

Applicant: **Taylor, Michelle**
Organisation: **University of Essex**
Funding Sought: **£278,231.00**

DPR7P\100040

Integrating genetic approaches into sub-Antarctic deep sea research and management

PRIMARY APPLICANT DETAILS

Title	Dr
Name	Michelle
Surname	Taylor
Organisation	University of Essex
Tel (Work)	
Email (Work)	
Address	

CONTACT DETAILS

Name	Robin
Surname	Fussell
Organisation	University of Essex
Tel (Work)	
Email (Work)	
Address	

CONTACT DETAILS

Title	Dr
Name	Rui
Surname	Vieira
Tel (Work)	
Email (Work)	
Address	

Section 1 - Contact Details

PRIMARY APPLICANT DETAILS

Title	Dr
Name	Michelle
Surname	Taylor
Organisation	University of Essex
Tel (Work)	
Email (Work)	
Address	

CONTACT DETAILS

Name	Robin
Surname	Fussell
Organisation	University of Essex
Tel (Work)	
Email (Work)	
Address	

CONTACT DETAILS

Title	Dr
Name	Rui
Surname	Vieira
Tel (Work)	
Email (Work)	
Address	

GMS ORGANISATION

Type	Organisation
Name	University of Essex
Phone (Work)	
Email (Work)	
Address	

Q3. Lead organisation type

Please select one of the below options.

- Other (e.g. Academic)

Section 2 - Title, Dates & Budget Summary

Q4. Project title

Integrating genetic approaches into sub-Antarctic deep sea research and management

Q5. Project dates

Start date:

01 April 2019

End date:

31 March 2022

Duration (e.g. 2 years, 3 months):

3 years

Q6. UKOT(s)

(See Guidance Notes)

Which UK Overseas Territory(ies) will your project be working in? You may select more than one UKOT from the options below.

South Georgia and The South Sandwich Islands (SGSSI)

* if you have indicated a territory group with an asterisk, please give detail on which territories you are working on here:

No Response

In addition to the UKOTs you have indicated above, will your project directly benefit any other country(ies)? If so, list here.

Antarctica

Q7. Budget summary

Year:	2019/20	2020/21	2021/22	Total request
Q7a. Request from Darwin:	£80,045.00	£127,387.00	£70,799.00	£ 278,231.00

Q7b. Proposed (confirmed and unconfirmed) co-financing as % of total project cost 27

Section 3 - Lead Organisation Summary

Q8. Lead organisation summary

Please provide the following information on the lead organisation

What year was your organisation established/ incorporated/ registered? 1968

What is the legal status of your organisation? University

How is your organisation currently funded? Funding council grants; tuition fees and educational contracts; research grants and contracts; endowment and investment income; income from subsidiaries (commercial activities including hotel, conference and consultancy services, rental of student residences).

Have you provided the requested signed audited/independently examined accounts? If you select "yes" you will be able to upload these. Note that this is not required from Government Agencies. No

Please provide details:

They can be found here: <https://www.essex.ac.uk/about/financial-statements>

Q9. Has your organisation been awarded Darwin Initiative funding before (for the purposes of this question, being a partner does not count)?

Yes

If yes, please provide details of the most recent awards (up to 6 examples)

Reference no.	Project leader	Title
EIDPR102	Dr Stuart Bunting (UoE)	Sustainable aquaculture, fisheries and livelihoods in the Indian Sundarbans
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>

Section 4 - Project Partners

Q10. Project partners

Please list all the partners involved (including the Lead Organisation) and explain their roles and responsibilities in the project. Describe the extent of their involvement at all stages, including project development. This section should illustrate the capacity of partners to be involved in the project, and how local institutions, local communities, and technical specialists are involved as appropriate.

Please provide written evidence of partnerships. Please add fields for more partnerships, if required. Details on roles and responsibilities in this project must be given for the Lead Organisation and all project partners.

N.B. There is a file upload button at the bottom of this page for the upload of all letters of support.

Lead Organisation name: University of Essex

Details (including roles and responsibilities and capacity to engage with the project):

University of Essex (UoE) will lead on this project and is responsible for the research on population genetics and direct management of hired project staff at UoE. Cefas will co-PI on this project and will lead on biodiversity assessments and advice to the UKOT Governments and CCAMLR. UoE and Cefas will co-coordinate the project and liaise with project collaborators and stakeholders to ensure its the successful delivery. BAS will contribute with expert knowledge on species identification, data analysis and macro- and megabenthic community assessments

UoE and Cefas will oversee the delivery of all aspects of the project, overseeing the input from a range of contributors. UoE's Dr Taylor has researched Antarctic deep-sea benthic ecosystems for over 10 years, using genomics as a tool to study deep-sea corals ecology and evolution. Cefas has extensive experience providing support to UKOTs, including development and implementation of marine protection strategies and are experienced in capacity building, fisheries management advice, habitat mapping and biodiversity assessments. BAS scientists bring extensive expertise in Antarctic benthic and deep-sea ecosystems, and long-term experience and expertise delivering research in the Sub-Antarctic and Antarctic UKOTs.

