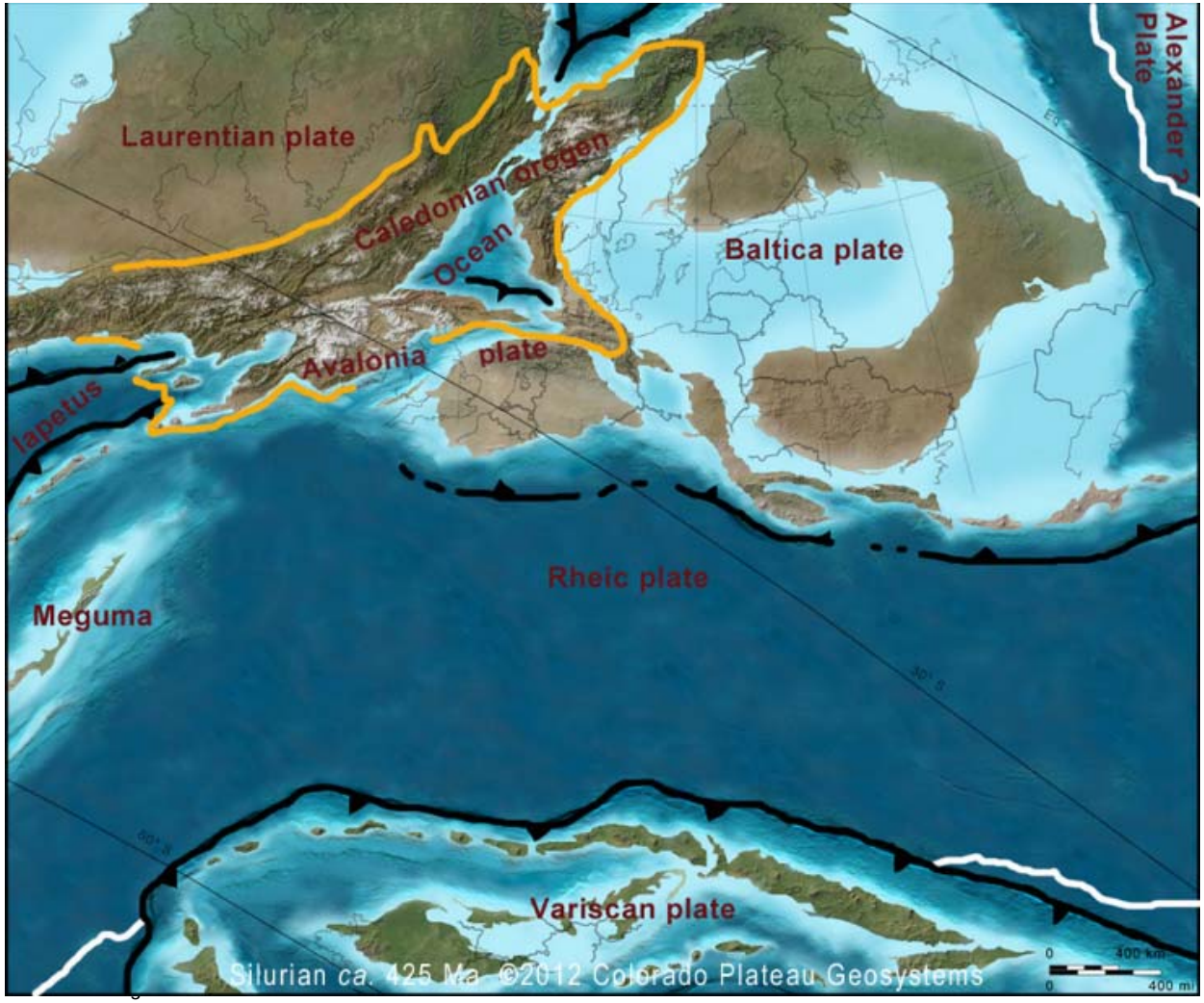




Introduction



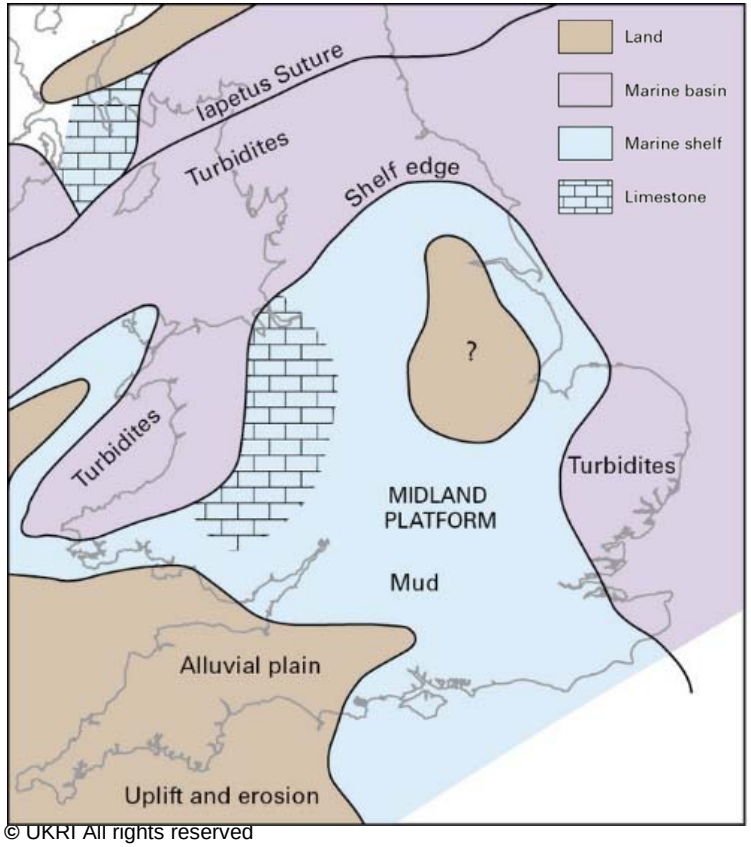




