



Marine Geoscience Report 028

Skerd Rocks

Overview

The Skerd, or *Sceirde*, Rocks are a rugged cluster of exposed and submerged skerries off the Connemara coast, south-west of Carna. They rise steeply from the Atlantic seabed and present significant hazards to navigation because of their shallow, near-awash reefs and strong tidal streams. The largest skerry, Skerd Mór, reaches 18 m above sea level, while numerous shallow shoals lie immediately offshore. These outcrops represent a boundary zone where ancient metamorphic and igneous rocks meet the full force of the Atlantic.

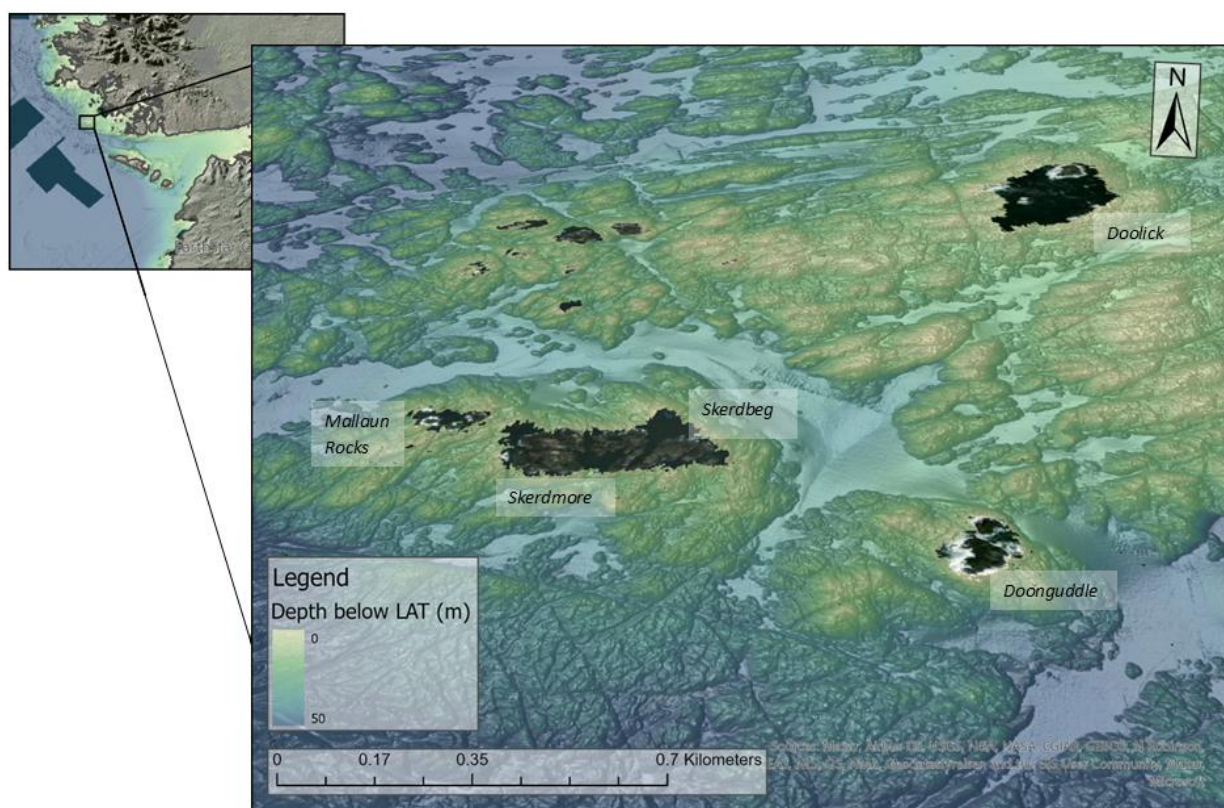


Figure 1: Overview of bathymetry around Skerd Rocks. Depths are referenced to Lowest Astronomical Tide (LAT).

Beneath this exposed seascape lies a long geological history, that begins in the Precambrian over 540 Ma, spans multiple continental collisions, volcanic eruptions, and granite intrusions, and ends in the present with bare rock reefs swept clean by waves and currents. The fact that these rocks stand proud on the seabed today, with little sediment cover, reflects this inherited bedrock structure, later glacial erosion and ongoing wave and tidal reworking.