Both UoE and Cefas personnel have the time and resources to undertake this project successfully.

Have you included a Letter of Support from this organisation? Yes

Do you have partners involved in the Project?

Yes

The limit for any single file uploaded as supporting materials with your application is 6MB. Please ensure documents are saved in PDF form where possible in order to minimise size.

1. Partner Name: Cefas

Website address: <https://www.cefas.co.uk/>

Details (including roles and responsibilities and capacity to engage with the project): Cefas is responsible for collecting, preserving, cataloguing, and transporting specimens from South Georgia to the UK. Cefas will lead on biodiversity assessments. Cefas will also play a lead role in disseminating results to the SGSSI Government, CCAMLR, and the SGSSI MPA five-year review process.

Have you included a Letter of Support from this organisation? Yes

Do you have more than one partner involved in the Project?

Yes

2. Partner Name: British Antarctic Survey

Website address: <https://www.bas.ac.uk>

Details (including roles and responsibilities and capacity to engage with the project): BAS will contribute with expert knowledge on species identification, data analysis and macro- and megabenthic community assessments.

Have you included a Letter of Support from this organisation? Yes

3. Partner Name: *No Response*

Website address: *No Response*

Details (including roles and responsibilities and capacity to engage with the project): *No Response*

Have you included a Letter of Support from this organisation? Yes
 No

4. Partner Name: *No Response*

Website address: *No Response*

Details (including roles and responsibilities and capacity to engage with the project): *No Response*

Have you included a Letter of Support from this organisation? Yes
 No

5. Partner Name: *No Response*

Website address: *No Response*

Details (including roles and responsibilities and capacity to engage with the project): *No Response*

Have you included a Letter of Support from this organisation? Yes No

6. Partner Name: *No Response*

Website address: *No Response*

Details (including roles and responsibilities and capacity to engage with the project): *No Response*

Have you included a Letter of Support from this organisation? Yes No


If you require more space to enter details regarding Partners involved in the Project, please use the text field below.

No Response

Please provide letters of support from the lead organisation and all partners as a combined PDF.

 [Darwin-Plus-Project Letters-of-Support](#)

 31/08/2018

 16:26:18

 pdf 459.1 KB

Section 5 - Project Staff

Q11. Project staff

Please identify the core staff on this project, their role and what % of their time they will be working on the project.

These should match the names and roles in the budget spreadsheet.

Please provide 1 page CVs for these staff.

Name (First name, Surname)	Role	% time on project	CV attached below?
Dr Michelle Taylor	Project Leader	20	Checked
Dr Rui Vieira	Co-Project Leader	20	Checked
To be hired	Laboratory technician	100	Unchecked
To be hired	Laboratory research assistant	100	Unchecked

Do you require more fields?

Yes

Name (First name, Surname)	Role	% time on project	CV attached below?
Ms Rachel Downey	Researcher	8	Checked
Dr David Barnes	Researcher	4	Checked
Dr Chris Darby	Researcher	2	Checked
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	Unchecked
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	Unchecked
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	Unchecked
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	Unchecked
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	Unchecked


Please provide 1 page CVs (or job description if yet to be recruited) for the Project staff listed above as a combined PDF. Ensure CVs clearly correspond to the named individual and role above.

The limit for any single file uploaded as supporting materials with your application is 6MB. Please ensure documents are saved in PDF form where possible in order to minimise size.

CVs

 30/08/2018

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 pdf 1.63 MB

Have you attached all Project staff CVs?

Yes

Section 6 - Background & Methodology

Q12. Summary of Project

Please provide a brief summary of your project, its aims, and the key activities you to undertake. Please note that if you are successful, this wording may be used by Defra in communications e.g. as a short description of the project on GOV.UK. Please bear this in mind, and write this summary for a non-technical audience.

South Georgia & South Sandwich Islands Marine Protected Area is one of the world's largest protected areas, protecting vast deep-ocean areas that harbour diverse vulnerable marine ecosystems. Understanding if the MPA is a source or sink of juvenile benthic organisms, and its role regionally, is important for conservation management and only possible to groundtruth with genetic approaches. This project investigates deep-sea diversity and the genetic connectivity of habitat-forming organisms within the SGSSI MPA and across the wider South Atlantic region.

Q13. Background

What is the current situation and the problem that the project will address? How will it address this problem? What key OT Government priorities and themes will it address?

A central premise of marine protected area (MPA) networks is they are comprised of connected populations, with a flow of larvae, juveniles, and/or adults between separate MPAs. These networks together maintain viable, robust communities able to survive sustainably. However, there is currently little information on the connectivity (genetic linkages) of deep-sea populations, protected or otherwise, across the sub-Antarctic. This information is required to make sound management decisions to protect the most diverse and/or well-connected areas, thereby maintaining sustainability.