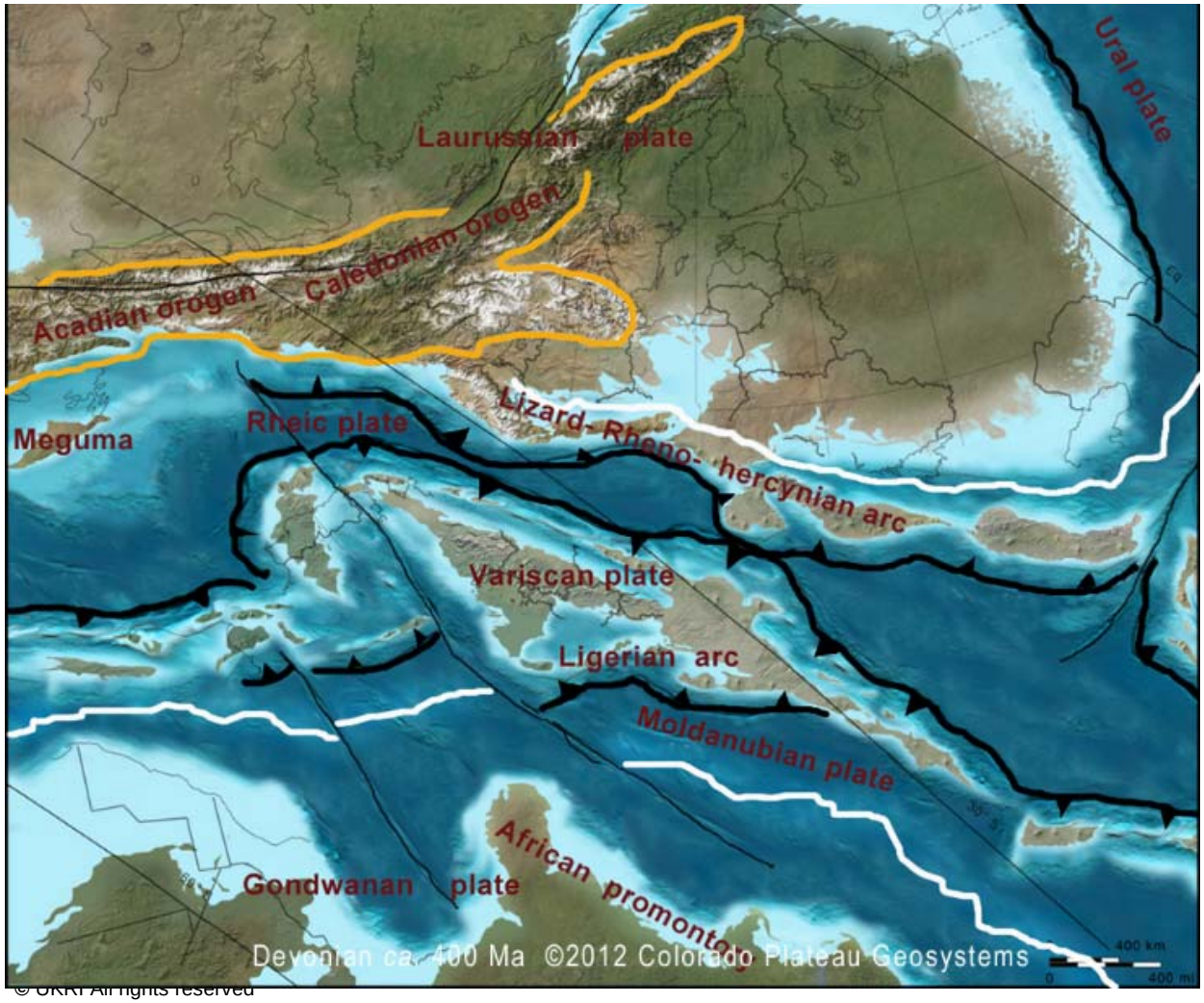
Silurian (444 – 419 Ma)

