



Key Points

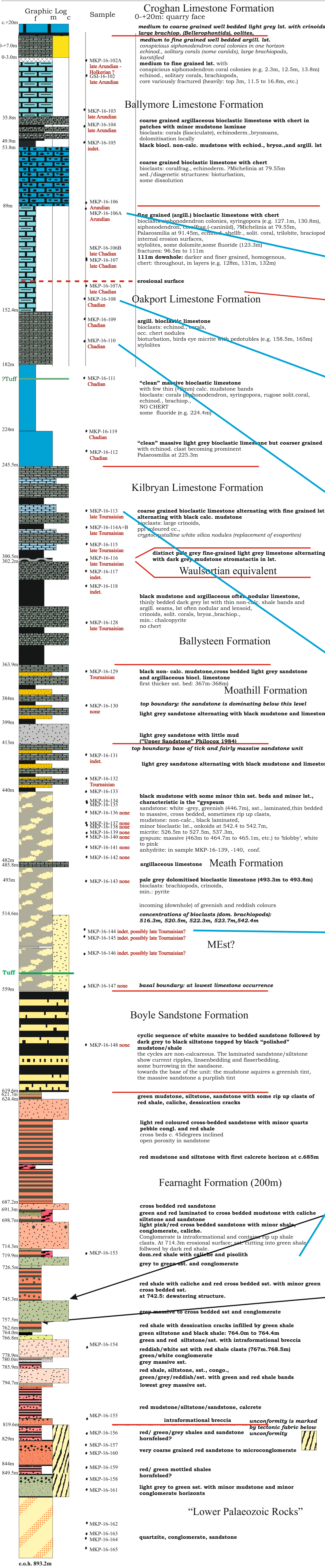
Traditional geological maps need “stratigraphic” units in order to delineate e.g. groups, formations, etc. However, each “stratigraphic unit” consists of a variety of facies. The same facies can occur in different “stratigraphic units” A sequence stratigraphic approach compared to the traditional “stratigraphic” approach leads to a much more dynamic interpretation of the geology and geological evolution of a depositional environment

The data gathered by the Geological Survey of Ireland during the past 5 years, while drilling the Viséan limestone succession of the north-west Irish Midlands, has been utilised for an initial sequence stratigraphic approach to these rocks.

An initial “summary stratigraphic” column is presented below, largely based on the deep boreholes Hillstreet 2 and Castlemeine. It is clear at this early stage, that the sedimentary development of the map area can be correlated with continental Europe (e.g. Belgian) 3rd-order sequences. More data is needed!

It is hoped, that the data gathered will be the starting point for more detailed facies analysis which will enable a more confident European correlation of sequence boundaries.

Borehole Number/Name: GSI-16-002, Castlemeine---Reference Borehole	
GridCoords: 0587809/0771024 (ITM)	Scale: 1:1000
Author: Dr. M. Pracht	Rockhead: 3m
Year: 2016	Elevation: quarry floor
	End of Hole: 893.2m
Micro-palaeontology: Dr.I.D.Somerville	
Stratigraphy: VIS	



LA = Litho-facies Association (see diagram below) with number 1 to 9 for a certain position on shelf/ramp. The letter after the number refers to a sub-facies. (Work in progress)

