



Darwin Initiative/D+ Project Half Year Report (due 31st October 2019)

Project reference	DPLUS089
Project title	Integrating genetic approaches into sub-Antarctic deep sea research and management
Country(ies)/territory(ies)	South Georgia and the South Sandwich Islands
Lead organisation	University of Essex (UoE)
Partner(s)	Cefas
Project leader	Dr Michelle Taylor
Report date and number (e.g. HYR3)	30 th Oct 2020 – late – done late Nov 2020
Project website/blog/social media etc.	N/A

1. Outline progress over the last 6 months (April – Sept) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up to end September).

The project was approximately 1 month behind the planned activities when Covid-19 restrictions were imposed. This meant a cessation of all activities for this project. All of the planned work for the Mar-April (end of year 1) activities involved either 1. Travel (Dr Taylor was meant to be visiting Paris museum to collect more specimens) or 2. Laboratory work (Dr Etsebeth, technician, was meant to be undertaking the UCE work through this period). We were able to get back into the lab in mid-July. I requested extra finance from Darwin to support either 100% of the furlough costs of our technician or the 20% furlough (after I was able to convince the university to support official furlough). Neither was supported. I therefore will be requesting a 6-month no-cost extension to this project and many budget changes as staff costings are going to be over that originally planned. Some outputs will likely also not be possible in the long term as with the fixed budget and fewer samples they are not possible within the bounds of the time and finance available.

Activities since April are limited due to the above. 192 samples have been processed (DNA extracted, cleaned, fragmented, indexed, amplified, cleaned, labelled, cleaned, and quality controlled) and are ready for sequencing. Kerry's contact was due to finished at the end of Dec 2020; it has been extended to the end of Jan 2021 (although most of it is holiday she is due thanks to covid delays).

The data acquired though the Blue Belt Programme RRS *Discovery* Expedition 99 in the South Sandwich Islands allowed the aims set under this Darwin Plus project to be addressed. The aim of the benthic sampling was to record the diversity and distribution of benthic communities along a latitudinal and depth gradient.

The epibenthic faunal dataset comprised of 541 samples, accounting for over 3,643 specimens belonging to 12 phyla, including: corals (Actiniaria, Alcyonacea, Hydrozoa, Pennatulacea, Scleractinia, Zoantharia), sponges (Desmospongiae), crinoids, sea stars, brittle stars and sea cucumbers, bryozoans, crustaceans (Amphipoda, Decapoda, Euphausiacea, Isopoda, Mysida, Pycnogonida), polychaetes and nematodes. In total, 81 preliminary taxa were recorded across the sampled areas; of these, 19 were provisionally identified to species level, belonging to 18 distinct families. The remaining taxa were

identified to higher taxonomic levels, whilst seven taxa could only be identified to phylum level. Malacostraca and Anthozoa were the most diverse class comprising six and five taxa respectively.

Data analysis is ongoing and, where possible, it will be collated with available biodiversity datasets to allow to advance our understanding of deep-sea habitats from the Atlantic sector of Southern Ocean and contribute to investigate the distribution of benthic communities in the region.

The team is actively disseminating information about Antarctic deep-sea habitats via social media (e.g. Twitter) and it is expected to disseminate results to a wider audience during the course of years 2 and 3.

The project team also attended the Deep-sea Biology Society Symposium (19-21 August 2020) and SCAR Open Science Conference (3-7 August 2020). Dr Vieira and Dr Barnes have contributed to the Britain's Distant Seas book, particularly with information on the South Georgia and the South Sandwich Islands.

Activities commenced	Current state
1.1 Collection and cataloguing of deep-sea coral samples and transported to the UK.	Completed
1.2.1 Specimens identified to highest possible level by Dr Taylor.	Completed
1.2.2 Research technician hired half way through year 1 to undertake genetic laboratory work.	Completed
1.2.3 Specimens of target species have DNA extracted, quality controlled, UCE libraries prepared, DNA sequenced	On-going
1.2.4 Research assistant hired half way through year 2 to undertake bioinformatics analyses.	Not completed
1.2.5 Connectivity of locations across SGSSI and wider sub-Antarctic analysed, and population structure investigated.	Not completed
1.3 Results written into a report for GSGSSI.	Not completed
1.4 Results written into a report for CCAMLR.	Not completed
2.1.1 Genetic data formatted for Genbank and species identification and metadata formatted for GBIF.	Not completed
2.1.2 Genetic data submitted to Genbank and species information to GBIF for quality control.	Not completed
2.2 Species records submitted to GBIF, WoRMS, OBIS and BODC.	Not completed
2.3 New species descriptions written for peer-review publication (e.g. <i>Zootaxa</i> , <i>Polar Biology</i>) and submitted to WoRMS.	Not completed
3.1 Deep sea biodiversity analysis conducted and integrated into reports to GSGSSI and CCAMLR.	On-going
4.1 Genomic connectivity publication written for submission to peer-review journal such as <i>Molecular Ecology</i> , <i>BMC Evolutionary Biology</i> etc.	Not completed
4.2 Diversity / biogeography of deep sea biodiversity of the SGSSI region publication written for submission to peer review journals such as <i>Deep Sea Research I</i> , <i>Polar Biology</i> , <i>Marine Ecology Progress Series</i> .	Not completed
4.3 Donation of samples to NHM and disseminate results to the wider audience.	Activity 50% completed. Further specimens will be donated if additional samples are collected.

2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

Please see above description of covid-related delays.

The budget is impacted and we are submitting a change request form (it is currently with UoE finance office) and a request for a 6 month no-cost extension due to covid delays.

2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?

Discussed with LTS: Yes – via email.

Formal change request submitted: No – en route

Received confirmation of change acceptance No

3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend:

3b. If yes, then you need to consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a rebudget Change Request as soon as possible. There is no guarantee that Defra will agree a rebudget so please ensure you have enough time to make appropriate changes if necessary.

4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?

We would like to re-iterate our request for extra finance to support the lab work that is now not possible. We had planned to cover 5 species of deep-sea coral in Work stream 1 – this is now not possible. An extra 3 months of technician lab time would make this possible.

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document. Additionally, if you were funded under R25 and asked to provide further information by your first half year report, please attach your response as a separate document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also** be raised with LTS International through a Change Request. **Please DO NOT send these in the same email.**

Please send your **completed report** by email to Darwin-Projects@ltsi.co.uk. The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g. Subject: 25-035 Darwin Half Year Report**