



The seabed geomorphology and geological structure of the Firth of Lorn, western Scotland, UK

John Howe (1), Riccardo Arosio (1), Dayton Dove (2), Roger Anderton (3), and Tom Bradwell (2)

(1) Scottish Association for Marine Science, Scottish Marine Institute, Oban, Argyll, PA37 1QA UK, (2) British Geological Survey, Murchison House, West Mains Rd., Edinburgh EH9 3LA U.K., (3) Kilmichael House, Kilmichael Glassary, Lochgilphead, PA31 8QA, U.K.

We present recently collected swath bathymetry from the Firth of Lorn. 553km² of data were collected during 2012-2013 as part of the INIS Hydro project (Ireland, Northern Ireland and Scotland Hydrographic Survey). The inshore waters covered by this survey represent a priority area for the renewable industry, shipping and tourism and encompass a number of Special Areas of Conservation (SAC) including for rocky reef habitat. Surprisingly, given this interest, this project is the first comprehensive bathymetric survey of the area.

This region of near shore continental shelf is revealed as a predominantly bedrock-dominated seabed, characterised by a series of narrow, stratigraphically constrained basins eroded into the Proterozoic and Palaeozoic-age bedrock. The principal basement of the region is composed of deformed Dalradian-age metasediments overlain unconformably by Silurian-age Old Red Sandstones and lavas. The resistant, uneroded igneous extrusives have formed raised rock platforms. Most strikingly the central region of the Firth of Lorn is dominated by an up to 150m high vertical cliff extending for approximately 20km. The origin of this prominent feature, here termed the Insh Fault, is not well understood however it may have resulted from a combination of Dalradian-age faulting and erosion of exposed softer metasediments in the central basin. Extensive seabed faulting also occurs; possibly as Dalradian-age syn-sedimentary faults. Carboniferous and Tertiary-age minor intrusives are common throughout the region in particular the Tertiary-age dolerite dyke swarms can be traced for many kilometres, exposed on the sediment-free bedrock surfaces.

The survey region includes the Corryvreckan Whirlpool and Great Race, beneath the tidal flows of which there are active submarine sand dunes. Evidence for past glaciation is widespread and well preserved in the Firth of Lorn with preserved moraines and over-deepened basins common across the area. Initial geological and geomorphological mapping shows that our understanding of the offshore outcrop geology can be greatly improved by the collection of these new high-resolution bathymetric datasets.