Geoscientist article

The British Geological Survey recently published two exciting new products that will be of interest to the wide geoscientific community in the UK: firstly, a new 1:625 000 scale Bedrock map for the UK and secondly the innovative UK Stratigraphical Chart, produced in collaboration with the Geological Society Stratigraphy Commission.

New Bedrock Geology map of the UK

The British Geological Survey has published a new small-scale map of the United Kingdom as two sheets: Bedrock Geology UK North & Bedrock Geology UK South; each available with their own descriptive booklet writes Alan Smith.

The 1:625 000 scale map (formerly known as the 'Ten-mile' map) is one of BGS's most popular publications. Since the map was first published in 1948 the two sheets have been familiar to students and academics, public bodies and commercial companies.

This fifth edition map is completely new but will be familiar to users of the previous maps as it aims for a similar level of detail. However, some parts are simplified (for example the Jurassic strata in England), and others more detailed (for example the Chalk in England and Wales and the 'Precambrian' of the Scottish North-West Highlands and Grampians.

The new maps are printed on larger sheets of paper and include all of Northern Ireland for the first time. There is an 80 km overlap so that all of the Lake District is present on the northern sheet and all of the North Yorkshire Moors on the southern one. With the additional space there is room for cross-sections showing the geological structure to a depth of about 15 km. If the northern section is removed or folded back the two sheets may still be mounted together as the title panel information, masked at top right by the overlap, is repeated at bottom left.

The topographic base map has been provided by Harper Collins, but the Ordnance Survey's National Grid is retained for easy reference, as is the index of published 1:50 000 geological maps sheets.

Both map sheets have an accompanying descriptive booklet. Attractively produced using full colour, these contain a useful introduction for non-geologists. Each geological period in the booklet is then described in a separate chapter with thumbnail sketch maps, photographs and illustrations.

With regard to the geological content of the map, a large number of the component 1:50 000 scale geological maps have been revised or resurveyed since the 1979 third edition, and this new information and improved understanding of the geology are reflected in the new map.

This edition has been created by generalisation of the latest 1:50 000 scale digital geological data for England, Wales and Scotland, and the 1:250 000 scale data for Northern Ireland. The data were first interrogated to provide digital selections of associated rock units, of all ranks, based on their stratigraphic correlations, hierarchies and lithologies in order to rationalise the multitude of beds, members, formations and groups, and the intrusive and extrusive rocks. Once established, the generalised digital selections were displayed in colour in order for a cartographic generalisation to be carried out. This cartographic generalisation was informed by the rock classification, emphasising important small units where necessary. The map is consistently more spatially accurate than the previous editions with more intricate linework possible. Many more faults are shown, including thrusts, and the classification and depiction of dykes is improved.

The most evident change on the new edition is in the key and the system for labelling geological units. The single column of boxes seen on earlier editions is replaced by a main column on the left, supplemented by additional columns to the right, where necessary, to show regional variation. This allows some of the geological complexity, best illustrated by BGS's new Stratigraphical Chart of the United Kingdom, to be seen in a simplified form. The single sequence of numbers from 1 to 115, first used to unify the geology of the UK on the third edition, is here replaced by a system of

letters and numbers. Again this echoes back to the first edition where sedimentary units in England and Wales were labelled with letters. Rather than reinstate these, as they did not include the 'Precambrian', an existing alternative scheme was adopted and modified. Here the initial letter of each geological period is used as the primary identifier, thus Ordovician rocks are labelled with an 'O', Carboniferous with a 'C' avoiding duplication by using established alternatives: 'E' for Cambrian and 'K' for Cretaceous. Within each period, units are numbered sequentially upwards, based on the chronostratigraphy or lithostratigraphy, whichever is most practicable, so that rocks which are the same age or approximately equivalent have the same number. A further benefit of this scheme is its flexibility; in future editions of the map it will easy to revise the stratigraphy by adding or removing units as appropriate.

