

Central Grampian Drift Group, Quaternary lithostratigraphy, Cainozoic of north-east Scotland

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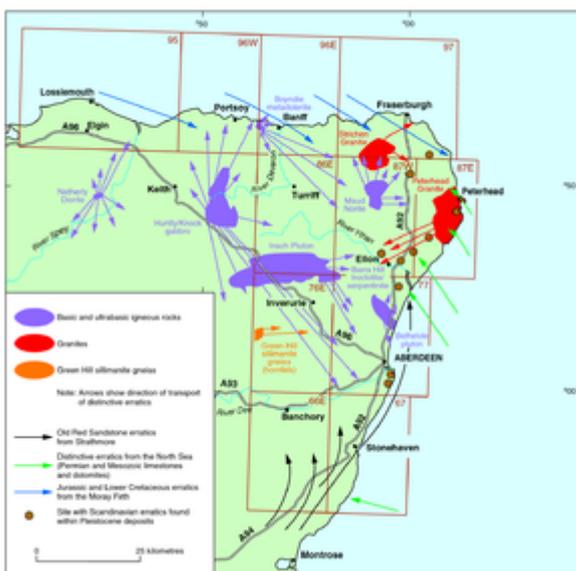
From: Merritt, J W, Auton, C A, Connell, E R, Hall, A M, and Peacock, J D. 2003. [Cainozoic geology and landscape evolution of north-east Scotland](#). Memoir of the British Geological Survey, sheets 66E, 67, 76E, 77, 86E, 87W, 87E, 95, 96W, 96E and 97 (Scotland).

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Central Grampian Drift Group



Transport paths of some indicator erratics in north-east Scotland. P915294.

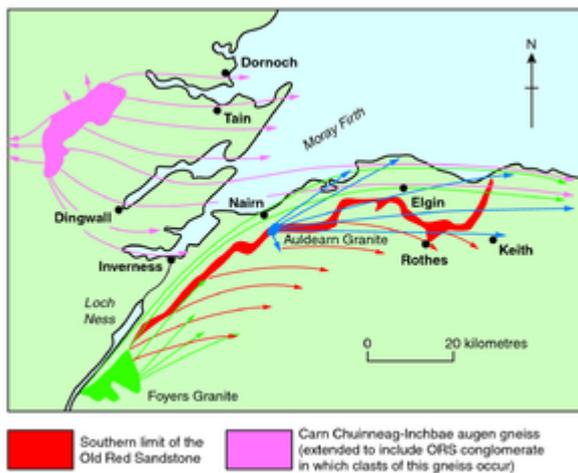
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Generalised flow-lines of ice during the Main Late Devensian glaciation.

P915251.

Deposits of the Central Grampian Drift Group occur on Sheet 95 Elgin and Sheet 96W Portsoy. They

were laid down by ice that radiated outwards from a centre over Rannoch Moor in the western Highlands, carrying rock fragments from the Central Highland Migmatite Complex and Caledonian igneous rocks as well as the local, dominantly psammitic Grampian Group rocks ([P915292](#); [P915294](#)). The ice that entered the district did so by two routes ([P915251](#)). Some ice flowed down the Spey valley and merged with ice from the East Grampians. Other ice flowed northwards towards the Moray Firth where it abutted, and merged with a more powerful stream emanating from the north-west Highlands. These combined ice streams flowed into the Moray Firth and along its southern shores. The relative power of the merging ice streams varied through time, resulting in the interdigitation of deposits of the three drift groups. As in the other groups, some formations have been identified that predate the Devensian.



Map showing the transport paths of some indicator erratics across the southern part of the Moray Firth. P915292.

