



Marine Geoscience Report 006

Saltee Islands

Overview

Located approximately 5 km off the coast of Kilmore Quay, the Saltee Islands, Great Saltee and Little Saltee, are underlain by distinctive pink granitoid bedrock. These islands record granite intrusion during the Caledonian Orogeny over 430 million years ago (Ma), followed by later glacial and coastal processes that shaped the present landscape.

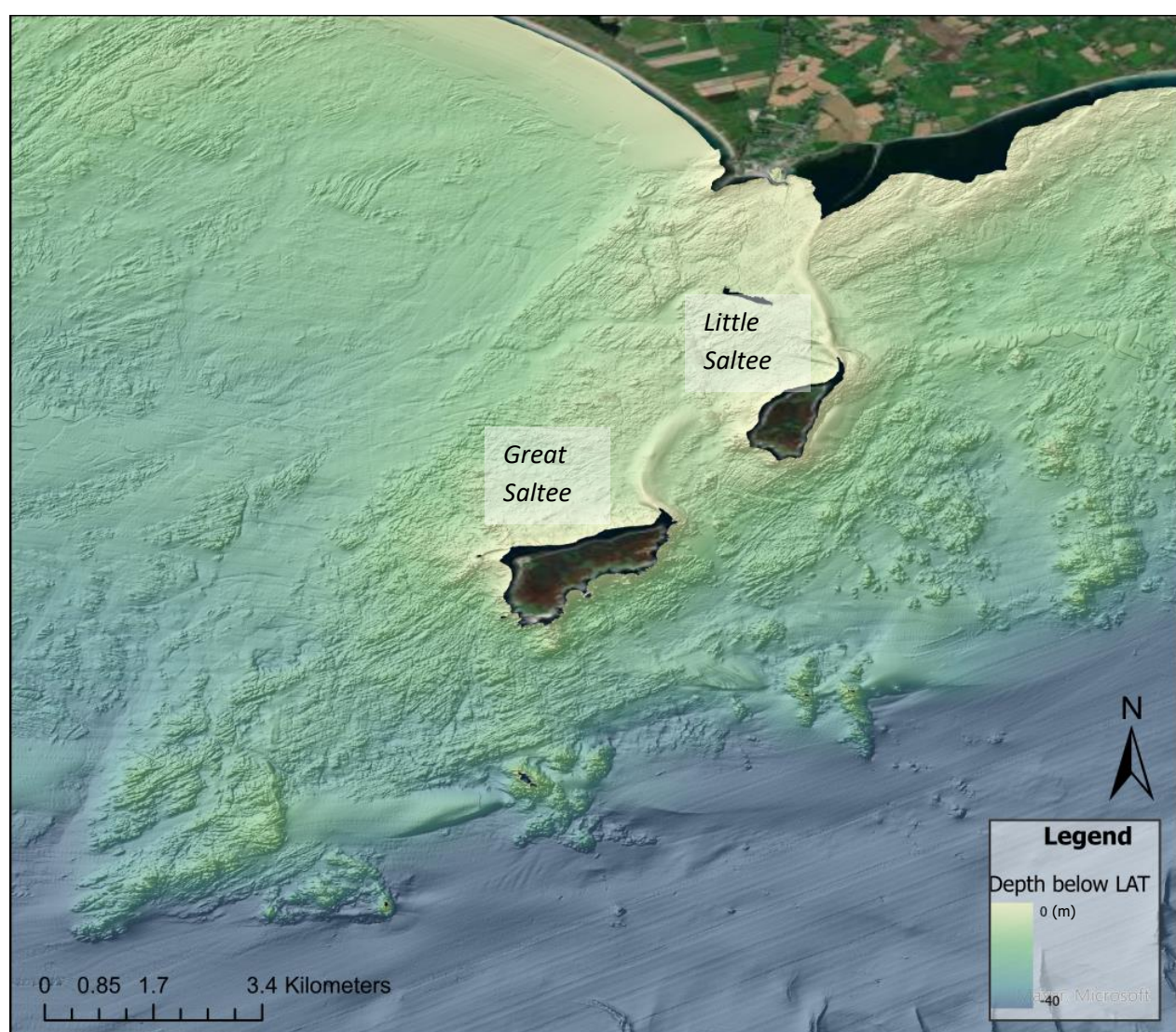


Figure 1: Bathymetry of the Saltee Islands. Depths are given as negative below Lowest Astronomical Tide (LAT), and positive above LAT.