The digital vector data for the earlier 4th edition Bedrock (and 1st edition Quaternary) are both available free of charge for non-commercial uses from the BGS website at:
http://www.bgs.ac.uk/products/digitalmaps/data_625k.html
It is planned to make the new 5th edition Bedrock geological data similarly available as soon as possible.

The new maps (flat or folded) and booklets are available separately from BGS, price £10 each or £15 for a map and accompanying booklet package; and the folded map and booklet come in a plastic wallet.
www.geologyshop.com
email:sales@bgs.ac.uk

{image for Figure 1 plus caption}
Figure 1 The bedrock geology map of the UK, 5th edition, North and South.

Stratigraphical Charts of the UK

The Stratigraphical Charts for northern and southern Britain, writes Colin Waters, are produced by the British Geological Survey in collaboration with the Geological Society Stratigraphy Commission.

The two charts present, in total, 28 lithostratigraphical columns for onshore regions of England, Scotland, Wales, Northern Ireland, the Isle of Man and offshore regions. The onshore regions broadly correspond to the extents of the BGS *Regional Guide Series* and the offshore equate to either single or combined *UK Offshore Regional Report Series* areas. They are intended to complement the new 1:625 000-scale bedrock geological maps and provide a stimulating teaching aid and reference chart for professional geoscientists.

The concept for the charts evolved from the Stratigraphical Table of Germany (Menning & German Stratigraphic Commission, 2002). As with the German chart, the aim is to present regional idealised lithostratigraphical columns, scaled against geological time. The time-scale used, the BGS Geological Time Chart 2007, is based upon the International Commission on Stratigraphy (ICS) "A Geologic Time Scale 2004" (Gradstein et al., 2004). Modifications have included the presentation of the British regional stage nomenclatures in the Carboniferous and Ordovician, in addition to the international names. Also, Quaternary and Tertiary (informal term) have been reinstated, with the former shown as a System, with a base at 2.6 Ma, following decisions approved by the International Union of Quaternary Research (INQUA) and ICS in 2007. Presenting the stratigraphical columns against a time-scale, rather than the traditional approach of displaying thickness, provides an opportunity to visualise, perhaps for the first time, the duration of units, and especially, the great amount of geological time that is represented by gaps in the succession. To maximise the level of detail, it has been necessary to have several scales: most of the Phanerozoic is shown at 1 cm = 10 Ma, although the Quaternary and the 'Precambrian' are shown at larger and smaller scale, respectively.

The stratigraphical nomenclature used on the charts is that formally defined in the BGS Stratigraphical Framework Reports (www.bgs.ac.uk/reference/reports/home.html) and the BGS Lexicon of Named Rock Units (www.bgs.ac.uk/lexicon/lexicon_intro.htms). The columns typically present group and formation nomenclatures. It has not been possible to present all the multitude of approved lithostratigraphical terms on the charts. Decisions have been made by the authors to present either the most representative or most widely known successions for each region. The lithostratigraphical units are coloured according to the dominant environment of deposition for that unit. This demonstrates the lateral extent of depositional environments across Britain and how environments have evolved with time. Symbols are used to denote key characteristics of the units, such as the presence of significant coal or evaporite deposits. Although designed to present the sedimentary and volcanic successions, the charts also display the extent (spatial and temporal) of the main intrusive igneous phases and tectonic events.

The unfolded charts are available from BGS, price £10
www.geologyshop.com

email:sales@bgs.ac.uk. Stratigraphical chart of the UK: Southern Britain 1st Edition ISBN 978-0-7518-3561-8 and Stratigraphical chart of the UK: Northern Britain 1st Edition ISBN 978-0-7518-3562-5.