The interplay between ice streams has resulted in complicated glacial sequences in the Inverness area, on Sheet 84W (Fletcher et al., 1996). There, psammite-rich tills laid down by central Grampian ice overlie tills dominated by Old Red Sandstone lithologies. The latter were laid down by ice that flowed from the Central Highlands via the Great Glen towards Inverness, where it crossed Old Red Sandstone strata. The more powerful flow of ice from the north-west Highlands forced the ice from the Great Glen eastwards across high ground towards the Elgin area, where it laid down sandstone-rich tills and associated glaciofluvial deposits. Some Mesozoic erratics occur in the surficial tills around Burghead and Lossiemouth, indicating that some ice crossed the southern margin of the Moray Firth ([P915292](#)). Deposits have been assigned to the Central Grampian Drift Group on Sheet 96W Portsoy, but Sheet 95 Elgin and Sheet 84W Fortrose were published before the group was formally established.

Till

Oxygen Isotope Stage	Teindland/Elgin	Boyne Limestone Quarry/Keith	Gardenstown/Banff	Byth/Crossbrae	Kirkhill/Leys	Peterhead/Cruden	Ellon/Fyvie	Aberdeen	Banchory	Stonehaven
Flandrian (Holocene) 1										
Loch Lomond Stadial 2a		Garra Hill Gelifluctate Bed		Todhous Gravel Bed			Woodhead Gelifluctate Bed			
Windermere Interstadial 2b		Garra Hill Peat Bed		Thinfolde Peat Bed			Woodhead	Mill of Dyce Peat Bed	Loch of Park Gyttja Bed	Glenbervie Peat Bed
Dimlington Stadial 2c	Spynie Clay Formation	Kirk Burn Silt Formation	Kirk Burn Silt Formation			St Fergus Silt Formation		Tulloch Clay Member		
	Waterworks Till Formation	Arnhash Till Member	Arnhash Till Member	Crossbrae Gelifluctate Bed	Manse Gelifluctate Bed	Ugie Clay Formation	Ugie Clay Formation	Drumthie Sand & Gravel Formation	Lochton Sand & Gravel Formation	Drumthie Sand & Gravel Formation
		Blackhills Sand & Gravel Formation	Blackhills Sand & Gravel Formation	Auchmedden Gravel Formation	Kirkhill Church Sand Formation	Essie Till Formation	Kipet Hills Sand & Gravel	Glen Dye Silts Formation	Glen Dye Silts Formation	Ury Silts Formation
	Tofthead Till Formation	Old Hythe Till Formation	Crovie Till Formation	Byth Till Formation	East Leys Till Formation	Hatton Till Formation	Hatton Formation	Mill of Forest Till Formation	Banchory Till Formation	Mill of Forest Till Formation
				Hythe Till Formation	Hythe Till Formation	Sandford Bay Till Member	Beamie Till Member	Higg/Kingswells Till members		
							Auchincruies Sand & Gravel Formation	Ness Sand & Gravel Member		
							Dem Burn Till Member			
early Late Devensian glaciation	Altonside Till Formation	Whitehills Glaciogenic Formation	Whitehills Glaciogenic Formation		Corse Diamictic Formation	Rafts at Oldmill	Pitturg Till Formation	Anderson Drive Diamictic Formation		
3				Alree of Byth Gravel Formation	Corseid Gelifluctate Bed					
4	Woodside Diamictic Formation		Pashinn Burn Gravel Bed			Aldie Till Formation	Handlacks Gelifluctate Bed			
5a-c	Badenian Sand Bed			Crossbrae Farm Peat Bed		Berryley Peat Bed				Burn of Benholm Peat Bed
Ipswichian Interstadial 5e	Teindland Palaeosol Bed	Truncated palaeosol			Ferriestack Palaeosol Bed	Moreest Farm Sand Bed				
	Orbliston Sand Bed									
6f	Deanshillock Gravel Formation	Red Burn Till Formation	Crag of Boyne Till Formation	Crossbrae Till Formation	Rottenhill Till Formation	Camp Faudh Till Formation	Pitturg Till in part?	Tillybrex Sand & Gravel Formation		Benholm Clay Formation
					West Leys Sand & Gravel Formation		Bellcampbell Till Formation			Birnie Gravel Formation
					Campbell Gelifluctate Bed					
					Swinden Sand Bed					
7f					Kirkhill Palaeosol Bed					
8f					Pitcow Sand & Gravel Formation					
					Kirkton Gelifluctate Bed					
					Denend Gravel Formation					
					Leys Till Formation					
References	Hall et al. (1995)	Sheet 96W Godwin and Willis (1959) Peacock and Merritt (2000a)	Sheet 96E Peacock and Merritt (1997)	Hall et al. (1995) Whittington et al. (1996)	Connell and Hall (1987)	Sheet 87E Connell and Hall (1987) Whittington et al. (1993)	Sheet 87W Connell and Hall (1987) Hall and Jarvis (1995)	Bremner (1931, 1943) McLean (1977) Munro (1986) Munro (1977)	Sheet 66E Vasari (1977)	Sheet 67 Auton et al. (2000)