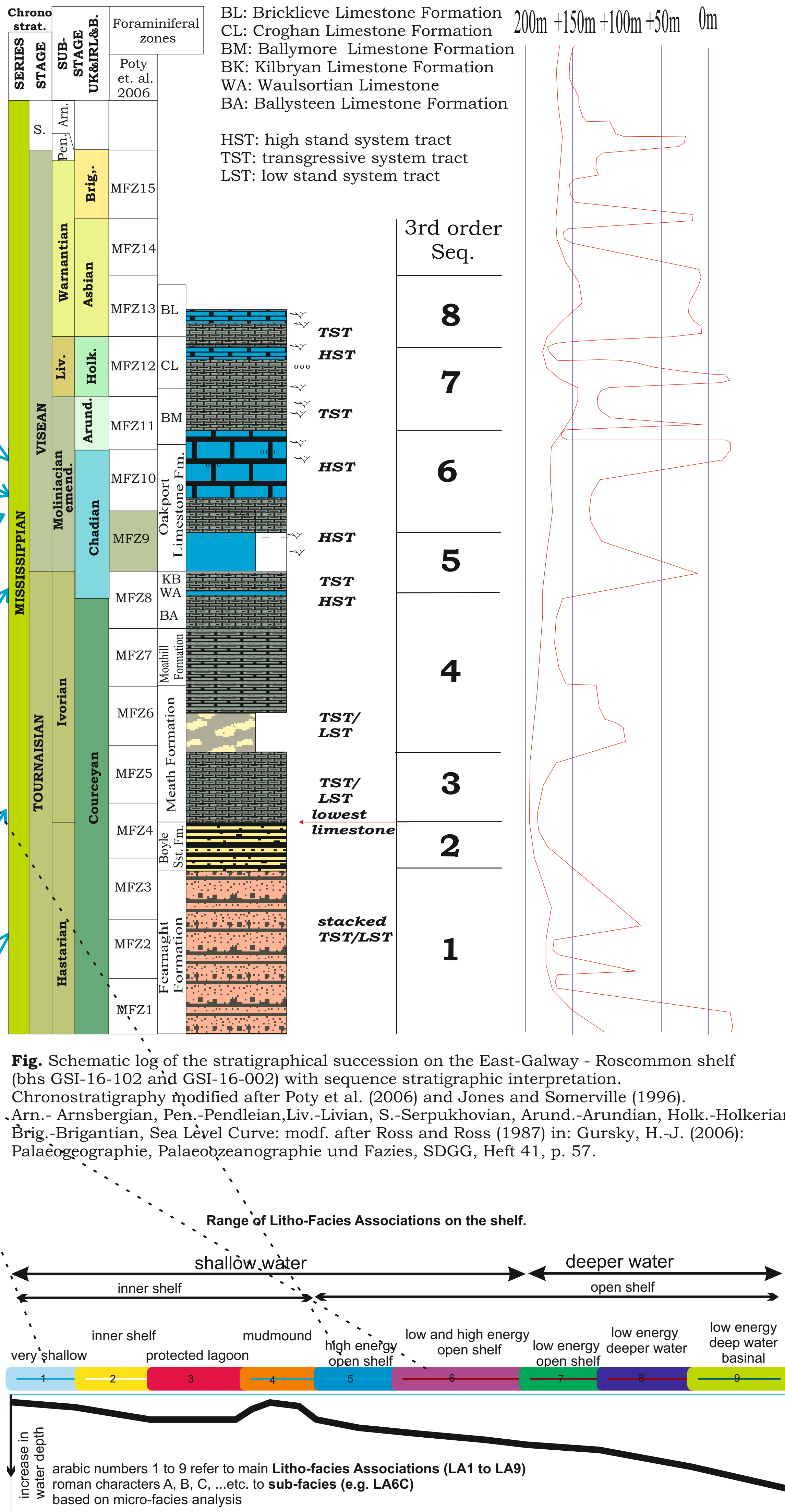
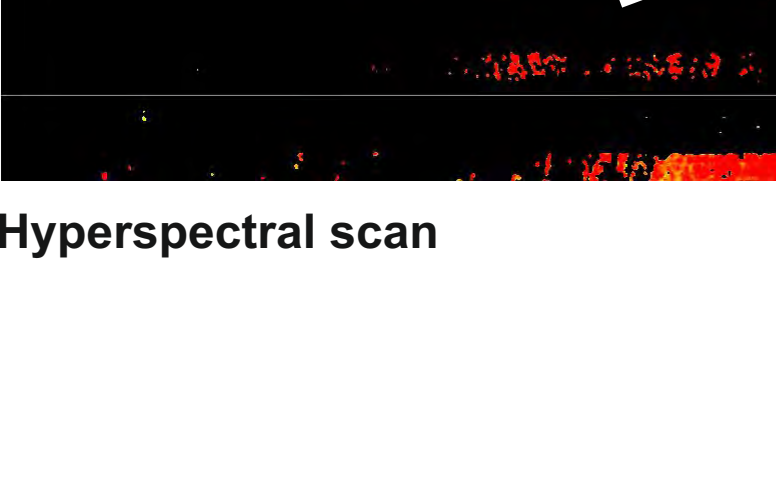
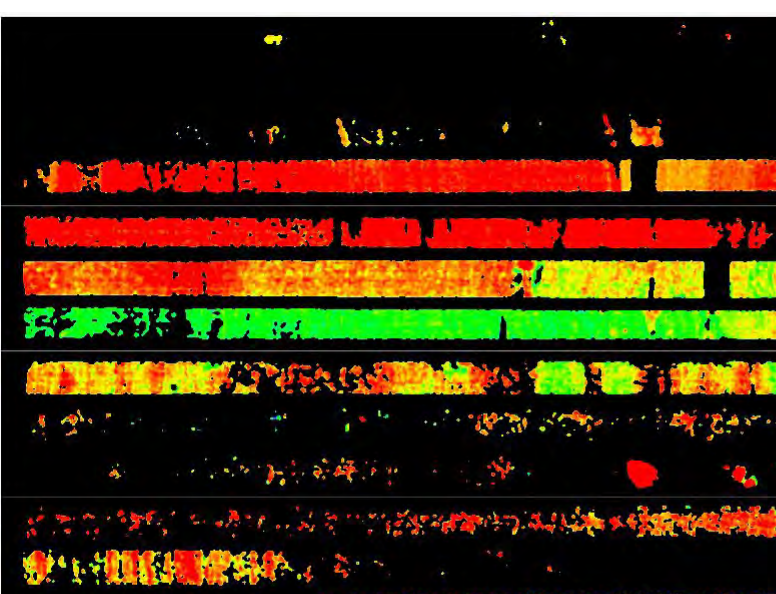