Geological History of Wexford

The geology of County Wexford is extremely complex, consisting of igneous, metamorphic and sedimentary rocks. Igneous and metamorphic rocks, older than 541 Ma, are present in the form of granites, quartzites, gneisses and schists between Kilmore Quay and Rosslare, and are part of the Rosslare Complex (Meehan, et al., 2018). The Rosslare Complex contains some of the oldest rocks in Ireland, believed to be at least 620 Ma. They are interpreted to have formed on the Avalonian microcontinent, as an oceanic plate subducted beneath Avalonia. This produced a range of igneous and metamorphic rocks (Hurley, 2020). This band of rocks is unique in Ireland, as rocks from Avalonia do not occur anywhere else on the island.

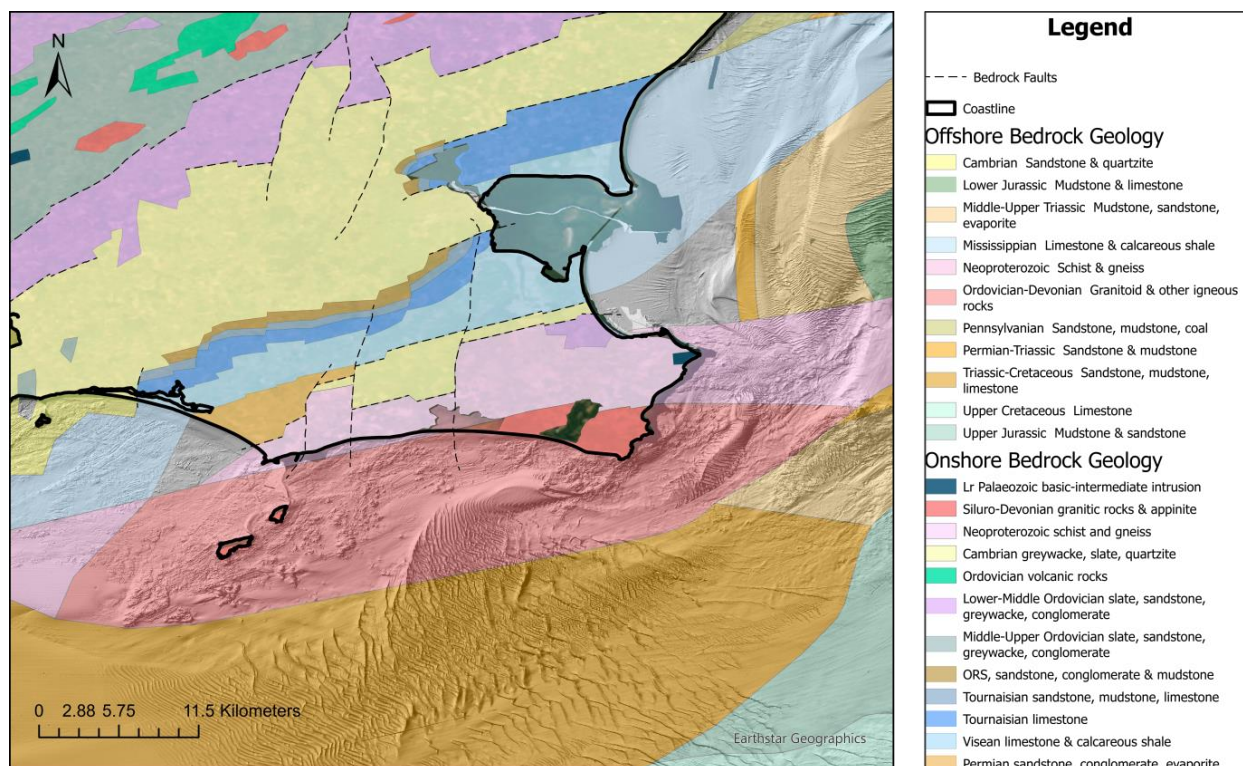


Figure 2: Geology of South Wexford.

Geology of the Saltees

Around Kilmore Quay, the bedrock is principally composed of thin bands of gneiss and dark grey schist, cross-cut in places by diorite dykes which were injected into the bedrock more than 420 Ma (Meehan, et al., 2018). The rocks were heavily deformed and metamorphosed during the Caledonian Orogeny, a major continental collision and mountain building event that took place between 470 and 400 Ma. The Saltees granite was emplaced during this deformation event (Meehan, et al., 2018).