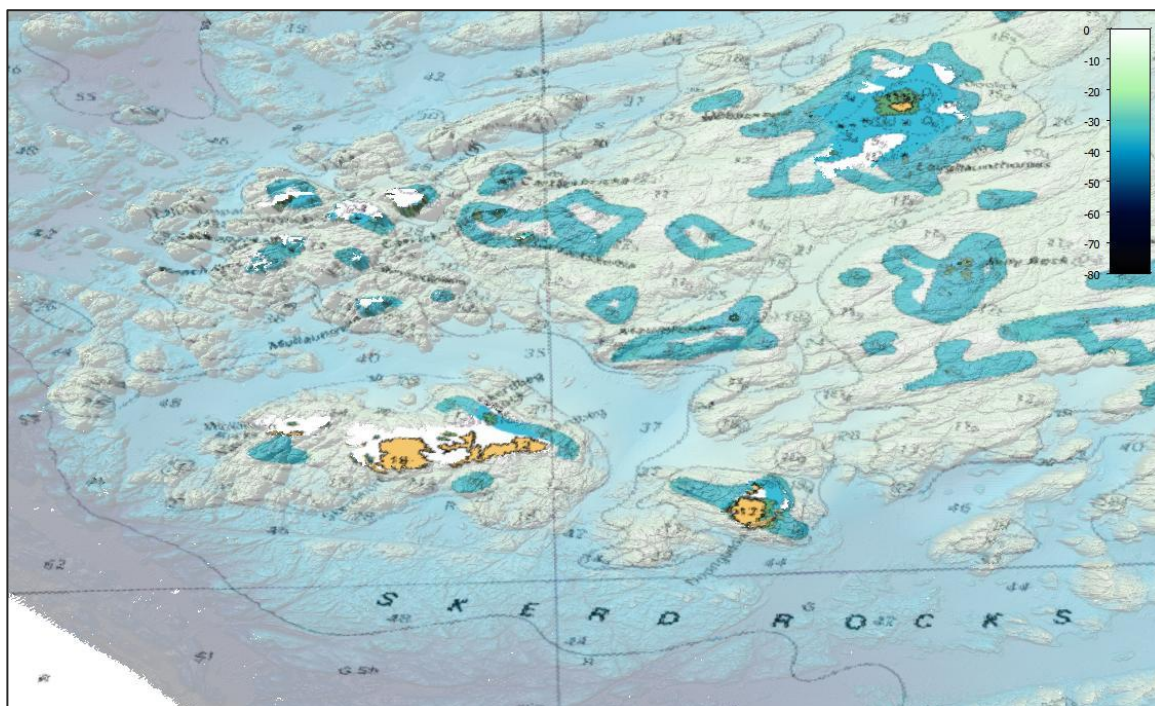


Figure 2: 3D bathymetry blended with nautical chart imagery showing shallow reefs and navigational hazards around the Skerdy seabed.

Geological history

The geological history begins in the late Precambrian Eon (800 to 541 Ma), when sediments and occasional volcanic layers accumulated along the rifting margin of the ancient continent Laurentia. This vast succession is the Dalradian Supergroup, a sequence of metasedimentary and metavolcanic rocks found not only in Connemara but also in North Mayo, Donegal and western Scotland, indicating a once-contiguous tectonic domain prior to the opening of the Iapetus Ocean (Ryan & Dewey, 2004). This sequence was later metamorphosed into schists, marbles and quartzites that form much of the Connemara Massif, north of Skerdy. As rifting progressed, the Iapetus Ocean opened and then widened to oceanic scale before later closure, a plate-tectonic cycle recorded by the Dalradian and younger rocks in the Galway Bay region (Pracht & Feely, 2004).

In the Early Ordovician (485 to 470 Ma), submarine volcanism and sedimentation to the south had built successions later metamorphosed at relatively low temperatures and pressures – conditions geologists' term greenschist facies. Greenschist facies produce greenish minerals such as chlorite and epidote and impart a soft sheen and foliation to the rocks. These greenschist-facies units are grouped as the South Connemara Group and form the metamorphic-volcanic basement south of the Skerdy fault line (Feely, et al., 2003).

