SPRING Grant Report: Marie Arnaud (School of Geography)

The water@leeds SPRING grant was used towards the purchase of components for the construction of Enroot minirhizotron (Fig. 1). This tool will be used to sampling at high frequency the root production in Mangrove forest and will be deployed during a field campaign in January/February 2018.

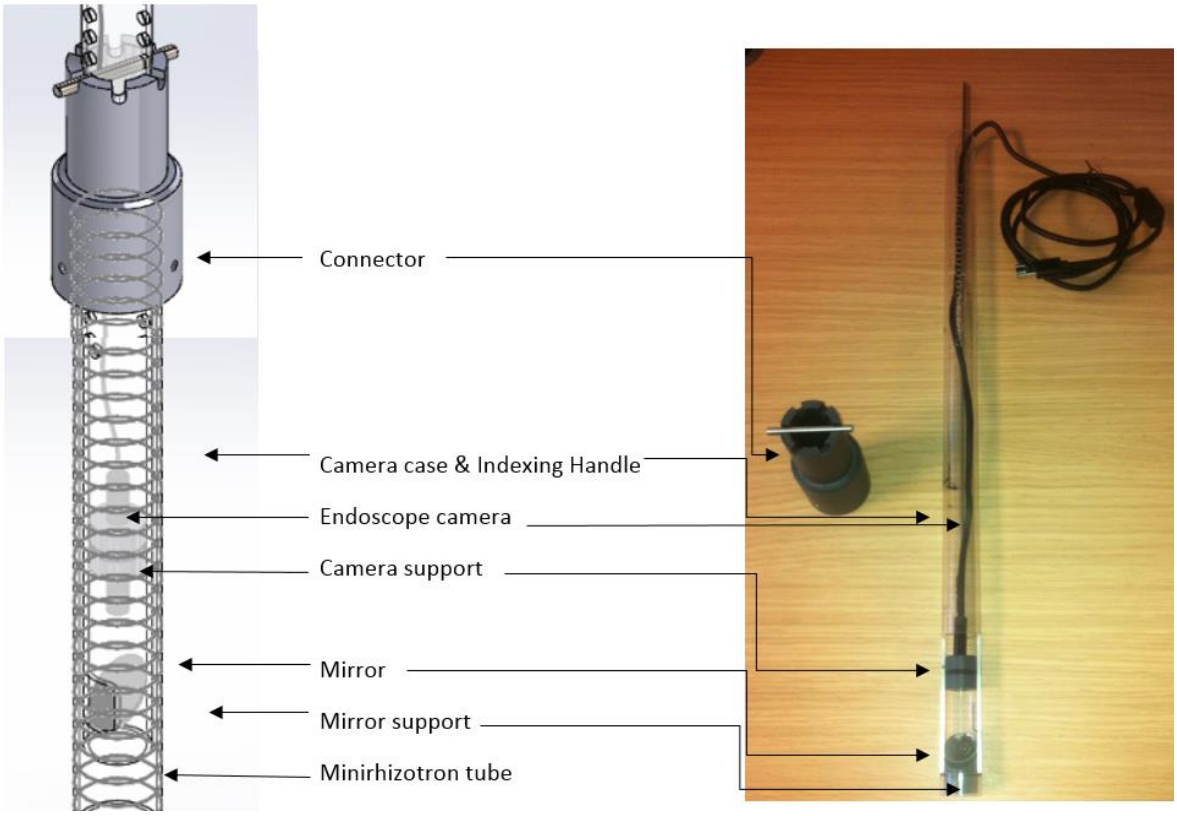

Figure 1: Enroot minirhizotron

Mangroves are amongst the most carbon-dense ecosystems in the world. The major input of organic carbon into mangrove soil seems likely to come from fine roots. However, our knowledge of fine root production in mangroves is severely limited, due in large part to the inherent difficulty of measuring such subterranean processes. Measurement techniques for fine root production are time consuming, expensive, and often destructive. Minirhizotrons offer a non-destructive alternative to quantify fine root production and enable high-frequency in situ monitoring with little disturbance after an initial settling period. However, commercial minirhizotron systems are often prohibitively expensive.

The tool that I developed, named Enroot minirhizotron, is an inexpensive, easy to build and partially 3D printable minirhizotron. The cost of the new minirhizotron is around ten times less than commercial minirhizotron. Enroot is light, waterproof and utilises a narrow minirhizotron tube that can fit between stilt-roots of mangrove.

With the help of Enroot, I will collect the first detailed data on patterns of root production in the second world's largest rehabilitated mangrove forest, in the Mekong Delta, Vietnam. The results will provide valuable data to inform projections of the response of mangrove carbon stocks to climate change, and will guide mangrove restoration and protection efforts both in the Mekong and beyond.

Thank Water@Leeds for providing this award!