MPAs are being established by CCAMLR (Convention for the Conservation of Antarctic Marine Living Resources), and bordering countries and territories. The largest of these is the South Georgia and the South Sandwich Islands (SGSSI) MPA, established with a number of objectives, including sustainable protection of vulnerable benthic species such as long-lived cold-water coral gardens and sponge fields. This mixed-use MPA includes benthic-closed areas (BCA) that protect known areas of high benthic biodiversity; connectivity between BCAs, other areas of SGSSI, adjacent seamounts, and the wider Southern Ocean is unknown. This research will support UK government commitments under the Convention on Biological Diversity to establish "comprehensive, effectively managed and ecologically representative networks" of MPAs.

Q14. Methodology

Describe the methods and approach you will use to achieve your intended Outcome and Impact. Provide information on how you will undertake the work (materials and methods) and how you will manage the work (roles and responsibilities, project management tools etc). Give details of any innovative techniques or methods.

This project is divided into three main workstreams, which will be integrated to provide scientific advice to the UK and UKOT governments and contribute new information on deep benthic biodiversity to CCAMLR.

Workstream 1: Genetic connectivity of sessile benthic organisms (UoE).

The obtained specimens will be identified to species level where possible (usually in 90% of samples). Collected specimens will then be combined with previously collected (200+) samples from across the sub-Antarctic. The mixed quality of specimens, from varied sources and preservation methods (e.g. by-catch, museums, formalin-preserved specimens), means a targeted DNA library preparation methodology is ideal. One such method uses Non-coding Ultra-Conserved elements (UCEs); these are sections of DNA distributed throughout the genome that are highly conserved, yet have variable flanking regions, making them useful for addressing questions across a range of evolutionary scales, including population genomics. Using a probe library of existing UCEs we will extract variable sections of the genome as single-nucleotide polymorphisms (SNPs). This data will allow us to examine population structure and gene flow within and between sampled populations across the Antarctic region.

Workstream 2: Benthic camera and in situ data collection (Cefas & BAS).

This workstream contains two aspects of in situ identification of benthic organisms around SGSSI. Through

the deployment of drop cameras, we will undertake an assessment of deep-sea benthic species richness occurring within and outside BCAs around SGSSI. In addition, any coincidental by-catch of benthic sessile organisms on longlines deployed around SGSSI will be collected by on-board fisheries observers. Specimens will be catalogued, preserved, and sent to the UK (UoE). Species richness and diversity assessments will then be conducted via species-level identifications of by-catch specimens alongside identifications of species from deep-sea imagery. Morphological and photo identifications will be cross-referenced using samples and drop camera images collected from the same locations during a survey in February 2019.









Workstream 3: Dissemination and Outreach (Cefas, UoE, BAS).

Project outputs (created by all partners) will be shared with the UKOT Governments and CCAMLR where relevant through Cefas and BAS. Such information will further enable GSGSSI in making informed decisions on vulnerability of local deep-sea benthic habitats and their protection. Results will also be disseminated through peer-reviewed papers, scientific conferences (e.g. International Symposium on Deep-Sea Corals, Deep-Sea Biology Symposium, POLAR 2020), and fact sheets aimed at a non-scientific audience. This project will be engaging with the UK Blue Belt Programme and the Natural History Museum, via the existing Cefas/NHM partnership, where non-scientific audiences will be engaged. The donation of samples to NHM and associated fact sheets will enable a wider audience to learn about the benthic diversity of SGSSI and Antarctica.

Project management: Monthly meetings with main project partners (UoE, Cefas) to update on logistics, activities, results, and analyses will ensure the smooth exchange of information and data. Collaborators (Dr Barnes and Ms Downey) shall be included in project meetings every 3 months.

If necessary, please provide supporting documentation e.g. maps, diagrams etc., using the File Upload below.

The limit for any single file uploaded as supporting materials with your application is 6MB. Please ensure documents are saved in PDF form where possible in order to minimise size.

 <u>Letter to MTaylor re GSGSSI Project Support</u>	 <u>Sampling map</u>
 31/08/2018	 30/08/2018
 16:27:08	 16:56:17
 pdf 57.75 KB	 pdf 4.35 MB

Section 7 - Objectives, Stakeholders & Sustainability

Q15. Project Objectives

How does this project:

- **Deliver against the priority issues identified in the assessment criteria**
- **Demonstrate technical excellence in its delivery**
- **Demonstrate a clear pathway to impact in the OT(s)**

Deliver against the priority issues

This project addresses the following Darwin Plus Priorities for round 7:

- Delivering a Blue Belt of marine protection around the OTs
- Implementing National Biodiversity Action Plans

Rationale

The UK Government is committed to supporting long-term, evidence-based protection of marine environments and sustainable fisheries across the UKOTs and, as a signatory of the Convention on Biological Diversity, has a commitment to establish a “comprehensive, effectively managed and ecologically representative network” of MPAs. To do this it is necessary to understand the processes that underpin persistence and ecological stability; dispersal pathways and genetic linkages between different populations of the same species are crucial for this and are a central pillar of effective spatial management. Population genetic connectivity is now a widely accepted tool for establishing and managing MPAs, as it provides important insights into locations of source and sink populations, and the scale of marine planning that is necessary to maintain sustainable populations. This project will contribute information on benthic biodiversity and connectivity across the South Atlantic Antarctic region.