NOTE: In general, minimal ages are shown. For example, Crossbrae Gelifluctate Bed may be OIS 2c to 4, Anderson Drive Diamictic may be OIS 6, Kirkhill Palaeosol Bed may be OIS 9 or 11. All Peat and Palaeosol beds are assigned to the group of the underlying or enclosing deposit. Italicized units are informal; they have not been entered into the BGS Lexicon.

Central Grampian Drift Group East Grampian Drift Group Banffshire Coast Drift Group Logie-Buchan Drift Group Meams Drift Group Dated unit

Correlation of lithostratigraphical units in north-east Scotland. P915347.

No formations have been mapped out individually, but a local stratigraphy has been established in the vicinity of the [Teindland](#) site (Hall et al., 1995; [P915347](#)). In the Elgin area, brown sandy tills of the Central Grampian Drift Group contain many well-rounded clasts derived from Old Red Sandstone conglomerates cropping out to the west. They overlie dark grey clayey tills containing shell fragments and Mesozoic erratics derived from the bed of the Moray Firth to the north-west (Peacock et al., 1968; Aitken et al., 1979). Hall et al. (1995a) name the former unit the Tofthead Till and the latter the Alton-side Till (Banffshire Coast Drift Group). They also recognise a younger sandy diamictic, the Waterworks Till. They conclude that all three tills, together with locally intervening units of sand and gravel, were laid down in different phases of the Main Late Devensian glaciation, the Waterworks Till being the result of a minor re-advance. The Tofthead Till probably correlates with the Old Hythe Till at the Boyne Limestone Quarry (Peacock and Merritt, 2000).

None of the three Late Devensian tills occurring in the vicinity of Teindland appears to be present at the main site. Instead, another sandy till unit occurs that Hall et al. (1995a) name as the Teindland Till and assign to the Early Devensian. It overlies a package of units that includes the Teindland Buried Soil, which probably dates from the Ipswichian (OIS 5e). The soil lies stratigraphically above a unit that Hall et al. (1995a) name as the Teindland Gravel. It is composed predominantly of rounded clasts of quartzite and psammite that are probably largely derived from Old Red Sandstone conglomerates. Nearby, it overlies the Red Burn Till, the oldest known till in this area. Although reddish brown in colour and containing clasts mostly of quartzite and psammite, this diamictic, like the Alton-side Till, contains some Mesozoic erratics and hence it is also assigned here to the Banffshire Coast Drift Group, albeit tentatively.

Another old till unit assigned here to the Central Grampian Drift Group occurs at the [Boyne](#)

[Limestone Quarry](#). This very sandy diamicton, the Craig of Boyne Till Formation, contains much decomposed, easily weathered calc-silicate rock and therefore appears to be weathered to a greater extent than it is (Peacock and Merritt, 2000). Nonetheless, it contains some clasts that have been considerably weathered in situ and is therefore likely to be pre-Devensian in age, like the Red Burn Till at Teindland.

Other deposits

Although the sand and gravel occurring on Sheet 95 Elgin was mainly laid down at the margin of the Moray Firth ice stream as it retreated, its composition suggests that much of the ice crossing the area was probably sourced in the central Highlands. Therefore, these glaciofluvial deposits should be assigned to the Central Grampian Drift Group, but no formal lithostratigraphical units have yet been set up. The only current named unit is the pre-Devensian Teindland Gravel.

References

[Full reference list](#)

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