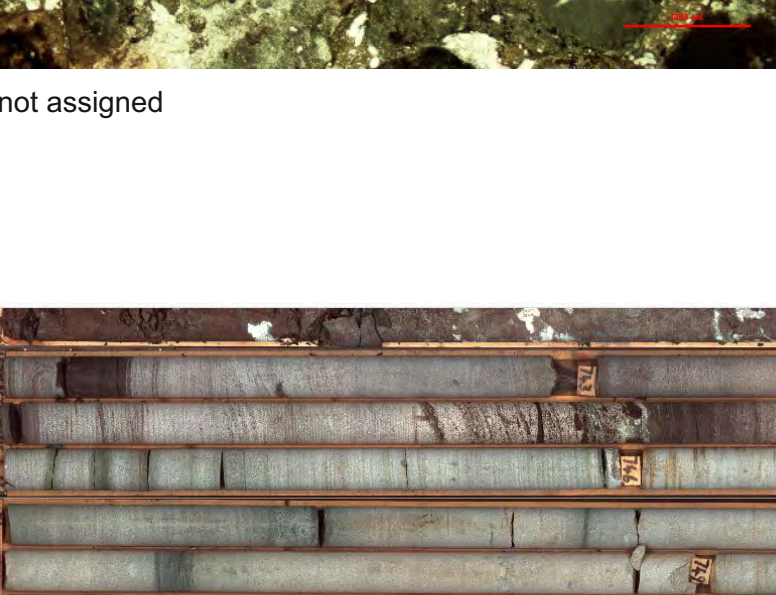
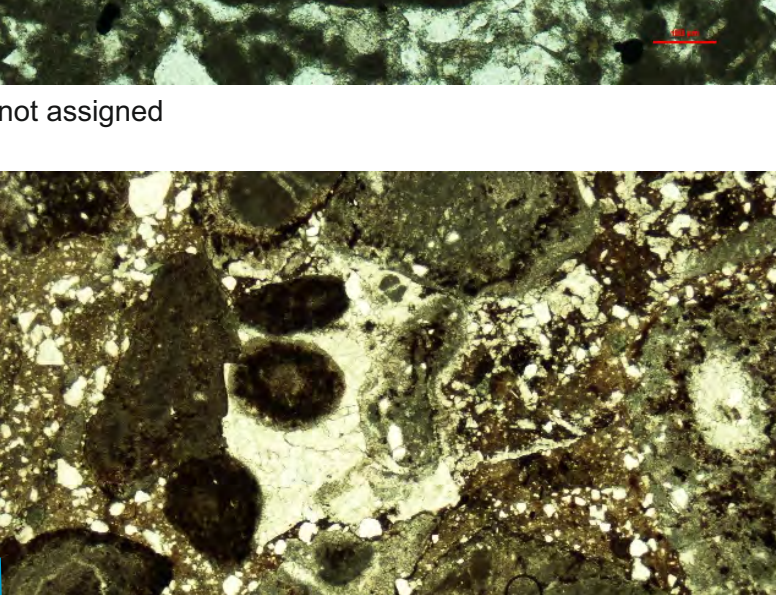
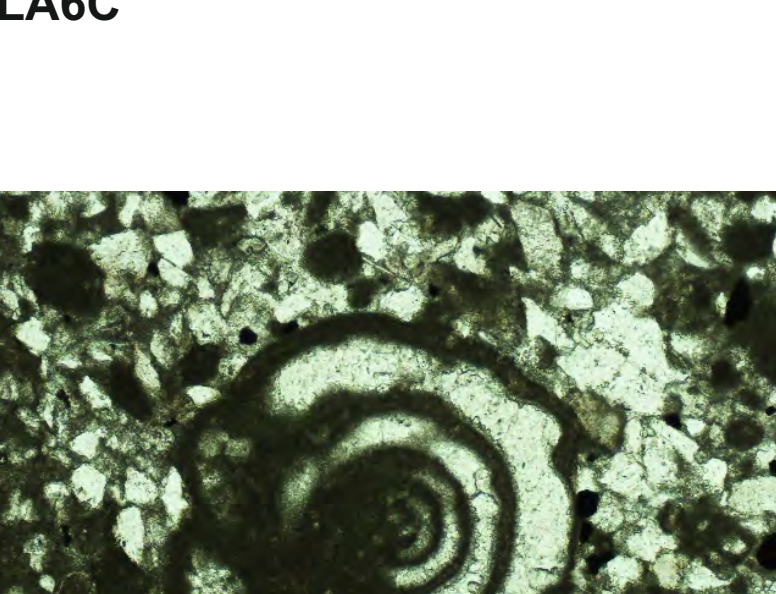
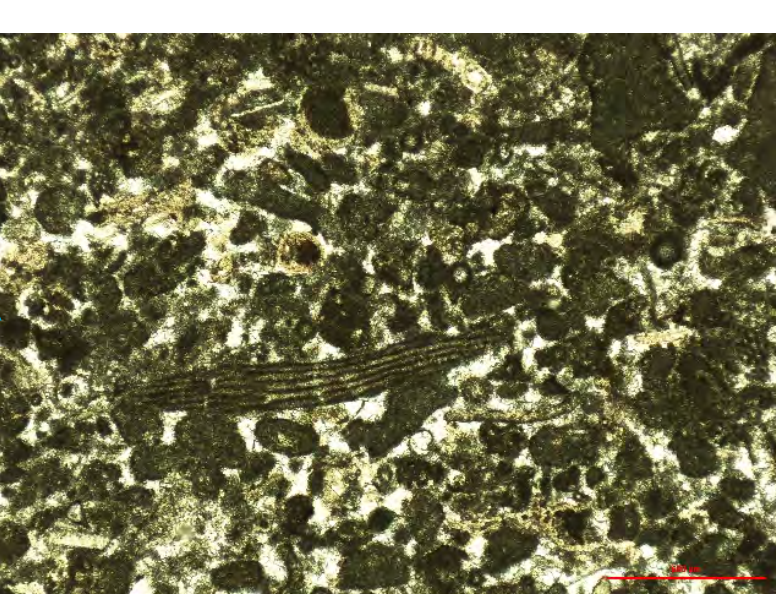