Activities

Benthic species richness assessments from already collected deep-sea images (drop camera) within the SGSSI, and those to be collected in an upcoming survey (RRS Discovery cruise, early 2019), will be used to identify the distribution of benthic communities and their diversity across the SGSSI area.

Genetic connectivity analyses will be undertaken on already collected specimens and those to be collected in two upcoming expeditions (one to the Larsen C ice shelf and one to the SGSSI in early 2019) to investigate population connectivity across SGSSI and the wider South Atlantic Antarctic region.

Pathways to impact

CCAMLR is committed to establishing a network of MPAs in the Southern Ocean, and up-to-date knowledge of the genetic connectivity and diversity of vulnerable benthic marine organisms across the sub-Antarctic is therefore essential in making informed decisions about management of a network of Antarctic MPAs. The outcomes of this project will feed directly to CCAMLR (via Cefas and BAS) to better inform MPA designation and management processes and into wider regional management decisions, such as the SGSSI MPA 5-year review process through reports submitted to the government of SGSSI.

Technical Excellence in Delivery

The partnership between the UoE, Cefas, and the British Antarctic Survey is key to this project's success and represents excellent value for money. Cefas brings practical, field and management skills, UoE brings complementary genetic research experience, and the British Antarctic Survey expertise in the region's biodiversity. Cefas has a well-established relationship with the UKOT Governments and an excellent record in providing evidence-based advice to support the government of SGSSI and FCO on issues related to the Southern Ocean and its fisheries. The legacy of this project is ensured by the continuing work between Cefas and UKOT Governments. Cefas also has substantial experience in delivering Darwin Plus projects.

Q16. Project Stakeholders

Who are the stakeholders for this project and how have they been consulted (include local or host government support/engagement where relevant)? Briefly describe what support they will provide and how the project will engage with them.

Stakeholder 1 - Government of SGSSI (GSGSSI)

Cefas has consulted GSGSSI in the preparation of this proposal and they have endorsed this project (see letter of support), the outcomes of which will feed into SGSSI MPA research and monitoring plans through reports. Cefas is in a strong position to do this as it regularly provides the GSGSSI with technical and scientific advice and support, including research and monitoring within the SGSSI MPA.

Stakeholder 2 - Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)

Since 2012, Cefas have been providing the Foreign and Commonwealth Office (FCO) with technical and

scientific advice in relation to the Antarctic fisheries managed internationally by CCAMLR. Cefas and UoE will be engaging with the GSGSSI by providing a report of project results. Cefas also heads the UK's scientific delegation to CCAMLR, with Dr Chris Darby serving as the UK Chief Scientist to CCAMLR, meaning this project will engage with CCAMLR through this route.

Q17. Institutional Capacity

Describe the lead organisation's capacity (and that of partner organisations where relevant) to deliver the project.

University of Essex

Dr Taylor has researched Antarctic deep-sea benthic ecosystems for over 10 years. She uses genomics to answer ecological and evolutionary questions and is considered a deep-sea coral expert. Dr Taylor has already extracted DNA from relatively old (~25 years in ethanol) samples and newer specimens to check feasibility and results were excellent. The UCE technique is novel, having only been established in Taylor lab in 2018 (the first ecological UCE protocol in the UK).

Overall, the University of Essex currently administers more than 500 separate research projects with a value in excess of £30m per annum, and so has considerable experience in managing and successfully concluding projects and grant research. The UoE has previously completed one Darwin project (EIDPR102).

Cefas

Cefas is an Executive Agency of the UK Government's Department for Environment, Food and Rural Affairs (Defra). Cefas is internationally renowned in applying world class science that is essential to a sustainable use and exploitation of resources around UK and overseas. Cefas has a range of resources and expertise with over 500 staff based in two UK laboratories, an ocean-going research vessel, and over 100 years of experience. Many Cefas scientists are leaders in their fields and advisors on international bodies such as the International Council for the Exploration of the Sea (ICES), and contributing to UK's scientific delegation to CCAMLR. Cefas is also involved in hundreds of successful marine and freshwater science and technology projects each year, working with a diverse range customers and partners, both nationally and internationally.

Cefas has successfully completed previous Darwin Plus funded projects (DPLUS026 and DPLUS045), and is working towards the delivering of the DPLUS067 and DPLUS079.