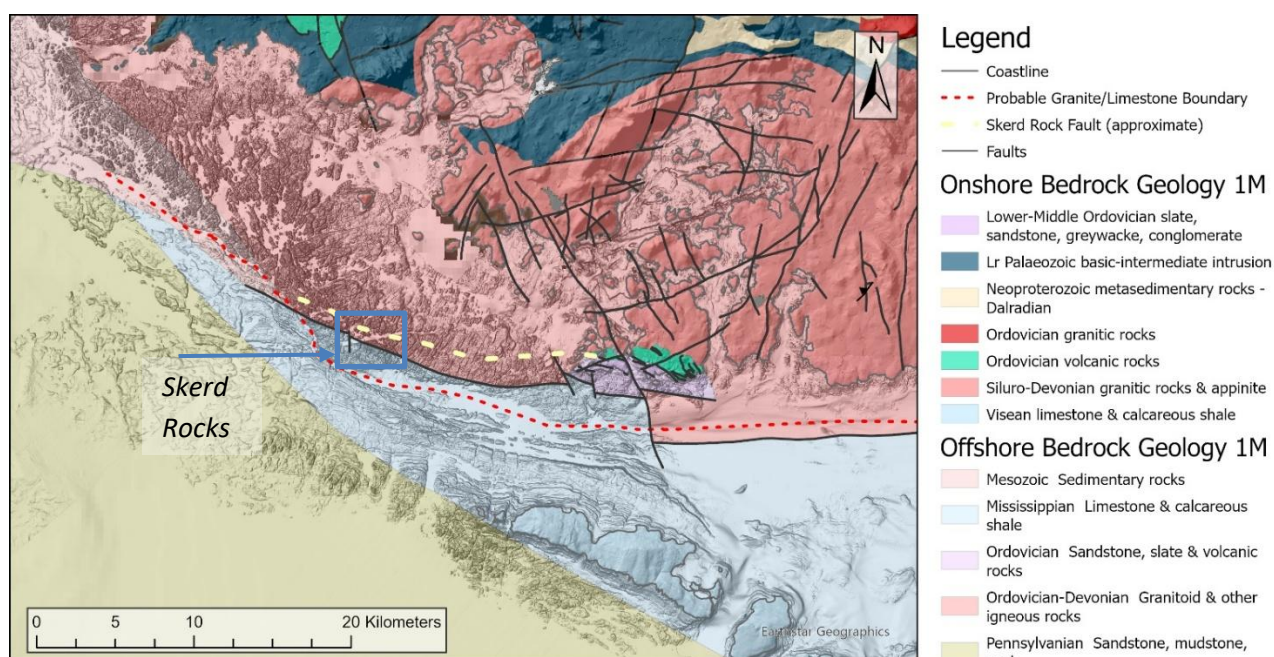


Figure 3: Regional Geology of western Galway, with approximate location of the Skerd Rocks Fault, after (Feely, 2025).

The convergence of these contrasting rock groups occurred during the Caledonian orogeny (475 to 400 Ma), a major continental collision and mountain-building episode caused by the closure of the Iapetus Ocean and the collision of crustal blocks (Pracht & Feely, 2004). This event sutured together the northern Dalradian terrane and southern Ordovician arcs along a major structure now recognised as the Skerd Rocks Fault (Leake & Tanner, 1994). The Skerd Rocks Fault runs east-west just north of the Skerd islets, though due to the complex structural history, it's difficult to distinguish the fault in the bathymetry data (Healy, 2003). The skerries themselves are underlain by greenschist-facies metavolcanics and metasediments, indicating their position on the southern side of the fault. Structurally, the Skerd Rocks lie within a zone of intense Caledonian deformation marked by major faults, joints and shear zones.