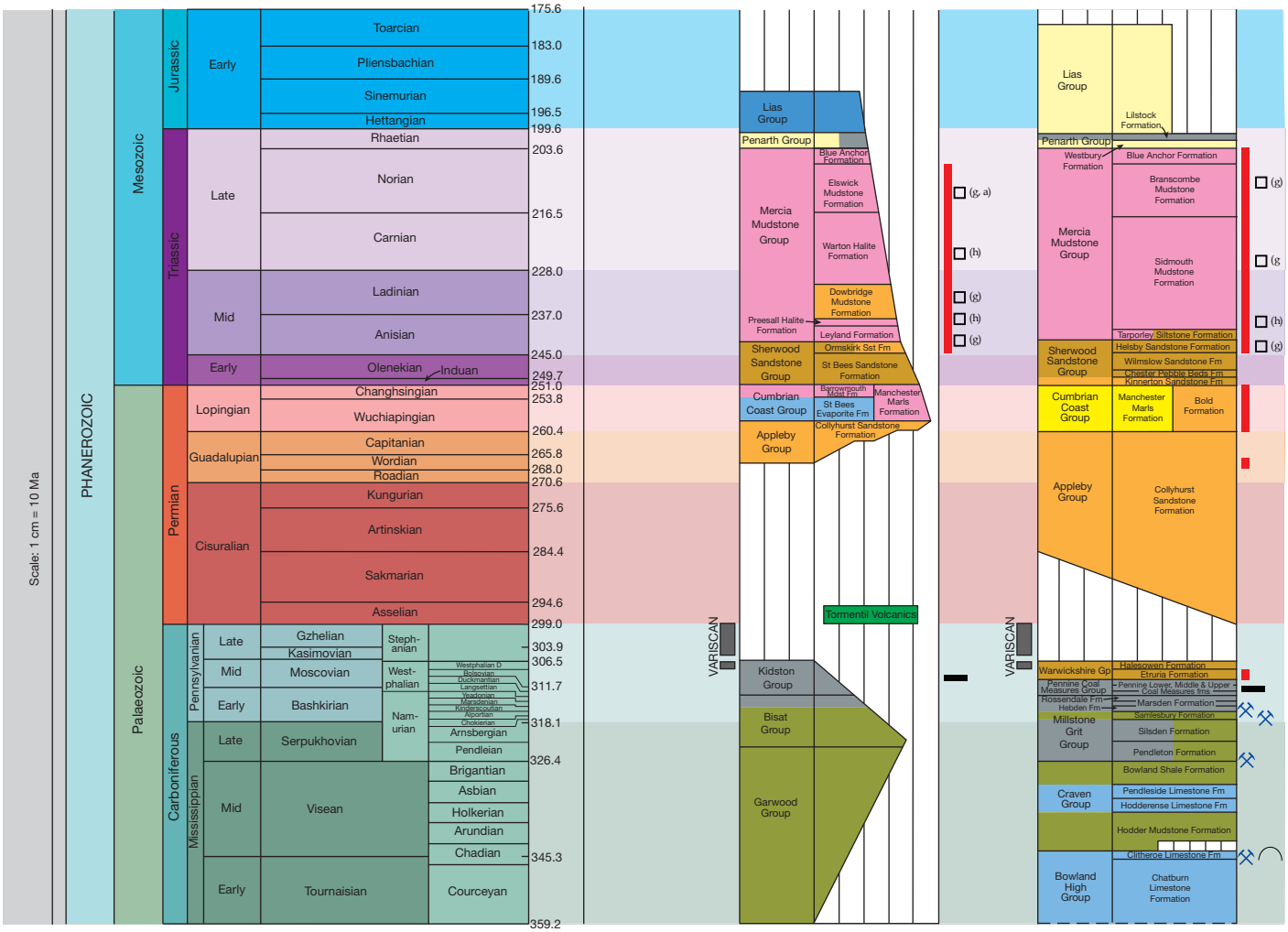
Ref:

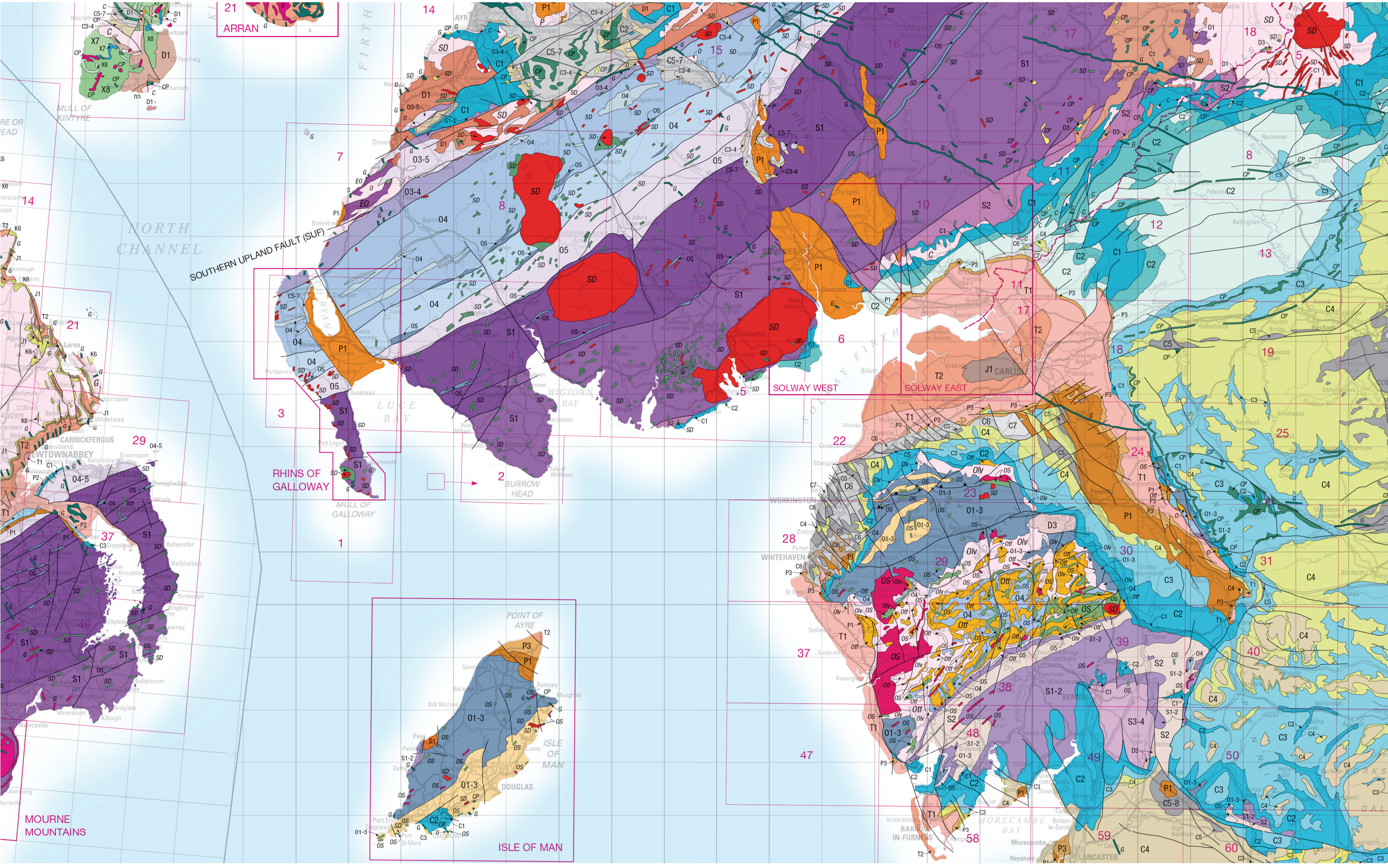
Gradstein, F M, Ogg, J G, Smith, A G, et al. 2004. A Geologic Time Scale: 2004. *Cambridge University Press*, 500pp.

Menning, M and German Stratigraphic Commission 2002. A geologic time scale 2002, in: German Stratigraphic Commission (ed,), Stratigraphic Table of Germany 2002.

{Image for Figure 2 plus caption}

Figure 2 Extract of the Stratigraphical Chart for Southern Britain showing the level of chronostratigraphical and lithostratigraphical details.