BAS

British Antarctic Survey is a component of the UK Government's Natural Environment Research Council (NERC). BAS is a five star research institute and delivers world-class polar-focused science and advises UK and other governments on climate and polar science issues. BAS has significant relevant expertise running ocean-going research vessels in the Atlantic-sector of the Southern Ocean region and two research stations in the South Georgia archipelago. BAS contributes to the International Council for the Exploration of the Sea (ICES) and UK's scientific delegation to CCAMLR and has been strongly involved in South Georgia and South Sandwich Island science for more than half a century. The BAS scientist involved in this project has published a number of high profile research papers on South Georgia marine biodiversity, its conservation and potential threats.

BAS has successfully completed previous Darwin funded projects (18-019, EIDCR-013 and DPLUS021), and is working towards delivering DPLUS071.

Q18. Sustainability

How will the project ensure benefits are sustained after the project has come to a close? If the project requires ongoing maintenance or monitoring, who will do this and how will it be funded?

Broadly, as Dr Taylor aims to understand the drivers of diversity (species and genetic) across the deep-sea, specifically using seascape genomics (where genomic connectivity is combined with environmental parameters) this research will be built upon after this project timeline is completed as results will form the basis of grant applications to undertake future sub-Antarctic seascape genomic projects.

Cefas is committed to support UKOTs beyond the project lifetime, developing effective management, monitoring, and enforcement strategies that are adequate to face the threats to UKOTs marine ecosystems. This project will help to inform ecosystem-based management decisions to protect locally unique biodiversity.

Outcomes and information from the completion of this project will be embedded in the UK Blue Belt Programme and the legacy management within, as well as provided to GSGSSI.

Samples collected during this project will be donated to the NHM for curation, which will allow future researchers to study them. Genetic data will be submitted to Genbank and species records to be submitted to online repositories (GBIF, Worms etc).

Section 8 - Funding and Budget


Q19. Budget

Please complete the appropriate Excel spreadsheet, which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet. Note that there are different templates for projects requesting over and under £100,000 Darwin Plus budget

- **R7 D+ Budget form for projects under £100,000**
- **R7 D+ Budget form for projects over £100,000**


Please refer to the Finance Guidance for Darwin and IWT for more information.

N.B.: Please state all costs by financial year (1 April to 31 March) and in GBP. Budgets submitted in other currencies will not be accepted. Use current prices – and include anticipated inflation, as appropriate, up to 3% per annum. The Darwin Initiative cannot agree any increase in grants once awarded.

 **darwin-plus-round7-budget-over-100k_REO (**

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Q20. Co-financing

Are you proposing co-financing?

Yes

Secured

Provide details of all funding successfully levered (and identified in the Budget) towards the costs of the project, including any income from other public bodies, private sponsorship, donations, trusts, fees or trading activity, as well as any your own organisation(s) will be committing.

(See "Finance for Darwin & IWT" and the "Guidance for Applicants" documents)

In budget - Dr Taylor's attendance at the Deep-sea coral symposium (Columbia, 2019), where preliminary data from this project will be presented, will be covered by a NERC International Opportunities Fund grant (XGBP). Attendance at the 2021 Deep-Sea Biology Symposium, where main results will be presented, will be covered by internal University of Essex finance (location to TBD, approximately XGBP).

Some overhead costs for UoE and Cefas are written as matched confirmed funding.

Not in budget - An IAA Challenge grant (XGBP) is seed-funding for this project and will cover initial DNA extractions, testing of protocols etc; this will commence in Oct 2018.

Unsecured

Provide details of any co-financing where an application has been submitted, or that you intend applying for during the course of the project. This could include co-financing from the private sector, charitable organisations or other public sector schemes.

Date applied for	Donor Organisation	Amount	Currency code	Comments
04 January 2019	NERC Standard grant		GBP	To look at seascape genomics around Antarctica – adding environmental data to genomic data
01 October 2019	AIRES / PhD fellowship		GBP	PhD student to research seascape genomics
No Response	No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response	No Response

Please give brief details including when you expect to hear the result. Please ensure you include the figures requested in the Budget Spreadsheet as Unconfirmed funding.

NERC standard grant results should be available by Sept 2018.

Do you require more fields?

No

Section 9 - Financial Controls, Value for Money & Open Access

Q21. Financial Controls

Please demonstrate your capacity to manage the level of funds you are requesting. Who is responsible for managing the funds? What experience do they have? What arrangements are in place for auditing expenditure?

To ensure that the resources of the project are utilised, the UoE has in place an effective grant management system to monitor grant expenditure. A member of the Post Award team at the UoE will oversee the financial administration of the project funds. Cefas will be responsible for managing the project funds directly allocated to them via a subcontract., All Cefas project expenditure will be approved by the Project Sponsor or a member of the Cefas Senior Management Team. The Cefas project manager has over 14 years of experience managing projects and project budgets, ranging from £Xk to £X k projects for Government and commercial customers, and varying complexity.

Auditors will be consulted and secured to undertake an audit of this project towards the end of its life.

Q22. Financial Management Risk

Explain how you have considered the risks and threats that may be relevant to the success of this project, including the risks of fraud or bribery.