By the Late Silurian to Early Devonian (420 to 380 Ma), the region experienced extensive plutonism, involving the intrusion and slow cooling of large bodies of molten rock at depth. This formed the 80 km long, west-north-west trending Galway Granite Batholith (Feely, et al., 2003). Granite emplacement effectively stitched the Skerd Rocks Fault, locking the two terranes together (Pracht & Feely, 2004). The Galway Granite's strength and resistance to erosion have had a lasting influence on the seabed morphology of the Skerd Rocks area.

Today, the Skerd Rocks themselves consist primarily of schists and quartzites of the South Connemara Group, Early to Middle Ordovician in age, around 490 to 470 Ma. These rocks originated as volcanic and sedimentary deposits on the Iapetus Ocean floor, intruded by granites (McKie & Burke, 1955). Many of these rocks exhibit strong foliation and metamorphic banding, mainly generated during the Ordovician phase of the Caledonian orogeny, which produced the dominant regional metamorphic fabrics in Connemara. The multiple fault orientations mapped in the Galway Granite record later, cooler brittle deformation during and after granite emplacement, as the regional stress field evolved. An early north-east trending set is partially annealed, consistent with faulting while the pluton was still hot, and is overprinted by near-vertical north-west trending faults, and a younger south-west trending set (Healy, 2003).

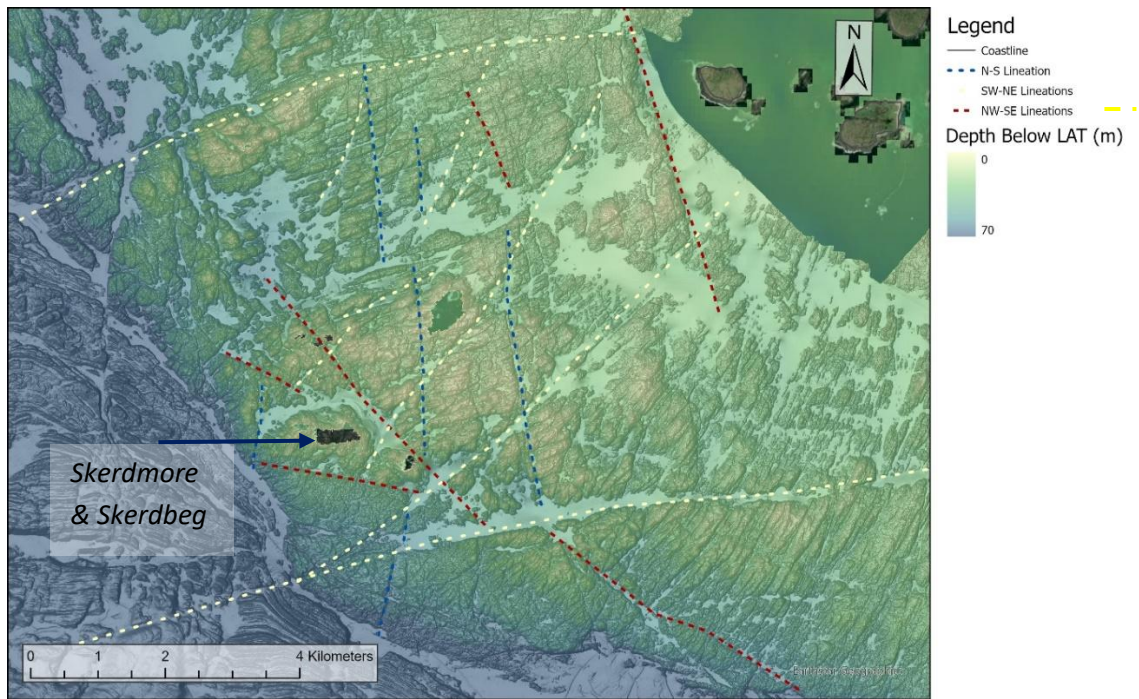


Figure 4: Bathymetry of Skerd Rocks, with various orientations of lineations marked.

During the Carboniferous period (359 to 299 Ma), warm shallow seas laid down extensive limestones across Ireland (Pracht & Feely, 2004). However, in the Skerd area, no Carboniferous cover is preserved. This absence may reflect non-deposition over a relative structural high, or later erosion of any cover that was deposited. The resistant granite and metamorphic basement therefore remained important in controlling the later seabed form.