- South tropic location
- Relatively low lying continental land
- Tropical to sub-tropical environment
- Sea-level fluctuations from waning glacial (relative to Ordovician ice age)
- Significant portions of Wales & England subject to marine conditions

Silurian



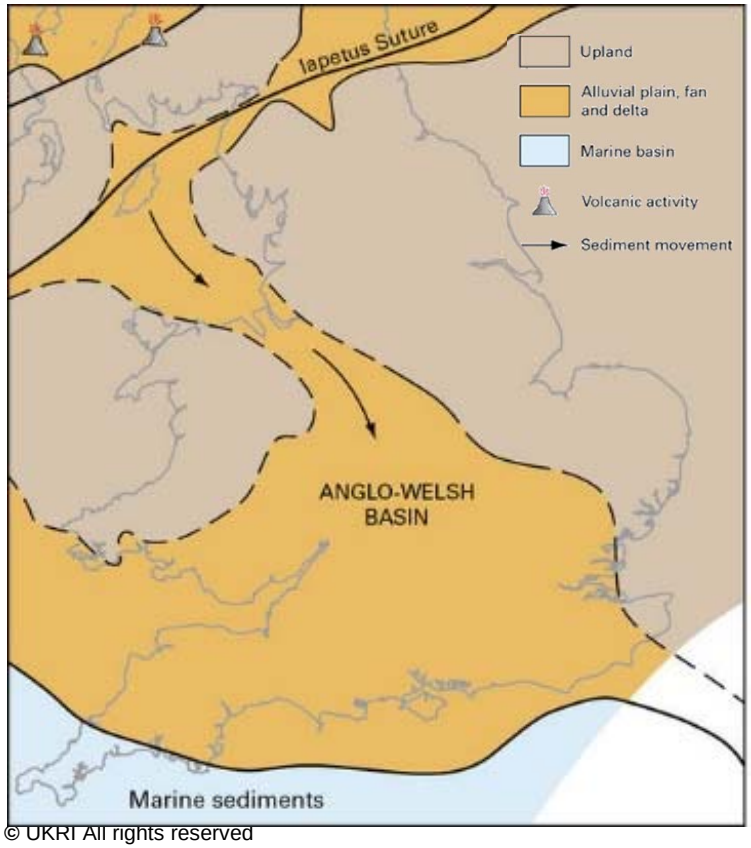
- Marine facies types in [relatively] shallow waters.
- Coalbrookdale Formation (Sheinwoodian/Homerian) – Calcareous mudstones and siltstones
- Much Wenlock Formation (Homerian) – Fossiliferous limestones.
  - Worked from deep mines as a flux in the iron industry and for agricultural lime.
- Marine regression towards the end of the Silurian starts a phase of continental conditions.