The University of Essex's Financial Regulations provide sound arrangements for internal financial management, accounting and control, and thus maintain appropriate anti-fraud measures. The University also has a clear anti-bribery policy that all staff and officials must adhere to.

Cefas has an anti-fraud policy which sets out a commitment to eliminate it amongst staff, contractors and suppliers. As a UK government agency Cefas adheres to the Bribery Act 2010.

Key risks identified in this project include (but not limited to):

- RSS Discovery survey work will be reviewed and risk assessed as part of Cefas' HSEQ policy and UoE safety whilst working abroad policy to ensure the safety of staff at all times. A standard operating procedure (SOP) will be produced for the survey and the vessel will have safety checks undertaken by a qualified member of Cefas staff.

- Considerations regarding weather in the survey region will be monitored as part of the check list for off-shore operations. Other technical risks will be considered and where necessary, suitable mitigation put in place.

Q23. Value for money

Please explain how you worked out your budget and how you will provide value for money through managing a cost effective and efficient project. You should also discuss any significant assumptions you have made when working out your budget.

The project budget was estimated based on the project team's experience undertaking similar work. Both UoEssex and Cefas have experience in managing similar projects, including previous Darwin-funded projects (Cefas), allowing the project team to deliver the project in a cost-effective and realistic budget, thus providing good value for money.

Collecting specimens from the deep-sea on a dedicated expedition to Antarctic would cost at least 800,000GBP; the methodology of collecting rare coral specimens from by-catch, under the CCAMLR Scheme

of International Scientific Observation allows us to maximise outputs from previous projects, and extend coverage of sampling locations, making this economically efficient. The non-SGSSI specimens, complementing specimens to be collected as part of this project, have been collected on several sea-going expeditions, each costing over XGBP each. The regional scope of this project would not be possible without these specimens making this project great value for money.

Deep-water camera work will be conducted under on-going projects, allowing the total cost of this project to be substantially reduced.

Dr Dave Barnes (BAS) and Ms Rachel Downey are also providing weeks of time in kind to identify specimens and photos for diversity analyses.

Q24. Outputs of the project and Open Access

All outputs from Darwin Plus projects should be made available on-line and free to users whenever possible. Please outline how you will achieve this and detail any specific costs you are seeking from Darwin Plus to fund this.

Species records to be submitted to BODC, GBIF, OBIS, and WoRMS, and a collection of samples will be donated to the Natural History Museum, under an existing Cefas/NHM partnership.

Genomic information will be submitted to GenBank within 18 months of the end of the project and therefore freely available globally. All bioinformatics coding will also be made available through publication (appendices) or on the Taylor lab website.

All publications will be made freely available through the UoEssex paper repository.

As an Executive Agency of Defra, Cefas complies with UK Government requirements to make all data available for re-use. Cefas has an internal data management system which published data directly on its Open Access Cefas Data Hub (<https://www.cefas.co.uk/cefas-data-hub>). From there the data are distributed to UK Data Archive Centres (DAC) for marine data by the Marine Environmental Data and Information Network (MEDIN). Cefas itself is a DAC for fisheries data. Data supplied to DACs can also be picked up by global data centres such as GBIF, thereby increasing the visibility of the data.

Outputs from this project will be provided to the Government of SGSSI and CCAMLR.

Q25. Safeguarding

See Guidance Note 3.7

Projects funded through Darwin Plus must fully protect vulnerable people all of the time, wherever they work. In order to provide assurance of this, we would like projects to ensure they have the appropriate safeguarding policies in place. Please check the box to confirm you have relevant policies in place at that these can be available on request.

Checked

Section 10 - Logical Framework

Q26. Logical Framework

Darwin Plus projects will be required to report against their progress towards their expected Outputs and Outcome if funded. This section sets out the expected Outputs and Outcome of your project, how you expect to measure progress against these and how we can verify this.

Annex D and Annex E in the Guidance Notes provides helpful guidance on completing a logical framework, including definitions of the key terms used below.

Impact:

To provide the GSGSSI and CCAMLR with new information on deep benthic ecosystems along the South Atlantic Antarctic Region allowing them to make informed decisions for the MPA review process.