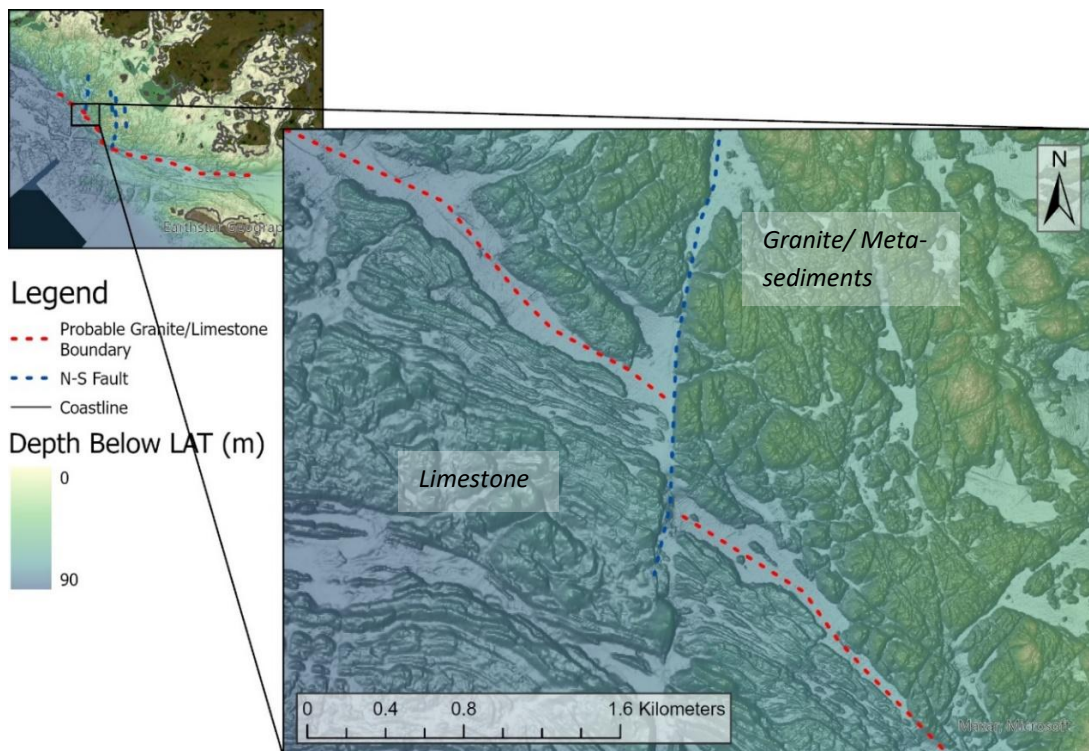


Figure 5: Bathymetry with possible north-south orientated fault displacing the inferred granite/limestone boundary.

Following the Carboniferous Period, there is a significant gap in the geological record in South Connemara from the end of the Carboniferous until the onset of the Quaternary, around 2.58 Ma. This absence of preserved strata is largely attributed to prolonged uplift and erosion, which removed much of the sedimentary cover that may have accumulated during this interval (Pracht & Feely, 2004).

