



# Marine Geoscience Report 006

## St. Patrick's Bridge

### Overview

Located approximately 5 km off the coast of Kilmore Quay, the Saltee Islands – Great Saltee and Little Saltee – are renowned for their unique geological characteristics, particularly the presence of pink granitoid rock. These islands, composed predominantly of granite, were shaped by significant geological events such as granitic intrusions during the Caledonian Orogeny over 430 million years ago (Ma), along with later glacial and coastal processes that have since sculpted the 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 Country Wexford is extremely complex, consisting of igneous, metamorphic and sedimentary rocks. Igneous and metamorphic rocks, from before 541 Ma, are present in the form of granites, quartzite, gneisses and schists between Kilmore Quay and Rosslare, and are part of the Rosslare Complex (Meehan, et al., 2018). The Rosslare Complex are some of the oldest rocks in Ireland, believed to be at least 620 Ma. They would have formed on the Avalonian microcontinent, as an oceanic plate subducted beneath Avalonia producing 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.

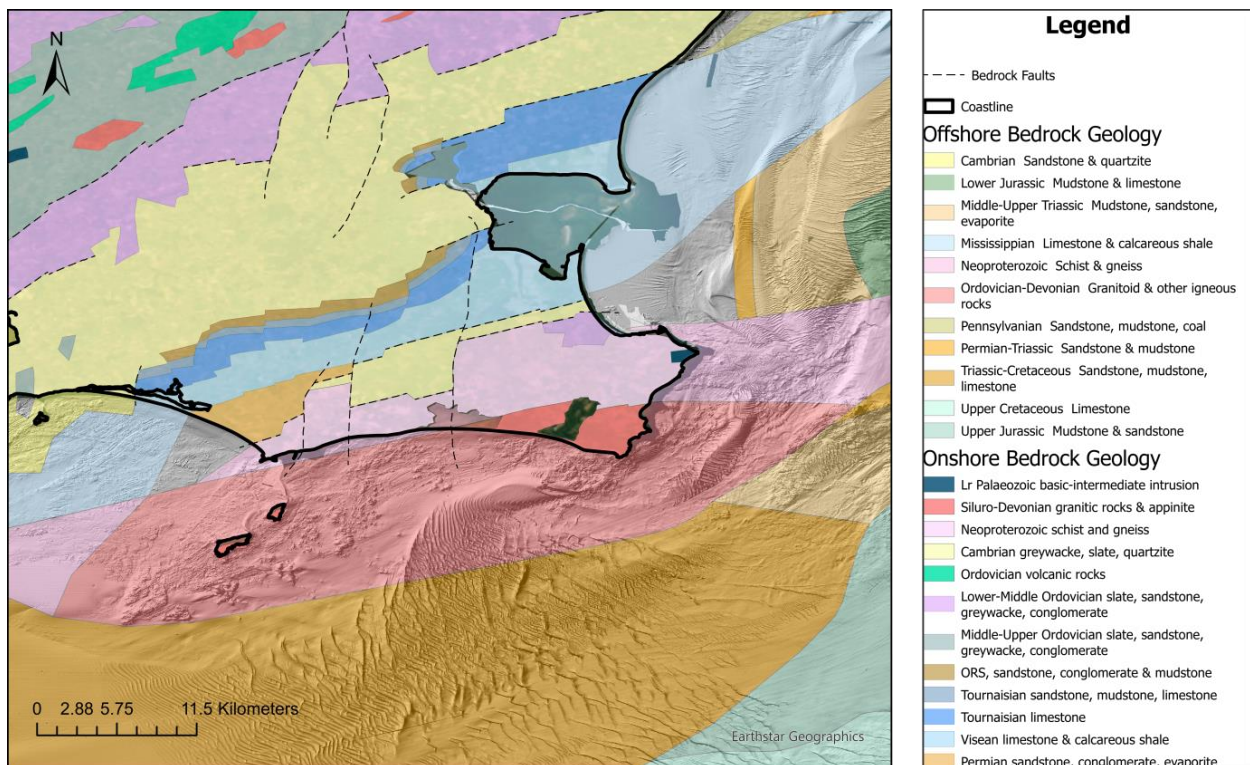


Figure 2: Geology of South Wexford.