The Saltees are made of pink granitoid, specifically granodiorite that was intruded into the Rosslare Complex about 436 Ma, during the Silurian to Devonian period. The Saltees granite is fine-grained and pink in colour, with an equigranular mixture of quartz, two different types of feldspar (plagioclase and microcline) and some mica (Kennan, 2009). The Saltees granite is found in few other places in Ireland, though there is some exposure on the southern shores of Wexford. It was emplaced within an actively deforming shear zone, meaning the granite itself was also deformed (Meehan, et al., 2018), resulting in a planar texture called foliation that dips steeply to the north-west (Kennan, 2009).

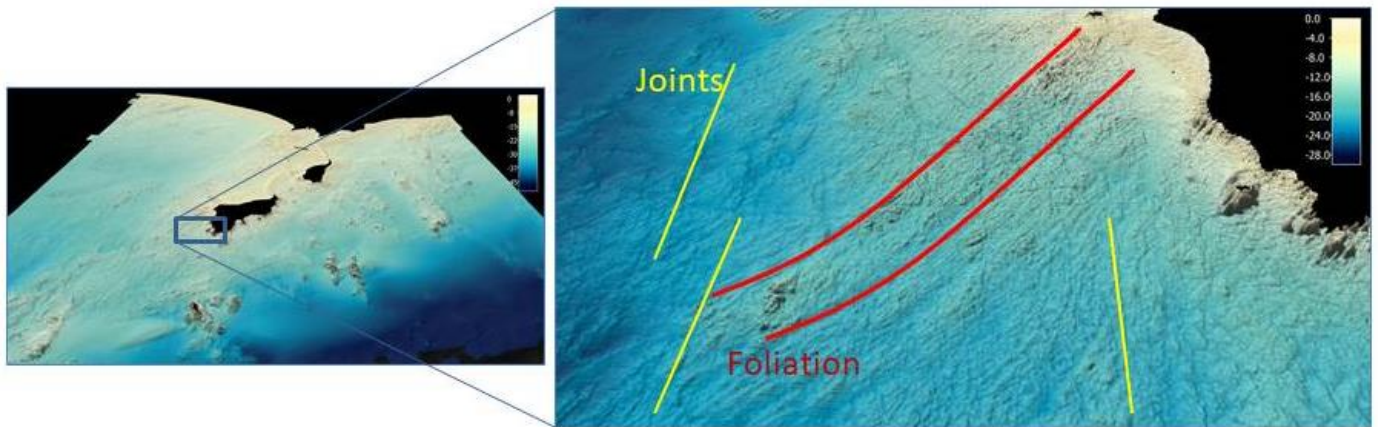


Figure 3: Structural features on the seabed around Great Saltee.

Detailed mapping of the seabed around the Saltees has revealed the presence of several submarine lineations and structural features. These include jointed granite surfaces and potential fault zones that continue offshore, with some of these features aligning with onshore structures visible on Little Saltee. The granite body, as seen in Figure 2, is roughly oval-shaped and elongated north-east to south-west, further reflecting the tectonic forces that shaped this region.