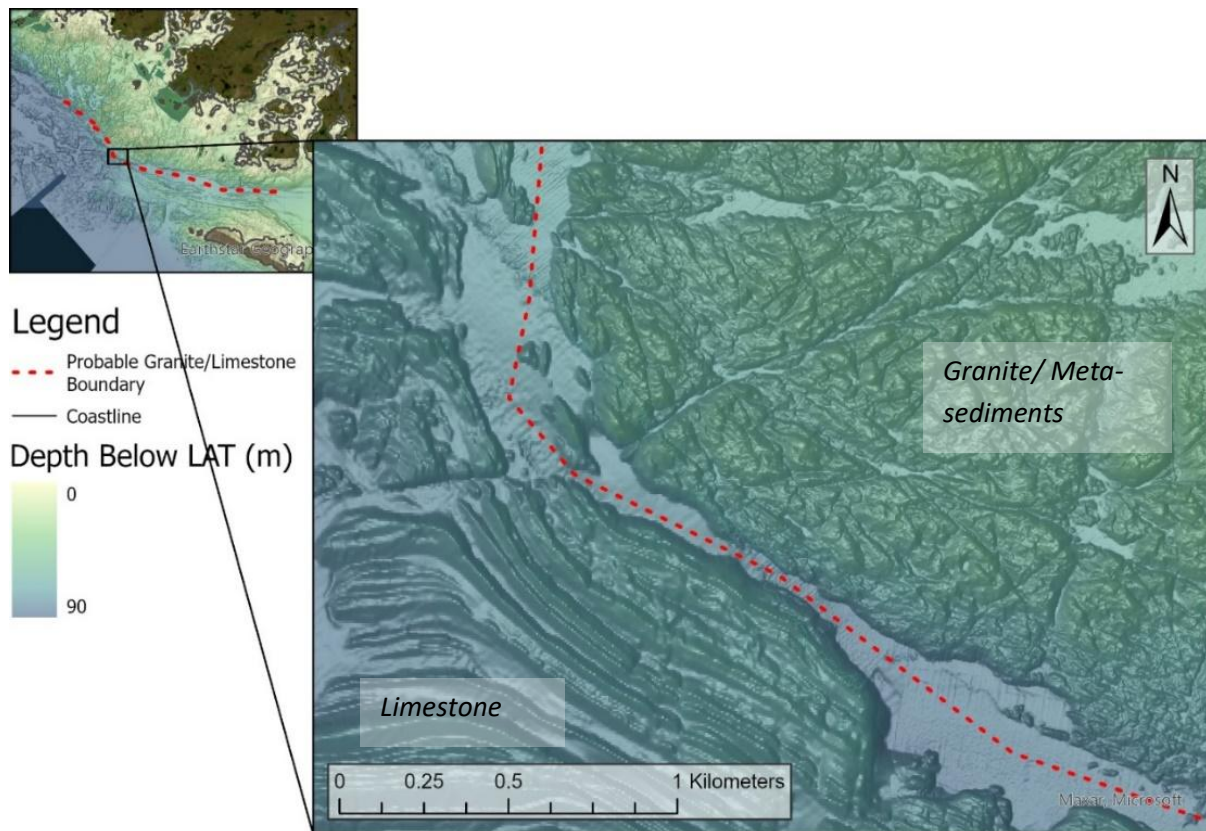


Figure 6: Inferred boundary between Granite and Limestone, determined from the differing outcrop morphology.

The Quaternary glaciations, beginning 2.58 Ma, played a major role in shaping the seabed. The British-Irish Ice Sheet flowed westwards across Galway Bay, scouring and streamlining the seabed, stripping soft covers, and depositing tills and erratics in sheltered areas. Deglaciation around 16 to 13 ka left a largely bare-rock platform at Skerd, subject to rapid post-glacial sea-level rise and Atlantic wave action (McCullagh, et al., 2020).

Seabed Features

INFOMAR bathymetry data shows that the Skerd region is dominated by exposed granite and metamorphic rock with steep-sided reefs and knolls, interspersed with boulders and patches of gravel lag. Boulder fields and erratics, likely deposited during deglaciation, are common and contribute to the reef complexity. Onshore, glacially sculpted granite and metamorphic bedrock exhibit polished surfaces, grooves, and striae in places, preserved due to minimal post-glacial sediment cover. Sediments occur as thin veneers in rock depressions or as mobile sand ribbons shaped by tidal currents (McCullagh, et al., 2020).

