
Castellior Farm Crag RIGS Site

NRW RIGS no. 153 [SH 54302 73907]

[GeoMôn Global Geopark original webpage](#)

RIGS Statement of Interest:

Castellior Farm Crag provides a striking example of one of Anglesey's most characteristic landscape features – glacially scoured bedrock. It provides one of the best and most accessible examples on the island of a roche moutonnée. 'Roche moutonnée' is a term for glaciated bedrock surfaces in the form of asymmetrical mounds of varying shape and size. The up-ice side of a roche moutonnée has been glacially scoured and is smoothly abraded; the down-ice side has a steeper, jagged slope as a result of glacial plucking. Castellior Farm Crag is one of a series of small rocky crags or bosses occurring in otherwise gently undulating farmland. The crag is roughly elliptical, measuring about 50m long (NE–SW), 45m wide (NW–SE) and 5m high. It is composed of micro-crystalline crossite and glaucophane schist of Precambrian age. The landform shows the text-book characteristics of a roche moutonnée with an asymmetrical form, a smooth stoss (up-ice) surface and a clearly plucked lee (down-ice) surface. Glacial plucking at the site has been facilitated by joint sets in the rock. Striae are locally preserved and the overall impression given by the form of the crag suggests ice movement from NNE to SSW.

Geological setting/context: About 2.4 million years ago there was a general cooling of the Earth's climate, heralding the onset of the Quaternary "Ice Age", a period of geological time extending to the present day. In reality, the period has seen a number of cold 'glacial' periods interspersed with warmer 'interglacial' periods such as the one in which we now live. Since about 450,000 years ago there have been at least four intensely cold periods during which large parts of upland Britain were covered by ice sheets for long periods. Although Anglesey was probably overrun by ice on these occasions, only evidence from the last major glacial phase – the Late Devensian – is known. Possible evidence from the warm interglacial period before the Late Devensian may locally have escaped the destructive erosional and depositional effects of the last glaciation. During the Late Devensian, around 20,000 years ago, Anglesey was completely submerged by ice. Two ice sheets from different sources were involved. The Snowdonian mountains were the source of ice streams that moved broadly northwards towards Anglesey, while a massive Irish Sea ice sheet, fed by glaciers from Scotland, Ireland and Cumbria, moved onto the island from the north. The Irish Sea ice stream was dominant, and travelled north-east to south-west across the island, broadly in keeping with its NE–SW-trending, structurally controlled rock ridges. The Welsh and Irish Sea ice streams met in the region of the present-day Menai Strait and produced a confluent south-westward flow. Deposits from the Irish Sea ice tend to contain a wide range of rock types from its diverse source areas and from the varied geology of the seafloor traversed. A red colouration is common, being derived partly from Permian-Triassic rocks offshore. The Irish Sea sediments commonly contain unconsolidated seafloor debris, including sand and shell fragments, dredged from the seafloor by the ice. Tertiary lignite, coal fragments and flint are also a characteristic component of the Irish Sea deposits. Alternatively, deposits from the Welsh ice sheet reflect the geology of its source areas, with a high proportion of Cambrian slates and mudstones, varied Ordovician igneous materials and a blue-grey colouration. Although the broad pattern of the island's glaciation has been understood for nearly 100 years, the exact timing of the arrival and retreat of the different ice masses is poorly understood, as is the relative extent of both ice masses during the Late Devensian. Anglesey contains an exceptional range of Quaternary evidence, in the form of coastal sediment exposures, glacial landforms and erratic boulders, which can be used to reconstruct the glacial history of the island, and elucidate regional variations in ice movement and sedimentary processes. Three separate networks of RIGS have been selected to demonstrate the glacial history of the island. These are:

1. sedimentary sequences;
2. erratic boulders;
and
3. glacial/glaciofluvial landforms.

Selected sites may belong to more than one of these networks.

Network context of the site: Castellior Farm Crag belongs to Network ('glacial/glaciofluvial landforms'). Anglesey exhibits an unusual combination of erosional and depositional landforms in close juxtaposition. Although the precise origin of the Menaian Platform (namely the low-lying surface that forms the general topography of the island) is disputed, the broad coincidence of the direction of strike and glacial movement led to significant and widespread erosion of the strike-line weaknesses that had previously been exploited by pre-glacial weathering. Most of Anglesey's major strike-line valleys were deepened by glacial action, and many troughs, including the largest – Malltraeth, extend beneath present sea level. As a result of structural and lithological controls, the island possesses a distinct north-east to south-west 'grain', rocky knolls and ridges being interspersed with basins and troughs containing extensive glacial, glaciofluvial and post-glacial sediments. In areas where strike-line weaknesses are only local, a 'bosslands' topography has arisen. Smooth polished rock is common and, locally, striations show that ice moved obliquely across ridges and bosses, deviating from the general north-east to south-west movement. Many of the hills and bosses, even the largest like Holyhead Mountain, demonstrate a typical roche moutonnée form, with smoothed up-ice and 'plucked' down-ice sides. Two RIGS, Castellior Farm Crag and Cae Mawr Crag, have been selected to demonstrate these classic erosional landforms which give Anglesey its characteristic landscape. The two sites demonstrate contrasting geological controls and glaciological processes.

References:

CAMPBELL, S. & BOWEN, D.Q. (1989). Quaternary of Wales. Geological Conservation Review Series No. 2. Nature Conservancy Council, Peterborough, 237pp.

GREENLY, E. (1919). The geology of Anglesey. Memoirs of the Geological Survey of Great Britain. HMSO, London, 980pp. (2 vols)

GREENLY, E. (1920). 1:50,000 (and 1 inch to 1 mile) Geological Map of Anglesey. Geological Survey of Great Britain, Special Sheet No. 92 and (93 with parts of 94, 105 and 106).

HOPLEY, D. (1963). The Coastal Geomorphology of Anglesey. Unpublished M.A. thesis, University of Manchester.

WHITTOW, J.B. & BALL, D.F. (1970). North-west Wales. In: Lewis, C.A. (ed.) The Glaciations of Wales and adjoining regions. Longman, London, 21–58. WILLIAMS, A.J. (2003). The sedimentology of Late Devensian glacial deposits in Anglesey, North-West Wales. Unpublished Ph.D. thesis, University of Liverpool.

Condition, use and management:

Present use: The site comprises a natural, glacially scoured rock outcrop located within pasture used for sheep and cattle grazing. A dry-stone wall bisects the crag and another borders part of the rock outcrop where it abuts the private road. Several gates have been placed as barriers at strategic locations to prevent animal access to the crag from the south-west.

Site condition: The crag is in excellent condition with its ice-smoothed and plucked surfaces clearly evident. The only obvious modification to the feature is the wall running across the outcrop which appears to have been derived from local sources, but not obviously the crag itself.

Potential threats: The most serious threat to the crag would be the removal of rock which could seriously damage the landform. Tipping waste or storing materials on or against it could also obscure the feature and reduce its value for education and research. (It should be noted that some tipping of rock and other inert materials has occurred adjacent to some of the other crags in the vicinity (see RIGS No...; Precambrian Reference Site).)

Site Management: The principal conservation aim is to maintain the morphology (shape and form) of the crag in as natural condition as possible. A close liaison should be maintained with the landowner(s) and local planning authority

over all aspects of site management. The current status of the coastal section is ideal and no modifications are currently required.