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions
<p>Outcome: A better understanding of the genetic connectivity of deep-sea coral communities across the SGSSI and sub-Antarctic region.</p>	<p>0.1 Management considerations based on better informed science of genetic connectivity. 0.2 Better understanding of the biodiversity and community structure of sub-Antarctic deep-water ecosystems.</p>	<p>0.1 Report to GSGSSI for 5-year MPA review process. 0.2 Working Group paper to CCAMLR with contributing information on biodiversity in the Atlantic Sector of the Convention Area.</p>	<p>GSGSSI remains committed to the sustainable exploitation of marine resources and protection of vulnerable habitats. Suitable candidates for research assistant jobs are sourced.</p>
<p>Output 1: Better informed management of SGSSI MPA with the provision of deep-sea connectivity information.</p>	<p>1.1 Samples collected, preserved, catalogued, and sent to the UK. 1.2 Genetic analysis conducted. 1.3 Genetic information is provided to GSGSSI. 1.4 Genetic information is available for advice in the protection of vulnerable ecosystems.</p>	<p>1.1 Samples available for genetic analysis. 1.2 Genetic data available for bioinformatic analysis. 1.3 Report to GSGSSI about the connectivity of SGSSI benthic closed areas and other regional deep-sea areas. 1.4 Working Group paper to CCAMLR about the connectivity of deep-sea areas across the Atlantic Sector of the Convention Area.</p>	<p>Weather allows data collection. Samples arrive in UK in sufficiently good condition.</p>

Output 2: Genetic data and species identification freely available	2.1 Genetic data submitted to Genbank – a global repository of genetic data.	2.1 Data made available online at: https://www.ncbi.nlm.nih.gov/genbank/	Samples arrive in UK in sufficiently good condition.
	2.2 Coral species identifications submitted to GBIF and therefore freely available.	2.2 Data made available at: https://www.gbif.org/	
	2.3 New species descriptions submitted to WoRMS.	2.3 Records made available on WoRMS database (http://www.marinespecies.org/)	

Output 3: Understanding the role of habitat heterogeneity in shaping deep benthic biodiversity.	3.1 Biodiversity analyses are completed, and shared with GSGSSI and CCAMLR.	3.1 Report to GSGSSI and CCAMLR about deep benthic ecosystems in the Atlantic Sector of the Convention Area.	A drop camera and trawl survey on the RRS Discovery to investigate the SGSSI benthic diversity was possible. Need for better understanding to support planned updates to the Fisheries Ordinance continues
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Output 4: . Dissemination of information about deep-sea habitats around SGSSI and the wider sub-Antarctic.	4.1 Peer-review publications about the connectivity across areas of the SGSSI and wider sub-Antarctic region.	4.1 Publication prepared and ready to submit. Once submitted tweets, news stories, and other outreach will be tracked to gauge impact.	The above science is completed successfully.
	4.2 Peer-review publication on the deep-water biodiversity of the SGSSI region.	4.2 Open access peer-reviewed publication.	
	4.3 Donation of samples to the NHM.	4.3 Collection of specimens available to the wider community. Engagement with non-scientific community (e.g. "Science Uncovered", European Researchers' Night).	
	4.4 Production of fact sheets about the biodiversity and pressures in the wider sub-Antarctic Atlantic region.	4.4 Fact sheets available to the stakeholders and wider public, including through the NHM.	

Output 5:*No Response**No Response**No Response**No Response*

Do you require more Output fields?**It is advised to have less than 6 Outputs since this level of detail can be provided at the Activity level.** No**Activities****Each activity is numbered according to the Output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1. Each new activity should start on a new line.**

- 1.1 Collection and cataloguing of deep-sea coral samples and transported to the UK.
- 1.2.1 Specimens identified to highest possible level by Dr Taylor.
- 1.2.2 Research technician hired half way through year 1 to undertake genetic laboratory work.
- 1.2.3 Specimens of target species have DNA extracted, quality controlled, UCE libraries prepared, DNA sequenced
- 1.2.4 Research assistant hired half way through year 2 to undertake bioinformatics analyses.
- 1.2.5 Connectivity of locations across SGSSI and wider sub-Antarctic analysed, and population structure investigated.
- 1.3 Results written into a report for GSGSSI.
- 1.4 Results written into a report for CCAMLR.
- 2.1.1 Genetic data formatted for Genbank and species identification and metadata formatted for GBIF.
- 2.1.2 Genetic data submitted to Genbank and species information to GBIF for quality control.
- 2.2 Species records submitted to GBIF, WoRMS, OBIS and BODC.
- 2.3 New species descriptions written for peer-review publication (e.g. Zootaxa, Polar Biology) and submitted to WoRMS.
- 3.1 Deep sea biodiversity analysis conducted and integrated into reports to GSGSSI and CCAMLR.
- 4.1 Genomic connectivity publication written for submission to peer-review journal such as Molecular Ecology, BMC Evolutionary Biology etc.
- 4.2 Diversity / biogeography of deep sea biodiversity of the SGSSI region publication written for submission to peer review journals such as Deep Sea Research I, Polar Biology, Marine Ecology Progress Series.
- 4.3 Donation of samples to NHM and disseminate results to the wider audience.

Section 11 - Implementation Timetable

Q27. Provide a project implementation timetable that shows the key milestones in project activities**Please complete the Excel spreadsheet linked below to describe the intended workplan for your project.****Darwin Plus Implementation Timetable****Please add columns to reflect the length of your project.****For each activity (add/remove rows as appropriate) indicate the number of months it will last, and fill/shade only the quarters in which an activity will be carried out.**

Once you have completed your implementation timetable please upload it using the file upload tool below.