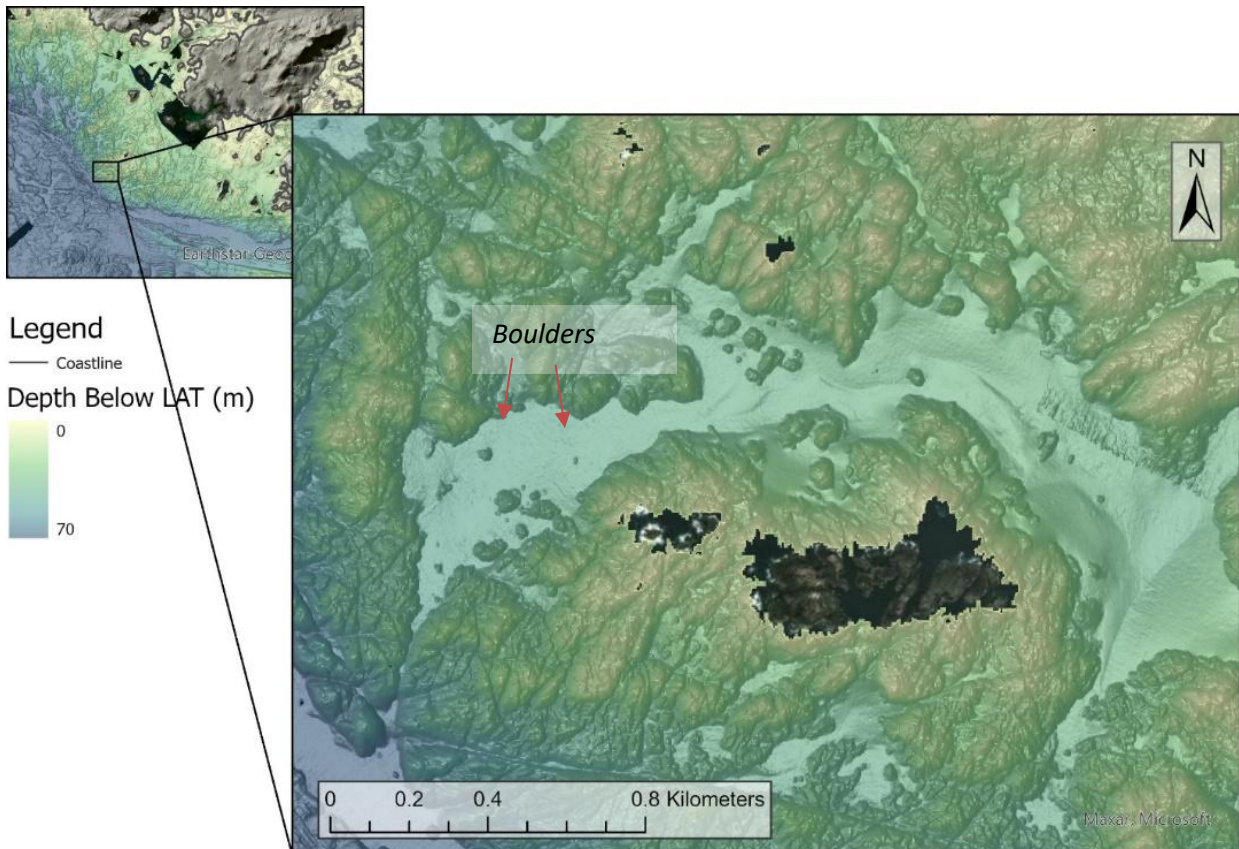


Figure 7: Boulders on the seabed around Skerd Mór

Hydrodynamic energy in this Atlantic setting is high, with strong tidal currents and persistent wave action winnowing away finer sediments and scouring the rock surface (McCullagh, et al., 2020). This produces areas of active seabed erosion, especially at the margins of reefs and shoals.

Palaeocoastline modelling indicates that during Quaternary lowstands, particularly at the Last Glacial Maximum 24 ka, sea level was substantially lower than today (probably around 50 m), meaning a much larger part of the Skerd ridge would have been emergent as a more extensive rocky island/skerry complex (Healy, 2003). As sea level rose, these higher areas became isolated skerries and submerged reefs. Today, the same processes that prevent sediment accumulation, including strong currents, wave scour and direct Atlantic exposure, also contribute to the Skerd Rocks' importance as a navigational hazard.