Scale: 1 cm = 10 Ma
PHANEROZOIC
Mesozoic
Palaeozoic
Jurassic
Triassic
Permian
Carboniferous
Pennsylvanian
Mississippian
Early
Late
Mid
Toarcian
Pliensbachian
Sinemurian
Hettangian
Rhaetian
Norian
Carnian
Ladinian
Anisian
Olenekian
Induan
Changhsingian
Lopingian
Wuchiapingian
Capitanian
Guadalupian
Wordian
Roadian
Cisuralian
Kungurian
Artinskian
Sakmarian
Asselian
Gzhelian
Kasimovian
Moscovian
Bashkirian
Serpukhovian
Steph-anian
West-phalian
Nam-urian
Westphalian D
Bolsovian
Duckmantian
Langsettian
Yeadonian
Marsdenian
Kinderscoutian
Alportian
Cholsterian
Arnsbergian
Pendleian
Visean
Brigantian
Asbian
Holkerian
Arundian
Chadian
Tournaisian
Courceyan
175.6
183.0
189.6
196.5
199.6
203.6
216.5
228.0
237.0
245.0
249.7
251.0
253.8
260.4
265.8
268.0
270.6
275.6
284.4
294.6
299.0
303.9
306.5
311.7
318.1
326.4
345.3
359.2
Lias Group
Penarth Group
Blue Anchor Formation
Mercia Mudstone Group
Elswick Mudstone Formation
Warton Halite Formation
Dowbridge Mudstone Formation
Preesall Halite Formation
Leyland Formation
Sherwood Sandstone Group
Ormskirk Sst Fm
St Bees Sandstone Formation
Barrowmouth Mdst Fm
Cumbrian Coast Group
St Bees Evaporite Fm
Manchester Marls Formation
Collyhurst Sandstone Formation
Appleby Group
Tormentil Volcanics
VARISCAN
Kidston Group
Bisat Group
Garwood Group
(g, a)
(h)
(g)
(h)
(g)
Lias Group
Lilstock Formation
Penarth Group
Westbury Formation
Blue Anchor Formation
Branscombe Mudstone Formation
Mercia Mudstone Group
Sidmouth Mudstone Formation
Tarporley Siltstone Formation
Helsby Sandstone Formation
Sherwood Sandstone Group
Wilmslow Sandstone Fm
Chester Pebble Beds Fm
Kinnerton Sandstone Fm
Cumbrian Coast Group
Manchester Marls Formation
Bold Formation
Appleby Group
Collyhurst Sandstone Formation
VARISCAN
Warwickshire Gp
Halesowen Formation
Etruria Formation
Pennine Coal Measures Group
Pennine Lower, Middle & Upper Coal Measures fms
Rossendale Fm
Marsden Formation
Hebden Fm
Millstone Grit Group
Sanlesbury Formation
Silsden Formation
Pendleton Formation
Bowland Shale Formation
Craven Group
Pendleside Limestone Fm
Hodderense Limestone Fm
Hodder Mudstone Formation
Clitheroe Limestone Fm
Bowland High Group
Chatburn Limestone Formation
(g)
(g)
(h)
(g)


SOUTHERN UPLAND FAULT (SUF)
NORTH CHANNEL
IRISH SEA
FIRTH OF CLYDE
SOLWAY FIRTH
WIGTOWN BAY
LUCE BAY
MORECAMBE BAY
SOLWAY WEST
SOLWAY EAST
ARRAN
MULL OF KINTYRE
RHINS OF GALLOWAY
MULL OF GALLOWAY
BURROW HEAD
MOURNE MOUNTAINS
ISLE OF MAN
POINT OF AYRE
DOUGLAS
CARRICKFERGUS
NEWTOWNABBEY
BANGOR
WHITEHAVEN
WORKINGTON
BARROW-IN-FURNESS
LANCASTER
CARLISLE
DUMFRIES
KENDAL
AYR