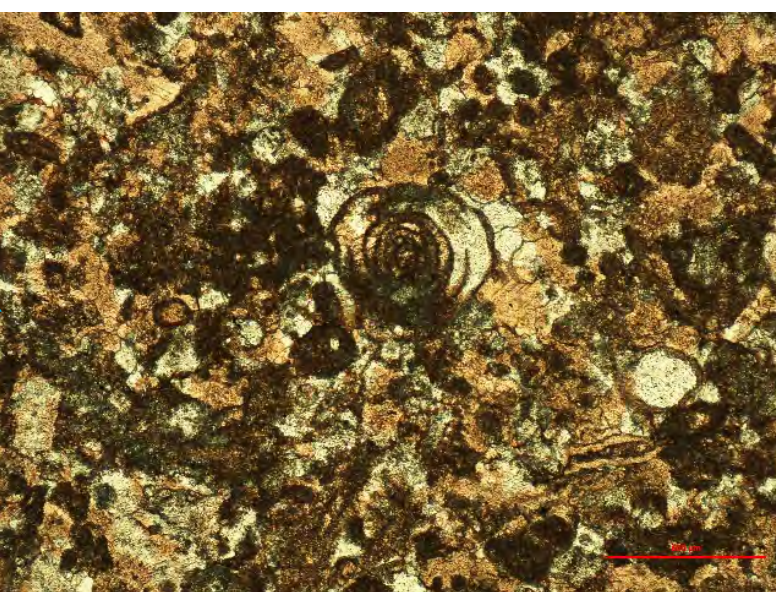
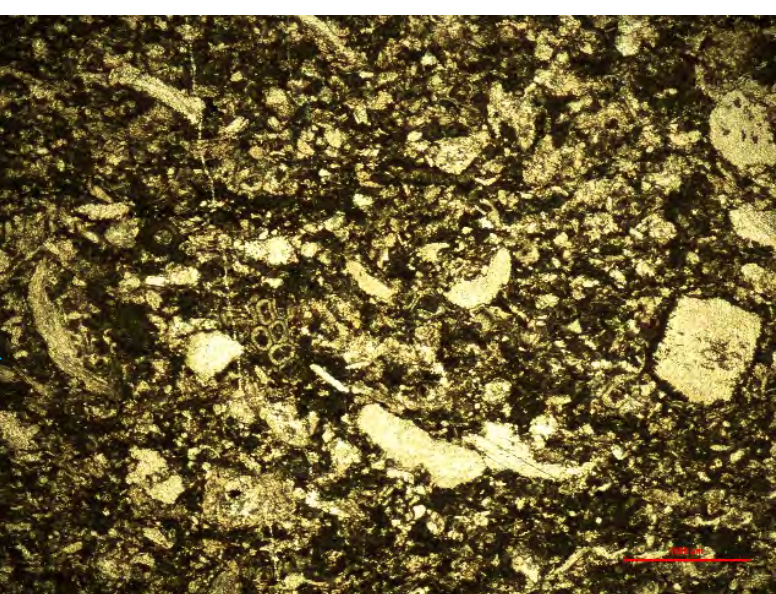
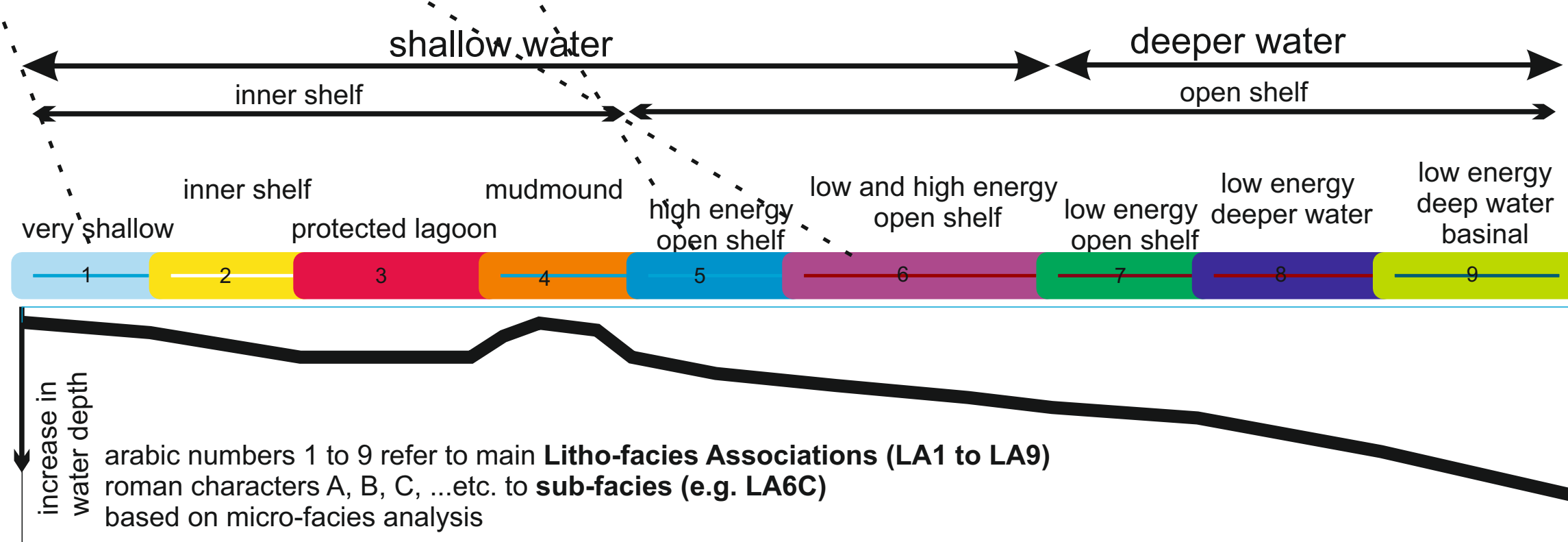