Devonian (419 – 359 Ma)

- Some of the first [major] non-marine deposits in England & Wales
- 30° to 15° South latitudes
- Variable tropical to semi-arid climate
- Large river system that drained Laurussia
- Vascular plants evolve

Devonian

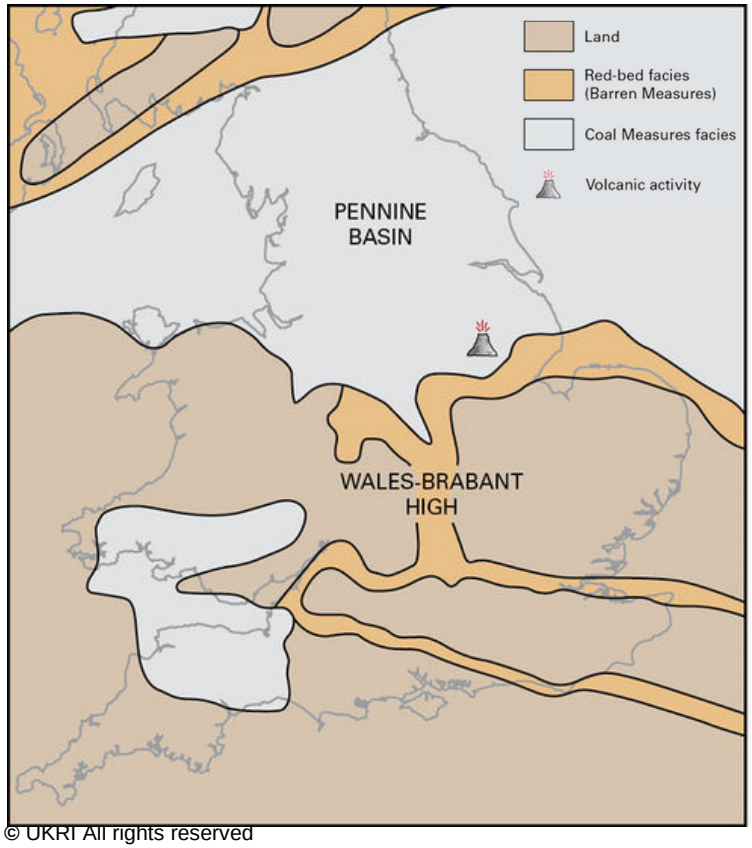


- Large fluvial and alluvial systems that drained higher topographic lands of Laurussia to the northwest
- Seasonal wet periods aided development of the large drainage systems
- Deposited the Lower and Upper Old Red Sandstone Groups
  - Fluvial deposits that vary from high sinuosity meandering rivers to sheet-like braided rivers

Carboniferous (359 – 299 Ma)

- Equatorial position
- Humid warm conditions
- Synonymous marine fauna and flora types
- Eustatic cyclicity
- Blocks (Askrigg & Alston) & Basins (Solway–Northumberland, Stainmore, Cleveland and Craven basins)

