

NORTH DONEGAL - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	Tremone Bay
Other names used for site	White Strand
IGH THEME	IGH5 Precambrian
TOWNLAND(S)	Ballycharry, Ballymagarahy
NEAREST TOWN/VILLAGE	Gleneely, Culdaff
SIX INCH MAP NUMBER	12
ITM CO-ORDINATES	659070E 947600N (White Strand)
1:50,000 O.S. SHEET NUMBER 3	GSI BEDROCK 1:100,000 SHEET NO. 1
GIS Code ND007	

Outline Site Description

Tremone Bay is a wide bay on the northeast coast of the Inishowen peninsula. The site is characterised by a sandy beach, shoreline bedrock exposures, a raised beach platform and coastal cliffs.

Geological System/Age and Primary Rock Type

The Inishowen ice-rafted debris (dropstone) deposits at the site are dated to c. 590–570 million years ago and are Neoproterozoic in age. These deposits have been interpreted as representing the global Marinoan-Varangerian glacial episode. (The Port Askaig Tillite is Sturtian in age, dated at c. 720 million years ago). The dropstone horizons occur in c. 600 m of lower Southern Highland Group (Fahan Grits, Cloghan Green Beds) strata.

Main Geological or Geomorphological Interest

Many of Neoproterozoic rock successions found worldwide are characterized by two glacial episodes: the Sturtian and the Marinoan-Varangerian (c. 590 million years ago). Ireland and Scotland (NE Laurentia) are typically considered as containing evidence of only one of these episodes, the older Sturtian glacial episode, in rocks of the Port Askaig Tillite. (This formation is a hugely important geological formation in the Dalradian Supergroup rocks of Ireland and Scotland.)

However, in Donegal, the Port Askaig Tillite occurs c. 3km-5km below (in the stratigraphic record) the Inishowen ice-rafted debris deposits found in coastal outcrops at the NW end of White Strand, Tremone Bay. As a result, the Tremone Bay site provides evidence for the second Neoproterozoic glacial episode (Marinoan-Varangerian) in the form of ice rafted debris and frozen diamictite clasts in coastal bedrock outcrops. Therefore the Dalradian Supergroup of Donegal is now recognized as containing two temporally and stratigraphically separate Neoproterozoic glaciogenic horizons: the older Port Askaig Tillite (base of the Argyll Group) and the younger Inishowen ice-rafted debris deposits (base of the Southern Highland Group). This site at Tremone Bay assists in building a temporal understanding the Dalradian Supergroup, and also an understanding of the breakup of the supercontinent of Rodinia and the opening of the Iapetus Ocean along this margin of Laurentia.

Site Importance – County Geological Site; recommended for Geological NHA

The Inishowen ice-rafted debris deposits at the Tremone Bay site indicate that the Dalradian Supergroup of Donegal contains strata representing both the Sturtian and the Marinoan-Varangerian glaciations. This internationally important site is hugely significant in helping to develop a temporal understanding the Dalradian Supergroup, and an understanding of the breakup of the supercontinent of Rodinia, and the opening of the Iapetus Ocean along this margin of Laurentia. This CGS is recommended for geological NHA status.

Management/promotion issues

This is an excellent site in terms of Cryogenian glaciations of the Neoproterozoic era and the so-called 'Snowball Earth' hypothesis. An easy to access public beach site, with adequate parking, it is an excellent geology and palaeo-environmental teaching site.



White Strand at Tremone Bay, looking southeast from beach, near parking area.



Cloghan Green Beds at the northwest end of White Strand, looking northwest along coast.



Raised beach platform at Tremone Bay, viewed looking northwest from beside GAA field, towards car park (centre) and outcrops at northwest end of White Strand.