## Geology of the Saltees

Around Kilmore Quay, the bedrock is principally composed of thick bands of gneiss and dark grey schist, crosscut in places by diorite dykes which would have been injected into the bedrock over 420 Ma (Meehan, et al., 2018). The rocks were heavily deformed and metamorphosed during the Caledonian Orogeny; it was during this deformation event that the Saltees granite was emplaced (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, 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 little other places in Ireland, though there is some exposure on the southern shores of Wexford. Saltees granite was emplaced during an actively deforming shear zone, leaving the granites also deformed (Meehan, et al., 2018), resulting in a planar texture called foliation that dips steeply to the NW (Kennan, 2009).

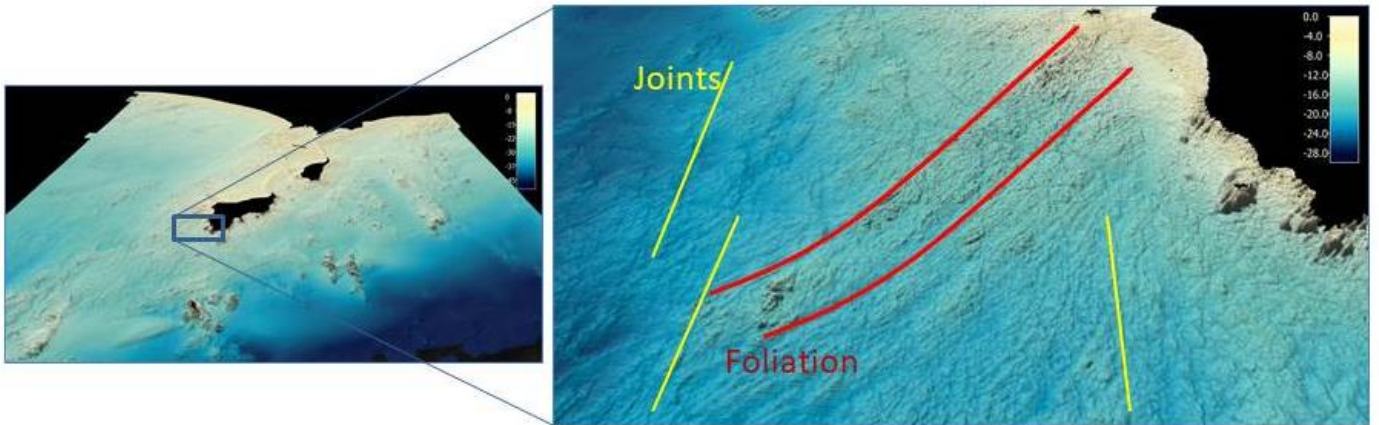


Figure 3: Structural features on the seabed around Great Saltee.

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 complete granite, as can be seen in Fig 2, is roughly oval shaped and elongated in the NE – SW, further reflecting the tectonic forces that shaped this region.