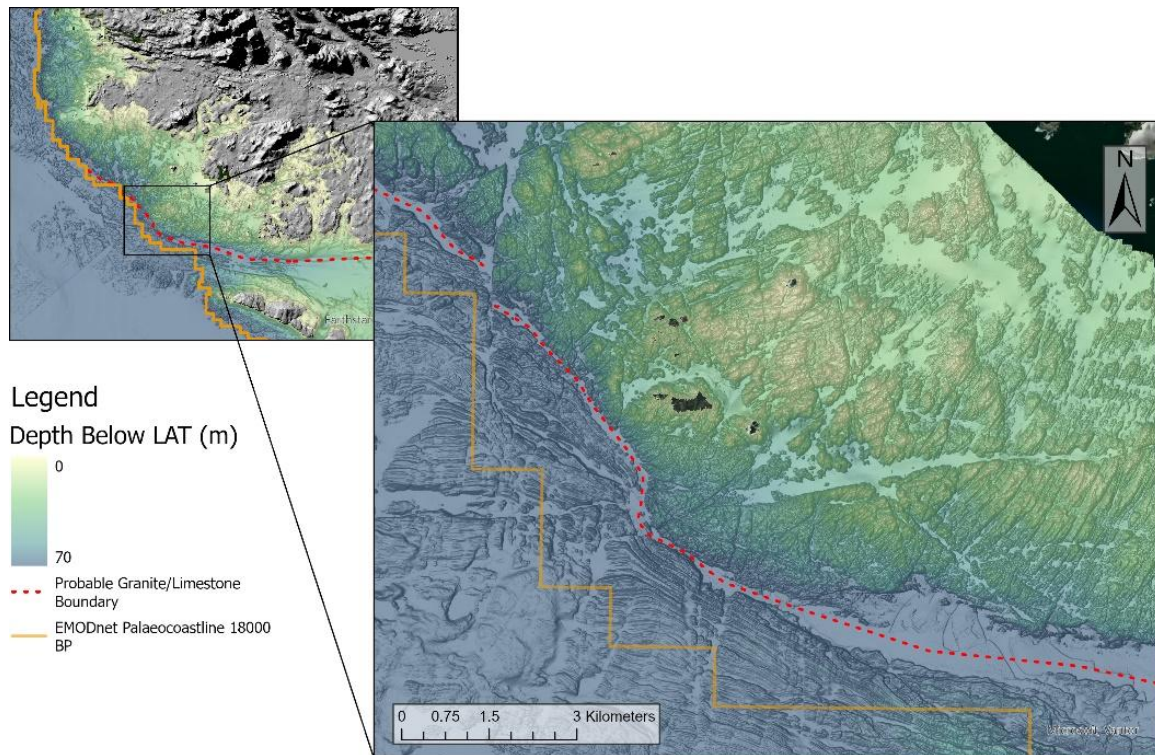


Figure 8: Modelled palaeocoastline of Ireland approximately 18 ka. Palaeocoastline data from (Brooks, et al., 2011).

Biodiversity

The varied seabed topography and strong tidal flushing of the Skerdyne area support diverse marine communities. Sublittoral rock hosts kelp forests, sponges, bryozoans and sea squirts in the shallows, while deeper rock and gravel areas support soft corals, encrusting fauna and echinoderms such as brittle stars (Sides, et al., 1994). The area's benthic species richness reflects the mixture of hard substrate, reef relief, gravel patches and strong water movement.

Conclusions

The Skerdyne Rocks record the combined influence of ancient bedrock structure, Quaternary glaciation and ongoing Atlantic marine processes. Their position close to the Skerdyne Rocks Fault, and their foundation of resistant metamorphic and granitic rocks, have produced a rugged seabed of shallow reefs, steep-sided knolls, boulder fields and thin sediment cover.

The bedrock framework reflects a long geological history, from Neoproterozoic rifting and Dalradian sedimentation to Ordovician volcanism, Caledonian deformation and later granite intrusion. Quaternary ice then scoured and streamlined the seabed, leaving a largely bare-rock platform that was partly drowned by post-glacial sea-level rise.

Today, strong tidal currents and Atlantic wave exposure continue to winnow fine sediment, scour reef margins and maintain the shallow, uneven seabed around the skerries. These same conditions support hard-substrate marine communities, but they also make the Skerdyne Rocks a significant navigational hazard. Continued seabed mapping helps clarify the link between bedrock geology, seabed morphology, habitat distribution and marine risk in this exposed part of Connemara.

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