

Geology of the Aberfoyle district: Holocene

From Earthwise

[Jump to navigation](#) [Jump to search](#)

This topic provides a summary of the geology of the Aberfoyle district - covered by the British Geological Survey. 1:50k geological map sheet 38E (Scotland).

Authors: C W Thomas, A M Aitken, E A Pickett, J R Mendum, E K Hyslop, M G Petterson, D Ball, E Burt, B Chacksfield, N Golledge and G Tanner (BGS).

The beginning of the Holocene (from 11 550 cal. yrs. BP) was marked by significant climatic warming, possibly in as little as a century. Glaciers wasted and receded rapidly, permafrost disappeared and the sea, already at a high level owing to crustal loading by the ice sheet, flooded Loch Lomond and the Forth Estuary. The change from arctic conditions at that time was sufficiently rapid that by the postglacial optimum, about 6 500 years ago, the climate was warmer and wetter than the present day. With the rise in sea level, a beach (now buried by younger deposits) formed at an approximate elevation of +10 m OD (Sissons and Smith 1965^[1]). Maximum sea levels within the district between 6 000 and 8 000 yrs BP were around +15 m OD. Isostatic rebound produced a gradual fall in relative sea level, allowing peat to grow extensively in the upper reaches of the estuary. A major marine transgression, named the Main Postglacial Transgression, began about 8 000 yrs ago, as a result of eustatic sea level rise from the melting of the North American ice sheet, outpacing continuing isostatic rebound. Once again the sea flooded Loch Lomond and the Forth valley as far as Cobleland [NS 532 987], laying down extensive marine silt and clay 'carse' deposits. Most of the earlier peat deposits were buried by the carse clays, but in a large area of Flanders Moss north of Woodend [NS 566 945], peat accumulation kept pace with the marine transgression. The transgression maximum was reached about 6 800 yrs ago, and remnants of the Main Postglacial Shoreline formed about this time exist near Carse of Shannochill [NS 539 985]. The section cut in the Goodie Water east of the Forth Glacier moraine, and the terminal moraine itself, demonstrate these relative changes in sea level as Loch Lomond Stadial ice decayed and the climate warmed (Sissons et al., 1965^[1], Smith, 1993^[2]). In the Goodie Water section, outwash gravels are first buried by marine shoreface grey fine-grained, sands, indicating initial transgression prior to isostatic recovery. Subsequently, isostatic rebound overtook sea level rise and the sea regressed eastwards down the Forth, allowing the subcarse clay peat to form. Subsequently, however, estuarine carse clays were deposited as the sea level rose with the melting of the North American ice sheet.

In recently glaciated parts of the district, unstable, oversteepened slopes were left unsupported once ice disappeared. Large quantities of unconsolidated superficial deposits on these steep slopes became unstable because of high water tables, resulting in numerous slope failures and rock falls as paraglacial landscape readjustment took place during isostatic rebound. Of particular note is the large slip in Gleann nam Meann, which covers nearly 1 km² and extends to the ridge between Gleann nam Meann and Gleann Casaig, immediately to the east. Massive rock failures are common in the north-east of the district between Glen Finglas and Loch Lubnaig, particularly on the steep sides of the latter.

The youngest deposits in the region include the alluvial deposits in fans and water courses, and lacustrine deposits laid down in standing water. Alluvial fans are common at the bases of steep slopes north of the Highland Boundary Fault, particularly along the shores of Loch Lubnaig. Though much less common, some fans are also developed in the lower relief ground to the south of the Highland Boundary Fault. A notable example occurs immediately west of Rednock House [NN 060 010]. The largest spreads of alluvium are associated with the headwaters of the River Teith, draining Loch Lubnaig and Loch Venachar. Spreads of alluvium also underlie the floodplain of the

River Forth to the west of Aberfoyle. The most extensive spreads within the district form the floodplain of the River Endrick, particularly between Drymen and the south-eastern end of Loch Lomond.

References

1. ↑ ¹⁰ ¹¹ Sissons, J B, Cullingford, R A, and Smith, D B. 1965. Some pre-carise valleys in the Forth and Tay basins. *Scottish Geographical Magazine*, Vol. 81, 115-124.
2. ↑ Smith, D E. 1993. Western Forth Valley. 456-463 in Quaternary of Scotland. Gordon, J E, and Sutherland, D G, (editors). *Geological Conservation Review Series*, No. 6. (London: Chapman & Hall.)

Geology of the Aberfoyle district - contents

[Summary](#)

[Introduction](#)

[Geological summary](#)

[History of research](#)

[Neoproterozoic to Cambrian: Dalradian supergroup](#)

[Highland Border Complex: Introduction](#)

[Principal tectonostratigraphical units](#)

[Devonian](#)

[Arbuthnot-Garvock Group \(ATGK\)](#)

[Strathmore Group \(SEG\)](#)

[Stratheden Group](#)

[Carboniferous](#)

[Inverclyde Group \(INV\)](#)

[Quaternary](#)

[Pleistocene](#)

Holocene

Minor intrusions

[Pre-caledonian amphibolite sheets \(Neo-proterozoic Basic Minor Intrusion Suite\)](#)

[Late-caledonian minor intrusions \(North Britain Siluro-Devonian Calc-alkaline Suite\)](#)

[Late-carboniferous quartz-dolerite dykes \(Central Scotland Late Carboniferous Tholeiitic Dyke Swarm\)](#)

[Basalts of unknown age within the highland border complex and the lower Devonian](#)

[Palaeogene basalts and dolerites](#)

Structural history

[Caledonian structures in the highland border complex and dalradian supergroup](#)

[Faulting](#)

Metamorphism

Concealed geology

[Regional and crustal-scale context](#)

[Gravity anomalies](#)

[Magnetic data](#)

Applied geology: Quarry products

[Sites of scientific interest and outstanding beauty](#)

[Water resources](#)

[Geohazards](#)

Information sources

Retrieved from

['http://earthwise.bgs.ac.uk/index.php?title=Geology_of_the_Aberfoyle_district:_Holocene&oldid=53093'](http://earthwise.bgs.ac.uk/index.php?title=Geology_of_the_Aberfoyle_district:_Holocene&oldid=53093)

Category:

- [Aberfoyle - the geology of the district](#)

Navigation menu

Personal tools

- Not logged in
- [Talk](#)
- [Contributions](#)
- [Log in](#)
- [Request account](#)

Namespaces

- [Page](#)
- [Discussion](#)

Variants

Views

- [Read](#)
- [Edit](#)
- [View history](#)
- [PDF Export](#)

More

Search

Navigation

- [Main page](#)
- [Recent changes](#)
- [Random page](#)
- [Help about MediaWiki](#)

Tools

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Permanent link](#)
- [Page information](#)

- [Cite this page](#)
- [Browse properties](#)

• This page was last modified on 29 July 2021, at 13:57.

- [Privacy policy](#)
- [About Earthwise](#)
- [Disclaimers](#)

