# GEOLOGICAL MAPPING AND STRUCTURAL ANALYSIS OF HOLY ISLAND, ANGLESEY, NORTH WALES

*Julião, E.L.[1,3]; Virmond, A.L.[1,3]; Branco, H.C.[2,3]*

[1]Universidade de São Paulo; [2]Universidade Federal do Paraná; [3]University of Liverpool

**ABSTRACT:** Holy Island is situated in Anglesey, North Wales, and it's known for its remarkable structures in Precambrian rocks. The main goal of this work is to assess the geological evolution of the area through geological mapping and structural analisys, presenting the lithostratigraphy and deformation history. Five units have been defined on the island. The first is a green foliated tremolite serpentinite, with relicts of igneous pyroxene surrounded by serpentine. The next three units constitute a metassedimentary sequence. The South Stack Formation (SSF) is constituted by interbedded layers of quartzite and schist. The quartzite is a green, massive, medium-grain sized rock, with preserved sedimentary structures. The other lithology is a chlorite-muscovite-quartz schist, with fine to medium-grain size, with granolepidoblastic texture. Holyhead Formation (HhF) is a massive white to greenish quartzite, with poorly sorted, coarse to very coarse, badly rounded fragments of quartz on a medium to fine rounded matrix, locally recristallized. The Roscolyn Formation (RF) is composed of two different types of quartzite. The first is dark-yellow to red, with fine-grained granoblastic texture, with feldspar and lithic fragments of schist. The second is dark-grey to white, with fine to coarse-grained granoblastic texture and pure composition. Not all contacts were observed and some are considered to be tectonic. The New Harbour Group (NHG) is characterized by pale-green biotite-chlorite-muscovite-quartz schist, with fine to very fine-grained granolepidoblastic texture and tight schistosity, defined by muscovite and chlorite. Paleogene dykes of diorite composition crosscut all units and present a NE-SW trend. Based on field evidence, three deformation phases have been identified. The first one, D1, is responsible by the development of a foliation (S1//S0) on the schists of NHG and a cleavage on the schists of SSF. The second, D2, formed regional open folds in all units observed, characterized by the presence of parasitic folds on outcrop scale. These folds are mainly moderately inclined to plunged inclined. Folds in SSF are tight, while in NHG there are thight and isoclinal folds. Other structures, such as kink bands and crenulations, occur mainly on the schist layers and are also understood as part of this phase. Finally, D3 is responsible for generating types 2 and 3 refolding patterns and crenulation on the NHG. In addition, it generated axial plane phyllitic cleavage in SSF rocks and the major thrust faults of the area. The structural analysis reveals that bedding on RF and SSF and the schistosity of the NHG are parallel. Also, the bedding cylindrical best fit agrees with the axis and axial planes of the first folds (F1) analysed in NHG, evidencing that the main folds in all units have been formed by the same deformation event. In addition, the best fit of F1 axis and the refolding patterns (F2) have a close pattern, which might indicate that both were coaxial. The kinematic indicators show transport towards SE, which is compatible with stretching lineation data. This project was developed through CAPES' and CNPq's Science without Borders program.

**KEYWORDS:** GEOLOGICAL MAPPING, STRUCTURAL GEOLOGY, BRITISH PRECAMBRIAN ROCKS, METASSENDIMENTARY SEQUENCES, DEFORMATION STAGES.