📄 **Implementation Timetable**

📅 30/08/2018

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📎 xlsx 11.1 KB

Section 12 - Monitoring and Evaluation

Q28. Monitoring and evaluation (M&E) plan

Describe, referring to the Indicators above, how the progress of the project will be monitored and evaluated, making reference to who is responsible for the project's M&E.

Darwin Initiative projects are expected to be adaptive and you should detail how the monitoring and evaluation will feed into the delivery of the project including its management. M&E is expected to be built into the project and not an 'add' on. It is as important to measure for negative impacts as it is for positive impact.

Work schedule and time management will be monitored through monthly meetings with project partners (UoE and Cefas).

Quarterly meetings with project partners and collaborators will ensure the maintenance of data and information flow between all partners.

The Research & Enterprise Office (UoE) supports the PI throughout the lifecycle of the grant, which includes administering the grant, contracts, monitoring grant expenditure and reporting to the funder, knowledge exchange and maximising impact of research findings.

Internal finances are managed in accordance with the university's Financial Regulations – expenditure is checked and authorised by the person(s) authorised in the department/school and claimed against the cost code set-up for the grant. The Post-Award team monitor expenditure against the cost code, hold records of receipts, check expenditure is in accordance with grant conditions and produce monthly reports. The PI is responsible for overall project management and finances with the support of the UoE Research & Enterprise Office. Research Funding Managers and Post-Award may attend meetings appropriate to them – regular interactions take place as and when necessary.

Cefas project managers operate in accordance with Cefas's ISO 9001 certified quality management system. The project manager will support the Cefas Principal Investigator (Dr Vieira) by holding regular reviews to monitor progress. The above list of Indicators and Means of Verification will form part of a monthly UoEssex and Cefas checklist that will be completed to track progress against milestone delivery, budget, and quality. This information will also be communicated to all UKOT stakeholders by the project partners, who has responsibility for all stakeholder communications.

Project PIs will have responsibility for the day-to-day delivery by their respective project teams and, ultimately, the quality of the project outputs.

Where the reviews identify new or increased risks to the project in terms of delivery, budget or resourcing,

the project managers and PI will explore options to revise the project plan to achieve the best outcome for the project. Any significant variations of the project plan in terms of delivery or budget, will be addressed through a "Contract Variation Request" submitted to Darwin Plus.

Number of days planned for M&E	36.00
<hr/>	
Total project budget for M&E (this may include Staff and Travel and Subsistence Costs) (£)	
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Percentage of total project budget set aside for M&E (%)	4.43
<hr/>	

Section 13 - Certification

Certification

On behalf of the

trustees

of

University of Essex

I apply for a grant of

£278,231.00

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful.

(This form should be signed by an individual authorised by the applicant institution to submit applications and sign contracts on their behalf.)

- I enclose one page CVs for key project personnel and letters of support.**
- I enclose the most recent 2 sets of signed and audited/independently verified accounts.**

Checked


Name	Mrs Shereen Anderson
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Position in the organisation	Deputy Director (Research Support)
<hr/>	

Signature (please upload e-signature)

 [SA Signature](#)

 31/08/2018

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Date

31 August 2018

Section 14 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance documents, including the "Guidance Notes for Applicants" and "Finance Guidance".	Checked
I have read, and can meet, the current Terms and Conditions for this fund.	Checked
I have provided actual start and end dates for this proposed project.	Checked
I have provided a budget based on UK government financial years i.e. 1 April - 31 March and in GBP.	Checked
I have checked that the budget is complete, correctly adds up and have included the correct final total at Q7.	Checked
The application has been signed by a suitably authorised individual.	Checked
I have included a 1 page CV for all the Project staff (listed at Q11) on this project, including the Project Leader.	Checked
I have included a letter of support from the applicant organisation, main partner(s) organisations and the relevant OT Government.	Checked
I have uploaded a signed copy of the last 2 years annual report and accounts for the lead organisation, or provided an explanation if not.	Checked
I have checked the Darwin Plus website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on GOV.UK.	Checked

We would like to keep in touch! Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under the Darwin Initiative, Darwin Plus and our sister grant scheme, the IWT Challenge Fund. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our quarterly project newsletter. You are free to unsubscribe at any time.

Checked

Data protection and use of personal data

Information supplied in this application form, including personal data, will be used by Defra as set out in the latest copy of the Privacy Notice for Darwin, Darwin Plus and the Illegal Wildlife Trade Challenge Fund available **here**. This Privacy Notice must be provided to all individuals whose personal data is supplied in the application form. Some information, but not personal data, may be used when publicising the Darwin Initiative including project details (usually title, lead organization, location, and total grant value) on the GOV.UK and other websites.

Information relating to the project or its results may also be released on request, including under the 2004 Environmental Information Regulations and the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality nor will we act in contravention of our obligations under the General Data Protection Regulation (Regulation (EU) 2016/679).