Carboniferous

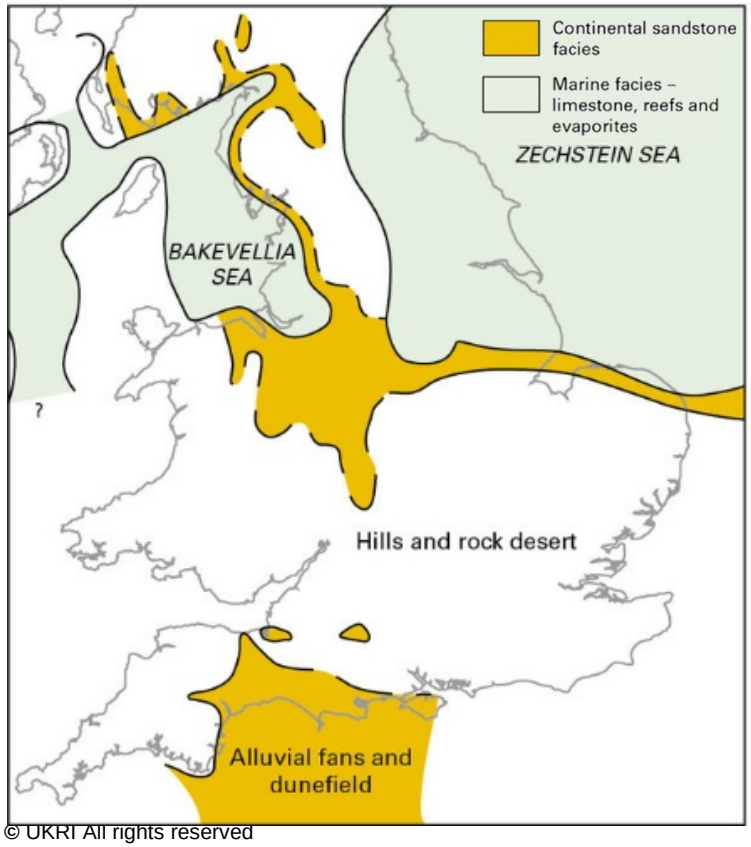


- Highly important economically
- Saw the deposition of mixed, successions of sandstones, mudstones, gritstones, and *coal*
- Deposition occurred in a variety of settings; deltas & rivers, marine, lakes, swamps and shallow marine
- Deposition of the ‘Barren Measures’ (Warwickshire Group) and the productive Coal Measures (coal & ironstone)
- Etruria Formation (WAWK) significant exploited for brick clay.

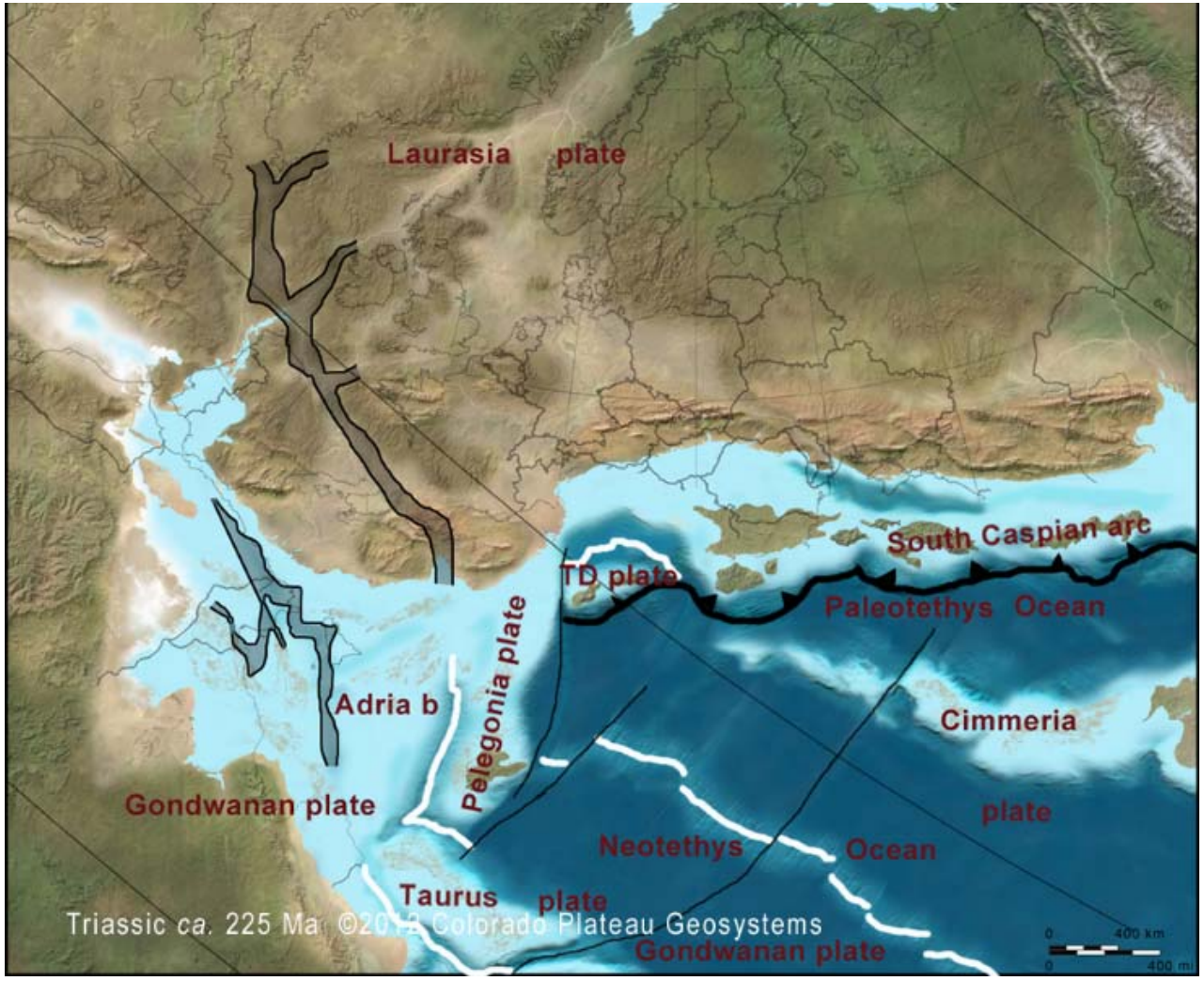
Permian (299 – 252 Ma)