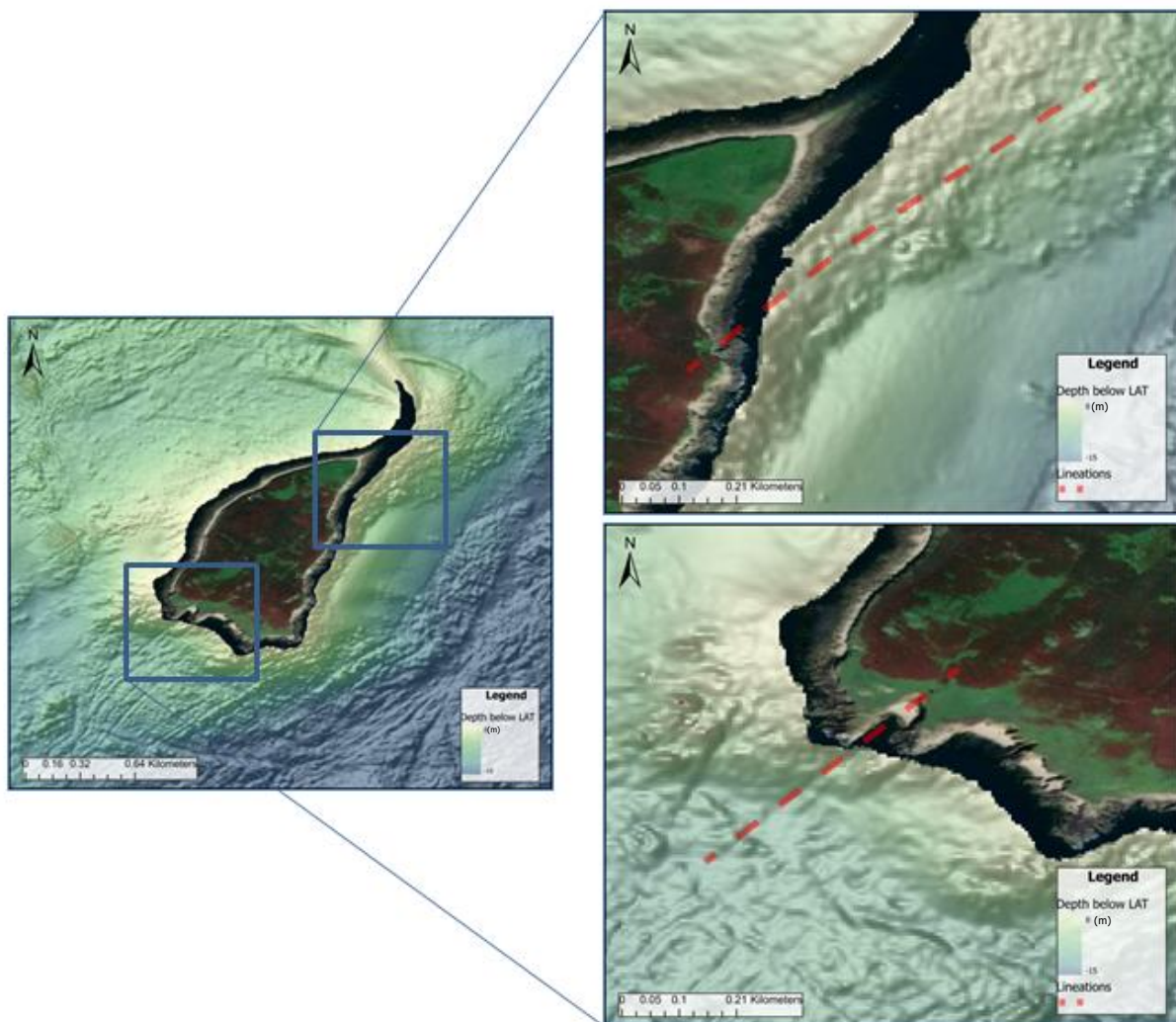


Figure 4: Offshore continuations of lineations on Little Saltee

The hinterland of Great Saltee is covered by limestone-rich clay, deposited by melting glaciers over 10 ka (Meehan, et al., 2018). These glacial deposits have subsequently been reworked by strong tidal currents, forming causeways between the two islands. Following deglaciation, rising sea levels and coastal erosion further modified the islands. Today, the rugged coastlines of the Saltee Islands are characterised by steep cliffs, sea stacks and wave-cut platforms, all products of ongoing marine erosion.

Conclusion

The Saltee Islands record a long geological history shaped by Caledonian granite intrusion, deformation, glaciation and ongoing coastal erosion. The islands' pink granitoid bedrock, jointed rock surfaces and offshore lineations reflect the tectonic history of south Wexford, while the surrounding seabed shows how glacial deposits, tidal currents and wave action continue to influence the marine landscape.

The rugged granite cliffs and steep rock formations have also shaped the islands' maritime and ecological significance. These exposed shores have long posed hazards for vessels navigating the area, particularly during poor visibility and rough seas. The islands' isolation, cliffs and ledges also provide important nesting habitat for seabirds, including puffins, gannets and guillemots. Together, these features make the Saltee Islands significant for both geology and biodiversity.

Bibliography

- Hurley, J., 2020. *Forlorn Point*. [Online]
Available at: <https://www.southwexfordcoast.com/swcprom/wp-content/uploads/2020/01/504-Forlorn-Point-geology.pdf>
- Kennan, P., 2009. *A Geological Visit to the Saltee Islands*. [Online]
Available at: https://www.geoschol.com/more/iga_field_guide_saltee_islands.pdf
- Meehan, R., Hennessy, R., Parkes, M. & Gatley, S., 2018. *The Geological Heritage of County Wexford. An Audit of County Geological Sites in County Wexford*, s.l.: Geological Survey Ireland.