MASTS small grant scheme: Final Report

TPSSG24: Acoustic Observation Model

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Funding Awarded: £1,800 to pay for storage space on the University of St Andrews server.

Purpose: The awarded grant has enabled me to purchase 3 TBs of space from the University of St Andrews to store collated echosounder data. These data will feed into an acoustic observation model that is being developed as part of a European H2020 International Cooperation project entitled: "Mesopelagic Southern Ocean Prey and Predators" (MESOPP – see www.mesopp.eu), which focuses on the study of micronekton in the Southern Ocean and links to ecology of top predators such as king penguins and elephant seals.

Implications:

Collated echosounder data will be processed and stored on the data server. These data will feed into several data products and projects, producing: i) a catalogue of Deep Scattering Layer (DSL) metrics (Proud et al., 2015); DSLs are acoustic representations of the mesopelagic community (200 – 1,000 m), which is primarily consistent of zooplankton and small fish, ii) a model to partition the ocean based on drivers of mesopelagic biomass (mesopelagic biogeography – see Proud et al. 2017) and iii) methods to identify species/other taxonomic groups via acoustics scattering models (see Proud et al., 2017 – Poster at 3rd International Symposium on Krill, June 2017, St Andrews*)* coupled with data from external sources such as the Ocean Biogeographic Information System (OBIS - providing occurrence data of species) and the Simple Ocean Data Assimilation (SODA) project (providing global climatology).

The data will also drive the development of the acoustic observation model, which predicts acoustic signal using output from ecosystem models (e.g. Atlantis, SEAPODYM etc.). The observation model will provide a means of validating the mesopelagic components of ecosystem model output.

References

Proud R, Cox MJ, Wotherspoon S, Brierley AS (2015) A method for identifying Sound Scattering Layers and extracting key characteristics (A Tatem, Ed.). Methods Ecol Evol 6:1190–1198.

Proud R, Cox MJ, Brierley AS (2017) Biogeography of the Global Ocean's Mesopelagic Zone. Curr Biol 27:113–119.