Fig. Schematic log of the stratigraphical succession on the East-Galway - Roscommon shelf (bhs GSI-16-102 and GSI-16-002) with sequence stratigraphic interpretation. Chronostratigraphy modified after Poty et al. (2006) and Jones and Somerville (1996). Arn. - Arnsbergian, Pen. - Pendleian, Liv. - Livian, S. - Serpukhovian, Arund. - Arundian, Holk. - Holkerian, Brig. - Brigantian, Sea Level Curve: modf. after Ross and Ross (1987) in: Gursky, H.-J. (2006): Palaeogeographie, Palaeoecographie und Fazies, SDGG, Heft 41, p. 57.

Range of Litho-Facies Associations on the shelf.



A considerable amount of research has been carried out in the Tournaisian and these rocks received much attention from the exploration and mining industries with particular attention to the Waulsortian buildups as host for major Zn-Pb deposits. Other studies focused on the upper Viséan (late Dinantian- MFZ13-15) carbonate successions and buildups in the North-West Basin, the Dublin Basin and the Shannon Trough (Gallagher 1996, Kelly 1996, Strogon et al. 1996, Somerville et al. 1996). Research into the deposition of the carbonate succession in the central part of the ramp/platform “between” these basins was carried out by e.g. Gallagher et al. 2006, Cozar and Somerville 2005. However, a large area of approx. 5000²km of Viséan carbonate lithologies remained undifferentiated on geological maps in the eastern parts of Co. Galway and most of Co. Roscommon.