- Hot arid, tropical latitudes
- Pangaea super-continent
- Significant uplift marked by relatively large unconformity (Variscan)
- Crustal extension and rifting (Atlantic, EIS, Cheshire, Worcester and North Sea)

Permian



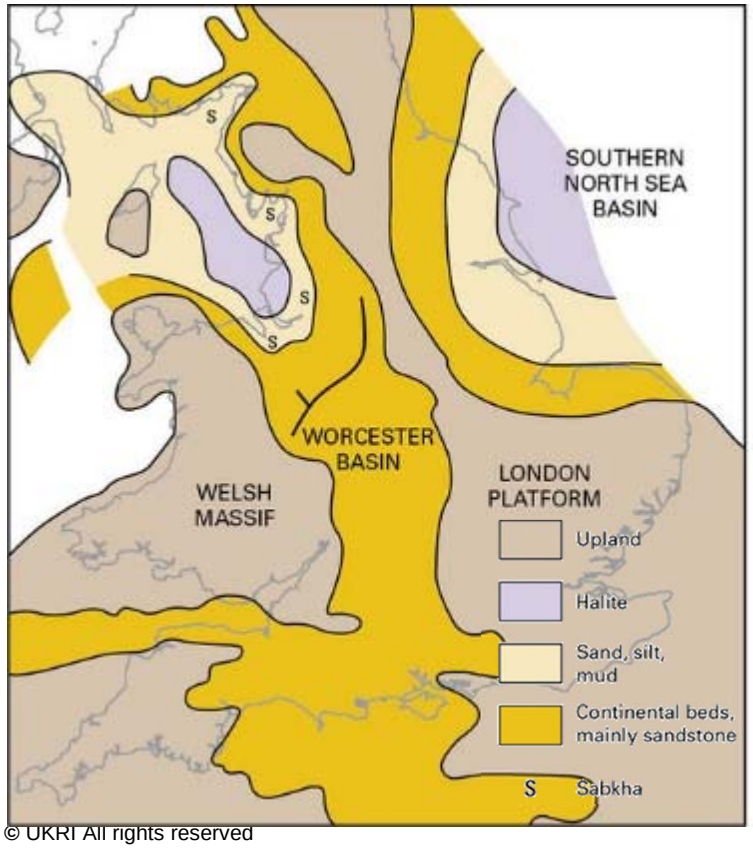
- Hot arid to semi-arid conditions
- Lots of mountain building as continents collided
  - Potential rain-shadowing effect
- Significant mass extinction with ~10% of species survived
- Arid conditions favoured Aeolian (wind-blown) conditions….
  - …like the Bridgnorth Sandstone (aquifer)
  - Some of largest bedforms to have existed in the UK



Triassic (252 – 201 Ma)

- Semi-arid conditions
- UK moving Northwards but still tropical latitudes
- Stereotypical ‘red-bed’ deposition from terrestrial environments
- Large rivers established during the early and Mid Triassic

Triassic



- Continuation of Permian hot arid to semi-arid conditions
- Large fluvial systems sourced from north France deposited the primarily fluvial Sherwood Sandstone Group (principal aquifer)
- Some desert sand dunes formed in the Cheshire area and surroundings
- Mercia Mudstone Group shows a transition to wetter conditions

Quaternary

- ~2.6 Ma years to present
- Glacial and interglacial periods
- Establishment of drainage systems recognisable to modern
- Deposition of lots of sand & gravel from various flood deposits (minor aquifers)

Conclusions

The evolution of the black country started way back in geological time.....

Brick clay	-	Carboniferous (Etruria Frm)
Sand & Gravel	-	Glaciogenic, alluvium & RTD's
Iron	-	Carboniferous (Coal Measures)
Coal	-	Carboniferous (Coal Measures)
Lime	-	Silurian (Much Wenlock)