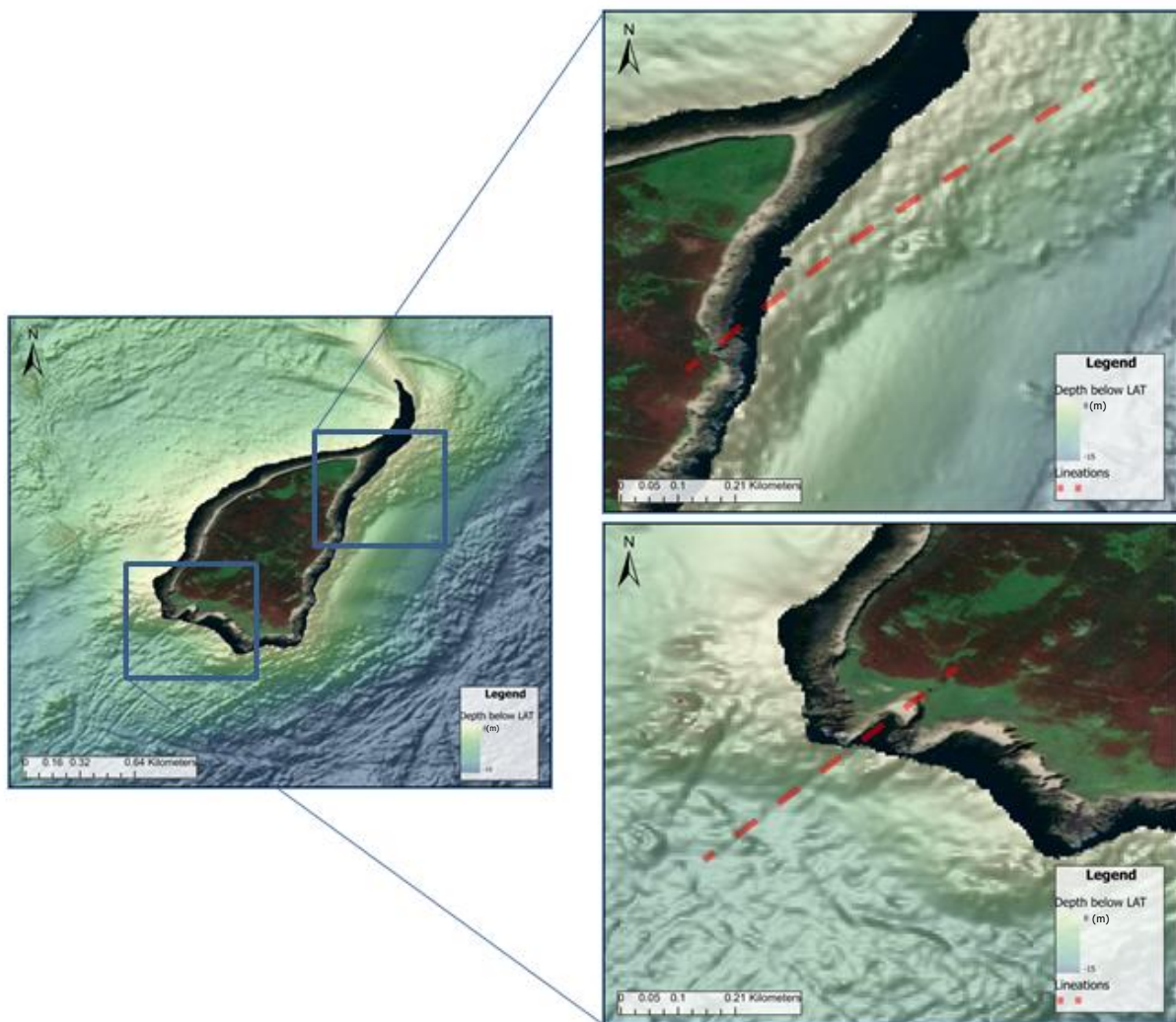


Figure 4: Offshore continuations of lineations on Little Saltee

The hinterland of Great Saltee is covered by limestone-rich clay, deposited by melting glaciers over 10 ka (Meehan, et al., 2018). From these glacial deposits, the strong tidal currents in the area have formed causeways between the two islands. After the glaciers melted and retreated, rising sea levels and coastal erosion further shaped the island. Today, the rugged coastlines of the Saltee Islands are characterized by steep cliffs, sea stacks and wave-cut platforms, all products of ongoing marine erosion.

## Conclusion

The Saltee Islands stand as a testament to the region's rich geological history, shaped by ancient tectonic events and ongoing coastal erosion. The rugged granite cliffs and steep rock formations that rise sharply from the sea not only reveal the islands' tectonic past but have also posed hazards for ships navigating these waters. Throughout history, many vessels have met their fate on these jagged shores due to poor visibility and rough seas. Additionally, the islands' isolation and ledges formed by the jointed granite provide a safe haven for a wide variety of seabirds, including puffins, gannets, and guillemots. This makes the Saltee Islands an important breeding ground for bird species, underscoring their significance as both a geological and ecological treasure.

## Bibliography

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