Between the years 2008 and 2019 the Geological Survey of Ireland carried out an extensive drilling programme targeting the Irish Midlands (Cos Galway and Roscommon), to address this part of the Viséan succession. The aims of the programme was the establishment of a robust stratigraphic framework for the Viséan rocks of this central part of the Carboniferous ramp/platform and correlate it with the data from surrounding areas.

Stratigraphic divisions of the borehole successions were made and sampling of the boreholes was carried out. Main objective was obtaining petrographic details of the various formations, and to determine the age of the different stratigraphic units, based on their macrofauna (corals) and microfossils (principally foraminifers and calcareous algae). A comprehensive detailed analysis and description of each sample has been made (on both the drillcore and the rocks in thin section) to characterise the formations and to establish their precise age-ranges. This has been augmented by photomicrographs of representative microfacies illustrating the main components, minerals and fossils.

References:

Hance, L., Poty, E. and Devuyt, F.X. 2002. Sequence stratigraphy of the Belfian Lower Carboniferous –tentative correlation with the British Isles. In: Carboniferous and Permian of the World (eds. L.V.Hills, C.M.Henderson and E.W. Bamber, pp.41-51. Canadian Society of Petroleum Geologists, Memoir no.19.
Jones, G.L., Somerville, I.D. 1996. Irish Dinantian biostratigraphy: practical applications. In: Strogon, P., Somerville, I.D., Jones, G. L. (eds). Recent Advances in Lower Carboniferous Geology. Geological Society Special Publication, 107, 371-385.
Poty, E., Devuyt, F.X., Hance, L. 2006. Upper Devonian and Mississippian foraminiferal and rugose coral zonations of Belgium and northern France: a tool for Eurasian correlations. Geological Magazine, 143, 829-857.
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