

TECTONOMAGMATIC EVOLUTION OF THE CORNUBIAN ORE PROVINCE; A NEW EARLY MAGMATIC EVENT?

The Cornubian Orefield underlying the south-west of England represents the most intensely mineralised region in the British Isles, with mined ore-deposits including W, Sn, Cu, Fe, Pb, As, Mn, Zn, U and Ag. The opening of the W-Sm Drakelands mine in 2015 highlighted a number of major gaps with respect to understanding the local relationship between ore-deposits and tectonic evolution. This includes the timing of emplacement of the economically-important granitic bodies at the margins of major plutons such as Dartmoor, and their petrogenetic origin. This project aims to resolve the timing and petrogenetic origin of felsic magmatism in south Devon, enabling new insights in the relationship between regional magmatism, tectonics and the cycling of economically important elements. The results from this project will refine previous models for the geological development of this terrane and answer the question, 'Why is Hemerdon granite rich in tungsten, when other local granites are relatively barren?'

Funding from the Mineralogical Society, supported fieldwork in Devon and Cornwall during the autumn of 2016. Fieldwork was invaluable to the success of the project, as it allowed for the sampling of petrogenetically-diverse granites and associated igneous intrusives at the Hemerdon, Headon, Lee Moor and Shaugh pits, operated by Wolf Minerals Ltd. and Sibelco (Figure 1). The geochronology of these granites is poorly constrained; accurate geochemical, geochronological and isotopic analyses will refine current tectonic models from the region and its relationship with the development of ore-deposits. The funding also allowed for the sampling of local felsic rocks that surround the Dartmoor plutons (Figure 2), where analyses of these bodies will help in constraining the role they play with respect to the tectonomagmatic evolution of the region.



Figure 1. Viewpoint looking south at the Headon pit (Crownhill Granite), south of Dartmoor. This pit is operated by Sibelco UK, who mine this site for kaolin and aggregates. Negligible W-Sn mineralisation found here, where the W-Sn Hemerdon granite is located just SW of this locality.



Figure 2. Viewpoint looking north east of the Kingsand Rhyolite formation, previously Ar-Ar dated to ca. 290 Ma, coeval with recently refined U-Pb dates of zircons for the Cornubian Granites. Here, we see weathered, pseudo-columnar, porphyritic rhyolite lava.